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Document Register

Project:
Cork Co Co.
An Tamhnaigh,
Clonakilty,
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WDG Job No.: 22055
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P1 - Information	
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Project: Proposed Development at An Tamhnaigh, Clonakilty, Co. Cork

Project No: 22055

Document Title: Civil Engineering Report

Document No: 22055-ZZ-XX-XX-XX-RP-WDG-CE-001

Date: October 2023

Date	Revision	Status	Originator	Checked	Approved
08/11/2023	A	P	IR	MW	MW

Table of Contents

1.0 Introduction

Walsh design group (WDG) were appointed by Cork County Council to produce a Civil Engineering Report as part of a planning application for the proposed residential development at An Tamhnaigh, Clonakilty, Co. Cork.

The proposed development on the site would consist of 35 dwelling units including 15 townhouses and 20 duplex apartment units. A new vehicular access to the site is proposed off the access road to the neighbouring Beechgrove Estate. The proposed development also provides for all landscaping and boundary treatments; public lighting and all site development works, including alterations to site levels.

This report is particularly concerned with the following engineering services:

- Flood Risk Assessment,
- Road design,
- Wastewater Drainage,
- Surface Water Drainage & Drainage Impact Assessment,
- Water Supply.

This report should be read in conjunction with the following accompanying drawings submitted with the planning application:

- 22055-ZZ-XX-XX-XX-DR-WDG-CE-001 Site Layout – Roads & Levels,
- 22055-ZZ-XX-XX-XX-DR-WDG-CE-002 Site Layout - Drainage,
- 22055-ZZ-XX-XX-XX-DR-WDG-CE-003 Site Layout – Water Supply,
- 22055-ZZ-XX-XX-XX-DR-WDG-CE-500 Surface Water Drainage Typical Details,
- 22055-ZZ-XX-XX-XX-DR-WDG-CE-501 Irish Water Standard Details – Wastewater,
- 22055-ZZ-XX-XX-XX-DR-WDG-CE-502 Irish Water Standard Details – Water Supply (Sheet 1 of 2),
- 22055-ZZ-XX-XX-XX-DR-WDG-CE-503 Irish Water Standard Details – Water Supply (Sheet 2 of 2),
- 22055-ZZ-XX-XX-XX-DR-WDG-CE-504 Construction Details,
- 22055-ZZ-XX-XX-XX-DR-WDG-CE-904 Site Layout – Areas to be taken in Charge.

1.1. Site Description

This site is located at An Tamhnaigh, Clonakilty, Co. Cork. The site area within the application redline boundary is 0.99ha. The ITM grid coordinates at the approximate centre of the site are E537436, N541553.

Figure 1: Site Location Map

Whilst the land is mostly grass covered at this time it is evident from older satellite photos that this site was used to store soil, cut from works on the adjacent school in 2012-2013. It was later used as a site carpark for the construction works on the neighbouring estate to its west. Currently, there is a site compound set up on the site for the extension works to the school building and a site walk over has shown evidence of more spoil being deposited on the site and the site investigation has confirmed that there is a significant volume of made ground on the site.

Figure 2: Site Location on Satellite Image of lands to the west of Clonakilty town centre (Google Earth)

The ground slopes upwards from the access point off the public road to a crown near the middle of the site, it then slopes down again towards the north end of the site. The lowest point on the site is 14.30m in the SE next to the public road. This rises to a high point of 24.10m just north of the centre of the site.

The western boundary of the site is formed by the boundary fence of an adjoining estate. The northern boundary is formed by the rear garden wall and hedge of 2 private houses. The eastern boundary is with the grounds of the Gaelscoil Mhichíl Uí Choileáin and the southern boundary is with the public roadway.

Figure 3: Site Location on Satellite Image of An Tamhnaigh (Google Earth)

2.0 Flood Risk

A desktop study of the history of flooding and the probability of flooding at the site was carried out with the intention of assessing the flood risk in accordance with *The Planning System and Flood Risk Management Guideline*s as published by the Department of the Environment, Heritage and Local Government give guidelines on flood risk and development planning.

The guidelines recommend a precautionary, sequential approach to assessing and managing flood risk and, where possible, to avoid development of sites that are at risk.

The sequential approach to flood risk assessment relies on the identification of Flood Zones. These are geographical areas within which the likelihood of flooding is in a particular range. There are three types of flood zones, defined in the guidelines as follows:

Flood Zone A – Where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);

Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1:100 for river flooding and between 0.1% or 1 in 1000 and 0.5% or 1:200 for coastal flooding);

Flood Zone C - where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood zone C covers all areas of the plan which are not in Zones A or B.

When the flood zone applicable to the site has been identified the guidelines describe the developments that would be appropriate within that zone, considering the level of flood risk involved.

2.1. Flood Maps

The OPW's online resource, Floodmaps.ie, was reviewed to assess the history and probability of all types of flooding at the proposed development site. Figure 4 shows an extract from the online flood map of the area around Clonakilty Town with the proposed site outlined in red.

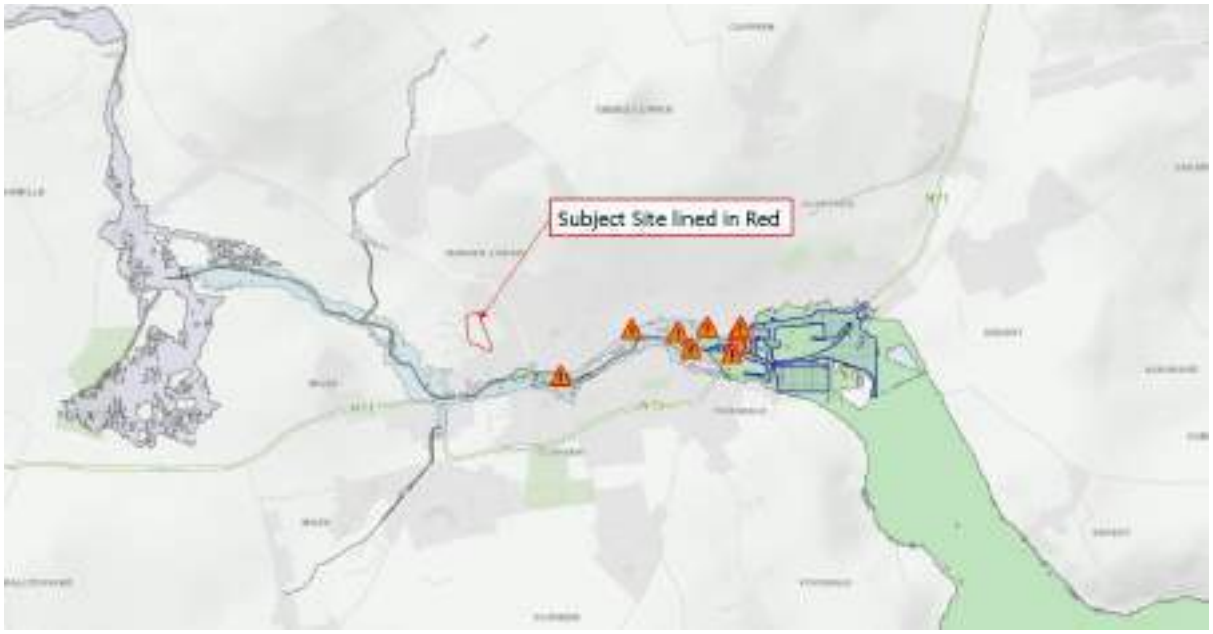


Figure 4: Floodmaps.ie extract map of development site and surrounding area.

The interactive flood map allows the following layers to be switched on to illustrate whether any type of flooding impacts an area:

- CFRAM River Flood Extents with AEP of 10%, 1% and 0.1%,
- CFRAM Coastal Flood Extents with AEP of 10%, 1% and 0.1%,
- National Indicative Fluvial Mapping – Present day with low and medium probability,
- GSI Groundwater flooding probability Maps with low, medium and high probability,
- Past flood events – indicated with hazard signs on the map and the extent of the recorded flood events shown with a blue outline and dotted hatch pattern.

All of these layers are switched on in the extract shown in Figure 4. The general area around the site was included and mapped in the Southwestern CFRAM Study and the map showing the current scenario, all probability fluvial flood extents (Map no. MMD/296235/E/DR/I20HCY27/EXFCDEXF/F2/03) is included in Appendix E to this report.

Flooding in the Clonakilty area occurs primarily along the banks of the Feagle River and in the town itself due to a combination of fluvial and coastal influences. It is clear from the available CFRAM data and historic records that the proposed development site at An Tamhnaigh has no recorded history of flooding of any kind. It is also clear that the site lies outside any areas that have a probability of flooding in any event, whether fluvial, coastal or groundwater, up to and including a 1 in 1000 year storm. This places the site in flood zone C where residential development is appropriate without requiring a justification test.

3.0 Street Design

The layout of the proposed streets and how they connect with the public access road to the Beechgrove estate is shown on WDG drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-001. Vehicular access is not proposed to the adjoining, Beechgrove Estate but pedestrian connectivity shall be provided in the north of the site and along the existing 1.8mwide footpath outside the proposed development entrance.

3.1. Design Guidelines

The proposed streets within the estate have been designed in substantial compliance with the following:

- Design Manual for Urban Roads and Streets (DMURS) - Dept. of Environment and Dept. of Transport Tourism and Sport-2019,
- Recommendations for Site Development Works for housing areas – DOE 1998,

3.2. Street Hierarchy

There are no *Link* streets or 'through roads' proposed in the development. The proposed streets would be considered as local streets in the DMURS hierarchy shown in Table 1. Local streets are described as streets that provide access within communities and to *Arterial* and *Link* streets. The Beechgrove access road could be described as local road which provides connection between the residential area and School and the regional Link R588, Fernhill Road. The R588 connects to Clonakilty Town centre as well as the N71 arterial route.

DMURS Description	Roads Act/NRA DMRB	Traffic Management Guidelines	National Cycle Manual
Arterial	National	Primary Distributor Roads	Distributor
Link	Regional (see note 1)	District Distributor Local Collector (see Notes 1 and 2)	Local Collector
Local	Local	Access	Access

Notes

Note 1: Larger Regional/District Distributors may fall into the category of Arterial where they are the main links between major centres (i.e. towns) or have an orbital function.

Note 2: Local Distributors may fall into the category of Local street where they are relatively short in length and simply link a neighbourhood to the broader street network.

Table 1: DMURS Table 3.1 - Terminology used in DMURS compared with other publications.

It is proposed to use two street widths within the development in order to create an internal hierarchy letting road users know when they are leaving the spine streets and entering residential cul-de-sacs through the use of narrower carriageways and reduced junction radii.

The local 'spine' street, running through the development in the north/south direction shall have a carriageway width of 5.5m and the local residential streets, off the spine street, shall have a carriageway width of 5.0m unless there is perpendicular parking off both sides, in which case the carriageway width shall be 6.0m to allow for manoeuvrability of parking vehicles. The proposed local street carriageway widths are in keeping with DMURS Table 4.55 (excerpt shown in Figure 5). All proposed 5.5m wide streets shall be served by at least one footpath with a minimum width of 2.0m and all estate streets shall have a sign posted speed limit of 30km/h.

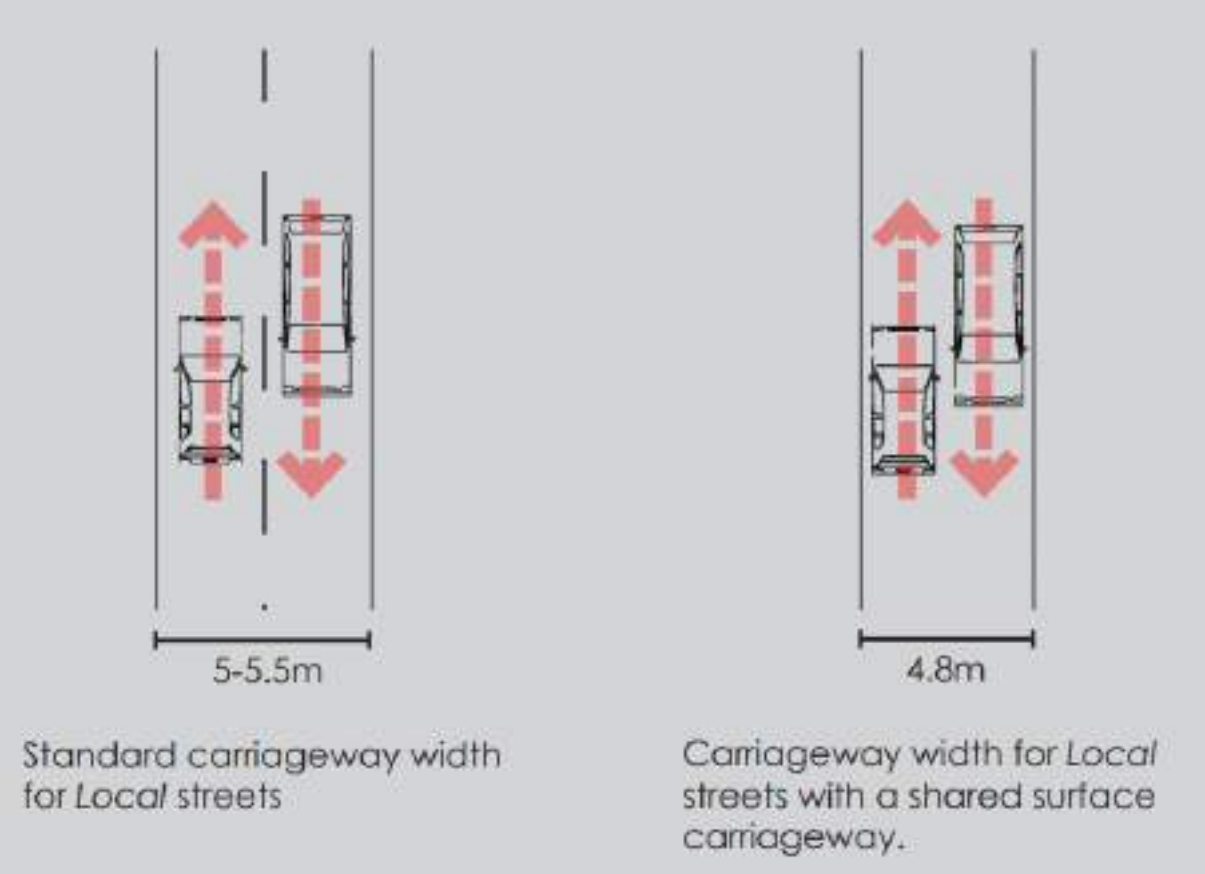


Figure 5: Excerpt from DMURS Table 4.55

3.3. Shared surfaces and Surface Materials

DMURS encourages the use of raised and shared surfaces which promote integration between pedestrians, cyclists, and drivers. This has been shown to be effective where pedestrian activities are high and vehicle movements are mainly due to lower-level access requirements and circulatory purposes.

DMURS recommends that, where design speeds of 30km/h are desired, periodic changes in the colour and/or texture of the street surfaces should be employed. In this development, shared surfaces are introduced through raised junctions and raised tables and the use of material changes in the street surface treatments.

Shared surfaces in the form of raised junctions and raised tables for traffic calming will be finished in bituminous surfacing with beige coloured chippings to differentiate these features

from the normal street surfaces finished in standard black bituminous surfacing, see WDG drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-504 for construction details.

The proposed locations and extent of these features are shown on WDG drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-001.

3.4. Traffic Calming

It is proposed to limit the vehicle speeds within the development to 30km/h using standard signage and traffic calming measures as recommended by DMURS and the Traffic Management Guidelines (DoELG 2003) to help improve driver behaviour and reduce vehicle speeds.

The more visible traffic calming measures proposed are raised tables and raised junctions with the proposed locations shown in WDG drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-001. These are positioned to reduce the lengths of straight and level streets that would allow a build-up of vehicle speed while also providing designated non-signalised, crossing points for pedestrians.

Both raised junctions and tables would be constructed in accordance with Diagram 6.34 of The Traffic Management Guidelines. The street level is raised 75mm and finished using bituminous surfacing with beige coloured chippings with 1:15 ramps at each side painted with white triangles (M112) to warn drivers of the elevation change (see Figure 6).

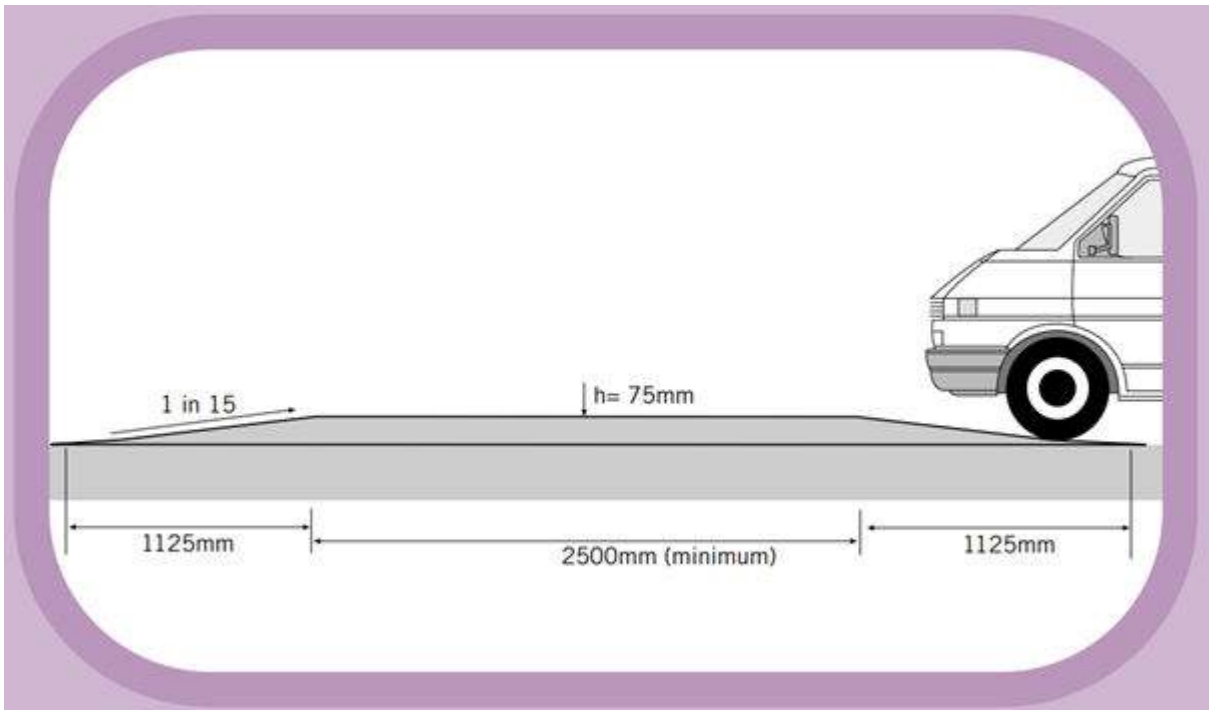


Figure 6: Traffic Management Guidelines, Diagram 6.34 - Raised Tables

Further measures to aid in traffic calming include keeping carriageway widths to a minimum and reducing corner radii as described in Sections 3.2 and 3.6.

3.5. Street Gradients

In accordance with DMURS guidelines, streets have been limited as far as possible, to gradients of 5% or less. The spine street between the entrance from the Beechgrove access Road and the residential area of the development, however, shall have a slope of 10% for a distance of approximately 45m.

The 10% gradient was introduced in order to avoid the excessive volumes of cut that would be required to lower the upper level of the site and there is not enough space to avoid the gradient by the road climbing at more of an angle to the natural ground slope. This section of the road is for vehicular access only and a separate footpath shall be provided for pedestrians, in accordance with Cork County Council's Residential Estates Design Guide (2011), at a slope of 1:20. It is proposed to construct the left side of this steeper section of road with a high friction/anti-skid surface treatment by Arkil (or similar approved) as it approaches the junction in order to prevent skidding and reduce braking distances, see Figure 7.

Figure 7: High friction/Anti-skid surfacing on a steeply sloped road approaching a junction.

This approach was discussed and agreed with the Local Authority Engineer and Estates Engineers prior to submitting the planning application.

The entrance road shall have a maximum slope of 2% for a distance of 7.0m from the public road edge in accordance with 'Recommendations for Site Development Works for Housing

Areas' (DoELG 1998). All proposed streets shall have a cross fall of 2.5%. Vertical alignment has been carefully considered to minimise the amount of cut and fill on site.

3.6. Corner Radii

According to DMURS section 4.3.3, reducing corner radii will significantly improve pedestrian and cyclist safety at junctions by lowering the speed at which vehicles can pass through corners and increasing the inter-visibility between users. At tighter corner radii vehicle and cyclist speeds are more compatible.

The majority of the junctions between local streets within the proposed development have corner radii of 1.0 – 2.0m. This is considered to be acceptable in residential developments where design speeds are low, and movements of larger vehicles are infrequent. The junction with the Beechgrove Access Road has radii of 3.0m to allow larger vehicles to enter and exit the wider road safely.

3.7. Entrance Sightlines

WDG drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-001 includes sightlines drawn at the proposed development's entrance. The sightlines illustrate that a driver leaving the development has a clear view to the near side road edge to the west for at least 45m from a setback of 2.4m from the inside edge of the carriageway. To the east, a clear 45m sightline is available to the centre of the Beechgrove Access Road which is marked with a solid white line on the eastern approach to the school entrance.

It is assumed that the Beechgrove Access Road has a speed limit of 50km/h and the safe stopping distance (SSD) on a non-bus route with a 50km/h speed limit is 45m according to Table 4.2 of DMURS (2019), see Table 2.

SSD STANDARDS

Design Speed (km/h)	SSD Standard (metres)
10	7
20	14
30	23
40	33
50	45
60	59

Forward Visibility

Design Speed (km/h)	SSD Standard (metres)
10	8
20	15
30	24
40	36
50	49
60	65

Forward Visibility on Bus Routes

Table 2: DMURS (2019); Table 4.2, Reduced SSD standards for application within cities towns and villages

Section 4.4.2 of DMURS (2019) states that a maximum setback or 'X' distance of 2.4m should be used for priority junctions in urban areas as longer setback distances allow higher vehicle speeds through junctions and may encourage more than one vehicle on the minor arm to go for the same gap in traffic on the major arm when it is not ideal that they do so. The shorter setback distances protect pedestrians and other vulnerable road users.

The visibility splay shall be kept clear of any vegetation or obstacle that could block a driver's view of oncoming vehicles or cyclists. Any boundary walls constructed within visibility splays shall be restricted to less than 800mm in height. Similarly, any planting within a visibility splay shall be of a species that will not grow to more than 800mm in height.

Nothing shall be planted or sown within a visibility splay without prior written permission from the Local Authority.

3.8. Pedestrian Crossings

Pedestrian crossings will be placed throughout the development on streets which have footpaths on both sides and at junctions, see WDG drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-001. The proposed pedestrian crossings are uncontrolled crossing points. Each crossing point shall be constructed using dished kerbs in accordance with Diagram 13.1 of the Traffic Management Guidelines 2013, see Figure 8.

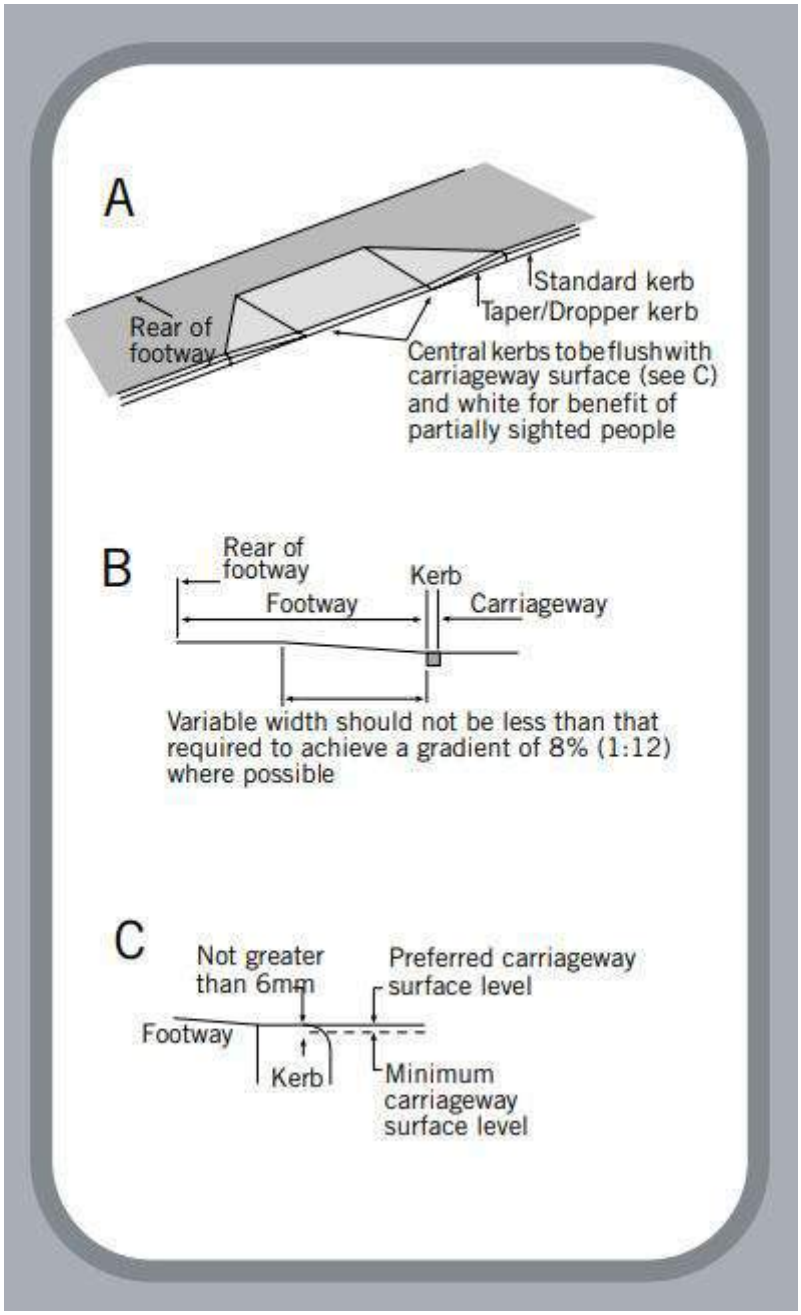


Figure 8: Diagram 13.1 Dished Crossing - Traffic Management Guidelines; DOT, 2013

Buff coloured tactile paving in accordance with Table 13.1 of the Traffic Management Guidelines shall be set in the footpath at each crossing point. Paving slabs measure 400mm x 400mm and shall be laid in a pattern of 3 wide by 2 deep (1200mm wide x 800mm deep) at each crossing point, as illustrated on drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-001.

3.9. Pavement Construction

Street pavement and footpath construction shall be carried out in accordance with the recognised standard; 'Recommendations for Site Development Works for Housing Areas; DoELG 1998'. Streets will be finished in bituminous surfacing and footpaths will be constructed in concrete. See WDG construction details drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-504 for road, footpath and kerb details.

Street construction assumes a minimum design CBR for the existing ground. The appointed main contractor will be obliged to carry out testing to establish the actual CBR prior to commencement of street construction.

3.10. Private Driveways & Paving

Each private dwelling plot with car parking included shall have driveway slopes in compliance with Technical Guidance Document M of the Building Regulations. Footpaths across all driveway entrances will be dished and incorporate dropped kerbs. All parking bays shall be constructed with permeable paving. The permeable paving will allow surface water to soak into the subsoil and ground water rather than leaving the site via the sewer network which is preferable in terms of SuDS.

3.11. Site Cut and Fill

Prior to any construction works on site the topsoil (approx. 200mm deep) will be stripped from the surface in all areas apart from the large green areas. This topsoil will be stockpiled, according to best practice, on site to be reused in private gardens and landscaped areas.

Stockpiles are to be located, formed and maintained according to best practice. Vegetation and any waste materials are to be removed from storage areas prior to stockpiling. Soils shall be stockpiled in the driest condition possible. Soil will be banked with a maximum side slope of 1 in 2 and grass seeded with a grass/clover mix to minimise soil erosion and help reduce infestation by nuisance weeds. Stockpiles are to be fenced off and have their contents identified using clear signage. No vehicles shall be allowed to pass over stockpiles.

Fill imported onto the site to be placed under buildings shall comply with Technical Guidance Document D of the Building Regulations and NSAI Standard Recommendation 21 (S.R.21). Fill imported for use under roadways shall comply with the Tii Specification for Roadworks Series 600 documents.

4.0 Surface Water Drainage

The proposed storm sewer collection system consists of a 100mm diameter pipe collection network around each house in accordance with TGD part H discharging to 225mm diameter uPVC sewer or larger under the development's streets. The surface water network layout is shown in drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-002 and the typical details for the surface water infrastructure are shown on drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-500.

The surface water sewers have been designed using the Causeway Flow design software and the Wallingford procedure for the design and analysis of urban drainage. The surface water system for the development is a single network falling generally from north to south, exiting the development at the proposed entrance and discharging to the Beechgrove network at an existing manhole in the public roadway just west of the development entrance.

The Beechgrove network falls generally from north to south and runoff from the development is attenuated in an underground tank in the green area to the south before the network continues southwards through the Woodlands Development. The discharge rate from the proposed development will be 3.4 litres/sec (see section 4.1.1 for calculations). As the proposed network will tie into the Beechgrove infrastructure, an extra 3.4 litres/sec will flow through the existing attenuation tank and so it will be necessary to upgrade the flow control at the tank's outlet to allow the increased flow and prevent overtopping in that network.

4.1. Surface Water Design and Simulation Criteria

The storm network's design criteria included:

- maximum rainfall of 50 mm/hr,
- maximum time of concentration of 30 minutes,
- minimum cover of 1.2m to pipes under streets,
- M5-60 of 16.1mm (Met Éireann),
- SPR of 0.3,

The storm networks were tested by simulating both summer and winter storms with durations of between 15 minutes and 24 hours and return periods of 1, 30 and 100 years with the following criteria:

- Summer volumetric runoff coefficient of 0.75,
- Winter volumetric runoff coefficient of 0.84,
- Areal runoff factor of 1.0,
- Additional flow for climate change of 20%,
- Additional Area due to urban creep of 10%.

The surface water sewer networks have been modelled and each individual pipe run has been designed such that no flooding will occur to individual elements during any storm up to and including 24-hour 100-year return period, summer, and winter storms. In all storm simulations an additional flow of 20% was added to account for future climate change and an additional 10% was added to the positively drained area to account for future urban creep.

(See detailed design in Appendix A to this document).

4.1.1. Allowable Discharge

In accordance with the recommendations of sustainable urban drainage systems (SuDS) the allowable stormwater discharge from the surface water network was calculated by means of the QBAR equation for small rural catchments (< 25 km^2) as indicated in the institute of Hydrology, UK Report No. 124. QBAR is calculated using the following formula:
$QBAR = (0.00108\ [AREA]^{0.89}\ [SAAR]^{1.17}\ [SOIL]^{2.17})$

Where,

QBAR (m^3/sec)	=	Annual peak flow
AREA (km^2)	=	Catchment area
SAAR (mm)	=	Standard annual average rainfall
SOIL	=	Index with values between 0.15 and 0.50

The variables for the sewer network are as follows:

AREA The catchment area of the estate that will have its runoff attenuated is 0.99ha = 0.0099km^2,

SAAR The standard average rainfall for the site for the period from 1941 to 1970 was obtained from the UKSUDS website and is approximately 1207 mm/year,

SOIL This index was obtained using the UKSUDS greenfield runoff map which places the site in an area of Type 2 soil with a Standard Percentage Runoff (SPR) of 0.3.

For developments smaller than 50ha, the allowable discharge is linearly interpolated from the QBAR value obtained for a 50ha site. Inputting the above data into the QBAR equation, QBAR Actual is calculated as follows:

QBAR	=	$(0.00108\ [0.5]^{0.89}\ [1207]^{1.17}\ [0.3]^{2.17})$
	=	0.172 m3/sec
	=	172 l/sec

By linear interpolation => Adjusted QBAR = 3.41 l/sec.

4.1.2. Hydrobrake

These vortex flow control devises are specifically designed for the required flow, have no moving parts, and are powered by water flow alone. The devices are designed to minimise risk of blockage but are also equipped with a bypass door that can be manually opened in case of blockage. The Manhole containing the hydrobrake will also be fitted with an overflow pipe, to prevent flooding in events more severe than the design storms.

4.1.3. Attenuation

In accordance with the Wallingford Procedure, using only impermeable areas in the modified rational method, a Cv (Volumetric Runoff Coefficient) of 0.75 is used for summer events and 0.84 for winter. For the purpose of calculating the volume and rate of flow in the network,

the maximum hardstanding area contributing to each pipe run was measured. The hardstanding consists of all roofs, driveways, roads, and other impermeable paving within the contributing area.

The proposed surface water network has been tested with the Causeway Flow software, simulating rainfall events up to and including the 24-hour, 100 year storm with a 20% addition allowed for climate change and a 10% addition to the positively drained area to allow for urban creep. Modelling shows that no flooding occurs.

During storm simulations on the network the choking of the flow using the hydrobrake resulted in flooding upstream of the flow control device. To eliminate flood risk in the system an attenuation tank was chosen for temporary storage of surface water runoff. The proposed attenuation tank will consist of ESS Eco-cell, cellular water storage modules (or similar approved) arranged to form a tank as shown on drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-500. The modules are moulded polypropylene and have an internal void ratio in excess of 95%.

The modules will be wrapped with a permeable geomembrane with lapped joints in accordance with the manufacturer's specification. A 100mm thick layer of thick coarse sand or class 6H selected granular material will surround the geotextile on the top and sides of the tank to provide protection from large sharp stones.

The cellular storage modules will be laid on a flat, level, and smooth base of selected, compacted granular material. A vent pipe from the top of the tank will allow the release of air during tank filling and allow air to be drawn into the tank as the water level falls. The vent box, protecting the top of the vent pipe, will consist of a Stanton heavy duty ductile iron double triangular surface box (or similar approved) with a vented cover, 300mm x 300mm clear opening and a minimum of 100mm frame depth on a mortar bed.

The minimum recommended soil cover over Eco-cell modules is 500mm in a green area and 650mm in a trafficked area. It is proposed to locate this tank under a green area with a soil cover in excess of 500mm. During construction, measures will be taken to prevent vehicles passing over or near the tank. A CBR of between 3% and 5% has been assumed at sub-base level. CBR testing will be carried out by the contractor prior to installation.

BRE Digest 365 Soil Infiltration Rate testing was carried out on the site and a test location close to the proposed attenuation tank returned an infiltration rate value of 0.13m/hr. The permeable geomembrane and porous surrounding aggregate will allow water to soak into the soil and this has been included in the design and simulations.

4.1.4. Hydrocarbon Interceptor

It is proposed to install a hydrocarbon bypass separator in the surface water network just downstream of the Hydrobrake. The interceptor shall be sized as follows:

- The peak flow rate of the surface water just before the final Hydrobrake at manhole S12 is 3.4 l/s. A Klargester NSBP004 (or similar approved) interceptor is designed to treat a maximum flow rate of 4.5 l/s.

Bypass separators are considered adequate in residential developments where the risk of a large spillage and heavy rainfall occurring at the same time is low.

4.1.5. Road Gullies

Gullies are positioned throughout the proposed roads for the collection of surface water from footpaths, roads, driveways, parking bays and other impervious areas for discharge into the drainage system. The minimum rate of gully provision recommended in; 'Recommendations for Site Development Works for Housing Areas' is one per 200m^2 of hard surface.

The 'Site 3D' software application was used to set out the roads and drainage for the development. This software positions gullies according to road area, gradient, and curvature. Low points are picked up by the software and gullies are doubled at the low point of sag curves to prevent ponding. Gullies are also positioned at the bottom of all ramps to the raised junctions where surface water would collect. Drawing no 22055-ZZ-XX-XX-XX-DR-WDG-CE-002 shows the proposed position of all road gullies.

All gullies in the roadways will be precast concrete complying with the requirements of BS 5911: Part 230. The outlet from the gullies will be 150mm diameter pipe set a minimum of 375mm off the floor of the chamber. This allows for debris and silt that falls through the grating to settle below the invert of the outlet pipe. The silt in gullies must be regularly cleaned out as part of the silt management and maintenance schedule in the operational phase of the housing development.

The class of gully grating required will be D400 as per the manhole covers. Gully gratings in roads will be set with the direction of the openings at right angles to the direction of traffic.

4.2. Drainage Impact Assessment

SuDS measures are proposed for the development in both public and private areas in accordance with the guidance from the County Development Plan 2022 Advice Note 1 on Surface Water management and the CIRIA SuDS Manual C753.

The Measures proposed will decrease the impact of the development on the receiving environment and also provide amenity and biodiversity on many cases. Regular maintenance of the SuDS measures will be required to ensure that they are effective throughout their design life.

4.2.1. Permeable Paving

Permeable paving is proposed for all car parking spaces in the development. The permeable paving will allow surface water to soak into the subsoil and ground water rather than leaving the site via the sewer network which is preferable in terms of SuDS. See the accompanying WDG drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-504 for the construction details of the permeable paving, see example in Figure 9.

CIRIA C753 (The SuDS Manual) notes that studies have shown that runoff typically does not occur from permeable pavements for rainfall events of up to 5 minutes in length. The paving's substrate intercepts and stores the runoff before some of it percolates into the surrounding

soil and any overflow is piped to the sewer network. The substrate shall be a minimum of 300mm deep and formed with washed, coarse, graded aggregate with 30% voids for water storage.

Figure 9: Example of permeable paving

4.2.2. Roadside Bioretention Tree Pits

Bioretention tree pits, constructed in accordance with CIRIA SuDS Manual Chapter 19 and the detail provided in drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-504, are proposed in roadside green areas of the site where a proportion of the surface water from the hard road and footpath surfaces can be channelled towards the tree base for temporary storage and percolation to ground water. The tree pits will be placed in isolated green planters where gaps in the kerbing or kerb drains allow surface water to fall to the base of the trees as per the examples in Figure 10. Where the tree pits need to be placed inside the footpath, the water shall be piped under the footpath into the pit and, in all cases, an overflow pipe will carry any overflow back to the sewer in heavier rainfall events. This prevents the tree's roots from being inundated for long periods, causing damage or disease.

Figure 10: Examples of tree pits in isolated green planters from the CIRIA SuDS Manual

Whilst the grass along the top of the roadside verges will most likely be mowed the local area around the base of each tree pit is to be set with a variety of planting including native wildflower grass seed mixes to promote urban biodiversity - providing habitat and food for native insects, invertebrates, and birds. This planting scheme will not be mowed regularly but occasionally cleaned and weeded. The bioretention tree pits offer runoff interception, filtration and water storage as well as offering further benefits such as evapotranspiration, cooling of runoff in the shade and the promotion of biodiversity.

CIRIA C753 (The SuDS Manual) Table 24.6 notes that, regarding interception design of tree root system (bio retention areas), pavements drained by tree root systems can be considered to provide Interception, i.e. it can be assumed that there will be zero runoff from the first 5 mm rainfall for 80% of events during the summer and 50% in winter.

See the accompanying WDG drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-002 for the proposed locations of the tree pits.

4.2.3. Rain Garden Planters

It is proposed that dwelling roofs can discharge to rain garden planters in back yards where they will provide treatment to roof runoff through evapotranspiration within the filter media of the rain garden structure. The planters will comprise of small, raised gardens enclosed in robust treated timber boxes with high permeability soil and a perforated surface water drain is to be provided at a low level to drain any excess surface water to the drainage network.

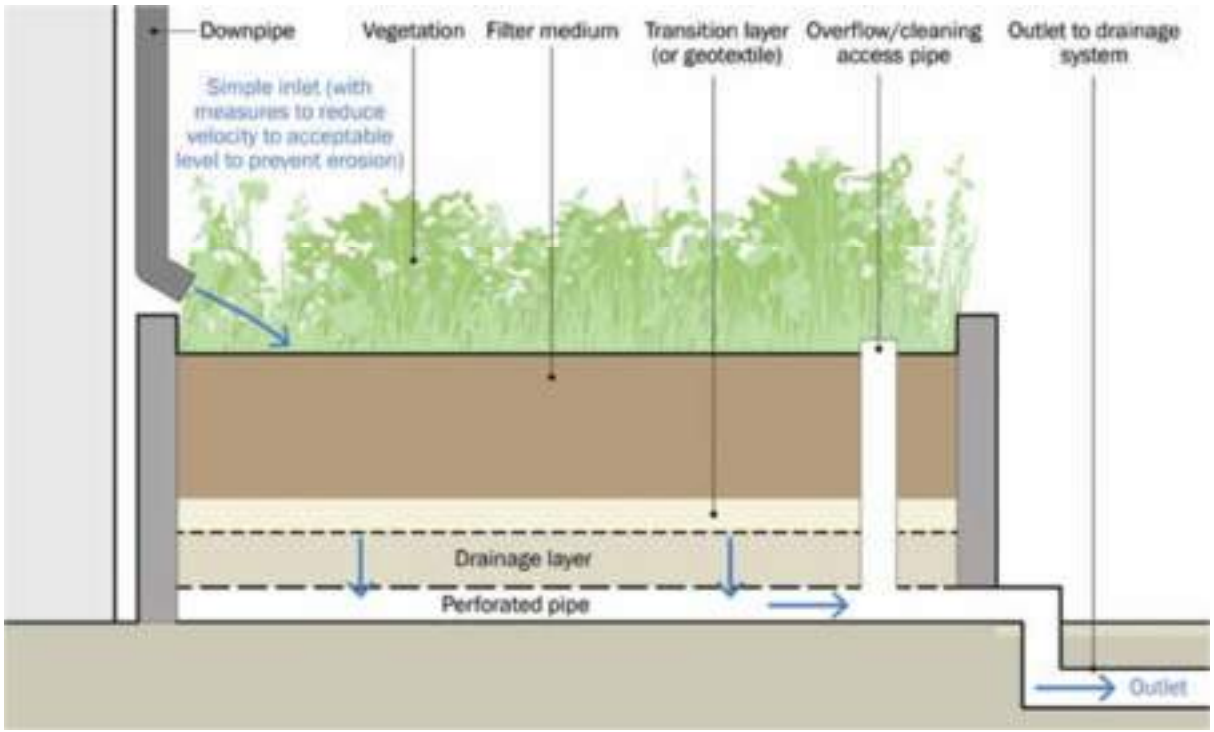


Figure 11: Section through a raised planter (CIRIA C753)

CIRIA C753 (The SuDS Manual) Table 24.6 notes that regarding interception design of rain gardens (bio retention areas), pavements drained by rain gardens can be considered to

provide Interception, i.e. it can be assumed that there will be zero runoff from the first 5 mm rainfall for 80% of events during the summer and 50% in winter.

4.2.4. Water Butts

It is proposed to install a 300-litre water butt to the rear of each dwelling that has a rear garden. The water butt shall be designed to collect water from the downpipes with a bypass system so that they do not overtop and flood the yard/garden. A tap on the water butt will allow the water to be used for gardening or car washing etc. and reduce demand on the local authority water supply whilst also reducing the roof runoff entering the surface water sewer. See the accompanying WDG drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-002 for an example of a water butt.

5.0 Wastewater Drainage

The layout of the proposed wastewater drainage network for the development is shown on WDG drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-002 and the typical details for the wastewater infrastructure are shown on drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-501. 2 separate conventional piped, gravity sewer networks are proposed.

The southern network falls towards the centre of the development and then connects to the Beechgrove wastewater infrastructure, to the west, at the existing manhole labelled F13. The northern network falls to the north and west from the centre of the development and connects to the existing manhole labelled S7 in the northeastern corner of the Beechgrove Development.

All sewers within the curtilage of individual houses have been designed and are to be installed in accordance with TGD Part H (2010) and will consist of 100 mm diameter uPVC Sewers from individual houses laid to falls of min 1:60 to connect to a 150mm and 225mm uPVC sewer to be laid under the estate street. Inspection chambers will be constructed within 1m of the boundary of each private property in accordance with Irish Water Standard Details.

All wastewater sewers in the public realm have been designed in compliance with Irish Water's Code of Practice for Wastewater Infrastructure – A Design and Construction Guide for Developers (Revision 2) July 2020. All construction details within the public realm will be in accordance with Irish Water, Wastewater Infrastructure Standard Details (Revision 4), July 2020.

A pre-connection enquiry was submitted to Irish Water to assess the feasibility of providing a connection to the site. See Appendix C to this document for the pre-connection enquiry form and calculations. Subsequently, Irish Water issued a confirmation of feasibility for the development (see Appendix C).

5.1. Wastewater Design Criteria

For the purposes of clarity, the wastewater sewer system has been designed using the following parameters, as required in Irish Water document IW-CDS-5030-03 Section 3.6:

- Flow per person: 150 L/day
- Average persons per household: 2.7 persons
- Unit consumption allowance (infiltration) 10%
- Minimum velocity for pipe running full: 0.75 m/sec
- Peak flow: 6 DWF

The population equivalent (PE) for the development is: 35 dwellings x 2.7 = 95.

The detailed hydraulic design parameters and calculations for the wastewater network as well as the longitudinal sections are included in Appendix B to this document.

6.0 Water Supply

It is proposed that a connection to the existing Irish Water infrastructure will be made in the public road just outside the development entrance. The water main layout is shown on WDG drawing no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-003 and the water main typical details are shown on drawings 22055-ZZ-XX-XX-XX-DR-WDG-CE-502 and 22055-ZZ-XX-XX-XX-DR-WDG-CE-503.

A pre-connection enquiry was submitted to Irish Water to assess the feasibility of providing a connection to the site. Irish Water issued a confirmation of feasibility for the development (see Appendix C). In its confirmation of feasibility letter Irish Water stated that the water supply can be facilitated without any upgrade by Irish Water after the third quarter of 2023.

Private properties will each have a separate service connection, fitted with an Irish Water approved boundary box immediately outside the boundary. Fire hydrants are placed so that no domestic property within the development is more than 46m from a hydrant. All potable water infrastructure will be constructed in accordance with the following Irish Water documents:

- IW-CDS-5020-03 Code of Practice for Water Infrastructure – Connections and Developer Services, July 2020 (Revision 2),
- IW-CDS-5020-01 Water Infrastructure Standard Details - Connections and Developer Services, July 2020 (Revision 4).

6.1. Water Demand

The mains water demand for the development is calculated, according to Irish Water criteria, using the following parameters:

- 150 litres/person/day,
- 2.7 persons per housing unit,
- Domestic ADPW = 1.25,
- 35 Housing Units.

7.0 Utilities

7.1. Electricity

ESB networks were contacted regarding power lines running in the vicinity of the site. There are no buried cables or overhead lines running through the site. The map provided by the ESB (see Appendix D) dose show underground MV/LV cable routes directly outside the proposed development entrance in the Beechgrove Access Road, and also at 2 other locations along the boundary with the Beechgrove Estate.

Any works on site shall be carried out in accordance with the following ESB document:

- Safe Construction with Electricity.

7.2. Gas

Gas Networks Ireland was contacted regarding the gas supply services in the vicinity of the proposed development site. GNI responded to confirm that there is *'No recorded Gas Network within the area of interest'.* See Appendix D for GNI's email response.

Appendix A

Surface Water Design

- Surface Water Sewer Network Design

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	16.100	Minimum Backdrop Height (m)	1.000
Ratio-R	0.300	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.028	5.00	21.590	1200	537400.434	541607.487	1.425
S2	0.009	5.00	21.831	1200	537416.188	541595.626	1.783
S3	0.032	5.00	21.245	1200	537449.086	541601.584	1.425
S4	0.077	5.00	21.922	1200	537425.042	541595.695	2.248
S5	0.010	5.00	21.791	1200	537432.119	541563.671	2.311
S6	0.029	5.00	21.004	1200	537407.124	541548.374	1.425
S7	0.037	5.00	21.574	1200	537430.525	541554.257	2.151
S8	0.018	5.00	21.640	1200	537441.460	541556.513	1.425
S9	0.020	5.00	20.311	1200	537448.885	541525.438	1.425
S10	0.012	5.00	20.018	1200	537438.087	541522.443	1.818
S11	0.015	5.00	19.404	1200	537440.637	541511.783	2.404
S12	0.010	5.00	16.925	1350	537462.461	541501.604	2.425
S13	0.005	5.00	15.004	1200	537479.488	541493.806	1.440
S14	0.007	5.00	14.248	1200	537484.952	541484.546	1.164
S15			14.295	1200	537478.239	541476.124	1.275

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S1	S2	19.720	0.600	20.165	20.048	0.117	168.5	225	5.33	40.4
1.001	S2	S4	8.854	0.600	20.048	19.989	0.059	150.1	225	5.47	40.2
2.000	S3	S4	24.754	0.600	19.820	19.674	0.146	169.5	225	5.41	40.2
1.002	S4	S5	32.797	0.600	19.674	19.480	0.194	169.1	225	6.01	38.7
1.003	S5	S7	9.548	0.600	19.480	19.423	0.057	167.5	225	6.17	38.3
3.000	S6	S7	24.129	0.600	19.579	19.423	0.156	154.7	225	5.38	40.2
1.004	S7	S10	32.701	0.600	19.423	18.593	0.830	39.4	225	6.43	37.6
4.000	S8	S9	31.950	0.600	20.215	18.886	1.329	24.0	225	5.20	40.8

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.004	39.9	3.1	1.200	1.558	0.028	0.0	42	0.595
1.001	1.065	42.3	4.0	1.558	1.708	0.037	0.0	47	0.678
2.000	1.001	39.8	3.5	1.200	2.023	0.032	0.0	45	0.623
1.002	1.002	39.9	15.3	2.023	2.086	0.146	0.0	96	0.936
1.003	1.007	40.0	16.2	2.086	1.926	0.156	0.0	100	0.956
3.000	1.049	41.7	3.2	1.200	1.926	0.029	0.0	42	0.622
1.004	2.090	83.1	22.6	1.926	1.200	0.222	0.0	80	1.791
4.000	2.679	106.5	2.0	1.200	1.200	0.018	0.0	22	1.057

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
4.001	S9	S10	11.206	0.600	18.886	18.593	0.293	38.2	225	5.29	40.5
1.005	S10	S11	10.961	0.600	18.200	17.979	0.221	49.6	225	6.53	37.4
1.006	S11	S12	24.081	0.600	17.000	15.495	1.505	16.0	225	6.65	37.1
1.007	S12	S13	18.728	0.600	14.500	13.564	0.936	20.0	225	6.76	36.9
1.008	S13	S14	10.752	0.600	13.564	13.084	0.480	22.4	225	6.82	36.7
1.009	S14	S15	10.770	0.600	13.084	13.020	0.064	168.3	225	7.00	36.3

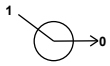
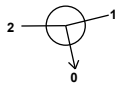
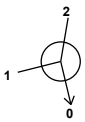
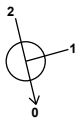
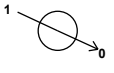
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
4.001	2.122	84.4	4.2	1.200	1.200	0.038	0.0	34	1.112
1.005	1.861	74.0	27.6	1.593	1.200	0.272	0.0	95	1.732
1.006	3.287	130.7	28.9	2.179	1.205	0.287	0.0	72	2.655
1.007	2.938	116.8	29.7	2.200	1.215	0.297	0.0	77	2.461
1.008	2.776	110.4	30.0	1.215	0.939	0.302	0.0	80	2.366
1.009	1.005	40.0	30.4	0.939	1.050	0.309	0.0	147	1.103

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	19.720	168.5	225	Circular Storm	21.590	20.165	1.200	21.831	20.048	1.558
1.001	8.854	150.1	225	Circular Storm	21.831	20.048	1.558	21.922	19.989	1.708
2.000	24.754	169.5	225	Circular Storm	21.245	19.820	1.200	21.922	19.674	2.023
1.002	32.797	169.1	225	Circular Storm	21.922	19.674	2.023	21.791	19.480	2.086
1.003	9.548	167.5	225	Circular Storm	21.791	19.480	2.086	21.574	19.423	1.926
3.000	24.129	154.7	225	Circular Storm	21.004	19.579	1.200	21.574	19.423	1.926
1.004	32.701	39.4	225	Circular Storm	21.574	19.423	1.926	20.018	18.593	1.200
4.000	31.950	24.0	225	Circular Storm	21.640	20.215	1.200	20.311	18.886	1.200
4.001	11.206	38.2	225	Circular Storm	20.311	18.886	1.200	20.018	18.593	1.200
1.005	10.961	49.6	225	Circular Storm	20.018	18.200	1.593	19.404	17.979	1.200
1.006	24.081	16.0	225	Circular Storm	19.404	17.000	2.179	16.925	15.495	1.205
1.007	18.728	20.0	225	Circular Storm	16.925	14.500	2.200	15.004	13.564	1.215
1.008	10.752	22.4	225	Circular Storm	15.004	13.564	1.215	14.248	13.084	0.939
1.009	10.770	168.3	225	Circular Storm	14.248	13.084	0.939	14.295	13.020	1.050

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	1200	Manhole	Adoptable	S2	1200	Manhole	Adoptable
1.001	S2	1200	Manhole	Adoptable	S4	1200	Manhole	Adoptable
2.000	S3	1200	Manhole	Adoptable	S4	1200	Manhole	Adoptable
1.002	S4	1200	Manhole	Adoptable	S5	1200	Manhole	Adoptable
1.003	S5	1200	Manhole	Adoptable	S7	1200	Manhole	Adoptable
3.000	S6	1200	Manhole	Adoptable	S7	1200	Manhole	Adoptable
1.004	S7	1200	Manhole	Adoptable	S10	1200	Manhole	Adoptable
4.000	S8	1200	Manhole	Adoptable	S9	1200	Manhole	Adoptable
4.001	S9	1200	Manhole	Adoptable	S10	1200	Manhole	Adoptable
1.005	S10	1200	Manhole	Adoptable	S11	1200	Manhole	Adoptable
1.006	S11	1200	Manhole	Adoptable	S12	1350	Manhole	Adoptable
1.007	S12	1350	Manhole	Adoptable	S13	1200	Manhole	Adoptable
1.008	S13	1200	Manhole	Adoptable	S14	1200	Manhole	Adoptable
1.009	S14	1200	Manhole	Adoptable	S15	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	537400.434	541607.487	21.590	1.425	1200		0 1.000	20.165	225
S2	537416.188	541595.626	21.831	1.783	1200		1 1.000 0 1.001	20.048 20.048	225 225
S3	537449.086	541601.584	21.245	1.425	1200		0 2.000	19.820	225
S4	537425.042	541595.695	21.922	2.248	1200		1 2.000 2 1.001 0 1.002	19.674 19.989 19.674	225 225 225
S5	537432.119	541563.671	21.791	2.311	1200		1 1.002 0 1.003	19.480 19.480	225 225
S6	537407.124	541548.374	21.004	1.425	1200		0 3.000	19.579	225
S7	537430.525	541554.257	21.574	2.151	1200		1 3.000 2 1.003 0 1.004	19.423 19.423 19.423	225 225 225
S8	537441.460	541556.513	21.640	1.425	1200		0 4.000	20.215	225
S9	537448.885	541525.438	20.311	1.425	1200		1 4.000 0 4.001	18.886 18.886	225 225
S10	537438.087	541522.443	20.018	1.818	1200		1 4.001 2 1.004 0 1.005	18.593 18.593 18.200	225 225 225
S11	537440.637	541511.783	19.404	2.404	1200		1 1.005 0 1.006	17.979 17.000	225 225
S12	537462.461	541501.604	16.925	2.425	1350		1 1.006 0 1.007	15.495 14.500	225 225
S13	537479.488	541493.806	15.004	1.440	1200		1 1.007 0 1.008	13.564 13.564	225 225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S14	537484.952	541484.546	14.248	1.164	1200	1	1.008	13.084	225
						0	1.009	13.084	225
S15	537478.239	541476.124	14.295	1.275	1200	1	1.009	13.020	225

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	Scotland and Ireland	Skip Steady State	x
M5-60 (mm)	16.100	Drain Down Time (mins)	240
Ratio-R	0.300	Additional Storage (m³/ha)	10.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	20	10	0
30	20	10	0
100	20	10	0

Node S12 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	14.500	Product Number	CTL-SHE-0079-3400-1600-3400
Design Depth (m)	1.600	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.4	Min Node Diameter (mm)	1200

Node S12 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.13000	Safety Factor	2.0	Invert Level (m)	14.500
Side Inf Coefficient (m/hr)	0.13000	Porosity	1.00	Time to half empty (mins)	196

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	76.0	76.0	1.600	76.0	76.0	1.601	0.0	76.0

Results for 1 year +20% CC +10% A Critical Storm Duration. Lowest mass balance: 99.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	10	20.214	0.049	4.2	0.0662	0.0000	OK
15 minute winter	S2	11	20.105	0.057	5.5	0.0678	0.0000	OK
15 minute winter	S3	10	19.872	0.052	4.8	0.0714	0.0000	OK
15 minute winter	S4	11	19.794	0.120	21.6	0.1816	0.0000	OK
15 minute winter	S5	11	19.607	0.127	22.8	0.1502	0.0000	OK
15 minute winter	S6	10	19.627	0.048	4.4	0.0657	0.0000	OK
15 minute winter	S7	11	19.524	0.101	32.4	0.1329	0.0000	OK
15 minute winter	S8	10	20.240	0.025	2.7	0.0313	0.0000	OK
15 minute winter	S9	10	18.926	0.040	5.7	0.0520	0.0000	OK
15 minute winter	S10	11	18.331	0.131	39.5	0.1575	0.0000	OK
15 minute winter	S11	11	17.091	0.091	41.5	0.1091	0.0000	OK
120 minute winter	S12	94	14.850	0.350	16.4	27.1177	0.0000	SURCHARGED
60 minute winter	S13	37	13.590	0.026	3.2	0.0309	0.0000	OK
30 minute winter	S14	19	13.134	0.050	4.0	0.0593	0.0000	OK
30 minute winter	S15	19	13.068	0.048	4.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1	1.000	S2	4.1	0.583	0.104	0.1406	
15 minute winter	S2	1.001	S4	5.5	0.716	0.129	0.0676	
15 minute winter	S3	2.000	S4	4.7	0.337	0.118	0.3514	
15 minute winter	S4	1.002	S5	21.4	0.955	0.537	0.7347	
15 minute winter	S5	1.003	S7	22.9	1.133	0.571	0.1927	
15 minute winter	S6	3.000	S7	4.3	0.394	0.103	0.2814	
15 minute winter	S7	1.004	S10	32.3	1.927	0.388	0.5475	
15 minute winter	S8	4.000	S9	2.7	0.757	0.025	0.1146	
15 minute winter	S9	4.001	S10	5.5	1.179	0.066	0.0527	
15 minute winter	S10	1.005	S11	39.4	1.769	0.533	0.2442	
15 minute winter	S11	1.006	S12	41.4	2.850	0.317	0.3501	
120 minute winter	S12	Hydro-Brake®	S13	2.9				
120 minute winter	S12	Infiltration		1.4				
60 minute winter	S13	1.008	S14	3.2	0.783	0.029	0.0470	
30 minute winter	S14	1.009	S15	4.0	0.632	0.099	0.0675	17.5

Results for 30 year +20% CC +10% A Critical Storm Duration. Lowest mass balance: 99.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	10	20.240	0.075	9.4	0.1016	0.0000	OK
15 minute winter	S2	10	20.136	0.088	12.3	0.1042	0.0000	OK
15 minute winter	S3	12	19.979	0.159	10.7	0.2185	0.0000	OK
15 minute winter	S4	11	19.978	0.304	44.4	0.4585	0.0000	SURCHARGED
15 minute winter	S5	11	19.715	0.235	46.4	0.2773	0.0000	SURCHARGED
15 minute winter	S6	10	19.652	0.073	9.7	0.0985	0.0000	OK
15 minute winter	S7	11	19.585	0.162	66.9	0.2134	0.0000	OK
15 minute winter	S8	10	20.251	0.036	6.0	0.0457	0.0000	OK
15 minute winter	S9	10	18.948	0.062	12.6	0.0792	0.0000	OK
15 minute winter	S10	11	18.582	0.382	82.3	0.4599	0.0000	SURCHARGED
15 minute winter	S11	11	17.145	0.145	87.0	0.1737	0.0000	OK
180 minute winter	S12	172	15.504	1.004	26.4	77.8066	0.0000	SURCHARGED
15 minute winter	S13	11	13.595	0.031	4.4	0.0360	0.0000	OK
15 minute winter	S14	11	13.149	0.065	6.7	0.0778	0.0000	OK
15 minute winter	S15	11	13.082	0.062	6.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1	1.000	S2	9.3	0.713	0.232	0.2565	
15 minute winter	S2	1.001	S4	12.0	0.884	0.284	0.1206	
15 minute winter	S3	2.000	S4	11.8	0.400	0.296	0.8624	
15 minute winter	S4	1.002	S5	43.2	1.086	1.084	1.3044	
15 minute winter	S5	1.003	S7	46.0	1.346	1.150	0.3356	
15 minute winter	S6	3.000	S7	9.5	0.467	0.229	0.4988	
15 minute winter	S7	1.004	S10	66.2	2.255	0.797	0.9606	
15 minute winter	S8	4.000	S9	5.9	0.938	0.056	0.2060	
15 minute winter	S9	4.001	S10	12.4	1.470	0.147	0.0948	
15 minute winter	S10	1.005	S11	82.3	2.071	1.113	0.4342	
15 minute winter	S11	1.006	S12	87.1	3.383	0.667	0.6201	
180 minute winter	S12	Hydro-Brake®	S13	2.9				
180 minute winter	S12	Infiltration		1.4				
15 minute winter	S13	1.008	S14	4.4	0.783	0.040	0.0684	
15 minute winter	S14	1.009	S15	6.7	0.730	0.167	0.0986	30.4

Results for 100 year +20% CC +10% A Critical Storm Duration. Lowest mass balance: 99.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	12	20.258	0.093	12.2	0.1247	0.0000	OK
15 minute winter	S2	12	20.239	0.191	16.1	0.2264	0.0000	OK
15 minute winter	S3	11	20.256	0.436	13.9	0.6006	0.0000	SURCHARGED
15 minute winter	S4	11	20.236	0.562	56.4	0.8479	0.0000	SURCHARGED
15 minute winter	S5	11	19.810	0.330	58.2	0.3895	0.0000	SURCHARGED
15 minute winter	S6	10	19.663	0.084	12.6	0.1132	0.0000	OK
15 minute winter	S7	11	19.633	0.210	84.9	0.2775	0.0000	OK
15 minute winter	S8	10	20.256	0.041	7.8	0.0520	0.0000	OK
15 minute summer	S9	10	18.954	0.068	15.6	0.0874	0.0000	OK
15 minute winter	S10	11	18.811	0.611	104.4	0.7352	0.0000	SURCHARGED
15 minute winter	S11	11	17.174	0.174	109.7	0.2088	0.0000	OK
240 minute winter	S12	228	15.879	1.379	27.6	106.8466	0.0000	SURCHARGED
15 minute winter	S13	10	13.597	0.033	5.0	0.0381	0.0000	OK
15 minute winter	S14	10	13.155	0.071	8.0	0.0853	0.0000	OK
15 minute winter	S15	11	13.087	0.067	7.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1	1.000	S2	12.2	0.743	0.306	0.5059	
15 minute winter	S2	1.001	S4	16.5	0.906	0.389	0.3351	
15 minute winter	S3	2.000	S4	15.2	0.402	0.382	0.9845	
15 minute winter	S4	1.002	S5	54.2	1.362	1.359	1.3044	
15 minute winter	S5	1.003	S7	57.9	1.457	1.447	0.3743	
15 minute winter	S6	3.000	S7	12.4	0.507	0.298	0.6239	
15 minute winter	S7	1.004	S10	83.7	2.306	1.007	1.2818	
15 minute winter	S8	4.000	S9	7.7	1.055	0.073	0.2375	
15 minute summer	S9	4.001	S10	16.2	1.511	0.192	0.2377	
15 minute winter	S10	1.005	S11	103.6	2.604	1.399	0.4315	
15 minute winter	S11	1.006	S12	109.2	3.503	0.836	0.7505	
240 minute winter	S12	Hydro-Brake®	S13	3.2				
240 minute winter	S12	Infiltration		1.4				
15 minute winter	S13	1.008	S14	5.0	0.783	0.045	0.0770	
15 minute winter	S14	1.009	S15	7.9	0.764	0.198	0.1116	39.4

Appendix B

Wastewater Design

- Wastewater Sewer Network South Design,
- Wastewater Sewer Network North Design.

Design Settings

Frequency of use (kDU)	0.50	Minimum Velocity (m/s)	0.75
Flow per dwelling per day (l/day)	405	Connection Type	Level Soffits
Domestic Flow (l/s/ha)	0.0	Minimum Backdrop Height (m)	0.500
Industrial Flow (l/s/ha)	0.0	Preferred Cover Depth (m)	1.200
Additional Flow (%)	0	Include Intermediate Ground	✓

Nodes

Name	Dwellings	Cover Level (m)	Manhole Type	Easting (m)	Northing (m)	Depth (m)
F8	8	20.390	Adoptable	537451.685	541526.102	1.350
F9	1	21.689	Adoptable	537444.331	541554.354	3.136
F10	6	19.919	Adoptable	537435.911	541519.804	1.350
F11		21.459	Adoptable	537428.554	541550.425	3.415
F12		20.998	Adoptable	537407.493	541545.546	3.099
F13		17.964	Adoptable	537390.971	541541.847	1.350

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
1.000	F8	F9	29.193	1.500	19.040	18.553	0.487	59.9	150
1.001	F9	F11	16.258	1.500	18.553	18.044	0.509	31.9	150
2.000	F10	F11	31.493	1.500	18.569	18.044	0.525	60.0	150
1.002	F11	F12	21.619	1.500	18.044	17.899	0.145	149.1	150
1.003	F12	F13	16.931	1.500	17.899	16.614	1.285	13.2	150

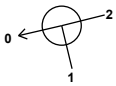
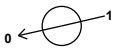
Name	Pro Vel @ 1/3 Q (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Dwellings (ha)	Σ Units (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.134	1.133	20.0	0.0	1.200	2.986	0.000	8	0.0	0.0	5	0.192
1.001	0.186	1.554	27.5	0.0	2.986	3.265	0.000	9	0.0	0.0	5	0.265
2.000	0.113	1.132	20.0	0.0	1.200	3.265	0.000	6	0.0	0.0	4	0.174
1.002	0.120	0.716	12.7	0.1	3.265	2.949	0.000	15	0.0	0.0	8	0.182
1.003	0.292	2.422	42.8	0.1	2.949	1.200	0.000	15	0.0	0.0	5	0.416

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	29.193	59.9	150	Circular	20.390	19.040	1.200	21.689	18.553	2.986
1.001	16.258	31.9	150	Circular	21.689	18.553	2.986	21.459	18.044	3.265
2.000	31.493	60.0	150	Circular	19.919	18.569	1.200	21.459	18.044	3.265
1.002	21.619	149.1	150	Circular	21.459	18.044	3.265	20.998	17.899	2.949
1.003	16.931	13.2	150	Circular	20.998	17.899	2.949	17.964	16.614	1.200

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	F8	1200	Manhole	Adoptable	F9	1200	Manhole	Adoptable
1.001	F9	1200	Manhole	Adoptable	F11	1200	Manhole	Adoptable
2.000	F10	1200	Manhole	Adoptable	F11	1200	Manhole	Adoptable
1.002	F11	1200	Manhole	Adoptable	F12	1200	Manhole	Adoptable
1.003	F12	1200	Manhole	Adoptable	F13	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
F8	537451.685	541526.102	20.390	1.350	1200		0	1.000	19.040	150
F9	537444.331	541554.354	21.689	3.136	1200	1	1.000	18.553	150
							0	1.001	18.553	150
F10	537435.911	541519.804	19.919	1.350	1200		0	2.000	18.569	150
F11	537428.554	541550.425	21.459	3.415	1200	1	2.000	18.044	150
						2	1.001	18.044	150
							0	1.002	18.044	150
F12	537407.493	541545.546	20.998	3.099	1200	1	1.002	17.899	150
							0	1.003	17.899	150
F13	537390.971	541541.847	17.964	1.350	1200	1	1.003	16.614	150
										

Design Settings

Frequency of use (kDU)	0.50	Minimum Velocity (m/s)	0.75
Flow per dwelling per day (l/day)	405	Connection Type	Level Soffits
Domestic Flow (l/s/ha)	0.0	Minimum Backdrop Height (m)	0.500
Industrial Flow (l/s/ha)	0.0	Preferred Cover Depth (m)	1.200
Additional Flow (%)	0	Include Intermediate Ground	✓

Nodes

Name	Dwellings	Units	Cover Level (m)	Manhole Type	Easting (m)	Northing (m)	Depth (m)
F1	14	0.0	21.804	Adoptable	537429.467	541564.319	1.350
F2	4	0.0	21.430	Adoptable	537444.740	541602.856	1.350
F3	2	0.0	21.905	Adoptable	537422.065	541597.343	2.214
F4			21.846	Adoptable	537417.309	541597.536	2.187
F5			21.726	Adoptable	537410.402	541601.800	2.122
F6			21.603	Adoptable	537403.304	541608.588	2.065
F7			20.420	Adoptable	537369.884	541617.650	1.350

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
1.000	F1	F3	33.843	1.500	20.454	20.228	0.226	149.7	150
2.000	F2	F3	23.336	1.500	20.080	19.691	0.389	60.0	150
1.001	F3	F4	4.760	1.500	19.691	19.659	0.032	148.8	150
1.002	F4	F5	8.117	1.500	19.659	19.604	0.055	147.6	150
1.003	F5	F6	9.822	1.500	19.604	19.538	0.066	148.8	150
1.004	F6	F7	34.626	1.500	19.538	19.070	0.468	74.0	150

Name	Pro Vel @ 1/3 Q (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Dwellings (ha)	Σ Units (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.120	0.715	12.6	0.1	1.200	1.527	0.000	14	0.0	0.0	8	0.172
2.000	0.113	1.132	20.0	0.0	1.200	2.064	0.000	4	0.0	0.0	4	0.155
1.001	0.131	0.717	12.7	0.1	2.064	2.037	0.000	20	0.0	0.0	10	0.200
1.002	0.132	0.720	12.7	0.1	2.037	1.972	0.000	20	0.0	0.0	10	0.201
1.003	0.131	0.717	12.7	0.1	1.972	1.915	0.000	20	0.0	0.0	10	0.200
1.004	0.172	1.019	18.0	0.1	1.915	1.200	0.000	20	0.0	0.0	8	0.247

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	33.843	149.7	150	Circular	21.804	20.454	1.200	21.905	20.228	1.527
2.000	23.336	60.0	150	Circular	21.430	20.080	1.200	21.905	19.691	2.064
1.001	4.760	148.8	150	Circular	21.905	19.691	2.064	21.846	19.659	2.037
1.002	8.117	147.6	150	Circular	21.846	19.659	2.037	21.726	19.604	1.972

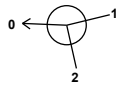
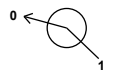
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	F1	1200	Manhole	Adoptable	F3	1200	Manhole	Adoptable
2.000	F2	1200	Manhole	Adoptable	F3	1200	Manhole	Adoptable
1.001	F3	1200	Manhole	Adoptable	F4	1200	Manhole	Adoptable
1.002	F4	1200	Manhole	Adoptable	F5	1200	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.003	9.822	148.8	150	Circular	21.726	19.604	1.972	21.603	19.538	1.915
1.004	34.626	74.0	150	Circular	21.603	19.538	1.915	20.420	19.070	1.200

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.003	F5	1200	Manhole	Adoptable	F6	1200	Manhole	Adoptable
1.004	F6	1200	Manhole	Adoptable	F7	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
F1	537429.467	541564.319	21.804	1.350	1200				
						0	1.000	20.454	150
F2	537444.740	541602.856	21.430	1.350	1200				
						0	2.000	20.080	150
F3	537422.065	541597.343	21.905	2.214	1200		1	2.000	19.691	150
							2	1.000	20.228	150
						0	1.001	19.691	150
F4	537417.309	541597.536	21.846	2.187	1200		1	1.001	19.659	150
										
						0	1.002	19.659	150
F5	537410.402	541601.800	21.726	2.122	1200		1	1.002	19.604	150
										
						0	1.003	19.604	150
F6	537403.304	541608.588	21.603	2.065	1200		1	1.003	19.538	150
										
						0	1.004	19.538	150
F7	537369.884	541617.650	20.420	1.350	1200		1	1.004	19.070	150
										

Appendix C

Irish Water Documents

Irish Water Documents:

- Pre-connection Enquiry Form,
- Confirmation of feasibility Letter.

Pre-connection enquiry form

Business developments, mixed use developments, housing developments

This form is to be filled out by applicants enquiring about the feasibility of a water and/or wastewater connection to Irish Water infrastructure. If completing this form by hand, please use BLOCK CAPITALS and black ink.
Please note that this is a digital PDF form and can be filled in electronically

Please refer to the **Guide to completing the pre-connection enquiry form** on page 14 of this document when completing the form.

*** Denotes mandatory/ required field. Please note, if mandatory fields are not completed the application will be returned.**

Section A | Applicant details

1 *Applicant details:

Registered company name (if applicable):

Trading name (if applicable):

Company registration number (if applicable):

Parent company registered company name (if applicable):

Parent company registration number (if applicable):

If you are not a registered company/business, please provide the applicant's name:

Cork County Council

*Contact name: Reamonn Walsh

*Postal address: Housing, Cork County Council, County Hall, Cork

*Eircode: T12R2NC

Please provide either a landline or a mobile number

Landline:

*Mobile:

*Email: reamonn.walsh@corkcoco.ie

2 Agent details (if applicable):

The fields marked with * in this section are mandatory if using an agent

*Contact name: Ian Reilly

Company name (if applicable): Walsh Design Group

*Postal address: The Mall,

Maryborough Woods, Douglas,

Cork

*Eircode: T12K8YT

Please provide either a landline or a mobile number

Landline: 0214774940

*Mobile

*Email: ian@wdg.ie

3 *Please indicate whether it is the applicant or agent who should receive future correspondence in relation to the enquiry:

Applicant ○ Agent ◉

Section B | Site details

4 *Site address 1 (include Site name/Building name/Building number):

An Tamhnaigh

***Address 2** -

***Address 3** -

***City/Town** Clonakilty

***County** Co. Cork **Eircode**

5 *Irish Grid co-ordinates (proposed connection point):

Eastings (X) 137473 Northings (Y) 414844

Note: Values for Eastings must be between 015,900 and 340,000. Northings, between 029,000 and 362,000
Eg. co-ordinates of GPO, O'Connell St., Dublin: E(X) 315,878 N(Y) 234,619

6 *Local Authority where proposed development is located:

Cork County Council

7 *Has full planning permission been granted? Yes ☐ No ☑

If 'Yes', please provide the current or previous planning reference number:

8 ***Is this development affiliated with a government body/agency?** Yes ☑ No ☐

If 'Yes', please specify the body/agency:

Cork County Council

Eg. IDA, HSE, LDA, etc. Cork County Council Housing Directorate

Section C | Development details

9 ***Please outline the domestic and/or industry/business use proposed:**

Domestic:

Property type	Number of units	Property type	Number of units
House	15	Apartments	16
Duplex	4	Number of Apartment Blocks	5

Industry/business:

Property type	Number of units	Property type	Number of units
Agricultural		Brewery / Distillery	
Restaurant / Café / Pub		Car Wash / Valeting	
Creche		Data Centre	
Fire Hydrant		Fire Station	
Food Processing		Hotel Accommodation	
Industrial / Manufacturing		Laundry / Laundrette	
Office		Primary Care Centre	
Residential / Nursing Care Home		Retail	
School		Sports Facility	
Student Accommodation		Warehouse	

Other (please specify type)		No. of Units	

9.1 Please provide additional details if your proposed business use are in the Food Processing, Industrial unit/ Manufacturing, Sports Facility or Other Categories.

9.2 Please provide the maximum expected occupancy in number of people, according to the proposed development you selected, e.g. Number of office workers, number of nursing home residents, maximum pub occupancy, number of hotel beds, number of retail workers:

10 ***Approximate start date of proposed development:**

0	1	/	0	6	/	2	0	2	4

11 ***Is the development multi-phased?** Yes ☐ No ☑

If 'Yes', application must include a master-plan identifying the development phases and the current phase number.

If 'Yes', please provide details of variations in water demand volumes and wastewater discharge loads due to phasing requirements.

12 ***Please indicate the type of connection required by ticking the appropriate box below:**

Both Water and Wastewater ◉ Please complete both Sections D and E

Water only ○ Please go to Section D

Wastewater only ○ Please go to Section E

Reason for only applying for one service (if applicable):

Section D | Water connection and demand details

13 ***Is there an existing connection to public water mains at the site?** Yes ☐ No ☑

13.1 If yes, is this enquiry for an additional connection to one already installed? Yes ☐ No ☐

13.2 If yes, is this enquiry to increase the size of an existing connection? Yes ☐ No ☐

14 **Approximate date water connection is required:** 0 1 / 1 1 / 2 0 2 4

15 ***What diameter of water connection is required to service the development?** 1 0 0 mm

16 ***Is more than one connection required to the public infrastructure to service this development?** Yes ☐ No ☑

If 'Yes', how many? ☐☐

17 **Please indicate the business water demand (shops, offices, schools, hotels, restaurants, etc.):**

Post-development peak hour water demand		**l/s**
Post-development average hour water demand		**l/s**

Please include calculations on the attached sheet provided. Where there will be a daily/weekly/seasonal variation in the water demand profile, please provide all such details.

18 **Please indicate the industrial water demand (industry-specific water requirements):**

Post-development peak hour water demand		**l/s**
Post-development average hour water demand		**l/s**

Please include calculations on the attached sheet provided. Where there will be a daily/weekly/seasonal variation in the water demand profile, please provide all such details.

19 **What is the existing ground level at the property boundary at connection point (if known) above Malin Head Ordnance Datum?**

1 4 . 5 ☐ m

20 **What is the highest finished floor level of the proposed development above Malin Head Ordnance Datum?**

2 2 . 2 ☐ m

21 **Is on-site water storage being provided?** Yes ☐ No ☑

Please include calculations on the attached sheet provided.

22 **Are there fire flow requirements?** Yes ☐ No ☑

Additional fire flow requirements over and above those identified in Q17-18		**l/s**

Please include calculations on the attached sheet provided, and include confirmation of requirements from the Fire Authority.

23 **Do you propose to supplement your potable water supply from other sources?** Yes ☐ No ☑

If 'Yes', please indicate how you propose to supplement your potable water supply from other sources (see **Guide to completing the application form** on page 15 of this document for further details):

Section E | Wastewater connection and discharge details

24 ***Is there an existing connection to a public sewer at the site?** Yes ☐ No ☑

24.1 If yes, is this enquiry for an additional connection to the one already installed? Yes ☐ No ☐

24.2 If yes, is this enquiry to increase the size of an existing connection? Yes ☐ No ☐

25 ***Approximate date that wastewater connection is required:** 0 1 / 1 1 / 2 0 2 4

26 ***What diameter of wastewater connection is required to service the development?** 2 2 5 mm

27 ***Is more than one connection required to the public infrastructure to service this development?** Yes ☑ No ☐

If 'Yes', how many? 2

28 **Please indicate the commercial wastewater hydraulic load (shops, offices, schools, hotels, restaurants, etc.):**

Post-development peak discharge		**l/s**
Post-development average discharge		**l/s**

Please include calculations on the attached sheet provided.

29 **Please indicate the industrial wastewater hydraulic load (industry-specific discharge requirements):**

Post-development peak discharge		**l/s**
Post-development average discharge		**l/s**

Please include calculations on the attached sheet provided.

30 Wastewater organic load:

Characteristic	Max concentration (mg/l)	Average concentration (mg/l)	Maximum daily load (kg/day)
Biochemical oxygen demand (BOD)			
Chemical oxygen demand (COD)			
Suspended solids (SS)			
Total nitrogen (N)			
Total phosphorus (P)			
Other			

Temperature range	
pH range	

31 *Storm water run-off will only be accepted from brownfield sites that already have a storm/surface water connection to a combined sewer. In the case of such brownfield sites, please indicate if the development intends discharging surface water to the combined wastewater collection system:

Yes ☐ No ☑

If 'Yes', please give reason for discharge and comment on adequacy of SUDS/attenuation measures proposed.

Please submit detailed calculations on discharge volumes, peak flows and attenuation volumes with this application

32 *Do you propose to pump the wastewater? Yes ☐ No ☑

If 'Yes', please include justification for your pumped solution with this application.

33 What is the existing ground level at the property boundary at connection point (if known) above Malin Head Ordnance Datum?

15.75 m

34 What is the lowest finished floor level on site above Malin Head Ordnance Datum? 20.1 m

35 What is the proposed invert level of the pipe exiting the property to the public road?

13.9 m

Section F | Supporting documentation

Please provide the following additional information (all mandatory):

- Site location map: A site location map to a scale of 1:1000, which clearly identifies the land or structure to which the enquiry relates. The map shall include the following details: ☑
  - i. The scale shall be clearly indicated on the map.
  - ii. The boundaries shall be delineated in red.
  - iii. The site co-ordinates shall be marked on the site location map.
- Details of planning and development exemptions (if applicable). ☑
- Calculations (calculation sheets provided below). ☑
- Site layout map to a scale of 1:500 showing layout of proposed development, water network and wastewater network layouts, additional water/wastewater infrastructure if proposed, connection points to Irish Water infrastructure. ☑
- Conceptual design of the connection asset from the proposed development to the existing Irish Water infrastructure, including service conflicts, gradients, pipe sizes and invert levels. ☑
- Any other information that might help Irish Water assess this pre-connection enquiry. ☑

Section G | Declaration

I/We hereby make this application to Irish Water for a water and/or wastewater connection as detailed on this form.

I/We understand that any alterations made to this application must be declared to Irish Water.

The details that I/we have given with this application are accurate.

I/We have enclosed all the necessary supporting documentation.

Any personal data you provide will be stored and processed by Irish Water and may be transferred to third parties for the purposes of the water and/or wastewater connection process. I hereby give consent to Irish Water to store and process my personal data and to transfer my personal data to third parties, if required, for the purposes of the connection process.

If you wish to revoke consent at any time or wish to see Irish Water's full Data Protection Notice, please see **https://www.water.ie/privacy-notice/**

Signature: 

Date: 26 / 04 / 2023

Your full name (in BLOCK CAPITALS):

IAN REILLY (on behalf of WDG)

Irish Water will carry out a formal assessment based on the information provided on this form.
Any future connection offer made by Irish Water will be based on the information that has been provided here.

Please submit the completed form to **newconnections@water.ie** or alternatively, post to:

Irish Water
PO Box 860
South City Delivery Office
Cork City

CONFIRMATION OF FEASIBILITY

Uisce Éireann
Bosca OP448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

Ian Reilly
Walsh Design Group
The Mall
Maryborough Woods
Douglas
Co. Cork
T12 K8YT

19 May 2023

Our Ref: CDS23003072 Pre-Connection Enquiry
An Tamhnaigh, Clonakilty, Co. Cork

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Irish Water has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Housing Development of 35 unit(s) at An Tamhnaigh, Clonakilty, Co. Cork **(the Development)**.

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection** - Feasible Subject to upgrades:

  Irish Water currently have a Capital Investment Programme (CIP) Project underway to alleviate the current supply challenges in the Clonakilty Water Supply Zone (WSZ) area. This Project is presently due for completion in Q3 2023 (Subject to change) at which stage, Irish Water Would be in a position to facilitate your physical connection to the Irish Water watermain networks.

  PLEASE NOTE: Your Pre-Connection enquiry relates to the Clonakilty WSZ. This WSZ is currently subject to capacity constraints. Accordingly, your attention is drawn to the following in particular:

  Whilst Irish Water can confirm that your proposed connection to the Irish Water watermain network can be facilitated at present, this confirmation of available capacity reflects current capacity only. Connections within the WSZ will be facilitated strictly in the order in which valid connection offers, as issued by Irish Water, are accepted by applicants. If you wish to proceed, please make a connection application (as detailed below) to Irish Water as soon as possible, subject to a valid Planning Permission having been received for the development. Connection applications will be considered on a first come basis.

- **Wastewater Connection** - Feasible Subject to upgrades:

  In order to facilitate the proposed connection at the Development, the Irish Water sewer network will have to be extended by approximately 25m. Irish Water currently does not have any plans to extend its network in this area. These works will be carried out by Irish Water and the costs for this will be included in your connection fee. Please see www.water.ie/connections/ for information on connection charges.

  The Applicant shall be responsible for obtaining all necessary permissions and allowing third parties to enter the development lands so to allow excavations and works to make the connection works. The Applicant shall also be responsible for providing a wayleave over the full section of sewer that passes through the Applicants lands.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Irish Water.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

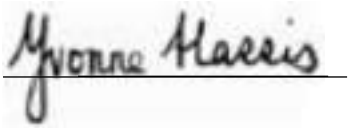
Where can you find more information?

- **Section A -** What is important to know?
- **Section B -** Details of Irish Water's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Irish Water's network(s). This is not a connection offer and capacity in Irish Water's network(s) may only be secured by entering into a connection agreement with Irish Water.

For any further information, visit **www.water.ie/connections, email** newconnections@water.ie or contact 1800 278 278**.**

Yours sincerely,



Yvonne Harris
Head of Customer Operations

Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Irish Water's network(s). • Before the Development can connect to Irish Water's network(s), you must submit a connection application and be granted and sign a connection agreement with Irish Water.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Irish Water connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Irish Water's network(s), including works in the public space, must be carried out by Irish Water*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Irish Water's network(s)?	• Requests for maps showing Irish Water's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with ***the Irish Water Connections and Developer Services Standard Details and Codes of Practice,*** available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

Section B – Details of Irish Water's Network(s)

The map included below outlines the current Irish Water infrastructure adjacent the Development: To access Irish Water Maps email datarequests@water.ie

Existing Water Infrastructure:

Existing Wastewater Infrastructure:

Note: The information provided on the included maps as to the position of Irish Water's underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Irish Water.

Whilst every care has been taken in respect of the information on Irish Water's network(s), Irish Water assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Irish Water's underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Irish Water's underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

Appendix D

Utilities

- ESB Map
- Email from GNI confirming no gas infrastructure in the area of interest.

ESB Networks

TITLE: 20230111-011_A3

COLOUR CODE:

- BLACK - 38KV & HIGHER VOLTAGE OVERHEAD LINES
- GREEN - MV(10KV/20KV) OVERHEAD LINES
- BLUE - LV (400V/230V) OVERHEAD LINES
- CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
- RED - MV/LV (10KV/20KV/400V/230V) UNDERGROUND CABLE ROUTES

DATE: 11-Jan-2023

** SCALE: 1:2500

** SCALE WHEN PRINTED ON AN A3 PAGE
XY COORDINATES DISPLAYED IN IRISH GRID COORDINATE SYSTEM

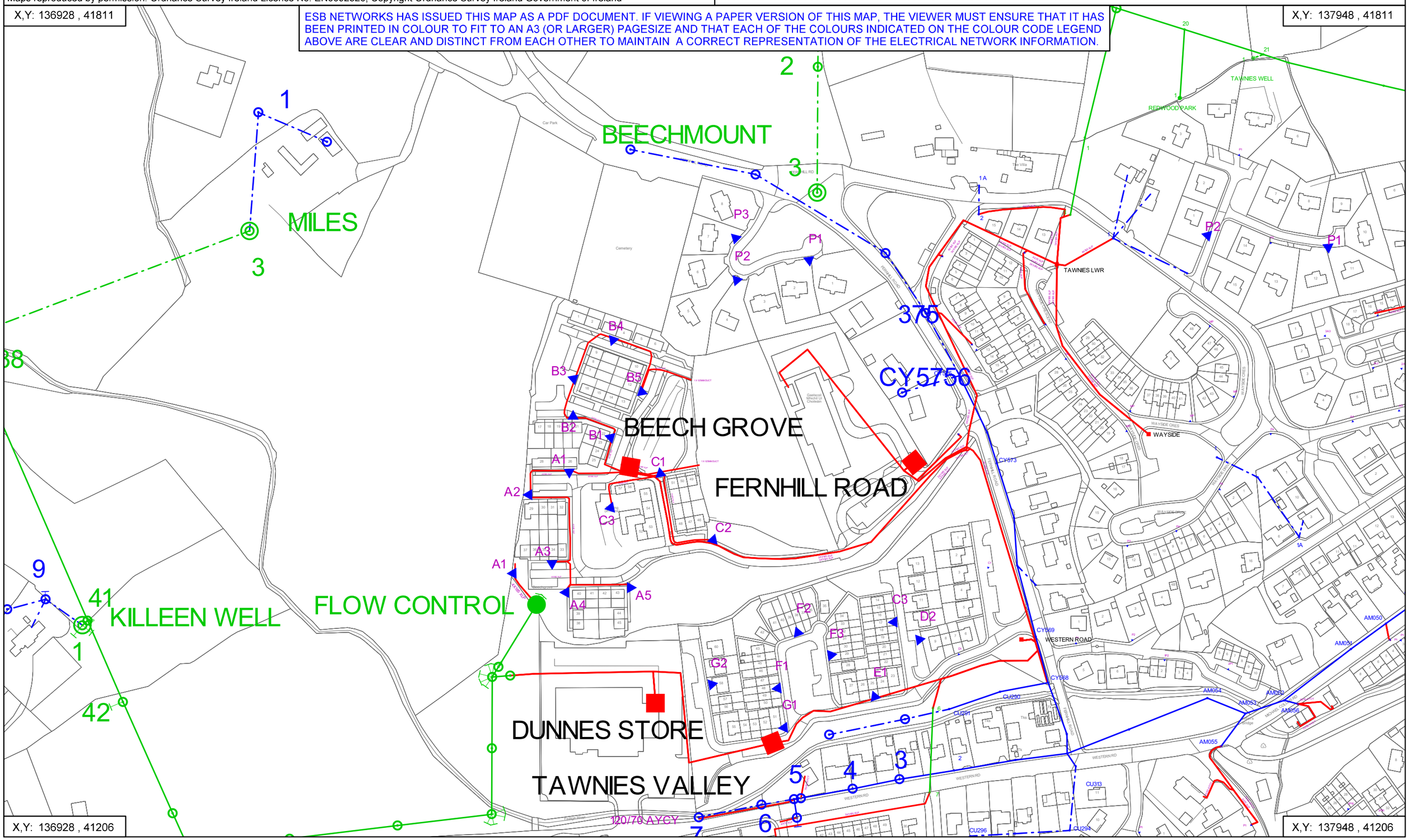
WARNING

THIS MAP INDICATES THE APPROXIMATE LOCATION OF ESB TRANSMISSION (400KV, 220KV, 110KV, 38KV) AND DISTRIBUTION (20KV, 10KV, 230V/400V) UNDERGROUND CABLES AND OVERHEAD LINES IN THE GENERAL AREA OF THE PROPOSED WORKS. ESB NETWORKS TAKES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE MAP. IT IS THE USER'S RESPONSIBILITY TO INDEPENDENTLY VERIFY THE INFORMATION AND THE LOCATION OF UNDERGROUND CABLES AND OVERHEAD LINES. LOW VOLTAGE (230V/400V) SERVICE CABLES (E.G. HOUSE SERVICES, FACTORY/SHOP SERVICES, PUBLIC LIGHTING LAMP SERVICES, ETC) ARE NOT INCLUDED BUT THEIR PRESENCE SHOULD BE ANTICIPATED. THE DEPTHS OF UNDERGROUND CABLES MUST NEVER BE ASSUMED. ADDITIONAL MORE DETAILED INFORMATION IS AVAILABLE FOR HIGH VOLTAGE TRANSMISSION UNDERGROUND CABLES (38KV, 110KV, 220KV, 400KV) FROM THE LOCAL ESB NETWORKS TRANSMISSION REPRESENTATIVE - SEE ATTACHED LIST FOR CONTACT DETAILS OR CALL 1800 372 757. NO WORK SHOULD BE CARRIED OUT IN THE VICINITY OF 38KV OR HIGHER VOLTAGE UNDERGROUND CABLES WITHOUT PRIOR CONSULTATION WITH ESB NETWORKS. BEFORE ANY MECHANICAL EXCAVATION IS UNDERTAKEN, THE ACTUAL LOCATION OF ALL UNDERGROUND ELECTRICITY CABLES MUST BE ESTABLISHED AND VERIFIED ON THE SITE USING: (A) UP-TO-DATE MAP RECORDS; (B) CABLE LOCATER EQUIPMENT OPERATED IN BOTH POWER AND RADIO MODES; (C) CAREFUL HAND DIGGING OF TRIAL HOLES USING 'SAFE DIGGING PRACTICE'. REFER ALSO TO 'HSA CODE OF PRACTICE FOR AVOIDING DANGER FROM UNDERGROUND SERVICES'. ESB TAKES NO RESPONSIBILITY FOR AND SHALL BEAR NO LIABILITY, HOWSOEVER ARISING, IN RELATION TO ANY DAMAGE, INJURY/DEATH OR LOSS OF SUPPLY AS A RESULT OF DAMAGE OR INTERFERENCE WITH ITS NETWORKS.

X,Y: 136928 , 41811

ESB NETWORKS HAS ISSUED THIS MAP AS A PDF DOCUMENT. IF VIEWING A PAPER VERSION OF THIS MAP, THE VIEWER MUST ENSURE THAT IT HAS BEEN PRINTED IN COLOUR TO FIT TO AN A3 (OR LARGER) PAGESIZE AND THAT EACH OF THE COLOURS INDICATED ON THE COLOUR CODE LEGEND ABOVE ARE CLEAR AND DISTINCT FROM EACH OTHER TO MAINTAIN A CORRECT REPRESENTATION OF THE ELECTRICAL NETWORK INFORMATION.

X,Y: 137948 , 41811



X,Y: 136928 , 41206

X,Y: 137948 , 41206

Ian

From: DIG <Dig@gasnetworks.ie>
Sent: 03 January 2023 12:40
To: Ian
Subject: RE: WDG 22055 - Request for information on GNI infrastructure, Clonakilty, Co. Cork
Attachments: Safety Booklet-A5-HSQE-GU-016.pdf

Thank you for your enquiry to the Gas Networks Ireland ***Dial Before You Dig*** service.

Gas Networks Ireland has ***No recorded Gas Network*** within your area of interest.

Before you start work, you must have a current gas network map (or maps) for the work location. A current gas network map (or maps) must always be kept on site while work is under way.

The Gas Network

For an overview of the existing Gas Network, please refer to the Gas Networks Ireland safety booklet, ***Safety advice for working in the vicinity of natural gas pipelines***, available at https://www.gasnetworks.ie/home/safety/dial-before-you-dig/

Reading your Map

- High pressure transmission gas pipe is shown **Red.**
- Medium pressure distribution gas pipe is shown **Blue.**
- Low Pressure distribution gas pipe is shown **Green.**

The gas network map is indicative only. You must conform to the safety and legal notices printed on the map. For further information on reading this map refer to the ***Safety Information*** below.

Breaking Ground

- Supervision by Gas Networks Ireland is **not** required when working in the vicinity of Distribution gas pipes (unless noted otherwise). Safe digging practices **must** be followed. All work in the vicinity of a gas transmission pipeline **must** be carried out in compliance with:
    - Health and Safety Authority, ***Code of Practice for Avoiding Danger from Underground Services.***

Critical Activity

Quarrying or blasting must not be carried out within 400 m of the gas network until Gas Networks Ireland has been consulted on **1800 42 77 47**

Aurora Telecom

- Part of the Aurora Telecom Network may be present on your network map. For further information, Aurora can be contacted on **01 892 6166** (Office Hours) or auroralink@gasnetworks.ie.

Safety Information

- Before starting work any work in the vicinity of the gas network, please refer to the Gas Networks Ireland safety booklet, ***Safety advice for working in the vicinity of natural gas pipelines***, available at https://www.gasnetworks.ie/home/safety/dial-before-you-dig/

  This booklet contains important safety information, including advice on how to read the gas network maps you have requested.

If you did not request this map, please contact Customer Service on **1800 200 694**.

Thank you for your enquiry to Gas Networks Ireland.

T 1800 20 50 50 (Emergency)
T 1800 42 77 47 (Dial Before You Dig enquiries)

E dig@gasnetworks.ie

Gas Networks Ireland Networks Services Centre, St. Margaret's Road, Finglas, D11 Y895 gasnetworks.ie | Find us on Twitter

Gas Networks Ireland

Useful Publications

- Heatlh and Safety Authority, ***Code of Practice for Avoiding Danger from Underground Services***
- Heatlh and Safety Authority, ***Guide to Safety in Excavations***

Both are available free of charge from: Health and Safety Authority on **0818 289 389** www.hsa.ie

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From: Ian <Ian@wdg.ie>
Sent: Tuesday 3 January 2023 11:50
To: DIG <Dig@gasnetworks.ie>
Subject: WDG 22055 - Request for information on GNI infrastructure, Clonakilty, Co. Cork

Hello,
My Client is applying for planning permission for a development in Clonakilty, Co. Cork.
The outline of the site is roughly marked on the screenshot below and the Irish Grid coordinates at the centre of the site are as follows:
E137476, N41490.

Would you please send on a map of the GNI infrastructure in the immediate area?

Kind Regards,
Ian Reilly BEng MSc MIEI
Ph: +353 21 4774940
E: ian@wdg.ie
On Behalf of Walsh Design Group

Head Office
The Mall, Maryborough Woods, Douglas, Cork, T12 K8YT | (021) 477 4940 | www.wdg.ie

Dublin Office
Unit 111, Q House, 76 Furze Road, Sandyford, Dublin 18, D18 PF29 | (01) 524 0191 | www.wdg.ie

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Tá an fhaisnéis á seachadadh dírithe ar an duine nó ar an eintiteas chuig a bhfuil sí seolta amháin agus féadfar ábhar faoi rún, faoi phribhléid nó ábhar atá íogair ó thaobh tráchtála de a bheith mar chuid de. Tá aon athsheachadadh nó scaipeadh den fhaisnéis, aon athbhreithniú ar nó aon úsáid eile a bhaint as, nó aon ghníomh a dhéantar ag brath ar an bhfaisnéis seo ag daoine nó ag eintitis nach dóibh siúd an fhaisnéis seo, toirimiscthe agus féadfar é a bheith neamhdhleathach. Níl Líonraí Gáis Éireann faoi dhliteanas maidir le seachadadh iomlán agus ceart na faisnéise sa chumarsáid seo nó maidir le haon mhoill a bhaineann léi. Ní ghlacann Líonraí Gáis Éireann le haon dliteanas faoi ghnímh nó faoi iarmhairtí bunaithe ar úsáid thoirmiscthe na faisnéise seo. Níl Líonraí Gáis Éireann faoi dhliteanas maidir le seachadadh ceart agus iomlán na faisnéise sa chumarsáid seo nó maidir le haon mhoill a bhaineann léi. Má fuair tú an teachtaireacht seo in earráid, más é do thoil é, déan teagmháil leis an seoltóir agus scrios an t-ábhar ó gach aon ríomhaire.
Féadfar ríomhphost a bheith soghabhálach i leith truaillithe, idircheaptha agus i leith leasaithe neamhúdaraithe. Ní ghlacann Líonraí Gáis Éireann le haon fhreagracht as athruithe nó as idircheapadh a rinneadh ar an ríomhphost seo i ndiaidh é a sheoladh nó as aon dochar do chórais na bhfaighteoirí déanta ag an teachtaireacht seo nó ag a ceangaltáin. Más é do thoil é, tabhair faoi deara chomh maith go bhféadfar monatóireacht a dhéanamh ar theachtaireachtaí chuig nó ó Líonraí Gáis Éireann chun comhlíonadh le polasaithe agus le caighdeáin Líonraí Gáis Éireann a chinntiú agus chun ár ngnó a chosaint. Líonraí Gáis Éireann cuideachta ghníomhaíochta ainmnithe, faoi theorainn scaireanna, atá corpraithe in Éirinn leis an uimhir chláraithe 555744 agus a tá hoifig chláraithe ag Bóthar na nOibreacha Gáis, Corcaigh, T12 RX96.

Go raibh maith agat as d'aird a thabhairt.

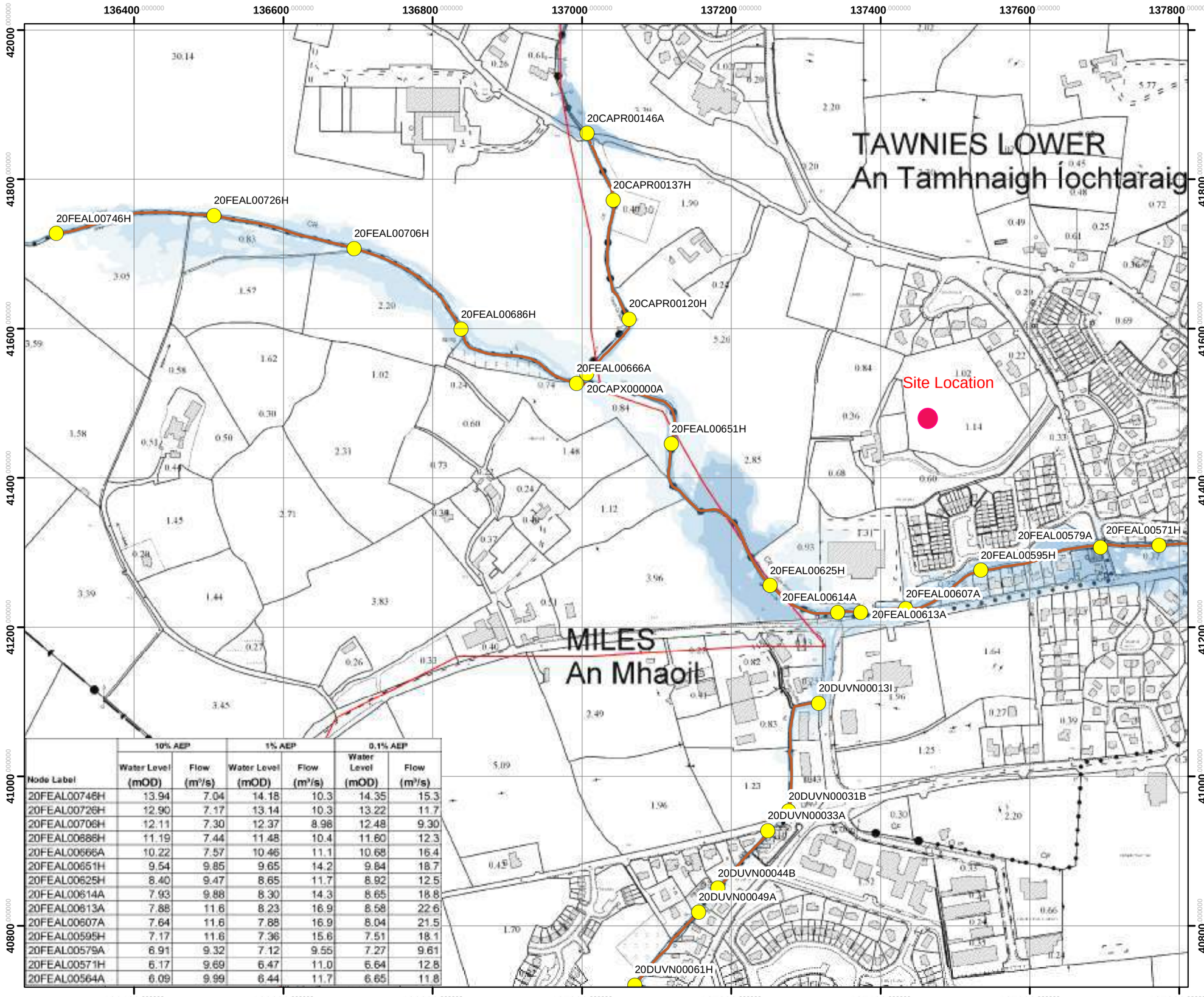
The information transmitted is intended only for the person or entity to which it is addressed and may contain confidential, commercially sensitive and/or privileged material. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon, this information by persons or entities other than the intended recipient is prohibited and may be unlawful. Gas Networks Ireland accepts no liability for actions or effects based on the prohibited usage of this information . Gas Networks Ireland is neither liable for the proper and complete transmission of the information contained in this communication nor for any delay in its receipt. If you received this in error, please contact the sender and delete the material from any computer.
E-Mail may be susceptible to data corruption, interception and unauthorized amendment. Gas Networks Ireland accepts no responsibility for changes to or interception of this e-mail after it was sent or for any damage to the recipients systems or data caused by this message or its attachments. Please also note that messages to or from Gas Networks Ireland may be monitored to ensure compliance with Gas Networks Ireland's policies and standards and to protect our business. Gas Networks Ireland a designated activity company, limited by shares, incorporated in Ireland with registered number 555744 and having its registered office at Gasworks Road, Cork, T12 RX96.

Thank you for your attention.

Appendix E

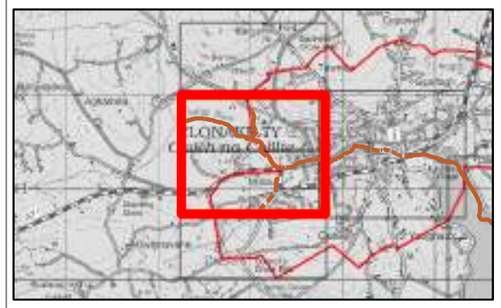
Flood Information:

- OPW Southwestern CFRAM Study Flood Map – Map No. MMD/296235/E/DR/I20HCY27/EXFCDEXF/F2/03,
- Past Flood Event Local Area Summary Report.



Node Label	10% AEP Water Level (mOD)	10% AEP Flow (m³/s)	1% AEP Water Level (mOD)	1% AEP Flow (m³/s)	0.1% AEP Water Level (mOD)	0.1% AEP Flow (m³/s)
20FEAL00746H	13.94	7.04	14.18	10.3	14.35	15.3
20FEAL00726H	12.90	7.17	13.14	10.3	13.22	11.7
20FEAL00706H	12.11	7.30	12.37	8.98	12.48	9.30
20FEAL00686H	11.19	7.44	11.48	10.4	11.60	12.3
20FEAL00666A	10.22	7.57	10.46	11.1	10.68	16.4
20FEAL00651H	9.54	9.85	9.65	14.2	9.84	18.7
20FEAL00625H	8.40	9.47	8.65	11.7	8.92	12.5
20FEAL00614A	7.93	9.88	8.30	14.3	8.65	18.8
20FEAL00613A	7.88	11.6	8.23	16.9	8.58	22.6
20FEAL00607A	7.64	11.6	7.88	16.9	8.04	21.5
20FEAL00595H	7.17	11.6	7.36	15.6	7.51	18.1
20FEAL00579A	6.91	9.32	7.12	9.55	7.27	9.61
20FEAL00571H	6.17	9.69	6.47	11.0	6.64	12.8
20FEAL00564A	6.09	9.99	6.44	11.7	6.65	11.8

Location Plan:



Legend:

- Model Nodes
- Flood Defence - Embankment
- Modelled River Centreline
- Defended Area
- AFA Boundary
- Upstream limit to tidal influence
- 10% AEP Flood Extent
- 1% AEP Flood Extent
- 0.1% AEP Flood Extent

IMPORTANT USER NOTICE: THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

SOUTH WESTERN CFRAM STUDY

OPW
Office of Public Works
Jonathan Swift Street
Trim Co. Meath

MOTT MACDONALD
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island
Co. Cork

Project:
South Western CFRAM Study

Map:
Clonakilty - Flood Extent

Map type:	Flood Extent
Source:	Fluvial Flooding
Map area:	Urban Area
Scenario:	Current

Drawn by:	Emily Shipton	Date:	Oct 2017
Checked by:	Barry O'Connor	Date:	Oct 2017
Approved by:	Fintan McGivern	Date:	Oct 2017

Map No.: MMD/296235/E/DR/I20HCY27/EXFCDEXF/F2/03

Sheet: 3 of 5 Revision: F2

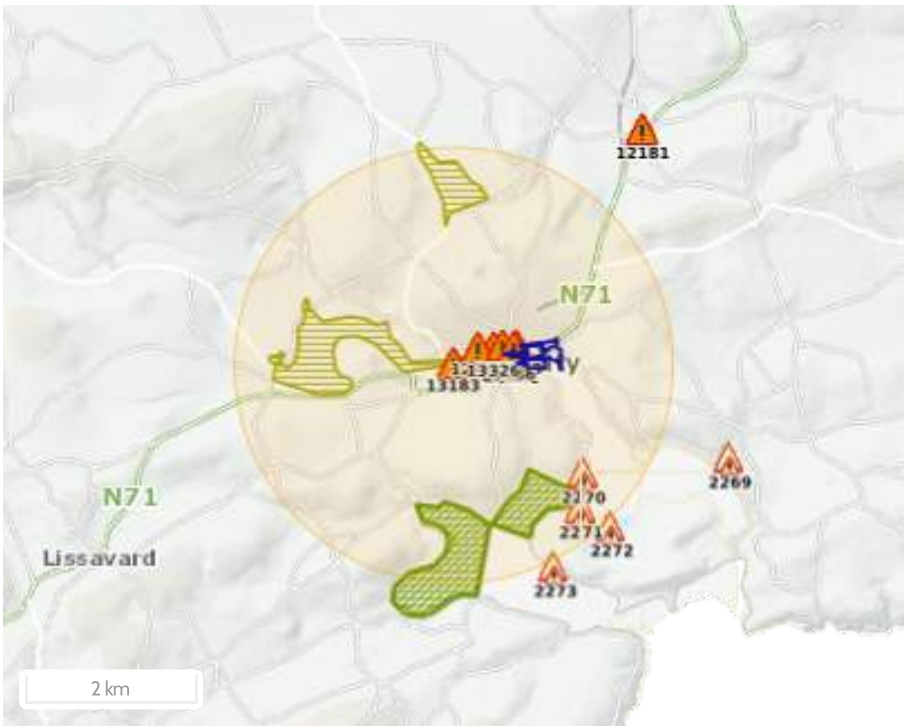
Drawing Scale: 1:5,000 Plot Scale: 1:1@A3

Past Flood Event Local Area Summary Report

Report Produced: **18/10/2023 8:12**

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "**Website**"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

16 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Flooding at Clonakilty on 03/12/2015 (ID-13326)	03/12/2015	Approximate Point
	Additional Information: Reports (0) Press Archive (0)		
2.	Clonakilty August 1986 (ID-3786)	04/08/1986	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
3.	Clonakilty Jan 1995 (ID-489)	27/01/1995	Exact Point
	Additional Information: Reports (2) Press Archive (0)		
4.	Inchydoney North of Causeway Recurring (ID-2270)	n/a	Exact Point
	Additional Information: Reports (2) Press Archive (0)		
5.	Inchydoney Island Strand Intake Recurring (ID-2271)	n/a	Exact Point
	Additional Information: Reports (2) Press Archive (0)		
6.	Clonakilty recurring (ID-3746)	n/a	Approximate Point
	Additional Information: Reports (6) Press Archive (9)		

	Name (Flood_ID)	Start Date	Event Location
7.	Flooding at Clonakilty on 28/08/2012 (ID-12890) **Additional Information:** Reports (0) Press Archive (0)	28/08/2012	Approximate Point
8.	Flooding at Clonakilty on 25/01/2013 (ID-12915) **Additional Information:** Reports (0) Press Archive (0)	25/01/2013	Approximate Point
9.	Flooding at Clonakilty on 11/09/2015 (ID-13183) **Additional Information:** Reports (0) Press Archive (0)	11/09/2015	Approximate Point
10.	Clonakilty Flooding 19th November 2009 (ID-10782) **Additional Information:** Reports (5) Press Archive (0)	19/11/2009	Approximate Point
11.	Clonakilty December 1989 (ID-490) **Additional Information:** Reports (4) Press Archive (0)	16/12/1989	Area
12.	Clonakilty, Co.Cork 6th January 2014 (ID-12101) **Additional Information:** Reports (1) Press Archive (0)	06/01/2014	Approximate Point
13.	Clonakilty Co.Cork 11th October 2012 (ID-11860) **Additional Information:** Reports (1) Press Archive (0)	10/10/2012	Approximate Point
14.	Flooding at Clonakilty, Co Cork, 28th June 2012 (ID-11677) **Additional Information:** Reports (2) Press Archive (0)	27/06/2012	Approximate Point
15.	Clonakilty,Co.Cork 28th August 2012 (ID-12020) **Additional Information:** Reports (1) Press Archive (0)	n/a	Approximate Point
16.	Clonakilty Undated (ID-1359) **Additional Information:** Reports (2) Press Archive (1)	n/a	Area

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Project: Proposed Residential Development at An Tamhnaigh, Clonakilty, Co. Cork

Project No: 22055

Document Title: Planning Stage Construction and Environmental Management Plan

Document No: 22055-ZZ-XX-XX-XX-RP-WDG-CE-002

Author: Ian Reilly BEng MSc MIEI

Date	Revision	Status	Originator	Checked	Approved
23.10.2023	Revision 0	Draft	IR	MW	MW

Table of Contents

1.0 Introduction

This Construction and Environmental Management Plan (CEMP) has been prepared by Walsh Design Group (WDG) on behalf of Cork County Council for a proposed Housing Development on a site at An Tamhnaigh, Clonakilty, Co. Cork. The CEMP has been prepared in parallel with the Environmental Impact Assessment Report (EIAR) for the project and takes cognisance of the specific mitigation measures outlined in the EIAR.
The CEMP provides a framework from which a construction stage CEMP will be developed to implement the mitigation measures described below which are designed to avoid, minimise, or mitigate adverse construction effects on the environment during construction of the development. The CEMP will be finalised following grant of planning permission and prior to construction to include all relevant conditions imposed by the Planning Authority. Additional mitigation measures may be added following consultation with relevant parties.
Should any ambiguity or contradiction arise in the preparation of the construction stage CEMP between the text of the CEMP, the mitigation measures and planning conditions, the following precedence shall apply:

1. Planning conditions,
2. Mitigation measures,
3. CEMP text.

The Contractor shall comply with any conditions arising from the site constraints identified and specified, all Statutory Regulations governing the works, and any additional measures or modifications that may be imposed on the proposed development by the Local Authority.

1.1. Background

Cork County Council are proposing to develop a site to the west of Clonakilty town centre, see Figure 1 & Figure 2. The Site will be accessed via the local road off the R588, Fernhill Road, which also serves the existing Beechgrove development and the school. The site is bounded to the west by the Beechgrove development, to the north by private dwellings, to the east by Gaelscoil Mhichíl Uí Choileáin and to the south by the local access road.

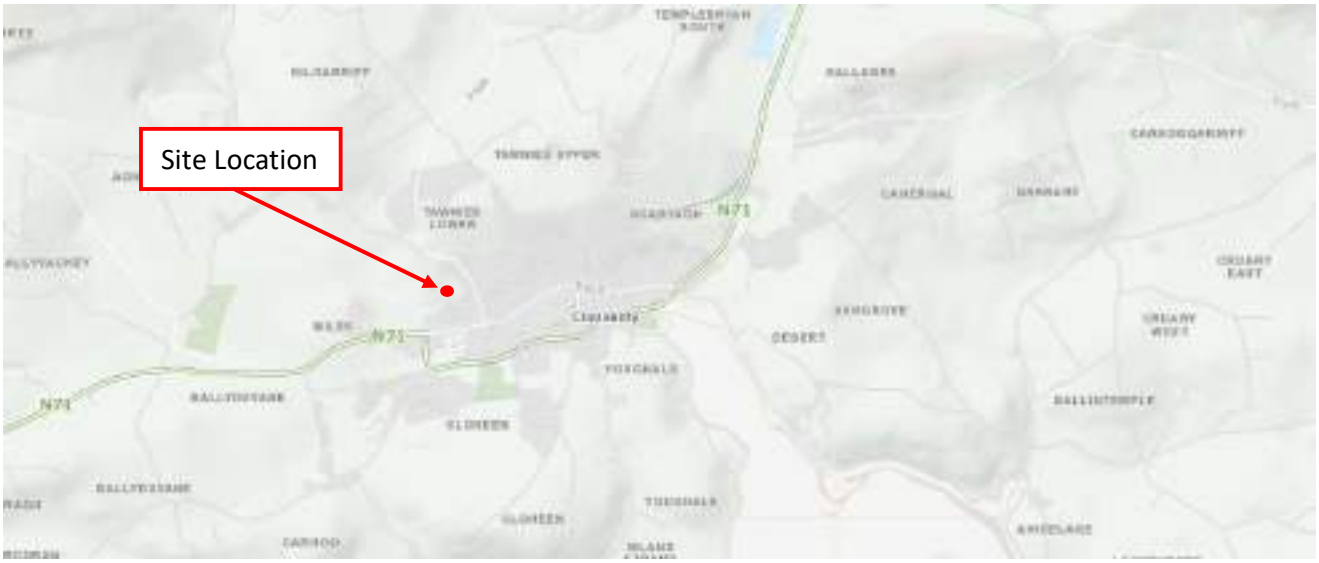


Figure 1 - Development Site Location Map

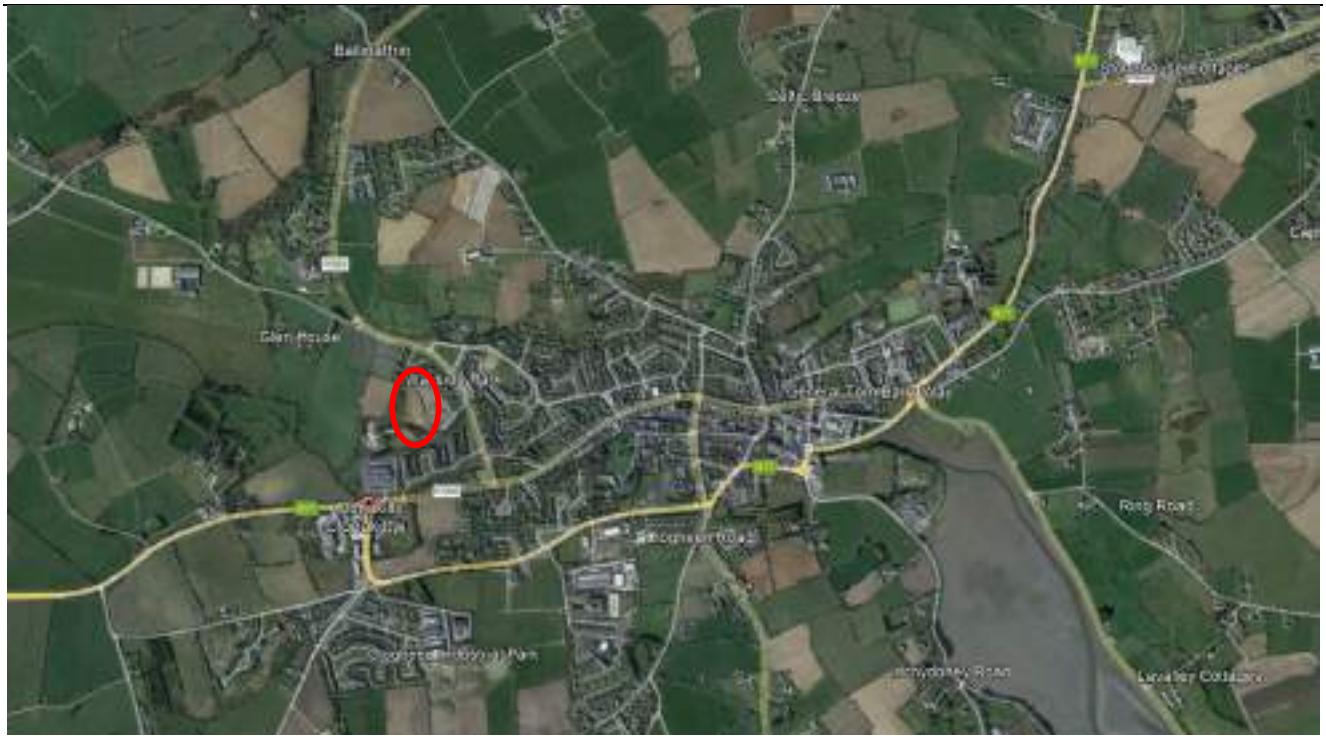


Figure 2 - Development Site Location Satellite Image – Development site circled in Red

1.2. Site Description

The site area within the application, redline boundary is approximately 0.99ha and the ITM grid coordinates at the approximate centre of the site are E537436, N541553. This is a greenfield site, currently used as agricultural land. The site generally slopes downwards from the north to the south. The high point of approximately 24.10m is at the top of a low mound in the north of the site and the low point of approximately 14.30m is at the southern boundary, along the edge of the local road. Several large mature trees are located along the western boundary ditch between the Beechgrove development and the site and in the green area just outside the southwest boundary.

1.3. Proposed Development

The proposed development on the site would consist of 35 dwelling units including 15 townhouses and 20 duplex apartment units as well as associated green areas, estate roads, boundary treatments, services and all other infrastructure required to develop a housing project. Architectural, Engineering and Landscaping drawings are included in the planning documentation; an outline of the development is shown in the Architect's site layout in Figure 3.

1.3.1. Access Road

Vehicular access to the development will only be possible via the existing local access road, off the Fernhill Road (R588). Pedestrian and cycle access will be provided alongside the access road and a potential future pedestrian connection with the Beechgrove Development, in the north of the site, is indicated in the Architect's Layout drawing, see Figure 3.

Figure 3 - Architect's Site Layout

1.3.2. Estate Roads

Estate roads will be constructed to provide circulation routes around the development. Roads will consist of bituminous surfacing on granular capping and subbase layers. Concrete footpaths will be provided. Services such as foul and surface water drainage, water, electricity, public lighting and telecommunications will be run under or next to the roads. Surface water from the roads and public hardstanding areas will be collected firstly in a selection of SuDS features. Residual runoff that does not infiltrate to the soil in those SuDS features will be conveyed by a local drainage network and discharge to the main drainage network to the south of the site, through the Woodlands Estate, at the greenfield runoff rate, having been attenuated on site.

1.3.3. Housing

The unit breakdown is given in paragraph 1.3 above. The housing units will be of typical domestic construction refer to the planning submission drawings for details. Foundations will be reinforced concrete (RC) strip footings. The buildings will be timber framed inner leaf with masonry/brick outer leaf. Concrete, asphalt or paved parking or driveways will be provided to the front of the units.

1.3.4. Landscaped Areas

Several green spaces and landscaped areas are proposed within the development. Refer to the Landscape Architect's design report and drawings for further details.

2.0 Development Construction Management

2.1. Safety Health and Environmental Considerations

The appointed Contractor will be required to prepare a Construction Health & Safety Plan which will be put in place prior to commencement of the works. At a minimum, this plan will include:

- Construction Health & Safety training requirements,
- Induction procedures,
- Emergency protocols,
- Details of welfare facilities,
- Risk assessments and Method Statements.

2.2. Development Phasing

It is envisaged that there may be some phasing of the development, as is commonplace for housing developments of this size. The exact configuration of the phasing has not been finalised at this stage, but the overriding principle will be to fully complete blocks of the development and isolate residents from the construction operations as much as possible.

2.3. Works Description

2.3.1. Site Access

Access to the construction site will be via the gate in the existing paladin fencing along the southern boundary of the site. At the early stages of construction, the access road within the site may be constructed from unbound stone. The access road will be paved and completed, including street furniture and footpaths, in advance of occupation of the first phase of the development.

Figure 4 - Construction Site Access

2.3.2. Site Set-up and Security

The first activity to be carried out at the site will be the establishment of site facilities and security. The site office and welfare facilities (site compound) will be confirmed in advance of the commencement of site works. All the sub-contractors as well as the main contractor and project managers will occupy offices within the construction compound. The site parking for all staff, contractors and visitors will also be located in this area. Erection of perimeter hoarding will take place at the start of the project alongside the site establishment and security works. The hoarding will be installed along the boundaries with neighbouring housing estates and completed phases of the proposed development, except for the dedicated access points. The extent of hoarding will be subject to the detailed phasing of the development and will ensure that areas under construction will be fenced off at all times. Gates will be provided at the access points and will be locked outside of working hours. Hoarding will consist of solid painted plywood on a timber support frame or similar. Hoarding will be properly designed to be secure and durable and will be maintained until it can be dismantled on completion of the development (or phase of the development).

2.3.3. Lighting

Lighting will be provided as necessary at construction compounds. Consideration of best practice and guidance in relation to lighting and wildlife impact such as Bats & Lighting Guidance Notes for Planners, Engineers, Architects and Developers (Bat conservation Ireland, December 2010); All lighting will be directional with appropriate cowling installed to minimise light spillage from the site. The height of lamp posts will be restricted (e.g., <8m where possible) to reduce the amount of light spillage to where it is not needed. The lights will be positioned facing away from the woodland and stream to the west, where possible, to minimize impact on bats that may use this area as a commuting route as well as other species who may use this habitat. Where possible all light fittings will be LED, have asymmetrical projection i.e. directional, and with colour temperature of 2700K (warm spectrum preferred by bats). The radiation will be above 500nm to avoid the blue or UV light, most disturbing to bats.

Construction work will generally be confined to daylight hours and lighting will generally not be required for the construction phase. There will however be occasions where the provision of portable lighting will be required such as evening work during later winter/early spring, works on roadways and power floating floors. Where possible and without jeopardising site safety, lights will be pointed down at a 45-degree angle and away from sensitive receptors. The site compound will have external lights for safety and security. This lighting will also be controlled by occupancy/motion sensors so that it will remain at a low output unless activated. This will mitigate light overspill as well as avoiding energy wastage. Construction stage lighting will be designed to minimise the broadcast of light to surrounding areas including sensitive receptors.

2.3.4. Site Clearance

To facilitate the earthworks operation, site clearance will have to be carried out to remove vegetation. Removal of woody vegetation shall only take place outside the bird breeding season (1st March to 31st August). No removal of habitats or movement of construction machinery will occur outside of the development works area/footprint during the construction phase. Existing trees and hedgerows shall be retained where possible. Temporary surface water management measures will be put in place prior to stripping of topsoil and will remain in place until the completion of the development, or until the completion of each phase. Refer to paragraph 3.1 for details of the surface water management measures.

Topsoil will be stripped from the area to be developed and from areas where site won fill may be excavated to bring the development to the correct level. All excavated topsoil will be stored in dedicated stockpiles with environmental controls in place. Prior to topsoil clearance, an Invasive Species Management Plan and survey is recommended to ensure areas of invasive plant species (if any) are identified and managed prior

to or during site clearance works. There is a responsibility on the Environmental Manager or Ecological Clerk of Works (ECoW) to regularly inspect and supervise maintenance of the environmental controls throughout the process.

2.3.5. Earthworks

Once surface water management measures are in place and topsoil has been stripped, earthworks operations can commence. This will consist of moving fill from the higher ground at the east to the lower ground to the west. Material will be excavated by 360° excavators and transported to the deposition area by articulated dumpers. The fill will then be placed by dozers and compacted using vibratory rollers. A testing regime will be implemented to ensure the acceptability of the fill and that the degree of compaction is sufficient. Fill will be brought to the required level across the site to allow construction of roads and foundations. An overall earthworks balance has been targeted i.e., no imported fill will be required for the bulk earthworks and no soil will be removed from the site.

2.3.6. House Construction

On completion of the bulk earthworks, construction of foundations for housing will commence. The exact construction sequence has not been determined, but it will be similar to that described below:

- Temporary roads will be constructed to provide access to each row of units. This will include the construction of surface water management and silt control infrastructure, including settlement ponds and silt fencing.
- Construction of foundations. It is envisaged that strip foundations will be used on this site. The locations of foundations will be set out on the ground. Importation of certified stone fill will be required for the layers under the floor slabs in compliance with the Building Regulations. Reinforcement will be fixed, formwork installed, and all required ducting placed prior to placement of concrete. Construction of foundations will require concrete deliveries to the site. Controls will be required to prevent any concrete material reaching local watercourses.
- Once foundations have cured, timber frames will be delivered to site and erected, followed by roofs.
- Scaffolding will be erected, and construction of the masonry/brick outer leaf will then be completed.
- Windows and doors will be installed, and first fix plumbing and wiring will be completed prior to external and internal rendering.
- On completion of rendering, second fix, plumbing wiring and carpentry will be completed, followed by floors, painting and finishing.
- At this stage, installation of drainage and services is likely to be underway, and the roads will be completed. Drives, footpaths, boundary walls and lawns will be finished, and final road pavements will be installed.

2.3.7. Landscaping

Landscaped areas will be completed at the same time as each phase. These areas will be brought to a level below the final grading and will be finished with reclaimed topsoil on completion. Seeding and planting will be in accordance with the landscape plan for the site. Refer to the Landscape Design Report prepared by Forrestbird Design.

3.0 Environmental Management

3.1. Surface Water

The subject site is on high ground that falls generally from North to South but also westward from a mound towards the north of the site. There are existing road gullies along the local access road to the south and in the Beechgrove estate road to the northwest.

Surface water will naturally tend to flow away from the higher ground towards the southern and western boundaries. The most sensitive parts of the site in terms of surface water will be northern boundary and sections of the western boundary that border private dwellings and the eastern boundary that is shared with Gaelscoil Mhichíl Uí Choileáin.

Run-off into excavations/earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions. Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. All run-off will be prevented from directly entering any water courses as no construction will be undertaken directly adjacent to open water.

No significant dewatering will be required during the construction phase which would result in the localised lowering of the water table. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavations are kept safe and relatively dry.

The measures outlined in the following sections will be put in place during the construction phase to ensure protection of surface waterbodies. Construction works will be informed by best practice guidance from Inland Fisheries Ireland on the prevention of pollution during development projects. These measures comply with the following relevant CIRIA and Inland fisheries guidance documents:

- Control of Water Pollution from construction Sites, Guidance for consultants and contractors (C532)
- Environmental Good Practice on Site (3rd edition) (C692)
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016)

3.2. Pollution Control

3.2.1. Suspended Solids

Prior to the commencement of topsoil stripping and earthworks operations, the following site-specific surface water management measures will be put in place:

Where possible, significant earthworks operations should be limited to the summer months.

Silt fencing will be installed around the perimeter of the site. The location of the silt fencing will be determined in the construction stage CEMP and will be subject to a detailed assessment of the area or phase to be developed. The purpose of the silt fencing is to prevent silt laden water leaving the site and entering neighbouring land with the potential to impact nearby watercourses. A typical silt fencing arrangement is shown below in Figure 5. It will consist of a double layer of geotextile membrane fixed to wooden stakes approximately 600mm high. The membrane will be anchored into the ground to form a continuous barrier to silt laden water from the works site. Silt fences will be monitored via a silt inspection log (to be maintained by the Environmental Manager/ECoW) and periodically maintained during the construction period. Typical

maintenance will consist of repairs to damaged sections of membrane and removal of a build-up of silt on the upslope side of the fence. Daily silt fence inspections are recommended as part of their operation ensuring that any necessary repairs can be expedited.

Figure 5 - Typical Silt Fencing Arrangement

Drainage ditches will be installed to intercept surface water where there is a risk of significant water flow into excavations or onto adjoining lands. There will also be a requirement to periodically pump water from excavations. All collected and pumped water will have to be treated prior to discharge. The run-off will be directed through appropriately sized settlement ponds in series to remove suspended solids before being discharged, see Figure 6.

Figure 6 - Settlement Ponds in Series

Emergency contact numbers for the Local Authority Environmental Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident.

Site personnel will be trained in the importance of preventing pollution and the mitigation measures described here to ensure same.

The Environmental Manager or ECoW will be responsible for the implementation of these measures. They will be inspected on at least a daily basis for the duration of the works, and a record of these inspections will be maintained.

Any temporary storage of soil, hardcore, crushed concrete or similar material will be stored 50m from any surface water drains. All temporary storage areas should also have surface runoff controls in place to prevent migration of possible materials. There can be no direct pumping of silty water from the works directly to any watercourse. All water from excavations must be treated by infiltration over lands or via settlement ponds, silt busters etc.

3.2.2. Flooding

The subject site is elevated and sloping to a degree that flooding is not anticipated in any event. The flood extent maps drawn up as part of the Southwestern CFRAM Study (floodinfo.ie) show that Clonakilty town is prone to flooding during fluvial and Tidal flood events, but this site is elevated enough and remote enough from the River Feagle that the site is not in any risk category in the CFRAM Study Maps.

3.2.3. Control of Cement Run-off

The washing out of concrete delivery vehicles is a potential source of pollution and shall be carried out in designated wash out areas only, see Figure 7.

Wash-out areas on site will be located more than 50m from any natural watercourse and properly designed with an impermeable liner to contain all cement laden water. No wash-out of ready-mix concrete vehicles shall be located within 10 metres of any temporary or permanent drainage features. Signage shall be erected

to clearly identify the wash-out areas. Sufficient wash-out areas shall be provided to cater for all vehicles at peak delivery times.

On-site batching of concrete is not envisaged, but ready to use mortar silos are often used for housing developments. These systems involve the delivery and storage of dry cement and aggregates in silos, water is added at the point of delivery to make mortar or plaster. The following controls shall be put in place for the on-site batching of concrete, mortar and render:

- The plant shall be maintained in good condition,
- Delivery of cement shall be means of a sealed system to prevent escape of cement,
- The plant shall be situated on a paved area at least 20m from any temporary or permanent drainage features,
- Emergency procedures shall be in place to deal with accidental spillages of cement or mortar.

Figure 7 - Concrete Truck Washout Area with Impermeable Liner

3.2.4. Accidental Leaks or Spills

No bulk chemicals will be stored within the active construction areas. Temporary oil and fuel storage tanks may be kept in the material storage area in suitable containers and will be stored on appropriately bunded spill pallets as required. Any fuel and oil stored on site shall be stored on bunded spill pallets (approved under BS EN 1992-3:2006). All bunds will be impermeable and capable of retaining a volume of equal to or greater than 1.1 times (>110%) capacity of the containers stored on them. In the event of a spillage, excess oil or fuel will be collected in the bund.

Refuelling of vehicles and the addition of hydraulic oils or lubricants to vehicles will be undertaken off site where possible. Where this is not possible, filling and maintenance will take place in a designated material storage compound, which is located at least 10 metres from any temporary or permanent drainage features. Spill protection equipment such as absorbent mats, socks and sand will be available in clearly marked bins/silos and in construction vehicles to be used in the event of an accidental release during refuelling. Training will be given to site workers in how to manage a spill event.

The following mitigation measures will be taken at the construction site to prevent any spillages to ground of fuels during machinery activities and prevent any resulting soil and/or groundwater quality impacts:

- Refuelling will be undertaken off site where possible,

Where mobile fuel bowsers are used the following measures will be taken:

- Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use,
- Any pump or valve will be fitted with a lock and will be secured when not in use,
- All bowsers to carry a spill kit and operatives must have spill response training; and
- Portable generators or similar fuel containing equipment will be placed on suitable drip trays,
- Weekly checks of spill kits will be carried out to ensure they are sufficiently stocked.

3.2.5. Monitoring

Daily checks will be carried out and recorded in a Surface Water Management Log to ensure surface water drains are not blocked by silt, or other items, and that all storage is located the required distance from surface water receptors. A daily log of inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not reoccur.

3.3. Noise Vibration & Dust Control

Construction of the development has the potential to create significantly increased noise and dust levels locally unless adequate controls are put in place. Earthworks operations will involve the use of heavy construction plant. Stockpiles of material and haul roads could become dusty in dry weather. Road and housing construction are also potential sources of noise and dust.

3.3.1. Noise Control

Specific noise abatement measures shall comply with the recommendations of BS5228-1 2009. These measures will include:

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise,
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations,
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract,
- Compressors and generators will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers,
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use,
- Any plant, such as generators or pumps, required to operate outside of permitted working hours for lighting, pumping etc. will be surrounded by an acoustic enclosure or portable screen,

- Location of plant shall consider the likely noise propagation to nearby sensitive receptors.

The earthworks will generate typical construction activity related noise and vibration sources from use of a variety of plant and machinery such as rock breakers (where required), excavators, lifting equipment, dumper trucks, compressors, and generators. The noise levels shall comply with the mitigation measures and any planning conditions.

A designated noise liaison will be appointed to site during construction works. Any complaints will be logged and followed up in a prompt fashion. In addition, prior to particularly noisy construction activity, e.g., excavation close to a property, etc., the site contact will inform the nearest noise sensitive locations of the time and expected duration of the works.

All works on site shall comply with BS 5228 2009+ A1 2014 (Parts 1 & 2) which gives detailed guidance on the control of noise and vibration from construction activities. In general, the contractor shall implement the following mitigation measures during the proposed infrastructure works:

- Avoid unnecessary revving of engines and switch off equipment when not required,
- Keep internal haul roads well maintained and avoid steep gradients,
- Minimise drop height of materials,
- Start-up plant sequentially rather than all together.

3.3.2. Vibration Control

Vibration limits to be applied for the infrastructure works will be those specified in the TII document Guidelines for the Treatment of Noise and Vibration in National Road Schemes (TII, Revision 1, 2004).

Allowable Vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration shall comply with the mitigation measures and any planning conditions.

3.3.3. Dust Control

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design, planning and effective control strategies. The siting of construction activities and soil stockpiles will take note of the location of sensitive receptors and prevailing wind directions to minimise the potential for significant dust nuisance. In addition, good site management will include the ability to respond to adverse weather conditions by either restricting operations onsite or using effective control measures quickly before the potential for nuisance occurs.

- During working hours, technical staff (e.g., Environmental Manager/ECoW) will be available to monitor dust levels as appropriate; and
- At all times, the dust management procedures put in place will be strictly monitored and assessed.

The dust minimisation measures will be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust generation. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed, and procedures implemented to rectify the problem. Dust levels shall comply with the mitigation measures and any planning conditions.

Specific dust control measures to be employed shall be as follows:

Site Routes

Site access routes (particularly unpaved areas) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions.

- A speed restriction of 15 km/hr will be applied as an effective control measure for dust for onsite vehicles or delivery vehicles within the vicinity of the site.
- Bowsers will be available during periods of dry weather throughout the construction period, with water sourced from the mains supply. The bowser will operate during dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use.
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced areas shall be restricted to essential site traffic only.

Demolition/Excavation

Demolition and excavation work during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust,
- During periods of very high winds (gales), activities likely to generate significant dust emissions will be postponed until the gale has subsided. The movement of truck containing materials with a potential for dust generation to an off-site location will be enclosed or covered.

Stockpiling

The location and moisture content of stockpiles are important factors which determine their potential for dust emissions. The following measures will be put in place:

- Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible,
- Regular watering will take place during dry/windy periods to ensure the moisture content is high enough to increase the stability of the soil and suppress dust,
- Permanent or long-term stockpiles of topsoil shall be seeded to limit dust emission.

3.4. Construction Traffic Management

It shall be the responsibility of the Developer and their appointed PSCS to implement and oversee a Construction Site Traffic Management Plan (CSTMP). The following list is a preliminary estimation of the daily traffic movements that will be generated by construction on the site:

- **Construction Workers / Site Staff -** Maximum number 30/day, generating 70 traffic movements,
- **Net Importation of fill material -** As required, less than 20 loads /day, generating 40 truck movements,
- **General Construction materials delivery (truck/ Van) -** On average 15 number/day, generating 30 traffic movements,
- **Construction Waste Removal -** When required, less than 30 loads/day, generating 60 truck movements.

It is recommended that the PSCS follow the guidance provided by the HSA in preparing the CSTMP. The HSA guidance document (Figure 3) and online fillable forms provide a framework of 6 main headings around which a full and detailed CSTMP can be formed. The headings are as follows:

1. **Information** – general site and responsible personnel information,
2. **Training** – proof of training or provision of training for relevant staff,
3. **Temporary Works** – Details of all temporary works relating to site traffic,
4. **Hazards** – Identification of hazards and risk assessments for same,
5. **Controls** – actions taken to mitigate risks identified,
6. **Resources** – equipment required to implement the plan i.e., hoarding, barriers, lighting signs etc.

Figure 8: HSA Construction Site Traffic Management Plan Guidance

The CSTMP shall outline issues which are relevant to the project and to provide solutions which are satisfactory to all concerned. The issues which we believe to be important are as follows:

- Proposed Traffic Routes – Planning and Management of same,
- Construction traffic logistics,
- Planning and management of expected traffic flow rates,
- Planning and management of delivery times,
- Site access and egress,
- Maintenance of public roads,
- Communication with local authorities and neighbours.

There are specific traffic management issues which the applicant can control. These are listed as follows:

- Extensive and thorough site rules for site traffic. This is issued to all sub-contractors at pre-appointment stage and shall ensure that they are contractually bound,
- Detailed delivery routes and times as a part of the rules which are in accordance with this traffic management plan – the options for delivery routes are limited by the fact that there will only be one entrance to the development site and traffic will approach on the Fernhill Road (R588) and the local access road,
- Gated access and egress will be established at the entrance to the development site allowing in only authorised traffic which has arrived at the appointed time and by the appointed route,
- Approved contractor parking for all construction related personnel – this will be provided internally within the secured development site area.

The rules regarding access routes, clearways, minimum road width, parking near hydrants, etc. will be relayed to all site staff. Any driver who breaches the rules will be noted and reported to their employer and any driver who consistently or knowingly breaks the rules will be refused further access to the site.

Signage will be erected along emergency vehicle routes, and critical areas such as assembly points and means of escape will be kept clear.

To ameliorate/mitigate impacts on the surrounding area and, to mitigate noise levels emanating from the site, all site development and building works will be carried out only during those hours stipulated by the County Council in conditions attached to the planning grant. Any deviation from these times shall be submitted to Cork County Council for approval.

3.4.1. Planning and Management of Delivery Times

In relation to deliveries to the site, all large deliveries will have to be notified to site management at least 24 hours in advance. No large deliveries will be allowed to the site during peak traffic times for the area. All deliveries must enter the site at the designated entrance and report to the site security man who in turn will contact the relevant persons to take charge of unloading, etc.

3.4.2. Site Access and Egress

Access and egress to the site will be controlled by the developer and their appointed main contractor. The access for construction traffic for the development will have to be via the single entrance. As development progresses and dwellings are occupied the traffic management plan and the location of the site compound will need to be continuously reviewed to minimise disruption to residents. The developer will provide information on the requirements of the site traffic access rules to all stakeholders, which will include the following:

- The prescribed access routes. The route identified shall be monitored and updated as required by construction sequencing and shall be followed at all times by drivers entering and exiting the site,
- No site access before the permitted start times,
- No site access after the permitted finish times,
- Strictly no parking on any access road to the site,
- Minimise disruption to any developed/occupied phases,
- No vehicle may park on or around any footpaths in the adjoining areas,
- Caution must be exercised entering and leaving the site,
- All vehicles must stop at the security barrier,

- All instructions from the developer or development staff must be obeyed,
- Vehicles leaving the site must do so only at an appropriate break in the traffic, and must not force their way into traffic,
- Only vehicles with specific business on the site can enter the site, once permission has been granted by the developer and/or his staff,
- Heavy vehicle drivers must check their tyres for lodged stones, and remove them prior to returning to the public roads,
- Site speed limit proposed is 15 kph.

3.4.3. Maintenance of the Public Road

For the duration of the construction period there will be a power washer and wheel wash located inside the main entrance to the site. This will wash the wheels and undercarriages of all vehicles leaving the site to ensure no debris leaves the site on vehicles. Adequate provision will be made on site for drainage of this area. All truck drivers must also inspect their vehicles before they leave the site for stones caught in their tyres or any other debris.

There will be parking spaces at the site compound, reserved for staff, clients, and visitors. This will be located adjacent to the site compound. On street parking will not be acceptable under any circumstances.

Unauthorised entry will not be permitted and will be prevented by a security system which will be in operation during construction.

The wastewater sewer, potable water supply and electrical and telecoms ducting shall require connections to existing infrastructure in the public realm. Works within public areas will be given priority, in terms of available staff and traffic management, to ensure that this component of the overall development is completed as expeditiously as possible, to minimise disruption. As part of any works (i.e., provision of services) within public roads/areas in the vicinity of the site, it will be ensured that these roads/areas will be re-instated to the satisfaction of Cork County Council.

3.5. Local Stakeholder Involvement

The Developer will, as required, liaise with owners of local properties in advance of works commencing onsite and coordinate works to have minimum impact on the operation of local properties. All signage used will meet the requirements of the Safety, Health & Welfare at Work (General Applications) Regulations 2007 and Chapter 8 Traffic Signs Manual.

3.6. Waste Management

This section outlines the measures that will be undertaken to minimise the quantity of waste produced at the site and the measures to handle the waste in such a manner as to minimise the effects on the environment. A site-specific Construction Waste Management Plan (WMP) has been prepared and will be employed to ensure sustainable and effective waste management throughout the construction and demolition phases of the project. Adherence to the WMP prepared for the construction works will ensure that the management of waste arising is dealt with in compliance with the provisions of the Waste Management Acts 1996 – 2015 and amendments. The waste management hierarchy to be adopted will be as follows:

1. Prevention and Minimisation,
2. Reuse of Waste,

3. Recycling of Waste,
4. Disposal.

Typical waste materials that will be generated from the demolition and construction works will include:

- Soil and Stones,
- Concrete, bricks, tiles and ceramics,
- Wood, glass and plastics,
- Metals,
- Gypsum-based construction material,
- Paper and cardboard,
- Mixed C&D Waste,
- Chemicals (Solvents, paints, adhesives, detergents etc.)

The management of all hazardous waste arisings, if they occur, shall be coordinated in liaison with health and safety management.

3.6.1. Waste Minimisation

Waste minimisation measures proposed are summarised as follows (and are described in more detail in the CWMP):

- Materials will be ordered on an 'as needed' basis to prevent over supply,
- Materials will be correctly stored and handled to minimise the generation of damaged materials,
- Materials will be ordered in appropriate sequence to minimise materials stored on site,
- A waste tracking log will be established,
- Sub-contractors will be responsible for similarly managing their wastes,
- All wood waste generated by site works will be inspected and examined and will be segregated as re-useable wood and scrap wood waste.

3.6.2. Waste Storage

The main waste storage area will be situated in the site compound A dedicated and secure area containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the development.

Waste materials generated will be segregated at the site compound, where it is practical to do so. Where the on-site segregation of certain waste types is not practical, offsite segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled.

The site Construction Manager will ensure that all staff are informed of the requirements for segregation of waste materials by means of clear signage and verbal instruction. Appointed employees will be made responsible for ensuring good site housekeeping.

3.7. Invasive Species

Construction works within the proposed works areas could potentially disturb stands of invasive plants and/or soils contaminated with invasive plant material, should such species be identified during site surveys. In addition to lands within the proposed works areas, there is an identified risk of invasive plant species being spread onto neighbouring lands and onto public roads and other locations. Construction

works could therefore result in the spread of invasive plant species both in-situ and ex-situ. The following measures are proposed to prevent the inadvertent spread of invasive plant species:

1. The Contractor will prepare an Invasive Alien Species (IAS) Management Plan for the works. The Plan must be clearly communicated to all site staff and must be adhered to if it is to be implemented successfully,
2. Prior to the development and landscaping works an updated survey by an appropriately experienced ecologist will be carried out to establish the full extents of the invasive plant species within the proposed development site boundary,
3. In accordance with the Tii guidance this survey will produce accurate 1:5000 scale mapping for the precise location of invasive species. The pre-construction surveys will be undertaken by suitable ecologists with competence in identifying the species concerned having regard to any seasonal constraint,
4. Areas of invasive species will be fenced off and signage installed where no works will take place within this area until such time as they can be eradicated/managed,
5. The invasive species will be appropriately managed (aiming for eradication) prior to any vegetation clearance works occurring where these species were identified.

For the best available methods of control and eradication refer to the NRA Guidelines (2010) and Fennell *et al*. (2018). It is recommended that a suitably experienced contractor is employed to undertake the invasive species eradication programme at the site. Several approaches are available for the control of invasive plant species consisting of chemical control, physical control, or a combination of both. For example, manual control may only work for small, new infestations such as young Buddleia shrubs, but a combination of manual and chemical control may be required to ensure the complete eradication of more established shrubs. The specialist contractor will advise/finalise the best approach based on their knowledge of the species in question.

4.0 Roles and Responsibilities

4.1. Construction Manager

The Construction Manager will have overall responsibility for the site during the construction phase. This will include implementation of the CEMP. The Construction Manager shall:

- Manage all construction staff and subcontractors to ensure the requirements of the CEMP, planning permission and all legislative requirements are complied with,
- Cooperate with the Environmental Manager to ensure that the works do not pose an environmental risk,
- Ensure all monitoring plans are maintained throughout the construction phase,
- Be responsible for implementing all response plans and notifying relevant bodies of any incidents.

4.2. Environmental Manager or Ecological Clerk of Works (ECoW)

The Environmental Manager will be responsible for all environmental monitoring during the construction phase. The duties of the Environmental Manager are summarised as follows:

- Carry out (or manage) all environmental monitoring and maintain auditable logs of all environmental requirements,
- Liaise with statutory bodies in relation to environmental issues,
- Prepare regular environmental reports and maintain the CEMP,
- Carry out environmental site audits to ensure the works are carried out in accordance with the CEMP. Advise the Construction Manager of non-conformances and areas for improvement.
- Review the Contractor's method statements with respect to environmental issues.
- Monitor compliance with the mitigation measures and any planning conditions relating to the environment.
- Assist the Construction Manager in the notification and investigation of all environmental incidents.
- Act as a point of contact to allow all site staff to take responsibility for and report environmental issues.
- Provide education and toolbox talks for all site staff and maintain an Environmental Notice Board.

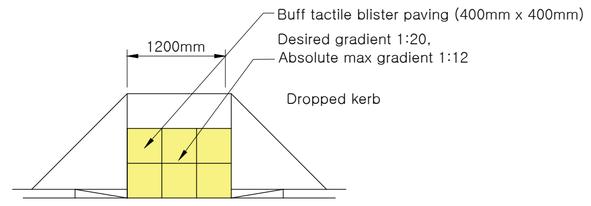
5.0 Conclusion

This planning stage CEMP sets out the overall management strategy for construction works for the proposed development. The CEMP aims to ensure the management of construction activity is carried out in a planned, structured, and considerate manner which minimises the impacts of the works on the local environment, residents, and commercial activities in the vicinity of the site. Due to the nature of construction works, there may be unforeseen events which occur at the site and the project team will actively manage any changes and discuss with the relevant authorities, where required. The project stakeholders are committed to ensuring that the construction activities to be carried out are actively managed to minimise potential issues.

Legend: Retaining Walls

- 0.0 – 0.5m Either Concrete Post and Panel to form permanent shutter for 250mm wide C30 concrete, to be provided to the high side (Private) or Low blockwork retaining wall (Public).
- 0.5 – 1.6m Proposed Blockwork Retaining Wall
- 1.6 – 2.0m Proposed Concrete Retaining Wall
- 2.0 – 3.0m Proposed Concrete Retaining Wall
- 3.0m and Greater Proposed Concrete Retaining Wall

Note: Heights indicated are the retaining height only – boundary walls/fences on top are not included – See Architect's Boundary Treatment Drawing

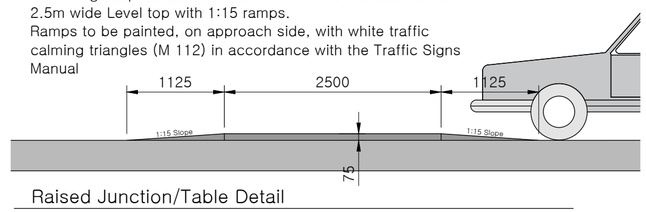


Uncontrolled pedestrian crossing path/kerb
Scale 1:50

Tactile Paving Note:
1. Uncontrolled crossings in accordance with 'Traffic Management Guidelines' DOT, 2019.
2. Module type B (400mm x 400mm) only is shown here and shall be used.
3. Tactile blister paving shall be bedded on 25mm moist sand/cement mortar (3:1), joints filled with 4:1 mix to within 2mm of the paving surface.
4. Dropped kerb shall have a maximum up-stand of 6mm.

Important:
Tactile paving shall also be provided across the top and bottom of all flights of public steps, to the full width of the steps and 800mm deep. See details on WDG drawing no. 19087-T-506

75mm high asphalt table raised over the finished road surface.
2.5m wide Level top with 1:15 ramps.
Ramps to be painted, on approach side, with white traffic calming triangles (M 112) in accordance with the Traffic Signs Manual



Raised Junction/Table Detail
Scale 1:50

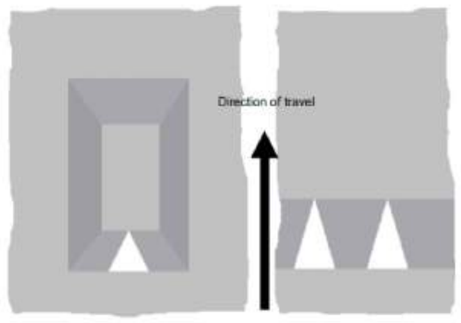
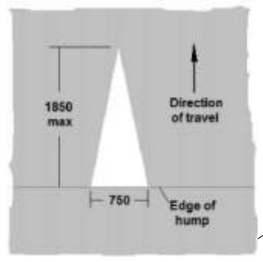


Figure 7.57:
Traffic Calming Triangle on Speed Cushion and Speed Hump



M 112
Traffic Calming Triangle

Access road gradient of 1:10 for approximately 45m.
The surface of the downhill lane of this section of road shall be finished in a high friction/anti-skid surface finish by Arkil (or similar approved) to prevent skidding and decrease braking distance.

Public access concrete footpath

There is an existing solid white line marking the centreline of the road on the approach to the school entrance to prevent overtaking

M114 (Stop road Marking)
RRM 017 (Stop Line)
RRM 001 (Solid centre Line)
Extends back 10m from the stop line

Slope of 1:50 for 7.0m back from the edge of the existing road as per Paragraph 2.7 of *Recommendations for Site Development Works for Housing Areas*

45m sightlnies from a setback of 2.4m in accordance with DMURS (2019) Section 4.4.5 and Table 4.2 – for a road with a design speed of 50km/h.
(Note: A road with a 30km/h design speed requires clear sightlines of 23.0m)

RUS 027: STOP

Legend – Roads & Paths

- Bituminous Surfacing with Beige coloured chippings to Raised Tables/junctions and residential cul de sacs
- Uncontrolled pedestrian crossing, detail above.
- Concrete Public access footpath

Rev	Description	Date	Drn	Chkd
0	Issued for planning	22.11.25	IR	MW

walsh design group
NSAI
Consulting Engineers
The Mall, Maryborough Woods, Douglas, Cork
Tel: 021-4774940 *email: info@wdg.ie*

Title:	Site Layout Roads & Levels
Project:	Housing Development, An Tamhnaigh, Clonakilty, Co. Cork
ID No:	22055-ZZ-XX-XX-XX-DR-WDG-CE-001
Date:	March 2023
Drawn by:	IR
Scale:	1:250
Purpose:	P3 - Planning
Rev:	0

Manhole Schedule				
MH No.	MANHOLE DIAMETER (mm)	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH TO SOFFIT (m)
S1	1200	21.590	20.165	1.200
S2	1200	21.831	20.046	1.556
S3	1200	21.245	19.820	1.200
S4	1200	21.922	19.674	2.023
S5	1200	21.791	19.480	2.086
S6	1200	21.004	19.579	1.200
S7	1200	21.574	19.423	1.926
S8	1200	21.640	20.215	1.200
S9	1200	20.311	18.886	1.200
S10	1200	20.018	18.200	1.593
S11	1200	19.404	17.000	2.179
S12	1350	16.925	14.500	2.200
S13	1200	15.004	13.564	1.215
S14	1200	14.248	13.084	0.939
S15	1200	14.295	13.020	1.050
F1	1200	21.804	20.454	1.200
F2	1200	21.430	20.080	1.200
F3	1200	21.905	19.691	2.064
F4	1200	21.846	19.659	2.037
F5	1200	21.726	19.604	1.972
F6	1200	21.603	19.538	1.915
F7	1200	20.420	19.070	1.200
F8	1200	20.390	19.040	1.200
F9	1200	21.689	18.553	2.986
F10	1200	19.919	18.569	1.200
F11	1200	21.459	18.044	3.265
F12	1200	20.998	17.899	2.949
F13	1200	17.964	16.614	1.200

Proposed connection point to the existing wastewater infrastructure Irish Grid: E137406, N41548

Proposed connection point to the existing wastewater infrastructure Irish Grid: E137426, N41472

Proposed connection point to the existing surface water infrastructure

Note:
Percolation tests and soakaways are to be allowed for in all back gardens, sized to soak away the runoff from each roof.

Ecocell attenuation tank lined wth a permeable membrane to allow infiltration.
See drawing no.22055-ZZ-XX-XX-XX-DR-WDG-CE-504 for further detail

Hydrobrake flow control limits outflow to to the QBAR flow rate of 3.4 litres/sec.

NSBP004 Hydrocarbon Interceptor by Klargester (or similar approved)

ATTENUATION TANK

Knotweed Containment Cell
Top of tank = 10.180

Flow rate of existing hydrobrake at the outlet from the existing attenuationm tank to be increased by 3.4 litres/sec to accomodate the additional flow from the proposed development without overtopping

6.0m wayleaves centred on foul and storm sewers

Wayleave over the attenuation tank extends out to 3.0m beyond the tank's edge

Gaelscoil Mhichíl Uí Choileáin

School Par

Block 2 · Block 3 · Block 4 · Block 5 · Block 6 · Block 7 · Block 8 · Block 9 · Block 10 · Block 11 · Block 12 · Block 13 · Block 14 · Block 15 · Block 16

Drainage Legend

- Proposed Wastewater Lines (Refer to STD-WW-07 & STD-WW-08)
- Proposed Wastewater Manholes (Refer to STD-WW-10, 11 & 12)
- Existing Wastewater Lines
- Existing Wastewater Manholes
- Proposed Surface Water Lines
- Proposed Surface Water Manholes
- Existing Surface Water Lines
- Existing Surface Water Manholes
- Application Boundary

Notes:
1. All Levels are relative to Ordnance Datum.
2. All coordinates are ITM.
3. Minimum cover to pipes under roadways to be 1200mm. Where this can not be achieved, concrete surround and cover should be provided in accordance with Irish Water Standard Detail STD-WW-08.
4. Manhole Covers to be adjusted to suit finished road levels.
5. D 400 Covers are to be used within roadways and green areas.
6. Manhole covers shall be hinged, non-rock design with 2 closed keyways.
7. Maximum distance between manholes to be 90m.
8. All pre-cast manhole rings to have a minimum of 150mm of concrete surround.
9. Pre-cast manhole rings to have a minimum of 150mm of concrete surround where depth to invert exceeds 2.0m.
10. Pipe joining shall be as per manufacturers instructions
11. All wastewater sewer pipes will be uPVC and will have a minimum 3.2mm wall thickness and SN8 stiffness class. Sewer pipes will comply with section 3.13 of the IW Code of Practice for Wastewater Infrastructure (Rev2) July 2020.
12. All foul and storm water pipes running close to any building or development structure to have a horizontal distance from the foundations of at least 3.0m or a distance equivalent to the depth of the sewer below the foundation, whichever is greater.
13. Storm water shall not be permitted to enter the foul sewer.
14. All connections to the foul sewer shall be made using Tee pieces built into the main line in accordance with IW standard detail STD-WW-03.
15. Built in connections to the foul sewer to facilitate the installation of washing machines and dishwashers to be provided.
16. A separate foul service pipe is to be taken from each house to the main sewer. Common drains are not permitted for use.
17. An inspection chamber in compliance with IW Standard Details STD-WW-03 (Rev2) and STD-WW-13 (Rev3) will be located within the curtilage of each premise, within 1.0m of the premise boundary as per section 3.11.14 of the wastewater Code of Practice.
18. The maximum backdrop permitted in foul manholes is 2.5m – refer to section 3.6 of the Wastewater Code of Practice and STD-WW-12 for more detail.
19. See section 3.5 of the IW Code of Practice for Wastewater for required separation distances.
20. The external face of proposed manhole chambers will be constructed a minimum of 0.5m from a kerb line and the external face of a sewer line will be constructed a minimum of 1.0m from a kerb line in accordance with section 3.5.16 of the Wastewater Code of Practice.
21. All foul sewer construction details for both gravity sewers and rising mains to comply with the following Irish Water Documents:

- IW-CDS-5030-01 Wastewater infrastructure Standard Details, July 2020, Revision 4.
- IW-CDS-5030-03 Code of practice for Wastewater Infrastructure, July 2020, Revision 2.

SuDS LEGEND

- Permeable Paving – overflows connected to the main surface water network (Details on WDG drawing No. 22055-ZZ-XX-XX-XX-DR-WDG-CE-504)
- Roadside Bioretention Tree Pits – overflows connected to the main surface water network (Details on WDG drawing No. 22055-ZZ-XX-XX-XX-DR-WDG-CE-504)
- Raingardens/Planters – overflows connected to the main surface water network (Details on WDG drawing No. 22055-ZZ-XX-XX-XX-DR-WDG-CE-504)
- 300 litre water butts

Rev.	Description	Date	Drn.	Chd.
0	Issued for planning	22.11.23	IR	WW

walsh design group
Consulting Engineers
The Mall, Maryborough Woods, Douglas, Cork
Tel: 021-4774940 email: info@wdg.ie

Title:	Site Layout Drainage
Project:	Housing Development, An Tamhnaigh, Clonakilty, Co. Cork
ID No:	22055-ZZ-XX-XX-XX-DR-WDG-CE-002
Date:	April 2023
Rev:	0
Drawn by:	IR
Scale:	1:500
Purpose:	P3 - Planning

Legend: Retaining Walls

- Water Main (80PE 100mm ϕ unless otherwise shown – Refer to STD-W-13 re. trenching & Backfilling)
- Existing Water Main
- Me — Bulk Meter (Refer to STD-W-26 & 26A)
- SV — Sluice Valve (Refer to STD-W-15)
- H — Hydrant (Refer to STD-W-18 & 19)
- AV — Air Valve (Refer to STD-W-22 & 23)
- Water service connection & boundary box (Refer to STD-W-01 & 03)

NOTES:

1. Do not Scale from the drawing.
2. All dimensions are in mm unless otherwise noted,
3. All coordinates are ITM,
4. All construction details and domestic connections will be constructed to the specifications provided in the Irish Water Document: 'Water Infrastructure Standard Details – Connection and Developer Services, Document Number IW-CDS-5020-01, (December 2017, Revision 03) and the Irish Water Publication 'Code of Practice for Water Infrastructure', IW-CDS-5020-03 (December 2017, Revision 1),
5. All Water mains shall be blue MDPE or HDPE and of a type PE80 (Polyethylene) and have an SDR-11 or SDR-17 rating. They will conform to IS EN 12201: Part 1 and Part 2 (Plastic Systems for Water Supply, Drainage and Sewerage Under Pressure – Part 1, General and Part 2, Pipes) and IS EN 12201-3 (Plastic Systems for Water Supply, Drainage and Sewerage Under Pressure – Part 3:Fittings),
6. Polyethylene pipes shall also conform to the following UK Water industry specifications (WIS): 4-32-08, 4-32-19 & IGN 4-32-18, 4-01-03.
7. Polyethylene pipes shall also conform to the specifications in Section 3.3 of the Irish Water Code of Practice for Water infrastructure, July 2020 (Rev 2),
8. All water mains shall comply with Section 3.11 of IW-CDS-5020-03 regarding depth of cover.
9. Air valve and hydrant covers, in grassed areas, shall be surrounded by a concrete plinth, 200mm all round and 100mm deep formed with C20/25 concrete, 20mm aggregate, bedded in clause 804 material. The plinth shall incorporate mild steel reinforcement links and have a bull-nose finish around its external perimeter. See section 3.18 of the Water Code of Practice.
10. No hydrant has been located within 6m of a property as per section 3.5.25 of the Water Code of Practice.
11. No new water main, up to and including 150mm ϕ, has been located within 3m of an existing or proposed structure. See section 3.5.9 of the Water Code of Practice.
12. Sluice valves have been placed at all junctions in accordance with sections 3.16.2 and 3.5.39 of the Water Code of Practice.
13. Air valves shall be positioned at localised high points as shown on the drawing and in accordance with the Water Code of Practice.
14. All "T" Junctions will be made at 90° – see Irish Water standard detail STD-W-07.
15. The minimum separation distances for Gas Networks Ireland infrastructure shall be in accordance with IS329 'Gas Distribution Mains' and IS328 'Code of Practice for Gas Transmission Mains' as amended/updated – See section 3.6 of the Water Code of Practice.
16. All water main construction shall be in compliance with the following Irish Water Documents:

Code of Practice for Water Infrastructure, IW-CDS-5020-03, July 2020 (Rev 2)

Water Infrastructure Standard Details, IW-CDS-5020-01, July 2020 (Rev 4)

Approximate connection point to the existing Irish Water infrastructure in the public road:
Irish Grid: E137518, N41410

Rev	Description	Date	Drn	Chkd
0	Issued for planning	22.11.23	IR	MW

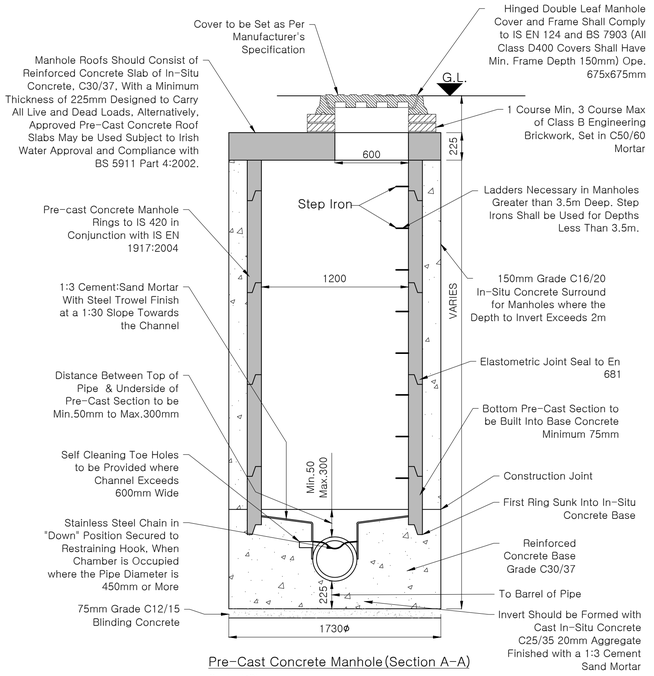
walsh design group

Consulting Engineers

The Mall, Maryborough Woods, Douglas, Cork

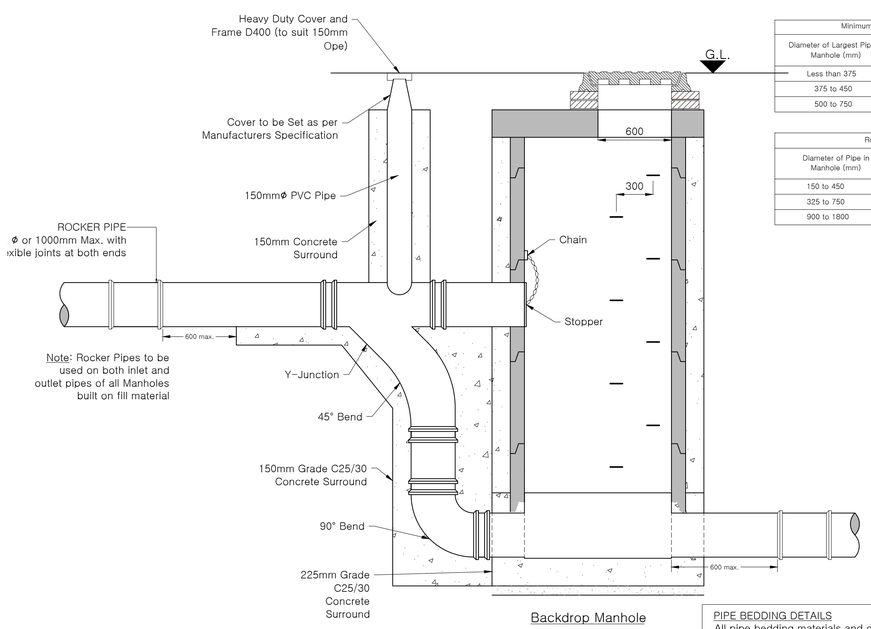
Tel: 021-4774940 *email: info@wdg.ie*

Title:	Site Layout Water Supply
Project:	Housing Development, An Tamhnaigh, Clonakilty, Co. Cork
ID No:	22055-ZZ-XX-XX-XX-DR-WDG-CE-003
Date:	April 2023
Drawn by:	IR
Scale:	1:250
Purpose:	P3 - Planning
Rev:	0



Pre-Cast Concrete Manhole(Section A-A)

Scale 1:25



Backdrop Manhole

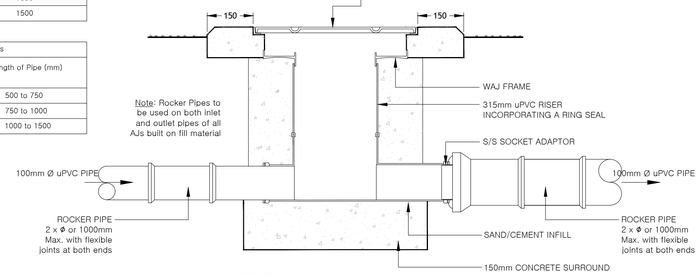
Scale 1:50

Minimum Manhole Diameters	
Diameter of Largest Pipe in Manhole (mm)	Internal Diameter of Manhole (mm)
Less than 375	1200
375 to 450	1350
500 to 750	1500

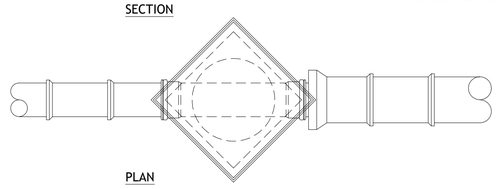
Rocker Pipe Lengths	
Diameter of Pipe in Manhole (mm)	Length of Pipe (mm)
150 to 450	500 to 750
325 to 750	750 to 1000
900 to 1800	1000 to 1500

IN REAR GARDENS:
GLYNWED STANDARD 300x300mm CLEAR OPENING LIGHT DUTY SINGLE SEAL COVER & FRAME IN GREY IRON, BLACK COATED AND INCORPORATING COUNTERSUNK LOCKING SCREWS.

IN PAVED AREAS:
GLYNWED STANDARD 300x300mm CLEAR OPENING MEDIUM DUTY SINGLE SEAL COVER & FRAME IN GREY IRON, BLACK COATED AND INCORPORATING LOCKING BOLTS.



SECTION

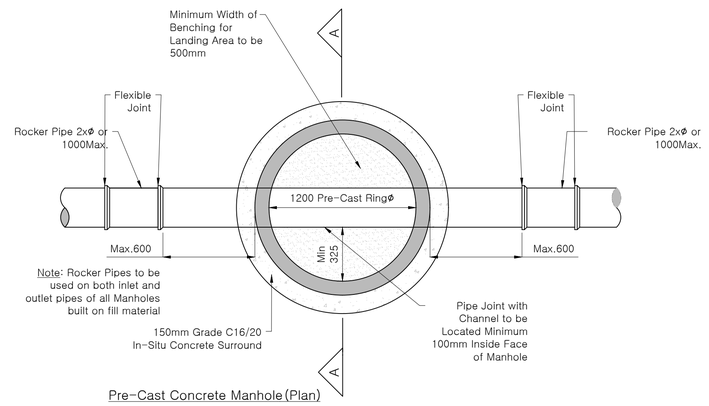


PLAN

ACCESS JUNCTION DETAIL

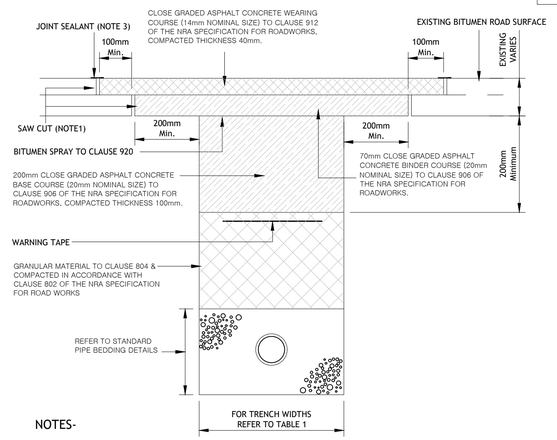
SCALE: 1:10

PIPE BEDDING DETAILS
All pipe bedding materials and details shall be in accordance with Recommendations for Site Development Works for Housing Areas (DoELG 1998) & Sewers for Adoption 8 - A Design and Construction Guide for Developers.



Pre-Cast Concrete Manhole(Plan)

Scale 1:25



NOTES-

1. ALL EDGES OF EXCAVATED AREA TO BE SAW CUT AS DETAILED.

2. 100°C HOT BITUMEN BINDER 50 PEN OR COLD THIOTROPIC BITUMEN 50-70 PEN TO BE APPLIED TO ALL VERTICAL CUTS IN ACCORDANCE WITH BS 594 PRIOR TO THE APPLICATION OF SURFACE LAYERS.

3. JOINTS SEALED WITH HOT BITUMEN AND TOPPED WITH FINE SAND/GRIT TO GET A MINIMUM 55 SKID RESISTANCE VALUE AS DETERMINED BY THE PORTABLE SKID RESISTANCE PENDULUM SHALL NOT EXCEED 3mm THICKNESS AND A WIDTH OF 40mm.

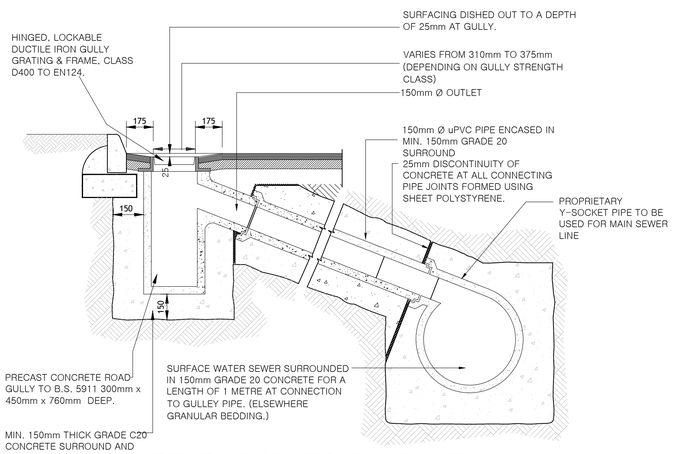
	NOMINAL PIPE DIAMETER (mm)	100	150	225	300	375	450	525	600	750	900	1050	1200	1200
RIGID PIPES	TRENCH WIDTH MIN (mm)	450	500	600	700	950	1050	1150	1250	1400	1950	2100	2300	2450
	TRENCH WIDTH MAX (mm)	650	700	800	900	1150	1250	1350	1450	1600	2150	2300	2500	2650

	NOMINAL PIPE DIAMETER (mm)	100	150	200	250	300
FLEXIBLE PIPES	TRENCH WIDTH MIN (mm)	450	450	600	600	700
	TRENCH WIDTH MAX (mm)	600	600	700	700	850

TABLE 1 - TRENCH WIDTHS

PAVEMENT REINSTATEMENT DETAILS

NOT TO SCALE



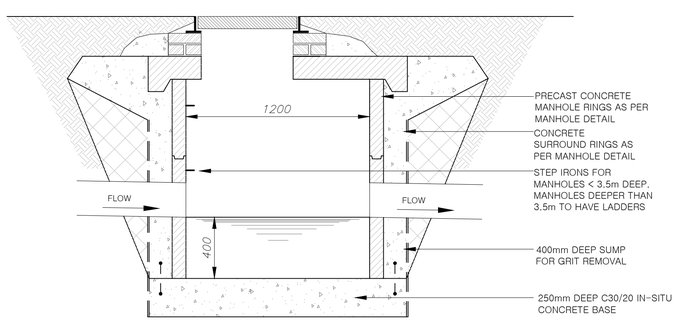
FOR STRENGTH CLASS OF GULLY REFER TO EN 124 : 1994, CLAUSE 5

NOTE 1 : PLACE OF INSTALLATION & FIGURES 9A AND 9B PROPRIETARY FITTINGS TO BE USED ON ALL PIPEWORK CONNECTIONS

NOTE 2 :
GROUP 1 - MIN. CLASS A15 GROUP 4 - MIN. CLASS D400
GROUP 2 - MIN. CLASS B125 GROUP 5 - MIN. CLASS E600
GROUP 3 - MIN. CLASS C250 GROUP 6 - MIN. CLASS F900

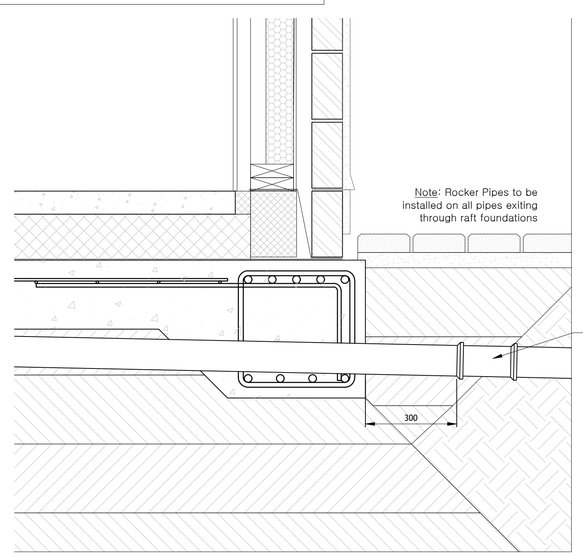
PRECAST CONCRETE GULLY IN MACADAM AREA

SCALE 1:20



TYPICAL SUMP MANHOLE

SCALE 1:20



RAFT FOUNDATION - ROCKER PIPE DETAIL

Scale 1:10

NOTES - General Pre-Cast Manhole

1. All dimensions are in millimetres, unless noted otherwise.

2. Pre-Cast Manhole Units: Complying with requirements of IS EN 1917 and BS 5911-Part 3.

3. Thicker Manhole bases required for sewers in excess of 3m deep where the size is greater than the standard minimum size.

4. Approved Pre-Cast Concrete Bases may be used incorporating channels, benching etc. subject to Irish Water for review.

5. Manhole roofs should consist of reinforced concrete slab of in-situ concrete, C30/37, with a minimum thickness of 225mm designed to carry all live and dead loads, alternatively, approved pre-cast concrete roof slabs may be used subject to Irish Water approval and compliance with BS 5911 Part 4:2002.

6. Covers and Frames shall be suitable for road and traffic conditions subject to approval from Cork County Council.

7. 200mm all around, 100mm deep concrete plinth with protective stainless steel metal band around covers in green areas.

8. All chambers to be checked for uplift by the developer based on ground conditions within the site. Should anti-floatation measures be required they shall be subject to approval from Irish Water.

9. All Concrete to be in Accordance with IS EN 206:2013.

10. Benching to be be formed of Grade 20/40 concrete and finished with a rendering of 25mm of Class 'B' cement mortar.

12. Concrete surround to be provided to manhole rings where depth to invert exceeds 2.0m or as directed by the Engineer.

NOTES - Backdrop Manhole

1. All dimensions are in millimetres, unless noted otherwise.

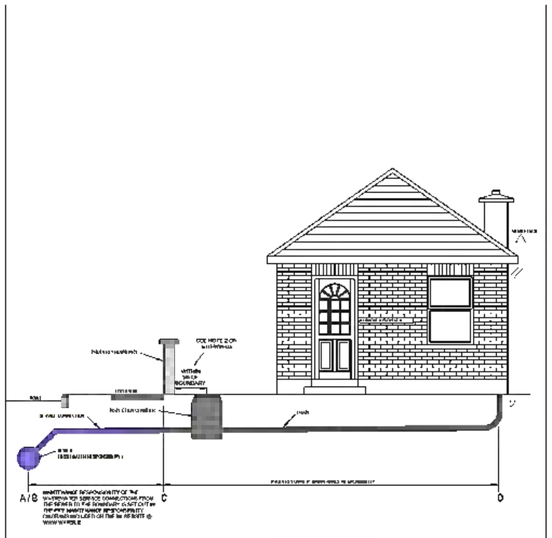
2. Rodding eye chamber shall be covered with approved heavy duty metal covers to IS 261 and BS 5834. Cover and frame shall be suitable for road and traffic conditions and is subject to the approval of Irish Water.

3. Manhole details to be in accordance with STD-WW-10 & 12 as set out in "Irish Water Connection and Developer Service (Wastewater Infrastructure Standard Details)"

Rev.	Description	Date	Drn	Ckd
0	Issued for planning	09.11.23	IR	MW

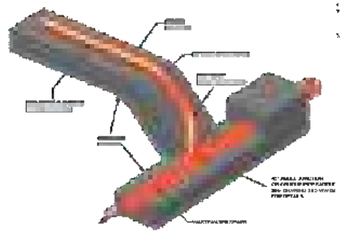
walsh design group
Consulting Engineers
The Mall, Monbrowbrough Woods, Douglas, Cork.
Tel: 021-4774940 email: info@wdg.ie

Title:	Surface Water Drainage Typical Details
Projects:	Housing Development, An Tamhnaigh, Clonakilty, Co. Cork
ID No:	22055-ZZ-XX-XX-XX-DR-WDG-CE-500
Date:	Oct 2023
Drawn by:	IR
Scale:	As shown
Purpose:	P3 - Planning
Rev:	0

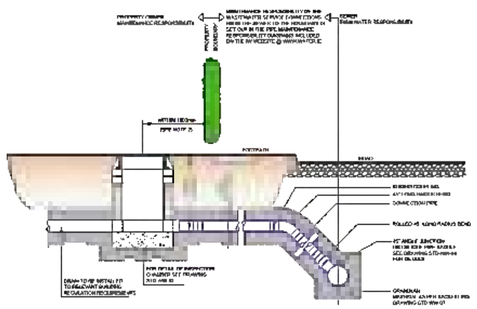


REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

TITLE: WASTEWATER SERVICE CONNECTION MAINTENANCE RESPONSIBILITY	SCALE: NOT TO SCALE	DATE: SEPT. 2015	
	DRAWING No: STD-WW-01	REV: 2	



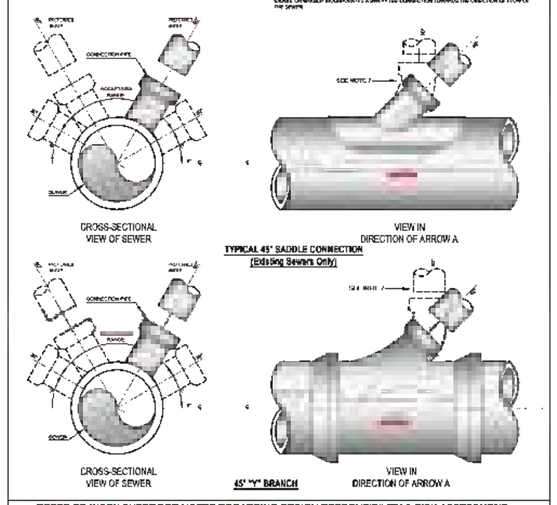
3D VIEW SHOWING SERVICE CONNECTION PIPEWORK



SECTION SHOWING DRAIN AND SERVICE CONNECTION PIPEWORK

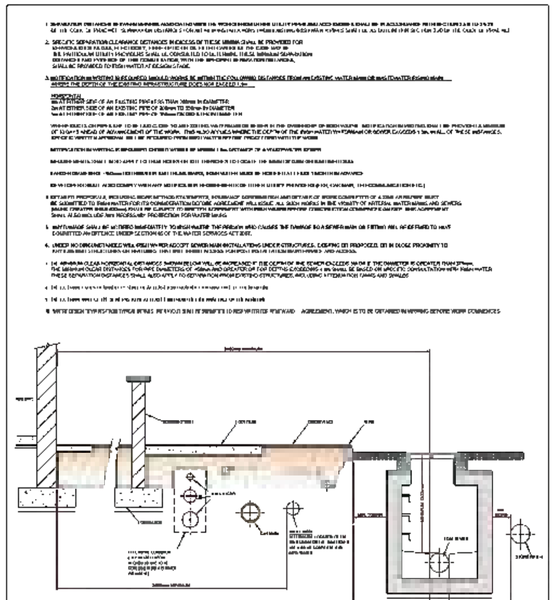
REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

TITLE: DRAINAGE SERVICE CONNECTION PIPEWORK	SCALE: NOT TO SCALE	DATE: SEPT. 2015	
	DRAWING No: STD-WW-03	REV: 2	



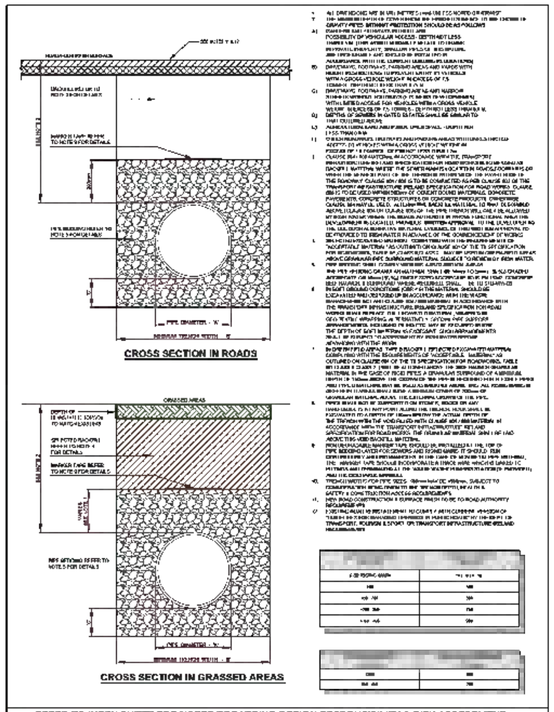
REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

TITLE: TYPICAL SEWER / SERVICE PIPE CONNECTION	SCALE: NOT TO SCALE	DATE: SEPT. 2015	
	DRAWING No: STD-WW-04	REV: 2	



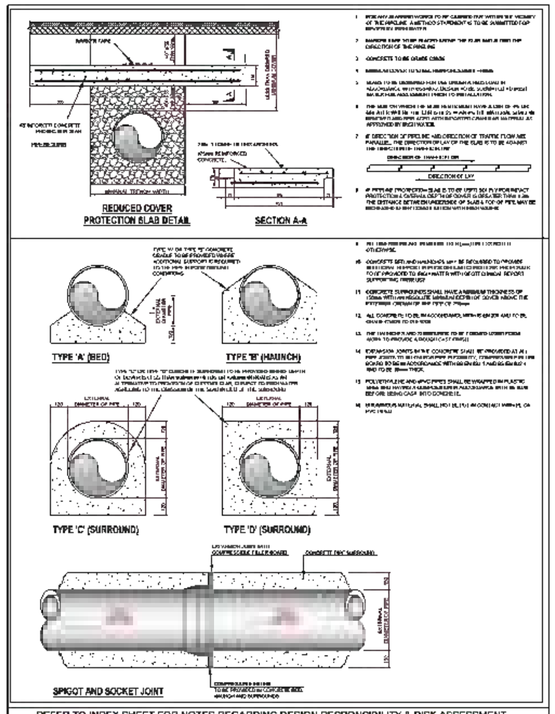
REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

TITLE: TYPICAL SERVICE LAYOUT INDICATING SEPARATION DISTANCES	SCALE: NOT TO SCALE	DATE: SEPT. 2015	
	DRAWING No: STD-WW-05	REV: 2	



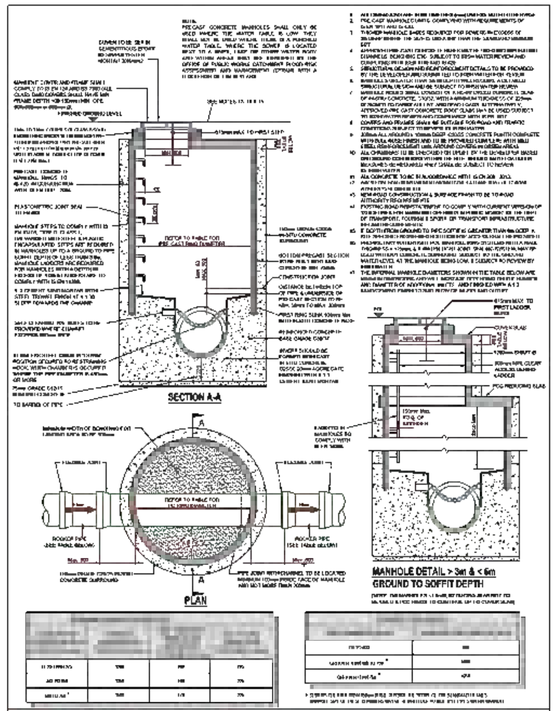
REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

TITLE: TRENCH BACKFILL AND BEDDING	SCALE: NOT TO SCALE	DATE: SEPT. 2015	
	DRAWING No: STD-WW-07	REV: 2	



REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

TITLE: CONCRETE PROTECTION SLAB, BED, HAUNCH, AND SURROUND, TO WASTEWATER PIPES	SCALE: NOT TO SCALE	DATE: SEPT. 2015	
	DRAWING No: STD-WW-08	REV: 1	



REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

TITLE: PRE-CAST CONCRETE MANHOLE WITH CAST IN SITU BASE	SCALE: NOT TO SCALE	DATE: SEPT. 2015	
	DRAWING No: STD-WW-10	REV: 3	

Standard Irish Water Detail References:

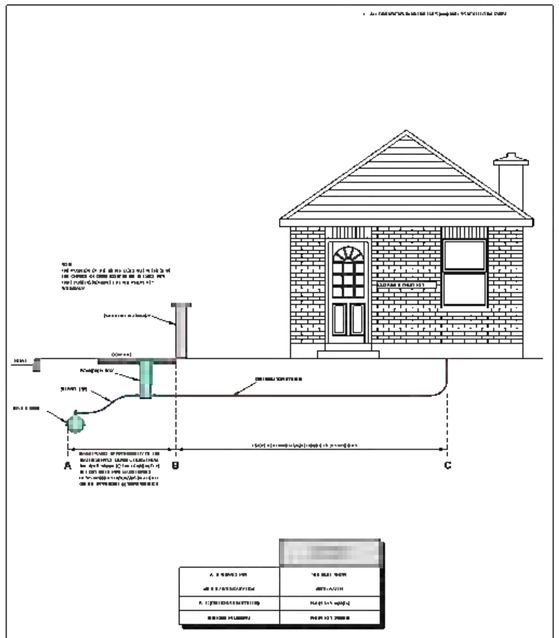
STD-WW-01 Waste water service connection responsibility
STD-WW-03 Drain & Service connection pipework
STD-WW-04 Typical Sewer/ Service pipe connection
STD-WW-11 Typical Service layout indicating separation distances
STD-WW-07 Trench Backfill & Bedding
STD-WW-08 Concrete bed, Haunch & surround to wastewater pipes
STD-WW-10 Pre-cast concrete manhole

Refer to dwg no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-002 for plan layout

Rev	Description	Date	Drn	Chkd
0	Issued for planning	08.11.23	IR	MW

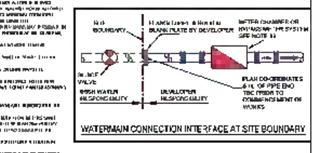
walsh design group
Consulting Engineers
The Mall, Mansborough Woods, Douglas, Cork.
Tel: 021-4774940 email: info@wdg.ie

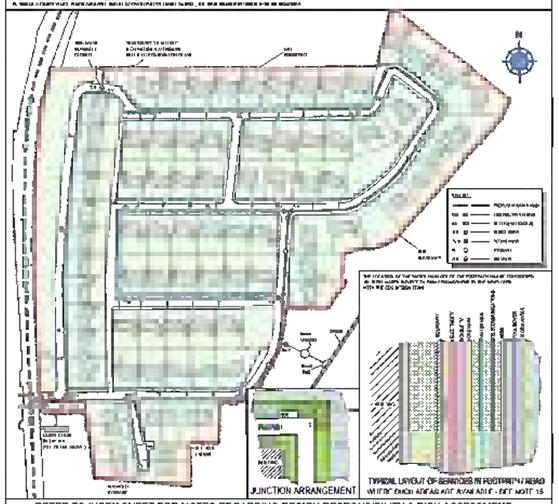
Title:	Irish Water Standard Details Wastewater
Project:	Housing Development, An Tamhnaigh, Clonakilty, Co. Cork
ID No:	22055-ZZ-XX-XX-XX-DR-WDG-CE-501
Date:	Oct 2023
Drawn by:	IR
Scale:	As shown
Purpose:	P3 - Planning
Rev:	0



REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

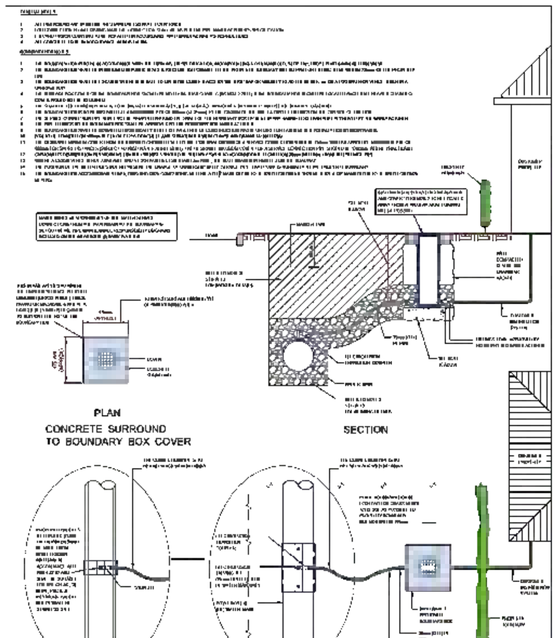
WATER SERVICE CONNECTION RESPONSIBILITY — STD-W-01 — 1





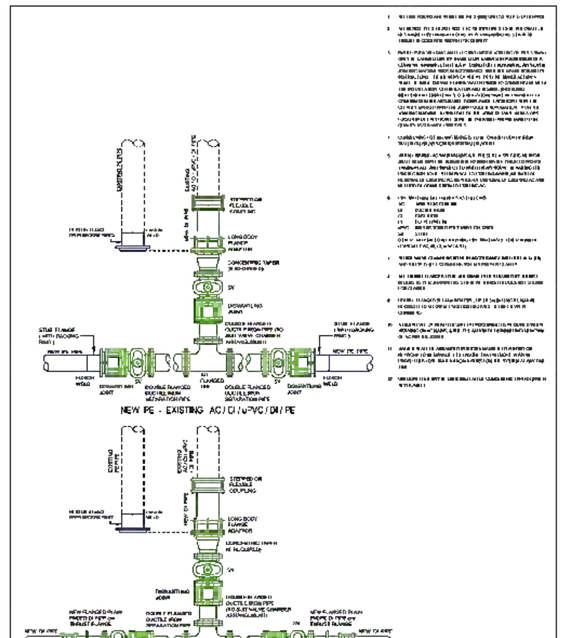
REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

TYPICAL LAYOUT OF WATER MAINS WITHIN DEVELOPMENTS — STD-W-02 — 2



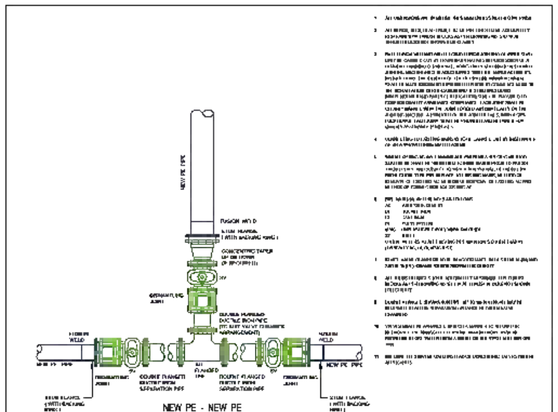
REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

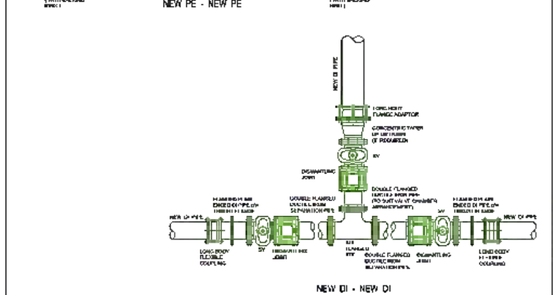
CONNECTION AND BOUNDARY BOX (25mm OD PIPE) — STD-W-03 — 4



REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

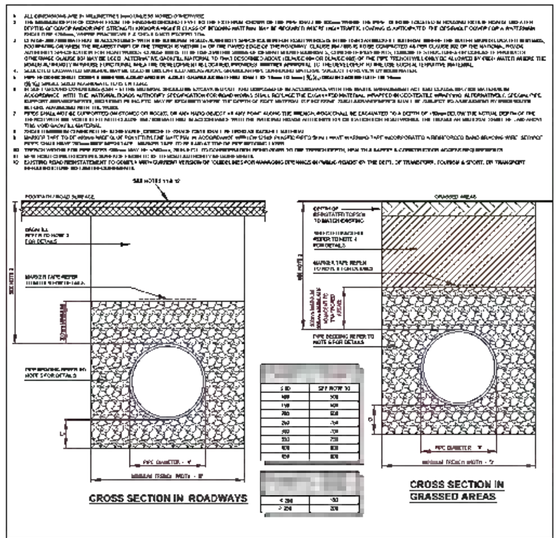
GENERAL PIPE CONNECTIONS (Sheet 3 of 7) — STD-W-06 — 3

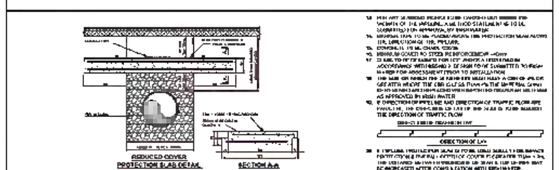




REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

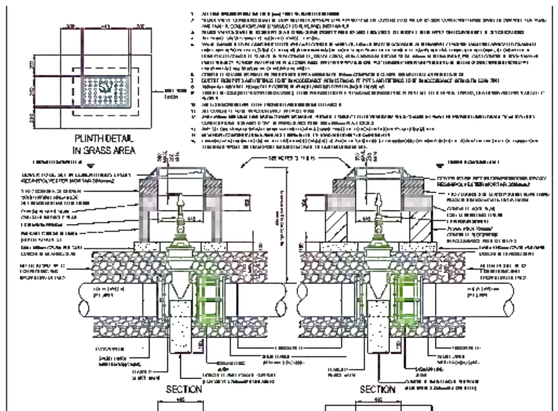
GENERAL PIPE CONNECTIONS (Sheet 4 of 7) — STD-W- 07 — 2





REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

TRENCH BACKFILL / BEDDING & MINIMUM COVER PROTECTION SLAB DETAIL — STD-W- 13 — 2



REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

SLUICE VALVE FOR POLYETHYLENE (P.E.) PIPE (< 350mm DIA.) (Sheet 2 of 2) — STD-W- 15 — 3

Standard Irish Water Detail References:

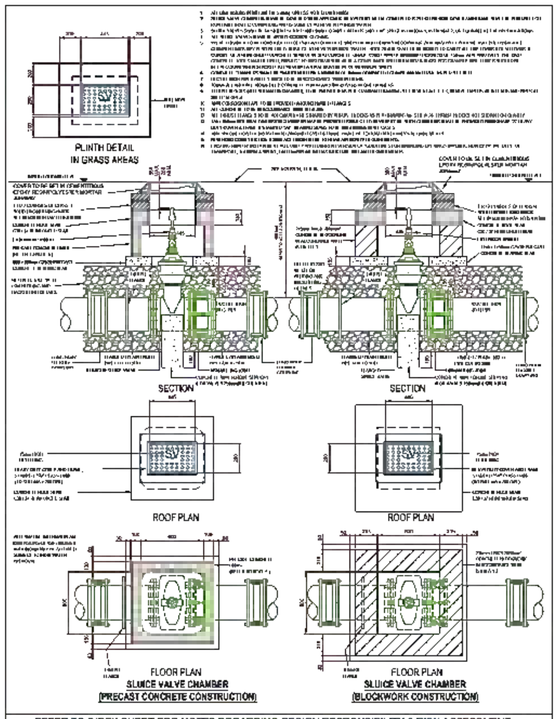
STD-W-01 Water Service Connection responsibility
STD-W-02 Typical Layout for Water Mains within developments
STD-W-03 Customer connection & boundary box
STD-W-06 General Pipe Connection
STD-W-07 General Pipe Connection
STD-W-13 Trench Backfill & Bedding
STD-W-15 Sluice valve for Polyethylene (P.E.) Pipe (<350mmø)

Refer to dwg no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-003 for plan layout

Rev.	Description	Date	Drn	Chkd
0	Issued for Planning	09.11.23	IR	MW

walsh design group
Consulting Engineers
The Mall, Manderacush Woods, Douglas, Cork.
Tel: 021-4774940 email: info@wdg.ie

Title:	Irish Water Standard Details Water Supply (Sheet 1 of 2)
Project:	Housing Development, An Tamhnaigh, Clonakilty, Co. Cork
ID No:	22055-ZZ-XX-XX-XX-DR-WDG-CE-502
Date:	Oct 2023
Drawn by:	IR
Scale:	As shown
Purpose:	P3 - Planning
Rev:	0

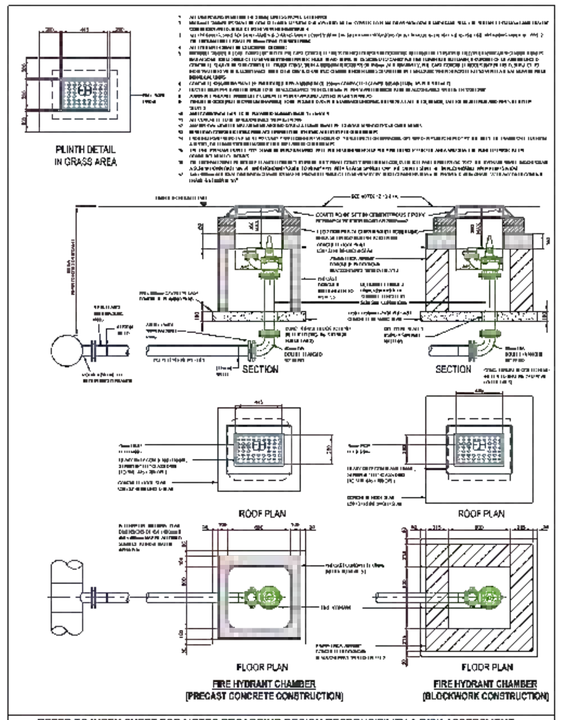


REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

SLUICE VALVE
FOR DUCTILE IRON (D.I.) PIPE (< 350mm DIA.)
(Sheet 1 of 2)

SCALE: NOT TO SCALE | DATE: SEPT. 2015

DRAWING No. STD-W- 14 | REV 4

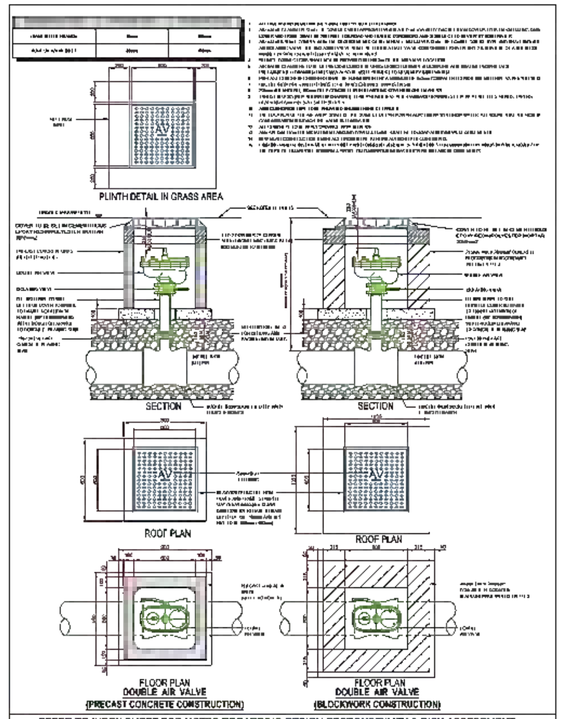


REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

OFF - LINE HYDRANT
FOR POLYETHYLENE (P.E.) PIPE
(Sheet 4 of 4)

SCALE: NOT TO SCALE | DATE: SEPT. 2015

DRAWING No. STD-W- 19 | REV 4

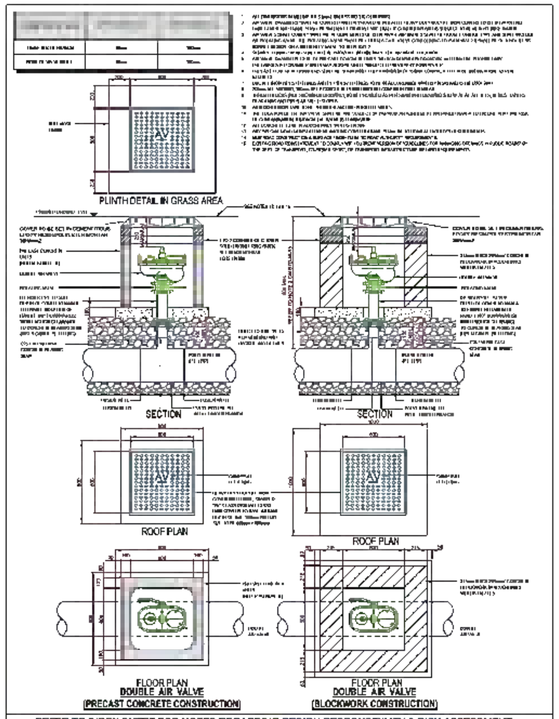


REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

ON - LINE AIR VALVE
FOR DUCTILE IRON (D.I.) PIPE
(Sheet 1 of 4)

SCALE: NOT TO SCALE | DATE: SEPT. 2015

DRAWING No. STD-W- 20 | REV 3

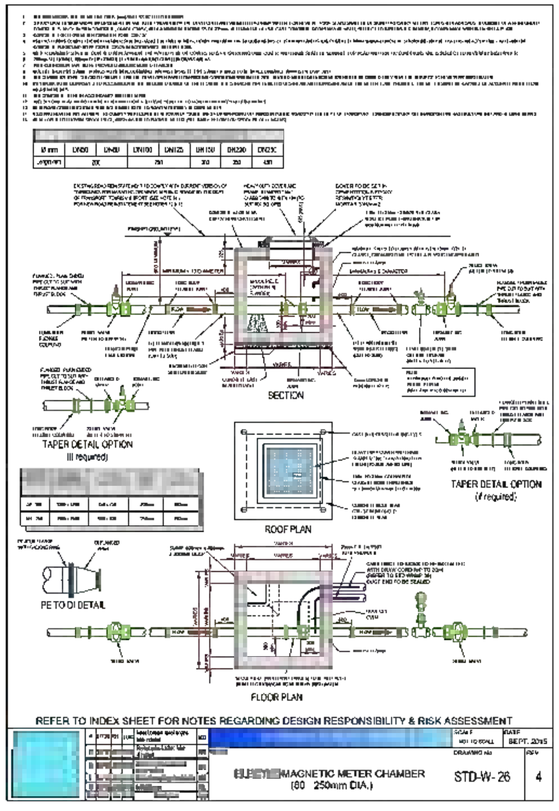


REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

ON - LINE AIR VALVE
FOR POLYETHYLENE (P.E.) PIPE
(Sheet 3 of 4)

SCALE: NOT TO SCALE | DATE: SEPT. 2015

DRAWING No. STD-W- 22 | REV 3

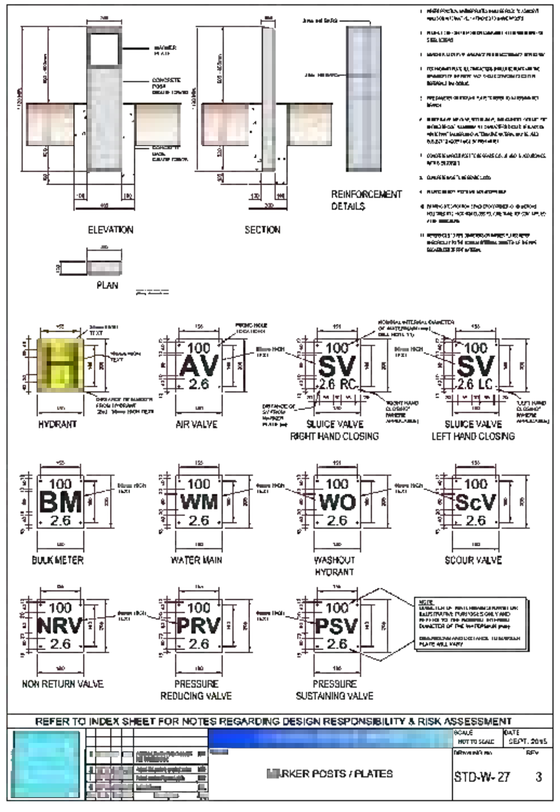


REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

MAGNETIC METER CHAMBER
(80 - 250mm DIA.)

SCALE: NOT TO SCALE | DATE: SEPT. 2015

DRAWING No. STD-W- 26 | REV 4

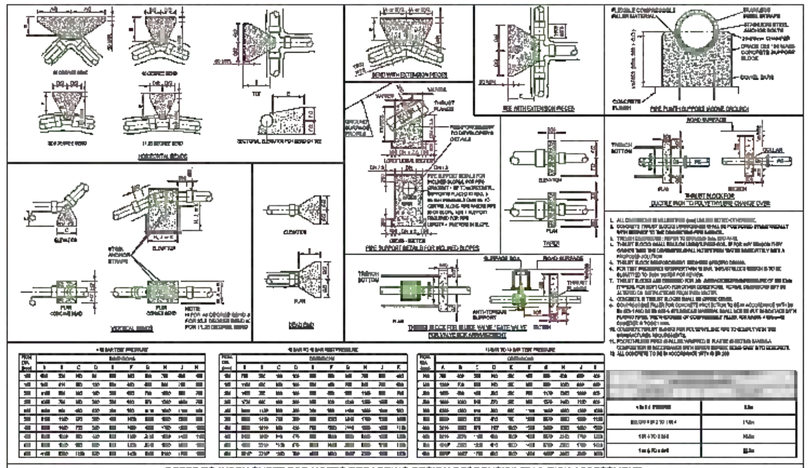


REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

MARKER POSTS / PLATES

SCALE: NOT TO SCALE | DATE: SEPT. 2015

DRAWING No. STD-W- 27 | REV 3



REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

TITLE: WATER MAIN THRUST AND SUPPORT BLOCKS

SCALE: NOT TO SCALE | DATE: SEPT. 2015

DRAWING No. STD-W-28 | REV 1

Standard Irish Water Detail References:

STD-W-14 Sluice valve for Ductile Iron (D.I.) Pipe (<350mmØ)
STD-W-19 Off-line hydrant for Polyethylene (P.E.) Pipe
STD-W-20 On-line Air Valve for Ductile Iron (D.I.) Pipe
STD-W-22 On-line Air Valve for Polyethylene (P.E.) Pipe
STD-W-26 Meter chamber (≤300mm Ø)
STD-W-27 Marker posts/ Plates
STD-W-28 Water main thrust & support blocks

Refer to dwgs no. 22055-ZZ-XX-XX-XX-DR-WDG-CE-003 for plan layout

Rev	Description	Date	Drn	Chd
0	Issued for planning	OCT/ 23	IR	MW

walsh design group
Consulting Engineers
The Mall, Mansborough Woods, Douglas, Cork
Tel: 021-4774940 email: info@wdg.ie

Title:	Irish Water Standard Details Water Supply (Sheet 2 of 2)
Project:	Housing Development, An Tamhnaigh, Clonakilty, Co. Cork
ID No:	22055-ZZ-XX-XX-XX-DR-WDG-CE-503
Date:	Oct 2023
Rev:	0
Drawn by:	IR
Scale:	As shown
Purpose:	P3 - Planning

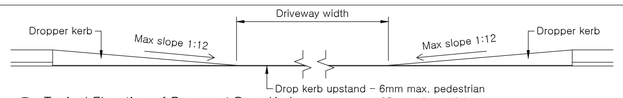
Tank Notes:

- ESS Eco-cell modules (or similar approved) measuring 690mm x 410mm x 450mm high, arranged as shown,
- Modules to be wrapped with a permeable geomembrane with lapped joints,
- Vent pipes and water pipes to be connected to the tank using heavy duty pipe collars and with stainless steel strangle bands for fastening around the pipe,
- 100mm thick layer of thick coarse sand or class 6H selected granular material to surround geotextile on the top and sides of the tank,
- Modules to be laid on a flat, level and smooth base of selected, compacted granular material,
- Vent Box – Stanton heavy duty ductile iron double triangular surface box (or similar approved) with a vented cover, 300mm x 300mm clear opening and a minimum of 100mm frame depth on mortar bed,
- Minimum cover over Eco-cell modules is 500mm in a green area and 650mm in a trafficked area,
- A CBR of between 3% and 5% has been assumed at sub-base level. CBR testing will be carried out by the contractor prior to installation.

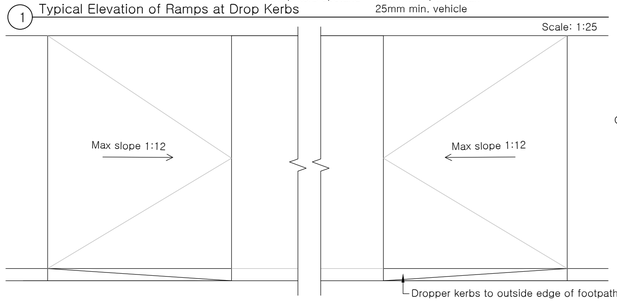
Flow Control:

- A Hydrobrake (or similar approved) will be installed at the attenuation outlet manhole to limit flow to the appropriate rate as follows:
- The flow control immediately downstream of the Tank in Manhole S12 will limit flow to 3.4 litres/sec,
- This vortex flow control device is specifically designed for the required flow, has no moving parts and is powered by water flow alone,
- The device is designed to minimise risk of blockage but is also equipped with a bypass door that can be manually opened in case of blockage,
- Outlet Manholes will also be fitted with an overflow pipe, in accordance with the manufacturer's recommendations, to prevent flooding in extreme rainfall events. The overflow level will be set such that flow from all events up to and including a 1 in 100 year storm event are contained.

Important:
When constructing/installing any proprietary products it is imperative to follow the manufacturer's/supplier's recommendations. Cross check with WDG if in doubt. All proprietary products to be CE marked and certified for use in the EU



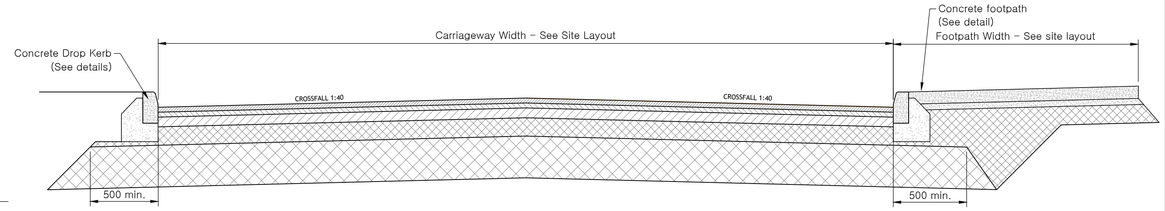
1 Typical Elevation of Ramps at Drop Kerbs



2 Typical Plan of Ramps at Drop Kerbs & Dished Footpaths

Scale: 1:25

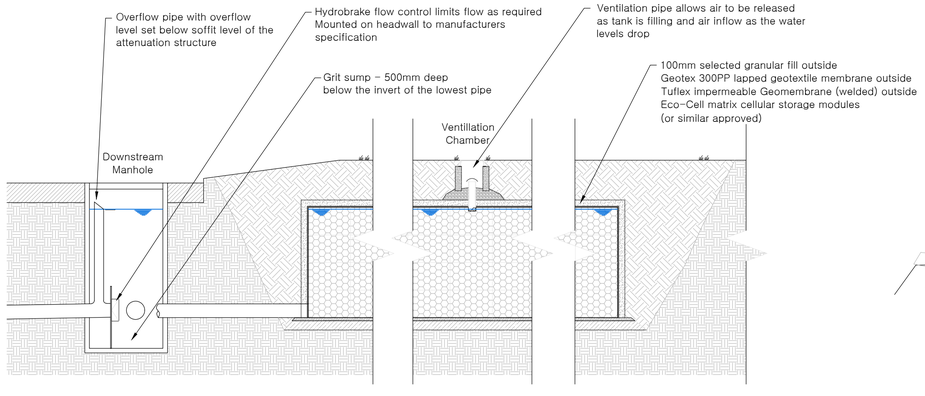
Standard Estate Road Construction
40mm BITUMINOUS SURFACING ON
TACK COAT ON
40mm BITUMINOUS BASE (BINDER) COURSE ON
80mm DENSE BITUMEN MACADAM ROADBASE ON
150mm TYPE B MATERIAL TO CLAUSE 804 & CLAUSE 808 (TII PUBLICATIONS, PUBLICATION NUMBER CC-SPW-00800, MARCH 2013) UNBOUND SUB-BASE ON
300–600mm CLASS 6F2 MATERIAL CAPPING LAYER ON
CLASS 6C STARTER LAYER MATERIAL (WHERE REQUIRED TO RAISE LEVELS) GRADED IN ACCORDANCE WITH TABLE 6/2 AND COMPACTED IN ACCORDANCE WITH TABLE 6/4 OF THE TII SPECIFICATION FOR ROADWORKS CC-SPW-00600.
(The depth of the Capping layer depends on CBR tests carried out on the Subgrade at 50m ctrs, by the contractor – please inform the Engineer of CBR results as soon as they are available)



3 Estate Road – Typical Cross Section

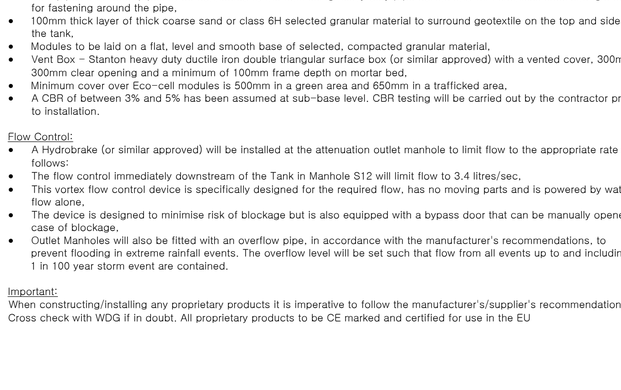
Scale: 1:25

Shared Surface Estate Road Construction
40mm BITUMINOUS SURFACING WITH BEIGE COLOURED STONE CHIPPINGS ON
TACK COAT ON
40mm BITUMINOUS BASE (BINDER) COURSE ON
80mm DENSE BITUMEN MACADAM ROADBASE ON
150mm TYPE B MATERIAL TO CLAUSE 804 & CLAUSE 808 (TII PUBLICATIONS, PUBLICATION NUMBER CC-SPW-00800, MARCH 2013) UNBOUND SUB-BASE ON
300–600mm CLASS 6F2 MATERIAL CAPPING LAYER ON
CLASS 6C STARTER LAYER MATERIAL (WHERE REQUIRED TO RAISE LEVELS) GRADED IN ACCORDANCE WITH TABLE 6/2 AND COMPACTED IN ACCORDANCE WITH TABLE 6/4 OF THE TII SPECIFICATION FOR ROADWORKS CC-SPW-00600.
(The depth of the Capping layer depends on CBR tests carried out on the Subgrade at 50m ctrs, by the contractor – please inform the Engineer of CBR results as soon as they are available)



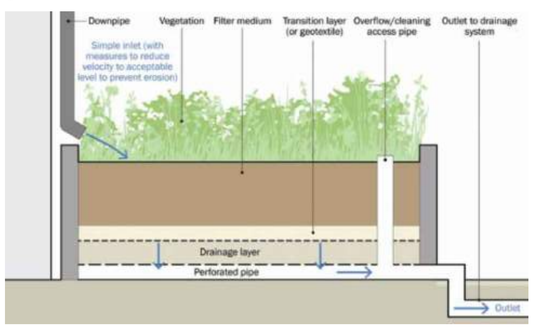
4 Attenuation Tank Section Details

Scale: 1:50



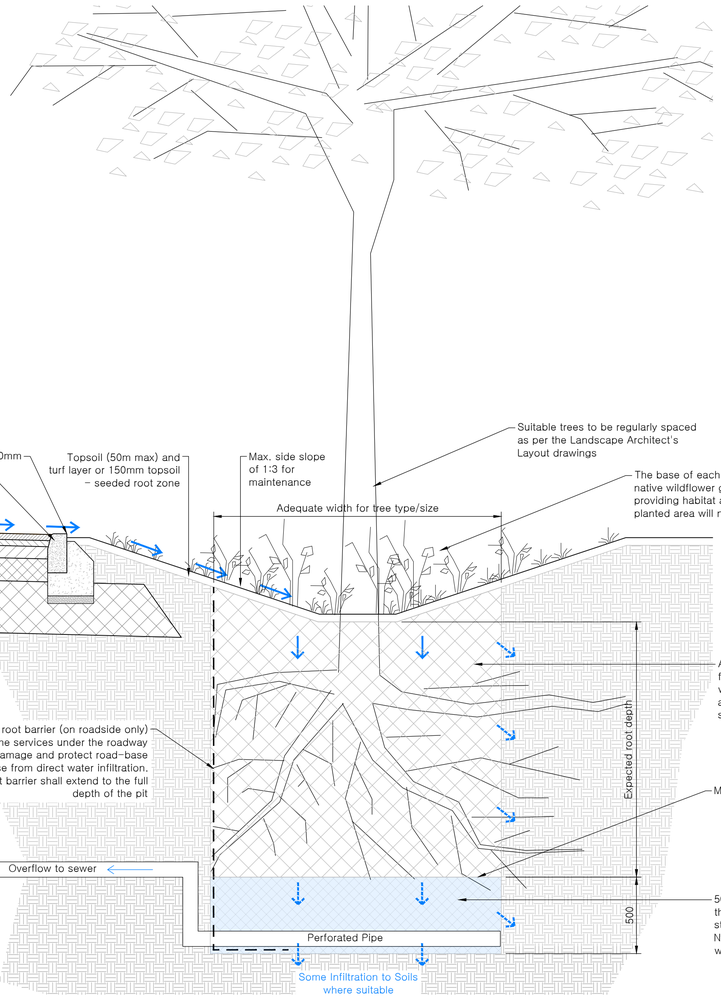
5 Permeable Paving Details (Private Driveways & Paths)

Scale: 1:20



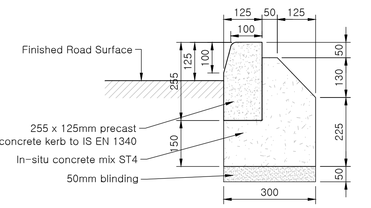
6 Section Through Raised Raingarden Planter

Scale: NTS



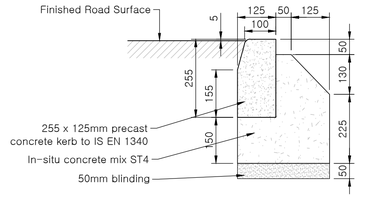
7 Roadside Bioretention Tree Pit

Scale: 1:20



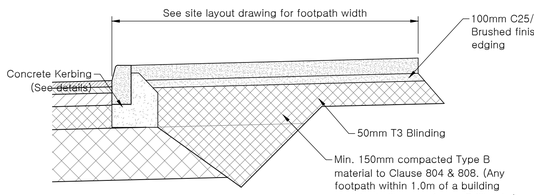
8 Concrete Kerb Detail

Scale: 1:10



9 Drop Kerb Detail

Scale: 1:10



10 Public Footpath – Typical Cross Section

Scale: 1:20

Rev	Description	Date	Drn	Chd
0	Issued for planning	05.11.23	IR	MW

walsh design group
NSAI

Consulting Engineers

The Mall, Maryborough Woods, Douglas, Cork
Tel: 021-4774940 email: info@wdg.ie

Title:	Construction Details
Projects:	Housing Development An Tamhnaigh, Clonakilty, Co. Cork
ID No:	22055-ZZ-XX-XX-XX-DR-WDG-CE-504
Date:	October 2023
Drawn by:	IR
Scale:	As Shown
Purpose:	P3 - Planning
Rev:	0

Legend

Taking in Charge Boundary

Areas to be taken in charge by Cork Councy Council

Areas in Management Company Ownership

N

Gaelscoil Mhichíl Uí Choileáin

New Public Footpath

Rev	Description	Date	Drn	Chkd
0	Issued for planning	22.11.23	IR	MW

walsh design group

Consulting Engineers

The Mall, Maryborough Woods, Douglas, Cork

Tel: 021-4774940 *email: info@wdg.ie*

Title:	Site Layout Areas to be taken in Charge
Project:	Housing Development, An Tamhnaigh, Clonakilty, Co. Cork
ID No:	22055-ZZ-XX-XX-XX-DR-WDG-CE-904
Date:	May 2023
Drawn by:	IR
Scale:	1:250
Purpose:	P3 - Planning
Rev:	0

Proposed Residential Development at Clonakilty, Co. Cork

Traffic & Transport Assessment.

Document Control Sheet

Client	Cork County Council.
Project Title	Proposed Residential Development Clonakilty, Co. Cork
Document Title	Traffic and Transport Assessment
Document No.	2305-TTA-D01
Job No.	2305TT
Date	25th July 2023
Status	Final Issue

Martin Hanley Consulting Engineers Ltd.
Traffic & Transportation,
Consulting Engineers,

Table of Contents

1.0 Introduction

Martin Hanley Traffic and Transportation Consulting Engineers have been engaged by Cork County Council, to prepare a Traffic and Transport Assessment (TTA) for the construction of a housing development involving 35 housing units. This report has been prepared as part of the planning application. The site is located on the western side of Clonakilty. Access to the development will be via the existing housing estate road from Fernhill Road R588. Fernhill Road R588 connects to the Western Road R588 to the south.

Traffic counts were carried out by Traffinomics Ltd. On the 23rd of May 2023 for the morning peak hours of 07:30 - 09:30 and the evening peak hours of 16:30-18:30. Counts were undertaken at the major junctions accessing the proposed development included the following junctions,

- Junction Estate Road / Fernhill Road R588
- Junction Western Road R588 / Fernhill Road R588

The expected year of completion for the development is taken to be 2025. In accordance with the "Traffic and Transport Assessment Guidelines, TII 2014", a traffic analysis was carried out for the AM & PM peak hours for the following time periods.

Base Year 2023

Opening Year 2025

Opening Year + 5 Year Forecast 2030.

Opening Year + 15 Year Forecast 2040.

This report has been prepared in accordance with the TII's 2014 publication "Traffic and Transport Assessment Guidelines" PE-PDV-02045 and the "Guidelines for Traffic Impact Assessments" as published by the Institution of Highways & Transportation U.K. in 1994. The purpose of a TTA is to assess the traffic impact of a development on the existing road network and propose any necessary mitigation measures to best accommodate the expected traffic volumes generated by the proposed development.

1.1 Conclusion Non- Technical Summary

The following are the main conclusions of the LinSig traffic analysis.

Junction Estate Road / Development Access

- The proposed access junction to the new housing development is shown to be operating well within capacity for all future design years. The maximum degree of saturation for traffic exiting the proposed development is 2.7% for the morning peak hour in the design year 2040.

- Junction sight distance of 45m to the east and west will be provided at 2.4m back from the road edge measured for design speed of 50km/hr in accordance with DMURS. The junction will be an uncontrolled STOP junction with appropriate road marking and signage provided.

Junction Estate Road / Fernhill Road R588

- The existing signalised junction is shown to be operating within capacity for all future design years. The maximum degree of saturation for traffic at this junction is 54.4% for the morning peak hour for traffic coming from the west on the existing estate road in the design year 2040.

Junction Western Road R588 / Fernhill Road R588

- The existing T junction is shown to be operating within capacity for all future design years. The maximum degree of saturation for traffic entering the junction is 62.8% for the morning peak hour for traffic on the western road in the design year 2040.

2.0 Policy Context

2.1 Introduction

In order to demonstrate that the development of the site complies with current national and local transport planning policy, a review was undertaken of the following documents:

- Cork County Council Development Plan 2022-2028
- Urban Design Manual: A Best Practice Guide 2009
- Smarter Travel - A Sustainable Transport Future 2009-2020
- Spatial Planning & National Roads – Guidelines for Planning Authorities 2012

2.2 Urban Design Manual: A Best Practice Guide 2009

This guide “focuses on creating well-designed, sustainable neighbourhoods that will stand the test of time”. This can also extend to industrial developments and provides a strong foundation for the design of such sites in relation to their accessibility – in particular walking and cycling. The manual follows a set of criteria of which the following are directly linked to this Transport Assessment.

- There are attractive routes in and out for pedestrians and cyclists
- The development is located in or close to a mixed-use centre
- The development’s layout makes it easy for a bus to serve the scheme
- The layout links to existing movement routes and the places people will want to get to
- Appropriate density, dependant on location, helps support efficient public transport

The manual recognises the need for planners to facilitate connections between new and existing developments, as well as key locations around the sites. These connections should be of high quality, direct, safe, and secure and facilitate existing movement and desired routes. Furthermore, public transport and sustainable transport is prioritised over private cars. Quality interchanges are highly desirable in promoting the uptake of public transport, including integration with sustainable transport modes, such as cycle parking/storage.

2.3 Smarter Travel – A Sustainable Transport Future 2009-2020

Smarter Travel is “designed to show how Ireland can reverse current unsustainable transport and travel patterns and reduce the health and environmental impacts of current trends and improve our quality of life”. The plan outlines the current transport trends and statistics in Ireland and focuses on policies which aim to increase transport sustainability by 2020.

Key goals of the policy include.

- Improving quality of life and accessibility to transport for all and, in particular, people with reduced mobility and those who may experience isolation due to lack of transport.
- Improving economic competitiveness through maximising the efficiency of the transport system and alleviating congestion and infrastructure bottlenecks.

- Minimising the negative impacts of transport on the local and global environment through reducing localised air pollutants and greenhouse gas emissions.
- Reducing overall travel demand and commuting distances travelled by the private car.

In Chapter 3 of the Smarter Travel Document the Government reaffirms its vision for sustainability in transport and sets out five key goals:
(i) to reduce overall travel demand,
(ii) to maximise the efficiency of the transport network,
(iii) to reduce reliance on fossil fuels,
(iv) to reduce transport emissions and
(v) to improve accessibility to transport.

To achieve these goals and to ensure that we have sustainable travel and transport by 2020, the Government sets the following key targets:

- Future population and employment growth will predominantly take place in sustainable compact forms, which reduce the need to travel for employment and services.
- 500,000 more people will take alternative means to commute to work to the extent that the total share of car commuting will drop from 65% to 45%
- Alternatives such as walking, cycling and public transport will be supported and provided to the extent that these will rise to 55% of total commuter journeys to work.
- The total kilometres travelled by the car fleet in 2020 will not increase significantly from current levels.
- A reduction will be achieved on the 2005 figure for greenhouse gas emissions from the transport sector.

2.4 Cork County Council Development Plan 2022-2028

Data indicates that a significant majority of trips (74.79%) originating in Clonakilty Electoral Area of Cork County are by private transport and are mainly car-based. Walking accounts for a significant proportion of journeys at 14.57 % while cycling comprises 1.69% of trips. Approximately 0.69% of trips are taken by public transport. See Table 2.1 below which is an extract from Cork County Council Development Plan 2022-2028 Chapter 12 Transport and Mobility. The targets for modal share for 2028 are also set out in the Development Plan and are shown in Table 2.1 below.

Commuting to or within Cloankilty	% Travelling to work by private Car	% Travelling to work by walking	% Travelling to work by cycling	% Travelling to work by public transport
Clonakilty Baseline	74.79	14.57	1.69	0.69
Clonakilty Targets for 2028	60.00	17.00	4.00	11.00

Table 2.1: Cork County Development Plan - Clonakilty existing baseline mode share for commuting compared to target mode for commuting.

3.0 Existing Conditions

3.1 Local Road Network

The site is located off the Fernhill Road R588 on the western side of Clonakilty, Co. Cork. Access to the development will be via the existing signalised junction at Fernhill Road. The site is located approx. 1.1km to the west of the town centre.

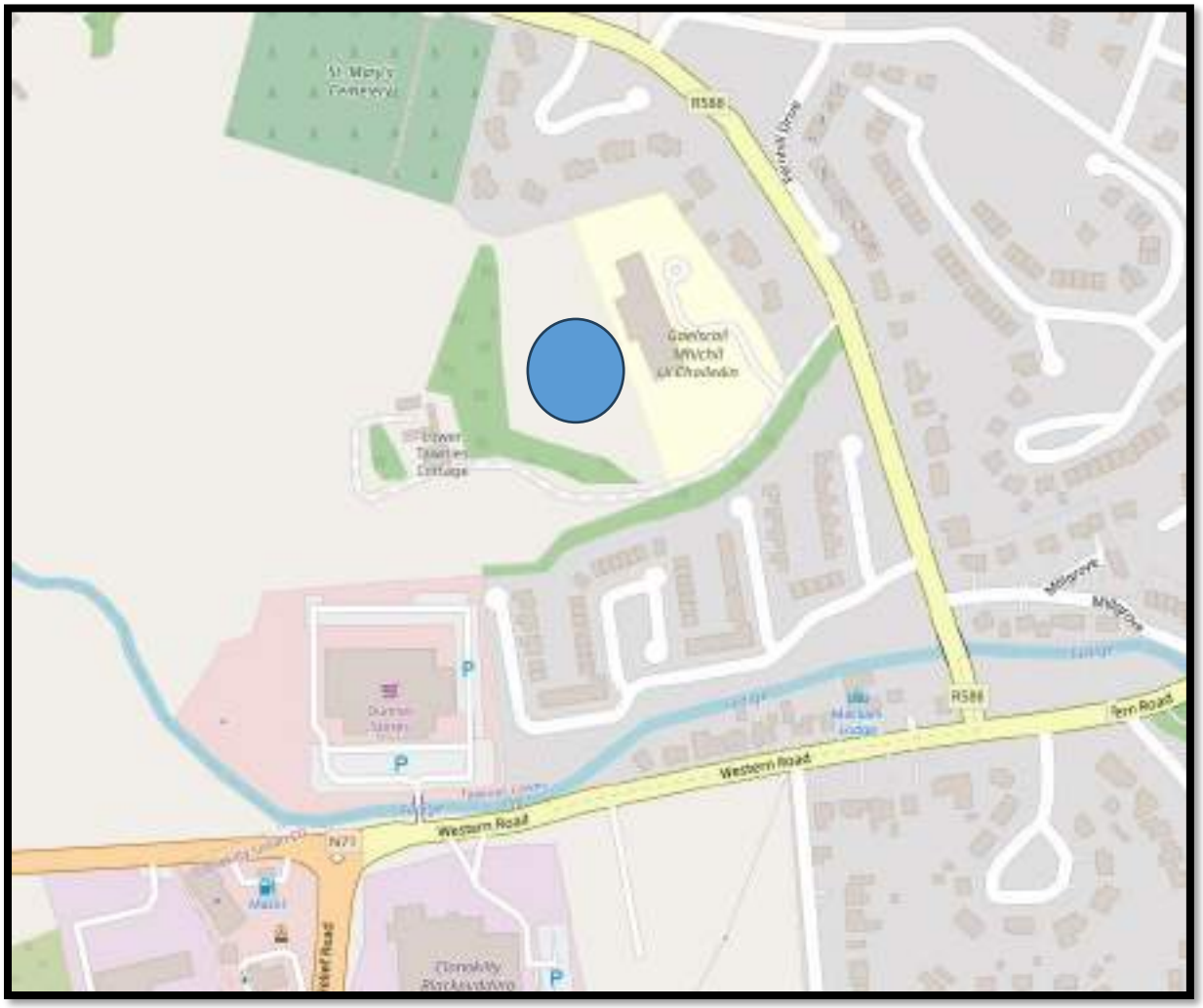


Fig 3.1: Local Road Network site location shown in blue.

3.2 Existing Traffic Conditions

Traffic counts were carried out by Traffinomics Ltd. on 23rd of May 2023 for the morning peak hours of 07:30 - 09:30 and the evening peak hours of 16:30-18:30. Full traffic count data can be found in appendix A of this report. Traffic counts were undertaken for the busiest traffic hours. As this is a residential development and the peak hours for traffic generation from the traffic counts are weekdays 08:30-09:30 and 17:15-18:15.

The existing junction was analysed using LinSig traffic modelling software. The outputs from LinSig show Degree of Saturation and Queue lengths as indicators of the operational efficiency of the junction. A Degree of Saturation of 100% indicates that the junction is operating at its theoretical maximum capacity, however, a value of 85% is considered to be the maximum optimum Degree of Saturation for an uncontrolled junction and 90% for traffic signal controlled junctions, allowing for a 15% & 10% reserve capacity for unusual events such as Bank Holiday weekends and sporting events.

A base model was developed in LinSig using the recorded traffic counts. LinSig software requires that all traffic modes collected from the counts be converted to Passenger Carrying Units (PCU's or car-equivalents). This is done to standardise the size disparity of different vehicle types, preventing an overestimation of smaller vehicle categories and underestimation of HGV's and other large vehicle categories. The traffic counts converted in PCU format allow for all modelled traffic flows to be equally represented in comparison to other categories, thereby removing any discrepancies in the input data.

Output from LinSig can be seen in Fig 3.2 for the AM peak hour 2023 and Fig 3.3 for the PM peak hour 2023.

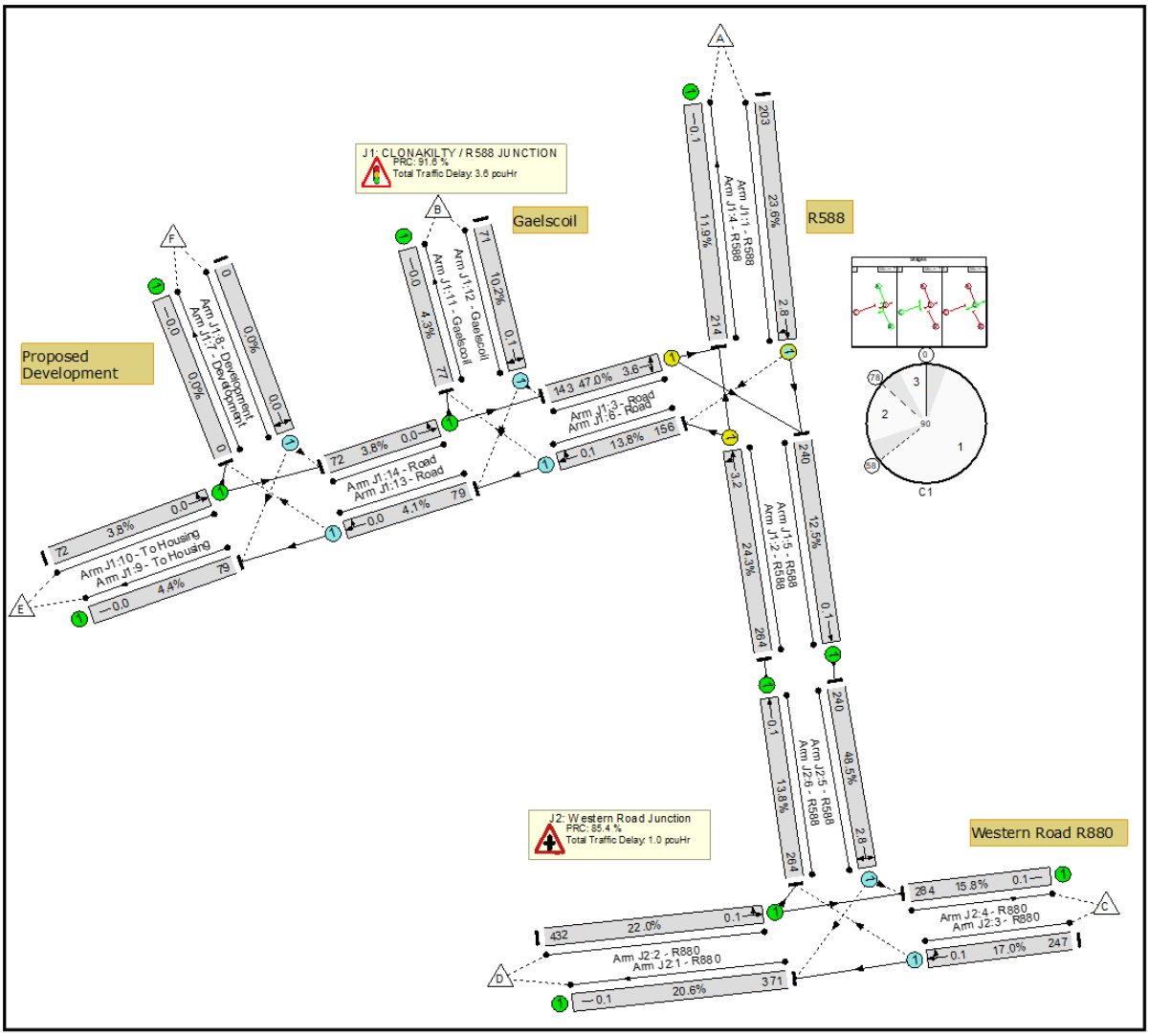


Fig 3.2: Scenario 1 AM 2023 Current Year

For the existing AM scenario, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm 3 Estate Link Road at the signalised junction as can be seen in Fig 3.2 above. The degree of saturation is measured at 47.0% with a mean maximum car queue length of 3.6 vehicles for the morning peak hours 08:30-09:30.

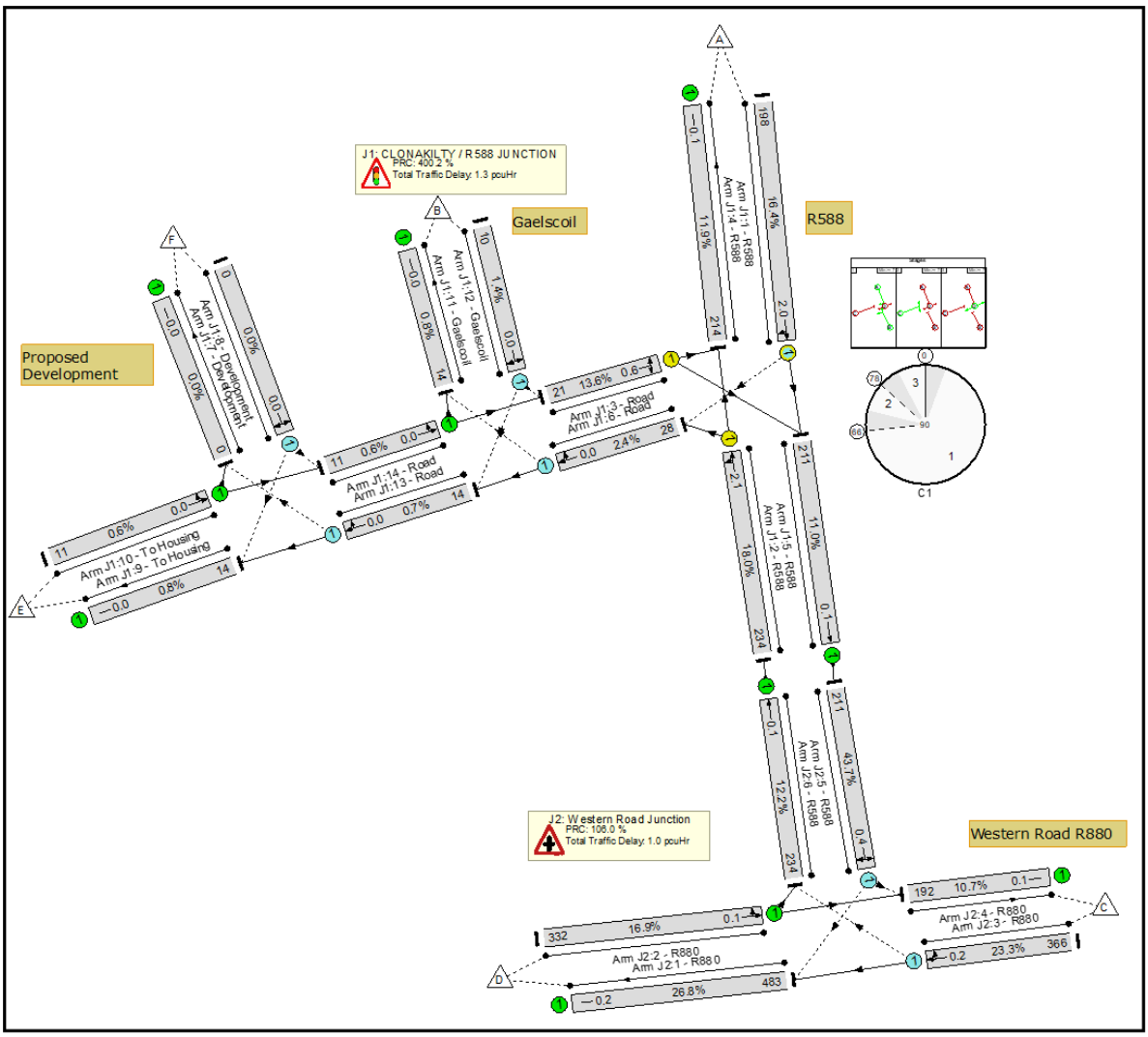


Fig 3.3: Scenario 5 PM 2023 Current Year

For the existing PM scenario, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm 4 J5 Fernhill Road R588 as can be seen in Fig 3.3 above. The degree of saturation is measured at 43.7% with a mean maximum car queue length of 0.4 vehicles for the evening peak hours 17:15-18:15. See Appendix C for LinSig output data.

4.0 Development

The proposed development consists of the construction of a housing development involving 35 housing units.

See drawings in Appendix D for the roads layout plan. This proposed development layout in figure 4.1 has been provided by Deady Gahan Architects.

Fig 4.1 Proposed Development Layout.

5.0 Trip Generation, Modal Split and Trip Distribution.

5.1 Trip Generation

TII's 2014 publication "Traffic and Transport Assessment Guidelines" states that for new developments a traffic analysis should be carried out during the busiest hours which have been identified from traffic counts as 08:30-09:30 and 17:15-18:15. As this is a residential development the morning and evening peak hours are considered as the peak hour for traffic generation. The TRICS database can be used to calculate the trip generation for this development. TRICS is a well-established UK and Irish national database which holds in excess of 2,100 site locations and 4,700 survey counts with over 98 separate land use sub-categories. Table 5.1 below show the total number of trips generated by the development for both Phase 1 and Phase 2. See Appendix B for trics data.

Residential Development Clonakilty		AM ARRIVAL 08:15-09:15	AM DEPARTURES 08:15-09:15	PM ARRIVAL 17:15-18:15	PM DEPARTURES 17:15-18:15
35 Units	per unit	0.18	0.46	0.45	0.25
	No.	35	35	35	35
	Trips	6	16	16	9
		AM ARRIVAL	AM DEPARTURES	PM ARRIVAL	PM DEPARTURES
TOTAL TRIPS PEAK HOURS		6	16	16	9

Table 5.1: Trip Generation from proposed Development .

5.2 Modal Split

In order to predict the level of traffic that will be generated by the proposed development, the means of transport (modal split) and quantity of traffic generated (trip attraction) must be considered. Given the location of the proposed development, the peak hour trips generated will primarily be by public transport and private car. In terms of modal split and national policies for the promotion of sustainable transport solutions, a reduction in car trips would be expected, with improvement in pedestrian / cycle facilities as well as improvement in public transport. In order to provide a robust traffic analysis, no reduction in car traffic volumes has been assumed in this report.

National policies, strategies, and guidelines for improvements to public transport systems and reductions in car usage are outlined in the Department of Transport Tourism and Sport's Planning Guidelines for Spatial Planning and National Roads 2012 and the Department of Transport, Tourism and Sport's Smarter Travel: A Sustainable Transport Future. In addition, the document a New Policy for Ireland 2009-2020 states that the key aims of any development plan must be to secure more sustainable residential development that reduces overall demand for transport by car and encourages modal shift towards sustainable travel modes (e.g., walking, cycling and public transport), whilst also ensuring the strategic traffic function of national roads is maintained."

5.3 Trip Distribution

The current distribution of traffic along Western Road and Fernhill Road will be used to determine directional split to and from the proposed development for both morning and evening peak hours. This peak hour directional split pattern is assumed to remain constant with the passage of time.

6.0 Traffic Growth

In order to predict likely future traffic conditions so that the impact of a development proposal on the road and transport network can be predicted and assessed, traffic forecasting considers the possible traffic flows generated by a development proposal as well as the existing background network traffic which is factored up.

The assessment years considered in this report are the Base Year (2023), which is the year the baseline traffic surveys were undertaken, the proposed Opening Year, which is the year of expected completion for the proposed development (2025) and the Design Years, taken as the opening year plus 5 years (2030) & the opening year plus 15 years (2040).

Transport Infrastructure Irelands publication "Project Appraisal Guidelines for National Roads Unit 5.3" 2019 was used to calculate growth factors for the background road network traffic. These Guidelines state that for the years 2016-2030 within Co Cork, a growth rate of 1.73% per annum can be assumed. This changes to 0.67% beyond 2030. The traffic counts from 2023 were factored up using these projected growth rates. The effects of traffic growth on the existing network plus the additional traffic generated by the proposed development have been compiled to provide a robust set of data for the traffic analysis.

Table 6.1 below shows the calculated growth factors based on a growth rate measured from the current year 2023.

Location		2025	2030	2040
County Cork	Growth Rate From 2023	103.49%	112.76%	119.66%

Table 6.1: TII Traffic Growth Rates County Cork.

7.0 Assignment of Development Trips

The proposed development will generate trips as outlined in section 5 of this report. As outlined in section 5.2 and 5.3, the expected modal split has been assumed to remain as it is at present with no increase in modal shift towards more sustainable transport patterns.

7.1 Traffic Assignment

Traffic models were produced for the scenarios outlined below. These models incorporate the measured traffic flows outlined in section 3.0, factored up as per section 6.0, along with predicted development traffic as described in section 5.1.

The list of traffic models built for the proposed development traffic assessment are:

- Base Year 2023
- Opening Year 2025
- Opening Year + 5 Year Forecast 2030
- Opening Year + 15 Year Forecast 2040

Six zones were used to construct the LinSig network labelled A to F. Access to the development will be through Zone F. The following are the trip assignment matrices.

					Destination			
		A	B	C	D	E	F=Dev	Tot
	A	0	26	43	107	27	0	203
	B	27	0	12	32	0	0	71
Origin	C	30	9	0	199	9	0	247
	D	131	42	216	0	43	0	432
	E	26	0	13	33	0	0	72
	F-Dev	0	0	0	0	0	0	0
	Tot	214	77	284	371	79	0	1025

Table 7.1: Traffic Assignment for AM Peak 2023

		Destination						
		A	B	C	D	E	F	Tot
	A	0	3	37	155	3	0	198
	B	1	0	1	8	0	0	10
Origin	C	51	2	0	311	2	0	366
	D	161	9	153	0	9	0	332
	E	1	0	1	9	0	0	11
	F-Dev	0	0	0	0	0	0	0
	Tot	214	14	192	483	14	0	917

Table 7.2: Traffic Assignment for PM Peak 2023

		Destination						
		A	B	C	D	E	F-Dev	Tot
	A	0	27	45	111	0	3	185
	B	28	0	0	33	0	0	61
Origin	C	31	9	0	206	9	2	258
	D	136	43	224	0	45	2	449
	E	27	0	13	34	0	0	75
	F-Dev	8	0	4	4	0	0	16
	Tot	229	80	285	388	54	7	1043

Table 7.3: Traffic Assignment for AM Peak 2025

		Destination						
		A	B	C	D	E	F-Dev	Tot
	A	0	3	38	160	3	8	213
	B	1	0	1	8	0	0	10
Origin	C	53	2	0	322	2	4	383
	D	167	9	158	0	9	4	348
	E	1	0	1	9	0	0	11
	F-Dev	4	0	3	3	0	0	10
	Tot	225	14	202	503	14	16	975

Table 7.4: Traffic Assignment for PM Peak 2025

		Destination						
		A	B	C	D	E	F-Dev	G-Dev
	A	0	29	48	121	30	3	232
	B	30	0	14	36	0	0	80
Origin	C	34	10	0	224	10	2	281
	D	148	47	244	0	48	2	489
	E	29	0	15	37	0	0	81
	F-Dev	8	0	4	4	0	0	16
	Tot	249	87	324	422	89	7	1179

Table 7.5: Traffic Assignment for AM Peak 2030

		Destination						
		A	B	C	D	E	F-Dev	Tot
	A	0	3	42	175	3	8	231
	B	1	0	1	9	0	0	11
Origin	C	58	2	0	351	2	4	417
	D	182	10	173	0	10	4	378
	E	1	0	1	10	0	0	12
	F-Dev	4	0	3	3	0	0	10
	Tot	245	16	219	548	16	16	1060

Table 7.6: Traffic Assignment for PM Peak 2030

		Destination						
		A	B	C	D	E	F-Dev	Tot
	A	0	31	51	128	32	3	246
	B	32	0	14	38	0	0	85
Origin	C	36	11	0	238	11	2	298
	D	157	50	258	0	51	2	519
	E	31	0	16	39	0	0	86
	F-Dev	8	0	4	4	0	0	16
	Tot	264	92	344	448	95	7	1250

Table 7.7: Traffic Assignment for AM Peak 2040

		Destination						
		A	B	C	D	E	F-Dev	Tot
	A	0	4	44	185	4	8	245
	B	1	0	1	10	0	0	12
Origin	C	61	2	0	372	2	4	442
	D	193	11	183	0	11	4	401
	E	1	0	1	11	0	0	13
	F-Dev	4	0	3	3	0	0	10
	Tot	260	17	233	581	17	16	1123

Table 7.8: Traffic Assignment for PM Peak 2040

8.0 Road Impact

8.1 LinSig Analysis

During the preparation of this report discussions have taken place with Cork County Council Roads Department.

In order to assess the capacity of the existing road network and access junction to the proposed development, traffic models were constructed using LinSig. LinSig is a computer software program dealing with capacities, mean max queue lengths (pcu) and delays at uncontrolled and signalised junctions.

The output results sheets from LinSig consist of tables of demand flow, capacities, queues and delays for the morning and evening peak hour analysis, for each arm of the junction. These tables contain start and finish times for each arm, traffic demand, Degree of Saturated Flow (DOS %), start queue length and queuing delay.

The DOS provides the basis for judging the acceptability of junction design and the capacity of existing junctions. In general, a DOS of 90% or less for controlled junctions is considered acceptable during the peak periods. A DOS of this value would indicate that at peak times the junction is at 90% of its operational capacity and therefore has a practical reserve capacity of 10%. This reserve capacity of 10% is considered by traffic engineers to be the level of reserve capacity at a junction required to cater for periods of unusually high traffic flow, such as bank holiday weekends, public entertainment, and sporting events etc.

The results from the LinSig analysis are shown in the pages which follow for the following traffic scenarios.

Scenario 1 AM 2023 Current Year
Scenario 2 AM 2025 Design Year
Scenario 3 AM 2030 Design Year
Scenario 4 AM 2040 Design Year
Scenario 5 PM 2023 Current Year
Scenario 6 PM 2025 Design Year
Scenario 7 PM 2030 Design Year
Scenario 8 PM 2040 Design Year

The full output from LinSig traffic analysis is available in Appendix C

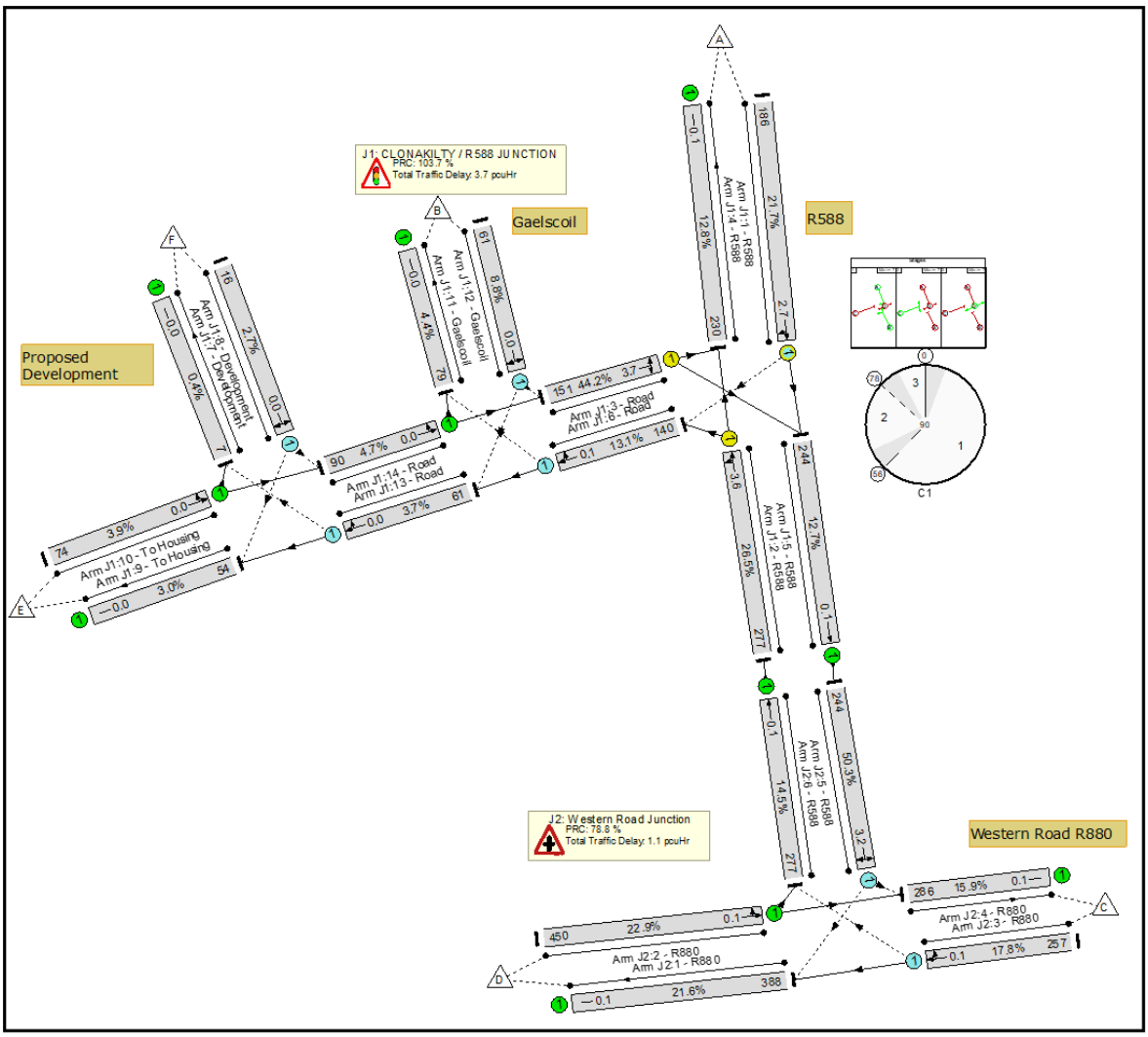


Fig 8.1: 'Scenario 2 AM 2025' Network Layout Diagram

For the AM 2025 scenario, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm J1 3 Estate Link Road as can be seen in Fig 8.1 above. The degree of saturation is measured at 44.2% with a mean maximum car queue length of 3.7 vehicles for the morning peak hours 08:30-09:30. The maximum degree of saturation for the new housing development is 2.7% with a mean maximum car queue length of 0.0 vehicles

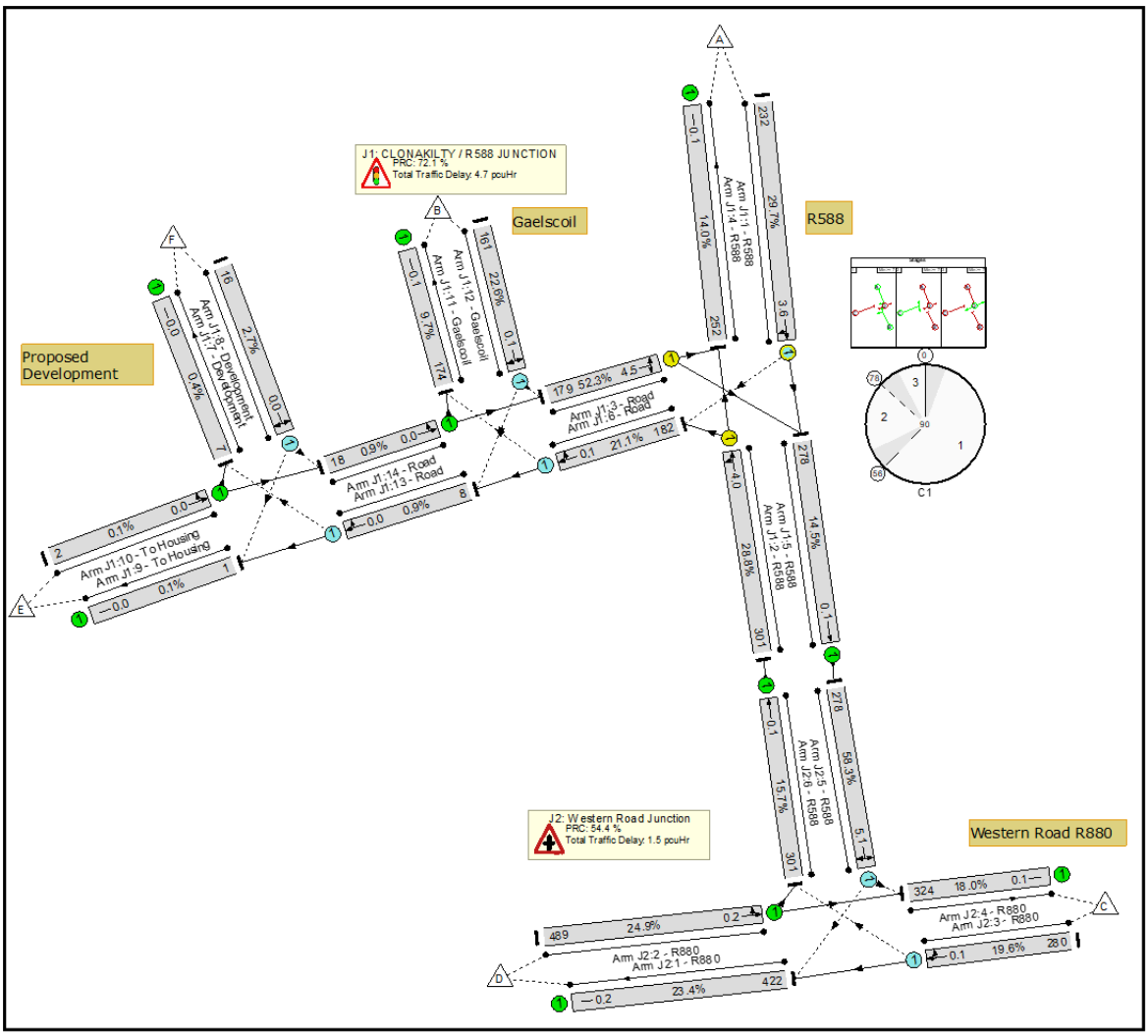


Fig 8.2: 'Scenario 3 AM 2030' Network Layout Diagram

For the AM 2030 scenario, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm J1 3 Estate Link Road as can be seen in Fig 8.2 above. The degree of saturation is measured at 52.3% with a mean maximum car queue length of 4.5 vehicles for the morning peak hours 08:30-09:30. The maximum degree of saturation for the new housing development is 2.7% with a mean maximum car queue length of 0.0 vehicles

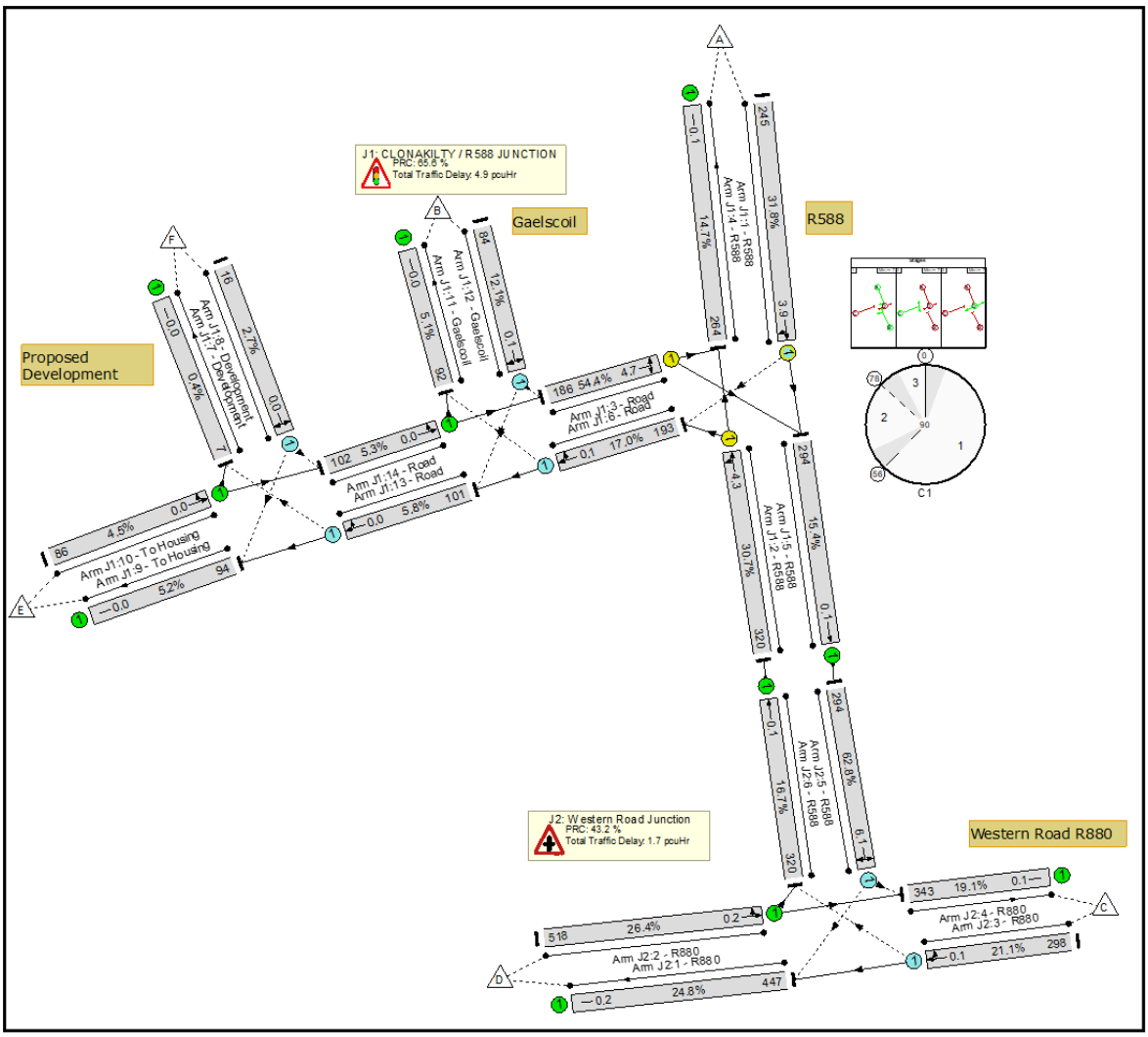


Fig 8.3: 'Scenario 4 AM 2040 Network Layout Diagram

For the AM 2040 scenario, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm J1 3 Estate Link Road as can be seen in Fig 8.3 above. The degree of saturation is measured at 54.4% with a mean maximum car queue length of 4.7 vehicles for the morning peak hours 08:30-09:30. The maximum degree of saturation for the new housing development is 2.7% with a mean maximum car queue length of 0.0 vehicles

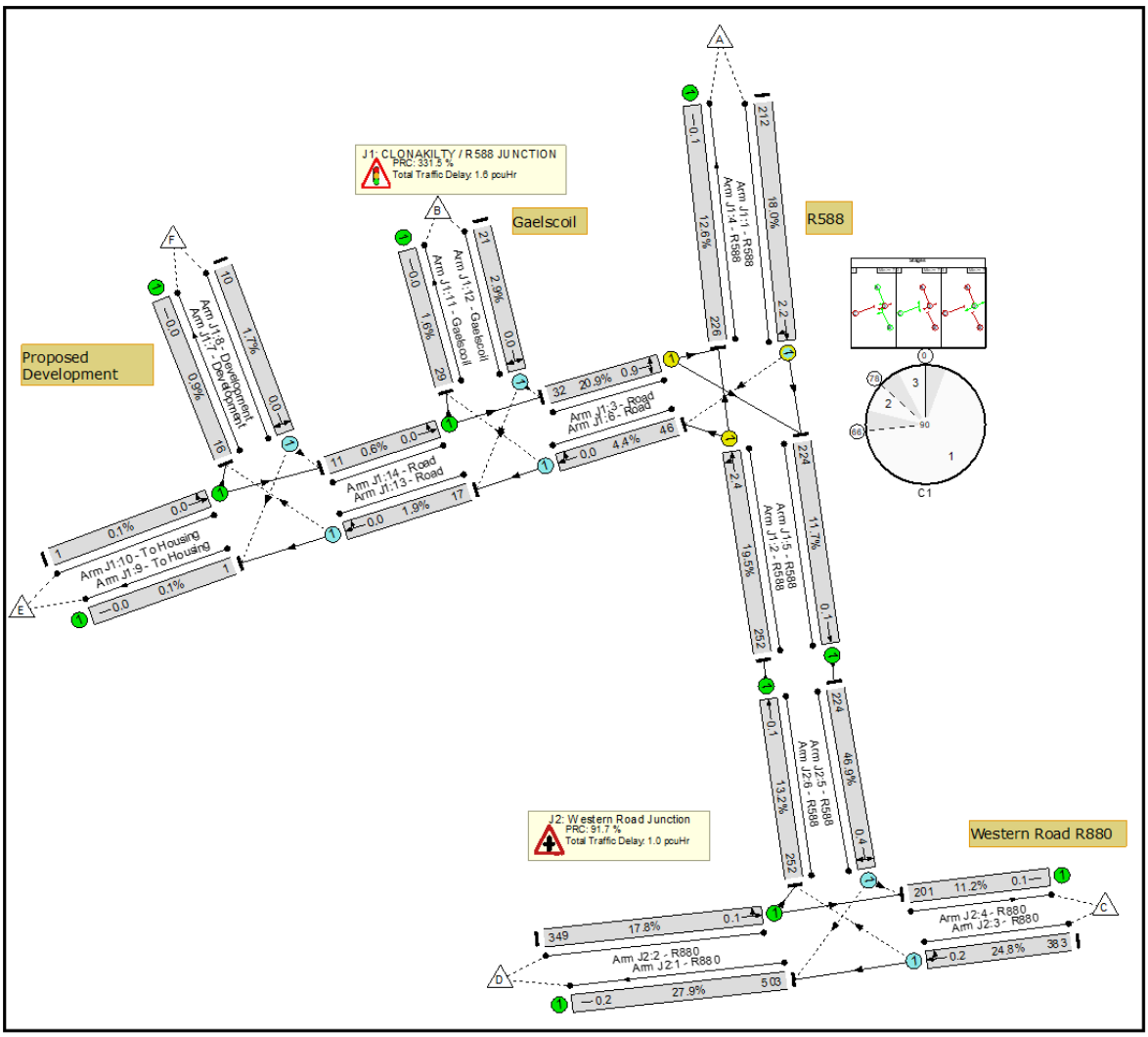


Fig 8.4: 'Scenario 6 PM 2025 Network Layout Diagram

For the PM 2025 scenario, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm 4 J2 Fernhill Road R588 as can be seen in Fig 8.4 above. The degree of saturation is measured at 46.9% with a mean maximum car queue length of 0.4 vehicles for the evening peak hours 17:15-18:15. The maximum degree of saturation for the new housing development is 1.7%.

See Appendix C for LinSig output data.

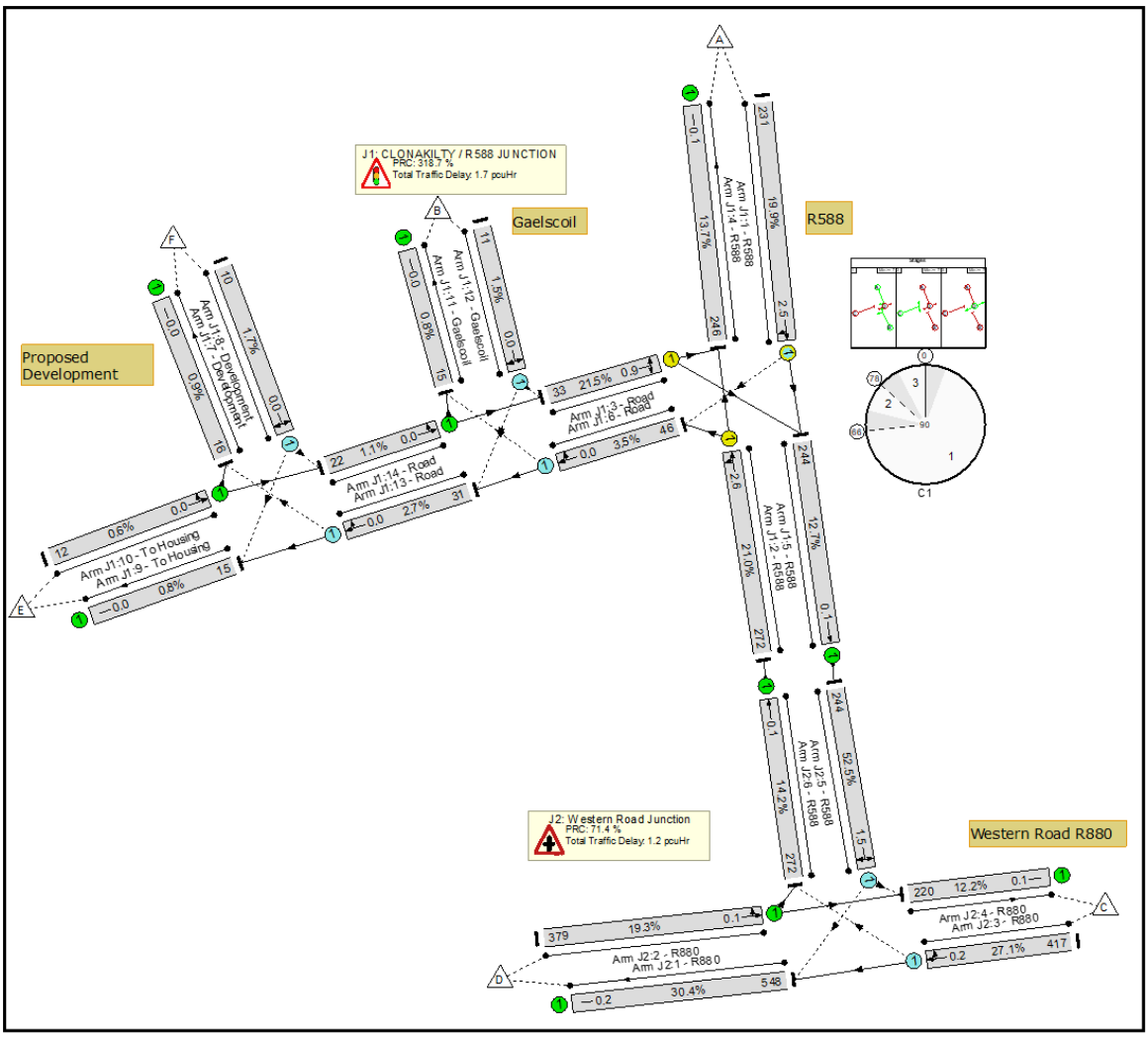


Fig 8.5: 'Scenario 7 PM 2030 Network Layout Diagram

For the PM 2030 scenario, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm 4 J2 Fernhill Road R588 as can be seen in Fig 8.5 above. The degree of saturation is measured at 52.5% with a mean maximum car queue length of 1.5 vehicles for the evening peak hours 17:15-18:15. The maximum degree of saturation for the new housing development is 1.7%.

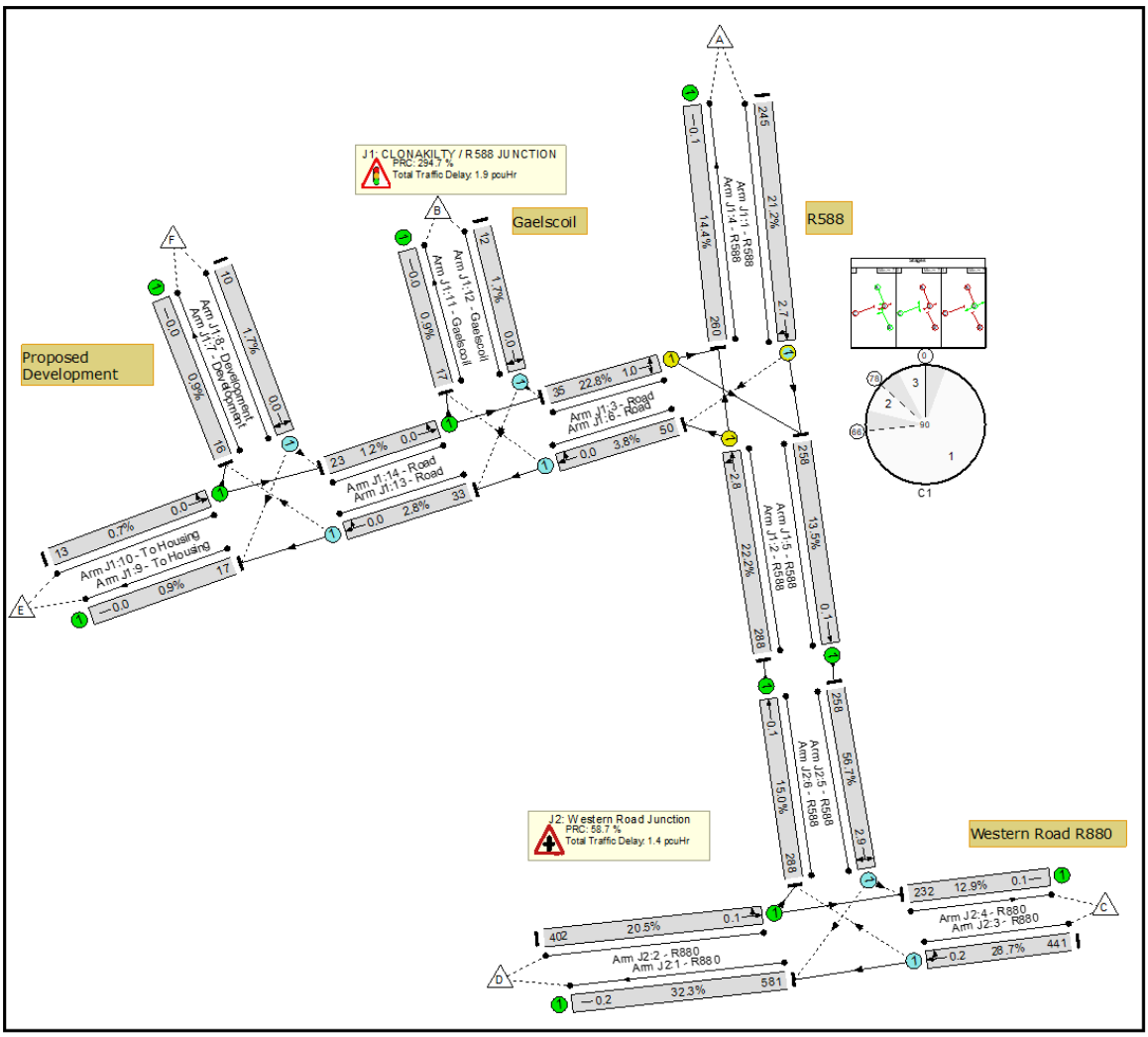


Fig 8.6: 'Scenario 8 PM 2040 Network Layout Diagram

For the PM 2040 scenario, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm 4 J2 Fernhill Road R588 as can be seen in Fig 8.6 above. The degree of saturation is measured at 56.7% with a mean maximum car queue length of 2.9 vehicles for the evening peak hours 17:15-18:15. The maximum degree of saturation for the new housing development is 1.7%.

The LinSig analysis shows how the saturation of the junctions increases over time, however, all junctions are also shown to be operating well within for all future design years. The detailed LinSig output data sheets are contained in Appendix C of the report.

9.0 Internal layout & Parking

Parking is an integral element of overall land use and transportation policy. The purpose of parking standards is to ensure that a considered and appropriate level of parking is provided to serve the new residential development.

Cork County Council Development Plan 2022 gives guidance on car parking standards for new developments. Table 12.6 of the Plan sets the car space allocation for various types of development including residential developments. Table 9.1 below shows a schedule of car parking spaces as set out by the Cork County Development Plan.

Land Use Category	Cork County Council Development Plan 2022-2028 - Car Parking Standards	Total Spaces Per Unit	Total Units	Parking spaces required
RESIDENTIAL				
35 House	2 spaces per unit	2	35	70
Total			35	70

Table 9.1: Car parking allocation

It is intended that all parking for the residential development will be facilitated within the site curtilage of each housing unit. The total number of parking spaces provided will be 70 spaces for the proposed residential development. All car parking spaces are required to be a minimum of 2.4m x 4.8m in size.

10.0 Pedestrians / Cyclists / Access for People with Disabilities

Cork County Council Development Plan 2022 gives guidance on cycle parking standards for new developments. Table 12.8 of the Plan sets the cycle space allocation for various types of development including residential developments.

Cork County Council Development Plan 2022-2028 - Cycle Parking Standards	Total Spaces Per Unit	Total Units	Min Cycle spaces required
1 per housing unit	1	35	35
1 visitor space per 5 units	0.2	35	7
Total			42

Table 10.1: Bicycle parking Standards.

Dropped kerbs, dished footpaths, raised pedestrian crossings and tactile paving will be provided at appropriate locations such as at the crossing points within the development. A total of 42 bicycle spaces will be provided as part of the development. Cycle spaces can generally be accommodated with the curtilage of the housing units with the visitor parking provided in a convenient location within the development.

The proposed Development is connected to the Town centre by a series of existing footpath and pedestrian crossing facilities. The proposed Development is located in close proximity to existing schools, shopping facilities and local services all within walking distance.

11.0 References

Cork County Council Development Plan (2022-2028)

Transport Infrastructure Ireland (2014) Traffic and Transport Assessment Guidelines TII, Dublin

Institution of Highways & Transportation (1994) Guidelines for Traffic Impact Assessment IHT, London

Transport Infrastructure Ireland (revised 2015) Design Manual for Roads and Bridges TII, Dublin

TRICS – A Trip Generation Database for Development Control, JMP, London

Transport Infrastructure Ireland (November 2004) Draft Traffic and Transport Assessment Guidelines TII, Dublin

Transport Infrastructure Ireland Project Appraisal Guidelines TII, Dublin 2010

Department of Tourism Transport and Sport "Design Manual for Urban Roads and Streets" (DMURS - 2013) DTTaS, Dublin

National Transport Authority "National Cycle Manual" (NCM - 2011) NTA, Dublin

Mr Martin Hanley, BE CEng MIEI

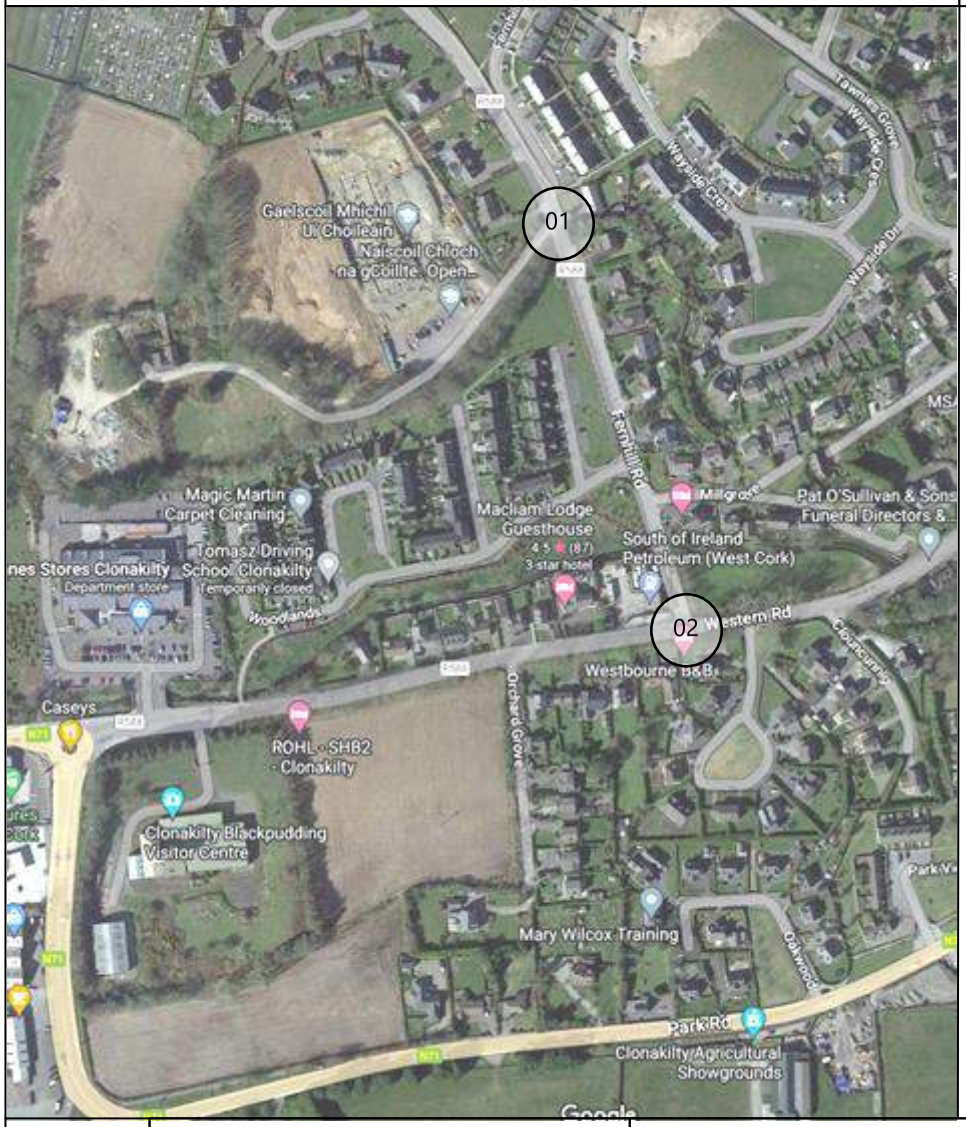
Signed: ……..

Senior Transportation Engineer.
Date: 25/07/2023

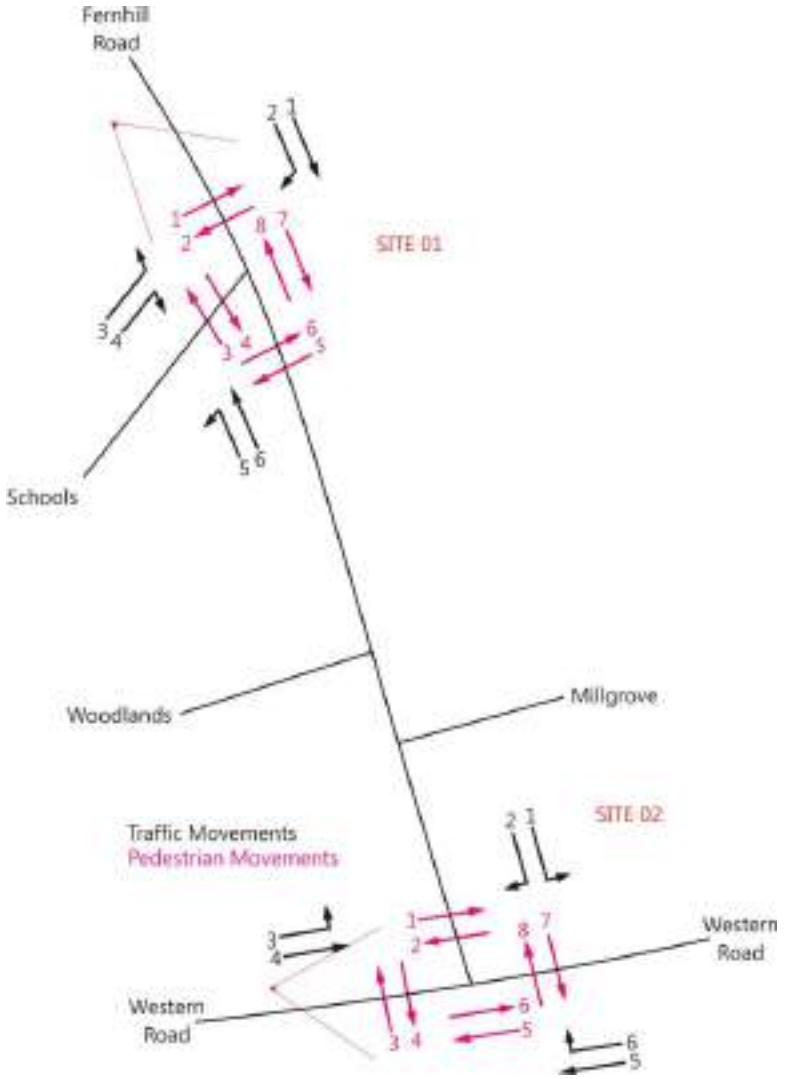
12.0 Appendices

13.0 Appendix A – Traffic Count Data

Site Locations



Movement Numbering



Job number: TRA/23/123	Job date: Week Commencing Tuesday 23rd May 2023	Drawing No: TRA/23/123-01	traffinomics.ie
Client: Martin Hanley Consulting Engineers		Author: SPW	

TRAFFINOMICS LIMITED

CLONIKILTY TRAFFIC COUNTS **MAY 2023**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/23/123**

SITE: 01 DATE: 23rd May 2023

LOCATION: Fernhill Road/Schools Access DAY: Tuesday

	MOVEMENT 1								MOVEMENT 2								MOVEMENT 3							
TIME	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**
07:30	0	0	7	6	1	0	14	15	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0
07:45	0	0	22	11	1	0	34	35	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0
08:00	0	0	16	4	0	0	20	20	0	0	1	0	0	0	1	1	0	0	1	0	0	0	1	1
08:15	0	0	23	3	2	0	28	30	0	0	3	0	0	0	3	3	1	0	1	1	0	1	4	4
H/TOT	0	0	68	24	4	0	96	100	0	0	6	1	0	0	7	7	1	0	2	1	0	1	5	5
08:30	0	1	23	5	0	0	29	28	3	0	16	1	0	1	21	20	0	0	13	1	0	0	14	14
08:45	0	0	22	4	2	0	28	30	2	0	26	0	0	0	28	26	0	0	31	2	0	0	33	33
09:00	0	0	44	5	1	0	50	51	0	0	9	0	0	0	9	9	0	0	10	0	0	0	10	10
09:15	0	0	25	3	2	1	31	34	0	0	3	2	0	0	5	5	0	0	2	1	0	0	3	3
H/TOT	0	1	114	17	5	1	138	143	5	0	54	3	0	1	63	60	0	0	56	4	0	0	60	60
P/TOT	0	1	182	41	9	1	234	243	5	0	60	4	0	1	70	67	1	0	58	5	0	1	65	65

	MOVEMENT 1								MOVEMENT 2								MOVEMENT 3							
TIME	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**
16:30	0	0	18	5	1	0	24	25	0	0	1	0	1	0	2	3	0	0	1	0	0	0	1	1
16:45	0	0	40	6	0	0	46	46	0	0	1	0	0	0	1	1	0	0	3	0	0	0	3	3
17:00	0	0	26	6	2	0	34	36	0	0	1	0	0	0	1	1	1	0	1	0	0	0	2	1
17:15	1	0	28	6	1	0	36	36	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0
H/TOT	1	0	112	23	4	0	140	143	0	0	5	0	1	0	6	7	1	0	5	0	0	0	6	5
17:30	0	0	37	6	2	0	45	47	0	0	1	0	0	0	1	1	0	0	1	0	0	0	1	1
17:45	0	0	46	3	1	0	50	51	0	0	2	1	0	1	4	5	0	0	0	0	0	0	0	0
18:00	3	0	54	4	0	0	61	59	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	2
18:15	0	0	24	4	0	0	28	28	0	0	1	1	0	0	2	2	0	0	1	0	0	0	1	1
H/TOT	3	0	161	17	3	0	184	185	0	0	4	2	0	1	7	8	0	0	3	1	0	0	4	4
P/TOT	4	0	273	40	7	0	324	328	0	0	9	2	1	1	13	15	1	0	8	1	0	0	10	9

TRAFFINOMICS LIMITED

CLONIKILTY TRAFFIC COUNTS **MAY 2023**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/23/123**

SITE: 01 DATE: 23rd May 2023

LOCATION: Fernhill Road/Schools Access DAY: Tuesday

	MOVEMENT 4								MOVEMENT 5								MOVEMENT 6							
TIME	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**
07:30	0	0	2	0	0	0	2	2	0	0	2	0	0	0	2	2	0	0	10	5	0	0	15	15
07:45	0	0	2	1	0	0	3	3	0	0	3	0	0	0	3	3	0	0	18	7	2	0	27	29
08:00	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	3	0	0	12	4	1	0	17	18
08:15	0	0	9	2	0	0	11	11	0	0	7	2	0	1	10	11	0	0	17	2	0	0	19	19
H/TOT	0	0	13	3	0	0	16	16	0	0	14	3	0	1	18	19	0	0	57	18	3	0	78	81
08:30	0	0	15	0	0	2	17	19	0	0	28	3	0	1	32	33	0	0	32	2	1	0	35	36
08:45	0	0	36	2	0	0	38	38	7	0	36	2	0	0	45	39	0	0	28	8	2	0	38	40
09:00	1	0	18	0	0	0	19	18	0	0	18	0	0	0	18	18	0	1	34	5	2	1	43	45
09:15	0	0	4	1	0	0	5	5	0	0	4	1	0	0	5	5	0	0	23	3	3	1	30	34
H/TOT	1	0	73	3	0	2	79	80	7	0	86	6	0	1	100	95	0	1	117	18	8	2	146	155
P/TOT	1	0	86	6	0	2	95	96	7	0	100	9	0	2	118	114	0	1	174	36	11	2	224	236

	MOVEMENT 4								MOVEMENT 5								MOVEMENT 6							
TIME	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**
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16:45	1	0	7	0	1	0	9	9	0	0	5	1	0	0	6	6	2	0	32	6	1	0	41	40
17:00	2	0	4	3	1	0	10	9	0	0	1	0	0	0	1	1	1	0	49	4	1	0	55	55
17:15	0	0	4	2	0	0	6	6	1	0	5	2	0	0	8	7	0	0	55	11	2	0	68	70
H/TOT	3	0	17	5	2	0	27	27	2	0	13	3	0	0	18	16	3	0	176	29	4	0	212	214
17:30	0	0	2	1	0	0	3	3	0	0	4	1	0	0	5	5	0	0	46	4	4	0	54	58
17:45	0	0	2	1	0	0	3	3	0	0	4	2	0	0	6	6	0	1	34	7	0	0	42	41
18:00	0	1	3	2	0	0	6	5	0	0	1	1	0	0	2	2	2	0	39	2	1	0	44	43
18:15	1	0	3	0	0	0	4	3	0	1	2	0	0	0	3	2	1	0	29	6	0	0	36	35
H/TOT	1	1	10	4	0	0	16	15	0	1	11	4	0	0	16	15	3	1	148	19	5	0	176	178
P/TOT	4	1	27	9	2	0	43	41	2	1	24	7	0	0	34	32	6	1	324	48	9	0	388	392

TRAFFINOMICS LIMITED

CLONIKILTY TRAFFIC COUNTS **MAY 2023**

PEDESTRIAN CROSSING COUNTS **TRA/23/123**

SITE: 01 DATE: 23rd May 2023

LOCATION: Fernhill Road/Schools Access DAY: Tuesday

PCU's Through Junction			PEDESTRIAN CROSSING COUNTS								
			P1	P2	P3	P4	P5	P6	P7	P8	TOTAL
16		07:30	0	0	0	1	0	0	1	1	3
37		07:45	0	0	0	0	0	0	0	0	0
22		08:00	1	0	1	1	1	1	0	2	7
37		08:15	2	2	2	3	1	0	2	0	12
112	112	**H/TOT**	3	2	3	5	2	1	3	3	22
62	158	08:30	5	18	16	5	1	1	0	0	46
89		08:45	8	23	16	6	0	0	0	0	53
70		09:00	3	1	2	2	0	0	0	0	8
42		09:15	2	0	1	1	0	0	0	0	4
263		**H/TOT**	18	42	35	14	1	1	0	0	111
376		**P/TOT**	21	44	38	19	3	2	3	3	133

PCU's Through Junction		PEDESTRIAN CROSSING COUNTS								
		P1	P2	P3	P4	P5	P6	P7	P8	TOTAL
29	16:30	0	3	2	1	2	2	0	2	12
50	16:45	1	0	0	2	0	5	2	1	11
38	17:00	1	1	3	0	0	1	1	0	7
38	17:15	0	2	2	0	0	0	0	0	4
155	**H/TOT**	2	6	7	3	2	8	3	3	34
49	17:30	1	2	1	3	0	0	0	1	8
56	17:45	1	1	1	1	0	0	1	2	7
61	18:00	0	0	1	4	0	0	2	0	7
31	18:15	0	1	2	2	0	0	3	0	8
197	**H/TOT**	2	4	5	10	0	0	6	3	30
352	**P/TOT**	4	10	12	13	2	8	9	6	64

TRAFFINOMICS LIMITED

CLONIKILTY TRAFFIC COUNTS **MAY 2023**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/23/123**

SITE: 02 DATE: 23rd May 2023

LOCATION: Fernhill Road/Western Road DAY: Tuesday

	MOVEMENT 1								MOVEMENT 2								MOVEMENT 3							
TIME	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**
07:30	0	0	4	0	0	0	4	4	0	0	5	7	1	0	13	14	0	0	9	3	0	0	12	12
07:45	0	0	8	1	0	0	9	9	0	0	18	9	1	0	28	29	0	0	17	5	2	0	24	26
08:00	0	0	5	0	0	0	5	5	1	0	10	6	0	0	17	16	0	0	14	4	1	0	19	20
08:15	0	0	13	1	0	0	14	14	0	0	21	2	2	0	25	27	0	0	21	2	0	1	24	25
H/TOT	0	0	30	2	0	0	32	32	1	0	54	24	4	0	83	86	0	0	61	14	3	1	79	83
08:30	0	1	13	1	0	0	15	14	0	0	35	10	0	2	47	49	0	0	48	6	1	1	56	58
08:45	0	0	25	0	1	0	26	27	0	0	41	3	0	0	44	44	0	0	69	10	2	0	81	83
09:00	1	0	21	1	0	0	23	22	0	0	45	5	1	0	51	52	0	1	44	5	1	1	52	53
09:15	0	0	7	4	0	0	11	11	0	0	27	1	1	1	30	32	0	0	20	3	2	1	26	29
H/TOT	1	1	66	6	1	0	75	75	0	0	148	19	2	3	172	177	0	1	181	24	6	3	215	223
P/TOT	1	1	96	8	1	0	107	107	1	0	202	43	6	3	255	263	0	1	242	38	9	4	294	306

	MOVEMENT 1								MOVEMENT 2								MOVEMENT 3							
TIME	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**
16:30	0	0	6	0	0	0	6	6	0	0	19	3	1	0	23	24	0	0	30	6	0	0	36	36
16:45	0	0	18	0	0	0	18	18	1	0	23	6	0	0	30	29	0	0	34	5	1	0	40	41
17:00	2	0	11	1	0	0	14	12	0	0	26	5	3	0	34	37	0	0	44	6	1	0	51	52
17:15	0	0	7	4	0	0	11	11	1	0	25	6	2	0	34	35	0	0	45	8	3	0	56	59
H/TOT	2	0	42	5	0	0	49	47	2	0	93	20	6	0	121	125	0	0	153	25	5	0	183	188
17:30	1	0	9	1	0	0	11	10	0	0	34	6	1	0	41	42	0	0	45	6	3	0	54	57
17:45	0	0	12	1	0	0	13	13	0	0	32	8	1	0	41	42	0	1	31	6	1	0	39	39
18:00	1	1	14	0	0	0	16	15	0	0	57	6	1	0	64	65	2	0	35	1	1	0	39	38
18:15	0	0	10	0	0	0	10	10	0	0	27	4	0	0	31	31	0	0	20	3	0	0	23	23
H/TOT	2	1	45	2	0	0	50	48	0	0	150	24	3	0	177	180	2	1	131	16	5	0	155	158
P/TOT	4	1	87	7	0	0	99	95	2	0	243	44	9	0	298	305	2	1	284	41	10	0	338	346

TRAFFINOMICS LIMITED

CLONIKILTY TRAFFIC COUNTS **MAY 2023**

MANUAL CLASSIFIED JUNCTION TURNING COUNTS **TRA/23/123**

SITE: 02 DATE: 23rd May 2023

LOCATION: Fernhill Road/Western Road DAY: Tuesday

	MOVEMENT 4								MOVEMENT 5								MOVEMENT 6							
TIME	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**
07:30	1	0	10	2	0	0	13	12	0	0	13	5	0	0	18	18	0	0	3	2	0	0	5	5
07:45	0	0	16	6	0	0	22	22	0	0	18	7	1	0	26	27	0	0	5	3	0	0	8	8
08:00	1	0	16	7	0	0	24	23	0	0	23	6	1	1	31	33	0	0	1	2	0	0	3	3
08:15	0	0	26	4	2	1	33	36	1	0	17	3	1	0	22	22	0	0	3	1	0	0	4	4
H/TOT	2	0	68	19	2	1	92	93	1	0	71	21	3	1	97	100	0	0	12	8	0	0	20	20
08:30	0	0	46	8	1	0	55	56	0	0	47	5	0	1	53	54	0	0	13	0	0	1	14	15
08:45	2	0	72	6	1	0	81	80	0	0	49	5	2	0	56	58	1	0	11	0	0	0	12	11
09:00	1	0	40	6	0	0	47	46	0	0	37	3	1	0	41	42	0	0	12	0	1	0	13	14
09:15	0	0	19	1	3	0	23	26	0	0	32	8	0	0	40	40	0	0	11	0	1	0	12	13
H/TOT	3	0	177	21	5	0	206	209	0	0	165	21	3	1	190	194	1	0	47	0	2	1	51	53
P/TOT	5	0	245	40	7	1	298	302	1	0	236	42	6	2	287	294	1	0	59	8	2	1	71	73

	MOVEMENT 4								MOVEMENT 5								MOVEMENT 6							
TIME	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**	**PCL**	**MCL**	**CAR**	**LGV**	**HGV**	**BUS**	**TOT**	**PCU**
16:30	0	2	38	5	0	0	45	44	0	0	44	7	0	0	51	51	0	0	13	2	0	0	15	15
16:45	1	0	30	5	0	0	36	35	1	0	65	9	0	0	75	74	1	0	11	1	0	0	13	12
17:00	0	0	43	7	0	0	50	50	1	0	47	8	1	0	57	57	1	0	12	0	0	0	13	12
17:15	1	1	27	7	0	0	36	35	0	0	65	8	0	0	73	73	2	0	22	0	0	0	24	22
H/TOT	2	3	138	24	0	0	167	164	2	0	221	32	1	0	256	255	4	0	58	3	0	0	65	62
17:30	1	0	44	2	0	0	47	46	0	0	59	10	1	0	70	71	0	0	12	3	0	0	15	15
17:45	1	0	31	4	3	0	39	41	1	0	67	12	0	0	80	79	0	0	14	4	0	0	18	18
18:00	0	0	20	1	0	0	21	21	0	0	67	7	0	1	75	76	0	0	14	2	0	0	16	16
18:15	1	0	39	6	0	0	46	45	2	0	49	1	0	0	52	50	2	0	11	1	0	0	14	12
H/TOT	3	0	134	13	3	0	153	154	3	0	242	30	1	1	277	277	2	0	51	10	0	0	63	61
P/TOT	5	3	272	37	3	0	320	317	5	0	463	62	2	1	533	532	6	0	109	13	0	0	128	123

TRAFFINOMICS LIMITED

CLONIKILTY TRAFFIC COUNTS **MAY 2023**

PEDESTRIAN CROSSING COUNTS **TRA/23/123**

SITE: 02 DATE: 23rd May 2023

LOCATION: Fernhill Road/Western Road DAY: Tuesday

PCU's Through Junction			PEDESTRIAN CROSSING COUNTS								
			P1	P2	P3	P4	P5	P6	P7	P8	TOTAL
30		07:30	2	4	0	0	0	0	1	0	7
64		07:45	1	1	0	0	0	0	0	0	2
41		08:00	1	2	0	0	0	0	0	0	3
66		08:15	6	4	0	0	0	0	1	0	11
201	201	**H/TOT**	10	11	0	0	0	0	2	0	23
121	293	08:30	9	0	0	0	0	0	2	0	11
154	383	08:45	4	1	0	0	0	0	1	1	7
128	469	09:00	4	4	0	0	0	1	0	0	9
72	475	09:15	0	2	0	0	0	0	0	0	2
475		**H/TOT**	17	7	0	0	0	1	3	1	29
676		**P/TOT**	27	18	0	0	0	1	5	1	52

PCU's Through Junction			PEDESTRIAN CROSSING COUNTS								
			P1	P2	P3	P4	P5	P6	P7	P8	TOTAL
66		16:30	7	15	0	0	0	0	0	0	22
88		16:45	2	4	0	0	0	0	0	0	6
101		17:00	3	5	0	0	0	0	0	0	8
105		17:15	5	4	1	0	2	0	0	1	13
361	361	**H/TOT**	17	28	1	0	2	0	0	1	49
109	404	17:30	3	6	1	0	0	0	0	1	11
94	410	17:45	4	2	0	0	0	0	2	2	10
118	427	18:00	6	3	0	0	0	0	0	0	9
64	386	18:15	4	10	0	0	0	0	0	2	16
386		**H/TOT**	17	21	1	0	0	0	2	5	46
746		**P/TOT**	34	49	2	0	2	0	2	6	95

14.0 Appendix B – Trics Data

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
VEHICLES
Calculation factor: 1 HHOLDS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. HHOLDS	Trip Rate	No. Days	Ave. HHOLDS	Trip Rate	No. Days	Ave. HHOLDS	Trip Rate
00:00 - 01:00	41	63	0.02	41	63	0.01	41	63	0.03
01:00 - 02:00	41	63	0.01	41	63	0.01	41	63	0.02
02:00 - 03:00	41	63	0.01	41	63	0.00	41	63	0.01
03:00 - 04:00	41	63	0.00	41	63	0.01	41	63	0.01
04:00 - 05:00	41	63	0.01	41	63	0.02	41	63	0.03
05:00 - 06:00	41	63	0.02	41	63	0.06	41	63	0.08
06:00 - 07:00	41	63	0.05	41	63	0.16	41	63	0.21
07:00 - 08:00	59	70	0.11	59	70	0.41	59	70	0.52
08:00 - 09:00	59	70	0.18	**59**	**70**	**0.46**	59	70	0.64
09:00 - 10:00	59	70	0.17	59	70	0.23	59	70	0.40
10:00 - 11:00	59	70	0.17	59	70	0.20	59	70	0.37
11:00 - 12:00	59	70	0.19	59	70	0.19	59	70	0.38
12:00 - 13:00	59	70	0.23	59	70	0.21	59	70	0.44
13:00 - 14:00	59	70	0.22	59	70	0.24	59	70	0.46
14:00 - 15:00	59	70	0.24	59	70	0.21	59	70	0.45
15:00 - 16:00	59	70	0.33	59	70	0.23	59	70	0.56
16:00 - 17:00	59	70	0.39	59	70	0.23	59	70	0.62
17:00 - 18:00	**59**	**70**	**0.45**	59	70	0.25	**59**	**70**	**0.70**
18:00 - 19:00	59	70	0.38	59	70	0.30	59	70	0.68
19:00 - 20:00	41	63	0.33	41	63	0.28	41	63	0.61
20:00 - 21:00	41	63	0.25	41	63	0.18	41	63	0.43
21:00 - 22:00	41	63	0.19	41	63	0.12	41	63	0.31
22:00 - 23:00	41	63	0.12	41	63	0.07	41	63	0.19
23:00 - 24:00	41	63	0.06	41	63	0.04	41	63	0.10
Daily Trip Rates:			4.12			4.14			8.25

Parameter summary

Trip rate parameter range selected:	5 - 425 (units:)
Survey date date range:	01/01/97 - 30/06/05
Number of weekdays (Monday-Friday):	59
Number of Saturdays:	0
Number of Sundays:	0
Optional parameters used in selection:	YES
Surveys manually removed from selection:	0

15.0 Appendix C – LinSig Traffic Analysis Output Data

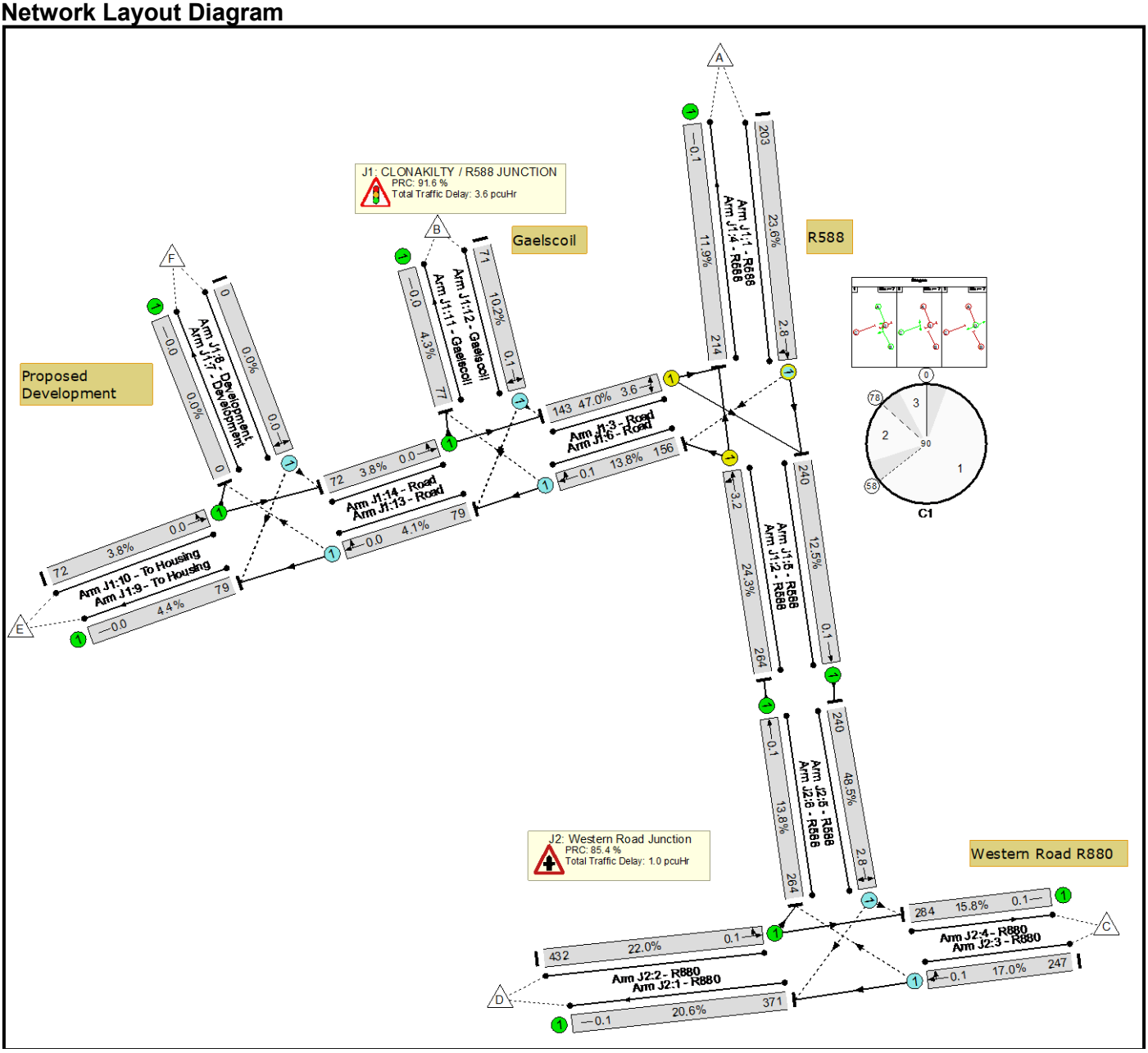
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	Clonakilty CCC.lsg3x
Author:	
Company:	
Address:	

Scenario 1: 'Scenario 1 AM 2023' (FG1: 'AM 2023', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Basic Results Summary

Item	*Lane Description*	*Lane Type*	*Full Phase*	*Arrow Phase*	*Num Greens*	*Total Green (s)*	*Arrow Green (s)*	*Demand Flow (pcu)*	*Sat Flow (pcu/Hr)*	*Capacity (pcu)*	*Deg Sat (%)*	*Turners In Gaps (pcu)*	*Turners When Unopposed (pcu)*	*Turners In Intergreen (pcu)*	*Total Delay (pcuHr)*	*Av. Delay Per PCU (s/pcu)*	*Mean Max Queue (pcu)*
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**48.5%**	**478**	**11**	**0**	**4.7**	**-**	**-**
J1: CLONAKILTY / R588 JUNCTION	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**47.0%**	**190**	**11**	**0**	**3.6**	**-**	**-**
1/1	R588 Ahead Right	O	A		1	53	-	203	1866	860	23.6%	42	11	0	0.7	12.6	2.8
2/1	R588 Ahead Left	U	B		1	53	-	264	1809	1085	24.3%	-	-	-	0.8	10.6	3.2
3/1	Road Left Right	U	C		1	15	-	143	1712	304	47.0%	-	-	-	1.8	44.3	3.6
4/1	R588	U	-		-	-	-	214	1800	1800	11.9%	-	-	-	0.1	1.1	0.1
5/1	R588 Ahead	U	-		-	-	-	240	1915	1915	12.5%	-	-	-	0.1	1.1	0.1
6/1	Road Right Ahead	O	-		-	-	-	156	1783	1133	13.8%	77	0	0	0.1	1.8	0.1
7/1	Development	U	-		-	-	-	0	1800	1800	0.0%	-	-	-	0.0	0.0	0.0
8/1	Development Right Left	O	-		-	-	-	0	1915	662	0.0%	0	0	0	0.0	0.0	0.0
9/1	To Housing	U	-		-	-	-	79	1800	1800	4.4%	-	-	-	0.0	1.0	0.0
10/1	To Housing Left Ahead	U	-		-	-	-	72	1915	1915	3.8%	-	-	-	0.0	1.0	0.0
11/1	Gaelscoil	U	-		-	-	-	77	1800	1800	4.3%	-	-	-	0.0	1.0	0.0
12/1	Gaelscoil Left Right	O	-		-	-	-	71	1532	699	10.2%	71	0	0	0.1	2.9	0.1
13/1	Road Right Ahead	O	-		-	-	-	79	1915	1915	4.1%	0	0	0	0.0	1.0	0.0
14/1	Road Ahead Left	U	-		-	-	-	72	1915	1915	3.8%	-	-	-	0.0	1.0	0.0
J2: Western Road Junction	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**48.5%**	**288**	**0**	**0**	**1.0**	**-**	**-**
1/1	R880	U	-		-	-	-	371	1800	1800	20.6%	-	-	-	0.1	1.3	0.1
2/1	R880 Ahead Left	U	-		-	-	-	432	1965	1965	22.0%	-	-	-	0.1	1.2	0.1

Basic Results Summary

3/1	R880 Ahead Right	O	-		-	-	-	247	1965	1453	17.0%	48	0	0	0.1	1.5	0.1
4/1	R880	U	-		-	-	-	284	1800	1800	15.8%	-	-	-	0.1	1.2	0.1
5/1	R588 Right Left	O	-		-	-	-	240	1719	494	48.5%	240	0	0	0.5	7.3	2.8
6/1	R588 Ahead	U	-		-	-	-	264	1915	1915	13.8%	-	-	-	0.1	1.1	0.1

C1

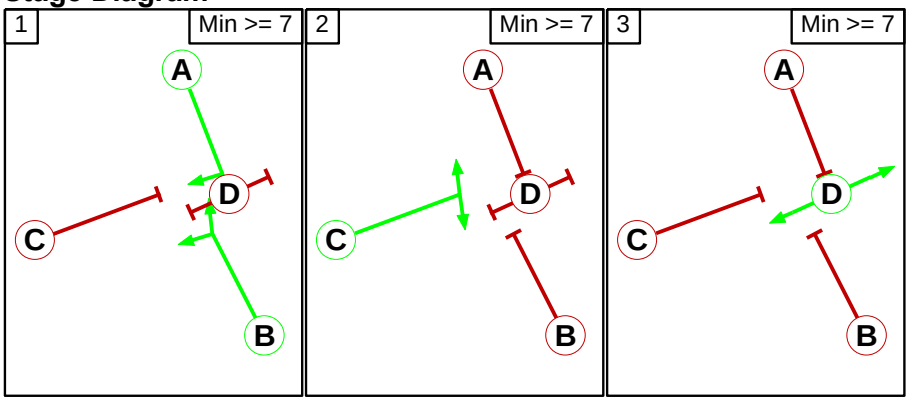
PRC for Signalled Lanes (%): 91.6
PRC Over All Lanes (%): 85.4

Total Delay for Signalled Lanes (pcuHr): 3.25
Total Delay Over All Lanes(pcuHr): 4.66

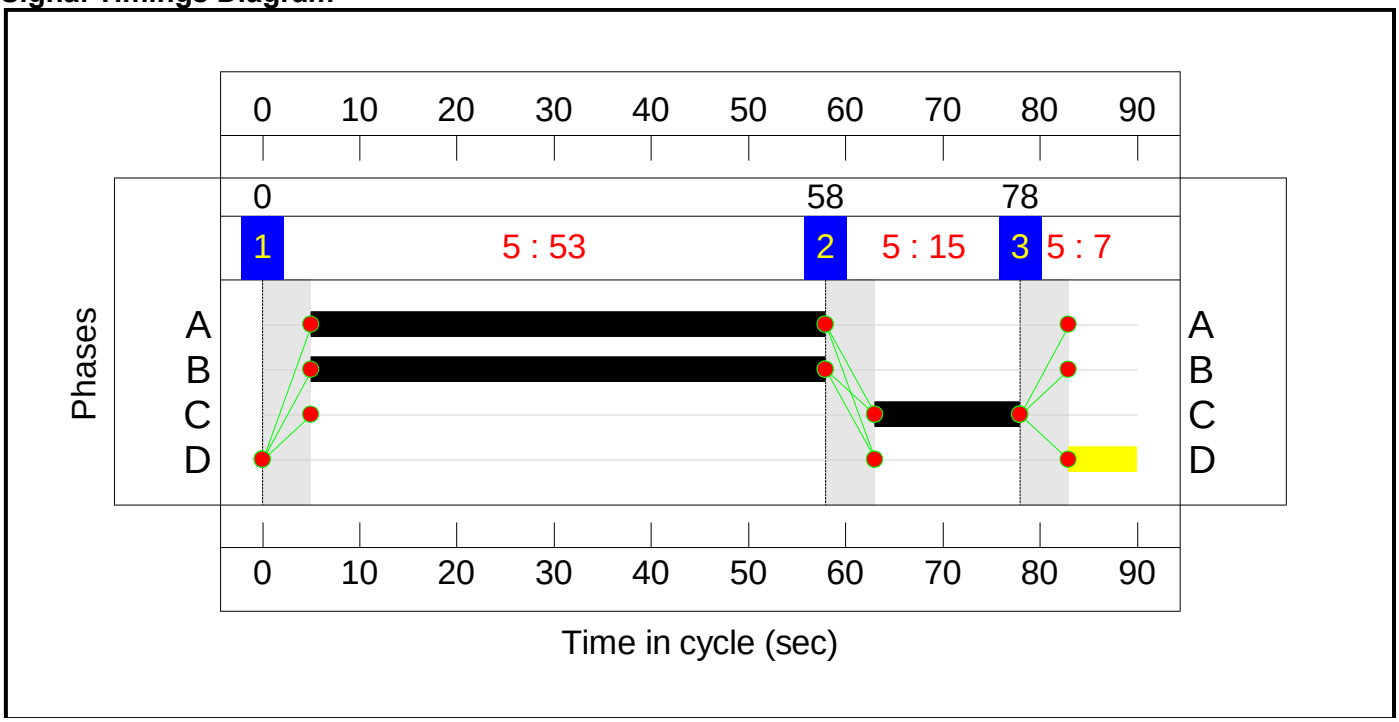
Cycle Time (s): 90

Basic Results Summary

Stage Diagram



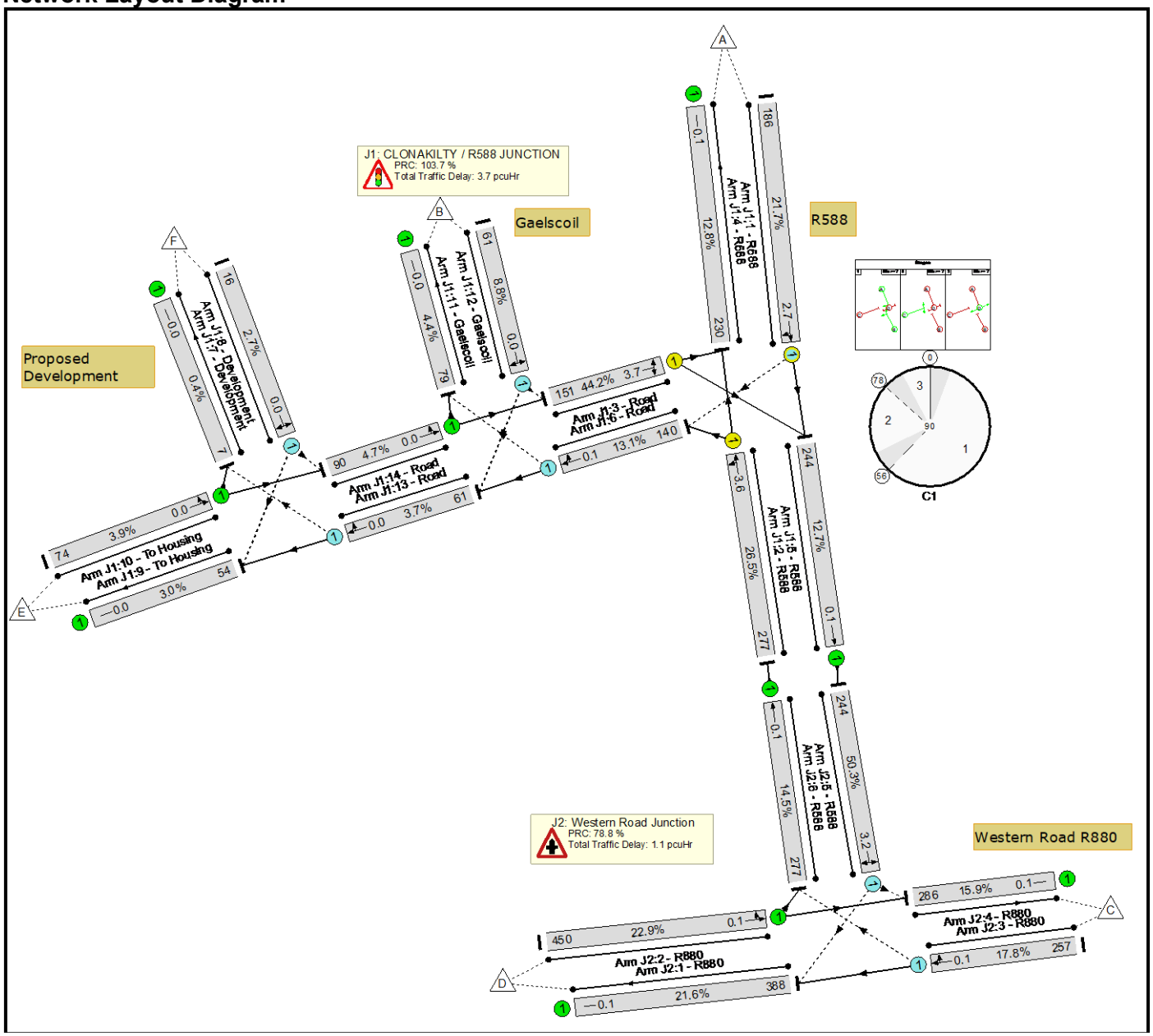
Signal Timings Diagram



Basic Results Summary

Scenario 2: 'Scenario 2 AM 2025' (FG2: 'AM 2025', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Basic Results Summary

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**50.3%**	**481**	**7**	**0**	**4.8**	**-**	**-**
J1: CLONAKILTY / R588 JUNCTION	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**44.2%**	**186**	**7**	**0**	**3.7**	**-**	**-**
1/1	R588 Ahead Right	O	A		1	51	-	186	1885	856	21.7%	23	7	0	0.7	13.7	2.7
2/1	R588 Ahead Left	U	B		1	51	-	277	1807	1044	26.5%	-	-	-	0.9	11.8	3.6
3/1	Road Left Right	U	C		1	17	-	151	1709	342	44.2%	-	-	-	1.7	41.0	3.7
4/1	R588	U	-		-	-	-	230	1800	1800	12.8%	-	-	-	0.1	1.1	0.1
5/1	R588 Ahead	U	-		-	-	-	244	1915	1915	12.7%	-	-	-	0.1	1.1	0.1
6/1	Road Right Ahead	O	-		-	-	-	140	1766	1068	13.1%	79	0	0	0.1	1.9	0.1
7/1	Development	U	-		-	-	-	7	1800	1800	0.4%	-	-	-	0.0	1.0	0.0
8/1	Development Right Left	O	-		-	-	-	16	1665	586	2.7%	16	0	0	0.0	3.2	0.0
9/1	To Housing	U	-		-	-	-	54	1800	1800	3.0%	-	-	-	0.0	1.0	0.0
10/1	To Housing Left Ahead	U	-		-	-	-	74	1915	1915	3.9%	-	-	-	0.0	1.0	0.0
11/1	Gaelscoil	U	-		-	-	-	79	1800	1800	4.4%	-	-	-	0.0	1.0	0.0
12/1	Gaelscoil Left Right	O	-		-	-	-	61	1532	695	8.8%	61	0	0	0.0	2.8	0.0
13/1	Road Right Ahead	O	-		-	-	-	61	1883	1641	3.7%	7	0	0	0.0	1.1	0.0
14/1	Road Ahead Left	U	-		-	-	-	90	1915	1915	4.7%	-	-	-	0.0	1.0	0.0
J2: Western Road Junction	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**50.3%**	**295**	**0**	**0**	**1.1**	**-**	**-**
1/1	R880	U	-		-	-	-	388	1800	1800	21.6%	-	-	-	0.1	1.3	0.1
2/1	R880 Ahead Left	U	-		-	-	-	450	1965	1965	22.9%	-	-	-	0.1	1.2	0.1

Basic Results Summary

3/1	R880 Ahead Right	O	-		-	-	-	257	1965	1440	17.8%	51	0	0	0.1	1.5	0.1
4/1	R880	U	-		-	-	-	286	1800	1800	15.9%	-	-	-	0.1	1.2	0.1
5/1	R588 Right Left	O	-		-	-	-	244	1721	485	50.3%	244	0	0	0.5	7.8	3.2
6/1	R588 Ahead	U	-		-	-	-	277	1915	1915	14.5%	-	-	-	0.1	1.1	0.1

C1

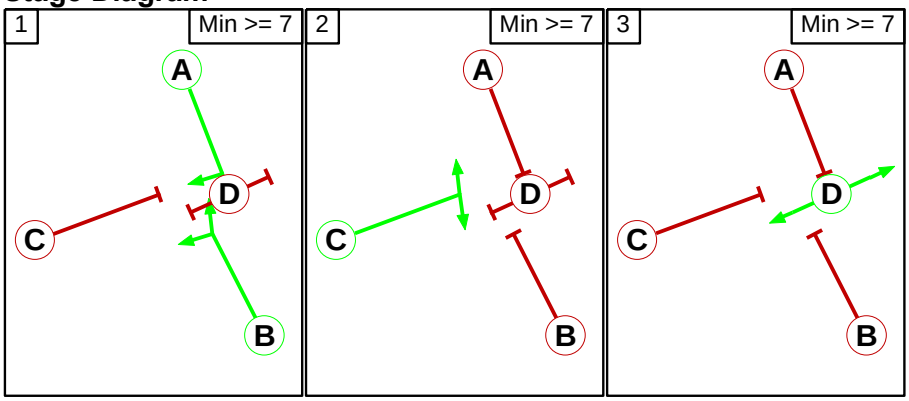
PRC for Signalled Lanes (%): 103.7
PRC Over All Lanes (%): 78.8

Total Delay for Signalled Lanes (pcuHr): 3.33
Total Delay Over All Lanes(pcuHr): 4.82

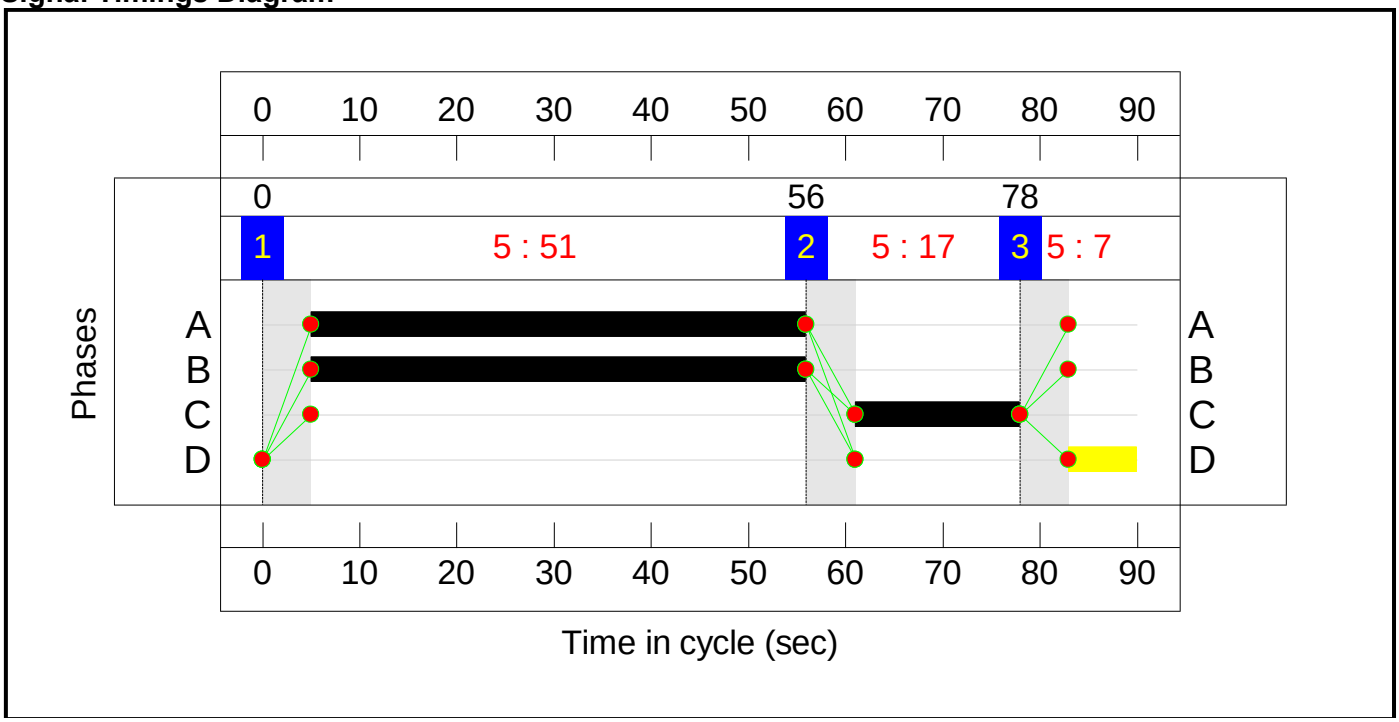
Cycle Time (s): 90

Basic Results Summary

Stage Diagram



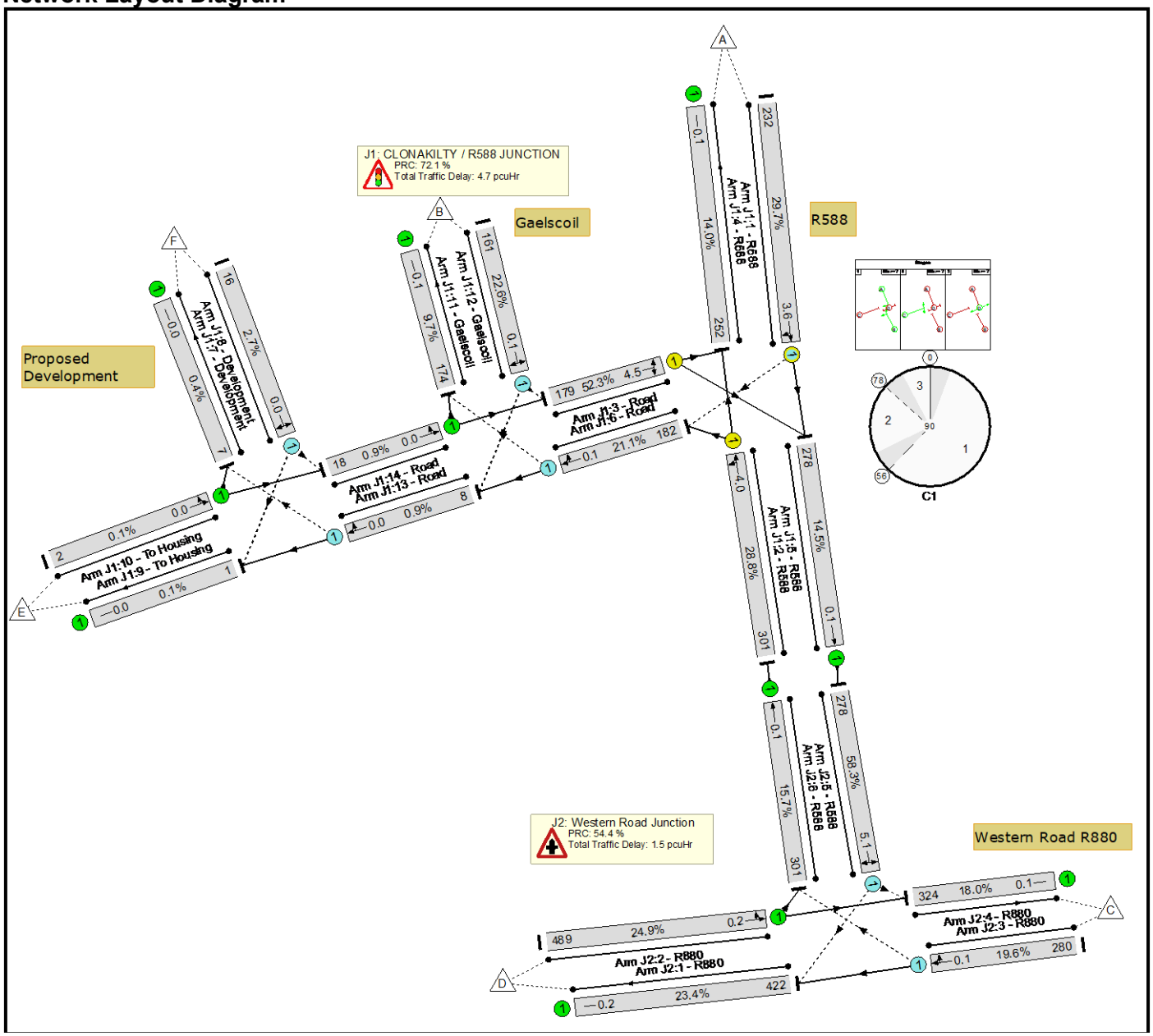
Signal Timings Diagram



Basic Results Summary

Scenario 3: ' Scenario 3 AM 2030' (FG3: 'AM 2030', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Basic Results Summary

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**58.3%**	**744**	**11**	**0**	**6.1**	**-**	**-**
J1: CLONAKILTY / R588 JUNCTION	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**52.3%**	**410**	**11**	**0**	**4.7**	**-**	**-**
1/1	R588 Ahead Right	O	A		1	51	-	232	1864	781	29.7%	52	11	0	1.0	15.3	3.6
2/1	R588 Ahead Left	U	B		1	51	-	301	1808	1045	28.8%	-	-	-	1.0	12.1	4.0
3/1	Road Left Right	U	C		1	17	-	179	1711	342	52.3%	-	-	-	2.1	43.1	4.5
4/1	R588	U	-		-	-	-	252	1800	1800	14.0%	-	-	-	0.1	1.2	0.1
5/1	R588 Ahead	U	-		-	-	-	278	1915	1915	14.5%	-	-	-	0.1	1.1	0.1
6/1	Road Right Ahead	O	-		-	-	-	182	1675	862	21.1%	174	0	0	0.1	2.6	0.1
7/1	Development	U	-		-	-	-	7	1800	1800	0.4%	-	-	-	0.0	1.0	0.0
8/1	Development Right Left	O	-		-	-	-	16	1665	599	2.7%	16	0	0	0.0	3.1	0.0
9/1	To Housing	U	-		-	-	-	1	1800	1800	0.1%	-	-	-	0.0	1.0	0.0
10/1	To Housing Left Ahead	U	-		-	-	-	2	1915	1915	0.1%	-	-	-	0.0	0.9	0.0
11/1	Gaelscoil	U	-		-	-	-	174	1800	1800	9.7%	-	-	-	0.1	1.1	0.1
12/1	Gaelscoil Left Right	O	-		-	-	-	161	1532	711	22.6%	161	0	0	0.1	3.3	0.1
13/1	Road Right Ahead	O	-		-	-	-	8	1693	906	0.9%	7	0	0	0.0	2.0	0.0
14/1	Road Ahead Left	U	-		-	-	-	18	1915	1915	0.9%	-	-	-	0.0	0.9	0.0
J2: Western Road Junction	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**58.3%**	**334**	**0**	**0**	**1.5**	**-**	**-**
1/1	R880	U	-		-	-	-	422	1800	1800	23.4%	-	-	-	0.2	1.3	0.2
2/1	R880 Ahead Left	U	-		-	-	-	489	1965	1965	24.9%	-	-	-	0.2	1.2	0.2

Basic Results Summary

3/1	R880 Ahead Right	O	-		-	-	-	280	1965	1425	19.6%	56	0	0	0.1	1.6	0.1
4/1	R880	U	-		-	-	-	324	1800	1800	18.0%	-	-	-	0.1	1.2	0.1
5/1	R588 Right Left	O	-		-	-	-	278	1718	477	58.3%	278	0	0	0.8	10.5	5.1
6/1	R588 Ahead	U	-		-	-	-	301	1915	1915	15.7%	-	-	-	0.1	1.1	0.1

C1

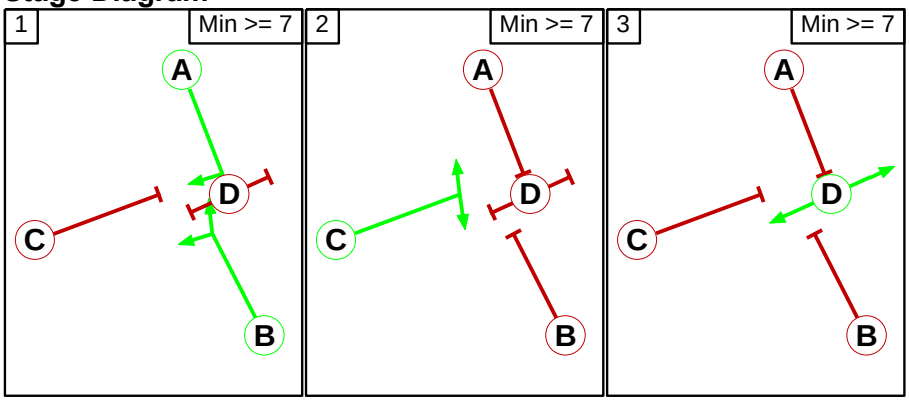
PRC for Signalled Lanes (%): 72.1
PRC Over All Lanes (%): 54.4

Total Delay for Signalled Lanes (pcuHr): 4.14
Total Delay Over All Lanes(pcuHr): 6.12

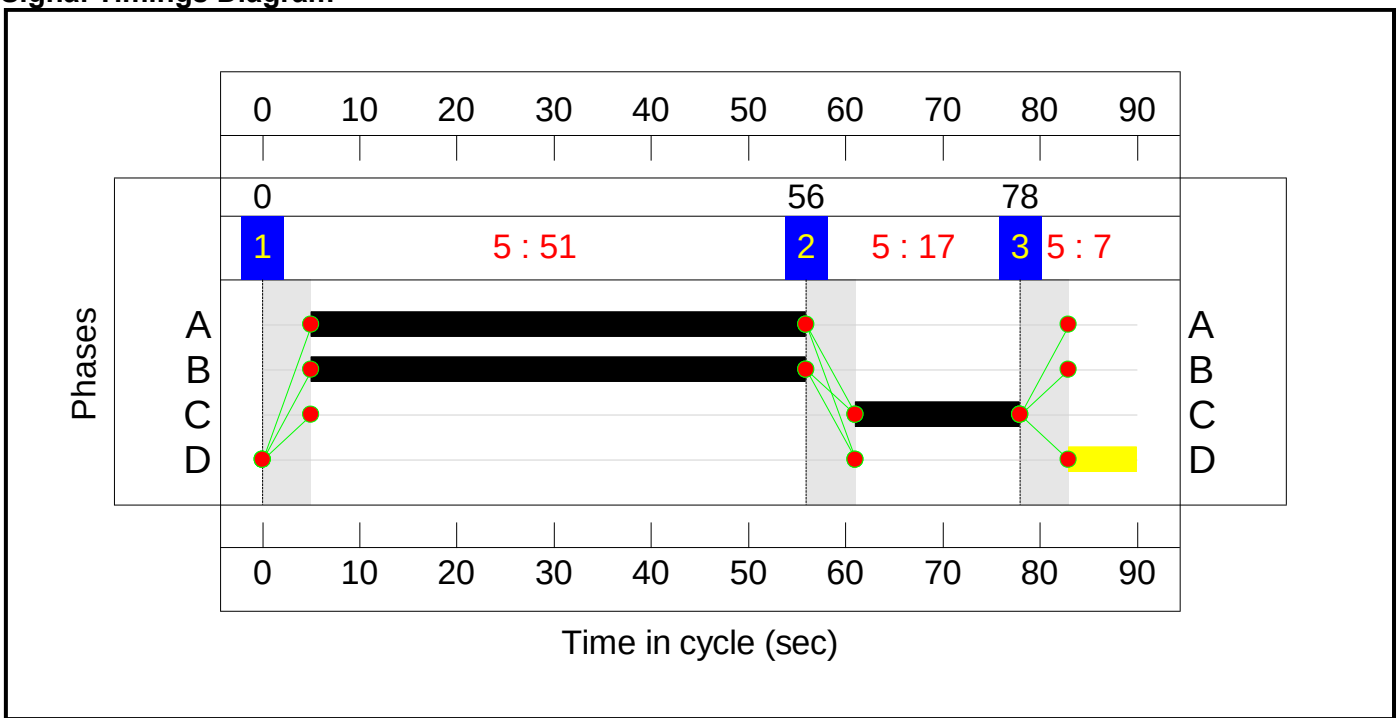
Cycle Time (s): 90

Basic Results Summary

Stage Diagram



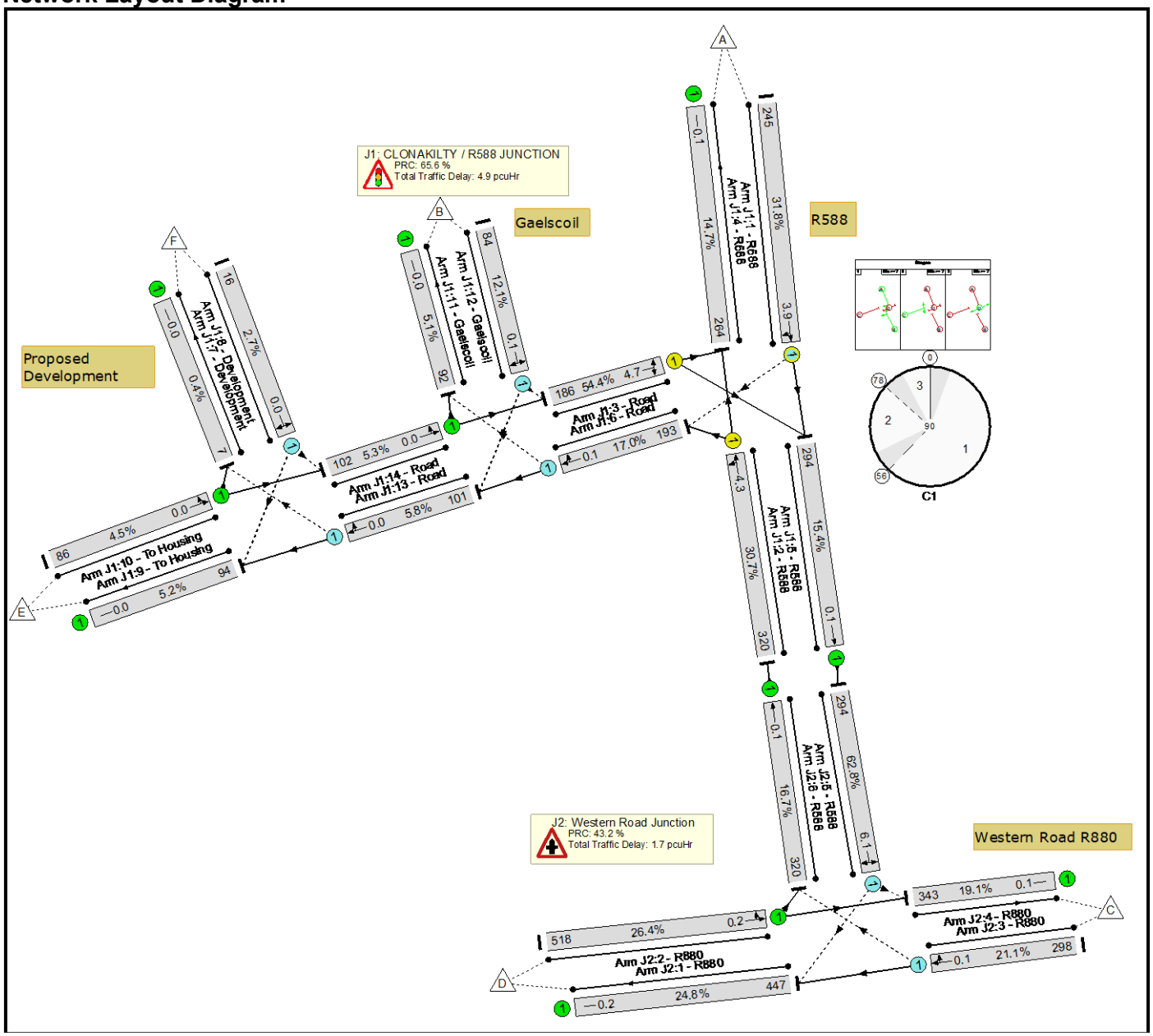
Signal Timings Diagram



Basic Results Summary

Scenario 4: 'Scenario 4 AM 2040' (FG4: 'AM 2040', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Basic Results Summary

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**62.8%**	**608**	**11**	**0**	**6.7**	**-**	**-**
J1: CLONAKILTY / R588 JUNCTION	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**54.4%**	**254**	**11**	**0**	**4.9**	**-**	**-**
1/1	R588 Ahead Right	O	A		1	51	-	245	1865	770	31.8%	55	11	0	1.1	15.9	3.9
2/1	R588 Ahead Left	U	B		1	51	-	320	1807	1044	30.7%	-	-	-	1.1	12.2	4.3
3/1	Road Left Right	U	C		1	17	-	186	1711	342	54.4%	-	-	-	2.3	43.8	4.7
4/1	R588	U	-		-	-	-	264	1800	1800	14.7%	-	-	-	0.1	1.2	0.1
5/1	R588 Ahead	U	-		-	-	-	294	1915	1915	15.4%	-	-	-	0.1	1.1	0.1
6/1	Road Right Ahead	O	-		-	-	-	193	1787	1139	17.0%	92	0	0	0.1	1.9	0.1
7/1	Development	U	-		-	-	-	7	1800	1800	0.4%	-	-	-	0.0	1.0	0.0
8/1	Development Right Left	O	-		-	-	-	16	1665	583	2.7%	16	0	0	0.0	3.2	0.0
9/1	To Housing	U	-		-	-	-	94	1800	1800	5.2%	-	-	-	0.0	1.1	0.0
10/1	To Housing Left Ahead	U	-		-	-	-	86	1915	1915	4.5%	-	-	-	0.0	1.0	0.0
11/1	Gaelscoil	U	-		-	-	-	92	1800	1800	5.1%	-	-	-	0.0	1.1	0.0
12/1	Gaelscoil Left Right	O	-		-	-	-	84	1532	693	12.1%	84	0	0	0.1	3.0	0.1
13/1	Road Right Ahead	O	-		-	-	-	101	1895	1737	5.8%	7	0	0	0.0	1.1	0.0
14/1	Road Ahead Left	U	-		-	-	-	102	1915	1915	5.3%	-	-	-	0.0	1.0	0.0
J2: Western Road Junction	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**62.8%**	**354**	**0**	**0**	**1.7**	**-**	**-**
1/1	R880	U	-		-	-	-	447	1800	1800	24.8%	-	-	-	0.2	1.3	0.2
2/1	R880 Ahead Left	U	-		-	-	-	518	1965	1965	26.4%	-	-	-	0.2	1.2	0.2

Basic Results Summary

3/1	R880 Ahead Right	O	-		-	-	-	298	1965	1413	21.1%	60	0	0	0.1	1.6	0.1
4/1	R880	U	-		-	-	-	343	1800	1800	19.1%	-	-	-	0.1	1.2	0.1
5/1	R588 Right Left	O	-		-	-	-	294	1718	468	62.8%	294	0	0	1.0	12.7	6.1
6/1	R588 Ahead	U	-		-	-	-	320	1915	1915	16.7%	-	-	-	0.1	1.1	0.1

C1

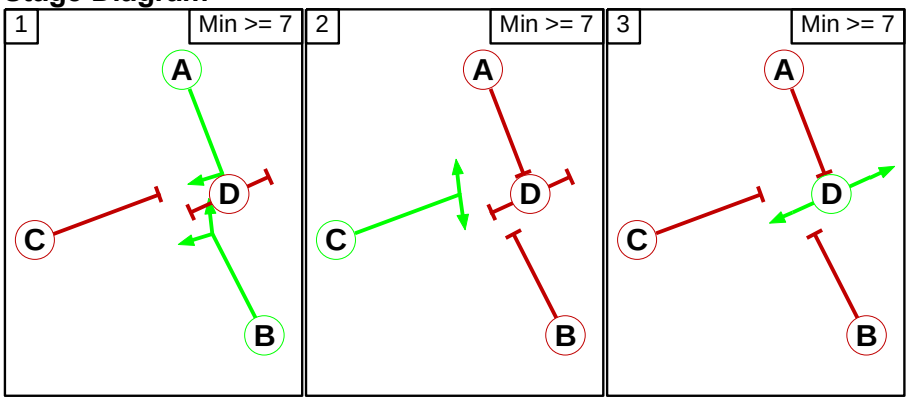
PRC for Signalled Lanes (%): 65.6
PRC Over All Lanes (%): 43.2

Total Delay for Signalled Lanes (pcuHr): 4.43
Total Delay Over All Lanes(pcuHr): 6.66

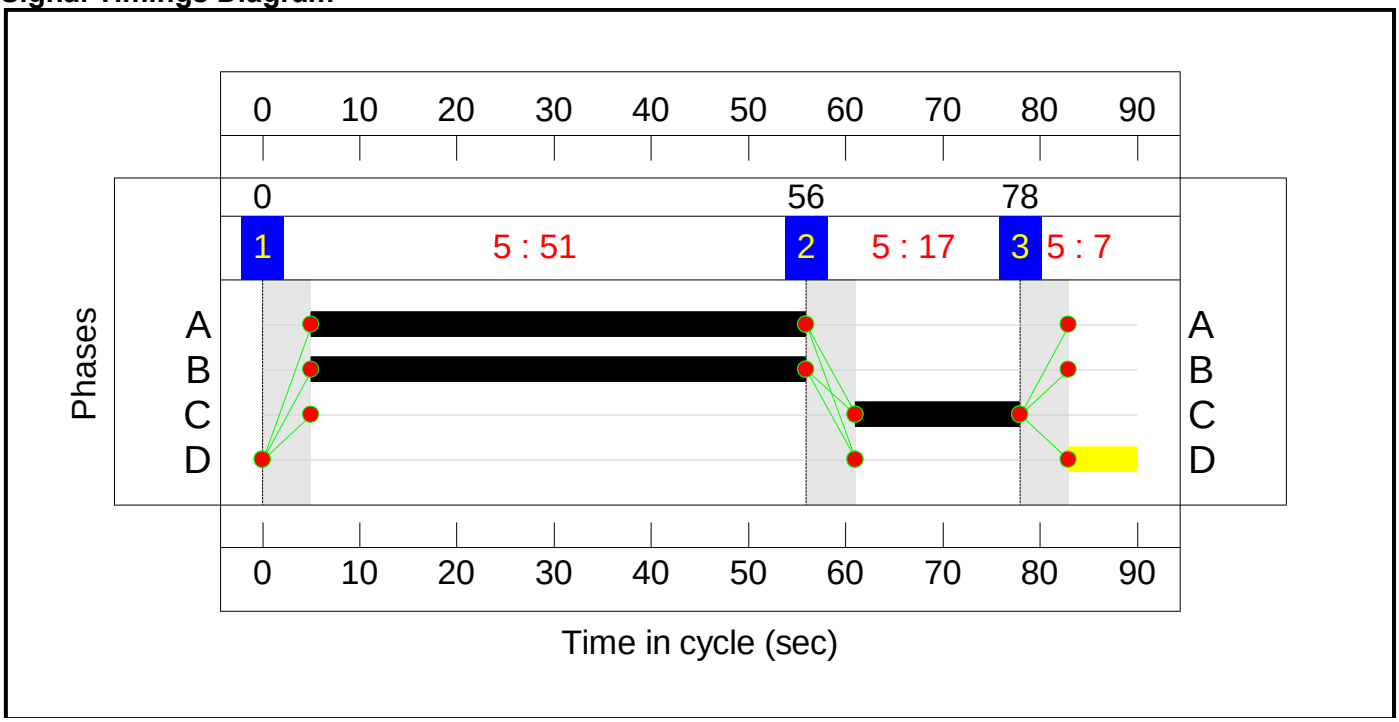
Cycle Time (s): 90

Basic Results Summary

Stage Diagram



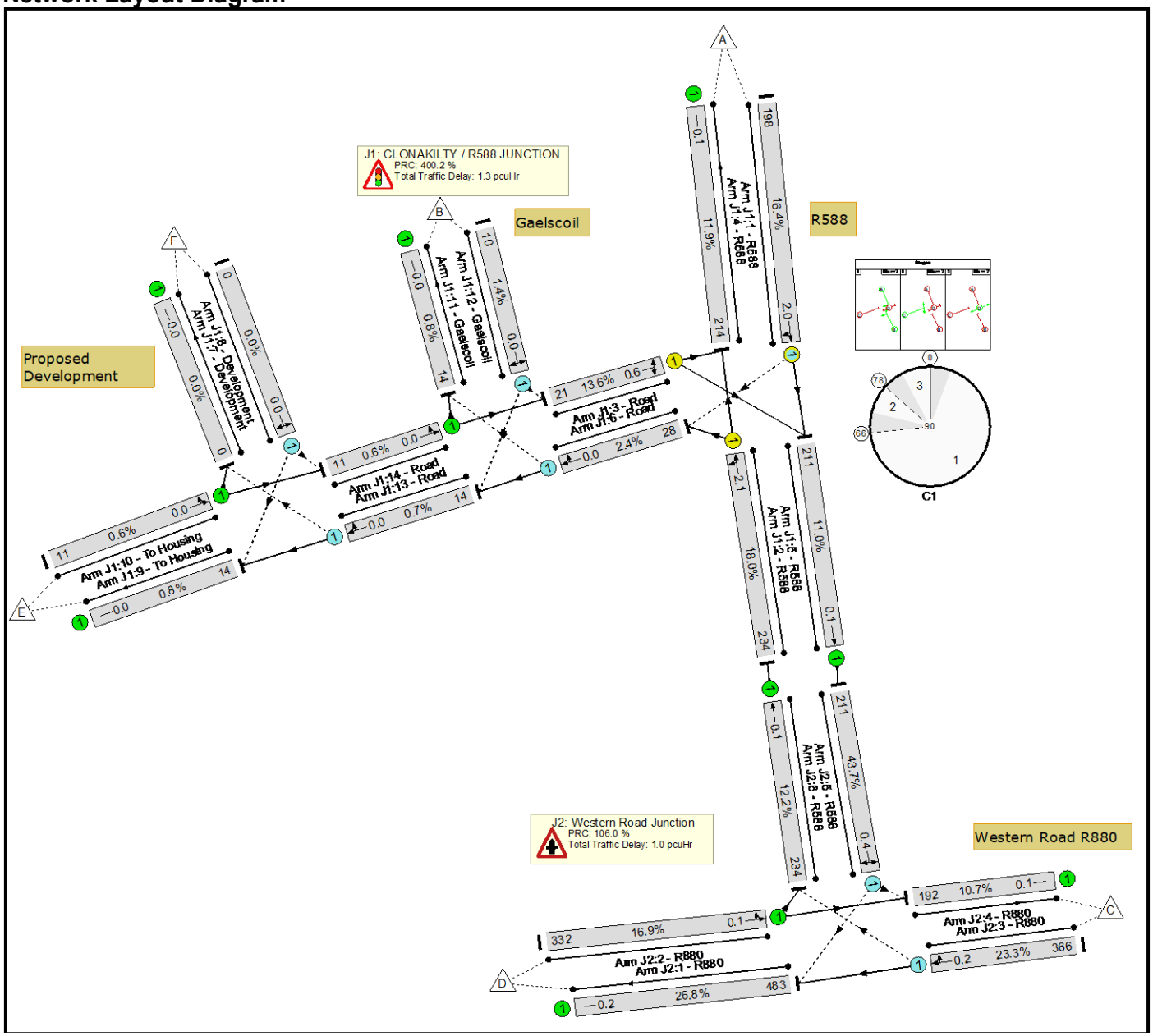
Signal Timings Diagram



Basic Results Summary

Scenario 5: 'Scenario 5 PM 2023' (FG5: 'PM 2023', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Basic Results Summary

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**43.7%**	**295**	**1**	**0**	**2.3**	**-**	**-**
J1: CLONAKILTY / R588 JUNCTION	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**18.0%**	**29**	**1**	**0**	**1.3**	**-**	**-**
1/1	R588 Ahead Right	O	A		1	61	-	198	1909	1209	16.4%	5	1	0	0.4	7.3	2.0
2/1	R588 Ahead Left	U	B		1	61	-	234	1888	1301	18.0%	-	-	-	0.4	6.7	2.1
3/1	Road Left Right	U	C		1	7	-	21	1733	154	13.6%	-	-	-	0.3	51.3	0.6
4/1	R588	U	-		-	-	-	214	1800	1800	11.9%	-	-	-	0.1	1.1	0.1
5/1	R588 Ahead	U	-		-	-	-	211	1915	1915	11.0%	-	-	-	0.1	1.1	0.1
6/1	Road Right Ahead	O	-		-	-	-	28	1781	1147	2.4%	14	0	0	0.0	1.6	0.0
7/1	Development	U	-		-	-	-	0	1800	1800	0.0%	-	-	-	0.0	0.0	0.0
8/1	Development Right Left	O	-		-	-	-	0	1915	597	0.0%	0	0	0	0.0	0.0	0.0
9/1	To Housing	U	-		-	-	-	14	1800	1800	0.8%	-	-	-	0.0	1.0	0.0
10/1	To Housing Left Ahead	U	-		-	-	-	11	1915	1915	0.6%	-	-	-	0.0	0.9	0.0
11/1	Gaelscoil	U	-		-	-	-	14	1800	1800	0.8%	-	-	-	0.0	1.0	0.0
12/1	Gaelscoil Left Right	O	-		-	-	-	10	1532	713	1.4%	10	0	0	0.0	2.6	0.0
13/1	Road Right Ahead	O	-		-	-	-	14	1915	1915	0.7%	0	0	0	0.0	0.9	0.0
14/1	Road Ahead Left	U	-		-	-	-	11	1915	1915	0.6%	-	-	-	0.0	0.9	0.0
J2: Western Road Junction	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**43.7%**	**266**	**0**	**0**	**1.0**	**-**	**-**
1/1	R880	U	-		-	-	-	483	1800	1800	26.8%	-	-	-	0.2	1.4	0.2
2/1	R880 Ahead Left	U	-		-	-	-	332	1965	1965	16.9%	-	-	-	0.1	1.1	0.1

Basic Results Summary

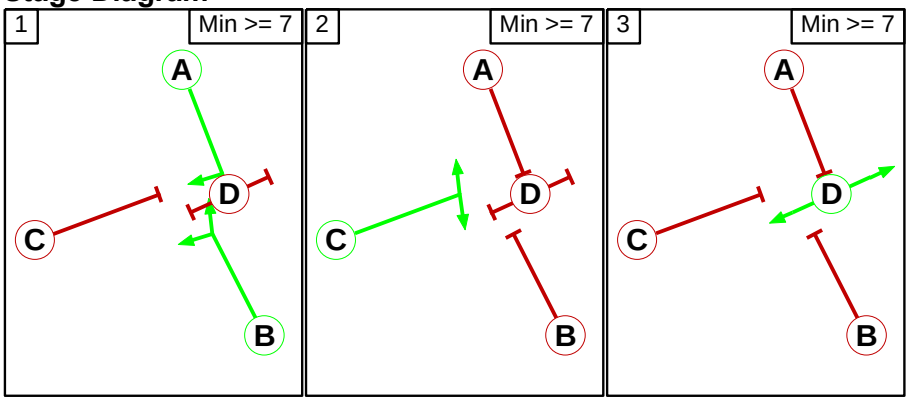
3/1	R880 Ahead Right	O	-		-	-	-	366	1965	1569	23.3%	55	0	0	0.2	1.5	0.2
4/1	R880	U	-		-	-	-	192	1800	1800	10.7%	-	-	-	0.1	1.1	0.1
5/1	R588 Right Left	O	-		-	-	-	211	1726	483	43.7%	211	0	0	0.4	6.6	0.4
6/1	R588 Ahead	U	-		-	-	-	234	1915	1915	12.2%	-	-	-	0.1	1.1	0.1

C1

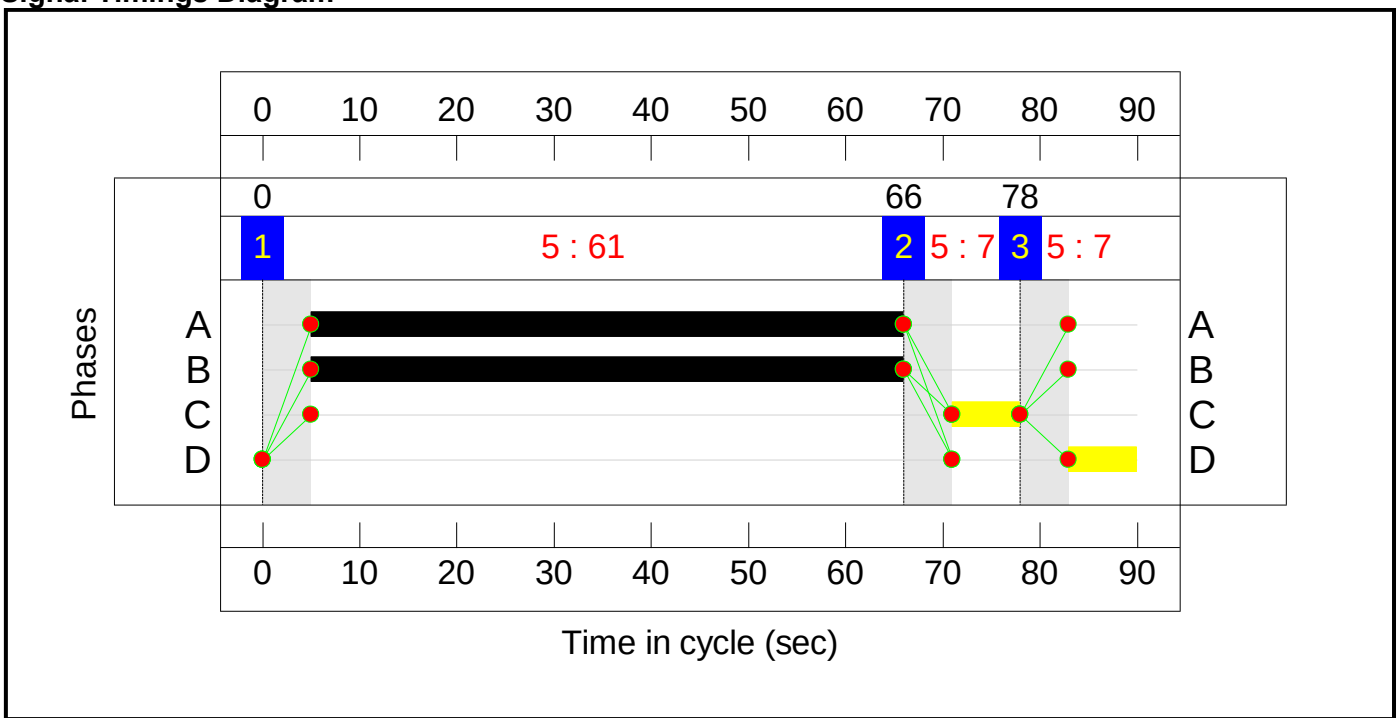
PRC for Signalled Lanes (%): 400.2
PRC Over All Lanes (%): 106.0
Total Delay for Signalled Lanes (pcuHr): 1.13
Total Delay Over All Lanes(pcuHr): 2.25
Cycle Time (s): 90

Basic Results Summary

Stage Diagram



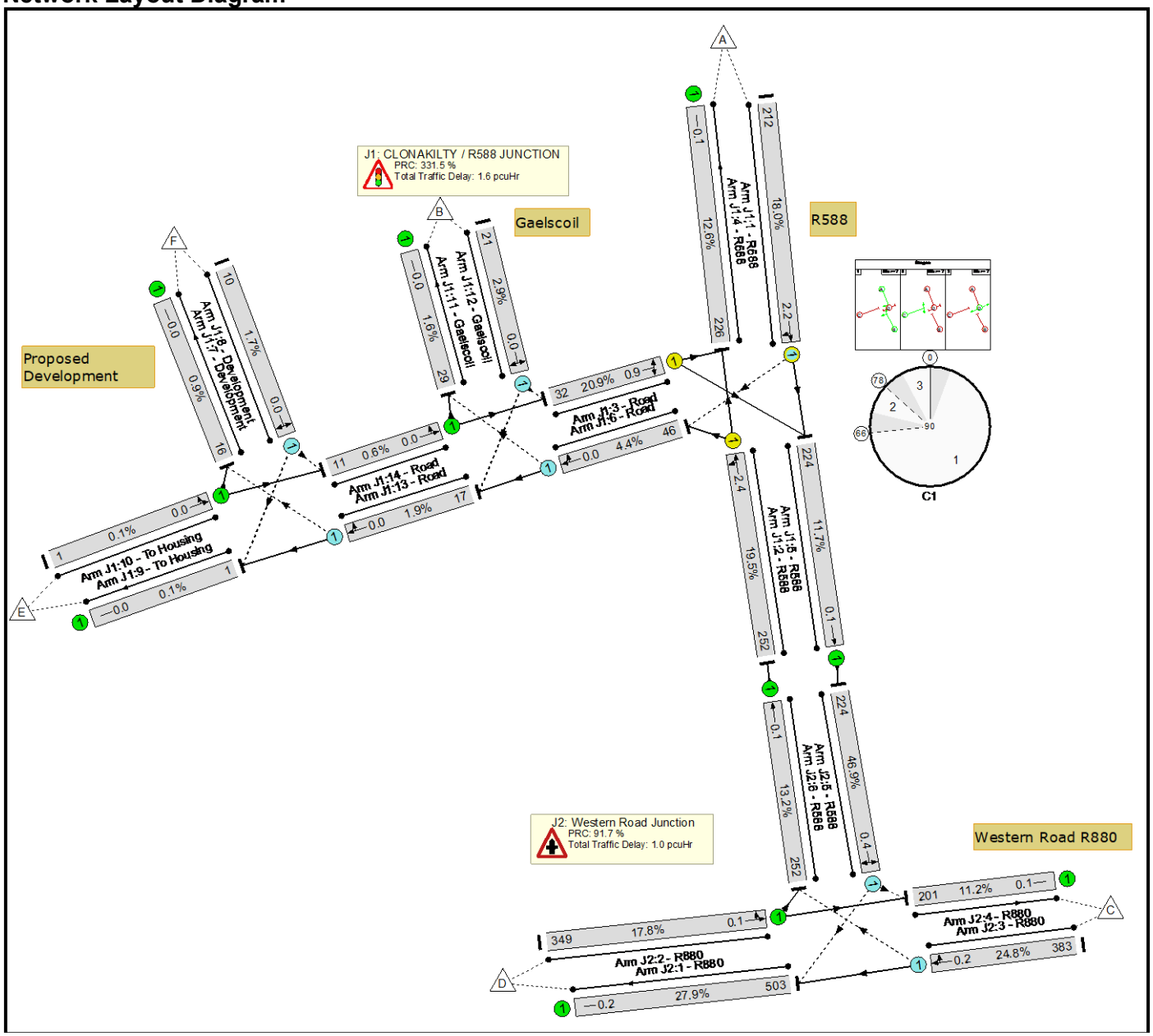
Signal Timings Diagram



Basic Results Summary

Scenario 6: 'Scenario 6 PM 2025' (FG6: 'PM 2025', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Basic Results Summary

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**46.9%**	**372**	**3**	**0**	**2.6**	**-**	**-**
J1: CLONAKILTY / R588 JUNCTION	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**20.9%**	**87**	**3**	**0**	**1.6**	**-**	**-**
1/1	R588 Ahead Right	O	A		1	61	-	212	1902	1176	18.0%	11	3	0	0.4	7.5	2.2
2/1	R588 Ahead Left	U	B		1	61	-	252	1879	1294	19.5%	-	-	-	0.5	6.8	2.4
3/1	Road Left Right	U	C		1	7	-	32	1726	153	20.9%	-	-	-	0.5	52.9	0.9
4/1	R588	U	-		-	-	-	226	1800	1800	12.6%	-	-	-	0.1	1.1	0.1
5/1	R588 Ahead	U	-		-	-	-	224	1915	1915	11.7%	-	-	-	0.1	1.1	0.1
6/1	Road Right Ahead	O	-		-	-	-	46	1750	1046	4.4%	29	0	0	0.0	1.8	0.0
7/1	Development	U	-		-	-	-	16	1800	1800	0.9%	-	-	-	0.0	1.0	0.0
8/1	Development Right Left	O	-		-	-	-	10	1665	600	1.7%	10	0	0	0.0	3.1	0.0
9/1	To Housing	U	-		-	-	-	1	1800	1800	0.1%	-	-	-	0.0	1.0	0.0
10/1	To Housing Left Ahead	U	-		-	-	-	1	1915	1915	0.1%	-	-	-	0.0	0.9	0.0
11/1	Gaelscoil	U	-		-	-	-	29	1800	1800	1.6%	-	-	-	0.0	1.0	0.0
12/1	Gaelscoil Left Right	O	-		-	-	-	21	1532	713	2.9%	21	0	0	0.0	2.6	0.0
13/1	Road Right Ahead	O	-		-	-	-	17	1678	875	1.9%	16	0	0	0.0	2.1	0.0
14/1	Road Ahead Left	U	-		-	-	-	11	1915	1915	0.6%	-	-	-	0.0	0.9	0.0
J2: Western Road Junction	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**46.9%**	**285**	**0**	**0**	**1.0**	**-**	**-**
1/1	R880	U	-		-	-	-	503	1800	1800	27.9%	-	-	-	0.2	1.4	0.2
2/1	R880 Ahead Left	U	-		-	-	-	349	1965	1965	17.8%	-	-	-	0.1	1.1	0.1

Basic Results Summary

3/1	R880 Ahead Right	O	-		-	-	-	383	1965	1546	24.8%	61	0	0	0.2	1.5	0.2
4/1	R880	U	-		-	-	-	201	1800	1800	11.2%	-	-	-	0.1	1.1	0.1
5/1	R588 Right Left	O	-		-	-	-	224	1726	477	46.9%	224	0	0	0.4	7.1	0.4
6/1	R588 Ahead	U	-		-	-	-	252	1915	1915	13.2%	-	-	-	0.1	1.1	0.1

C1

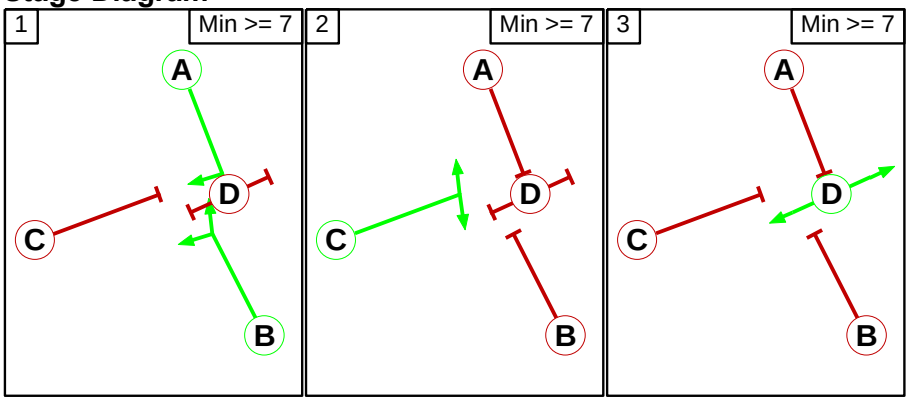
PRC for Signalled Lanes (%): 331.5
PRC Over All Lanes (%): 91.7

Total Delay for Signalled Lanes (pcuHr): 1.39
Total Delay Over All Lanes(pcuHr): 2.64

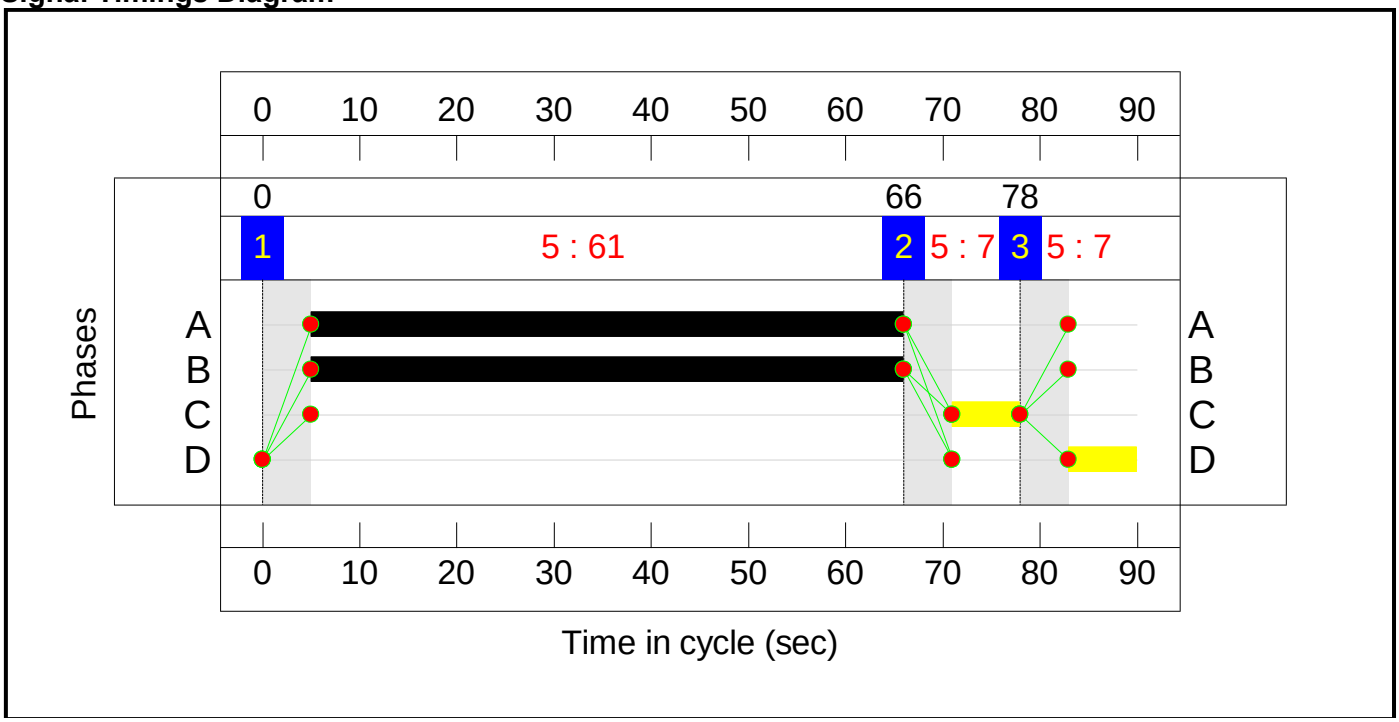
Cycle Time (s): 90

Basic Results Summary

Stage Diagram



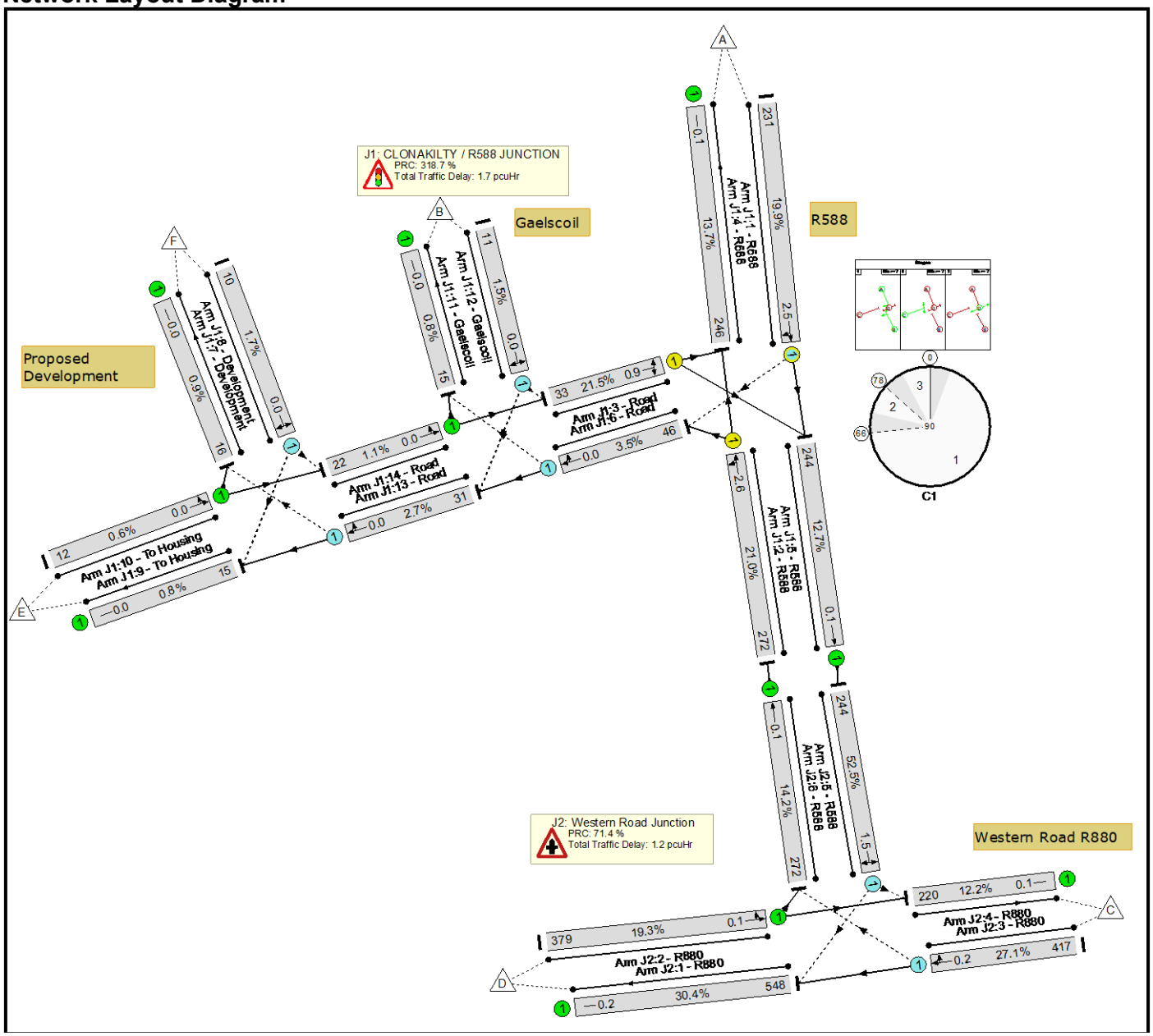
Signal Timings Diagram



Basic Results Summary

Scenario 7: 'Scenario 7 PM 2030' (FG7: 'PM 2030', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Basic Results Summary

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**52.5%**	**373**	**3**	**0**	**3.0**	**-**	**-**
J1: CLONAKILTY / R588 JUNCTION	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**21.5%**	**63**	**3**	**0**	**1.7**	**-**	**-**
1/1	R588 Ahead Right	O	A		1	61	-	231	1903	1160	19.9%	11	3	0	0.5	7.9	2.5
2/1	R588 Ahead Left	U	B		1	61	-	272	1882	1296	21.0%	-	-	-	0.5	6.9	2.6
3/1	Road Left Right	U	C		1	7	-	33	1727	154	21.5%	-	-	-	0.5	53.1	0.9
4/1	R588	U	-		-	-	-	246	1800	1800	13.7%	-	-	-	0.1	1.2	0.1
5/1	R588 Ahead	U	-		-	-	-	244	1915	1915	12.7%	-	-	-	0.1	1.1	0.1
6/1	Road Right Ahead	O	-		-	-	-	46	1826	1322	3.5%	15	0	0	0.0	1.4	0.0
7/1	Development	U	-		-	-	-	16	1800	1800	0.9%	-	-	-	0.0	1.0	0.0
8/1	Development Right Left	O	-		-	-	-	10	1665	597	1.7%	10	0	0	0.0	3.1	0.0
9/1	To Housing	U	-		-	-	-	15	1800	1800	0.8%	-	-	-	0.0	1.0	0.0
10/1	To Housing Left Ahead	U	-		-	-	-	12	1915	1915	0.6%	-	-	-	0.0	0.9	0.0
11/1	Gaelscoil	U	-		-	-	-	15	1800	1800	0.8%	-	-	-	0.0	1.0	0.0
12/1	Gaelscoil Left Right	O	-		-	-	-	11	1532	710	1.5%	11	0	0	0.0	2.6	0.0
13/1	Road Right Ahead	O	-		-	-	-	31	1777	1133	2.7%	16	0	0	0.0	1.6	0.0
14/1	Road Ahead Left	U	-		-	-	-	22	1915	1915	1.1%	-	-	-	0.0	1.0	0.0
J2: Western Road Junction	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**52.5%**	**310**	**0**	**0**	**1.2**	**-**	**-**
1/1	R880	U	-		-	-	-	548	1800	1800	30.4%	-	-	-	0.2	1.4	0.2
2/1	R880 Ahead Left	U	-		-	-	-	379	1965	1965	19.3%	-	-	-	0.1	1.1	0.1

Basic Results Summary

3/1	R880 Ahead Right	O	-		-	-	-	417	1965	1541	27.1%	66	0	0	0.2	1.6	0.2
4/1	R880	U	-		-	-	-	220	1800	1800	12.2%	-	-	-	0.1	1.1	0.1
5/1	R588 Right Left	O	-		-	-	-	244	1726	465	52.5%	244	0	0	0.6	8.1	1.5
6/1	R588 Ahead	U	-		-	-	-	272	1915	1915	14.2%	-	-	-	0.1	1.1	0.1

C1

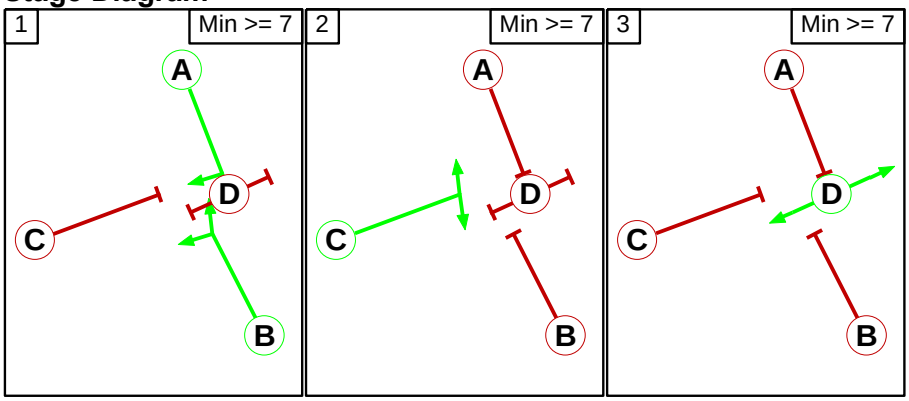
PRC for Signalled Lanes (%): 318.7
PRC Over All Lanes (%): 71.4

Total Delay for Signalled Lanes (pcuHr): 1.51
Total Delay Over All Lanes(pcuHr): 2.96

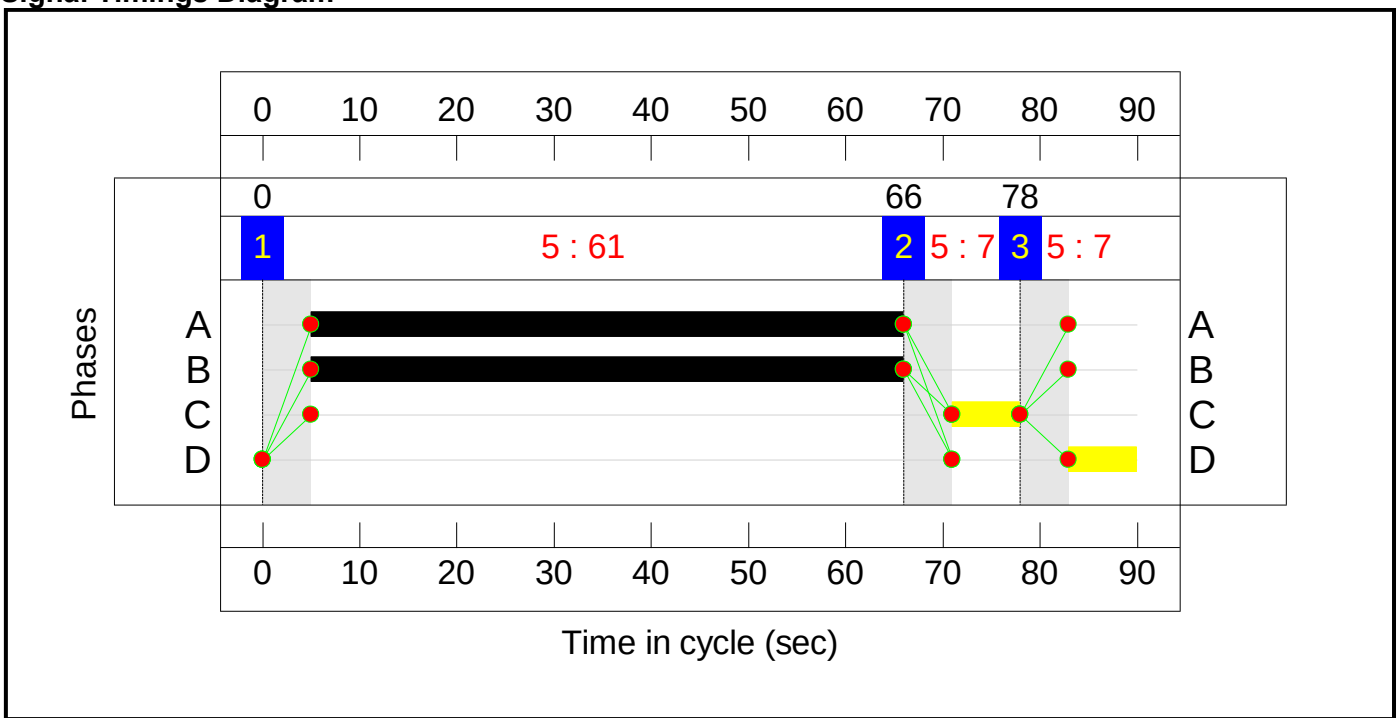
Cycle Time (s): 90

Basic Results Summary

Stage Diagram

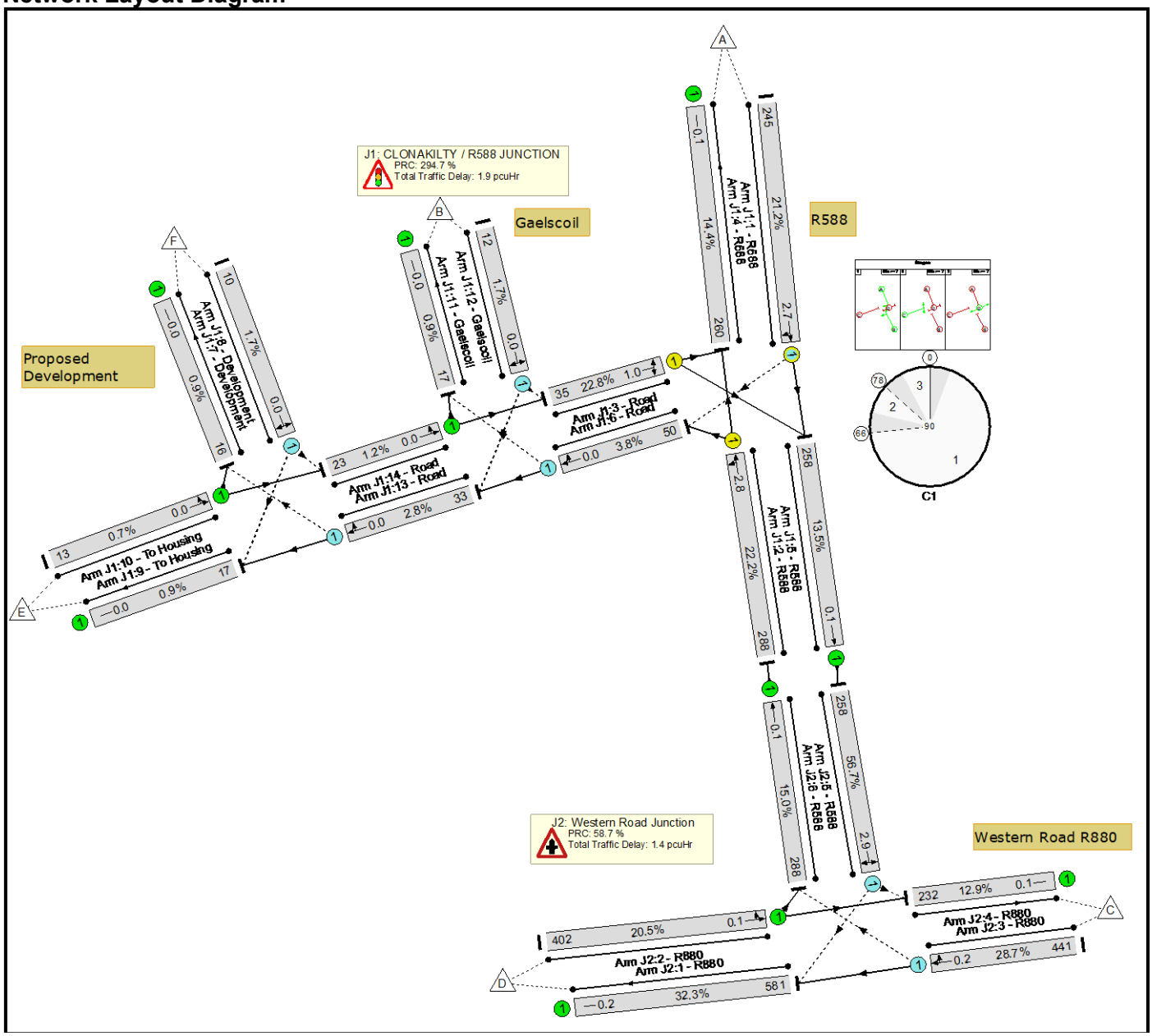


Signal Timings Diagram



Scenario 8: 'Scenario 8 PM 2040' (FG8: 'PM 2040', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Basic Results Summary

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**56.7%**	**395**	**3**	**0**	**3.3**	**-**	**-**
J1: CLONAKILTY / R588 JUNCTION	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**22.8%**	**68**	**3**	**0**	**1.9**	**-**	**-**
1/1	R588 Ahead Right	O	A		1	61	-	245	1903	1155	21.2%	13	3	0	0.5	8.1	2.7
2/1	R588 Ahead Left	U	B		1	61	-	288	1882	1296	22.2%	-	-	-	0.6	6.9	2.8
3/1	Road Left Right	U	C		1	7	-	35	1727	154	22.8%	-	-	-	0.5	53.3	1.0
4/1	R588	U	-		-	-	-	260	1800	1800	14.4%	-	-	-	0.1	1.2	0.1
5/1	R588 Ahead	U	-		-	-	-	258	1915	1915	13.5%	-	-	-	0.1	1.1	0.1
6/1	Road Right Ahead	O	-		-	-	-	50	1822	1305	3.8%	17	0	0	0.0	1.4	0.0
7/1	Development	U	-		-	-	-	16	1800	1800	0.9%	-	-	-	0.0	1.0	0.0
8/1	Development Right Left	O	-		-	-	-	10	1665	597	1.7%	10	0	0	0.0	3.1	0.0
9/1	To Housing	U	-		-	-	-	17	1800	1800	0.9%	-	-	-	0.0	1.0	0.0
10/1	To Housing Left Ahead	U	-		-	-	-	13	1915	1915	0.7%	-	-	-	0.0	0.9	0.0
11/1	Gaelscoil	U	-		-	-	-	17	1800	1800	0.9%	-	-	-	0.0	1.0	0.0
12/1	Gaelscoil Left Right	O	-		-	-	-	12	1532	710	1.7%	12	0	0	0.0	2.6	0.0
13/1	Road Right Ahead	O	-		-	-	-	33	1785	1160	2.8%	16	0	0	0.0	1.6	0.0
14/1	Road Ahead Left	U	-		-	-	-	23	1915	1915	1.2%	-	-	-	0.0	1.0	0.0
J2: Western Road Junction	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**56.7%**	**327**	**0**	**0**	**1.4**	**-**	**-**
1/1	R880	U	-		-	-	-	581	1800	1800	32.3%	-	-	-	0.2	1.5	0.2
2/1	R880 Ahead Left	U	-		-	-	-	402	1965	1965	20.5%	-	-	-	0.1	1.2	0.1

Basic Results Summary

3/1	R880 Ahead Right	O	-		-	-	-	441	1965	1539	28.7%	69	0	0	0.2	1.6	0.2
4/1	R880	U	-		-	-	-	232	1800	1800	12.9%	-	-	-	0.1	1.1	0.1
5/1	R588 Right Left	O	-		-	-	-	258	1726	455	56.7%	258	0	0	0.7	9.2	2.9
6/1	R588 Ahead	U	-		-	-	-	288	1915	1915	15.0%	-	-	-	0.1	1.1	0.1

C1

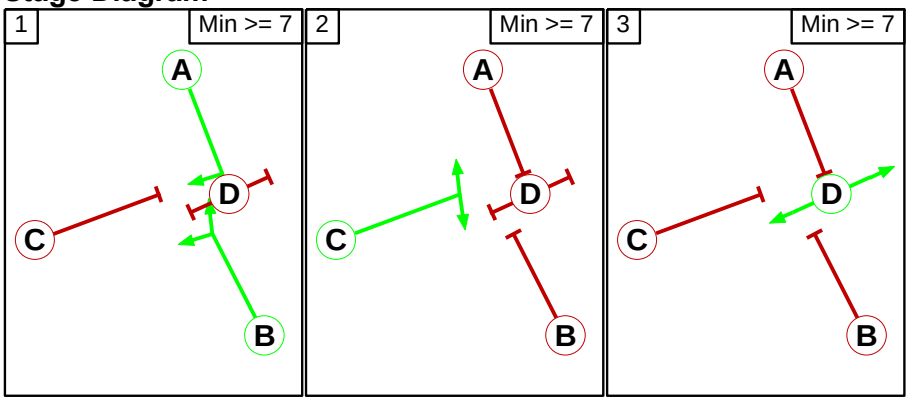
PRC for Signalled Lanes (%): 294.7
PRC Over All Lanes (%): 58.7

Total Delay for Signalled Lanes (pcuHr): 1.62
Total Delay Over All Lanes(pcuHr): 3.25

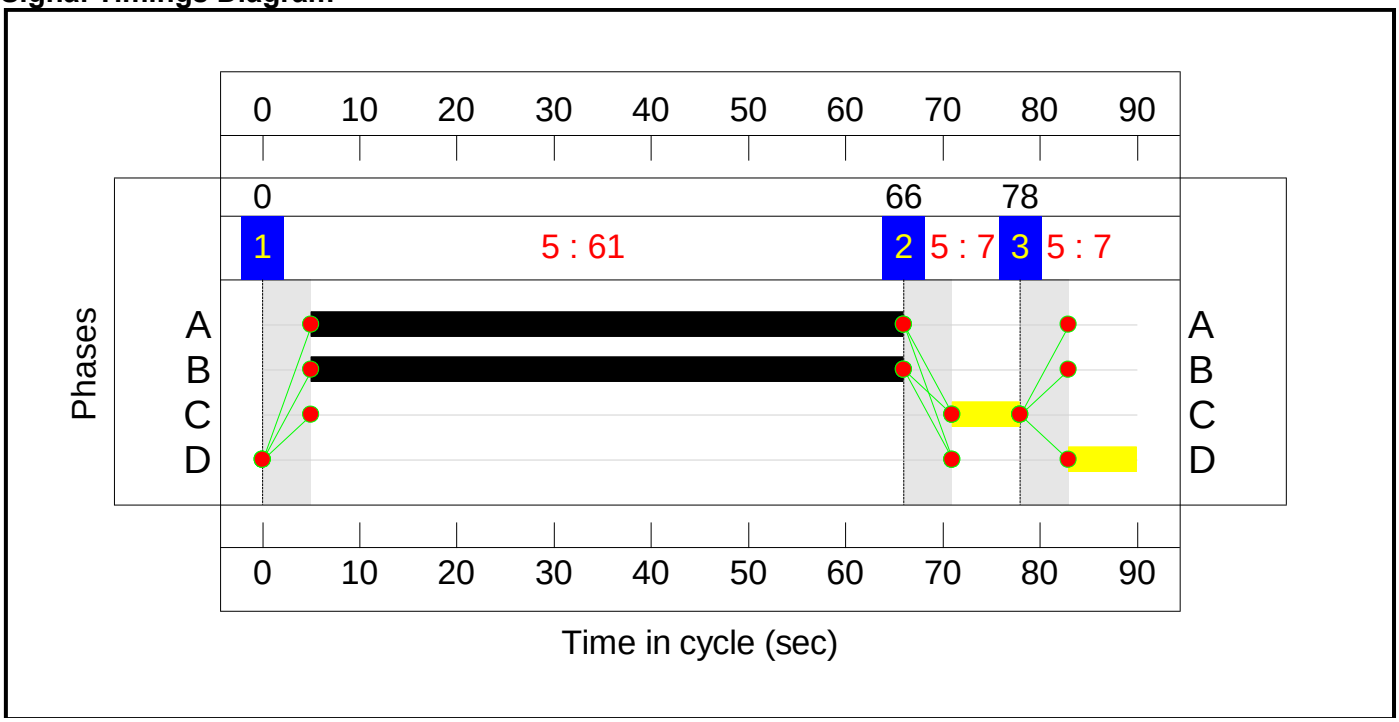
Cycle Time (s): 90

Basic Results Summary

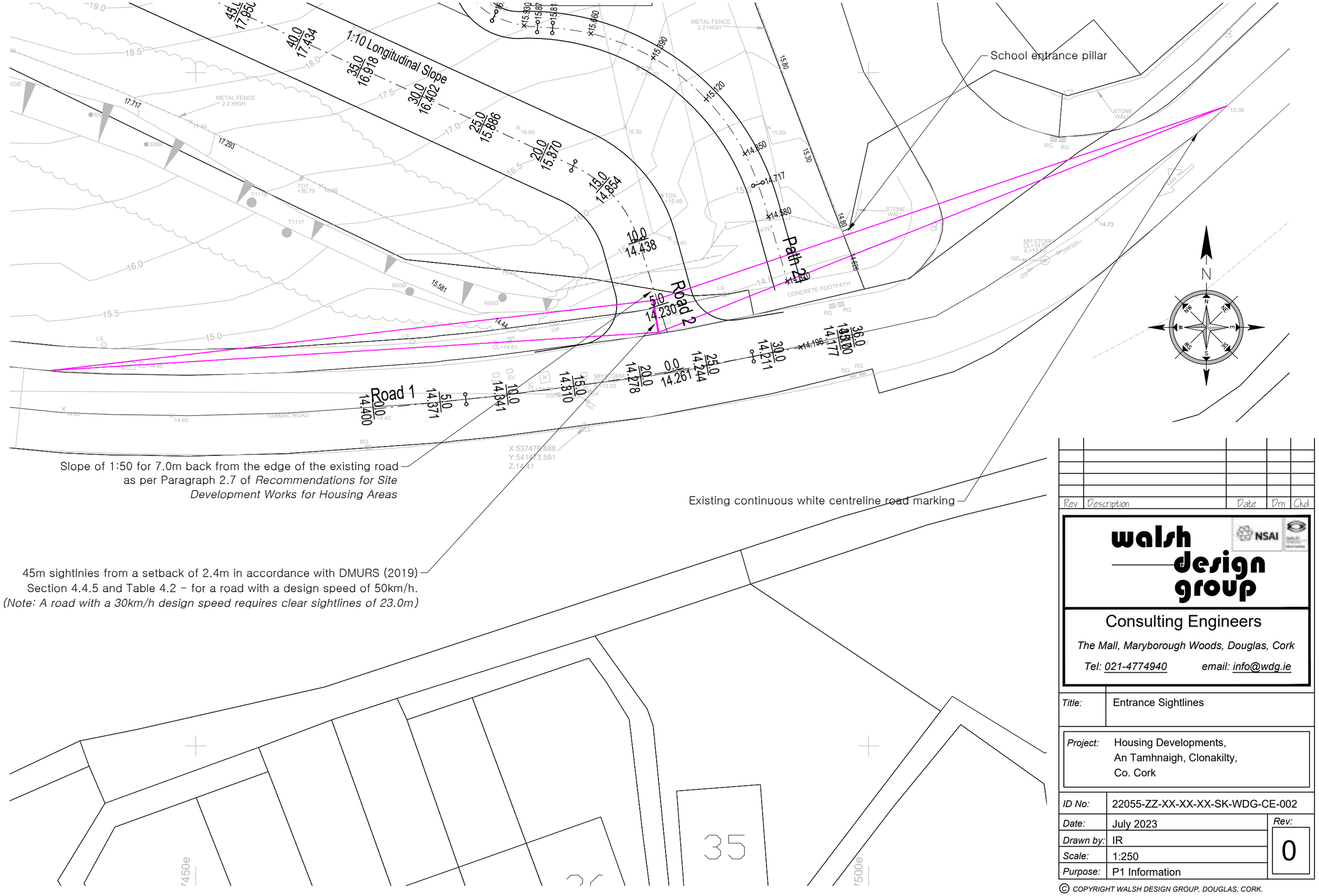
Stage Diagram



Signal Timings Diagram



16.0 Appendix D- Drawings



Rev	Description	Date	Dm	Ckd

walsh design group

NSAI

Consulting Engineers

The Mall, Maryborough Woods, Douglas, Cork

Tel: 021-4774940 *email: info@wdg.ie*

Title:	Entrance Sightlines
Project:	Housing Developments, An Tamhnaigh, Clonakilty, Co. Cork
ID No:	22055-ZZ-XX-XX-XX-SK-WDG-CE-002
Date:	July 2023
Drawn by:	IR
Scale:	1:250
Purpose:	P1 Information
Rev:	0