Cork City Council Part 8 Development. For Inspection Purposes Only!

GREENFIELD LRD

VOLUME III | EIAR

Appendices

Murnane & O'Shea Ltd.
BUILDING CONTRACTORS

Cork City Council Planning Department. For Inspection Purposes Only!

HW/P hw planning

DEADY GAHAN ARCHITECTS

Keohane Geological & Environmental Consultancy

egis

DOSA DENIS O'SULLIVAN & ASSOCIATES CONSULTING ENGINEERS

SR LA SIMON RONAN LANDSCAPE ARCHITECTS

MODEL WORKS

DIXON BROSNAN ENVIRONMENTAL CONTULTANTS

Lane Purcell Archaeology LPA

Trinity Consultants awnconsulting

GREENFIELD LRD

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CHAPTER ONE

INTRODUCTION

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APPENDIX 1-1 CCC Minutes

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APPENDIX A – Section 247 Consultation Minutes

LRD Meeting held on 11/12/24 under Section 247 of the Planning and Development Act 2000 (as amended)

Cork City Council
Culture, Community and Placemaking Directorate
Pre-Planning Meeting Minutes Ref: LRD 140-24

Section 247 (2) of the Planning & Development Act 2000 (as amended) states *"the planning authority shall advise the person concerned of the (1) **procedures involved in considering a planning application** including any requirements of the permission regulations, and shall, as far as possible, indicate (2) **the relevant objectives of the development plan which may have a bearing on the decision** of the planning authority."*

1. Site Location/Site Address	Greenfield, Ballincollig, Cork.
2. Person Requesting Meeting	John O' Brien, Harry Walsh Consulting
3. Applicant	Murnane & O'Shea Limited
4. Person's Interest in Land/Letter of Consent	Letter of Consent included
5. Meeting attendees	**Applicants Team:** John O'Brien. HW Planning Eamonn Gahan, Deady Gahan Architects Ger Naughton, Deady Gahan Architects Tara O'Leary, EGIS Group Liam O'Toole, DOSA Consulting Engineers Harry Walsh, Harry Walsh Planning Paudie Murnane, Murnane O' Shea Kieran O'Donovan, Murnane O' Shea Simon Ronan, Landscape Architecture **Cork City Council:** Evelyn Mitchell, Senior Executive Planner, Planning & Development Management Kevin O' Connor, Senior Planner, Planning Policy Kevin Cullen, Senior Executive Architect, City Architects Valerie Fenton, Executive Engineer, Planning & Development Management Tony Lynch, Senior Executive Transport Officer, Planning Policy Tony Donovan, Senior Executive Engineer, Water Services Eoghan McSweeney, Executive Engineer, Environmental Management Emer O' Callaghan, Senior Parks & Landscape offer, Parks & Recreation Rosemarie McDonald, Biodiversity Officer, Parks & Recreation Liam Buckley, Area Engineer Robert Farrell, Executive Planner, Planning Policy Fiona Redmond, Senior Planner, Planning & Development Management Anthony Angelini, Assistant Staff Officer, Planning & Integrated Development

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	Apologies: Ashleigh Murray, Executive Conservation Officer, Planning Policy
6. Meeting	11/12/24. 11.30am-12.30pm. MS Teams

DOCUMENTATION SUBMITTED

BRIEF DESCRIPTION OF DEVELOPMENT/PROPOSAL
Include Uses and Characteristics

RECENT PLANNING HISTORY ON SITE – NONE
None

COMPLIANCE WITH LRD THRESHOLDS
Yes

APPLICANT MUST READ COMMENTS BELOW IN CONJUNCTION WITH & REFER TO CORK CITY DEVELOPMENT PLAN: HTTPS://WWW.CORKCITY.IE/EN/CORK-CITY-DEVELOPMENT-PLAN/ OR VIEW HARD COPY AT CORK CITY COUNCIL

KEY DEVELOPMENT PLAN OBJECTIVES: CORK CITY DEVELOPMENT PLAN 2022
AS PREVIOUSLY ADVISED

MINISTERIAL AND OTHER GUIDELINES
As previously advised

MEETING AGENDA
Any recording devises including AI tools are not permitted at this meeting. • Introduction – mute mikes

Cork City Council:

1. **Evelyn Mitchell, Senior Executive Planner, Planning & Development Management:**

- Introduced meeting.
- Outlined details of the site.

2. **Kevin O' Connor, Senior Planner, Planning Policy:**

- From a Strategic Planning perspective, the application is acceptable in principle
- Concerned about the delivery of roads and the delivery of units. The preference is to see some units built before road is developed.
- Special contribution in relation to amenities in the area.

3. **Tony Donovan, Senior Executive Engineer, Water Services:**

- At the previous meetings we addressed the requirements for Storm Water and Flood Risk Management.
- Offline discussions have been held with Murnane O'Shea and DOSA. Drainage requirements are progressing.
- Clarification is required on the following section included in the South Ballincollig Drainage Study – Sustainable Drainage Strategy.

6.1.3 Drainage Proposal for Residential Developments

It is required that for areas zoned for residential use that:

- That all runoff within the curtilage of the property boundary pass through at least one suitable SuDS component prior to discharging to downstream SuDS components.
- Storage up to the 1 in 100 year event including climate change allowance shall be provided within the curtilage of the property boundary, with maximum discharge rates/volumes in accordance with Section 3.
- Runoff from public areas (such as roads, parking areas, hard and soft landscaped areas, and footpaths) shall pass through at least one SuDS component prior to discharging to the final downstream detention/retention SuDS components.
- Runoff from roofs can be managed using water butts, rainwater harvesting, rain gardens, infiltration trenches, permeable paving, and soakaways.
- Runoff from hardstanding areas can be managed using permeable paving, filter strips, swales, and bioretention systems.
- The final SuDS components located within the development shall comprise basins/ponds/wetlands, prior to discharge to the Maglin River or local surface water sewer.

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4. **Eoghan McSweeney, Executive Engineer, Environmental Management:**

To properly assess the proposed development, the following details will be required:

4.1 Construction Environmental Management Plan
4.2 Construction and Demolition Resource Waste Management Plan
4.3 Operational Waste Management Plan
4.4 Swept Path Drawing for Refuse Vehicles
4.5 Noise & Vibration Impact Assessment
4.6 Air Quality Report
4.7 Energy & Climate Action Statement

4.1 Construction Environmental Management Plan

A Construction Environmental Management Plan shall be submitted, this plan shall provide details of intended construction practice for the development, including phasing of the works, piling requirements, mitigation measures for noise & vibration, dust and air quality. Detail in relation to traffic management, lighting, pedestrian safety, water quality protection measures and hours of work to be included.

4.2 Construction and Demolition Resource Waste Management Plan

The developer shall prepare a Construction and Demolition Resource Waste Management Plan (RWMP) as set out in the Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for C&D Projects (2021) including demonstration of proposals to adhere to best practice and protocols. The RWMP shall include specific proposals as to how the RWMP will be measured and monitored for effectiveness; these details shall be placed on the file and retained as part of the public record.

4.3 Operational Waste Management Plan

An Operational Waste Management Plan is required detailing how the waste arising in the development will be managed. Details shall include proposals for waste reduction, reuse, recycling, vented bin storage, as well as who will manage the waste, present it for collection, and dispose of it. The plan should outline who will present the communal waste bins from the Apartment Blocks and Creche for collection. Provisions should be made within the properties for internal bins to match those that are presented for waste - i.e. provide, general waste, recycling and compost bins.
Apartment Blocks - Calculations are to be prepared to show quantities of waste produced versus the volume of waste storage provided in each storage area. Drawings of Bin Stores to be provided and location of bin stores to provide ease of access for residents as well as those presenting waste for collection.

Further detail required in relation to waste storage for the childcare facility - Calculations are to be prepared to show quantities of waste produced versus the volume of waste storage provided. Location of childcare facility bin storage to be identified and confirm if management company or childcare facility operator will present this waste for collection. Drawings of bin storage area to be provided.

Further detail required in relation to bin storage facilities for townhouses, terraced houses and duplexes within this development. Calculations are to be prepared to show quantities of waste produced versus the volume of waste storage provided for townhouses. Storage facilities to be provided within each properties curtilage. Bins to be screened from view for townhouses/terraced houses.

All bin storage drawings for the various house types and communal bins to be submitted and appended to the Operational Waste Management Plan.

4.4 Swept Path Drawing for Refuse Vehicle

It is not clear if a refuse vehicle can enter and turn within the development during waste collection. A swept path analysis of a refuse vehicle is required.

4.5 Noise & Vibration Impact Assessment

Given the proximity of the proposed development site to the existing Castle Road and N22, as well as the proposed Distributor Road a Noise Impact Assessment shall be submitted.
Given the proximity of the proposed development site to the existing Castle Road, N22, and the proposed Distributor Road, a comprehensive Noise Impact Assessment shall be submitted:
(a) An inward Noise Impact Assessment will be required to assess the potential noise impact from the existing road network and future Distributor Road traffic on properties. Baseline noise monitoring shall be conducted in general accordance with ISO 1996 when schools and universities are in term to capture representative traffic conditions. The location of noise monitoring and methodology shall be agreed with the Planning Authority in advance.
The resulting Acoustic Design Statement (ADS) must comply with ProPG guidelines and demonstrate how internal noise levels, as specified in BS8233:2014, will be achieved. The assessment shall evaluate noise levels within internal rooms of the proposed properties, external areas including back gardens, and communal amenity spaces. For duplex/apartments, noise levels shall be assessed at various floor heights, including balconies.
The impact of the future Distributor Road noise levels shall be factored into the assessment. Noise mapping of existing and future conditions shall be included in the final report, accounting for any mitigation measures. The developer shall provide detailed specifications of construction assemblies, glazing, ventilation strategies, noise barriers to meet both internal and external noise criteria.
The developer shall determine if an existing noise barrier is present along the site boundary with the N22 and shall liaise with TII to establish exact location and barrier specifications. Where noise barriers are proposed or existing, the developer shall outline the maintenance agreement that will be implemented throughout the development's lifetime, including service agreement duration.

(b) The noise impact assessment shall evaluate impacts on surrounding properties during both construction and operational phases. Using the baseline monitoring levels, construction noise threshold levels shall be established in accordance with the ABC method outlined in BS 5228 "Noise Control on Construction and open sites Part 1: Code of practice for basic

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information and procedures for noise control." For the operational phase, the assessment shall include predicted noise levels at surrounding properties, compared to relevant thresholds, and account for noise generated from the childcare facility, heat pumps, air conditioning units, and other mechanical plant.

4.6 Air Quality Report

Given the proximity of the proposed development site to the Castle Road, N22, and the proposed Distributor Road, an Air Quality Impact Assessment shall be submitted that meets EPA air quality standards. A reference should also be made to WHO targets for indicative purposes. This assessment shall evaluate both construction and operational stages in terms of air quality impacts on surrounding properties and properties within the development.
The primary focus of the report shall outline the potential air quality impact from the existing road network and future Distributor Road traffic emissions on habitants of the properties, both internal and external, as well as within amenity spaces. The assessment shall include air quality evaluation at various levels of apartment blocks and balconies, with particular attention to properties closest to the N22 and future Distributor road in relation to air quality limit thresholds.
Air quality monitoring shall be conducted to establish baseline conditions and evaluate emissions generated from roads and their potential cumulative impact (N22, Castle Road, and future Distributorroad) on receptors. Monitoring shall be carried out when schools and universities are in term. As a minimum, PM10, PM2.5, and NO2 shall be monitored on site. The location of air quality monitoring and methodology shall be agreed with the Planning Authority in advance.

The report shall provide:

- A detailed outline of methodologies used for monitoring and analysis
- A comprehensive evaluation of air quality levels in relation to relevant standards and guidelines
- Proposed mitigation measures to address any identified air quality issues, ensuring the health and well-being of future residents and the surrounding community
- The assessment must demonstrate compliance with EPA air quality standards and include recommendations for maintaining acceptable air quality levels throughout the development's lifecycle.

4.7 Energy & Climate Action Statement

No detail has been provided regarding the proposed energy use within the development. It is not clear what form of space/water heating is proposed for the development. The developer shall submit a 'Climate Action and Energy' statement and endeavour to use sustainable source of energy, and to operate an energy conservation policy on the design and operation of the residential scheme.

5. Emer O' Callaghan, Senior Parks & Landscape Officer, Parks & Recreation:

- Condition survey of all hedgerows – no indication of retention of the eastern boundary hedgerow. The retention of hedgerows is welcome.
- Central open space is bisected by hedgerows – which negates the potential for open space usability and informal play.
- Apartment blocks –provision of play as per the design guidelines for new apartments – indicated for one block and not the other.
- SUDs – design detail required and locations- maintenance plans will be required - eg Tree planting pits , swales etc
- Local play – natural play with innovative design but no fixed equipment. Location of playground seems to be in different locations in different drawing.
- Plaza is indicated for central open space as well as multipurpose open space and playground – can this be clarified.

Information required:

- Scheule of landscape implementation – works to be completed prior to occupancy
- Management and maintenance plans for agreed Landscape Design.

6. Rosemarie McDonald, Biodiversity Officer, Parks & Recreation:

- Biodiversity Survey.
- An Ecological Impact Assessment to cover: habitat survey, bat surveys to check for potential roosts and the usage on site, breeding bird and wintering bird surveys.
- Would need further details on the potential use of the area by bats and wintering/breeding birds.
- A survey for IAPS and produce a separate IAPS management plan for the site.

7. Valerie Fenton, A/Senior Executive Engineer, Planning & Development Management:

- No objection to relocation of car parking spaces.
- Not in favour of secondary access onto the Kilumney Link Road.
- Would be concerned that the estate could be used as a rat run.
- Cross section of distribution road would be beneficial.

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8. **Liam Buckley, Area Engineer:**

- There is at least one drainage pipe taking surface water from the Kilumney Road to an open drain within the development site. The inlet on Killumney Road is at 51.8805112798873, -8.609451055526735. This will need to be tied into the new proposed surface water system dependent on levels. Alternatively, a new gully and pipe will be required at a sufficient depth to tie into the proposed new surface water system. This would be subject to a survey and discussion with the Area Office.
- Clarification on new junction with Kilumney Road/Greenfields Road – is this to be signalised?
- Pedestrian connections from the proposed development to the existing pedestrian network to the north - It is thought that there should be at least one formal pedestrian crossing point on Kilumney Road/Greenfields Road, location of crossing(s), type of crossing(s) to be agreed with Area Engineer and Urban Roads and Streets Engineer.

9. **Tony Lynch, Senior Executive Transport Officer, Planning Policy:**

- The number and location of the vehicular entrances are acceptable, additional traffic management measures required to limit through traffic within the proposed development
- The final set back of the building line along Kilumney Link Road needs agreement to allow for the future enhancement of this street; there is a requirement to provide additional pedestrian crossing points along Kilumney Road as well.

10. **Ashleigh Murray, Executive Conservation Officer, Planning Policy (apologies):**

- Views, sections and visualisations are still required to enable a full assessment on the impact of the setting of the Ballincollig Castle, a protected structure (PS1225).
- The sensitivity of the castle and its setting should be considered when positioning the varied-height blocks throughout the development.

11. **Evelyn Mitchell, Senior Executive Planner, Planning & Development Management:**

- Regarding creche facility – looking for client to liaise with Cork City childcare company.
- Would like to see further detail on the house mix.

12. **Kevin Cullen, Senior Executive Architect, City Architects:**

- Reasonably happy with the urban design strategy.
- However, a much greater level of detail will be required as regards the design for the structures and streetscapes in order to demonstrate good place-making.

Applicant Team:

- Pre-consultation EIR will have detailed phasing plan.
- Intention to have road development lag behind construction of housing.
- Site specific flood study to be presented.
- AWN have been tasked with noise and air quality monitoring. Confident that noise will not be an issue for residents.
- Photo montages will be provided where required.
- Will consider severing the distributor road link to reduce potential for "rat running".

- AOB

- Close

Post-meeting note: subsequent meeting held to discuss proposals to prevent rat running – EG - Deady Gahan, HW - HW Planning, MOS, Kevin Cullen Tony Lynch and Evelyn Mitchell.

ATTENDEE	SIGNATURE	DATE
Anthony Angelini Assistant Staff Officer	Anthony Angelini	18/02/25

*The applicant is advised in accordance with **Section 247** (3) of the Planning and Development Act 2000 (as amended), that "the carrying out of any consultations shall not prejudice the performance by a Planning Authority of any other of its functions under this Act, or any regulations made under this Act & cannot be relied upon in the formal planning process or in legal proceedings".*

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APPENDIX B – Section 32C LRD Meeting Minutes

Meeting held on 01/05/25 under Section 32C of the Planning and Development Act 2000 (as amended)

Cork City Council
Planning and Integrated Development Directorate
LRD Opinion Meeting Minutes Ref: LRD25-03

Section 32C. (1) of the Planning & Development Act 2000 (as amended) states *"Where the prospective LRD applicant submits a request in accordance with section 32B, the planning authority shall convene an LRD meeting to take place within the period of 4 weeks beginning on the date on which the request is received by the planning authority."*

1. Site Location/Site Address	Greenfield, Ballincollig, Cork.
2. Person Requesting Meeting	Harry Walsh – HW Planning
3. Applicant	Murnane & O'Shea Limited
4. Person's Interest in Land/Letter of Consent	Owners Letters of Consent
5. Meeting attendees	**Applicant:** Harry Walsh, HW Planning John O'Brien, HW Planning Kieran O'Donovan, Murnane & O'Shea Ltd Paudie Murnane, Murnane & O'Shea Ltd Liam O'Toole - DOSA Consulting Engineers Tara O'Leary – Egis Richard Butler – Modelworks Studio Simon Ronan - Simon Ronan Landscape architecture Avril Purcell - Lane Purcell Archaeology Carl Dixon – Dixon Brosnan Eamonn Gahan - Deady Gahan Architects Ger Naughton - Deady Gahan Architects **Cork City Council:** Fiona Redmond, Senior Planner, Development Management Evelyn Mitchell, Senior Executive Planner, Development Management Emer O'Callaghan, Senior Parks and Landscape Officer, Parks and Recreation Eoghan McSweeney, Executive Engineer, Environmental Management Kevin Cullen, Senior Executive Architect, City Architects Micheál Shanahan, Executive Engineer, Development Management Rosemarie McDonald, Biodiversity Officer, Parks and Recreation Tony Lynch, Senior Executive Transport Officer, Planning Policy Majella McMorrow, Senior Staff Officer, Development Management **Apologies:** Thomas Kane, Tree Officer, Executive Parks and Landscape Officer, Parks and Recreation Tony Donovan, Senior Executive Engineer, Water Services Ciara Brett, Executive Archaeologist, Planning Policy Ashleigh Murray, Executive Conservation Officer, Planning Policy

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6. Meeting	Held on 01/05/2025 at 2pm via Teams

DOCUMENTATION SUBMITTED

BRIEF DESCRIPTION OF DEVELOPMENT/PROPOSAL

Include Uses & Characteristics

ZONING OBJECTIVES

DEVELOPMENT PLAN OBJECTIVES

MEETING AGENDA

Any recording devises including AI tools are not permitted at this meeting.

1. **Introduction**

   Evelyn Mitchell, Senior Executive Planner opened the meeting

2. **Applicant Comments**

- Development is a mixture of apartments, duplexes and houses, totalling 548 units
- The density of the development is 45.3 Unit/Ha
- The is linkage with the old railway line
- Vehicular access via 2 entrances from Greenfield Road with separate pedestrian entrances
- Plans to limit linkages into the site to reduce the chances of it becoming a rat run

3. **Planning Authority Comments**

3.1 Parks and Recreation

- Play Provision – informal non-equipped design solutions if imaginatively and practically conceived - taking advantage of site features, may be suitable and adequate to meets children's play needs.
- There is a net gain in tree cover with the level of planting indicated, and this is welcomed.
- Suds provision has been outlined. The sunken areas for SuDs provision in the central landscape areas – are they large enough for informal kickabout?
- Cork County Council Draft Recreational & Amenity Policy is referred to in the submitted documents – this is not relevant to Cork City Council.
- The issue/concern of the lack of separation of the public and semi-private open spaces in the courtyards of the apartments weas raised.
- Taxus is to be removed from the planting palette as the fruits are toxic.
- The defects period and maintenance periods are to be identified

3.2 Environment

Looking for a number of reports:

- Construction Environmental Management Plan
- Construction and Demolition Resource Waste Management Plan
- Operational Waste Management Plan
- Swept Path Drawing for Refuse Vehicle
- Refuse Autotrack drawing has been provided. The information provided is sufficient at this time.
- Noise Impact Assessment
- Air Quality Report
- Energy & Climate Action Statement

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3.3 Urban Roads and Street Development

- Generally the overall layout is acceptable please see below a number of points from Sustainable Travel perspective:
    - Road and safety assessment/ audit carried out internally in relation to speed control measures – signage relationship with shared surfaces. DMURS to be reference and clarified.
    - General observation that may be picked up by Traffic however : possible clash with property entrance to the northeast against proposed central island of the main Greenfields Road see image below.
    - Taking in charge area to designed and constructed in tandem with services laid to mitigate any future legal issues - wayleaves. All services co-ordinated and laid within future public area where humanly possible.
    - Client needs to firm up internally drop kerb lines / tactile locations to ensure safe crossing point locations i.e that they are directly opposite throughout site. DMURS to be reference and clarified.
    - Internal Corner Radii with suitable safe sightline to be adhered to in compliance with guidelines set out in DMURS.

3.4 Biodiversity

- Would request more detail on the volume of hedgerow retention within the proposed development.
- Would request to have breeding bird surveys incorporated into the suite of surveys being conducted for the proposed development.
- Would ask for further information regarding the type of biodiversity enhancements being incorporated into the proposed development such as nest boxes, bat boxes, bee hotels etc.

3.5 Architect

- There is good site permeability
- The Courtyard as a semi private space is positive
- Hard to define as residents shared space as opposed to public space without the use of a gate
- Architectural expression – character of area & change of language

3.6 Drainage (read out at meeting)

- **Storm Water**
  The overall storm water drainage strategy is acceptable and incorporates our feedback and comments from previous S247 meetings. Some comments in relation to the access and maintenance of the proposed attenuation tanks will be included in the Opinion Report.

- **Flood Risk Management**
  A detailed site-specific flood risk assessment was submitted which is acceptable and addressed the relevant issues.

3.7 Tree Officer (read out at meeting)

- A detailed Arboricultural report complaint with BS5837:2012 will need to be submitted.
- Given the development is to be taken in charge, it is essential that the species specified are appropriate for long term retention in the given locations.

3.8 Traffic

- Submission inline with previous discussion
- Active travel provision
- Cycle connection near Creche

4. Response of Applicant

- There have been no bats discovered on the site
- A breeding birds survey to be looked at
- There will be an EIS
- Detailed sections showing pinch points in relation to the hedgerows will be submitted
- The plan is for the courtyards to be communal, a full analysis will be undertaken
- There will be a noise barrier in the SW corner

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5. **AOB**

6. **Close**

ATTENDEE	SIGNATURE	DATE
Anthony Angelini Assistant Staff Officer	Anthony Angelini	27/05/25

*The applicant is advised in accordance with **Section 32E** of the Planning and Development Act 2000 (as amended), that "Neither the taking place of an LRD meeting nor the provision of an LRD opinion shall prejudice the performance by the planning authority of its functions under this Act or any regulations under this Act or any other enactment and cannot be relied upon in the formal planning process or in legal proceedings.*

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APPENDIX 1-2 LRD25-03 Notice of Opinion

Cork City Council Planning Department. For Inspection Purposes Only!

Comhairle Cathrach Chorcaí
Cork City Council

Halla na Cathrach, Corcaigh - City Hall, Cork - T12 T997

Harry Walsh,
Harry Walsh Planning,
5 Joyce House,
Barrack Square,
Ballincollig,
Cork.
P31 KP84

28/05/2025

Large-Scale Residential Development (LRD) Opinion
Planning and Development Act 2000 (as amended)
Planning and Development Regulations 2001 (as amended)

RE: LRD25-03
Greenfield, Ballincollig.

A Chara,

With reference to your application LRD25-03 Opinion Stage at Greenfield, Ballincollig, Cork, I enclose the following for your attention:

- Notice of Opinion
- LRD Opinion Report
- Appendices
  - A. Section 247 Consultation minutes
  - B. Section 32C LRD Meeting minutes
  - C. Internal Consultee Reports
  - D. External Consultee Reports
  - E. End-to End Alignment

I trust that this is in order.

Yours sincerely,

Anthony Angelini

Anthony Angelini
Assistant Staff Officer
Planning and Integrated Development

We are Cork.

Cork City Council Planning Department. For Inspection Purposes Only!

Comhairle Cathrach Chorcai
Cork City Council
Halla na Cathrach, Corcaigh - City Hall, Cork - T12 T997

Notice of Large-Scale Residential Development (LRD) Opinion

Planning and Development Act 2000 (as amended)
Planning and Development Regulations 2001 (as amended)
Planning And Development (Large-Scale Residential Development) Regulations 2021

Reference Number: LRD25-03

Proposed Development: The proposed development comprises a Large-Scale Residential Development (LRD) at Greenfield (townland), Ballincollig Cork. The proposed development consists of the demolition of an existing dwelling house, farmyard and associated agricultural buildings and the construction of a residential development of 548 no. units (234 no. dwelling houses and 314 no. apartment/duplex units. Vehicular access to the proposed development will be provided via 2 no. entrances from the Greenfields Road with separate pedestrian entrances also provided. Ancillary site works include the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex buildings, a creche facility and public realm upgrades to the Greenfield Road.

Location: Greenfield (townland), Ballincollig, Cork

Recommendation & Opinion

Based on the information submitted by the applicant in accordance with section 32B of the Planning and Development Act 2000 (as amended), the proposed development falls within the definition of large-scale residential development, as set out in section 2 of the Planning and Development Act 2000 (as amended).

Having examined and considered the information submitted by the applicant, the submissions from the internal and external consultees and the discussions that took place at the LRD meeting, the Planning Authority is of the opinion that the documentation submitted in accordance with Section 32B of the Planning and Development Act 2002 (as amended) **requires further consideration and amendment to constitute a reasonable basis on which to make an application for a Large-Scale Residential Development.**

In the event that the applicant proceeds to submit a planning application, it is advised that the LRD application should be accompanied in the first instance by:

- A statement of response to the issues set out in the LRD opinion,
- A statement that in the applicant's opinion the proposal is consistent with the relevant objectives of the Development Plan for the area.

Furthermore in accordance with Section 32D(a) and (b) of the LRD Act, the applicant is hereby notified that the documents submitted in relation to the following issues do not constitute a reasonable basis

on which to make an application. The applicant is advised that the following issues or areas must be addressed in any documents submitted in a future planning application, to constitute a reasonable basis on which to make an application.

1. Density

Further consideration and justification of the proposed density on site having regard to the Sustainable Residential Development and Compact Settlements (2024) - Guidelines for Planning Authorities and the recently published Emerging Preferred Route (EPR) for Luas Cork.

2. Urban Design/Architecture

Further consideration and amendment of the proposed development in terms of its layout, urban design form and architecture noting in particular Appendix D of the Sustainable Residential Development and Compact Settlements Guidelines 2024 'Design Checklist - Key Indicators of Quality Urban Design and Placemaking' and the detailed comments from the City Architect's Section attached. Key areas to be reconsidered and amended include issues raised in the report under the following headings: 'enclosure', 'active edge', and 'responsive built form'.

For detailed guidance in relation to these issues please see the report from the City Architect's Section (Appendix C).

3. Transport Infrastructure Ireland (T.I.I.)

Further consideration and amendment of the proposed development having regard to the submission received from T.I.I. (See Appendix D) with particular reference to the following issues:

(a) Drainage,
(b) Amelioration of existing environment national road impacts for future residents (in particular given the absences of any existing noise attenuation measures along the N22 in the vicinity of the site),
(c) Landscaping and boundary treatments including future management.

It should be noted that T.I.I has advised that it is unable to ascertain or evaluate that national road interactions associated with the T.I.I. maintained area and all associated infrastructure assets including lighting, gantries, signage, substations, noise landcape and boundary treatments including management and especially drainage arrangements have been considered, especially with regard to future residenital amenity and maintenance and safety of the national road network.

4. Transport & Infrastructure (C.C.C.)

Further consideration and amendment of the proposed development in terms of certain transport infrastructural issues as outlined in the report of the S.E.E. Strategic Transport Officer (See Appendix C) in relation to the following issues:

(a) Internal Active Travel Connectivity,
(b) Vehicular Accessibility - Maglin Distributor Road/Sustainable Access Corridor,
(c) Car Parking- including taking in charge and the redesign of a number of locations,
(d) Sightlines - in terms of securing greater sightlines at the Maglin Distributor Road location, and
(e) Transportation Assessment information provided.

5. Urban Streets & Roads Design/Sustainable Travel

Further consideration and amendment of the design of the development having regard to the reports from the Urban Streets & Roads Design Section and the Area Engineer (See Appendix C) in relation to the following issues:

(a) Compliance of the proposed design/layout etc. viz-a-viz DMURS.
(b) Possible re-design of the development having regard to a potential clash with the existing property entrance to the northeast with the proposed central island of the main Greenfields Road.
(c) Clarification on the signalization of the proposed junction with Kilumney Road/Greenfields Road.

6. Noise Impact

Further consideration and possible amendment of the development in terms of the impact of the proposed Maglin Distributor Road and the N22 and other external noise upon the site layout and the detailed design of any necessary mitigation measures – See report from Environment Section in this regard (Appendix C) and S.247 meeting note requirements. See also T.I.I. comments in this regard as per attached submission).

Please note that it may be necessary to liaise further with the Planning Authority in this regard given potential impacts on layout/design/location and type of any necessary mitigation measures etc.

7. Air Quality

Further consideration and possible amendment of the development in terms of the impact of the proposed Maglin Distributor Road and the N22 and other external air quality impacts on air quality for habitants of the properties, both internal and external, as well as within amenity spaces any impact upon site layout and detailed design of any necessary mitigation measures – See report from Environment Section in this regard (Appendix C) and also the S.247 meeting note requirements issued.

8. Housing - Part V

Further consideration and amendment of the proposed development having regard to the need to correct the imbalance of houses versus apartments as proposed (See Housing Section report in this regard in Appendix C).

9. Water Infrastructure/Supply

Further consideration and possible amendment of the proposed development having regard to the submission received from Uisce Eireann.

10. Stormwater Drainage

Further consideration and amendment of the proposed development in terms of the proposed attenuation tanks including their siting, maintenance arrangements and design of same (See Drainage report attached – Appendix C).

11. Surface Water Drainage

Further consideration and possible amendment of the proposed development in terms of the surface water drainage along Greenfields Road/Kilumney Link Road (see Area Engineer's report in this regard – Appendix C).

12. Biodiversity

Further consideration and possible amendment of proposed development (a) the extent of hedgerow retention within the proposed development and (b) following Appropriate Assessment Screening and the carrying out of full Ecological Impact Assessment/Surveys.

13. Landscape Design/Open Space Strategy/Trees

Further consideration and amendment of the proposed landscape strategy to take account of the issues/requirements of the Senior Parks & Landscape Officer and the Tree Officer (see attached reports in this regard – Appendix C).

14. Childcare Facility

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Further consideration and amendment of the proposed development having regard to the submission of Cork City Childcare in relation to the detailed design of the proposed facility (See Appendix D).

15. Environmental Impact Assessment

Further consideration of the scoping and content of the E.I.A.R. required as part of any application including the need to take into account future development within the wider area and associated impacts of same. You are advised to engage with the Planning Authority in regard to the scoping of the E.I.A.R.

16. Masterplan

Further consideration and amendments to the proposed Masterplan/future development of adjoining lands to take into account possible duplication of connecting roads – particularly to the south of the site – with any proposed connecting routes designed right up the site boundary to enable ease of future connections.

17. Phasing

Further consideration of a proposed Phasing Strategy for the site to take account of the need for in-tandem delivery of social and physical infrastructure as required for Tier 2 ZO2 zoned sites particularly the Maglin Distributer Road S.A.C., the creche facility and retail unit. Clarification/amendment of the timing of the completion of this section of the proposed Maglin Distributor Road and non-residential elements within the overall site construction timeline should also be submitted.

18. Other Submissions

Further consideration and possible amendment of the proposed development to take account of the submissions received from Inland Fisheries Ireland and the N.T.A.

Please note that the further consideration of these issues will require an amendment to the documents and/or design proposals submitted at the application stage.

Furthermore, pursuant to article 16A (7) of the Planning and Development Regulations 2001 (as amended), the prospective applicant is hereby notified that, in addition to the requirements as specified in articles 20A, 22 and 23 the following specific information should be submitted with any application for permission. These are in addition to the information submitted at Opinion stage which should be updated accordingly having regard to any changes which are proposed as a result of the above.

1a. Revised drawings and documentation to take into account of the further consideration of the issues raised above and any associated amendments, and the reports/comments of reports and submissions in Appendices C and D.

2a. An updated Statement of Consistency – to include an assessment of the proposed development against:

- Cork Metropolitan Area Transport Strategy CMATS 2040 (2020) and the recently published Emerging Preferred Route (EPR) for Luas Cork.
- The specific objectives of the Cork City Development Plan is required including Objective 10.57, the ZO2 zoning of the site and objectives for same and objectives for Tier 2 sites including reference to a mix of uses and the proposed non-residential elements of the proposal.
- It should be noted that some Development Plan standards such as private open space for houses have been superseded by national standards including those outlined within the Sustainable Residential Development and Compact Settlements (2024) - Guidelines for Planning Authorities and the Statement of Consistency should be updated to reflect latest standards.

3a. An E.I.A.R. which takes into account issues raised in Item 15 above (N.B. Scoping of the E.I.A.R. will need to take place and any necessary amendments to the scheme arising on foot of the E.I.A. process will need to be incorporated into the design and submitted).

4a. A Phasing Strategy which takes into account the need for in-tandem delivery of social and physical infrastructure as required for Tier 2 ZO2 zoned sites, particularly this section of the Maglin Distributer Road S.A.C., the creche facility and retail unit. Justification of the need for a 10-year permission and clarification of the phasing of the completion of this section of the Maglin Distributor Road and other non-residential elements within the overall construction timeline should also be submitted.

5a. Reports/Surveys including any necessary revised layouts/mitigation measures as required by the Environment & Waste Management Section and the submission from T.I.I. (for the required content of these reports please see Appendix C and D as well the details outlined in the S.247 pre-planning notes issued by CCC including:

(i) A Construction Environmental Management Plan.
(ii) A Construction and Demolition Resource Waste Management Plan.
(iii) An Operational Waste Management Plan.
(iv) Swept Path Drawing for Refuse Vehicle.
(v) Noise Impact Assessment.
(vi) Air Quality Report.
(vii) Energy & Climate Action Statement.

6a. Revised drawings to show the alterations recommended within the report of the Strategic Transport Officer (See Appendix C), the Area Engineer and the Urban Streets & Roads Design Section.

7a. A Traffic & Transportation Assessment including any necessary alterations to the scheme to address any issues arising and the comments of the Strategic Transport Officer in his report (appendix C).

8a. A Quality Audit which references the Design Manual for Urban Roads and Streets, and which takes into account the comments of the Area Engineer and the Urban Streets & Roads Design Section.

9a. A Public Lighting Report (Note - This should consider the need to ensure the protection of any bat species).

10a. Revised drawings and architectural design including layouts, elevations etc. to take account of the detailed issues/concerns raised by the City Architect's Section.

11a. An Urban Design Statement which describes how the development has incorporated placemaking and how the how the proposal would respect, reflect or contribute to the character and vibrancy of the particular neighbourhood, centre or area, commensurate with the nature and scale of the development, and how the development would deliver or contribute towards a quality urban environment and public realm with a focus on accessibility, pedestrian priority and permeability.

12a. Drawings and details including layouts/elevations of the proposed retail unit to support the vibrancy of this new area. Note – mention is made of a shop unit in some but not all of the drawings/documents.

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13a. An Architectural Design Report and Masterplan drawing showing the potential development of future surrounding lands.

14a. A Universal Design Statement.

15a. An Operational Management Plan /Report (inc. Lifecycle Report).

16a. A justification for the demolition of the existing dwelling and farm buildings as required under Paragraph 11.154 of the Cork City Development Plan 2022-2028.

17a. An updated Housing Quality Assessment following any revisions made to the development addressing housing mix requirements of the Cork City Development Plan 2022-2028 and to demonstrate compliance with all the relevant national minimum standards for housing and apartments.

18a. A revised Schedule of Accommodation and updated to reflect any design changes.

19a. A fully comprehensive Landscape and Visual Impact Assessment and associated set of Photomontages with viewing locations selected in consultation with the Planning Authority.

20a. Updated drainage details and Site-Specific Flood Risk Assessment which takes into account any alterations arising from the issues raised above and the comments of the Strategic Transport Officer, T.I.I. and any necessary design changes.

21a. Detailed drawings showing the proposed attenuation tanks and locations for same to address the concerns outlined in the Drainage report attached (See Appendix C).

22a. Revised surface water drainage details and drawings which take account of the existence of pipe(s) taking surface water from the Kilumney Link Road/Greenfields Road to an open drain within the development site- See Area Engineer's report in this regard.

23a. An Archaeological Impact Assessment Report.

24a. (i) An Appropriate Assessment report to assess the impact of the proposed development on the Natura 2000 conservation sites and look at the in-combination impacts of surrounding developments have on the Natura 200 sites.

(ii) A Natura Impact Statement should the proposed development be screened in to have a significant impact on the Natura 2000 sites.

(iii) An Ecological Impact Assessment (EcIA) to include all relevant surveys including the additional information recommended by the Biodiversity Officer (See Report in Appendix C) i.e. breeding bird surveys.

(iv) Any necessary alterations to the scheme arising from the surveys and information to be provided above including biodiversity enhancements as recommended by the Biodiversity Officer.

25a. A detailed Landscape Masterplan which takes into account the issues raised in the above section and within the reports of the Senior Parks & Landscape Officer, the Tree Officer, the Biodiversity Officer and City Architect's Section (in relation to the Maglin Distributor Road planting) to include amongst other items and considerations:

- A Hardscape & Softscape Plan including materials and species number type and size prioritising the use of native species.
- A detailed Arboricultural report complaint with BS5837:2012.
- A Hedgerow Survey,

- Tree/Hedgerow Impact and Protection Plan.
- Boundary treatment details for all parts of the site (i.e. overall and individual site boundaries) and omission of any paladin fencing proposed. Parking area to the south fronting the public open space should be bounded by low soft landscaping. Creche open space area should be suitable demarcated where visible.
- Full details of the size, species and quantities of any trees proposed should be submitted with particular attention paid to the appropriate landscaping of the Maglin Distributor Road/S.A.C.
- The removal of Taxus from the planting palette.
- The identification of defects period and maintenance periods. The species selected should be appropriate for long term retention in the given locations.
- The integration of informal non-equipped design solutions in play provision which could take advantage of site features.
- Clarification of the sunken areas for SuDs provision in the central landscape areas as to whether they are large enough for informal kickabout and possible redesign of same.
- Possible redesign of the treatment of the public open space and semi-private/private open space within the courtyard areas – including the access arrangements to same.
- Provision of private patio spaces for ground floor duplex/apartment units – including the landscaped delineation of the boundaries to same.[1]

26a. A Statement of Design Acceptance (S.O.D.A.) from Uisce Eireann and any other information required by Uisce Eireann as raised in its submission (See Appendix D).

27a. A statement on how the development has considered climate resilience from design to implementation stages.

28a. A Scheme Sustainability Statement (Objective 5.16 and Chapter 11 of the Plan) demonstrating how the proposal positively responds to the impact of climate change through mitigation and adaption measures. It should be noted that as per Paragraph 11.273 of the Plan *'As part of the Scheme Sustainability Statement, applicants will be required to demonstrate how these considerations were explored and taken forward through the evolution of the development proposal and where they have not been taken forward, reasons are given as to why the measures were not technically feasible or viable. The level of information and commitments within the Statement should be proportionate to the scale and complexity of the development proposal.'*

29a. Revised drawings/design of the prosed creche taking into account the submission from Cork City Childcare (See Appendix D).

30a. A Taking in Charge Plan.

31a. Revised Part V proposals/site layout drawings to take into account the requirements of the Housing Section (See Appendix C) i.e. to show a minimum of 25 houses & 40 apartments as such units – with these units to be pepper potted around the site.

32a. Documentary proof of the date of purchase of Parcel 2 by the applicant at application stage viz-a-viz the Part V detail submitted and any necessary adjustments to same in the absence of such proof.

33a. A Schools Demand Assessment following liaison with the Department of Education clarifying demand levels and numbers of pupils on waiting lists for enrolment years in schools within Ballincollig and the wider catchment.

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[1] Please note that the Cork County Council Draft Recreational & Amenity Policy which is referred to in the submitted documents is no longer relevant to proposals within the Cork City Council administrative area.

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PLEASE NOTE:
Under sections 32E and 247(3) of the Planning and Development Act 2000 (as amended), neither the carrying out of pre-application consultations nor the taking place of an LRD meeting and the provision of an LRD opinion (where applicable) shall prejudice the performance of the planning authority of its functions under this Act or any Regulations under this Act or any other enactment and cannot be relied upon in the formal planning process or in legal proceedings.

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APPENDIX 1-3 Scoping Letters

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2 January 2025

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Accreditations
ISO 9001:2015
ISO 14001:2015
ISO 45001:2018

Re: EIAR Scoping – Proposed Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork.

Dear Sir/Madam,

We act on behalf of Murnane & O'Shea Limited who are preparing an application for a Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork. The application will be accompanied by an Environmental Impact Assessment Report (EIAR). Site location maps and a proposed site layout prepared by Deady Gahan Architects accompany this letter. The purpose of this letter is to seek any additional comments An Taisce may have and that we should have regard to when preparing the EIAR for the project.

01 The Site

The subject lands of circa 15.17 hectares in area are situated in the townland of Greenfield, southwest of Ballincollig town centre. The lands are currently in agricultural use and bound to the south by the N22 and to the west by a small cluster of existing residential properties/farmyard and the Greenfield/Killumney Road which serves as the primary access point from the site.

Most of the subject lands are included within an area zoned as 'ZO 2 New Residential Neighbourhoods' in the Cork City Development Plan 2022 (CDP), with a portion of the site to the east included within the 'ZO 15 Public Open Space' zoning objective which state respectively.

> ZO 2 - *'To provide for new residential development in tandem with the provision of the necessary social and physical infrastructure.'*
>
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Figure 01. CDP Zoning Map

02 Proposed Development

The proposed development comprises a 10-year permission for the construction of a development of 566 no. residential units consisting of 112 no. 4 bed units, 194 no. 3 bed units, 174 no. 2 bed units and 86 no. 1 bed units. The proposed development also includes a crèche facility and convenience retail outlet. Primary access to the proposed development will be via a new junction from the Greenfield Road which provides for the initial western section of the Maglin Urban Expansion Area (MUEA) Sustainable Access Corridor which can facilitate future access to further undeveloped and zoned lands within the wider MUEA. Ancillary site development works including ground works and retaining structures, foul drainage, stormwater drainage, water supply, electrical substation kiosks, boundary treatments, bicycle and car parking and landscaping. The areas of the site identified within the ZO 15 Public Open Space will be included within public open space/landscaped amenity areas, assisting in site drainage and green infrastructure proposals.

03 Summary

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Please do not hesitate to contact us if you have any queries.

Yours Sincerely

John O'Brien
HW Planning

- Enclosure 1 – Site Location Mapping
- Enclosure 2 – Site Layout Plan prepared by Deady Gahan Architects.

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24 January 2025

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The proposed development includes a 122 no. child capacity, two storey creche facility with a net floor area of 840 m2, centrally located within the subject site. This letter is accompanied by the propsoed creche facility building plans and Figure 2 as shown below provides an illustrative site plan of the creche site.

Figure 02. Site Plan Extract showing location of proposed creche.

03 Summary

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- Enclosure 3 – Proposed Creche Building Plans prepared by Deady Gahan Architects.

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2 January 2025

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2 January 2025

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The Secretary
Development Application Unit
Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media
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Email: ministers.office@tcagsm.gov.ie

2 January 2025

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Company Reg. No.
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Accreditations
ISO 9001:2015
ISO 14001:2015
ISO 45001:2018

Re: EIAR Scoping – Proposed Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork.

Dear Sir/Madam,

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The Secretary,
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2 January 2025

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2 January 2025

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2 January 2025

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The Secretary
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Booterstown Hall
Booterstown
Blackrock
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Email: GSIPlanning@gsi.ie

2 January 2025

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The Secretary
The Heritage Council
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Kilkenny
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Email: mail@heritagecouncil.ie

2 January 2025

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The Secretary
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Email: planning@water.ie

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John O'Brien
HW Planning

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The Secretary,
Department of the Environment, Climate and Communications,
Tom Johnson House,
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D04 K7X4
Email: customer.service@decc.gov.ie

2 January 2025

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Accreditations
ISO 9001:2015
ISO 14001:2015
ISO 45001:2018

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The Secretary
National Monuments Service,
Department of Housing, Local Government and Heritage
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D01 W6X0
Email: nationalmonuments@housing.gov.ie

2 January 2025

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Minister for Housing, Local Government and Heritage
c/o The Manager, Development Applications Unit,
National Parks and Wildlife Service (NPWS),
Department of Housing, Local Government and Heritage,
Newtown Road,
Wexford,
Y35 AP90.
Email: manager.dau@housing.gov.ie

2 January 2025

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The Secretary,
National Transport Authority,
Dún Scéine,
Harcourt Lane,
Dublin 2,
D02 WT20
Email: info@nationaltransport.ie

2 January 2025

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The Secretary
Office of Public Works,
Jonathan Swift Street,
Trim,
Co. Meath,
C15 NX36
Email: info@opw.ie

2 January 2025

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The Secretary
Teagasc
Oak Park,
Carlow
R93 XE12
Email: info@teagasc.ie

2 January 2025

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The Secretary
Transport Infrastructure Ireland,
Parkgate Business Centre,
Parkgate Street,
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D08 DK10
Email: landuseplanning@tii.ie

2 January 2025

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The proposed development comprises a 10-year permission for the construction of a development of 566 no. residential units consisting of 112 no. 4 bed units, 194 no. 3 bed units, 174 no. 2 bed units and 86 no. 1 bed units. The proposed development also includes a crèche facility and convenience retail outlet. Primary access to the proposed development will be via a new junction from the Greenfield Road which provides for the initial western section of the Maglin Urban Expansion Area (MUEA) Sustainable Access Corridor which can facilitate future access to further undeveloped and zoned lands within the wider MUEA. Ancillary site development works including ground works and retaining structures, foul drainage, stormwater drainage, water supply, electrical substation kiosks, boundary treatments, bicycle and car parking and landscaping. The areas of the site identified within the ZO 15 Public Open Space will be included within public open space/landscaped amenity areas, assisting in site drainage and green infrastructure proposals.

03 Summary

As stated previously, the purpose of this letter is to seek any comments the Health & Safety Authority may have that we should have regard to when preparing the EIAR for the project.

I would be grateful if you would forward any comments you may have on the proposed development to me at our office address listed below, or by email – info@hwplanning.ie. For convenience, this letter has been sent via email and hard copy to the addresses identified above.

Cork City Council Planning Department. For Inspection purposes Only!

Please do not hesitate to contact us if you have any queries.

Yours Sincerely

John O'Brien
HW Planning

- Enclosure 1 – Site Location Mapping
- Enclosure 2 – Site Layout Plan prepared by Deady Gahan Architects.

Cork City Council Planning Department
For Inspection Purposes Only!

hw planning

Connecting people.
Connecting places.

The Secretary,
Department of Agriculture Food and the Marine,
Agriculture House,
Kildare Street,
D02 WK12
Email: info@agriculture.gov.ie

2 January 2025

HW Planning
5 Joyce House,
Barrack Square,
Ballincollig,
Cork
P31 KP84

www.hwplanning.ie
info@hwplanning.ie
+353 (0)21 487 3250

Directors:
Harold Walsh
Conor Frehill

Company Reg. No.
486211

Accreditations
ISO 9001:2015
ISO 14001:2015
ISO 45001:2018

Re: EIAR Scoping – Proposed Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork.

Dear Sir/Madam,

We act on behalf of Murnane & O'Shea Limited who are preparing an application for a Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork. The application will be accompanied by an Environmental Impact Assessment Report (EIAR). Site location maps and a proposed site layout prepared by Deady Gahan Architects accompany this letter. The purpose of this letter is to seek any additional comments the Department of Agriculture Food and the Marine may have and that we should have regard to when preparing the EIAR for the project.

01 The Site

The subject lands of circa 15.17 hectares in area are situated in the townland of Greenfield, southwest of Ballincollig town centre. The lands are currently in agricultural use and bound to the south by the N22 and to the west by a small cluster of existing residential properties/farmyard and the Greenfield/Killumney Road which serves as the primary access point from the site.

Most of the subject lands are included within an area zoned as 'ZO 2 New Residential Neighbourhoods' in the Cork City Development Plan 2022 (CDP), with a portion of the site to the east included within the 'ZO 15 Public Open Space' zoning objective which state respectively.

> ZO 2 - *'To provide for new residential development in tandem with the provision of the necessary social and physical infrastructure.'*
>
> ZO 15 – *'To protect, retain and provide for passive and active recreational uses, open space, green networks, natural areas and amenity facilities.'*

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John O'Brien
HW Planning

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The Secretary
Irish Farmers Association
Irish Farm Centre,
Bluebell,
Dublin 12,
ED12 YXW5
Email: info@ifa.ie

2 January 2025

HW Planning
5 Joyce House,
Barrack Square,
Ballincollig,
Cork
P31 KP84

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+353 (0)21 487 3250

Directors:
Harold Walsh
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Company Reg. No.
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Cork City Council Planning Department. For Inspection purposes Only!

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John O'Brien
HW Planning

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Cork City Council Planning Department - For Inspection Purposes Only!

Connecting people.
Connecting places.

The Secretary,
Planning Department,
Cork County Council,
County Hall,
Carrigrohane Road,
Cork,
T12 R2NC.
Email: PlanningInfo@CorkCoCo.ie

6 January 2025

HW Planning
5 Joyce House,
Barrack Square,
Ballincollig,
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P31 KP84

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Yours Sincerely

John O'Brien
HW Planning

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Cork City Council Planning Department. For Inspection Purposes Only!

APPENDIX 1-4 Scoping Responses

Cork City Council Planning Department. For Inspection Purposes Only!

From: DIG
To: John O"Brien | HW Planning
Subject: RE: 09. EIAR Scoping - Proposed Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork.
Date: Tuesday 7 January 2025 08:23:28
Attachments: image001.png
Greenfield Ballincollig.pdf
Safety Booklet-A5-HSQE-GU-016.pdf

Thank you for your enquiry to the Gas Networks Ireland *Dial Before You Dig* service, please find the attached network map for your area of interest.
Gas Networks Ireland has *Distribution 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.

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.*

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.

Service Pipes

- Service pipes feeding individual properties are not generally shown but their presence should always be anticipated. For further information on domestic gas services refer to the *Safety Information.*

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 42 77 47.

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

Useful Publications

- Health and Safety Authority, *Code of Practice for Avoiding Danger from Underground Services*
- Health 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

From: jobrien@hwplanning.ie

Sent: Thursday, January 2, 2025 2:44 PM

To: networksinfo@gasnetworks.ie

Subject: 09. EIAR Scoping - Proposed Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork.

Dear Sir/Madam

Cork City Council Planning Department. For Inspection Purposes Only!

Please see attached relating to a proposed 'Large-Scale Residential Development' (LRD) to be accompanied by an Environmental Impact Assessment Report (EIAR) at Greenfield, Ballincollig, Cork, which we intend on submitting to Cork City Council in the coming months, on behalf of our client 'Murnane & O'Shea Limited'.

The purpose of this letter is to seek any additional comments you may have and that we should have regard to when preparing the EIAR for the LRD project. The attached have also been sent to you via hard copy for your convenience.

Kind Regards

John O'Brien

Planning Consultant

HW Planning

5 Joyce House

Barrack Square,

Ballincollig, Co. Cork

---

hwplanning.ie
+353 (0)21 4873250

+353 (0)87 1332570

LinkedIn

The content of this email may be confidential or legally privileged. If you are not the intended recipient you should delete this email and not read, disclose, distribute, copy, use or reply upon the information contained therein. If you have received this correspondence in error, please notify HW Planning immediately. We are committed to ensuring the security and protection of the personal information that we process in full accordance with our data management policy.

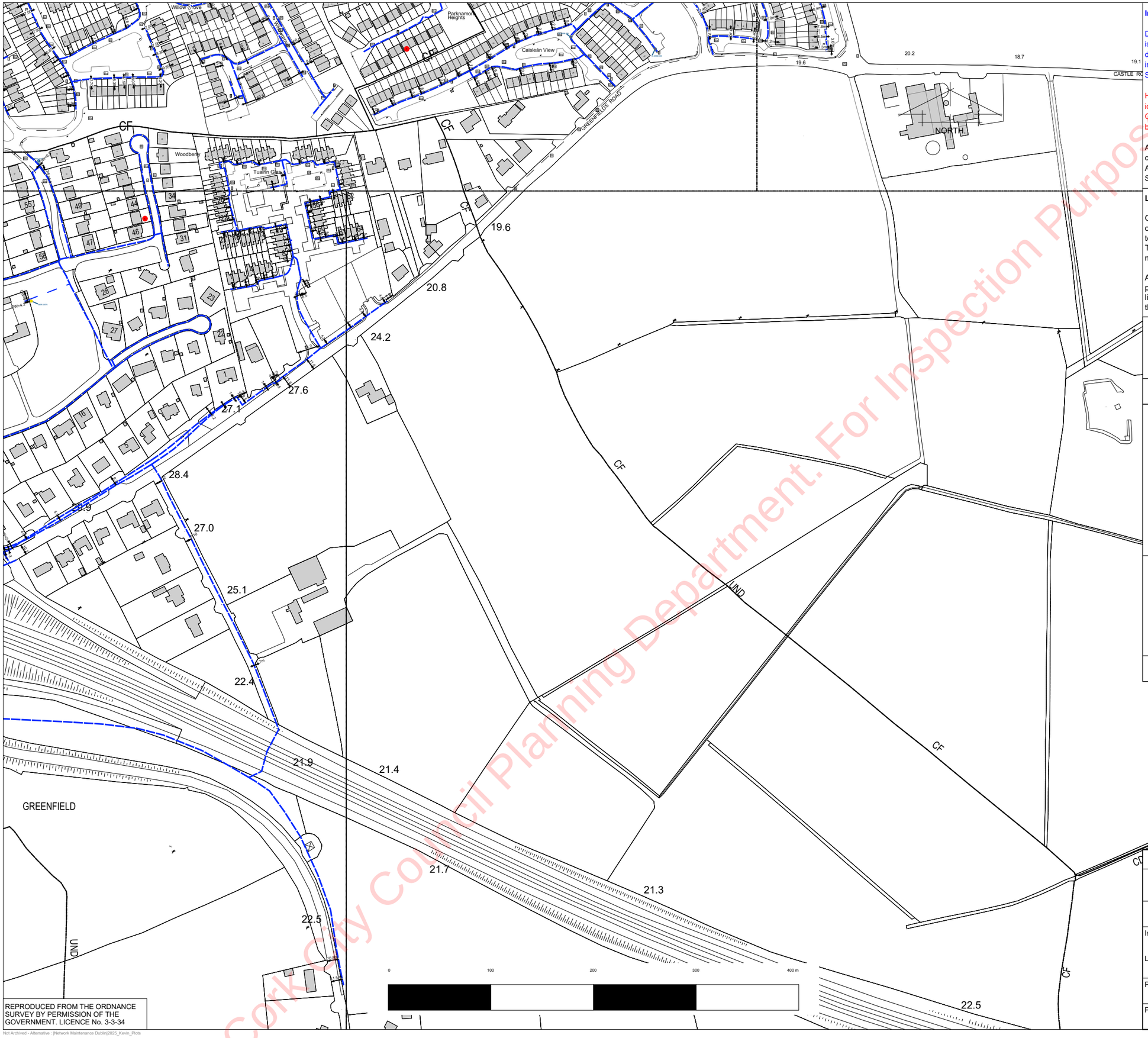
Tá an fhaisnéis á seachadadh dírithe ar an duine nó ar an eintiteas chuig a bhfuil sí seolta amháin agus féadfar ábhar faoi rún, faoi phribhléid nó ábhar atá íogair ó thaobh tráchtála de a bheith mar chuid de. Tá aon athsheachadadh nó scaipeadh den fhaisnéis, aon athbhreithniú ar nó aon úsáid eile a 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.

Cork City Council Planning Department. For Inspection Purposes Only!



Important Safety Notice:

Damage to gas pipelines can result in serious injury or death. Gas network information is provided as a general guide. The exact location and depth of medium or low pressure distribution gas pipes must be verified on site by carrying out necessary investigations, including, for example, hand digging trial holes along the route of the pipe.
Service pipes are not generally shown but their presence should always be anticipated.

High pressure transmission pipelines are shown in red. If a transmission pipeline is identified within 10m of any intended excavations then work must not proceed before GNI has been consulted. The true location and depth of a transmission pipeline must be verified on site by a representative of GNI. Contact can be made through 1800 427 747.

All work in the vicinity of the gas network must be completed in accordance with the current edition of the Health & Safety Authority publication, Code of Practice For Avoiding Danger From Underground Services which is available from the Health and Safety Authority (01 614 7000) or can be downloaded at www.hsa.ie.

Legal Notice:

Gas Networks Ireland (GNI) and its affiliates, accept no responsibility for the accuracy of any information contained in this document including data concerning location and technical designation of the gas distribution and transmission network (the Information). The Information should not be relied on for accurate distance or depth of cover measurements.

Any representations and warranties, express or implied, are excluded to the fullest extent permitted by law. No liability shall be accepted for any loss or damage including, without limitation, direct, indirect or consequential loss, arising out of or in connection with the use or re-use of the Information.

- Aurora Telecom Fibre Optic Cable
- Aurora Telecom Duct
- Aurora Telecom Sub-duct
- Aurora Telecom Inserted Gas Pipe

Contact Aurora Telecom on 1800-427-399 or (01)203-0120.

- Transmission Pipe (High Pressure)
- Transmission Pipe (Construction Issue)
- Distribution Pipe (Medium Pressure)
- Distribution Pipe (Low Pressure)
- Service Pipe (Medium Pressure)
- Service Pipe (Low Pressure)
- Strategic Pipe (Medium Pressure)
- Strategic Pipe (Low Pressure)
- Inserted Pipe (Medium Pressure)
- Inserted Pipe (Low Pressure)
- Distribution Pipe (Abandoned)
- CP Cable

.C=?	Cover (depth in meters)		Pressure Monitor
	CP Ground Bed		Protection (Sleeve)
	End Cap		Protection (Slabbing)
	Hot Tap		Reducer
	Installation		Service Terminator
	Valve		Tee
*	Mains Verification **		Transition

** Please contact GNI on 1800-427747 for specific information.

Design Department - DUBLIN

GAS NETWORK INFORMATION

Issue: HW Planning	
Location: Greenfield Ballincollig	
Plot Date: 07/01/2025	Contact: J O' Brien
Plotted by: KOC	Scale: 1:2500

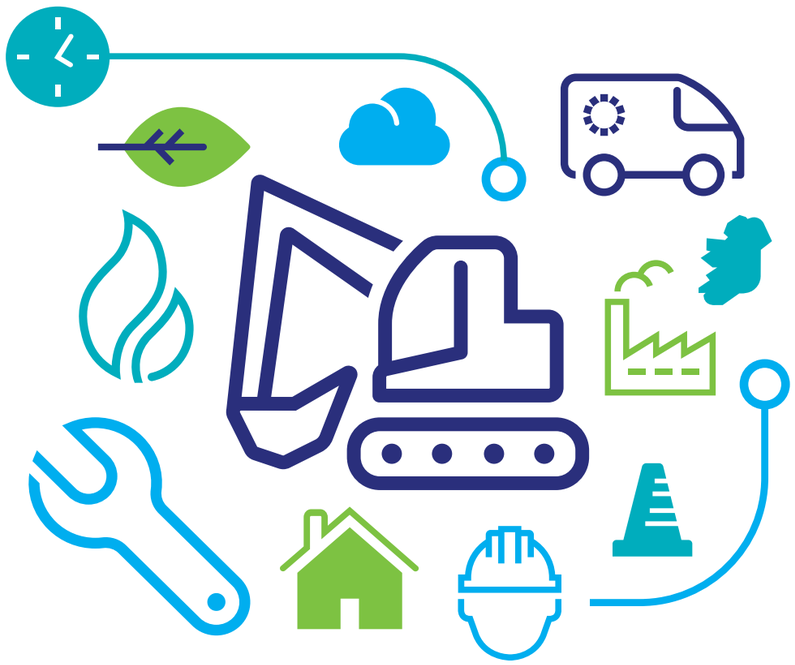
REPRODUCED FROM THE ORDNANCE SURVEY BY PERMISSION OF THE GOVERNMENT. LICENCE No. 3-3-34

Cork City Council Planning Department. For Inspection Purposes Only!

Not Archived - Alternative : [Network Maintenance Dublin]2025_Kevin_Plots

Gas Networks Ireland

Safety advice
for working in the vicinity of natural gas pipelines



DIAL BEFORE YOU DIG
1800 42 77 47
In Emergency call **1800 20 50 50** Gas Networks Ireland

When planning any excavation works dial
1800 42 77 47
to obtain up to date gas network maps.
Monday to Friday 9am – 5.30pm

Or you can sign up to DBYD online at
gasnetworks.ie/dbyd
and have access to maps 24 hours, 7 days a week
You can also contact us on
dig@gasnetworks.ie

If you have damaged a gas pipe call
1800 20 50 50
immediately, even if you do not suspect that gas is leaking
24 hours, 7 days a week

If you smell gas call
1800 20 50 50
24hr emergency service

Cork City Council Planning Department. For Inspection Purposes Only!

Contents

This booklet contains important safety advice. Please read the following before you start work:

Natural gas characteristics and behaviour 4
Risks of damaging a gas pipe 5
Risks from a damaged gas pipe 6
Gas Networks Ireland transmission network 7
Gas Networks Ireland construction methods 11
Gas Networks Ireland construction – depth of cover 12
Requesting Gas Networks Ireland maps 13
Reading Gas Networks Ireland maps 14
Gas services 16
Safe systems of work 17
What to do if a gas pipe is damaged 20
Gas Networks Ireland contacts 21
Other useful publications 22

Natural gas **characteristics and behaviour**

Characteristics

Natural gas is:

- a highly flammable gas;
- lighter than air and will rise when released;
- non-toxic (but can suffocate in enclosed or confined spaces); and
- made up mostly of methane and has a smell added for safety purposes.

Behaviour

During an uncontrolled escape, natural gas will behave in the following ways:

- In open excavations, where there is a clear path to the atmosphere, natural gas will rise, dilute and disperse into the air.
- If the path to the atmosphere is blocked, the gas will travel through soil, ducts, drains, sewers and voids. It can also follow the line of other buried utility services. This can lead to gas entering a building or other confined spaces, and may lead to a fire or explosion.

Note: Never cover a damaged gas pipe; or attempt to carry out a repair. Call 1800 20 50 50 immediately.

Cork City Council Planning Department. For Inspection Purposes Only!

Risks of **damaging a gas pipe**

The risks of damaging a gas pipe can be classified as:

Highest Risk

Mechanical excavators pose the highest risk and "should not be used within 500 mm of a gas distribution pipe."
(HSA Code of Practice)

Mechanical excavators must not be used within 3 metres of a Transmission pipeline.
(Refer to Code of Practice for Working in the Vicinity of the Transmission Network - AO/PR/127)

High Risk

Hand held power tools should not be used directly over the line of a gas pipe, unless the gas pipe has been positively located by hand and a safe working distance has been established.

Use of handheld power tools is not permitted within 1.5 m of a Transmission pipeline.
(Refer to Code of Practice for Working in the Vicinity of the Transmission Network - AO/PR/127)

Damage to gas pipes from power tools presents a high risk to the operatives involved in the work.

Low Risk

Hand digging using shovels and spades presents the lowest risk of damaging a gas pipe.

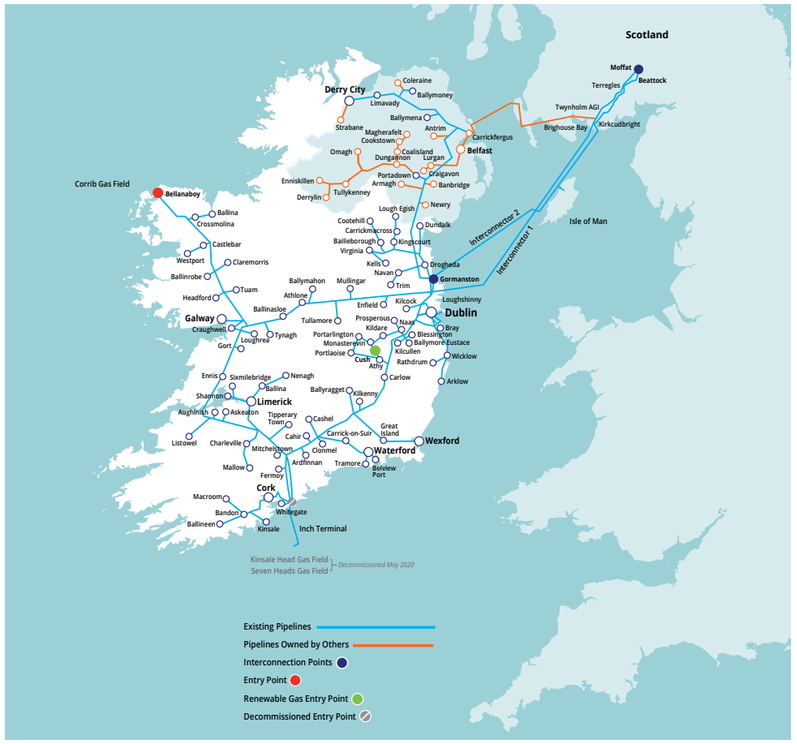
This is the method that should be used where the presence of gas pipes is suspected or close to a known gas pipe.

Risks from a **damaged gas pipe**

- Remember when gas escapes, or is released in an uncontrolled way; it can fuel a fire, give rise to an explosive atmosphere or cause asphyxiation.
- If you suspect there is a gas leak, immediately call Gas Networks Ireland's 24hr Emergency Service on **1800 20 50 50**.
- Gas can quickly fill underground cavities and travel into buildings through soil, or following the line of other buried utilities.
- Gas can only burn if exposed to an ignition source:
  - Do not turn electrical switches on or off
  - Do not operate any plant or equipment
  - Do not use naked flames, smoke or vape
  - Do not use mobile phones in the vicinity.
- Move people away from, and upwind of, the affected area.
- If gas has entered a confined space or building:
  - Open doors and windows
  - Turn off the gas supply at the meter
  - Do not expose to an ignition source.

Cork City Council Planning Department. For Inspection Purposes Only!

Gas Networks Ireland **transmission network**



Gas Networks Ireland transports gas in Ireland through a network of steel and polyethylene (PE) pipes. The network operates at pressures between 20 mbar and 85 bar and is split between Transmission and Distribution pipelines.

The **Transmission** system is made up of steel pipes and operates from 7 bar to 85 bar.

The **Distribution** system is made up mostly of polyethylene pipes and operates from 20 mbar to 7 bar.

The **network**

The network is made up of three elements:

- Transmission pipes
- Distribution pipes
- Pressure Regulating Installations

Transmission pipes

These are high pressure pipelines that transfer gas across the country. They are constructed from steel, with a black, white, cream, yellow or concrete coating, and may have marker posts at intervals along their length, particularly at field boundaries and road crossings.

If a transmission pipeline is identified near intended excavations then work must not proceed until Gas Networks Ireland Transmission has been consulted on 1800 42 77 47.

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Distribution pipes

These are medium or low pressure pipelines within urban areas. They are mainly constructed from Polyethylene (PE) and are predominantly yellow in colour, but may have brown or black stripes. There are two types – Mains and Services.

Mains gas pipes usually run parallel to property in the footpath, grass verge or road and range in size from 63 mm to 400 mm diameter.

Service gas pipes are connected to mains and run to a meter position at the property, and range in size from 20 mm to 63 mm diameter.

Note: There is a limited use of steel pipes in areas like bridges or where only shallow depths can be achieved.

There are still a small number of ductile and cast iron gas mains in use, ranging in size from 3 inch (75 mm) to 24 inch (600 mm) in diameter (these mains are similar in appearance to metal water mains). Steel and PE gas services are run from these metal mains to the meter location at each building.

These ductile and cast iron mains and services have been largely replaced with PE pipes. In urban areas a large number of redundant ductile or cast iron pipes are utilised as carrier pipes for new PE pipelines.

Some Distribution pipelines have been classified as strategic mains due to their pressure, diameter and/ or location and the elevated consequences if they are damaged.

If a Distribution strategic main is identified near an intended excavation then work must not proceed until Gas Networks Ireland has been consulted on 1800 42 77 47.

District Regulating Installation (DRI)

Pressure Regulating Installations

There are two types: Above Ground and Under Ground

Above Ground Installations (AGI) / District Regulating Installations (DRI)

An AGI/DRI is a fenced area containing a visible arrangement of pipework and ancillary equipment and will be clearly marked with Gas Networks Ireland signage. Some DRI's can be housed in a steel unit with no fencing surround.

Under Ground Installations (UGI /DRIug)

Gas Networks Ireland also have underground pressure regulating installations which have metal or concrete cover plates. There will be no visible arrangement of pipework etc, as this will be contained within the chamber.

If an AGI/DRI or UGI/DRIug is identified near intended works, then work must not proceed until Gas Networks Ireland has been consulted on 1800 42 77 47.

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Gas Networks Ireland **construction methods**

Gas Networks Ireland use three main construction methods:

'Dig' Technique

Open Cut – installing pipe using standard trenching techniques. Pipe is laid with a sand or pea gravel surround and gas marker tape is laid above the sand.

'No-Dig' Techniques

Insertion – utilising existing metal gas mains / services as a carrier for new PE pipes. Inserted PE may be a close or loose fit. The carrier pipe is broken out at connection points, i.e. at pipe joints or where a gas service pipe is connected.

Moling/Directional Drilling – installing mains/ services where a 'moling' machine drills from one location to another pulling the pipe behind it using "no-dig" technology.

Note: Where pipe has been installed using "no-dig" techniques, the gas pipe will not have sand surround or marker tape.

Gas Networks Ireland construction – **depth of cover**

Typical service arrangement

New Mains – Normally 750 mm in roads and 600 mm in footpaths. (1.1 m in open fields)

New Services – 450 mm rising to 375 mm within 1.5 m of the building line. In some cases these depths are not achievable.

Note:

Older mains and services may have reduced cover.

Services and other connections are taken from the top of the main and will therefore have a reduced depth of cover.

Alteration since original installation – roads, footpaths and grass verges may have been altered since the gas main or service was laid and reduced the depth of cover.

Purge Points and Test Caps – Mains are laid with "purge points" and/or test caps at the ends. These may also rise above the top of the main.

Gas Valve Covers –Gas valves are a key safety component part of the gas network.

Some gas mains and services have valves installed below ground with valve covers marked "GAS".

Do not cover over or remove gas valve covers.

The risk of a gas valve cover being removed or covered over is particularly high during resurfacing or reinstatement works.

Even shallow excavation techniques such as road planing can damage gas pipelines with reduced cover.

Service Connection

Purge Point

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Requesting **Gas Networks Ireland maps**

Gas Networks Ireland operates a **Dial Before You Dig** service to enable those involved in excavations to obtain natural gas network maps prior to starting work.

This service operates from 9am to 5.30pm, Monday to Friday.

Or you can sign up to DBYD online at **gasnetworks.ie/dbyd** and have access to maps 24 hours, 7 days a week.

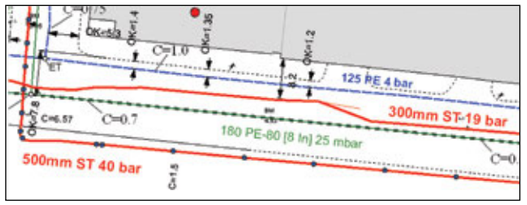
You can also email your enquiry to: **dig@gasnetworks.ie**

Maps will be sent out by post or by email where appropriate. When you contact Gas Networks Ireland to request a map, ensure you give the precise location of the intended works. You may be required to give some information regarding the nature of the planned work, i.e. start date, any high risk activity, etc.

Ensure you have allowed enough time for the maps to be obtained and to organise for the pipe location to be marked out if transmission pipelines are involved.

Note: Typical turnaround for maps is five working days when contact is made through phone or email, however using the online system will allow you instant access to up-to-date maps.

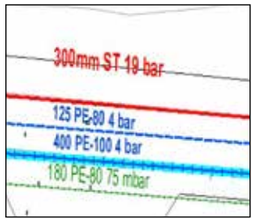
Organisers or planners of any work should ensure that the map is made available to personnel on-site.



Excerpt from a Gas Networks Ireland map.

Reading **Gas Networks Ireland maps**

Note: Natural Gas Network maps will only show mains and not services.
See page 16 for more information on service pipe locations.



The colour coding is as follows:

Red = Transmission Main*
= 7 to 85 bar.

Blue = Distribution Medium Pressure
= 100 mbar to 7 bar.

Blue Buffer =Distribution strategic main*
= 100 mbar to 7 bar.

Green = Distribution Low Pressure
= up to 100 mbar.

Typical AGI

Pressure regulating installations are marked as:

DRI – District Regulating Installation (Above Ground).

DRIug - District Regulating Installation (Under Ground).

UGI – Under Ground Installation.

AGI – Above Ground Installation.

** If you obtain a natural gas network map that shows a **red** Transmission main in the area of the proposed works or a distribution strategic main with a blue buffer, a consultation with Gas Networks Ireland **must** take place **before** starting works. Gas Networks Ireland will advise you on the safety measures required and will arrange for the location of the pipe to be marked out on site.*

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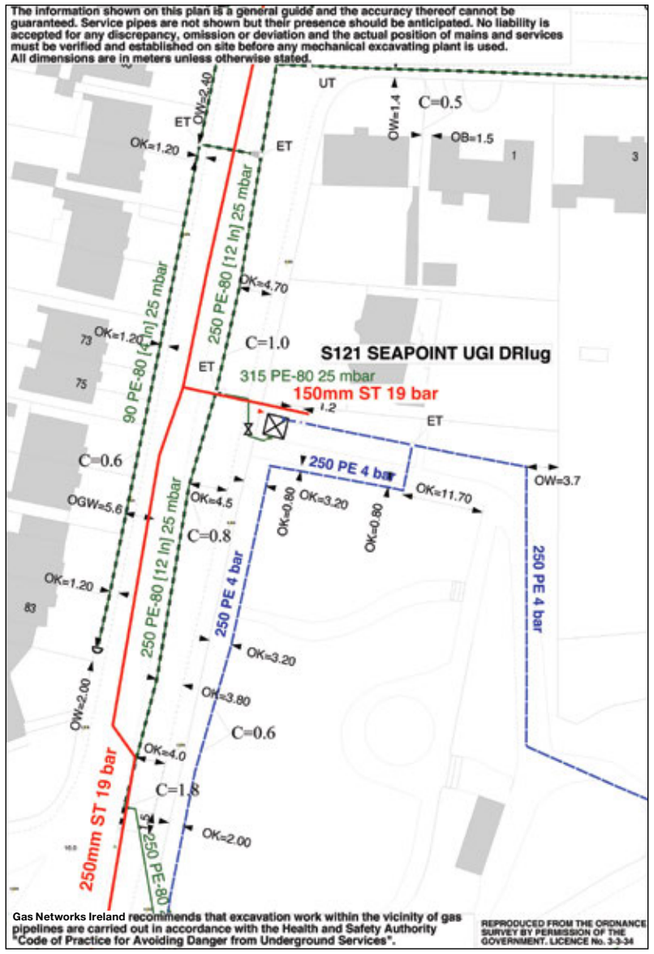
Reading **Gas Networks Ireland maps**



Example of a Gas Networks Ireland map

Abbreviations

OK = Kerb, Curb
ORE = Road Edge
ORB = Rail Base
OB = Building
OW = Wall
OF = Fence
ODW = Dividing Wall
OGW = Garden Wall
RD = Road
BR = Branch
RED = Reducer
C = Cover to top of pipe
LH = Left Hand
RH= Right Hand
SWP = Sweep
CNR = Corner
S = South
N = North
E = East
W = West
No. = Number
Ctr = Centre
CL = Centre Line
Trans = Transition
DIV = Dividing
PK = Park
Conn = Connection
Opp = Opposite
Cplg = Coupling
ST = Steel
PE = Polyethylene

Gas **services**

Typical service arrangement

Service riser cover

Natural gas services are not normally identified on network maps, but their presence should be assumed. Services will normally, but not always, run at right angles from the main to the meter point.

To assist in determining the approximate position of gas services ensure you:

- Obtain a natural gas network map to identify the position of the gas main.
- Complete a site survey looking for gas meter boxes/cabinets, house entry points, service risers and gas valve covers.
- Older buildings may have no visible signs of a service, as the service may run directly into the building underground, with the meter fitted internally. In these cases a check should be made inside the building to identify the meter position.

Note: Ensure you utilise safe digging practices to locate the exact position of gas services.

Domestic meter box

Six meter cabinet

Purpose built multi-meter house (apartment complex).

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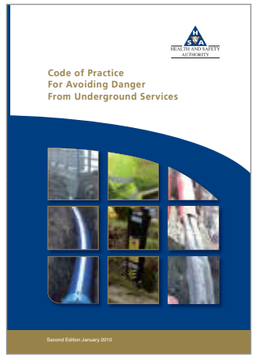
Safe systems of work

Safe systems of work, as recommended by the Health and Safety Authority (HSA) should be employed on all projects.

Guidance on this can be found in the:

HSA: Code of Practice for Avoiding Danger from Underground Services.

Available from HSA website: **www.hsa.ie**



A safe system of work will include the following elements:

- Planning.
- Obtaining and using utility maps.
- Identifying pipes/services.
- Safe digging practices.
- Explosives must not be used within 30 m of any gas pipe (400 m for Transmission Pipelines), without prior consultation with Gas Networks Ireland.
- Piling, directional drilling or boring must not take place within 15 m of a gas pipe unless Gas Networks Ireland has been consulted.
- Extra care should be exercised when performing 'hot work' (such as welding) where a gaseous atmosphere could exist. If this potential exists Gas Networks Ireland must be consulted.
- Extra care should also be taken when using welding equipment, burners, torches or other heat generating equipment near pipelines (even if there is no potential for a gaseous atmosphere to exist) to ensure that the heat or sparks generated do not lead to the melting of polyethylene pipes or damage to pipeline coatings.

Contact Gas Networks Ireland for general enquiries on: 1800 464 464.

Safe systems of work

Planning

- Early contact should be made with Gas Networks Ireland to obtain a Natural Gas Network map.
  Dial Before You Dig 1800 42 77 47
  or visit **gasnetworks.ie/dbyd**
- Work involving piling, demolition, directional drilling, use of explosives or 'hot works' should be mentioned, as this may necessitate a site visit from Gas Networks Ireland personnel.
- Ensure you have allowed enough time to obtain the maps.

Maps

- Gas Networks Ireland will issue maps as outlined in this booklet. It is imperative that these maps are available for the operatives on-site for the duration of any works.
  The responsible person should ensure that operatives on-site understand the maps.

Identifying Pipes

- Steel, cast iron and ductile iron gas pipes can usually be traced using a conventional pipe/cable locating device set to "R" (Radio) mode.
- Polyethylene mains and services cannot be traced using conventional devices, so it is essential that maps are used and site surveys for meter boxes, valve covers, service risers, reinstatement scarring and other signs are completed.
- During the progress of works ensure no gas valve covers or markers are covered over.
- The position of gas mains and services should be marked out as they are located.

Note: Transmission pipelines pipelines and Distribution strategic mains must be marked out by a Gas Networks Ireland inspector.

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Safe systems of work

Safe Digging Practices:

- As per the HSA Code of Practice, gas mains and services should be located by digging trial holes by hand. Mechanical excavators should not be used within 500 mm of any gas main.
  Mechanical excavators MUST NOT be used within 3 m of a Transmission pipeline.
  (Refer to Code of Practice for Working in the Vicinity of the Transmission Network - AO/PR/127)
- Never use hand held power tools directly over gas pipes unless precautions to prevent damage have been made and the pipe has been positively located.
  Use of handheld power tools is not permitted within 1.5 m of a Transmission pipeline.
  (Refer to Code of Practice for Working in the Vicinity of the Transmission Network - AO/PR/127)
- Do not leave a polyethylene gas pipe exposed.
- Provide adequate support for any gas pipe uncovered during the work.
- Report any damage, no matter how minor it may appear, to **1800 20 50 50.**
- If you have any concerns regarding safety around gas pipes contact Gas Networks Ireland for advice on **1800 464 464**.

What to do if a gas pipeline is damaged
(or if you smell gas in the area)

- Do not turn any electrical switches on or off, e.g. ignition switches.
- Do not operate any plant or equipment.
- Move people away from, and upwind of, the affected area. Restrict employee and public access to the affected area.
- Prevent smoking, vaping, the use of naked flames, the use of mobile phones and other ignition sources in the vicinity of the leak.
- Report the leak/damage immediately to:
  Gas Networks Ireland 24hr Emergency Service on 1800 20 50 50.
- Provide accurate information on your location and the nature of the incident.
- Do not attempt to repair the damage.
- Do not cover up a damaged main or service, this may lead to the gas travelling through soil, ducts, sewers, chambers or voids and potentially building up inside a premises or confined space.
- Do not turn off any gas valves in the road or footpath (you may be causing further problems by doing so).
- Assist Gas Networks Ireland emergency personnel as required.
- Remember any damage to gas pipes, even if the pipe does not appear to be leaking, must be reported to Gas Networks Ireland.

If you smell gas call

1800 20 50 50

24hr emergency service

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Gas Networks Ireland contacts

The main contact numbers for Gas Networks Ireland are

24hr Emergency Service
1800 20 50 50
24 hours, 7 days a week

Dial Before You Dig
1800 42 77 47
Monday to Friday 9am – 5.30pm

or sign up to DBYD online
gasnetworks.ie/dbyd

General Enquiries
1800 464 464
Monday to Friday 8am – 8pm
Saturday 9am – 5.30pm

gasnetworks.ie

For "Dial Before You Dig" posters or stickers for your workplace call: **1800 464 464**

Other useful publications

HSA: Code of Practice for Avoiding Danger from Underground Services

HSA: Guide to Safety in Excavations

both are available free of charge from:
Health and Safety Authority on **01 614 7000**
www.hsa.ie

ESB Networks: How you can avoid hitting electrical cables when digging and drilling

available free of charge from:
ESB Networks on **1800 372 757**
esb.ie/esbnetworks

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The main contact details for Gas Networks Ireland are:

General Enquiries
1800 464 464

Dial Before You Dig
1800 42 77 47

24hr Emergency Service
1800 20 50 50

networksinfo@gasnetworks.ie

gasnetworks.ie

Guideline No: HSQE/GU/016 Rev 2 Date: November 2020

Cork City Council Planning Department. For Inspection Purposes Only!

From: Michael McPartland
To: John O"Brien | HW Planning
Subject: . EIAR Scoping - Proposed Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork
Date: Wednesday 15 January 2025 11:15:30
Attachments: image004.png
email_852418dc-7261-46bd-8cad-0f5cfb922b46.png
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home_d6e0b8ad-bed2-44cf-a08c-5ceec6c9c9fe.png
external-signature_6737b7d5-5705-4554-b86d-f0ded9774efe.png

John,

Thank you for your recent email regarding the above-mentioned.
It appears it may be proposed to dispose of septic effluent from the development to the public sewer. IFI would ask that Irish Water signifies there is sufficient capacity in existence so that it does not overload either hydraulically or organically existing treatment facilities or result in polluting matter entering waters. Should this not be the case then please forward proposals for alternative treatment and disposal options.
IFI would ask that there be no interference with, bridging, draining, or culverting of the adjacent river or any watercourse its banks or bankside vegetation to facilitate this development, without the prior approval of IFI and that full cognisance is given to IFI "Guidelines on protection of fisheries during construction works in and adjacent to waters"

https://www.fisheriesireland.ie/media/guidelines-on-protection-of-fisheries-during-construction-works-in-and-adjacent-to-waters

Additionally, any development works which would result in loss of flood plain or increase in off site flows above greenfield levels should be avoided.

Michael Mc Partland
Senior Fisheries Environmental Officer.

Iascach Intíre Éireann
Inland Fisheries Ireland
Tel + 353 (0)26 412 21/2
Fax + 353 (0)26 412 23
Email michael.mcpartland@fisheriesireland.ie
Web www.fisheriesireland.ie
Sunnyside House, Macroom, Co. Cork, Ireland. P12 X602

Help Protect Ireland's Inland Fisheries

Michael McPartland
Senior Fisheries Environmental Officer

Michael.McPartland@fisheriesireland.ie • +353 (0)26 41222 • www.fisheriesireland.ie • P12 X602

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An Roinn Comhshaoil, Aeráide agus Cumarsáide
Department of the Environment, Climate and Communications

Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

John O'Brien
HW Planning
5 Joyce House
Barrack Square,
Ballincollig, Co. Cork

22 January 2025

Re: EIAR Scoping - Proposed Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork
Your Ref: n/a
Our Ref: 25/01

Dear John,

Geological Survey Ireland is the national earth science agency and is a division of the Department of the Environment, Climate and Communications. We provide independent geological information and interpretation and gather various data for that purpose. Please see our website for data availability.

With reference to your email received on the 06 January 2025, concerning the EIAR Scoping - Proposed LRD at Greenfield, Ballincollig, Cork, we recommend using our various data sets when conducting the EIAR, SEA, planning and scoping processes for developments, plans and policies. For more detailed information on how to access this data please access 'Data and Maps' Data & Maps (gsi.ie) on our 'Geoscience for planning' webpage. Use of our data or maps should be attributed correctly (please refer to each individual dataset's metadata for correct attribution).

For specific data available for Environmental Assessment and Planning topics please follow this link [Data by Environmental Assessment and Planning Topic (gsi.ie)], where you will find our data arranged by environmental assessment topic as illustrated below:

Land and soils	Water	Climate Change
Soil • Subsoils (Quaternary Geology) • Tellus Geochemistry • Geotechnical *Geology* • Bedrock • Geophysics • Bedrock & Quaternary 3D	*Groundwater* • Aquifers GW vulnerability, GWPSs (GWPPs) *Surface water* • Tellus Geochemistry *Estuarine & marine waters* • Marine and coastal *Flooding* • GWClimate • Karst	*Carbon accounting / Carbon balance* • Geothermal • Carbon capture and storage *Climate change trends* • National coastal change assessment

Cultural Heritage	Material Assets	The Landscape
Archaeology • Cherish *Underwater Archaeology* • Shipwrecks	*Built Services* • Natural resources (Minerals & Aggregates) • Active quarries	*Landscape Appearance & Character* • Physiographic units *Historical landscapes* • Historic mines

Other Relevant Data		
Natural (Geo) hazards • Landslide Susceptibility Mapping • Groundwater flooding • Coastal vulnerability • Subsidence • Radon	*Natural heritage* • Geoheritage (County Geological Sites) • Dimension Stone/Stone Built Ireland	

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Department of the Environment, Climate and Communications

Geological Survey
Suirbhéireacht Gheolaíochta
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Other Comments

Should development go ahead, all other factors considered, Geological Survey Ireland would much appreciate a copy of reports detailing any site investigations carried out. The data would be redacted for confidentiality and added to Geological Survey Ireland's national database of site investigation boreholes, implemented to provide a better service to the civil engineering sector. Data can be sent to the Geological Mapping Unit, at mailto:GeologicalMappingInfo@gsi.ie.

If we can be of any further help, please do not hesitate to contact me Clare Glanville, or my colleague Trish Smullen at GSIPlanning@gsi.ie.

Yours sincerely,

Dr. Clare Glanville
Senior Geologist
Geoheritage and Planning Programme
Geological Survey Ireland

Trish Smullen
Geologist
Geoheritage and Planning Programme
Geological Survey Ireland

The publicly available data referenced/presented here, should in no way be construed as Geological Survey Ireland support for or objection to the proposed development or plan. The data are made freely available to all and can be used as independent scientific data in assessments, plans or policies. It should be noted that in many cases these data are a baseline or starting point for further site specific assessments.

Geological Survey Ireland, Block 1, Booterstown Hall, Booterstown, Blackrock, Co Dublin, A94 N2R6
Bloc 1, Halla Bhaile an Bhóthair, Baile an Bhóthair, An Charraig Dhubh, Baile Átha Cliath, A94 N2R6
T +353 (0)1 678 2000 **www.gsi.ie** *Fáiltítear roimh comhfhreagras i nGaeilge*

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From: INFO
To: Info
Subject: TII Ref: TII25-129935 - EIAR Scoping - Residential Development at Greenfield Ballincollig Cork
Date: Wednesday 29 January 2025 09:37:22
Attachments: image001.png

Dear Mr. O'Brien,

Thank you for your correspondence of 2 January 2025 regarding the above. Transport Infrastructure Ireland's (TII's) position in relation to your enquiry is as follows.

TII wishes to advise that it is not in a position to engage directly with planning applicants with respect to proposed developments. TII will endeavour to consider and respond to planning applications referred to it, given its status and duties as a statutory consultee under the Planning Acts. The approach to be adopted by TII in making such submissions or comments will seek to uphold official policy and guidelines, as outlined in the Section 28 Ministerial Guidelines 'Spatial Planning and National Roads Guidelines for Planning Authorities' (DoECLG, 2012) and TII publications. Regard should also be had to other relevant guidance available at www.TII.ie.

The issuing of this correspondence is provided as best practice guidance only and does not prejudice TII's statutory right to make any observations, requests for further information, objections or appeals, following the examination of any valid planning application referred.

TII observed that the proposed development site has a boundary with the N22. It is noted that the development is proposed to locate dwellings and potentially other infrastructure in proximity to national road boundary. Based on the information available, TII are unable to ascertain or evaluate that national road interactions within the TII maintained area and all associated infrastructure assets including lighting, gantries, signage, substations, boundary treatments and drainage arrangements have been considered especially with regard to future residential amenity and maintenance of the national road network.

For clarity, TII will entertain no future claims in respect of impacts (e.g., noise, air, dust, drainage, light, visual etc.) from the proposed development or future occupants, if approved, due to the presence of the existing road. TII advises that regard needs to be had to the provisions of Chapter 3 of the DoECLG Spatial Planning and National Roads Guidelines for Planning Authorities in the preparation of a future planning application.

With respect to EIAR scoping issues, the recommendations indicated below provide only general guidance for the preparation of an EIAR, which may affect the national roads networks. No part of this submission shall be construed as TII giving consent to access or alter any national road infrastructure assets including drainage regimes, structures, safety, etc. In the event that any damage is caused by any development works to the national road or associated assets, overground or underground, costs arising to fully remediate all impacted infrastructure assets to TII Publications standards and requirements will be pursued.

The project promoter should have regard, inter alia, to the following:

Having regard to the EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports, 2022 it is recommended as appropriate that the national road and light rail

networks are recognised as strategic transport assets under "material assets". EIAR assessment and mitigation should have regard to the following:

- **National Roads**: Official policy for development at or near national roads is set out in in the DoECLG Spatial Planning and National Roads Guidelines for Planning Authorities (2012) available at https://www.gov.ie/en/collection/85b83-planning-guidelines-standards/

- **TII Publications**: In addition, as part of TII's responsibilities for managing and improving the country's national road and light rail networks, the Authority sets development guidance and standards for traffic and road assessments and construction that may be necessary by reason of proposed development location, scale or typology to be prepared to accompany applications for developments or works. Technical guidance and standards are contained in TII Publications, available at https://www.tiipublications.ie/

In addition, the EIAR should have regard to, *inter alia*, to the following:

National Road Network:

- TII would be specifically concerned as to potential significant impacts the development would have on the national road network (and junctions with national roads), in the proximity of the proposed development.

- Consultations should be had with the relevant Local Authority/National Roads Design Office, with regard to the locations of existing and future national road schemes.

- The EIAR should have regard to any prior Environmental Impact Statement or Assessment Report and all conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in the area. The developer should, in particular, have regard to any potential cumulative impacts.

- The EIAR should have regard to the provisions of Chapter 3 of the DoECLG 's 'Spatial Planning and National Roads Guidelines for Planning Authorities', in the assessment, in particular, the EIAR and associated design:
    - Should be cognisant of Environmental Noise Regulations 2006 (SI 140 of 2006) and how the development will affect and interact with action plans by the relevant competent authority as well as the Guidelines for the Treatment of Noise and Vibration in National Road Schemes (1st Rev., National Roads Authority, 2004)). Any additional works/structures required shall be funded by the developer.
    - With respect to the extent of the landscaping and boundary treatments, Details of proposed management of this area and also measures to ensure the protection of the national road network at this location shall be required as part of a future planning application. Any additional works/structures required should be funded by the developer.
    - The EIAR should identify structures (lighting, gantries etc) associated with national road management located in close vicinity to the proposed development site. There is a need to address these matters of interactions for future residents. Any additional works/structures required should be funded by the developer.
    - With respect to the extent of the lands, it should be noted that national road surface water drainage regimes are constructed with the objective of disposing of national road surface water only. It is important that capacity in the national roads surface water drainage regime is retained to address this essential function.
    - TII advises it would not support any private development application accessing the national road drainage regime and the Council should ensure that this does not occur. TII expects that this will be demonstrated by the future applicant.

TII Publications:

- It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment (TTA) be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site, with reference to impacts on the national road network and junctions of lower category roads with national roads. In relation to national roads, TII's 'Traffic and Transport Assessment Guidelines' (2014) should be referred to in relation to proposed development, with potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of TII's TTA Guidelines, which addresses requirements for sub-threshold TTA.

- The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required.

Haul routes utilising the national road network:

- Elements of the national road network are operated and managed by a combination of (Public Private Partnerships) PPP Concessions, Motorway Maintenance and Renewal Contracts (MMaRC) and local road authorities, in association with TII. In relation to haul route identification, the applicant/developer should clearly identify haul routes proposed and fully assess the network to be traversed to ascertain any operational requirements, including delivery timetabling, etc., to ensure that the strategic function of the national road network is safeguarded.

- Separate structure approvals/permits and other licences and works specific deeds of indemnity may be required in connection with the proposed haul route, including where temporary modification to the road network may be required. Consultation with all relevant local authorities, PPP Companies and MMaRC Contractors, may also be required.

- All structures on the haul route should be checked by the applicant/developer to confirm their capacity to accommodate any abnormal load proposed, including abnormal weight load. Additionally, any damage caused to the pavement on the existing national road arising from any temporary works due to the turning movement of abnormal loads (e.g. tearing of the surface course, etc.) shall be rectified in accordance with TII Pavement Standards and details in this regard shall be agreed with the Road Authority

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prior to the commencement of any development on site.

TII environmental assessment guidance:

- The EIAR should have regard to TII's Environmental Assessment and Construction Guidelines, including the 'Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes' (National Road Authority (NRA), 2014).

- The EIAR should consider the European Communities '(Environmental Noise) Regulations 2018' (S.I. No. 549 of 2018)) and, in particular, how the development will affect future action plans by the relevant competent authority. The developer may need to consider the incorporation of noise barriers to reduce noise impacts (see 'Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes' (NRA, 2014)).

Notwithstanding any of the above, the developer should be aware that this list is non-exhaustive, thus site and development specific issues should be addressed in accordance with best practice.

I hope that this information is of assistance to you.

Kind regards

Suzanne Cahill
Regulatory & Administration Executive
Transport Infrastructure Ireland

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Cork City Council Planning Department. For Inspection Purposes Only!

Suite 1, John Dunlop House, Marina Commercial Park, Centre Park Road, Cork, T12 P9PV
Tel: 021 4310500, Email: info@corkcitychildcare.ie

Date: 31st January 2025

RE: Proposed Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork.

To whom it may concern,

Cork City Childcare carried out a childcare needs assessment for the Proposed Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork, area. The accompanying table is a list of Childcare Services located within 3 km radius surrounding this area. The childcare needs assessment was conducted with information gathered from the Tusla register on the week of 27/01/2025. The Childcare Assessment reflects the services that are in operation within 3km radius of the Greenfield, Ballincollig, Cork, area. Please note this is a mix of full day care, sessional preschools, and/or part-time childcare services, combined Early Learning and care/school aged childcare.

According to the ***Childcare Facilities Guidelines for Planning Authorities, 2001,*** a standard of one childcare facility providing for a minimum 20 childcare places per approximately 75 dwellings is a guideline provided. In terms of this development, with 480 dwellings proposed (omitting 86 one bedroom dwellings) , that would average **approximately 128 childcare spaces at a minimum.** Based on the childcare availability surrounding this location there is a need for a larger childcare facility to be considered offering a range of different service types, such as sessional/part time/full day care/drop in/after-school.

It is clear from the capacity assessment undertaken by Cork City Childcare that there are minimal places available in the area. There are 8 of these services offering preschool only sessions, operating on only a 15-hour week basis. In most cases additional childcare provision, alongside this three hour per day, is required to meet the needs of working families and parents engaged in training and education.

Within a 3km radius of of the Greenfield, Ballincollig, Cork, area there are only three services catering for full day care. Only two of these services is currently providing care for children under the age of two years. Many childcare services in the 3km radius surrounding this area operate an internal waitlist, to meet the needs of families already within the service, that often **comprises of a two year wait.** Please note this is not inclusive of the external waitlist available to additional children and families in the area. The demand for baby places is at an all-time high. The Annual Early Years Sector Profile Survey 2020/2021 report states that for every two babies enrolled in services, approximately three are placed on a waiting list (154%). A link to the full report is available here: Annual Early Years Sector Profile Survey 2020/2021 report

The Central Statistics Office Ireland (CSO, 2023) also reported there was a total of 1,704 children aged between 0-4 years, 1,913 children aged between 5-9 years and 1,887 children aged between 10-14 years residing within a 3km radius of the Greenfield, Ballincollig, Cork, area. as of, 2023. Everchanging dynamics in how young families are now living has also added to the already existing childcare demand associated with the area.

According to *Census of Population 2022 Profile 3 - Households, Families and Childcare* National

- Almost one-third (331,783) of children under the age of 15 in the State were in some form of childcare.
- A crèche or a similar facility was the most common form of childcare (42%), followed by an unpaid relative or family member (28%).
- A crèche was the most common type of childcare used among 0- to 4-year-olds. Over half (56%) used this childcare option and a further 19% used an unpaid relative or family member.
- Primary school children were most likely to be in some type of childcare (52%).

Cork City

- There were 146,235 families in Cork in April 2022, up from 138,895 (+5%) in 2016. The average number of children per family in the county was 1.32, compared with 1.34 nationally.
- There were 113,667 children aged 15 and under in Cork in April 2022. Of these, 38,604 (34%) were in childcare, compared with 33% nationally.

Based on the county average of 1.32 children per family, applying this to the 480 proposed family homes (omitting the 86 one bedroom dwellings) results in an estimate 633.6 children. Given that 34% of these children (the county average for those requiring childcare) would need childcare within a 15-year cycle, this equates to approximately 215.4 children. **Therefore, we would recommend and advocate for a larger childcare facility than the proposed 122 space one in the reports and plans for this LRD.** It is vital that Cork City has sufficient capacity to support the growing demand for childcare in lands located at the Greenfield, Ballincollig, Cork, area.

In conclusion, with reference to the Childcare Facilities Guidelines for Planning Authorities (2001), **a capacity of 128 at minimum would align with the recommendations provided.** However, given the national demand for childcare services and the significant shortage of spaces for children aged 1-3 years, we would advocate for the development of a larger facility. The area of Ballincollig has seen substantial housing growth in recent years, yet the availability of childcare services has not kept pace. We are experiencing a high volume of inquiries from parents who are facing long waiting lists, which highlights the pressing need for additional childcare spaces. We would therefore recommend a facility with greater capacity, accommodating a broader range of age groups.

Thank you for the opportunity to submit this proposal and contribute to the development of much-needed childcare services in Cork City. I am enthusiastic about the potential positive impact this facility could have on the community and its families. Please feel free to reach out if you require any further details, clarification, or additional support as you move forward with the planning and implementation of this Childcare Facility. I would be more than happy to assist in any way I can to ensure the successful development and operation of this important project.

Kind regards,

Leanne Twomey

Development Officer

Cork City Childcare Committee

Directors: Eibhlín Mhic Pharthalain, Eileen Wedel, Marian Quinn, Johanna Forde
CRO Number: 354923 Charity Number: 20204749

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Cork City Childcare- Capacity Assessment

ELC Childcare					
Name	**Address**	**Service Type**	**Age Range**	**Capacity**	**Available places**
Rainbow Rascals Montessori School	22 Hawthorn Ave, Inniscarra View, Ballincollig, Co. Cork	Sessional	2-6 yrs	11	0
Cheeky Cherubs Early Years Schools – Bishopstown	19 Uam Var Avenue, Bishopstown, Cork City, Co. Cork	Full Day/ Part Time/ Sessional	2-6 yrs	40	0
Child Vision Pre-school	c/o Guide Dogs HQ, Model Farm Road, Ballincollig, Co. Cork	Sessional	2-6 yrs	11	0
The Willows Montessori	The Willows, Model Farm Road, Co. Cork	Sessional	2-6 yrs	22	2
Kindercare Childcare	Unit 4,5,8,9,10, Classes Lake Retail Centre, Classes Lake, Ovens, Co. Cork	Full Day/ Part Time/ Sessional	0-6 yrs	190	0
Positive Ideas T/A Highcare Childcare	Caisleán Drive, Ballincollig, Co. Cork	Full Day	0-6 yrs	160	0
Eileens Playschool	8 Glincool Drive, Maglin, Ballincollig, Co. Cork	Sessional	2-6 yrs	22	0
Spraoi Pre-school	9 The Paddocks, West Village, Ballincollig, Co. Cork	Sessional	2-6 yrs	19	0
Innishmore Family Resource Centre	Innishmore, Ballincollig, Co. Cork	Sessional	2-6 yrs	68	0
Na Seoda Oga	Community Centre, Station Road, Ballincollig, Co. Cork	Sessional	2-6 yrs	38	0
Ballincollig Early Years Pre school (BRFC)	The Village Centre, Station Road, Ballincollig, Cork, Co. Cork	Sessional	2-6 yrs	54	0

School Aged Childcare					
Name	**Address**	**Service Type**	**Age Range**	**Capacity**	**Available places**
Sherpa Kids Gaelscoil an Chaisleáin	Tanner Park , Coolroe, Ballincollig, Co. Cork	Stand Alone	4-12 yrs	48	0
Cheeky Cherubs	Highfield Park, Carriganarra, Ballincollig, Co. Cork	Combined	4-10 yrs	24	0
Kindercare Childcare	Unit 8, 9 & 10, Classes Lake Retail Park, Ballincollig, Co. Cork	Combined	4-12 yrs	22	0
Na Seoda Oga	Ballincollig Community Hall, Station Road, Ballincollig, Co. Cork	Combined	4-12 yrs	25	0
Positive Ideas T/A Highcare Childcare	Caisleán Drive, Ballincollig, Co. Cork	Combined	4-12 yrs	60	0

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For the attention of John O'Brien
HW Planning
5 Joyce House
Barrack Square,
Ballincollig, Co. Cork

05 st February 2025

By Email: jobrien@hwplanning.ie

Uisce Éireann
Bosca OP 6000
Baile Átha Cliath 1
D01 WA07
Éire

Uisce Éireann
PO Box 6000
Dublin 1
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T: +353 1 89 25000
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www.water.ie

Re: EIA Scoping Request – Proposed 556 no. unit residential development with childcare and convenience retail facilities plus associated works at Greenfield Ballincollig, Cork.

Dear John O'Brien

Uisce Éireann has received notification of your Environmental Impact Assessment (EIA) scoping request relating to Murnane & O'Shea Ltd's forthcoming application to construct a 556 unit residential development in Ballincollig, Cork City.

Please see attached, Uisce Éireann's scoping opinion in relation to your proposals and Uisce Éireann's public infrastructure & assets.

On receipt of the planning referral, Uisce Éireann will review the finalised Environmental Impact Assessment Report (EIAR) as part of our planning assessment. Uisce Éireann's will then issue a statutory response to the Planning Authority in line with our obligations as a statutory consultee.

Uisce Éireann's Response to EIAR Scoping Request

The proposed site boundary as described appears to have no interaction with existing UE assets , however please note that Uisce Éireann does not allow build over of its infrastructure, and if such an impact is to be expected, an agreement between the applicant and our diversions team will be necessary.

The proposed development will require significant water and wastewater services from Uisce Éireann's network. The applicant is encouraged to engage with UEs connections department at an early juncture, submit a pre connection enquiry to Uisce Éireann and receive a Confirmation of Feasibility (COF) letter from our connections department, that will form part of the formal planning application lodgment documentation.

In addition to the specific items outlined above please note the following aspects of Water Services which should be considered in the scope of an EIAR where relevant;

Stiúrthóirí / Directors: Tony Keohane (Cathaoirleach / Chairman), Niall Gleeson (POF / CEO), Christopher Banks, Fred Barry, Gerard Britchfield, Liz Joyce, Patricia King, Eileen Maher, Cathy Mannion, Michael Walsh.
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin, Ireland D01NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Uisce Éireann is a design activity company, limited by shares.
Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363.

In addition to the specific items outlined above please note the following aspects of Water Services which should be considered in the scope of an EIAR where relevant;

a) Where the development proposal has the potential to impact an Uisce Éireann Drinking Water Source(s), the applicant shall provide details of measures to be taken to ensure that there will be no negative impact to Uisce Éireann's Drinking Water Source(s) during the construction and operational phases of the development. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified as part of the report.

b) Where the development proposes the backfilling of materials, the applicant is required to include a waste sampling strategy to ensure the material is inert.

c) Mitigations should be proposed for any potential negative impacts on any water source(s) which may be in proximity and included in the environmental management plan and incident response.

d) Any and all potential impacts on the nearby reservoir as public water supply water source(s) are assessed, including any impact on hydrogeology and any groundwater/ surface water interactions.

e) Impacts of the development on the capacity of water services (*i.e. do existing water services have the capacity to cater for the new development*). This is confirmed by Uisce Éireann in the form of a Confirmation of Feasibility (COF). If a development requires a connection to either a public water supply or sewage collection system, the developer is advised to submit a Pre-Connection Enquiry (PCE) enquiry to Uisce Éireann to determine the feasibility of connection to the Uisce Éireann network.

f) The applicant shall identify any upgrading of water services infrastructure that would be required to accommodate the proposed development.

g) In relation to a development that would discharge trade effluent – any upstream treatment or attenuation of discharges required prior to discharging to an Uisce Éireann collection network.

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h) In relation to the management of surface water; the potential impact of surface water discharges to combined sewer networks and potential measures to minimise and or / stop surface waters from combined sewers.

i) Any physical impact on Uisce Éireann assets – reservoir, drinking water source, treatment works, pipes, pumping stations, discharges outfalls etc. including any relocation of assets.

j) When considering a development proposal, the applicant is advised to determine the location of public water services assets, possible connection points from the applicant's site / lands to the public network and any drinking water abstraction catchments to ensure these are included and fully assessed in any pre-planning proposals. Details, where known, can be obtained by emailing an Ordnance Survey map identifying the proposed location of the applicant's intended development to datarequests@water.ie

k) Other indicators or methodologies for identifying infrastructure located within the applicant's lands are the presence of registered wayleave agreements, visible manholes, vent stacks, valve chambers, marker posts etc. within the proposed site.

l) Any potential impacts on the assimilative capacity of receiving waters in relation to Uisce Éireann discharge outfalls including changes in dispersion / circulation characterises. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified within the report.

m) Any potential impact on the contributing catchment of water sources either in terms of water abstraction for the development (*and resultant potential impact on the capacity of the source*) or the potential of the development to influence / present a risk to the quality of the water abstracted by Uisce Éireann for public supply should be identified within the report.

n) Where a development proposes to connect to an Uisce Éireann network and that network either abstracts water from or discharges wastewater to a "protected"/ sensitive area, consideration as to whether the integrity of the site / conservation objectives of the site would be compromised should be identified within the report.

o) Uisce Éireann does not permit building over of its assets. As an applicant you are required to;

- survey the site to determine the exact location of the assets. Any trial investigations should be carried out with the agreement and in the presence of Uisce Éireann.
- Provide evidence of separation distances between the existing Uisce Éireann assets and proposed structures, other services, trees, etc. have to be in accordance with the Irish Water Codes of Practice and Standard Details.

p) Where a diversion of Public Infrastructure may be required subject to layout proposal of the development and separation distances, the applicant is required to submit a Diversions Enquiry to diversions@water.ie

q) Mitigation measures in relation to any of the above ensuring a zero risk to any Uisce Éireann drinking water sources (Surface and Ground water).

This is not an exhaustive list.

Please note;

- Where connection(s) to the public network is required as part of the development proposal, applicants are advised to complete the Pre-Connection Enquiry process and have received a Confirmation of Feasibility letter from Uisce Éireann ahead of any planning application.
- Uisce Éireann will not accept new surface water discharges to combined sewer networks.
- Where a new connection(s) is sought, the applicant or developer shall enter into water and/or wastewater connection agreement(s) with Uisce Éireann prior to the commencement of this development.
- Where an existing connection is on place, the applicant or developer may be required to enter into a new or revised water and/or wastewater connection agreement(s) with Uisce Éireann prior to the commencement of this development.

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Queries relating to this EIAR scoping request should be directed to planning@water.ie

An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

Our Ref: G Pre00002/2025
(Please quote in all related correspondence)

13 February 2025

HW Planning
5 Joyce House,
Barrack Square,
Ballincollig,
Co Cork
P31 KP84

Via email to: jobrien@hwplanning.ie

Proposed Pre Planning Development: Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork

A chara,

I refer to correspondence received in connection with the above.

Outlined below are heritage-related observations/recommendations of the Department co-ordinated by the Development Applications Unit under the stated headings.

Architectural

The Department has reviewed the documentation submitted in relation to the above named request and has the following observations:

It is noted that the proposed development site is adjacent to Ballincollig Castle, which is included in the Record of Protected Structures, RPS ID: 1225, in the Cork City Development Plan 2022-2028. It is recommended the applicants engage in pre-planning consultation with Cork City Council's Architectural Conservation Officers, Jessie Castle and Ashleigh Murray, contactable at 021 492 4000 / jessie_Castle@corkcity.ie / ashleigh_murray@corkcity.ie.

The Architectural Conservation Officers are best placed to advise on any assessments and/or mitigation measures necessary in respect of any potential visual impact or otherwise relating to Ballincollig Castle.

Aonad na nIarratas ar Fhorbairt, Oifigí an Rialtais, Bóthair an Bhaile Nua, Loch Garman, Y35 AP90
Development Applications Unit, Government Offices, Newtown Road, Wexford, Y35 AP90
manager.dau@npws.gov.ie
www.gov.ie/housing

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The above observations/recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations that the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority/authorities, in his/her role as statutory consultee under the Planning and Development Act, 2000, as amended.

You are requested to send any further communications to this Department's Development Applications Unit (DAU) at: manager.dau@npws.gov.ie

Is mise, le meas,

Brian Bone
Development Applications Unit
Administration

From: David OConnor (Housing)
To: Info
Subject: Murnane & O"Shea Ltd.
Date: Wednesday 21 May 2025 14:55:41

Our Ref: G Pre Planning-CK-LRD Ballincollig

A Chara,

I acknowledge receipt of your recent consultation.

In the event of observations, you will receive a co-ordinated heritage-related response by email from Development Applications Unit (DAU).

The normal target turnaround for pre-planning and other general consultations is six weeks from date of receipt. In relation to general consultations from public bodies under the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 to 2011, the Department endeavours to meet deadline dates, where requested.

If you have not heard from DAU and wish to receive an update, please email manager.dau@npws.gov.ie

Kind regards

David O'Connor
Executive Officer
An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage
Aonad na nIarratas ar Fhorbairt
Development Applications Unit
Oifigí an Rialtais
Government Offices
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Newtown Road, Wexford, County Wexford, Y35 AP90
—
David.oconnor@npws.gov.ie
Manager.DAU@npws.gov.ie

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CHAPTER TWO

PROJECT DESCRIPTION & ALTERNATIVES CONSIDERED

APPENDIX 2-1 Construction & Environmental Waste Management Plan – DOSA Consulting Engineers
APPENDIX 2-2 Construction Traffic Management Plan – DOSA Consulting Engineers
APPENDIX 2-3 Proposed Site Layout – Deady Gahan Architects
APPENDIX 2-4 Infrastructure Report – DOSA Consulting Engineers
APPENDIX 2-5 Green & Blue Infrastructure/Landscape Design Rationale Report – Simon Ronan Landscape Architecture
APPENDIX 2-6 Landscape Masterplan – Simon Ronan Landscape Architecture

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APPENDIX 2-1 Construction & Environmental Waste Management Plan – DOSA Consulting Engineers

Cork City Council Planning Department. For Inspection Purposes Only!

DOSA

DENIS O'SULLIVAN & ASSOCIATES

CONSULTING ENGINEERS

RESIDENTIAL DEVELOPMENT AT GREENFIELD, BALLINCOLLIG, CORK

CONSTRUCTION & ENVIRONMENTAL WASTE MANAGEMENT PLAN

DATE 07/07/2025

REVISION 1

JOB NO. 6081

Joyce House, Barrack Square, Ballincollig, Co. Cork

T 021 4871781 F 021 4874157 info@dosa.ie www.dosa.ie

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DOCUMENT CONTROL

PROJECT NAME: Residential Development at Greenfield, Ballincollig, Cork

PROJECT NUMBER: 6081

REVISION	DATE	FILE NAME: Residential Development			
1	07.07.2025	DESCRIPTION: Construction Environmental Management Plan			
			PREPARED	CHECKED	APPROVED
		INITIAL	SO'G	LO'T	LO'T
		DATE	07.07.2025	07.07.2025	07.07.2025
		FILE NAME:			
		DESCRIPTION:			
			PREPARED	CHECKED	APPROVED
		INITIAL			
		DATE			
#	Insert Date	FILE NAME:			
		DESCRIPTION: Insert description			
			PREPARED	CHECKED	APPROVED
		INITIAL	Initials	Initials	Initials
		DATE	Insert Date	Insert Date	Insert Date
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		DESCRIPTION: Insert description			
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1 Introduction

Denis O'Sullivan & Associates (DOSA) were engaged as Consulting Engineers for the proposed development at Greenfield, Ballincollig, Cork.

This document comprises the Construction & Environmental Waste Management Plan and in particular provides details of the intended construction practice for the development including construction access and phasing, the proposed hours of working, noise management measures and off-site disposal of construction waste. The proposed sustainable management of wastes arising during the construction phase are also provided demonstrating how environmental impacts are minimised during the construction phase of the development.

The plan will be updated accordingly and if necessary by the Contractor as the project progresses.

1.1 Site Location

The subject site (currently greenfield) is located within the Ballincollig town boundary. The site is a greenfield site characterised by its gently sloping topography. The site is directly bound on the north by the existing Greenfields Road and to the south by the Ballincollig Bypass (N22). The western lands are currently in agricultural use but are also zoned in the Current City Development Plan.

A snapshot of the application boundary is outlined in Figure 1.1 below.

Figure 1.1 – Context Map (Source: Google Maps)

2 Proposed Development Description

A Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork. The proposed development consists of the demolition of an existing dwelling house and farmyard with associated agricultural buildings and the construction of a mixed-use residential development of 544 no. residential units consisting of 232 no. dwelling houses, 312 no. apartment/duplex units, a two storey creche facility, commercial/retail unit and all ancillary site development works. The proposed 232 no. dwelling houses will include 100 no. 4 bedroom detached/semi-detached dwelling houses, 124 no. 3 bedroom semi-detached/townhouse dwelling houses and 8 no. 2 bedroom townhouse units. The proposed 312 no. apartment/duplex units will include 61 no. 3 bedroom units, 171 no. 2 bedroom units and 80 no. 1 bedroom units, to be provided in 28 no. apartment/duplex buildings ranging in height from 3-4 storeys. One of the proposed apartment buildings (Block 3) will provide the ground floor commercial/retail unit.

Vehicular access to the proposed development will be via two entrances from Greenfields Road (L2216) with separate pedestrian/cycle connections also provided from Greenfields Road. Ancillary site works include the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex buildings, creche and commercial/retail unit, landscaping and servicing proposals including the upgrade of public footpaths/active travel infrastructure and water service infrastructure, 2 no. pedestrian crossings on Greenfields Road and the installation of a noise attenuation screen along the site's southern boundary.

The proposed development is highlighted in Figure 2.

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Figure 2 – Proposed Development

3 Potential Impact of Construction Works

The construction phase of the development will generate a certain amount of activity on the site. The general activities on site are likely to generate air and noise emissions and traffic movements. Alongside these general activities there will also be an amount of construction waste generated. The excavation of foundations and trenches for ductwork and sewers may require the removal of some rock underlying the site. However, it is likely the volume of rock to be removed will be minimal and localised and should not require a rock-breaker. The requirement to alter/balance ground levels to facilitate the construction of the development will ensure that the majority of excavated material will be re-used on site and therefore minimise movements of earthworks vehicles out of the site.

3.1 General Construction Activities

When considering a development of this nature, the potential noise & traffic impact on the surroundings must be considered for the construction phase. The construction phase will involve the preparation of the site, excavation of on-site material, construction of site roads and building of the proposed dwellings. With the construction activity there will be an increased number of vehicular movements in the locality, both construction and worker vehicles. The construction at the site will also have the potential of raising dust into the air and depositing or spilling material on access roads during the construction works. Noise will also be emitted from the construction site during the course of the works, with limits on the hours of operation the norm to keep noise impacts to a minimum (see section 8.2 below). The flow of vehicular traffic to and from a construction site is also a potential source of relatively high noise levels.

The potential for vibration at neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces, see section 8.3 below.

There is potential for some noise and dust impacts on the closest buildings adjoining the Greenfields Road, with the most significant constraint centring on vehicular access and egress from the site and the impact on the public roads.

The likely effects include noise and air blown dust being emitted from the site. The measures outlined in general for the site will seek to mitigate and/or remove impacts on the existing residents and the public road and these mitigation measures are detailed in the subsequent sections.

3.2 Developer Liaison

An information notice board will be erected at the construction site entrance. This notice board will be listed with a designated contact number to assist residents in contacting the developer with any queries.

3.3 Mitigation Measures

There is a requirement that all the mitigation measures contained in the EIAR and NIS to be complied with. These have been captured in this report where relevant but for reference have been included in Appendix C&D of this report.

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4 Construction Works & Sequencing

Construction activities will undoubtedly have impacts and associated mitigation measures will be required to address any proposed works.

4.1 Phasing

It is anticipated that the works will be carried out in 4 phases as per Figure 4.1 below.

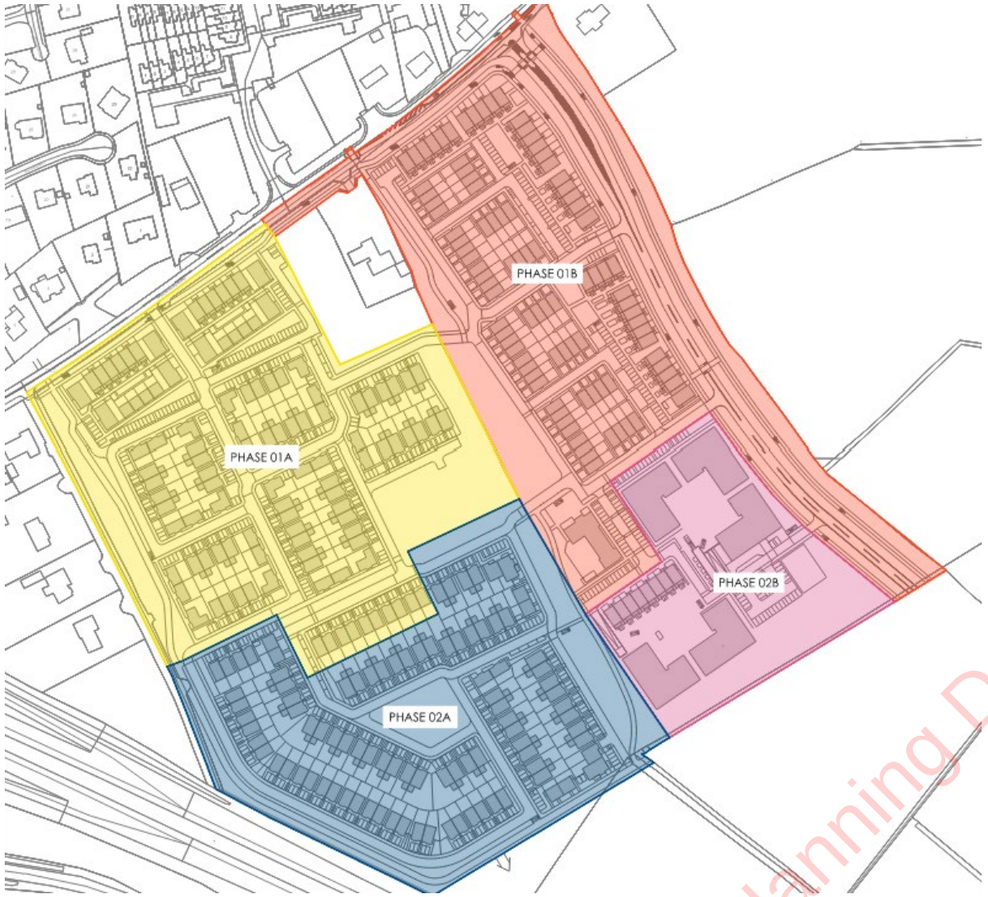

Figure 4.1 – Proposed Phasing

4.2 Construction Site Access

Access to the works will be from the existing Greenfields Road. A proposed site access drawing for the various stages is diagrammatically represented and included in Appendix A.

4.3 Perimeter Fencing

The first task in the construction phase will be to erect a stock-proof fence along the perimeter boundary of the development. This stock proof fence will be such that small and medium sized

mammals will not become trapped inside the construction area. This boundary fence will primarily restrict public access to the work area.

4.4 Site Compound

The establishment of a site compound will be undertaken at commencement stage. The indicative location is as per that highlighted in Appendix A.

4.5 Stripping & Earthworks

In parallel with access road construction the main earthmoving works will be undertaken on the site. As the plant required for this phase will remain on site and not leave until the work is complete and the materials input is minimal, it is considered that the site access outlined and highlighted in Appendix A will be adequate to cater for the construction works.

Level platforms will be excavated for each residential building and there will be a requirement to import stone material for the access roads and to the front of each dwelling. Measures will be in place to contain dust and/or to ensure that mud and other debris are kept off the public roadways. Existing on-site material will be reprofiled where suitable. External material will be imported from licensed and regulated quarries.

If during the course of development external suitable material becomes available the process of importing same under an Article 27 agreement will be explored and implemented. Article 27 of the European Communities (Waste Directive) Regulations, 2011, allows an "economic operator" to decide, under certain circumstances, that a material is a by-product and not a waste.

All works will be carried out in accordance with Departmental guidelines and procedure.

4.6 Bulk Earthworks

The proposed topography on site has been estimates using Kubla Cubed volumetric analysis software. This software utilises earthworks TIN (Triangulated Irregular Networks) prism volume calculation engine to estimate volumes. A TIN is a network of interconnected triangles that represent the surface of the land. The software then uses these TINs to calculate the volume of the earth moved by creating prisms between the existing and proposed ground surfaces. Each prism is essentially a three-dimensional shape with a triangular base and a height representing the difference in elevation between the existing and proposed ground. By summing the volumes of all these prisms, the software can accurately estimate the cut and fill volumes for the project.

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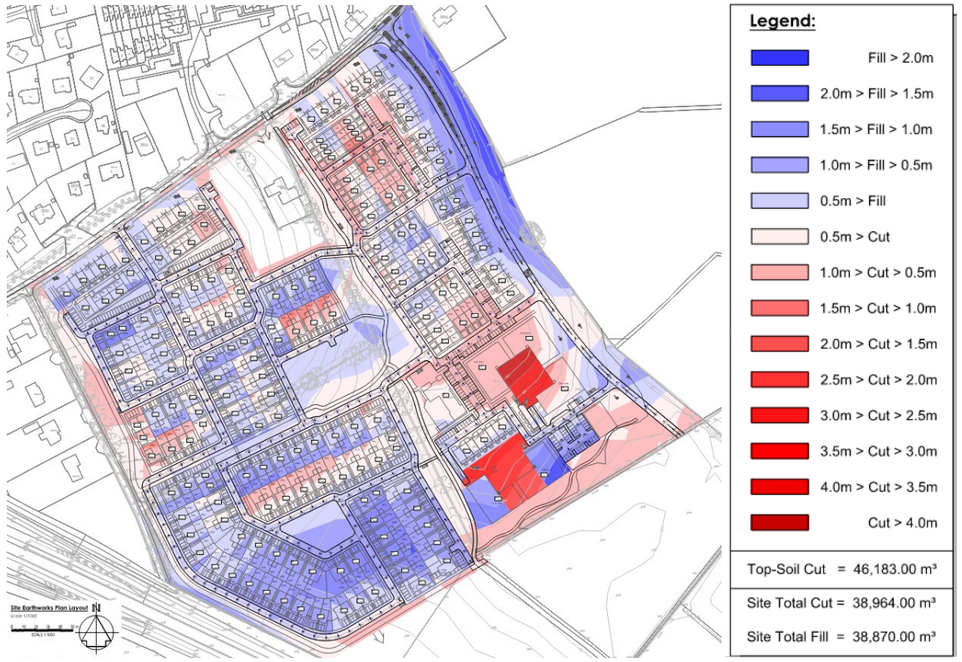

Figure 4.6 – Cut & Fill

4.6.1 Earthworks Impact

The existing site slopes evenly towards a central low point. As outlined in Section 4.5 above, the development has been designed to minimize cut and fill throughout the site, in keeping the proposed finish floor levels of the units and the proposed road levels as close to the existing ground levels as possible.

The duration that subsoils layers are exposed to the effects of weather shall be minimised. Disturbed subsoil layers will be stabilised as soon as practicable (e.g., backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material shall be protected for the duration of the works. Stockpiles of subsoil material shall be located separately from topsoil stockpiles. These stockpiles will be monitored throughout the construction phase. Monitoring of ground conditions and stability of excavations will be monitored on an on-going basis. Once the earthworks and landscaping are completed, the risk of sediment loading of water courses is significantly reduced.

The main areas of potential impact with respect to earthworks are as follows: -

- Excessive Dust deposition
- Potential spillage of oil and diesel used on site for plant and equipment

4.6.2 Earthworks Mitigation

The proposed mitigation measures for both the construction and operational phases include:

- Careful selection of stockpile locations to-avoid, as far as practical, double handling of materials; avoid steep slopes; avoid natural overland flow paths of stormwater runoff; provide shelter from the prevailing wind direction.
- Blading off the vegetative layer (for separate storage). Vegetation will not be incorporated in the stripped topsoil.
- Avoid stripping in inclement wet weather conditions. Wet soils are more difficult to work and handle and it is more likely to damage soil structure in wet conditions.
- Avoid extending topsoil stripping into the mineral soil layer. Limiting height of stockpiles to avoid anaerobic conditions occurring.
- Profiling of stockpiles to promote rainwater runoff.
- Check dams and / or straw bales will be installed along the alignment of roadside drainage to slow flows and remove silt. These will be constructed using clean stone and geotextile spanning across the drainage channel
- Placement of silt fencing downgradient of stockpiles to catch any fines carried by stormwater runoff.
- Stockpiles will be allowed vegetate naturally, which will reduce erosion by wind and water.
- A street sweeper will attend site regularly to clean the road when there are truck movements in and out of the site.
- Earthworks will be suspended during extreme weather conditions. An extreme rainfall event will be classified as an event that corresponds to the Met Éireann Orange–Weather Alert for Rainfall.
- Hard surface roads will be regularly swept to remove mud and aggregate materials from their surface.
- Public roads outside the site will be regularly inspected for cleanliness, and cleaned as necessary.
- Material handling systems and Site stockpiling of materials will be designed and laid out to minimise exposure to wind; and
- Water misting or sprays will be used on stockpiles as required if particularly dusty activities are necessary during dry or windy periods.
- Potential hydrocarbon spillages during the construction stage are unmitigated and depend largely on the volume released, hydrocarbons reaching the surface water environment would have a local short-term direct slight negative impact on water quality and a short term indirect slight negative impact on habitats downstream. Hydrocarbons attenuate naturally in the environment, so any negative impacts are reversible. During the operational phase there would be comparatively little hydrocarbons apart from parked cars. Interceptors as part of the SuDS train will mitigate this concern.
- Any storage of oils and diesel on site will be in steel or plastic tanks of good integrity and bunded to 110 % of tank capacity. All fuel and hydraulic fluids will be stored in the site COSHH store located in the site compound.
- Refuelling of site plant will be carried out at the site compound where a concrete refuelling pad will be provided adjacent to the fuel storage tank. When refuelling takes place directly from self-bunded mobile refuelling bowsers, spill kits will be readily available (kept in the machine). Refuelling of mobile plant will not take place within 50m of any sensitive

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receptor. Toolbox talks on refuelling will be given to delivery drivers in addition to plant operatives.

- Fuels, lubricants and hydraulic fluids for equipment used on the construction site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice.
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the site and properly disposed of. Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
- Appropriate spill control equipment, such as oil soakage pads, will be kept in the site plant to deal with any accidental spillage. Spare spill kits will be kept at the construction site compound in the container adjacent to the fuel storage

4.7 Site Establishment

- On commencement of works on site a site compound will be established over the proposed green area. In this area the following facilities/provisions will be made:
- Site offices, canteen and toilet / changing facilities c/w temporary water supplies and wastewater disposal
- Secure compound and containers for storage of materials and plant.
- Temporary vehicle parking areas.
- Contained area for machinery refuelling and construction chemical storage.
- Contained area for washing out of concrete and mortar trucks.
- A security/herras fencing will be provided at the main site entrance. All vehicles and personnel will be checked on entry to ensure no unauthorised access or fly-tipping. Heras fencing will also be provided around all boundaries as required.
- Water supply for the construction facilities will be taken from the mains supply which is adjacent the site. Power for the pumps and small power requirements for construction activities will be supplied from diesel generators until such time as the permanent site power supply is available.

4.7.1 Lighting

Lighting associated with the site works could cause disturbance/displacement of fauna. If of sufficient intensity and duration, there could be impacts on reproductive success.
Lighting mitigation measures will follow *Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers* (Bat Conservation Ireland, 2010). The following measures will be applied in relation to construction works lighting:
Lighting will be provided with the minimum luminosity necessary for safety and security purposes. Where possible, lighting will be restricted to the working area and using the cowl and angling noted above, will minimise overspill and shadows on sensitive habitats outside the construction area
During construction, lighting will be positioned and directed so that it does not to unnecessarily intrude on adjacent ecological receptors and structures used by protected species. The primary area of concern is the potential impact on the retained treelines and hedgerows

Site lighting will typically be provided by tower mounted temporary portable construction floodlights. The floodlights will be cowled and angled downwards to minimise spillage to surrounding properties. The following measures will be applied in relation to site lighting:

- Lighting will be provided with the minimum luminosity sufficient for safety and security purposes. Where practicable, precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas;
- Where possible, construction lights will be switched off when not in use; and
- Lighting will be positioned and directed so that it does not to unnecessarily intrude on adjacent ecological receptors and structures used by protected species. The primary area of concern is the potential impact on the retained treelines and hedgerows. There will be no directional lighting focused towards these sensitive habitats and cowling and focusing lights downwards will minimise light spillage.

Works will primarily take place during hours of daylight to minimise disturbance to any nocturnal mammal species.

4.8 Demolition

The construction of the proposed development will involve the demolition of four buildings, removal of hard surfacing and existing services. Figures 4.10.1 and 4.10.2 below, depicts the buildings that are to be demolished. Material is to be disposed of to a landfill or facility licensed to take that class of material.

Figure 4.10.1 – Aerial of buildings to be demolished

The approximate gross internal floor area to be demolished per building is tabulated in the Table 4.10 below

Building	Building Type	Area (m^2)
House	Derelict Dwelling	190m^2
1	Outbuilding	511m^2
2	Outbuilding	135m^2

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3	Outbuilding	714m²
Total GIA for Demolition		1550m²

Table 4.10 – Demolition Areas

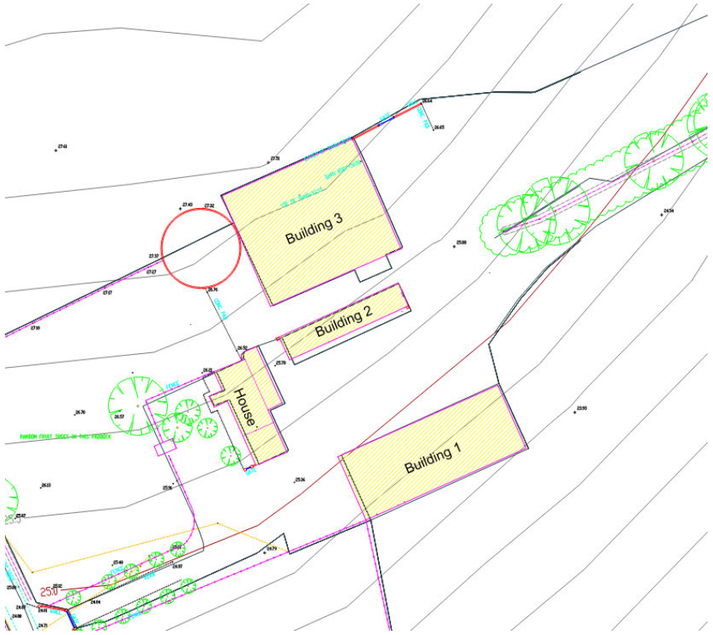

Figure 4.10.2 –Labelled Buildings to be Demolished

Demolition works are likely to proceed as follows:

- Asbestos survey to be carried on existing buildings.
- Environmental clean of all known environmental hazards and deleterious materials.
- Demolition of existing services and removal from site.
- Demolition of buildings as indicated, crushing to commence and spoil to begin to be removed from site; material to be recycled and stockpiled on site and covered.

4.9 Landscaping

Any trees outside the development zone will be protected for the duration of the construction activities on site and in accordance with BS 5837. Protective measures will include a protection fence erected beyond the branch spread of the trees and no construction activities will take place within the protective barrier save for perimeter fencing along the site boundaries.

4.10 Site Infrastructure

Proposed site infrastructure will be completed in a coordinated approach in line with the delivery of the residential units. It is anticipated that works will be staged in a similar nature. A more detailed discussion on site infrastructure is contained further in this chapter.

4.11 Residential Unit Construction

Once the site development and infrastructure are sufficiently advanced, construction of individual residential units will commence. It is envisaged that this will commence with the proposed units at the entrance to the site working inwards.

The basic sequence of residential construction is well established and the basic steps are as follows:

Substructure:

Construction of foundations and rising walls. This involves a degree of excavation and all excavated material will be disposed of site in a licenced waste management facility. Concrete and blocks will be delivered over a number of days. At this stage hard-core will be placed over the footprint of the units and roadways, which will generate a significant amount of truck movements into the site. The substructure will include allowances for under slab services/ utilities serving the units.

Concrete Floor Slab:

Pouring of concrete floor slab over the internal footprint of the units. This is generally completed in a single pour involving a number of concrete trucks delivering in one day.

External & Internal Walls:

Construction of external and internal blockwork walls of 100/215mm solid blockwork will commence. Blocks, mortar, etc. will be delivered on standard trucks over a continued period as the work progresses.

Floor Installation & Prefabricated Roof Truss Installation:

Construction of floor and roof erection will commence. Prefabricated floor joists & roof trusses will be delivered on standard trucks over a continued period as the work progresses.

Window & Installation:

Sealing of the building will continue with the installation of windows and doors. Again, these will be manufactured off site and deliver for installation.

Plastering (Internal & External):

Plastering of both the internal and external walls will involve the delivery of material supplies on an on-going basis.

Second Fix Carpentry, Mechanical & Electrical Services:

Installation of sprinkler, lighting, alarm system, power outlets, etc. This is undertaken once the building is weathered and does not involve the delivery of bulk materials.

Site Finishes:

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Tie-ins to main site services, road surfacing, and general landscaping will be carried out with no need for bulk materials. The delivery of construction materials and its impact on traffic volumes will be dealt with in a construction stage Traffic Management Plan.

4.11.1 Concrete Pouring Mitigation Measures

The release of cement to water courses will be prohibited. The proposed mitigation measures for the construction phases involving concrete pouring include:

- Concrete pours will occur in contained areas using shuttering. Rinsing down of concrete trucks will be done at a dedicated location on site–adjacent to the construction site compound, or at a suitable alternative location. Signage will be erected at each concrete pour location directing drivers to the rinse down area. This rinse down area will be removed at the end of the construction phase.

5 Infrastructural Works

The site development works will comprise new roads, footpaths, surface and foul water drainage, watermains and installation of service ducts for various utilities such as electricity, gas and telecommunications services. Each of these services are dealt with individually in the following sections.

5.1 Surface Water Drainage

The storm water system will involve a network of underground pipelines and manholes discharging to the existing watercourse 'Lisheens 19' at the southern boundary via SuDS measures and an attenuation system, which will be fitted with flow control devices to ensure no increase in peak flows and an oil interceptor and silt trap to remove any traces of oil and silt washed off road surfaces.

The services layout drawings included as part of the planning stage documentation show the proposed surface water drainage layout for the entire site.

5.1.1 Impact

The main areas of potential impact with respect to storm water runoff are as follows: -

- Discharge of hydrocarbons can be a source of contamination of watercourses/groundwater.
- Siting of drainage services within the development to avoid future undermining/subsidence of building structures.
- Local flooding caused by overloading of the drainage system.
- Potential settlement of services through filled areas of the site.
- Back flows through surface water outfalls during extreme flood events.

5.1.2 Mitigation

The proposed mitigation measures for both the construction and operational phases include:

- A Site Environment Plan (SEP) identifying fuel storage and refuelling locations will be developed and this plan will also identify the spill kit locations. Spill response kits will be required for each piece of heavy equipment (i.e., Excavators, Loaders, Trucks) which will be at least 21 litre drum size each with spill pads, sorbent, small boom, plastic garbage bag and gloves.
- Silt traps will be installed on surface water drains during the site development works.
- Constructing buildings and roads above the flood level to ensure that back flows through the surface water outfalls will not occur.
- All foul and other waste water will be discharged to the foul drainage system.
- The storm drainage system with associated hydrocarbon interceptors and silt collection will be cleaned and maintained on an on-going basis throughout its lifetime in a manner and frequency that is in line with guidelines.

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- Areas stripped of vegetation will be kept to a minimum; enough to keep pace with house construction. On-going landscaping and restoration of completed units will be carried out. This will reduce areas of soil exposed to erosion.
- During the operational phase the runoff from the site will be controlled and managed using a suite of SuDS and engineering controls. These will include tree pits, infiltration basins, filter drains, blue/green roofs, raingarden / bio retention tree pits and stormwater attenuation tanks fitted with flow control devices.

The following measures will be implemented for the storage and use of hydrocarbons on site:

- Diesel tanks, used to store fuel for the various items of machinery, will be self-contained and double-walled.
- Refuelling will be carried out from these tanks or from delivery vehicles and will not be left unattended.
- Fuels, lubricants and hydraulic fluids for equipment used on the construction site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice - (Enterprise Ireland BPGCS005).
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the site and properly disposed of.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
- The development's road network will be finished with tarmac or asphalt surface which will discharge runoff to a piped drainage system.
- Proven engineering practice will apply during the hydraulic design process.
- Surface water drains will be installed in roads and streets and in pre-determined wayleaves adjacent to building structures.
- Spillage and leaks of oil from cars parked in the development during the operational phase is unavoidable. To reduce the potential impacts, oil interceptors will be incorporated into the site drainage design.
- The area is serviced by mains gas and this utility will be provided to the new development. The use of home heating oil is therefore eliminated so the risk has been removed.

The proposed development is not anticipated to cause an adverse impact on the surface water regime given the remedial and reductive measures previously outlined. Normal proven construction reinstatement and backfilling procedures will follow pipe laying, jointing, and testing procedures.

5.2 Foul Sewer Drainage

The proposed foul water drainage system is illustrated in the services drawings and will discharge to the public network on Greenfields Road. All works will be in accordance with Irish Water Specifications and details.

5.2.1 Impact

The potential impacts of the proposed development in terms of foul sewer are: -

- Impacts on surface water drains and watercourses in the event of leaks from the foul water drainage system.
- Impact on groundwater and soils in the event of leaks from the foul water drainage system.
- Overloading of foul water drainage infrastructure causing damage and blockages.
- Potential damage to local authority wastewater treatment plant and utilities.
- Siting of foul drains to avoid future undermining/subsidence of building structure.

5.2.2 Mitigation

The proposed mitigation measures are:

- Proven engineering practice shall apply during the hydraulic design process of the foul sewer network.
- Foul sewers will be installed in accordance with I.S. EN 752: Drains and Sewer Systems outside buildings.
- The ability of the ground to support the proposed drainage network has been confirmed by site investigation works.
- The foul sewer network will be vented in accordance with standard working practice.
- Foul water drains will be installed in roads and streets

5.3 Potable Water

It is proposed to provide a new 200mm I.D. Ø (inside diameter) HDPE connection to the public watermain located on the Greenfields Road adjacent to the proposed site with associated hydrants, valves and metering requirements.

Water distribution supply to each building will be sized to cater for the requirements of those particular uses. Metered connections will be made to the trunk supply main.

5.3.1 Impact

The main areas of potential impact with respect to water supply are as follows: -

- New developments can cause difficulties for existing water supply.
- Reduction of existing storage capacity.
- Reduction of pressure in existing water supply.
- Siting of watermains to avoid future undermining/subsidence of building structures and permit ease of maintenance.

5.3.2 Mitigation

The proposed mitigation measures are: -

- The existing water supply feeds will be protected at all times during construction.
- Watermains will be installed in roads and streets.

The existing water supply will have adequate capacity to meet the projected water demand of the development. No adverse impact is foreseen on existing water supply or pressure. Firefighting provision will have no extra significance over and above any similar development of this kind.

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5.4 Electrical Systems

Power and communications cabling will generally be run underground in a system of ducts and draw pits. Power supply will be taken from an adjoining supply on the Greenfields Road and stepped down to 380V 3- phase for distribution through the site.

The basic infrastructure will be constructed at an early stage and the branch lines will be extended to various areas of the site as construction progresses. The installation of these services involves extensive trenching and the generation of surplus excavated material. The volume of this material has been calculated and it will be used within the site for re-grading around the site as development progresses. The impact of such works will be disturbance to users of the existing supply. The client will seek to minimise any disturbance to existing users by complying with the supplier utilities specifications/conditions and details.

6 Health & Safety

6.1 General

As required by the Safety Health and Welfare at Work (Construction) Regulations 2013, a Project Supervisor Design Process (PSDP) will be appointed by the developer to co-ordinate the design effort and to address and minimise construction risks during the design period. Notification of this appointment will be sent to the HSA by means of their Approved Form 1 (AF1). As detailed design advances post planning, a "Preliminary Health and Safety Plan" will be compiled by the PSDP.

This will be passed on to the appointed Project Supervisor Construction Stage (PSCS) to be developed into a full project Health and Safety Plan. Notification of this appointment and the commencement date of construction will sent be to the HSA by means of their Approved Form 2 (AF2).

The construction areas will be delineated and will be under the control of the PSCS who will co-ordinate and supervise all safety aspects of the project. A Safety File will be compiled and maintained on site for the duration of the project and this and the implementation of the Plan will be subject to regular audits. All personnel and their subcontractors who will be working on or attending site will attend and comply with a Site Safety Induction Course to be provided by the Site Safety Officer. Construction workers carrying out safety critical tasks must complete Construction Skills Certification Scheme (CSCS) training, and general operatives will be required to have a valid and current safe-pass card.

All Contractors shall be requested to provide a sound working environment for all employees involved in the design, construction and operation of the PV Plant. This shall take into account all applicable national laws, guidelines and standards.

The Contractors will ensure that the following HSE objectives are met:

- Zero accidents and injuries with respect to all involved workers.
- Zero harm to workers, the public and the environment.

Each Contractor will prepare and implement the Health, Safety and Environmental (HSE) Plan and associated working instructions and procedures that will govern their actions at all times. The HSE Plan will cover the following aspects:

- Project Policy Statement.
- Roles and Responsibilities.
- Site regulation, including, for example, housekeeping, barricades, excavations, tools and equipment, electrical work, ladders and scaffolds, etc.
- Risk Management and Hazard Identification.
- HSE training.
- HSE management of subcontractors.
- Work Permit system.
- Personnel Protective Equipment (PPE).
- Inspection and auditing
- HSE meetings.

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- Incident Investigation and Reporting
- Site security
- Medical care and first aid

Furthermore, the Contractors will implement an emergency response plan outlining all necessary measures and communication procedures in case of emergency situations. The preparation and application of the HSE shall be audited independently throughout the construction period.

6.2 Control Substances Hazardous to Health

The strategy for controlling all substances coming onto site and all work activities and progress which may generate hazardous substances will be managed and controlled in accordance with best practice guidance. Some control measures to be employed are as follows:

- All fuels and chemicals will be stored in designated areas, with deliveries of all hazardous materials supervised;
- Storage tank or container facilities will be appropriately bunded with designated areas as far as possible from any watercourses or surface drains;
- In case of spills or discharges, remedial action will be taken as soon as possible, and set procedures will be compiled with;
- A logistics plan will be developed to take into account the management and control of hazardous substances on site; and
- Personal protective equipment (PPE) suitable to prevailing conditions will be used by all construction workers.

6.3 Emergency, Fire and Accident Procedures

Emergency routes and procedures will be continuously adapted to suit the construction sequence and stage of the Development. An Emergency Fire and Accident plan will be prepared, generally following the guidelines for plan contents below and updated on a regular basis to take account of construction progress:

- Definition of the management organisation and responsibility for safety;
- Definition of appropriate fire prevention measures, including good housekeeping of site, welfare facilities and offices;
- Use of non-flammable/fire retardant materials for protection of finished works;
- Safe use and safe storage of flammable materials of all categories, whether solid, liquid or gas;
- Appropriate waste management procedures;
- Monitoring the type and frequency of fire inspection/audits;
- Suitable site accommodation location, construction and detection/firefighting systems;
- Development of evacuation plans, to include setting of systems in place to ensure that emergency vehicles have been called and all personnel have safely left the area;
- Training and fire drills.

7 Air Quality

Construction works will be carried out in such a way as to limit the emissions to air of pollutants (particularly dust and fine particles (PM10)), employing Best Practicable Means. The site will be managed in accordance with the CWMP to minimise the potential effects on air quality from construction. Monitoring will be undertaken throughout the construction period to enable proactive management of dust and PM10 levels. Wind speed and direction will be included in the monitoring.

7.1 Communications

Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement includes explaining the nature and duration of the works to local residents and businesses.

The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details

7.2 Effective material storage and handling

The storage and handling of construction materials can be a significant dust emission source. The adoption of appropriate dust control measures will greatly reduce dust emissions from these sources and ensure that any adverse effects are reduced or eliminated.

Handling and storage areas will be sited as far away as is reasonably and practically possible from public/residential areas. Handling and storage areas will be actively managed and fine, dry material will be stored inside enclosed shield/coverings or within a central storage area. Any storage areas that are not enclosed will be covered/sheeted. Prolonged storage of debris on site will be avoided. Vehicles carrying dusty materials into or out of the site shall be sheeted down to prevent any escape of materials.

7.3 Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

7.4 Construction Plant

Construction plant can be a significant source of emissions although control measures can be implemented to minimise any adverse impacts. The following measures will be employed:

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- Site plant and equipment will be kept in good repair and maintained in accordance with the manufacturer's specifications. Allowing for economic constraints, the plant will be selected on the basis of which has the least potential for dust and other emissions;
- Plant will not be left running when not in use (i.e., no idling);
- Plant with dust arrestment equipment will be used where practical;
- Where practical, cleaner fuels will be employed for construction plant; and
- Enclosures will be erected around major construction plant items as appropriate and where practical.
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

7.5 Vehicle Movements

Vehicle movements may result in dust emissions (by re-suspending dust from the road or from spilling dusty loads) and exhaust emissions. However, a number of control measures can be adopted to eliminate or minimise such emissions:

- Wheel washing facilities close to the site entrance to prevent mud from construction operations being transported on to adjacent public roads;
- Any spillages from vehicles leaving the site will be promptly removed;
- Damping down of site haul roads by water bowser during prolonged dry periods;
- Regular cleaning of hard-surfaced site entrance roads;
- Ensuring that dusty materials are transported appropriately (e.g., sheeting of vehicles carrying spoil and other dusty materials);
- Confinement of vehicles to designated haul routes within the site;
- Restricting vehicle speeds on haul roads and other unsurfaced areas on the site;
- All vehicles will be maintained to minimise exhaust emissions;
- Hoarding and gates to prevent dust breakout; and
- Appropriate dust site monitoring will be included within the site management practices to inform site management of the success of dust control measures used.
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site logbook.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

7.6 Dust

Dust control will be best achieved at sources, and if possible, activities will be carried out in a manner so as to preclude dust generation. Dust levels will be controlled and the development operated in a way which is not detrimental to the amenity of local residents. If dust is generated, steps will initially be taken to protect workers in the vicinity who shall, as a minimum, be issued with dust masks. Dust will, if possible, be contained in the location in which it is generated, and be controlled and managed therein. Dust suppression measures will be carried out to ensure that dust nuisance affecting neighbouring properties is minimised and the following control measures and good management practices, will be employed:

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Site operations will be planned to take into account local topography, prevailing wind patterns and local sensitive receptors e.g., schools, residences and ecological designated sites;
- Burning of materials on site will be prohibited;
- Loading and unloading will only be permitted in designated hard standing areas;
- Provision of water sprays and wind/dust fences where possible, particularly in dust sensitive locations;
- Stockpiles of soil, arising or other granular material will be sheeted, covered and/or treated to prevent dust raising that may cause risk to health or nuisance to the public;
- Hoarding will be erected around construction activities to minimise dust blow from site;
- An appointed person will oversee/control activities and handle complaints;

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8 Noise Management

Noise and vibration levels will be controlled as set out below to ensure that the Development is operated in a way that minimises detrimental impact to the amenities of local residents.

8.1 Construction Noise

Infrastructure works, excavations, and foundation construction will be among the most significant activities. Although concreting operations will also give rise to noise, the levels generated would not be considered to be significant.

In order to minimise the noise impact further on the adjoining properties it is proposed that heavy equipment and machinery including pneumatic drills, construction vehicles and generators only work between the hours shown below. In addition, no deliveries and/or removal of materials will occur outside of these hours. All plant and equipment will be maintained in good working order in accordance with BS.5228 in order to minimise air and noise emissions.

Normal working hours are outlined below,

Normal Working Hours:

Monday to Friday:	08.00 to 18:00hrs
Saturdays:	08.00 to 16:00hrs

On occasions it may prove necessary to carry out noisy activities outside of normal working hours. In such instances prior consultation will be carried out with Cork City Council and local residents outlining the nature and reason for the works and their likely duration.

During construction, the measures summarised below, are to be employed:

- Details of construction activities, prediction levels/assessments will be discussed with the relevant authority, both prior to construction and during construction. Detailed construction programmes will be available in advance of work starting on site;
- Where work outside of agreed hours or likely to exceed specified noise, limits is necessary then this shall only proceed subject to notification to Cork City Council Environmental Health Officer and local residents, and approval given.
- Except for emergency situations, notification will be in advance of any requirement for out of hours/noisy working.
- Where the potential for noise exists, 'Best Practicable Means' will be used to reduce noise to achieve compliance consistent with the recommendations of BS 5228, and may include:
- Careful selection of plant items, construction methods, programming, and implementing a 'noise and vibration protocol', which outlines monitoring frequency and action levels etc;
- The appointed contractor will evaluate the choice of excavation, breaking, piling or other working method taking into account various ground conditions and site constraints. Where alternative lower noise generating equipment are available that will provide equivalent structural / excavation results, these will be selected to control noise within the relevant thresholds, where it is practicable to do so.

- For mobile plant items such as dump trucks, cranes, excavators and loaders, the installation of an acoustic exhaust, utilising an acoustic canopy to replace the normal engine cover and / or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB. Mobile plant will be switched off when not in use and not left idling.
- For percussive tools such as pneumatic concrete breakers and tools a number of noise control measures include fitting a muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed;
- Where compressors, generators and pumps are located in proximity to NSLs and have the potential to exceed the construction noise thresholds, these will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation; and
- Resonance effects in panel work or cover plates can be reduced through stiffening or the application of damping compounds, while other noise nuisance can be controlled by fixing resilient materials in between the surfaces in contact.
- For all materials handling, ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials
- Design and use of site hoarding and screens/noise barriers, to provide acoustic screening at the earliest opportunity;
- Vehicles and machinery will not be left running when not in use (i.e., no idling);
- Choice of routes and programming for the transport of construction materials.
- A designated Community Liaison Officer (CLO) will be appointed to site during construction works. Any noise complaints will be logged and followed up in a prompt fashion by the CLO. In addition, prior to particularly noisy construction activity, the CLO will inform the nearest noise sensitive locations of the time and expected duration of the noisy works

8.2 Noise Limits

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phases of a project. Local authorities normally control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

In the absence of specific noise limits, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise.

The approach adopted here calls for the designation of a NSL into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a Construction Noise Threshold (CNT) that, if exceeded, indicates a potential significant noise impact is associated with the construction activities, depending on context.

The table below sets out the values which, when exceeded, signify a potential significant effect at the façades of residential receptors, as recommended by BS 5228-1:2009+A1:2014.

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Assessment Category and Threshold Value Period	Threshold Value (dB)		
	Category A	Category B	Category C
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends [D]	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

a. Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.
b. Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.
c. Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.
d. 19:00–23:00 weekdays, 13:00–23:00 Saturdays and 07:00–23:00 Sundays.

Table 8.0Example Threshold of Potential Significant Effect at Dwellings

It should be noted that this assessment method is only valid for residential properties, and if applied to commercial premises without consideration of other factors, may result in an excessively onerous thresholds being set.

8.2.1 Proposed Threshold Levels for Noise

Taking into account the proposed document outlined above and making reference to the baseline noise environment monitored around the Proposed Development site (referred to in Section 10.6.1), CNTs are set using Category A for the closest NSLs to the proposed development.

8.2.2 Interpretation of the Construction Noise Levels (CNL)

In order to assist with interpretation of the significance of a CNL, includes guidance as to the likely magnitude of impact associated with construction activities, relative to the CNT. This guidance is taken from the UK document Design Manual for Roads and Bridges (2020) LA 111 Sustainability & Environmental Appraisal. Noise and Vibration Rev 2 (DMRB: Noise and Vibration - UKHE 2020) and adapted to include the EPA 2022 EIAR Guidelines.

Impact Guidelines for Noise Impact Assessment Significance (Adapted from DMRB)	CNL per Period	EPA EIAR Guidelines	Determination
Negligible	Below or equal to baseline noise level	Not Significant	Depending on range of CNL, baseline noise level and duration
Minor	Above baseline and below or equal to CNT	Slight to Moderate	
Moderate	Above baseline and below or equal to CNT +5 dB	Moderate to Significant	
Major	Above CNT +5 dB	Significant to Very Significant	

Table 8.1 Interpretation of CNL at Dwelling

The adapted DMRB guidance outlined will be used to assess the predicted construction noise levels at NSLs and comment on the likely impacts during the construction stages.

During the construction phase the contractor will carry out noise monitoring at representative NSLs to evaluate and inform the requirement and / or implementation of noise management measures. Noise monitoring will be conducted in accordance with ISO 1996-1(ISO 2016) and ISO 1996-2 (ISO 2017).and industrial noise.

8.3 Vibration

There are two aspects to the issue of vibration that are considered for this development: the risk of cosmetic or structural damage to buildings; and human response to vibration. In the case of this development, vibration levels used for the purposes of evaluating building protection and human response are expressed in terms of Peak Particle Velocity (PPV) in mm/s.
There is no published statutory Irish guidance relating to the maximum permissible vibration levels for either building response. The following standards are the most widely accepted in this context and are referenced here in relation to cosmetic or structural damage to buildings:

- British Standard BS 5228-2: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Vibration (BS 5228 – 2); and
- British Standard BS 7385: 1993: Evaluation and measurement for vibration in buildings. Part 2: Guide to damage levels from ground borne vibration (BS 7385-2).

8.3.1 Cosmetic or Structural Damage to Buildings

BS 5228-2 and BS 7385 define the following thresholds for cosmetic damage to residential or light commercial buildings: PPV should be below 15 mm/s at 4 Hz to avoid cosmetic damage. This increases to 20 mm/s at 15 Hz and to 50 mm/s at 40 Hz and above. At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.
The standard also notes that below 12.5mm/s PPV, the risk of damage tends to zero. Historically important buildings that are difficult to repair might require special consideration on a case by case basis, but buildings of historical importance should not be assumed to be more sensitive unless they are structurally unsound. If a building is in an unstable state, then it will tend to be more vulnerable to the possibility of damage arising from vibration or any other ground borne disturbance. The vibration limit range for protected and historical buildings are equal to or up to 50% of those for light framed buildings, depending on their structural integrity. Where no structural defects are noted, the same limit to those for light framed buildings apply. This is summarised in Table 8.2 below.

Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
	4 Hz to 15 Hz	15 Hz and above
Unreinforced or light framed structures. Residential or light commercial buildings.	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
Unsound or Vulnerable Structures	6mm/s	

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Note 1: Values referred to are at the base of the building.

Note 2: At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

Table 8.2-Transient Vibration Guide Values for Cosmetic Damage

8.3.2 Human Perception

Humans are sensitive to vibration stimuli, and perception of vibration at high magnitudes may cause concern to building occupants. BS 5228-2:2009+A1:2014 notes that vibration typically becomes perceptible at around 0.15 to 0.3 mm/s and may become disturbing or annoying at higher magnitudes. Higher levels of vibration are typically tolerated for single events or events of short-term duration, particularly during construction projects and when the origin of vibration is known. Table 8.3 presents the significance table relating to potential impacts to building occupants during construction based on guidance from BS5228-2:2009+A1:2014 and the DMRB Noise and Vibration (UKHE 2020) document and the associated EPA significant ratings.

Criteria	DMRB Impact Magnitude	EPA Significance Rating
≥10 mm/s PPV	Very High	Very Significant
≥1 mm/s PPV	High	Moderate to Significant
≥0.3 mm/s PPV	Medium	Slight to Moderate
≥0.14 mm/s PPV	Low	Not significant to Slight
<0.14 mm/s PPV	Very Low	Imperceptible to Not significant

Table 8.3-Guidance on Effects of Human Response to PPV Magnitudes

Monitoring devices will be placed on all boundaries proximate to the construction site and along routes for construction traffic.

9 Environmental Risk Assessment & Management Plan

The potential risks are typically assessed under a number of headings, including but not limited to:

- Noise – proximity of neighbouring residences
- Nuisance caused by dust emissions
- Impact of traffic - deliveries and removal of material
- Impact of traffic – road safety and cleanliness
- Hazardous Materials –storage
- Containment – spillage from oil tanks
- Containment – potentially turbid surface water
- Containment – concrete truck washings
- Disposal of foul water from compound
- Disposal of demolition waste and surplus materials

The risks are be discussed on site during construction as if unmitigated and then with proposed mitigation measures in place. The nature of these risks will change as the project progresses. For instance, in the earthworks phase the principal concerns would be noise, dust/mud and turbid surface water runoff, whereas in later phases issues such as traffic control and waste management would be seen as critical.

RISK MATRIX

The above section outlines the type of risks associated with the project at this stage of development. These can then be tabulated to give a qualitative assessment of these risks, based on the potential consequences and likelihood of occurrence. The matrix identified in Table 9.0 can be used as a basis to classify the risk. The objective is that following implementation of the appropriate mitigation measures all identified risks are in the Low-Intermediate range, and are therefore considered acceptable

	H	Low-Med (Intermediate)	Medium (Unacceptable)	High (Unacceptable)	Emergency (Unacceptable)
Likelihood	M	Low	Low-Med (Intermediate)	Medium (Unacceptable)	High (Unacceptable)
	L	Low	Low	Low-Med (Intermediate)	Medium (Unacceptable)
	LL	Low	Low	Low	Low-Med (Intermediate)
		LL	L	M	H
		Consequence			

Table 9.0 – Risk Matrix

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10 Construction & Demolition Waste Management on Site

Surplus or waste materials arise from either the materials imported to site or from those generated on site. Imported materials are those, which are brought to the project for inclusion into the permanent works. Generated materials are those, which exist on the project such as topsoil, sub-soil, trees and materials from demolition works etc.

However, there are other considerations to waste management such as waste reduction, segregation of waste, disposal of waste, financial impacts of waste disposal and recording, monitoring, education and reviewing. This plan outlines the procedures that will be put in to place.

10.1 Waste Streams

Waste materials generated on site will fall into three categories for management, these are:

- Re-use
- Recycle
- Landfill

<u>Re-use</u>

If surplus materials can be used in the permanent works, they are classified as materials, which have been re-used. If they are surplus to requirements and need to be removed from site and they can be removed and used in their present form, they can be removed from site for reuse.

<u>Recycling</u>

If the surplus material cannot be re-used in its present form but could be used in a different form, it is sent for recycling e.g., timber can be recycled to make chipboard.

<u>Landfill</u>

If either of the above cannot be satisfied then the only option left is to send the surplus materials to landfill.

10.2 Waste Generated during Works

Waste Types	Waste Category	European Waste Code (EWC)	Colour Code	Origin of Waste
Tarmac	Inert	17 01 06		Site Strip & Demolition Works
Concrete	Inert	17 03 01		Construction & Demolition Works
Brick/Block	Inert	17 01 06		Site Strip & Demolition Works
Timber	Active/Bio	17 02 01		Construction & Demolition Works
Glass	Active/Bio	17 02 02		Construction & Demolition Works
Subsoils	Inert	17 05 04		Site Strip & Excavation Works
Metals	Active/Bio	17 04 07		Construction & Demolition Works
Plasterboard	Active/Bio	17 08 02		Construction & Demolition Works
Packaging		15 01 01 (Note 1) 15 01 02 (Note 2) 15 01 03 (Note 3)		Construction Works
Mixed		17 09 04		Construction & Demolition Works

Table 10.0 – Generated Waste

Note 1: 15 01 01 is the EWC code for paper and cardboard packaging

Note 1: 15 01 02 is the EWC code for plastic packaging

Note 1: 15 01 03 is the EWC code for wooden packaging

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10.3 Site Segregation

A specific area on the site shall be laid out and labelled to facilitate the separation of materials for potential recycling, salvage, reuse and return. Recycling and waste bins are to be kept clean and clearly marked in order to avoid contamination of materials. The labelling systems shall be the Waste Awareness Colour Coding Scheme. The skips will be clearly identified to ensure the workforce will deposit the correct materials into the correct skip. Skips for segregation of waste for the construction works will be:

- Wood
- Metal
- Brick/rubble
- Canteen waste

As works progress and other trades come to site other skips will be placed to enable certain waste to be removed from site. This is likely to include:

- Plasterboard
- Paper and cardboard (bagged up)

10.4 Waste Cycle

Site Enabling Works (including Demolition)	
Waste Types	**Waste Stream**
Concrete	Crushed & Re-used on site
Tarmac	Landfill
Stone/Blocks	Crushed & Re-used on site
Timber	Recycled
Subsoils	Recovery for land improvement works under article 27 or soil recovery.
Metals	Scrap Value
Plasterboard	Landfill

Table 10.1 – Waste Cycle – Site Enabling Works

Construction Works	
Waste Types	**Waste Stream**
Plasterboard	Return/Landfill
Bricks/Blocks	Landfill
Timber	Recycled
Cardboard	Recycled
Mortar	Landfill
Metals	Scrap Value
Paints	Landfill
Soils	Recovery for land improvement works under article 27 or soil recovery.

Table 10.2 – Waste Cycle – Construction Works

The skips will be monitored to ensure that contamination of segregated skips does not occur.

The client and contractor will need to continually review the type of surplus materials being produced and where they can change the site set up to maximise on re-use or recycling and ensure that the use of landfill will be the last resort.

10.5 Transport of Waste

Any of the waste that is removed from the site (including inert waste) shall only be transported by an individual or company which holds a valid Waste Collection Permit to transport such material. The Contractor will ensure that any person transporting waste off the site will have a copy of their Waste Collection Permit on the vehicle at all times.

10.6 Permitted/Licensed Facilities Used

Any waste (including inert waste) removed from any site shall only be taken to facilities which hold either a valid Waste Facility Permit issued by Cork City Council or a Waste License issued by the EPA.

10.7 Site Recording

The Contractor will ensure that a record shall be maintained of all waste removed from the site. The record shall include information on the type of waste removed, the quantity removed, the date removed, and details of whether the waste in question was being removed for either disposal or recovery/recycling, details of the transporter of waste, details of the facility to which waste is removed (including license or permit number). A location shall be identified where all records in regard to waste transport, recycling, disposal will be held for inspection.

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Details of the inputs of materials and outputs of wastes from the project will be investigated and recorded in a Waste Audit, which will identify the amounts, nature and composition of the waste generated. The audit will examine the manner in which the waste is produced and how management practices may contribute to the production of waste. The measured waste quantities will be used to quantify the costs of management and disposal in a Waste Audit Report, which will also record lessons learned for future projects.

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Appendix A -Site Access Plan

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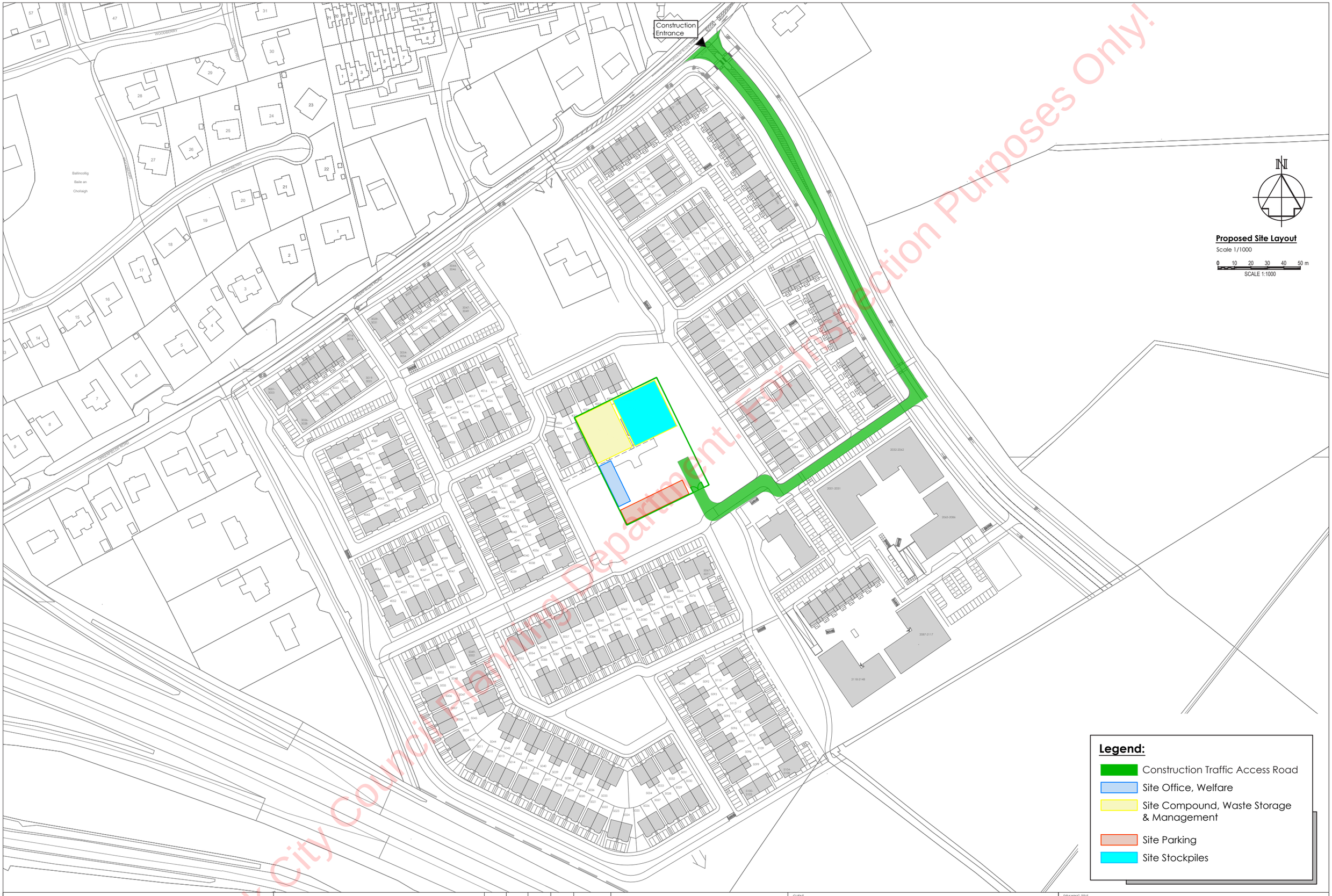

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PROJECT: Residential Development at Greenfield, Ballincollig

DRAWING TITLE: Site Facilities / Compound

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APPENDIX 2-2 Construction Traffic Management Plan – DOSA Consulting Engineers

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DOSA

DENIS O'SULLIVAN & ASSOCIATES

CONSULTING ENGINEERS

RESIDENTIAL DEVELOPMENT AT GREENFIELD, BALLINCOLLIG, CO. CORK

CONSTRUCTION TRAFFIC MANAGEMENT PLAN

DATE 07/07/2025

REVISION 1

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PROJECT NAME: Residential Development At Greenfield, Ballincollig, Co. Cork

PROJECT NUMBER: 6081

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			PREPARED	CHECKED	APPROVED
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1 Introduction

This Preliminary Construction Traffic Management Plan has been prepared by DOSA Consulting Engineers as part of the documentation in support of a planning application for a proposed residential development at Greenfield, Ballincollig, Co. Cork.

The purpose of this preliminary Plan is to address how construction traffic will access and egress this development site. It will also address the impact of construction related traffic on the surrounding road network during the construction stage.

The objectives of the Plan are to ensure that the construction traffic from the proposed development can be accommodated on the surrounding road network without significant impact on other road users.

It will ultimately be the responsibility of the main appointed Contractor to prepare and submit the detailed Construction Traffic Management Plan to Cork City Council for approval. It is intended that this preliminary plan will be agreed with Cork City Council and will then be used to provide guidance to the main Contractor when the Contractor commences the preparation of the detailed Plan.

1.1 Site Location

The subject site (currently greenfield) is located within the Ballincollig town boundary. The site is a greenfield site characterised by its gently sloping topography. The site is directly bound on the north by the existing Woodberry/Greenfields Road and to the south by the Ballincollig Bypass (N22). The western lands are currently in agricultural use but are also zoned in the Current City Development Plan. A snapshot of the application boundary is outlined in Figure 1.1 below.

Figure 1.1 – Context Map (Source: Google Maps)

1.2 Proposed Development

A Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork. The proposed development consists of the demolition of an existing dwelling house and farmyard with associated agricultural buildings and the construction of a mixed-use residential development of 544 no. residential units consisting of 232 no. dwelling houses, 312 no. apartment/duplex units, a two storey creche facility, commercial/retail unit and all ancillary site development works. The proposed 232 no. dwelling houses will include 100 no. 4 bedroom detached/semi-detached dwelling houses, 124 no. 3 bedroom semi-detached/townhouse dwelling houses and 8 no. 2 bedroom townhouse units. The proposed 312 no. apartment/duplex units will include 61 no. 3 bedroom units, 171 no. 2 bedroom units and 80 no. 1 bedroom units, to be provided in 28 no. apartment/duplex buildings ranging in height from 3-4 storeys. One of the proposed apartment buildings (Block 3) will provide the ground floor commercial/retail unit.

Vehicular access to the proposed development will be via two entrances from Greenfields Road (L2216) with separate pedestrian/cycle connections also provided from Greenfields Road. Ancillary site works include the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex buildings, creche and commercial/retail unit, landscaping and servicing proposals including the upgrade of public footpaths/active travel infrastructure and water service infrastructure, 2 no. pedestrian crossings on Greenfields Road and the installation of a noise attenuation screen along the site's southern boundary.

The proposed development is highlighted in Figure 1.2.

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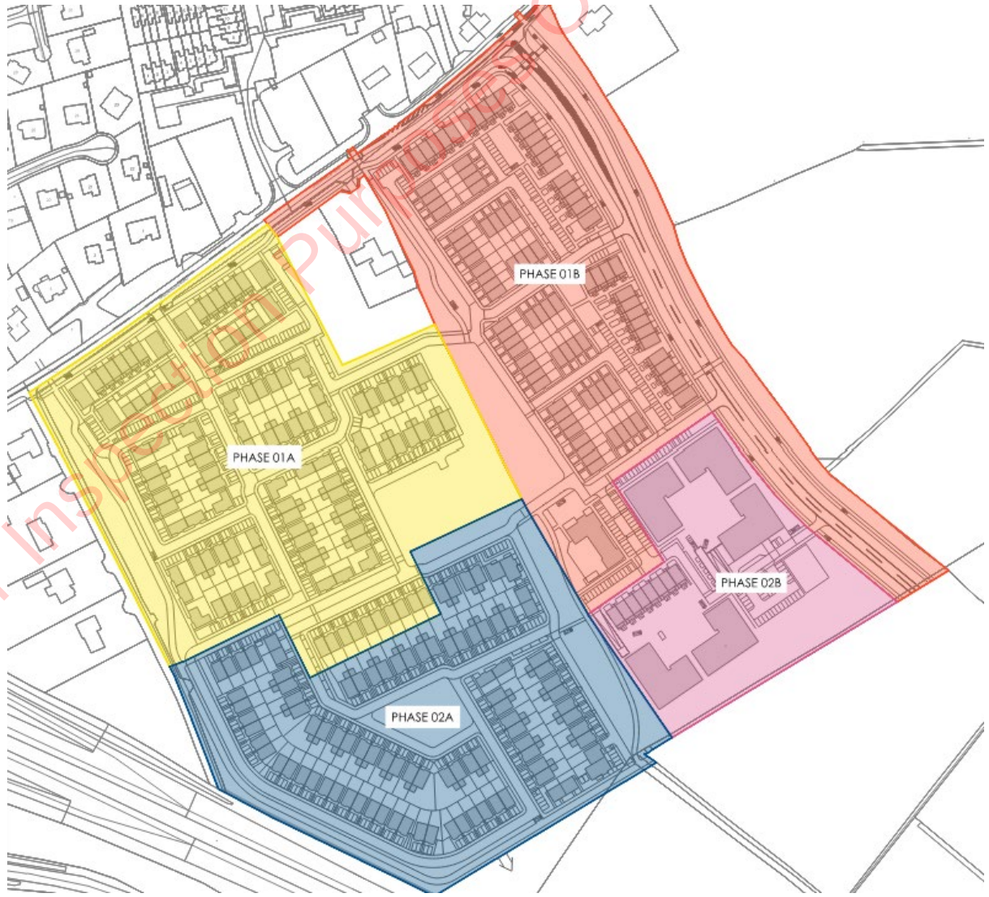
Figure 1.2 – Proposed Development

2 Phasing/ Construction Program

It is anticipated that the works will be carried out in a number of phases. Details of the overall phasing plan are outlined on the Proposed Phasing Layout Drawings in Appendix A. It is anticipated that the construction access will be via the new site entrance for phase 1. This will run parallel with the construction of Phase 1 of the Residential units and the associated internal road network.



Legend:

Phase 01A	-	130 Units Portion of active travel paths along Kilumney Road. Demolition of existing dwelling & Farm Sheds.
Phase 01B	-	134 Units Complete works along Kilumney Road. Complete sustainable access corridor. Complete Creche.
Phase 02A	-	116 Units
Phase 02B	-	164 Units Total Completion

Figure 2.0 – Proposed Phasing

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Phase	Year 1				Year 2				Year 3				Year 4				Year 5				Year 6				Year 7				Year 8			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1A					17	17	18	18	17	17	18	18																				
1B													18	19	19	19	18	19	19	19												
2A																					22	22	23	23	22	22						
2B																											23	23	18	18	19	19
Total	0	0	0	0	17	17	18	18	17	17	18	18	18	19	19	19	18	19	19	19	22	22	23	23	22	22	23	23	18	18	19	19
Cumulative	0	0	0	0	17	34	52	70	87	104	122	140	158	177	196	215	233	252	271	290	312	334	357	380	402	424	447	470	488	506	525	544
Annually	-				70				140				215				290				380				470				544			

Figure 2.1 – Proposed Phasing Breakdown

3 Construction Trip Generation

During the construction period for the proposed development, there will be a number of high activity periods where construction related traffic will be highest.

The most active of these periods are likely to be:

- Excavation to reduced levels including basement
- Construction of the actual buildings.

The nature of the construction process is such that the traffic generated will comprise short periods of high activity interspersed with longer periods with relatively low level of truck movements into and out of the site over the 10-year construction period.

The schedule of works below outlines the work that will be associated with the development are as follow.

- Preparation of site compound including parking area.
- Securing of site boundaries, including erection of site hoarding, as required.
- Erection of appropriate Health and Safety signage and warning signs.
- Excavation and on-site storage of topsoil.
- Installation of foul drainage, storm drainage and watermain systems.
- Construction of internal roadway to provide access to dwellings.
- Construction of Dwellings, services and associated structures.

3.1 HGV Vehicular Trip Generation

Estimates of traffic generation associated with the construction phases will be derived from first principles using the guidance from TRICS Construction Traffic Research Report, 2008 (Ref. 14-18).

It is assumed that the total construction vehicle movements will take place over approximately 255 days per year (i.e., no movements on Sundays and Bank Holidays). This equates to approximately 22 construction days on average per month. It is envisaged that the construction works associated with the development scheme will take place over a period of approximately 9 years.

Whilst it is recognised that there will be some variation in flows on a day-to-day basis, it is envisaged that on average there would be circa 40 construction/HGV vehicle movements per day. The largest variation is likely to be during the bulk excavation period where it is anticipated it will be in the order of 60 construction/HGV vehicle movements per day.

As the development progresses through planning and procurement an update can be provided on the number of HGV trips generated. This will include detail on the number of six-wheel grab lorries generated during the bulk excavation period.

3.2 Construction Worker Trip Generation

As the application progresses it will be possible to make an informed assumption on the number of construction workers on site each day which is likely to range between 75-150 depending on construction stage. This will be agreed with officers from Cork City Council along with likely mode share. It is anticipated that there will be approximately 50 site operative vehicles per day as carpooling will be encouraged.

4 Construction Traffic Management

4.1 General

Local traffic and transport impacts are primary issues and concerns for all construction projects. As such, managing the potential impacts of construction is a key priority. Potential construction impacts include on-street congestion causing traffic delays, potentially increased road hazards, conflict with pedestrians and cyclists, noise from vehicles and air quality impacts from vehicle emissions and dust.

The section provides an overview of the logistics of construction, including vehicular access routes, loading and unloading locations, anticipated vehicle frequencies, sizes and movements, and details of core working hours.

4.2 Construction Vehicle Routing

The details of the proposed construction routing will be agreed with Cork City Council, prior to commencement of construction works. To facilitate this all entry and exit points for Heavy Construction Vehicles will be located along the existing Woodberry/Greenfields Road. The proposed routes of construction vehicles across the wider network are shown in Figure 4.2 below It is proposed the magenta route would be the main access route from the East & the blue route from the West. It is considered appropriate to avoid routes where vulnerable road users and construction vehicles could conflict. Likewise, it is considered appropriate to avoid routes where scheduled road works and construction vehicles could conflict. The Site Manager or Banksman will keep up to date on scheduled roadworks, events and incidents in the area. Any major roadworks or events on the preferred route that result in the deviation of the preferred route will be agreed with officers at Cork City Council in advance where feasible.

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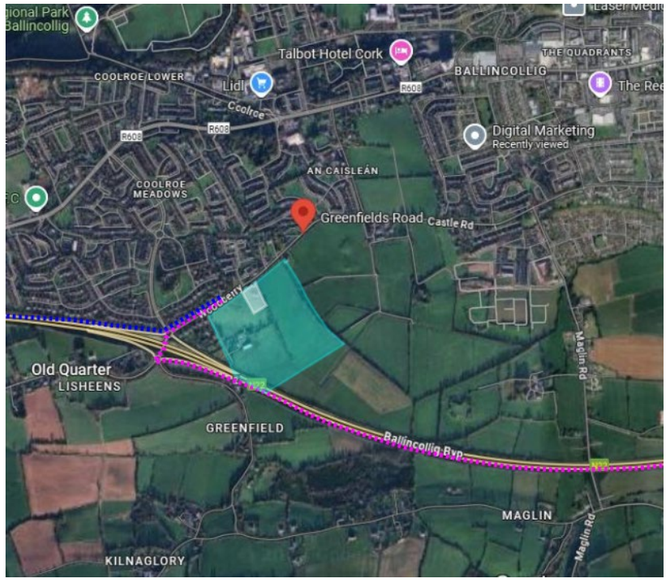

Figure 4.2 – Proposed Delivery Access Routes

4.3 Route Compliance

Use of the agreed vehicle routes should be accepted by the contractor and should be communicated to all individuals associated with the works. It is envisaged that this information will be communicated in the form of a leaflet or email and will include information with regard to times of operation, delivery routes, the call up procedure and delivery slot information.

Any repeated non-compliance of the proposed construction route could result in disciplinary procedures or the termination of the workers / supplier's contract.

4.4 Delivery and Servicing for the Site

4.4.1 Deliveries

All construction deliveries will take place on-site utilising the site access onto Woodberry/Greenfields Road. All vehicles will be met by a banksman before being directed into a dedicated unloading area. Vehicles will then load / unload before exiting via the same route.

All users associated with the site should be made aware of construction deliveries and appropriate safety measures should be put in place to ensure safety of staff and pedestrians. Vehicles should have to book a timeslot which will be allocated on a first come first serve basis. A board where the delivery slots can be reserved should be put up on Site. The Site Manager will stagger the deliveries to minimise the impact on and off the site. A banksman will meet all deliveries on site prior to them undertaking any manoeuvres.

4.4.2 Vehicle Frequency

Where feasible, the contractor will seek to minimise deliveries during the weekday peak hours (08:00 – 09:00 and 17:00 – 18:00).

4.4.3 Vehicle Size

It is likely that the majority of vehicles accessing the site will be 6-wheel grab lorries (8.1m), rigid delivery vehicles (7.8m), 6-wheel concrete pump lorries (7.7m) and delivery vans (5.6m). As such it is envisaged that all vehicles accessing the site for purposes of construction will be less than 10m in length.

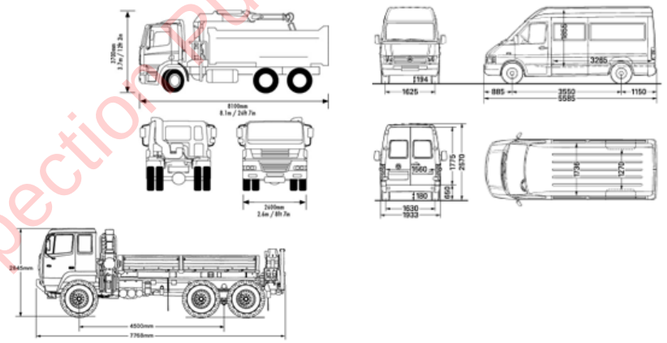

Figure 4.4.3 – Proposed Delivery Truck Dimensions

4.4.4 Non-Road Mobile Machinery

The following non-road mobile machinery is likely to be used on site.

- Breaker
- Dumper trucks
- Tower / Mobile Cranes
- Excavators
- Compacter / Rollers
- Drills / Cutters
- Piling Rig
- Fork Lift Truck

4.4.5 Vehicle Dwell Times

Delivery vehicles are unlikely to attend the site for longer than 30 minutes and will be encouraged to turn off their engines while idling to reduce CO2 emissions.

4.4.6 Control of Deliveries

All deliveries should be controlled by a strict delivery booking system which will distribute deliveries across the week and across working hours. Deliveries should not be accepted outside of their designated timeslot, and such deliveries will be asked to re-book, unless there is capacity to accommodate within the specified loading area.

On a weekly basis the Site Manager should evaluate details of the daily profile of deliveries proposed for the upcoming week. Hauliers will be required to contact the site and indicate their delivery schedule for the following day. The proposed deliveries will be checked against the weekly delivery

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schedule. This will be overseen by the Site Manager to ensure that HGV deliveries are scheduled, ensuring that there is always space at the site to accommodate the necessary plant and deliveries.

- When planning deliveries, the following will be considered:
- All deliveries to the site should be restricted to the timings set out within this document.
- Deliveries will be permitted only in the specified loading area on site; and
- Material storage areas will be prepared on-site in advance of deliveries to minimise loading and unloading times.

It is anticipated that all deliveries to the site will be organised to take place between the hours of 08:00 – 18:00, Monday to Friday and 08:00 – 16:00 Saturday (subject to confirmation / approval from CCC). Where feasible the contractor will seek to minimise deliveries during the weekday peak hours (08:00 – 09:00 and 17:00 – 18:00).

Sufficient time will be given between deliveries to allow for any delays as a result of the delivery vehicle getting stuck in traffic or the loading / unloading taking longer than expected and to avoid any vehicles waiting on the surrounding road network.

The following measures will be implemented to reduce the number of vehicle movements to the site.

- 'Backloading' vehicle operation, where site delivery vehicles are utilised to remove waste materials from the site as part of the same trip, where possible; and
- Practical re-use of any aggregates on site and recycling of material, where possible.

With proper planning and an efficient delivery schedule, unnecessary vehicle trips to the site will be kept to a minimum.

4.5 Construction Personnel

The number of construction workers on site is still unknown. However, the contractor, where feasible, will seek to recruit construction workers from the local area. This will help maximise the potential for construction workers to travel to the site via sustainable means.

As such it is likely that the construction workforce will reside in the local Cork area and therefore, in most instances, the majority of construction staff will have the opportunity to arrive at the site via vehicle, public transport, bicycle or via foot.

There will be construction personnel parking (in the form of a temporary car park), for cars and vans on site.

4.6 Construction Traffic Access

Construction Traffic shall access shall vary depending on the phases. The intension would be to access the construction phases via sections of road completion of the main link/distributor road as indicated in Appendix B.

Figure 4.6 – Current access Point

4.6.1 Car Parking

Temporary car parking facilities for construction vehicles will be provided within the site boundary.

5 Construction Traffic Mitigation

5.1 Standards

Insofar as the construction of this development may impact on the surrounding road network, the development and associated roadworks shall be undertaken in compliance with the requirements of Cork City Council and any other requirements that the Council may impose during the course of the works.

5.2 Project Team

It shall be the duty of the Project Team to provide the main Contractor in good time with all necessary designs, details, drawings, and specifications so that the Contractors can, in conjunction with the Project Team, prepare detailed proposals and programmes for the execution of the works.

The proposals shall be submitted to Cork City Council and shall incorporate any requirements included in the conditions of the planning permission for the development.

It shall also be the duty of the Project Team to ensure that the Contractors proposals are reasonable and that they are implemented in a safe and competent manner.

5.3 Main Contractor

It shall be the duty of the Main Contractor in conjunction with the Project Team to prepare detailed construction and traffic management proposals for the implementation of the works.

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The Contractor shall give adequate and timely notice to Cork City Council.
The Contractor(s) shall also be responsible for implementing the traffic management proposals in a safe and competent manner on an ongoing basis

5.4 Construction Manager

There will be a designated Site Manager to deal with any complaints and enquiries from the general public and any other interested parties. The details of the Site Manager (including a 24-hour phone number) will be provided to CCC prior to activities beginning on-site. The Site Manager's details will also be advertised at the site entrance.

The Site Manager for the project will undertake the transport co-ordination role for the site. In this respect, their main responsibilities should include:

- Managing the implementation of the Construction Management Plan.
- Vehicle scheduling.
- Informing CCC of the commencement of construction works.
- Informing local residents and DCC of any major or noise intensive works associated with the construction of the site to avoid / minimise disruption.
- Checking for scheduled road works,
- Handling any complaints; and
- Acting as a point of contact for employees, contractors CCC and the general public.

The Site Manager should be responsible for keeping neighbours within the site's vicinity informed of the construction progress. In this respect, the Site Manager should ensure that there is adequate liaison between the following key stakeholders throughout the construction period:

- The Contractor.
- The Developer.
- Site neighbours.
- Cork City Council; and
- Other local stakeholders such as emergency services or local transport providers.

5.5 Subcontractors

Individual subcontractors involved in activities such as waste removal should be required to incorporate the relevant requirements from the CTMP into their activities as well as statutory requirements. Any potential sub-contractors will be required to show how they will comply with the CTMP and how targets will be achieved and impacts minimised.

5.6 Good Neighbours Policy

The contractor will strive to be 'Good Neighbours', with systems employed to ensure local issues are understood. As part of this the contractor could sign up to the Considerate Constructor Scheme (CCS).

An induction specific to the development site will be provided to all personnel before construction commences. This will incorporate health and safety; on-site construction works and issues and sensitivities in the context of the surrounding community.

5.7 Dust and Dirt Control

The control of dust and dirt is a prime concern for all construction projects, particularly during periods of dry and windy weather. Best practice guidance 'Dust and Air Mitigation Measures' guidance provided by the Institute for Air Quality Management will be utilised to control dust.

Mud and debris on the road are regarded as one of the main environmental nuisances and safety problems arising from construction sites. All HGVs removing spoil from the site will be fully sheeted to minimise the risk of any mud over spilling onto the highway.

Further to this, all skips and storage area for cement, sand and fine aggregates will be sheeted/covered when not in use. All HGVs serving the site will be required to ensure that their wheels have been cleared of mud and debris, with wheel washing facilities provided on site. Similarly, provision will be made for cleaning of the road whenever required.

Pavements and carriageway fronting the access used for the construction will be swept daily, and the need for this will be continuously monitored throughout the day, in light of site operations and weather conditions. Goods, waste material and wheelbarrows will be secured and covered prior to being transported to and from the site to prevent the escape of debris and dust.

The contractor will ensure that the area around the site including the public road is regularly and adequately swept to prevent any accumulation of dust and dirt.

The Site Manager will undertake daily inspections of the site and the roads surrounding the site to ensure that dust control measures are complied with. The Site Manager will record and respond to all dust and air quality pollutant emissions complaints and will maintain a log of any complaints and any action taken to resolve the issues.

The frequency of site inspections will increase when activities with a high potential to produce dust are being carried out as well as during periods of prolonged dry or windy conditions.

5.8 Fuel Consumption / Emissions

The contractor will strive to procure local contractors for the project, thereby minimising transport costs and impact on the local environment. The use of the booking system for deliveries will also help to ensure that the construction site is serviced in an efficient manner which will help to minimise the number of vehicle movements that would be generated.

A further measure that will be employed is encouraging all delivery vehicles to switch off engines as they are waiting at the site, thereby preventing unnecessarily idling vehicles.

5.9 Debris on Roads

A wheel cleaning procedure will be used in order to mitigate the amount of debris that could potentially be deposited on the roads by vehicles exiting the site. An area close to the site exit will be utilised for wheel washing prior to vehicles leaving site. A power washer will be used to wash off any mud from the vehicle's wheels, with excess mud/slurry being collected and disposed of.

The wheel wash station will remain on site until the development is complete. The proposed wheel cleaning procedure will consist of:

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- Before leaving the site, vehicles will be inspected for any heavy deposit left on wheels. If present, these will be removed manually.
- Following inspection, all wheels are to be washed down using a high-pressure jet wash until clear of all deposits.
- Vehicles will be permitted to leave site following approval of the site manager/site representative that the above steps have been completed to a satisfactory standard.

The site will be kept as free of mud as is practical during ground working operations. Machine and wagon trafficking around the site will be kept to a minimum in order to reduce the effects of rain on 'broken' ground.

The construction site access into the site will be secured. The site will be secured whenever construction personnel are not present. Site contact details and out of hours emergency contact details will also be prominently displayed on site hoardings. Daily inspections will be undertaken in the vicinity of the site and on footways to check for potential hazards (including blocked footways and the build-up of rubbish).

5.10 Pedestrian Safety Measures

Pedestrian safety throughout the construction programme will be paramount. To ensure pedestrian safety during loading and unloading activity, a Banksman / traffic marshal should be present to minimise the likelihood of conflict with pedestrians. Warning signage will be provided locally to the site to ensure that vehicles, pedestrian and cyclists are aware that construction activity is taking place. The site will be properly secured, helping to ensure that pedestrians and the general public cannot access the construction site unauthorised.

5.11 Other

Site contact details and out of hours emergency contact details will also be prominently displayed on site hoardings. Daily inspections should be undertaken in the vicinity of the site and on footways to check for potential hazards (including blocked footways and the build-up of rubbish).

Heavy goods vehicles associated with the construction of the development must:

- Have Side Guards fitted, unless it can be demonstrated to the reasonable satisfaction of the Employer, that the Lorry will not perform the function for which it was built, if Side Guards are fitted.
- Have a close proximity warning system fitted comprising of a front mounted, rear facing CCTV camera (or Fresnel Lens where this provides a reliable alternative), a Close Proximity Sensor, an in-cab warning device (visual or audible) and an external warning device to make the road user in close proximity aware of the driver's planned manoeuvre.
- Have a Class VI Mirror; and
- Bear prominent signage on the rear of the vehicle to warn cyclists of the dangers of passing the vehicle on the inside.

The Site Manager should ensure that all contractors and fleet operators at the site sign with vehicles over 3.5 tonnes will be required to have the vulnerable road user safety kit fitted, as outlined in Figure 6.11.

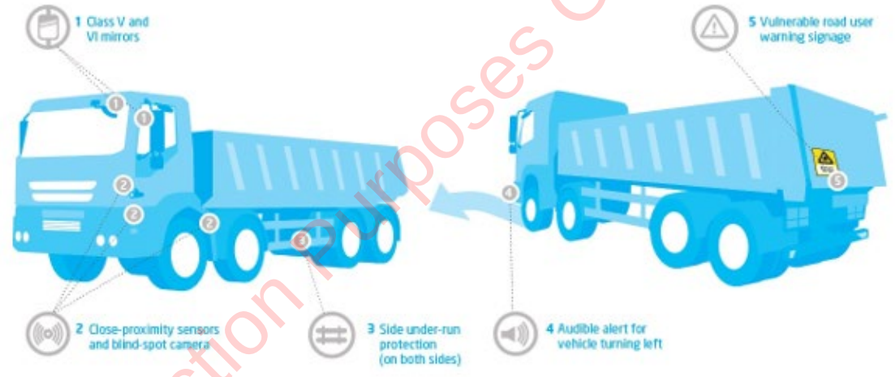

Figure 6.11 – Delivery Truck Safety Measures

The Site Manager should undertake checks of vehicles accessing the site. In the event that a vehicle arrives at the site and is not fitted with the above safety kit then the vehicle may be refused entry and a non-conformance report completed.

The Site Manager / Contractor should ensure that all contractors and fleet operators accessing the site have received the correct level of training and have had driver license checks.

5.12 Construction Travel Plan

The contractor will be encouraged as part of the contract to introduce a Travel Plan for its staff to limit the number of private car trips to the site. The Travel Plan will form part of the final Construction Management Plan and will be agreed with CCC prior to works beginning on site.

The construction site will provide facilities to encourage sustainable travel such as drying area, storage facilities and secure bike parking. Where staff are required to travel to site by car, they will be encouraged to do so by carpooli

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Appendix A- Development Phasing Plans

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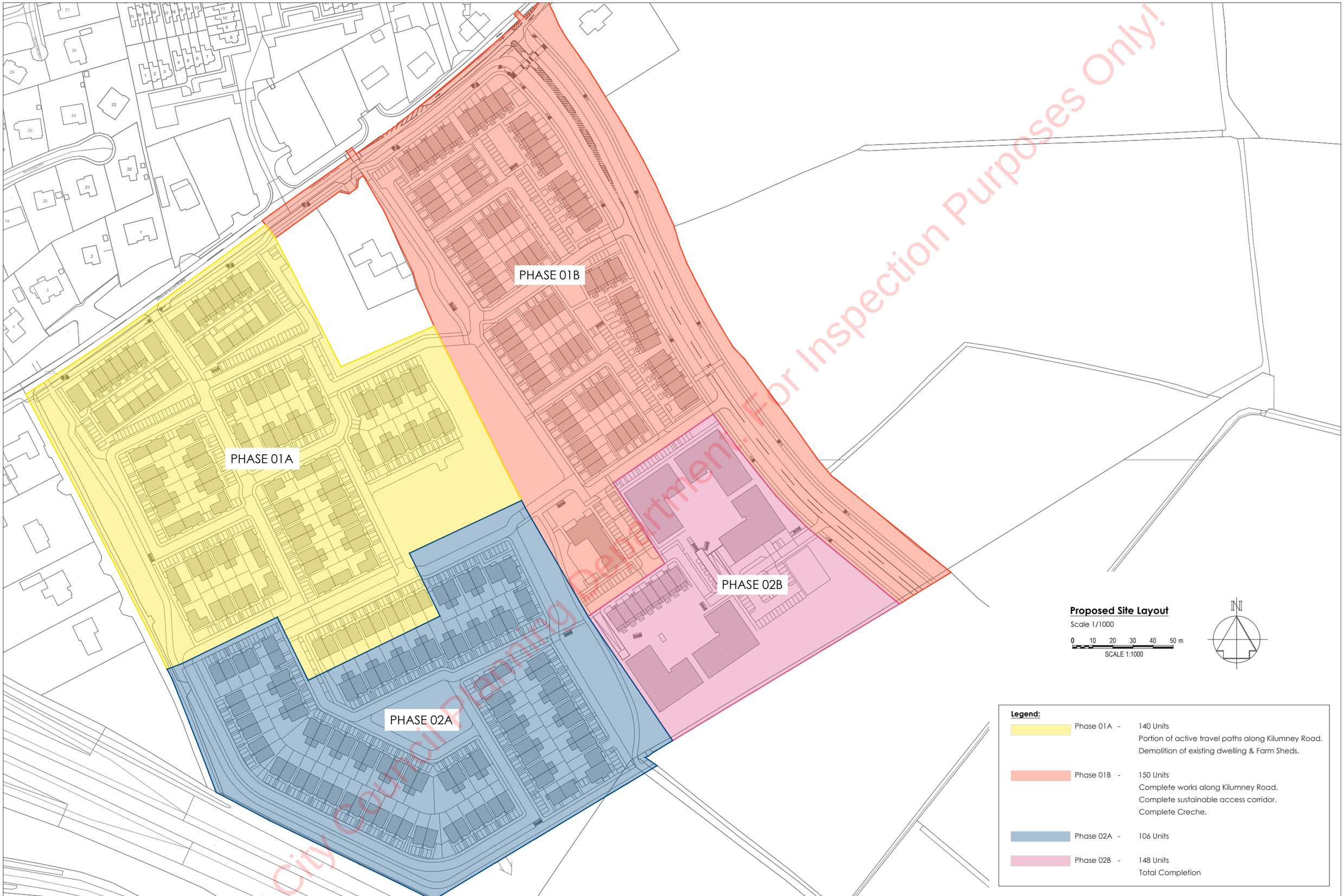

Proposed Site Layout

Scale 1/1000

0 10 20 30 40 50 m

SCALE 1:1000

N

Legend:

- Phase 01A - 140 Units
  Portion of active travel paths along Kilumney Road.
  Demolition of existing dwelling & Farm Sheds.
- Phase 01B - 150 Units
  Complete works along Kilumney Road.
  Complete sustainable access corridor.
  Complete Creche.
- Phase 02A - 106 Units
- Phase 02B - 148 Units
  Total Completion

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REV.	DRAWN	CHKD	APPRVD	DATE	DETAILS
C	K.M.	L.O'T.	L.O'T.	07.07.'25	Issued for LRD Planning Application

CLIENT: Murnane & O'Shea Ltd.

PROJECT: Residential Development at Greenfield, Ballincollig

DRAWING TITLE: Phase Plan

SHEET: A1 / A3

SCALE: 1:1000 / 1:2000

PROJECT NO. 6081 _ DRAWING NO. 1164 _ STATUS/ISSUE C

Appendix B – Construction Access

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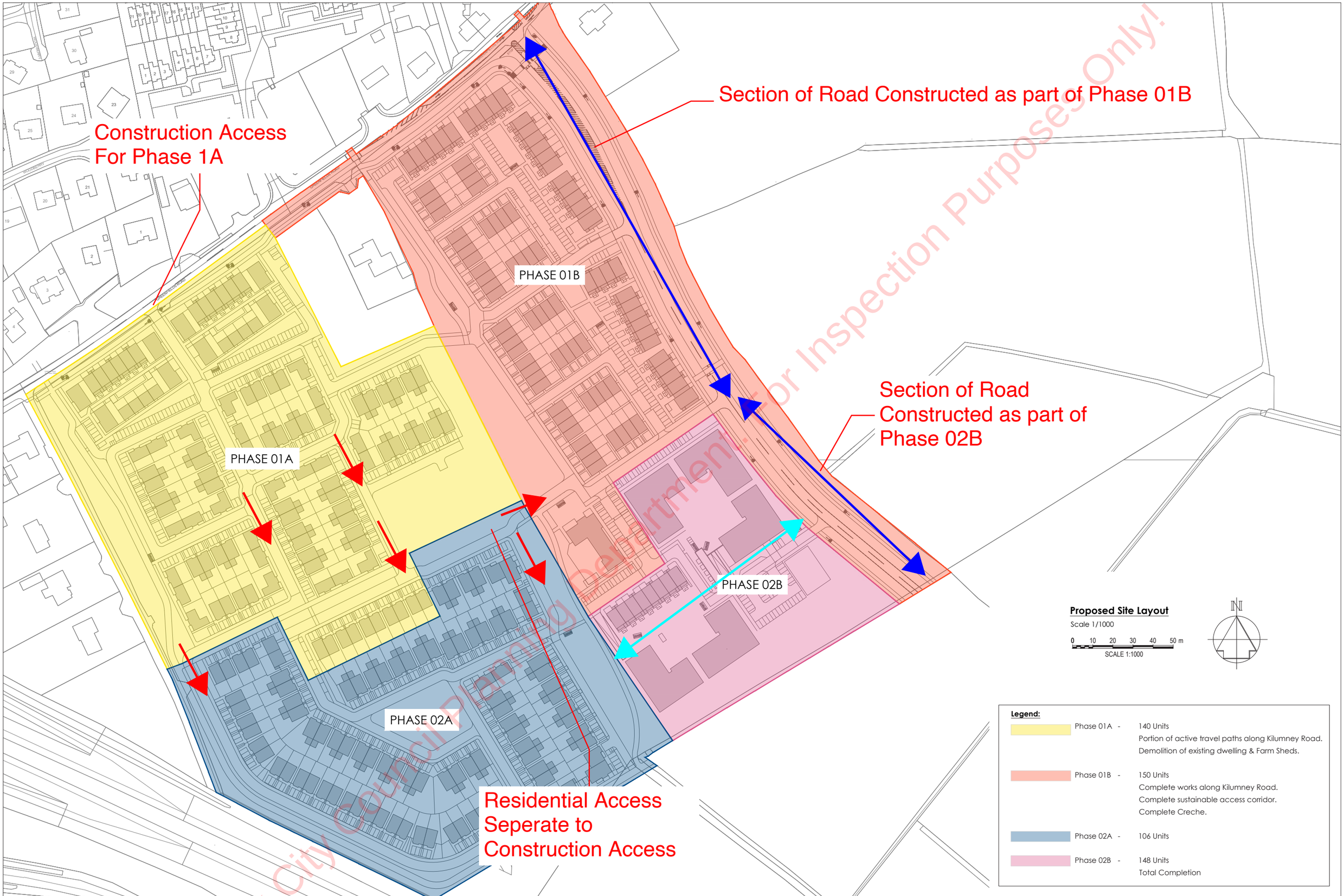

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CLIENT: Murnane & O'Shea Ltd.

PROJECT: Residential Development at Greenfield, Ballincollig

DRAWING TITLE: Construction Access Phasing Plan

SHEET: A1 / A3

SCALE: 1:1000 / 1:2000

PROJECT NO. 6081 _ DRAWING NO. 1164 _ STATUS/ISSUE C

APPENDIX 2-3 Proposed Site Layout – Deady Gahan Architects

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DO NOT SCALE. WORK TO FIGURED DIMENSIONS ONLY.
ALL EXISTING DIMENSIONS TO BE CHECKED ON SITE.
DRAWN ON AUTOCAD R2004 AT DEADY GAHAN ARCHITECTS LTD
LAYERS ON THIS DRAWING COMPLY WITH BS 1192: PART 5

AREAS SCHEDULE	
SITE AREA	15.2 Ha
DEV. AREA	12.1 Ha
NO.UNITS	544
OPEN SPACE	15.3% Usable
DENSITY	45 Unit/Ha

- Character Area 1 - Greenfield View
- Character Area 2 - Castle Park
- Character Area 3 - Beech Green
- Character Area 4 - Sycamore Park
- Character Area 5 - Village Mews

LOCATION OF SITE NOTICE
PROPOSED UNCONTROLLED PEDESTRIAN CROSSING
PROPOSED UNCONTROLLED PEDESTRIAN CROSSING
PROPOSED SUSTAINABLE ACCESS CORRIDOR
PROPOSED 4m WIDE SIGNALISED PEDESTRIAN CROSSING
PEDESTRIAN ENTRANCE
EXISTING ADJOINING PROPERTY
SITE ENTRANCE
PROPOSED LOCATION OF ACTIVE TRAVEL PATHS TO ACCOMMODATE FUTURE ROAD WIDENING
RELOCATED ENTRANCE AND ROADSIDE BOUNDARY OF ADJOINING PROPERTY TO FACILITATE ACTIVE TRAVEL PATHS
LOCATION OF SITE NOTICE
SITE ENTRANCE
PEDESTRIAN ENTRANCE
PROPOSED UNCONTROLLED PEDESTRIAN CROSSING
SITE ENTRANCE
PROPOSED SHOP AT GROUND FLOOR OF BLOCK 3
SITE ENTRANCE
PROPOSED GREENWAY
LOCATION OF SITE NOTICE
LOCATION OF SITE NOTICE
PROPOSED GREENWAY
ACCESS PROVIDED SOUTH TO FUTURE DEVELOPMENT
2.5m HIGH TIMBER NOISE BARRIER

FOR LOCATION OF SITE NOTICES - REFER TO LOCATION MAPS - DWG NO. 20195/P/001 & 20195/P/002

PLEASE REFER TO SRLA LANDSCAPE DRAWINGS FOR DETAILS OF BOUNDARY AND SURFACE TREATMENTS

PLEASE REFER TO ENGINEERS DRAWINGS FOR ROAD DETAILS

Denotes area of land subject to planning application

NORTH

PROPOSED SITE PLAN - MASTERPLAN
SCALE 1:1000 @ A1

date	rev	name	chk	note
18.07.25	P2	GN	EJG	ISSUE FOR PLANNING

DEADY GAHAN ARCHITECTS
EASTGATE VILLAGE, LITTLE ISLAND, CORK
T: 021 4355016 W:WWW.DGARCHITECTS.IE
EMAIL:INFO@DGARCHITECTS.IE

Project
PROPOSED RESIDENTIAL DEVELOPMENT
GREENFIELD,
BALLINCOLLIG, CO. CORK

Drawing title
PROPOSED SITE LAYOUT
MASTERPLAN

Scale	Drawn	Checked	Date
1:1000 @ A1	GN	EJG	23.05.2025
Project No. 20195	Drg. No. 20195/P/003		Revision P2

☐ Information \ Comments ☐ Tender
☒ Planning ☐ Construction

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APPENDIX 2-4 Infrastructure Report – DOSA Consulting Engineers

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DOSA

DENIS O'SULLIVAN & ASSOCIATES

CONSULTING ENGINEERS

RESIDENTIAL DEVELOPMENT AT GREENFIELD, BALLINCOLLIG, CORK

INFRASTRUCTURE REPORT

DATE 07/07/2025

REVISION 2

JOB NO. 6081

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PROJECT NUMBER: 6081

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2	07.07.2025	DESCRIPTION: Infrastructure Report			
			PREPARED	CHECKED	APPROVED
		INITIAL	SO'G	LO'T	SO'G
		DATE	07.07.2025	07.07.2025	07.07.2025
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		DATE			

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1 *Introduction*

DOSA Consulting Engineers were engaged as Consulting Engineers for the proposed development at Greenfields, Ballincollig, Cork.

1.1 Objectives

A number of site investigations have been carried out and their findings have been incorporated to deal with solutions to:

- Storm Water Drainage Network
- Foul Drainage Network
- Water Supply

1.2 Site Location

The subject site (currently greenfield) is located within the Ballincollig town boundary. The site is a greenfield site characterised by its gently sloping topography. The site is directly bound on the north by the existing Greenfields Road and to the south by the Ballincollig Bypass (N22). The western lands are currently in agricultural use but are also zoned in the Current City Development Plan.

A snapshot of the application boundary is outlined in Figure 1.2 below.

Figure 1.2 – Context Map (Source: Google Maps)

1.3 Site Topography

The topography of the site gently slopes from the north and west to a low point on the south-eastern boundary which is approximately +18.42m AOD. The elevation height along the perimeter from the north, west and southern side varies from +30.0m to +19.0m AOD. A full Topographical feature and level survey has been completed. Figure 1.3 shows a snip of the topographical survey.

Figure 1.3 – Site Topography

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1.4 Existing Hydrological Environment

The site is within hydrometric area19 (Lee, Cork Harbour and Youghal Bay). Hydrometric area No19 includes the surface catchment drained by the River Lee and all streams entering tidal water in Cork Harbour and Youghal Bay and between Knockaverry and Templebreedy. The site is in the sub catchment of Glasheen(Corkcity)_SC_010 (EPA Segment Code 19_17). The surface water catchment divide is shown on Figure 1.4.

The main hydrological features of the area are the "Lisheens 19" and "Maglin North" networks. Both of these watercourse's flow in a westerly direction. The Maglin North watercourse is joined by the Maglin South River approximately 2km downstream from the subject site before discharging to the Curragheen River, which is approximately a further 2km downstream. The Curragheen River then flows in a north-easterly direction and joins the River Lee before ultimately discharges to Cork harbour. Figure 1.5 below illustrates the main hydrological features associated with the site.

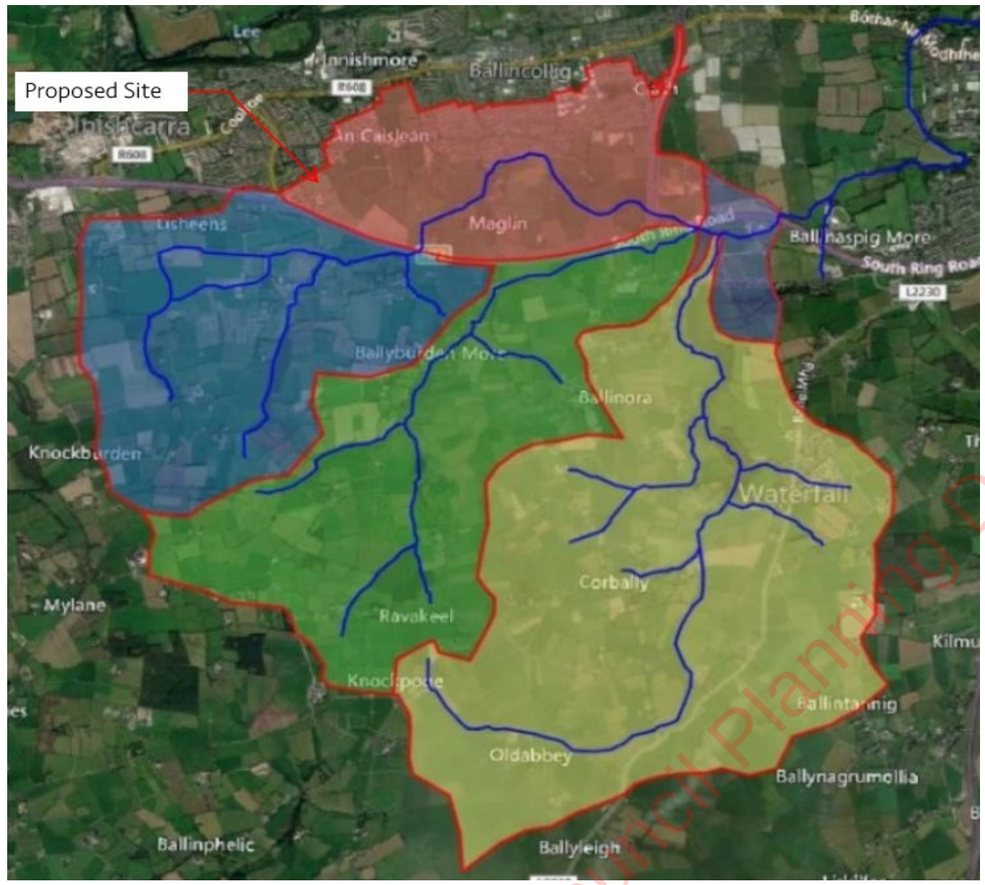

Figure 1.4 – Catchments (Source: MWP FRA)

Figure 1.5 – Convergence of Watercourses (Source: MWP-South Ballincollig Drainage Study)

1.5 Proposed Development

A Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork. The proposed development consists of the demolition of an existing dwelling house and farmyard with associated agricultural buildings and the construction of a mixed-use residential development of 544 no. residential units consisting of 232 no. dwelling houses, 312 no. apartment/duplex units, a two storey creche facility, commercial/retail unit and all ancillary site development works. The proposed 232 no. dwelling houses will include 100 no. 4 bedroom detached/semi-detached dwelling houses, 124 no. 3 bedroom semi-detached/townhouse dwelling houses and 8 no. 2 bedroom townhouse units. The proposed 312 no. apartment/duplex units will include 61 no. 3 bedroom units, 171 no. 2 bedroom units and 80 no. 1 bedroom units, to be provided in 28 no. apartment/duplex buildings ranging in height from 3-4 storeys. One of the proposed apartment buildings (Block 3) will provide the ground floor commercial/retail unit.

Vehicular access to the proposed development will be via two entrances from Greenfields Road (L2216) with separate pedestrian/cycle connections also provided from Greenfields Road. Ancillary site works include the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex buildings, creche and commercial/retail unit, landscaping and servicing proposals including the upgrade of public footpaths/active travel infrastructure and water service infrastructure, 2 no. pedestrian crossings on Greenfields Road and the installation of a noise attenuation screen along the site's southern boundary.

The proposed development is highlighted in Figure 1.6.

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Figure 1.6 – Proposed Development

2 Storm Water Design

2.1 Design Response to Section 247/LRD Meeting Commentary/Queries

2.1.1 247 Meetings

Queries raised via meetings and minutes of notes from 247 meetings have been incorporated into the design. This has been noted in the LRD Opinion

"The overall storm water drainage strategy is acceptable and incorporates our feedback and comments from previous S247 meetings."

2.1.2 LRD Meeting

Area Engineer Comments

"There are at least one drainage pipe taking surface water from the Kilumney Road to an open drain within the development site. The inlet on Kilumney Road is 51.8805112798873, - 8.609451055526735. This will need to be tied into the new proposed surface water system dependent on levels. Alternatively, a new gully and pipe will be required at a sufficient depth to tie into the proposed new surface water system. This would be subject to a survey and discussion with the Area Office."

Response

A connection to the proposed stormwater network has been provided for in the design. Refer to Drawing 6081-4221

Drainage Section – Cork City Council Comments

The overall storm water drainage strategy is acceptable and incorporates our feedback and comments from previous S247 meetings.

In relation to the proposed attenuation tanks, there are concerns over how the tanks will be accessed for maintenance. Attenuation Tank Nr. 5 is located in a green area between a private area and an area to be Management Company. There appears to be no access for plant and equipment.

Attenuation Tank Nr. 6 is located in an area of public open space and amenity. It is located a significant distance from an access road and would require crossing pedestrian/cycle paths. There are concerns that accessing the tank with plant and equipment could significantly damage the landscaping. Also, the SuDS schematic layout shows numerous trees planted on top of and around the tank which would further impede access.

Please clarify how the tanks will be accessed, identifying access routes and locations for the safe parking and positioning of plant and equipment.

Also no drawings were provided for the attenuation tank. Please provide general arrangement and cross section drawings for each of the proposed attenuation tanks. Please note that internal walls or any internal obstructions to cleaning should be avoided. Access covers with fall arrests are required on opposite sides of the tanks to facilitate cleaning.

Response

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Detailed General Arrangement Plans have been included for all attenuation Tanks proposed. Refer to drawings

6081-4280, 6081-4281, 6081-4282, 6081-4283, 6081-4284 & 6081-4285

Tank locations have been reviewed and located in open areas. (minor repositioning to that previously submitted). In relation to Access and maintenance all tanks are accessible. Any sloped areas in and around tanks will be a maximum of 1:4. Off road parking green parking (Reinforced grass parking areas) have been provided for all tanks as indicated on relevant drawings listed above. No landscaping trees will be planted over the reinforced tanks. It will be predominantly grass with potentially small pockets of low level shrubs. These are indicated on the drawings listed above.

Any access paths, landscaping areas etc that require traversing will be such designed so that there is no damage

In terms Of Operation and Maintenance the use of Reinforced concrete tanks is robust and maintenance free. The typical arrangement is the following train

- A Petrol interceptor which is accessible only via an on-grade heavy duty manhole cover.
- An inlet manhole to the tank will have a sump incorporated to trap silt so as to reduce the need to access the tank.
- The SuDS train is followed by a reinforced concrete attenuation tank. This is accessed via a number of heavy-duty manholes covers and fall arrest gates. (anticipated requirement to enter is extremely low). In the unlikely event of entry being necessary only trained personnel in confirmed spaces will be permitted in any tank and this will be detailed and highlighted in any handover/maintenance files at taking in charge stage. There are no moving parts or plant associated with these tanks.
- The outflow will be controlled by a hydrobrake located in an outlet manhole abutting the tank. This will be a vortex arrangement and separate access to that of the tank itself.

Specifically In relation to the proposed attenuation tank no. 5 and concerns over how the tanks will be accessed for maintenance. and its location in a green area between a private area and an area to be Management Company the inclusion of drawing no. 6081-4284 and the notes highlighted above should alleviate these concerns

In relation Attenuation Tank Nr. 6 (should be tank 3)

- being located in an area of public open space and amenity,
- located a significant distance from an access road,
- requiring crossing pedestrian/cycle paths. , that accessing the tank with plant and equipment
- could significantly damage the landscaping .
- the SuDS schematic layout shows numerous trees planted on top of and around the tank which would further impede access.

Drawing No. 6081-4282 shows the tank being relocated and orientated differently. There will be access to both the north and south from adjacent access roads. Similar to all tank locations there will be no trees or significant SuDS measures that impede the locations and operations of the attenuation tanks.

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General arrangement and cross section drawings for each of the proposed attenuation tanks and their interaction with landscaping have been included as part of the package. Internal walls are required for structural purposes but large openings in same will provide access. Addition access covers will provide safe access if required. There will be no obstructions to cleaning and maintenance of these tanks.

2.2 Surface Water System

It is proposed to discharge treated and attenuated stormwater runoff to the existing watercourse (Lisheens 19) at the southeastern boundary. Site design will be so that a gravity network is achieved. Figure 2 highlights the locations of existing watercourses on and near the site.

Figure 2 Stormwater Discharge Options

In order to reduce the effects of the surface runoff on potential flooding, a Stormwater Management Plan will be applied to surface water discharges into adjacent watercourses. The Stormwater Management Plan can be applied to control the rate of runoff from new development. The maximum permitted surface water outflow from the new development is to be restricted to that of the existing Greenfield site by the usage of attenuation storage.

Control of runoff by attenuation methods requires a hydraulic control to restrict the magnitude of flows passing downstream, together with an upstream storage capacity to contain the volume of runoff held back by the hydraulic control. The flows are proposed to be attenuated in the surface water system by adopting a flood storage attenuation tank along with restricted outlets as the control devise. The storage volume required has been designed using the computer aided design package Windes 10.4.

The attenuation strategy for the site is for the detention of flows in interlinked attenuation tanks preceded by hydrocarbon Interceptors.

2.3 Surface Water Drainage Network

The surface water drainage network for the proposed development was modelled using the Microdrainage software application. The surface water pipe lengths, slopes, contributing impermeable areas, upstream invert levels, upstream cover levels and pipe diameters were entered into the model using the drawings supplied.

2.4 Design Criteria:

The proposed surface water drains have been designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS), the Department of the Environment's Recommendations for Site Development Works for Housing Areas, the Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Waste Water Disposal" and BS EN 752: 2008 Drain and Sewer Systems Outside Buildings.

- Return period for pipe work design 2 years
- Return period for attenuation design 100 years
- Soil Type 0.3
- Allowable Outflow 49.600 l/sec
- Time of entry 5 minutes
- M5 – 60 18.800 mm
- Ratio "r" 0.250
- Pipe Friction (Ks) 0.6 mm
- Minimum Velocity (based on pipe flowing full) 1.0 m/s
- Rainfall Runoff from Roads and Footpaths 100%
- Rainfall Runoff from Roofs 80%
- Rainfall Runoff from Driveways 80%
- Rainfall Runoff from Green Areas 20%
- Rainfall Depth Factored for Climate Change (as per GDSDS) 20%

(in accordance with GDSDS Volume 2, Chapter 6, Table 6.2 – see below)

Climate Change Category	Characteristics
River flows	20% increase in flows for all return periods up to 100 years
Sea level	400+mm rise (see Climate Change policy document for sea levels as a function of return period)
Rainfall	10% increase in depth (factor all intensities by 1.1)
	Modify time series rainfall in accordance with the GDSDS climate change policy document

Table 6.2 Climate Change Factors to be Applied to Drainage Design

The global variables required for the model were the M5-60 and Rainfall Ratio. These two factors may be read from maps contained in the Wallingford procedure. They enable the program to calculate the intensity, duration and frequency characteristics of storms.

M5-60 is the rainfall depth based on a 60-minute storm of 5 years return period. Ratio R is the ratio of the 60-minute storm to the 2-day storm for the 5-year return period events. These values are as follows:

- M5-60 = 18.800mm
- Ratio R = 0.250

Microdrainage generates design storms using the principles set out in the Flood Studies Report (NERC 1975).

A summer rainfall profile was used for the design of the pipework and a winter rainfall profile was used for the design of the storm water attenuation to give the critical design. A summer profile gives higher rainfall intensities and results in higher runoff rates and is used to determine the required capacity of the pipework. A winter rainfall profile gives a flatter more sustained profile and results in higher runoff volumes and is used to determine the attenuation/storage requirements.

The surface water drainage network was assessed for compliance with maximum and minimum velocities, pipe length etc. The network was designed to ensure velocities in the network and pipe gradients did not exceed the maximum velocity of 4.0m/s. The minimum velocity allowed was 1.00m/s.

The design of the drainage network was assessed using events with a range of different durations to determine the critical event for each return period analysed as follows:

- 1 in 2-year return period events were used to ensure that the system did not surcharge;
- 1 in 100-year return period events were used to ensure that flooding did not occur.

2.4.1 Pre-Development Conditions

The catchment area of this proposed development is 15.457 hectares (ha).

In accordance with Section 3.2.4 of the South Ballincollig Strategic Flood Risk Assessment – Drainage Study, the allowable discharge rate will be developed using the Institute of Hydrology Report No. 124: Flood estimation for small catchments. The Standard Annual Average Rainfall (SAAR) at this site is taken as 1131mm. The Soil Type has a corresponding soil coefficient of 0.3.

$$QBAR = 0.00108 \times (AREA)^{0.89} \times (SAAR)^{1.17} \times (SOIL)^{2.17}$$

QBAR = The Mean Annual Peak Flow (Permissible outflow in m3.sec

AREA = Area of the Catchment (site) in km^2

SAAR = Standard Annual Average Rainfall

SOIL = Soil index

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As the development is smaller than 50 ha, the analysis for determining the permissible outflow uses 50 ha in the formula and linearly interpolates the flow rate value based on the ratio of the development to 50 ha. This is a statistical based method within the Microdrainage Software utilizing the Regional Flood Frequency by Catchment Characteristics to give the Index Flood (QBAR)

Design summary sheets for the QBAR value are contained in Appendix D.

The Mean Annual Peak Flow (permissible outflow) was calculated for the particular design development areas.

The allowable runoff estimation method utilises IH 124 and the Soil Index value taken from the Micrcodrainage Design Package mapping system gives a Soil Index of 0.3.

2.4.2 Post-Development Conditions

The stormwater management plan adopted for the particular development involves using interlinked attenuation tanks located in the green areas of the site.

All surface water runoff arising from the paved development will be drained away from the site. The attenuation tanks will be designed for a 100-year storm event. The maximum discharge from the tanks will be limited to calculated permissible runoff (QBAR) for the catchment area. The catchment areas as outlined in Figure 2.3.2 below;

Catchment Area Reference	Catchment Area (Ha)
1	4.416 Ha
2	1.057 Ha
3	3.243 Ha
4	0.789Ha
5	1.082 Ha
6	4.870 Ha

Fig 2.3.2 Catchment Areas

Based on the proposed development design there will be a change in the land surface. Therefore, due to this proposed change a corresponding increase in the peak rate of surface runoff from the site will arise during times of high rainfall.

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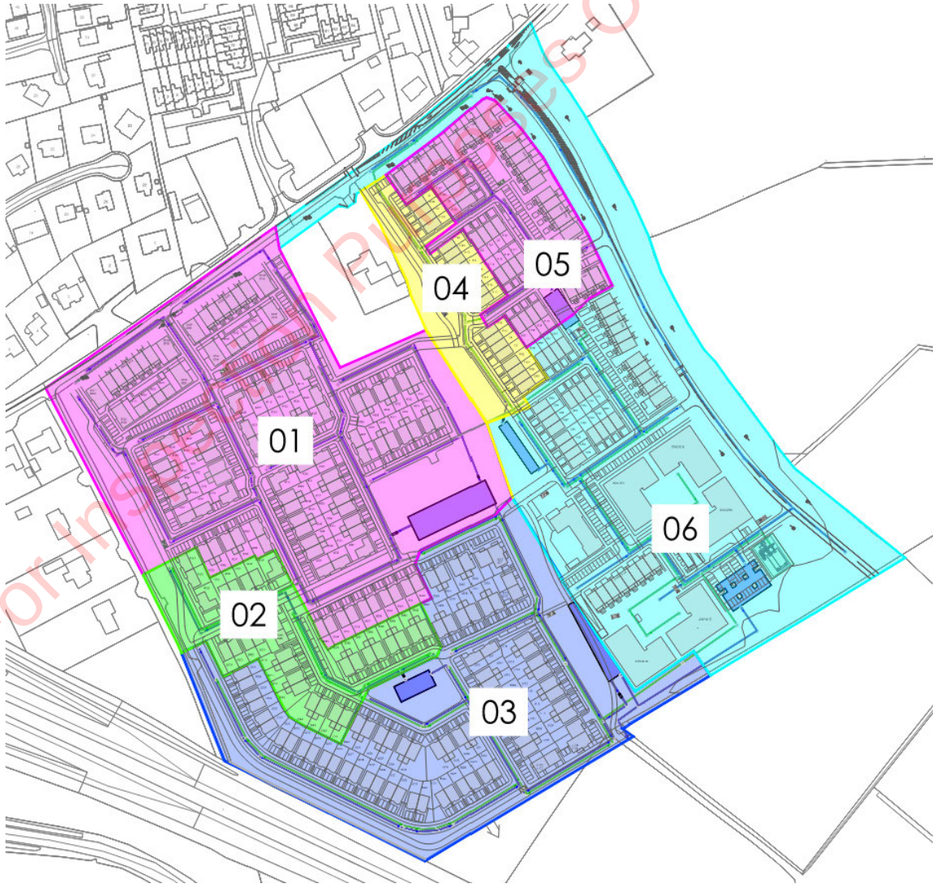

Fig 2.9 Proposed Development Catchment Areas

The flood peak runoff rates from the post-development grassy permeable area (Q_p grass) and the post-development impervious area (Q_p imp.) using the Rational Method (100% impermeability of hard surfaces) are calculated using Windes 10.4. The Sources Control Module of the Microdrainage Software was used to design the attenuation tank capacities. This module also provides the critical storm duration for the attenuation tank during the design process.

It should be noted that climate change has been accounted for in the design. As per volume 5 of the GDSDS a factor of 20% has been incorporated into the design.

The allowable runoff utilising IH 124 of49.600 l/second for the entire catchment area for the site of 15.457 hectares. The allowable runoff equates to 3.209 l/second/hectare.

2.5 Attenuation Tanks

2.5.1 Volume of Attenuation Tanks

The proposed attenuation system attenuates surface water to restrict the outflow to the equivalent of the existing agricultural runoff. This ensures the development will not give rise to any impact downstream of the site. It's the council's preference not to use proprietary modular systems

so it is proposed to use reinforced concrete underground tanks. These systems will be impermeable and no infiltration of the runoff to the ground is proposed. (from attenuation tanks) These systems will be used under the large open spaces/public courtyard areas within the development.

The capacity of the attenuation tanks is designed to cater for the capacity required for a 1 in 100-year ARI event. The breakdown of each catchment area runoff is outlined in the Table 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.4.5 & 2.4.6 below;

Runoff Calculations	Catchment Area No. 1		
	Area (Ha)	Runoff Factor	Net Area (Ha)
Roofs (includes private footpath)	0.980	0.800	0.784
Grass (Public Area)	1.163	0.200	0.233
Roads & Footpaths	1.582	1.000	1.582
Rain Garden	0.000	0.000	0.000
Blue/Green Roofs	0.000	0.000	0.000
Rear Gardens	0.514	0.000	0.000
Net Runoff	**4.416**		**2.599**

Table 2.4.1 Catchment Area No. 1 Runoff Summary

Runoff Calculations	Catchment Area No. 2		
	Area (Ha)	Runoff Factor	Net Area (Ha)
Roofs (includes private footpath)	0.234	0.800	0.187
Grass (Public Area)	0.236	0.200	0.047
Roads & Footpaths	0.429	1.000	0.429
Rain Garden	0.000	0.000	0.000
Blue/Green Roofs	0.000	0.000	0.000
Rear Gardens	0.158	0.000	0.000
Net Runoff	**1.057**		**0.663**

Table 2.4.2 Catchment Area No. 2 Runoff Summary

Runoff Calculations	Catchment Area No. 3		
	Area (Ha)	Runoff Factor	Net Area (Ha)
Roofs (includes private footpath)	0.684	0.800	0.547
Grass (Public Area)	0.854	0.200	0.170
Roads & Footpaths	0.980	1.000	0.980
Rain Garden	0.000	0.000	0.000
Blue/Green Roofs	0.000	0.000	0.000
Rear Gardens	0.725	0.000	0.000
Net Runoff	**3.243**		**1.697**

Table 2.4.3 Catchment Area No. 3 Runoff Summary

Runoff Calculations	Catchment Area No. 4		
	Area (Ha)	Runoff Factor	Net Area (Ha)
Roofs (includes private footpath)	0.166	0.800	0.132
Grass (Public Area)	0.201	0.200	0.040
Roads & Footpaths	0.193	1.000	0.193
Rain Garden	0.000	0.000	0.000
Blue/Green Roofs	0.000	0.000	0.000
Rear Gardens	0.229	0.000	0.000
Net Runoff	**0.789**		**0.365**

Table 2.4.3 Catchment Area No. 4 Runoff Summary

Runoff Calculations	Catchment Area No. 5		
	Area (Ha)	Runoff Factor	Net Area (Ha)
Roofs (includes private footpath)	0.247	0.800	0.197
Grass (Public Area)	0.276	0.200	0.055
Roads & Footpaths	0.465	1.000	0.465
Rain Garden	0.000	0.000	0.000
Blue/Green Roofs	0.000	0.000	0.000
Rear Gardens	0.094	0.000	0.000
Net Runoff	**1.082**		**0.717**

Table 2.4.3 Catchment Area No. 5 Runoff Summary

Runoff Calculations	Catchment Area No. 6		
	Area (Ha)	Runoff Factor	Net Area (Ha)
Roofs (includes private footpath)	1.417	0.800	1.134
Grass (Public Area)	1.997	0.200	0.399
Roads & Footpaths	1.456	1.000	1.456
Rain Garden	0.000	0.000	0.000
Blue/Green Roofs	0.000	0.000	0.000
Net Runoff	**4.870**		**2.989**

Table 2.4.3 Catchment Area No.6 Runoff Summary

These overall capacities are summarised in Table 2.4.4 below:

Tank No.	Capacity (m^3)	Restricted Outlet (l/sec)
1	1,627.50	**14.200 l/sec**
2	481.25	**3.400 l/sec**
3	1050.00	**10.400 l/sec**

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4	300.00	**2.500 l/sec**
5	480.00	**3.500 l/sec**
6	1650.00	**15.600 l/sec**

Table 2.4.4 Attenuation Tank Sizes

2.6 Hydrocarbon Treatment

A petrol interceptor is a trap used to filter out hydrocarbon pollutants from rainwater runoff. It is used in construction to prevent fuel contamination of streams carrying away the runoff.

Petrol interceptors work on the premise that some hydrocarbons such as petroleum and diesel float on the top of water. The contaminated water enters the interceptor typically after flowing off roads or hardstanding areas before being deposited into the first tank inside the interceptor.

The first tank builds up a layer of the hydrocarbon as well as other scum. Typically, petrol interceptors have 3 separate tanks each connected with a dip pipe, as more liquid enters the interceptor the water enters into the second tank leaving the majority of the hydrocarbon behind as it cannot enter the dip pipe, whose opening into the second tank is below the surface.

However, some of the contaminants may by chance enter the second tank. This second tank will not build up as much of the hydrocarbon on its surface. As before, the water is pushed into the third tank and more water enters the second. The third tank should be practically clear of any hydrocarbon floating on its surface. As a precaution, the outlet pipe is also a dip pipe. When the water leaves the third tank via the outlet pipe it should be contaminant free.

In this project there are a number of catchment areas and attenuation tanks that eventually discharge to the Lisheens 19 watercourse. The hydrocarbon specifications are summarized in Table 2.5 below.

Tank Reference	Petrol Interceptor Make & Model	Impermeable Treatment Area (m^2)	Treatment Capacity (m^2)
Tank No. 1	CNSB40s & CNSB6s	25,550.0	25,557.0
Tank No. 2	CNSB15s	6,250.0	8,335.0
Tank No. 3	CNSB30s	16,320.0	16,670.0
Tank No. 4	CNSB10s	3,850.0	5,660.0
Tank No. 5	CNSB15s	7,170.0	8,335.0
Tank No. 6	CNSB80s	29,940.0	41,667.0

Table 2.5 Hydrocarbon Specifications

2.7 Silt Control

The proposed petrol interceptor from Conder Environmental also includes a silt storage capacity in addition to the oil storage capacity that allow silt to be collected in the interceptor prior to discharge to the proposed attenuation tanks. This silt build-up can then be removed from the tanks. The interceptors will be specified at detailed design stage.

2.8 Construction & Operational Stage Run-Off

Both construction and operational phase surface-water drainage from the proposed development site will ultimately discharge into the adjacent stormwater watercourses. Where surface-water run-off occurs at the site during the construction phase, it will be managed and controlled prior to discharge into the environment by implementing standard environmental controls. Temporary banks shall be in place to ensure that runoff is directed to a temporary detention pond which shall be provided to reduce the amount of silt in the run-off. The location of these banks and temporary detention ponds will be indicated and confirmed in a Construction Stage Construction & Environmental Management Plan. The development will also include the construction of a gravity surface-water drainage network throughout the site. The surface-water drainage network will include the installation of dedicated attenuation facilities upstream of proposed outfall to the Lisheens 19 watercourse, to attenuate discharges to the undeveloped Greenfield run-off rates with the operation of proprietary hydro-brake flow-control devices. The attenuation facility is sized on the basis of a design storm with a 100-year return period and an additional 20% allowance for the effect of climate change.

The attenuation facilities will be in the form of a series of interlinked attenuation tanks. They will be an off-line component of the drainage network into which runoff is diverted once flows reach a specified threshold.

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3 Foul Sewer System

3.1 Foul Sewer Design

A Pre-Connection Enquiry was submitted to Uisce Eireann. The Uisce Eireann Reference Number for this enquiry is CDS24008100. The response to this Enquiry was issued by Uisce Eireann on 4th March 2025. This confirmed that, subject to a valid connection agreement being put in place, the proposed connection to the Uisce Eireann network could be facilitated. The Statement of Design Acceptance as received from Uisce Éireann is included in Appendix B.

- **Wastewater Connection** - Feasible without infrastructure upgrade by Uisce Éireann
  - Uisce Éireann note your proposal for provision of a pumping station. 24-hour storage shall be provided for the proposed pumping station, with sensor on existing network to limit/inhibit pumping in order to ensure surcharging of the existing network does not occur. Sufficient ground space shall be provided to allow for 3600m3 storage and future expansion of the PS. The Discharge Connection shall be on to the 450mm sewer on Maglin Road. There is currently insufficient capacity available to connect to the network to the north and any connection to same would require downstream upgrades around and after the R608 roadway. These options can be explored further at Connection Application stage.

Fig 3.0 Extract From Uisce Eireann COF

The foul sewer has been designed using the System 1 and Simulation Modules of the Micro-drainage package. The foul network design addresses present day design issues and can view velocities at Full Bore, Proportional Depth and 1/3 flow.

A model of the proposed foul drainage network was built using the micro-drainage software applications. The model was analysed and amended until the results met with the design criteria specified.

The network has been designed to achieve self-cleansing velocities at 1/3 flow whilst maintaining minimum gradients.

Final Discharge options will be as per Uisce Eireanns Confirmation of Feasibility (COF) and Statement of Design Acceptance (SODA). The connection will be constructed by Uisce Eireann as exempted development in accordance with Schedule 2, Part 1, Class 58 of the Planning & Development Regulations 2001.

3.1.1 Development Breakdown

544 No. Dwellings

Section 3.6 of The Irish Water Code of Practice Wastewater Infrastructure states that for the gravity sewers shall be designed to carry a minimum wastewater volume of 6 times the dry weather flow (6DWF) which is to be taken as 446 litres per dwelling

Loading = (544) (446) / (24) (60) (60) = 2.808 litres/second

6DWF =16.849 litres/second

1 shop

Maximum of 8 no. staff.

From the EPA Code of Practice for Small Communities, Business, Leisure Centres and Hotels Loading = 30 L/Person/day

Loading = (8) (30) / (24) (60) (60) = 0.0027 litres/second

6DWF =0.017 litres/second

Crèche

128 No Staff & 24 No. Children

From the EPA Code of Practice for Small Communities, Business, Leisure Centres and Hotels Loading = 60 L/Person/day

Loading = (152) (60) / (24) (60) (60) = 0.106 litres/second

6DWF =0.63 litres/second

The overall quantity of wastewater for the proposed development is estimated at **254 m³** per day.

This is based on the unit schedule submitted by the architect. The foul waste within the development will be collected via an internal gravity network and will discharge to the public foul sewer via a gravity connection.

All works will be in accordance with Uisce Eireann Code of Practice for Wastewater Supply & the Wastewater Infrastructure Standard Details Document Number: IW-CDS-5030-01.

The foul water network model was built and analysed using the Micro-drainage Software application and was assessed to ensure velocities maintained a self-cleansing velocity. The system will consist of an internal gravity network discharging to the existing Uisce Eireann asset via a new pumping station and rising main.

3.2 Pumping Station Design

The pumping stations will be designated as a Type-3 pumping station as per the Irish Water Code of Practice. The storage provided in both pumping stations shall equate to 24-hour storage capacity at dry weather flow (DWF) or 446l/dwelling.

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All details relating to the size, location & layout of the pumping station will be in accordance with Part 5 - Pumping Stations of the IW Code of Practice.

The Design Report for the pumping station as designed by Molloy Environmental Systems is included in Appendix L of this Report.

4 Water Supply

As with the drainage network, a Pre-Connection Enquiry was submitted to Irish Water under Reference No. CDS24008100. This confirmed that, subject to a valid connection agreement being put in place, the proposed connection to the Irish Water network could be facilitated with upgrades potentially required. The Statement of Design Acceptance as received from Uisce Éireann is included in Appendix B.

- **Water Connection** - Feasible Subject to upgrades
  - In order to be able to supply the subject site, Watermain upgrades of approximately 250 meters are required. The Upgrade will be from Station Road to Maglin Road along Sunningdale. There will be a requirement of a spine main thought the development to be able to serve future developments and to have a future link to Maglin Road Watermain. This Main is currently sized to be 200mm.

Fig 4.0 Extract From Irish Water COF

The Confirmation of Feasibility document is included in Appendix A

Water distribution supply to each building will be sized to cater for the requirements of those particular uses. Metered connections will be made to the main in accordance with Irish Water specifications and details.

All works will be in accordance with Irish Water Code of Practice for Water Supply & the Water Infrastructure Standard Details Document Number: IW-CDS-5020-01.

Residential Water Demand

In accordance with the Irish Water Code of Practice for Water & Wastewater Infrastructure, the demand should be taken as 405l/day/unit. Given the proposed development is for 548 no. units, this should be taken as **221,940 litres.**

Shop Water Demand

The shop unit. I would assume a maximum of 8 no. staff here.

From the EPA Code of Practice for Small Communities, Business, Leisure Centres and Hotels Loading = 30 L/Person/day = 240l/day.

Crèche Water Demand

Assume 128 No. Staff & 24 No. Children

From the EPA Code of Practice for Small Communities, Business, Leisure Centres and Hotels Loading = 60 L/Person/day = 9,120 l/day

Total loading for the development can be taken as **231,300 litres or 231.30m³**

The average day/peak week demand should be taken as 1.25 times the average daily demand so this should be increased **to 289.125m³**

5 Summary of Results

The storm water network was built and analysed using the Microdrainage Software application and were assessed for a 1 in 2 year storm & 1 in 100 year storm. A summary of the results is summarised in the Microdrainage outputs in the Appendices.

The global variables, pipeline and manhole schedules for both the surface water network and foul network were printed and are included in the Appendices. These show the basic pipe details such as pipe length, diameter, roughness coefficient, upstream invert, velocity, etc.

The stormwater system is designed to ensure no surcharge occurs during a 1 in 2-year return period event.

No flooding was predicted to occur for the 1 in 100-year return period event. Surcharging and flood risk occurred for a number of critical storm events, but this is allowed and does not compromise the network.

The foul water network model was built and analysed using the Micro-drainage Software application and was assessed to ensure velocities maintained a self-cleansing velocity. The system will consist of an internal gravity network discharging to the existing Irish Water asset.

The water supply design and layout has been designed as per Irish Water Design Codes.

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Appendix A -Uisce Eireann Confirmation of Feasibility (COF)

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CONFIRMATION OF FEASIBILITY

Uisce Éireann
Irish Water

Stephen O'Grady

Dosa Engineers, Joyce House
Barrack Square, Ballincollig
Cork. P31KP84

4 March 2025

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

Our Ref: CDS24008100 Pre-Connection Enquiry
Greenfields, Adj. to Greenfields Road, Ballincollig, Cork

Dear Applicant/Agent,

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

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Housing Development of 566 unit(s) at Greenfields, Adj. to Greenfields Road, Ballincollig, Cork, (the **Development)**.

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

- **Water Connection**
  - Feasible Subject to upgrades
  - In order to be able to supply the subject site, Watermain upgrades of approximately 250 meters are required. The Upgrade will be from Station Road to Maglin Road along Sunningdale. There will be a requirement of a spine main thought the development to be able to serve future developments and to have a future link to Maglin Road Watermain. This Main is currently sized to be 200mm.
- **Wastewater Connection**
  - Feasible without infrastructure upgrade by Uisce Éireann
  - Uisce Éireann note your proposal for provision of a pumping station. 24-hour storage shall be provided for the proposed pumping station, with sensor on existing network to limit/inhibit pumping in order to ensure surcharging of the existing network does not occur. Sufficient ground space shall be provided to allow for 3600m3 storage and future expansion of the PS. The Discharge Connection shall be on to the 450mm sewer on Maglin Road. There is currently insufficient capacity available to connect to the network to the north and any connection to same would require downstream upgrades around and after the R608 roadway. These options can be explored further at Connection Application stage.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann 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 Uisce Éireann.

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?

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

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

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

Stiúrthóirí / Directors: Niall Gleeson (POF / CEO), Jerry Grant (Cathaoirleach / Chairperson), Gerard Britchfield, Liz Joyce, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Paul Reid, Michael Walsh.
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin, Ireland D01NP86
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Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363.

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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 Uisce Éireann's network(s). • Before the Development can connect to Uisce Éireann's network(s), you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.
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?	• Uisce Éireann connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Uisce Éireann's network(s), including works in the public space, must be carried out by Uisce Éireann*. *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 Uisce Éireann's network(s)?	• Requests for maps showing Uisce Éireann'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 Uisce Éireann 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)

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Appendix B – Uisce Eireann Statement of Design Acceptance (SODA)

Cork City Council Planning Department. For Inspection Purposes Only!

Natasha Sutton
Dosa Engineers
Joyce House
Barrack Square
Ballincollig,
Cork
P31KP84

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

27 June 2025

Re: Design Submission for Greenfields, Adj. to Greenfields Road, Ballincollig, Cork (the "Development")
(the "Design Submission") / Connection Reference No: CDS24008100

Dear Natasha Sutton,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Uisce Éireann has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before you can connect to our network you must sign a connection agreement with Uisce Éireann. This can be applied for by completing the connection application form at www.water.ie/connections. Uisce Éireann's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Uisce Éireann's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Uisce Éireann does not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Uisce Éireann representative:
Name: Kyle Jackson
Email: kyle.jackson@water.ie

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

Appendix A

Document Title & Revision

- [6081-4221-C]
- [6081-4222-C]
- [6081-4223-C]
- [6081-4224-C]
- [6081-4231-B]
- [6081-4232-B]
- [6081-4233-B]
- [6081-4238-A]
- [6081-4239-A]
- [6081-4260-A]
- [6081-4261-A]
- [6081-4262-A]
- [6081-4263-A]
- [6081-4264-A]
- [6081-4265-A]
- [6081-4266-A]
- [6081-4267-A]

*For further information, visit **www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Uisce Éireann will not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

Stiúrthóirí / Directors: Niall Gleeson (POF / CEO), Jerry Grant (Cathaoirleach / Chairperson), Gerard Britchfield, Liz Joyce, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Paul Reid, Michael Walsh.
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Appendix C – Allowable Runoff QBAR Values

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Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Catchment Area No. 1 Greenfields Ballincollig, Cork	
Date 25/02/2025 File	Designed By S.O.'Grady Checked By	
Micro Drainage	Source Control W.12.4	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	4.416	Urban	0.000
SAAR (mm)	1135	Region Number	Ireland South

Results l/s

QBAR Rural	14.2
QBAR Urban	14.2
Q100 years	26.1
Q1 year	12.0
Q30 years	22.5
Q100 years	26.1

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Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Catchment Area No. 2 Greenfields Ballincollig, Cork	
Date 25/02/2025 File	Designed By S.O.'Grady Checked By	
Micro Drainage	Source Control W.12.4	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	1.057	Urban	0.000
SAAR (mm)	1135	Region Number	Ireland South

Results l/s

QBAR Rural	3.4
QBAR Urban	3.4
Q100 years	6.2
Q1 year	2.9
Q30 years	5.4
Q100 years	6.2

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Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Catchmnet Area No. 3 Greenfields Ballincollig, Cork	
Date 25/02/2025 File	Designed By S.O.'Grady Checked By	
Micro Drainage	Source Control W.12.4	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	3.243	Urban	0.000
SAAR (mm)	1135	Region Number	Ireland South

Results l/s

QBAR Rural	10.4
QBAR Urban	10.4
Q100 years	19.1
Q1 year	8.8
Q30 years	16.5
Q100 years	19.1

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Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Catchment Area No. 4 Greenfields Ballincollig, Cork	
Date 25/02/2025 File	Designed By S.O.'Grady Checked By	
Micro Drainage	Source Control W.12.4	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	0.789	Urban	0.000
SAAR (mm)	1131	Region Number	Ireland South

Results l/s

QBAR Rural	2.5
QBAR Urban	2.5
Q100 years	4.6
Q1 year	2.1
Q30 years	4.0
Q100 years	4.6

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Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Catchment Area No. 5 Greenfields Ballincollig, Cork	
Date 25/02/2025 File	Designed By S.O.'Grady Checked By	
Micro Drainage	Source Control W.12.4	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	1.082	Urban	0.000
SAAR (mm)	1131	Region Number	Ireland South

Results	l/s
QBAR Rural	3.5
QBAR Urban	3.5
Q100 years	6.4
Q1 year	2.9
Q30 years	5.5
Q100 years	6.4

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Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Catchment Area No. 6 Greenfields Ballincollig, Cork	
Date 25/02/2025 File	Designed By S.O.'Grady Checked By	
Micro Drainage	Source Control W.12.4	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	4.870	Urban	0.000
SAAR (mm)	1131	Region Number	Ireland South

Results	l/s
QBAR Rural	15.6
QBAR Urban	15.6
Q100 years	28.6
Q1 year	13.2
Q30 years	24.7
Q100 years	28.6

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Appendix D – 1 in 2 Year Design Sheets

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	100	Add Flow / Climate Change (%)	20
M5-60 (mm)	18.800	Minimum Backdrop Height (m)	0.200
Ratio R	0.250	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Inverts

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	1.493	8-12	6.051	12-16	1.364

Total Area Contributing (ha) = 8.908

Total Pipe Volume (m³) = 298.341

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S1.000	61.085	0.500	122.2	0.173	5.00	0.0	0.600	o	225
S1.001	45.380	0.272	166.8	0.073	0.00	0.0	0.600	o	225
S1.002	20.705	0.316	65.5	0.018	0.00	0.0	0.600	o	225
S2.000	56.415	0.338	166.9	0.140	5.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.86	28.500	0.173	0.0	0.0	4.7	1.18	47.0	28.1
S1.001	50.00	6.61	28.000	0.246	0.0	0.0	6.7	1.01	40.1	40.0
S1.002	50.00	6.82	27.728	0.264	0.0	0.0	7.1	1.62	64.3	42.9
S2.000	50.00	5.93	27.750	0.140	0.0	0.0	3.8	1.01	40.1	22.7

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S1.003	51.655	0.812	63.6	0.140	0.00	0.0	0.600	o	300
S1.004	6.205	0.310	20.0	0.040	0.00	0.0	0.600	o	300
S1.005	10.685	0.671	15.9	0.040	0.00	0.0	0.600	o	300
S3.000	45.635	0.850	53.7	0.090	5.00	0.0	0.600	o	225
S3.001	5.890	0.150	39.3	0.000	0.00	0.0	0.600	o	225
S3.002	66.465	1.500	44.3	0.124	0.00	0.0	0.600	o	225
S3.003	63.645	0.381	167.0	0.157	0.00	0.0	0.600	o	300
S1.006	74.710	1.994	37.5	0.197	0.00	0.0	0.600	o	375
S1.007	66.585	1.275	52.2	0.194	0.00	0.0	0.600	o	375
S1.008	7.600	0.076	100.0	0.000	0.00	0.0	0.600	o	450
S4.000	62.150	0.600	103.6	0.138	5.00	0.0	0.600	o	225
S4.001	57.765	0.346	167.0	0.088	0.00	0.0	0.600	o	300
S4.002	9.150	0.055	166.4	0.000	0.00	0.0	0.600	o	300
S4.003	7.000	0.042	166.7	0.000	0.00	0.0	0.600	o	300
S5.000	61.775	1.043	59.2	0.168	5.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.003	50.00	7.26	27.412	0.544	0.0	0.0	14.7	1.97	139.6	88.4
S1.004	50.00	7.29	26.600	0.584	0.0	0.0	15.8	3.53	249.5	94.9
S1.005	50.00	7.33	26.290	0.624	0.0	0.0	16.9	3.96	279.9	101.4
S3.000	50.00	5.43	28.500	0.090	0.0	0.0	2.4	1.79	71.1	14.6
S3.001	50.00	5.47	27.650	0.090	0.0	0.0	2.4	2.09	83.3	14.6
S3.002	50.00	6.03	27.500	0.214	0.0	0.0	5.8	1.97	78.3	34.8
S3.003	50.00	6.91	26.000	0.371	0.0	0.0	10.0	1.21	85.8	60.3
S1.006	50.00	7.75	25.619	1.192	0.0	0.0	32.3	2.97	327.8	193.7
S1.007	50.00	8.20	23.625	1.386	0.0	0.0	37.5	2.51	277.5	225.2
S1.008	50.00	8.26	22.350	1.386	0.0	0.0	37.5	2.03	323.4	225.2
S4.000	50.00	5.81	27.850	0.138	0.0	0.0	3.7	1.28	51.1	22.4
S4.001	50.00	6.60	27.250	0.226	0.0	0.0	6.1	1.21	85.8	36.7
S4.002	50.00	6.72	26.904	0.226	0.0	0.0	6.1	1.22	86.0	36.7
S4.003	50.00	6.82	26.849	0.226	0.0	0.0	6.1	1.22	85.9	36.7
S5.000	50.00	5.60	27.850	0.168	0.0	0.0	4.5	1.70	67.7	27.3

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S4.004	54.075	0.324	166.9	0.065	0.00	0.0	0.600	o	300
S4.005	12.460	0.233	53.5	0.050	0.00	0.0	0.600	o	300
S6.000	52.900	0.300	176.3	0.167	5.00	0.0	0.600	o	225
S4.006	82.705	3.250	25.4	0.210	0.00	0.0	0.600	o	300
S1.009	15.190	0.760	20.0	0.000	0.00	0.0	0.600	o	450
S7.000	53.690	1.850	29.0	0.128	5.00	0.0	0.600	o	225
S7.001	23.365	0.750	31.2	0.005	0.00	0.0	0.600	o	225
S7.002	20.825	0.750	27.8	0.005	0.00	0.0	0.600	o	225
S7.003	22.925	0.750	30.6	0.005	0.00	0.0	0.600	o	225
S8.000	65.800	2.100	31.3	0.140	5.00	0.0	0.600	o	225
S7.004	37.670	1.875	20.1	0.000	0.00	0.0	0.600	o	225
S1.010	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	600
S1.011	9.000	0.036	250.0	0.000	0.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S4.004	50.00	7.56	26.807	0.459	0.0	0.0	12.4	1.21	85.8	74.6
S4.005	50.00	7.66	26.483	0.509	0.0	0.0	13.8	2.15	152.3	82.7
S6.000	50.00	5.90	26.550	0.167	0.0	0.0	4.5	0.98	39.0	27.1
S4.006	50.00	8.10	26.250	0.886	0.0	0.0	24.0	3.13	221.2	144.0
S1.009	50.00	8.31	22.274	2.272	0.0	0.0	61.5	4.56	725.6	369.2
S7.000	50.00	5.37	26.850	0.128	0.0	0.0	3.5	2.44	96.9	20.8
S7.001	50.00	5.53	25.000	0.133	0.0	0.0	3.6	2.35	93.5	21.6
S7.002	50.00	5.67	24.250	0.138	0.0	0.0	3.7	2.49	99.1	22.4
S7.003	50.00	5.83	23.500	0.143	0.0	0.0	3.9	2.38	94.4	23.2
S8.000	50.00	5.47	24.850	0.140	0.0	0.0	3.8	2.35	93.3	22.7
S7.004	50.00	6.05	22.750	0.283	0.0	0.0	7.7	2.93	116.6	46.0
S1.010	50.00	8.32	20.000	2.555	0.0	0.0	69.2	1.54	434.2	415.2
S1.011	50.00	5.18	19.996	0.000	14.2	0.0	2.4	0.82	32.7	14.2

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S9.000	57.850	2.090	27.7	0.161	5.00	0.0	0.600	o	225
S1.012	61.075	0.410	149.0	0.054	0.00	0.0	0.600	o	300
S1.013	8.820	0.150	58.8	0.000	0.00	0.0	0.600	o	300
S10.000	61.865	0.700	88.4	0.167	5.00	0.0	0.600	o	225
S1.014	85.230	0.991	86.0	0.188	0.00	0.0	0.600	o	300
S11.000	47.175	1.250	37.7	0.068	5.00	0.0	0.600	o	225
S11.001	60.975	0.365	167.1	0.186	0.00	0.0	0.600	o	300
S11.002	18.105	0.108	167.6	0.000	0.00	0.0	0.600	o	300
S11.003	45.565	1.676	27.2	0.141	0.00	0.0	0.600	o	300
S11.004	23.415	0.550	42.6	0.076	0.00	0.0	0.600	o	300
S11.005	31.960	0.600	53.3	0.077	0.00	0.0	0.600	o	300
S12.000	23.370	0.140	166.9	0.077	5.00	0.0	0.600	o	225
S11.006	3.235	0.019	170.3	0.000	0.00	0.0	0.600	o	375

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S9.000	50.00	5.39	22.050	0.161	0.0	0.0	4.4	2.50	99.3	26.2
S1.012	50.00	6.18	19.960	0.215	14.2	0.0	8.7	1.29	90.9	52.0
S1.013	50.00	6.25	19.550	0.215	14.2	0.0	8.7	2.05	145.2	52.0
S10.000	50.00	5.74	20.100	0.167	0.0	0.0	4.5	1.39	55.3	27.1
S1.014	50.00	7.09	19.400	0.570	14.2	0.0	18.3	1.70	119.9	109.7
S11.000	50.00	5.37	25.050	0.068	0.0	0.0	1.8	2.14	84.9	11.0
S11.001	50.00	6.21	23.800	0.254	0.0	0.0	6.9	1.21	85.8	41.3
S11.002	50.00	6.45	23.435	0.254	0.0	0.0	6.9	1.21	85.6	41.3
S11.003	50.00	6.71	23.327	0.395	0.0	0.0	10.7	3.03	214.0	64.2
S11.004	50.00	6.87	21.651	0.471	0.0	0.0	12.8	2.42	170.8	76.5
S11.005	50.00	7.11	21.101	0.548	0.0	0.0	14.8	2.16	152.6	89.0
S12.000	50.00	5.39	20.250	0.077	0.0	0.0	2.1	1.01	40.1	12.5
S11.006	50.00	7.15	20.110	0.625	0.0	0.0	16.9	1.39	153.0	101.6

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S11.007	1.000	0.006	166.7	0.000	0.00	0.0	0.600	o	375
S11.008	8.145	0.041	198.7	0.000	0.00	0.0	0.600	o	225
S11.009	26.290	0.157	167.5	0.061	0.00	0.0	0.600	o	225
S13.000	39.400	0.700	56.3	0.145	5.00	0.0	0.600	o	225
S13.001	32.000	1.004	31.9	0.076	0.00	0.0	0.600	o	225
S11.010	64.775	0.388	166.9	0.149	0.00	0.0	0.600	o	300
S14.000	66.775	2.250	29.7	0.128	5.00	0.0	0.600	o	225
S14.001	16.115	0.250	64.5	0.000	0.00	0.0	0.600	o	225
S14.002	102.940	1.000	102.9	0.236	0.00	0.0	0.600	o	300
S14.003	12.055	0.200	60.3	0.050	0.00	0.0	0.600	o	300
S14.004	11.810	0.100	118.1	0.050	0.00	0.0	0.600	o	300
S14.005	9.950	0.100	99.5	0.050	0.00	0.0	0.600	o	300
S14.006	50.410	0.942	53.5	0.117	0.00	0.0	0.600	o	300
S11.011	5.895	0.035	168.4	0.000	0.00	0.0	0.600	o	450
S11.012	67.565	0.522	129.4	0.000	0.00	0.0	0.600	o	450
S11.013	13.400	0.092	145.7	0.000	0.00	0.0	0.600	o	450

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S11.007	50.00	7.16	19.500	0.625	0.0	0.0	16.9	1.40	154.7	101.6
S11.008	50.00	5.15	19.494	0.000	3.4	0.0	0.6	0.92	36.7	3.4
S11.009	50.00	5.58	19.453	0.061	3.4	0.0	2.3	1.01	40.1	14.0
S13.000	50.00	5.38	21.000	0.145	0.0	0.0	3.9	1.75	69.5	23.6
S13.001	50.00	5.61	20.300	0.221	0.0	0.0	6.0	2.33	92.5	35.9
S11.010	50.00	6.49	19.296	0.431	3.4	0.0	12.4	1.21	85.8	74.1
S14.000	50.00	5.46	23.750	0.128	0.0	0.0	3.5	2.41	95.8	20.8
S14.001	50.00	5.63	21.500	0.128	0.0	0.0	3.5	1.63	64.9	20.8
S14.002	50.00	6.73	21.250	0.364	0.0	0.0	9.9	1.55	109.5	59.1
S14.003	50.00	6.83	20.250	0.414	0.0	0.0	11.2	2.03	143.4	67.3
S14.004	50.00	6.97	20.050	0.464	0.0	0.0	12.6	1.45	102.2	75.4
S14.005	50.00	7.07	19.950	0.514	0.0	0.0	13.9	1.58	111.4	83.5
S14.006	50.00	7.46	19.850	0.631	0.0	0.0	17.1	2.15	152.3	102.5
S11.011	50.00	7.53	18.908	1.062	3.4	0.0	29.4	1.56	248.7	176.6
S11.012	50.00	8.16	18.873	1.062	3.4	0.0	29.4	1.79	284.0	176.6
S11.013	50.00	8.29	18.351	1.062	3.4	0.0	29.4	1.68	267.6	176.6

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S1.015	41.275	0.165	250.2	0.000	0.00	0.0	0.600	o	525
S1.016	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	525
S1.017	8.300	0.088	94.3	0.000	0.00	0.0	0.600	o	300
S15.000	32.225	0.500	64.5	0.083	5.00	0.0	0.600	o	225
S15.001	51.410	1.500	34.3	0.136	0.00	0.0	0.600	o	225
S15.002	20.405	0.150	136.0	0.050	0.00	0.0	0.600	o	225
S15.003	17.275	0.150	115.2	0.050	0.00	0.0	0.600	o	300
S15.004	17.390	0.100	173.9	0.065	0.00	0.0	0.600	o	300
S15.005	24.945	0.249	100.2	0.078	0.00	0.0	0.600	o	300
S15.006	40.395	0.269	150.2	0.115	0.00	0.0	0.600	o	375
S15.007	29.710	0.198	150.1	0.097	0.00	0.0	0.600	o	375
S15.008	50.560	0.337	150.0	0.129	0.00	0.0	0.600	o	375
S15.009	66.345	0.442	150.1	0.181	0.00	0.0	0.600	o	375
S15.010	49.475	0.650	76.1	0.122	0.00	0.0	0.600	o	375
S15.011	45.460	0.305	149.0	0.132	0.00	0.0	0.600	o	450
S15.012	45.915	0.200	229.6	0.040	0.00	0.0	0.600	o	450
S16.000	99.775	0.500	199.6	0.219	5.00	0.0	0.600	o	300

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.015	50.00	8.78	18.259	1.632	17.6	0.0	47.7	1.41	305.6	286.3
S1.016	50.00	8.79	17.650	1.632	17.6	0.0	47.7	1.41	305.7	286.3
S1.017	50.00	5.09	17.646	0.000	28.0	0.0	4.7	1.62	114.5	28.0
S15.000	50.00	5.33	23.000	0.083	0.0	0.0	2.2	1.63	64.9	13.5
S15.001	50.00	5.71	22.500	0.219	0.0	0.0	5.9	2.24	89.2	35.6
S15.002	50.00	6.02	21.000	0.269	0.0	0.0	7.3	1.12	44.5	43.7
S15.003	50.00	6.21	20.850	0.319	0.0	0.0	8.6	1.46	103.5	51.8
S15.004	50.00	6.46	20.700	0.384	0.0	0.0	10.4	1.19	84.1	62.4
S15.005	50.00	6.72	20.600	0.462	0.0	0.0	12.5	1.57	111.0	75.1
S15.006	50.00	7.18	20.351	0.577	0.0	0.0	15.6	1.48	163.0	93.8
S15.007	50.00	7.51	20.082	0.674	0.0	0.0	18.3	1.48	163.1	109.5
S15.008	50.00	8.08	19.884	0.803	0.0	0.0	21.7	1.48	163.1	130.5
S15.009	50.00	8.83	19.547	0.984	0.0	0.0	26.6	1.48	163.1	159.9
S15.010	50.00	9.23	19.105	1.106	0.0	0.0	30.0	2.08	229.6	179.7
S15.011	50.00	9.68	18.455	1.238	0.0	0.0	33.5	1.66	264.5	201.2
S15.012	50.00	10.26	18.150	1.278	0.0	0.0	34.6	1.34	212.7	207.7
S16.000	50.00	6.50	23.300	0.219	0.0	0.0	5.9	1.11	78.4	35.6

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S16.001	17.485	0.105	166.5	0.043	0.00	0.0	0.600	o	300
S16.002	51.262	1.195	42.9	0.123	0.00	0.0	0.600	o	300
S16.003	6.610	0.040	165.3	0.000	0.00	0.0	0.600	o	300
S16.004	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	300
S16.005	4.695	0.019	247.1	0.000	0.00	0.0	0.600	o	225
S17.000	35.995	1.273	28.3	0.131	5.00	0.0	0.600	o	225
S16.006	14.795	0.127	116.5	0.000	0.00	0.0	0.600	o	225
S16.007	10.740	0.100	107.4	0.000	0.00	0.0	0.600	o	225
S18.000	40.355	1.500	26.9	0.050	5.00	0.0	0.600	o	225
S18.001	32.660	0.500	65.3	0.178	0.00	0.0	0.600	o	225
S19.000	30.445	1.000	30.4	0.088	5.00	0.0	0.600	o	225
S18.002	9.125	0.100	91.3	0.050	0.00	0.0	0.600	o	300
S18.003	49.280	0.583	84.5	0.159	0.00	0.0	0.600	o	300
S20.000	51.236	1.883	27.2	0.127	5.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S16.001	50.00	6.74	22.800	0.262	0.0	0.0	7.1	1.22	85.9	42.6
S16.002	50.00	7.09	22.695	0.385	0.0	0.0	10.4	2.41	170.2	62.6
S16.003	50.00	7.18	21.500	0.385	0.0	0.0	10.4	1.22	86.3	62.6
S16.004	50.00	7.20	20.000	0.385	0.0	0.0	10.4	0.99	70.0	62.6
S16.005	50.00	5.09	19.996	0.000	2.5	0.0	0.4	0.83	32.9	2.5
S17.000	50.00	5.24	21.250	0.131	0.0	0.0	3.5	2.47	98.2	21.3
S16.006	50.00	5.45	19.977	0.131	2.5	0.0	4.0	1.21	48.1	24.3
S16.007	50.00	5.59	19.850	0.131	2.5	0.0	4.0	1.26	50.1	24.3
S18.000	50.00	5.27	23.250	0.050	0.0	0.0	1.4	2.53	100.7	8.1
S18.001	50.00	5.60	21.750	0.228	0.0	0.0	6.2	1.62	64.4	37.0
S19.000	50.00	5.21	22.250	0.088	0.0	0.0	2.4	2.38	94.6	14.3
S18.002	50.00	5.69	21.250	0.366	0.0	0.0	9.9	1.65	116.4	59.5
S18.003	50.00	6.17	21.150	0.525	0.0	0.0	14.2	1.71	121.0	85.3
S20.000	50.00	5.34	22.450	0.127	0.0	0.0	3.4	2.52	100.1	20.6

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S21.000	21.005	0.126	166.7	0.065	5.00	0.0	0.600	o	225
S21.001	9.570	0.057	167.9	0.000	0.00	0.0	0.600	o	225
S18.004	7.585	0.045	168.6	0.000	0.00	0.0	0.600	o	375
S18.005	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	375
S18.006	12.970	0.052	249.4	0.000	0.00	0.0	0.600	o	225
S22.000	30.300	0.750	40.4	0.116	5.00	0.0	0.600	o	225
S18.007	60.880	0.544	111.9	0.190	0.00	0.0	0.600	o	300
S23.000	30.865	0.185	166.8	0.061	5.00	0.0	0.600	o	225
S18.008	49.875	0.258	193.3	0.102	0.00	0.0	0.600	o	375
S16.008	59.645	0.398	149.9	0.203	0.00	0.0	0.600	o	375
S24.000	40.750	0.350	116.4	0.136	5.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S21.000	50.00	5.35	20.750	0.065	0.0	0.0	1.8	1.01	40.2	10.6
S21.001	50.00	5.51	20.624	0.065	0.0	0.0	1.8	1.01	40.0	10.6
S18.004	50.00	6.26	20.567	0.717	0.0	0.0	19.4	1.39	153.8	116.5
S18.005	50.00	6.28	20.000	0.717	0.0	0.0	19.4	1.14	126.1	116.5
S18.006	50.00	5.26	19.996	0.000	3.5	0.0	0.6	0.82	32.7	3.5
S22.000	50.00	5.24	20.750	0.116	0.0	0.0	3.1	2.06	82.1	18.8
S18.007	50.00	5.95	19.944	0.306	3.5	0.0	9.0	1.49	105.0	53.9
S23.000	50.00	5.51	19.250	0.061	0.0	0.0	1.7	1.01	40.1	9.9
S18.008	50.00	6.59	19.065	0.469	3.5	0.0	13.4	1.30	143.5	80.4
S16.008	50.00	7.26	18.807	0.803	6.0	0.0	22.9	1.48	163.2	137.7
S24.000	50.00	5.56	19.700	0.136	0.0	0.0	3.7	1.21	48.1	22.1

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S16.009	19.115	0.076	250.0	0.000	0.00	0.0	0.600	o	450
S25.000	24.140	0.417	57.9	0.348	5.00	0.0	0.600	o	300
S16.010	36.055	0.144	250.0	0.068	0.00	0.0	0.600	o	525
S26.000	19.850	1.312	15.1	0.259	5.00	0.0	0.600	o	300
S16.011	39.355	0.238	165.4	0.102	0.00	0.0	0.600	o	525
S15.013	8.315	0.033	250.0	0.000	0.00	0.0	0.600	o	675
S15.014	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	675
S15.015	36.935	0.123	300.3	0.000	0.00	0.0	0.600	o	300
S15.016	69.575	0.232	299.9	0.000	0.00	0.0	0.600	o	300
S1.018	47.735	0.159	300.2	0.000	0.00	0.0	0.600	o	300
S1.019	10.120	0.034	300.0	0.000	0.00	0.0	0.600	o	300
S1.020	70.060	0.234	300.0	0.000	0.00	0.0	0.600	o	300
S1.021	70.060	0.234	300.0	0.000	0.00	0.0	0.600	o	300

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S16.009	50.00	7.51	18.409	0.939	6.0	0.0	26.6	1.28	203.8	159.8
S25.000	50.00	5.19	18.750	0.348	0.0	0.0	9.4	2.07	146.4	56.5
S16.010	50.00	7.93	18.333	1.355	6.0	0.0	37.9	1.41	305.7	227.4
S26.000	50.00	5.08	19.500	0.259	0.0	0.0	7.0	4.06	287.2	42.1
S16.011	50.00	8.31	18.188	1.716	6.0	0.0	47.7	1.74	376.5	286.0
S15.013	50.00	10.34	17.950	2.994	6.0	0.0	82.3	1.65	591.5	493.7
S15.014	50.00	10.35	17.917	2.994	6.0	0.0	82.3	1.65	591.5	493.7
S15.015	50.00	5.68	17.913	0.000	21.6	0.0	3.6	0.90	63.8	21.6
S15.016	50.00	6.97	17.790	0.000	21.6	0.0	4.3	0.90	63.8	25.9
S1.018	50.00	7.85	17.558	0.000	49.6	0.0	9.9	0.90	63.8	59.5
S1.019	50.00	8.04	17.399	0.000	49.6	0.0	9.9	0.90	63.8	59.5
S1.020	50.00	9.33	17.365	0.000	49.6	0.0	9.9	0.90	63.8	59.5
S1.021	50.00	10.62	17.131	0.000	49.6	0.0	9.9	0.90	63.8	59.5

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SS.036	30.000	1.500	1050	S1.000	28.500	225				
SS.035	29.500	1.500	1050	S1.001	28.000	225	S1.000	28.000	225	
SS.034	29.650	1.922	1200	S1.002	27.728	225	S1.001	27.728	225	
SS.037	29.250	1.500	1050	S2.000	27.750	225				
SS.033	29.250	1.838	1200	S1.003	27.412	300	S1.002	27.412	225	
							S2.000	27.412	225	
SS.032	28.100	1.500	1050	S1.004	26.600	300	S1.003	26.600	300	
SS.031	28.050	1.760	1050	S1.005	26.290	300	S1.004	26.290	300	
SS.041	30.000	1.500	1050	S3.000	28.500	225				
SS.040	29.150	1.500	1050	S3.001	27.650	225	S3.000	27.650	225	
SS.039	29.000	1.500	1050	S3.002	27.500	225	S3.001	27.500	225	
SS.038	27.500	1.500	1050	S3.003	26.000	300	S3.002	26.000	225	
SS.030	28.000	2.381	1350	S1.006	25.619	375	S1.005	25.619	300	
							S3.003	25.619	300	
SS.029	25.200	1.575	1350	S1.007	23.625	375	S1.006	23.625	375	
SS.028	24.000	1.650	1350	S1.008	22.350	450	S1.007	22.350	375	
SS.025	29.350	1.500	1050	S4.000	27.850	225				
SS.024	28.750	1.500	1050	S4.001	27.250	300	S4.000	27.250	225	
SS.023	29.050	2.146	1200	S4.002	26.904	300	S4.001	26.904	300	
SS.022	29.150	2.301	1200	S4.003	26.849	300	S4.002	26.849	300	
SS.026	29.350	1.500	1050	S5.000	27.850	225				
SS.021	29.250	2.443	1200	S4.004	26.807	300	S4.003	26.807	300	
							S5.000	26.807	225	
SS.020	28.050	1.567	1050	S4.005	26.483	300	S4.004	26.483	300	
SS.019	28.050	1.500	1050	S6.000	26.550	225				
SS.027	27.750	1.500	1050	S4.006	26.250	300	S4.005	26.250	300	
							S6.000	26.250	225	
SS.018	24.500	2.226	1350	S1.009	22.274	450	S1.008	22.274	450	
							S4.006	23.000	300	576
SS.015	28.350	1.500	1050	S7.000	26.850	225				
SS.014	26.500	1.500	1050	S7.001	25.000	225	S7.000	25.000	225	
SS.013	25.750	1.500	1050	S7.002	24.250	225	S7.001	24.250	225	
SS.012	25.000	1.500	1050	S7.003	23.500	225	S7.002	23.500	225	
SS.016	26.350	1.500	1050	S8.000	24.850	225				
SS.011	24.250	1.500	1050	S7.004	22.750	225	S7.003	22.750	225	
							S8.000	22.750	225	
SS.017	23.500	3.500	1500	S1.010	20.000	600	S1.009	21.515	450	1365
							S7.004	20.875	225	500
SS.009	22.500	2.504	1500	S1.011	19.996	225	S1.010	19.996	600	
SS.067	23.550	1.500	1050	S9.000	22.050	225				
SS.008	22.000	2.040	1200	S1.012	19.960	300	S1.011	19.960	225	
							S9.000	19.960	225	
SS.007	21.050	1.500	1050	S1.013	19.550	300	S1.012	19.550	300	
SS.066	21.600	1.500	1050	S10.000	20.100	225				
SS.006	20.900	1.500	1050	S1.014	19.400	300	S1.013	19.400	300	
							S10.000	19.400	225	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SS.065	26.550	1.500	1050	S11.000	25.050	225				
SS.064	25.300	1.500	1050	S11.001	23.800	300	S11.000	23.800	225	
SS.063	25.700	2.265	1200	S11.002	23.435	300	S11.001	23.435	300	
SS.062	25.400	2.073	1200	S11.003	23.327	300	S11.002	23.327	300	
SS.061	23.150	1.499	1050	S11.004	21.651	300	S11.003	21.651	300	
SS.060	22.600	1.499	1050	S11.005	21.101	300	S11.004	21.101	300	
SS.059	21.750	1.500	1050	S12.000	20.250	225				
SS.058	22.100	1.990	1350	S11.006	20.110	375	S11.005	20.501	300	316
							S12.000	20.110	225	
SS.057	22.000	2.500	1350	S11.007	19.500	375	S11.006	20.091	375	591
SS.056	22.000	2.506	1350	S11.008	19.494	225	S11.007	19.494	375	
SS.055	21.650	2.197	1200	S11.009	19.453	225	S11.008	19.453	225	
SS.054	22.500	1.500	1050	S13.000	21.000	225				
SS.053	21.800	1.500	1050	S13.001	20.300	225	S13.000	20.300	225	
SS.052	21.350	2.054	1200	S11.010	19.296	300	S11.009	19.296	225	
							S13.001	19.296	225	
SS.051	25.250	1.500	1050	S14.000	23.750	225				
SS.050	23.000	1.500	1050	S14.001	21.500	225	S14.000	21.500	225	
SS.049	22.750	1.500	1050	S14.002	21.250	300	S14.001	21.250	225	
SS.048	21.750	1.500	1050	S14.003	20.250	300	S14.002	20.250	300	
SS.047	21.550	1.500	1050	S14.004	20.050	300	S14.003	20.050	300	
SS.046	21.450	1.500	1050	S14.005	19.950	300	S14.004	19.950	300	
SS.045	21.350	1.500	1050	S14.006	19.850	300	S14.005	19.850	300	
SS.044	20.750	1.842	1350	S11.011	18.908	450	S11.010	18.908	300	
							S14.006	18.908	300	
SS.043	20.600	1.727	1350	S11.012	18.873	450	S11.011	18.873	450	
SS.042	20.000	1.649	1350	S11.013	18.351	450	S11.012	18.351	450	
SS.005	20.100	1.841	1500	S1.015	18.259	525	S1.014	18.409	300	
							S11.013	18.259	450	
SS.004	19.750	2.100	1500	S1.016	17.650	525	S1.015	18.094	525	444
SS.003	19.750	2.104	1500	S1.017	17.646	300	S1.016	17.646	525	
SS.116	24.500	1.500	1050	S15.000	23.000	225				
SS.115	24.000	1.500	1050	S15.001	22.500	225	S15.000	22.500	225	
SS.114	22.500	1.500	1050	S15.002	21.000	225	S15.001	21.000	225	
SS.113	22.350	1.500	1050	S15.003	20.850	300	S15.002	20.850	225	
SS.112	22.200	1.500	1050	S15.004	20.700	300	S15.003	20.700	300	
SS.111	22.100	1.500	1050	S15.005	20.600	300	S15.004	20.600	300	
SS.110	22.000	1.649	1350	S15.006	20.351	375	S15.005	20.351	300	
SS.109	21.900	1.818	1350	S15.007	20.082	375	S15.006	20.082	375	
SS.108	21.700	1.816	1350	S15.008	19.884	375	S15.007	19.884	375	
SS.107	21.400	1.853	1350	S15.009	19.547	375	S15.008	19.547	375	
SS.106	20.800	1.695	1350	S15.010	19.105	375	S15.009	19.105	375	
SS.105	20.150	1.695	1350	S15.011	18.455	450	S15.010	18.455	375	
SS.104	19.500	1.350	1350	S15.012	18.150	450	S15.011	18.150	450	
SS.132	24.800	1.500	1050	S16.000	23.300	300				
SS.131	24.300	1.500	1050	S16.001	22.800	300	S16.000	22.800	300	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SS.130	24.700	2.005	1200	S16.002	22.695	300	S16.001	22.695	300	
SS.129	23.000	1.500	1050	S16.003	21.500	300	S16.002	21.500	300	
SS.128	23.000	3.000	1200	S16.004	20.000	300	S16.003	21.460	300	1460
SS.127	22.000	2.004	1200	S16.005	19.996	225	S16.004	19.996	300	
SS.133	22.750	1.500	1050	S17.000	21.250	225				
SS.126	21.850	1.873	1200	S16.006	19.977	225	S16.005	19.977	225	
							S17.000	19.977	225	
SS.125	21.350	1.500	1050	S16.007	19.850	225	S16.006	19.850	225	
SS.147	24.750	1.500	1050	S18.000	23.250	225				
SS.146	23.250	1.500	1050	S18.001	21.750	225	S18.000	21.750	225	
SS.145	23.750	1.500	1050	S19.000	22.250	225				
SS.144	22.750	1.500	1050	S18.002	21.250	300	S18.001	21.250	225	
							S19.000	21.250	225	
SS.143	22.650	1.500	1050	S18.003	21.150	300	S18.002	21.150	300	
SS.140	23.950	1.500	1050	S20.000	22.450	225				
SS.142	21.750	1.000	1050	S21.000	20.750	225				
SS.141	22.150	1.526	1050	S21.001	20.624	225	S21.000	20.624	225	
SS.139	22.250	1.683	1350	S18.004	20.567	375	S18.003	20.567	300	
							S20.000	20.567	225	
							S21.001	20.567	225	
SS.138	22.250	2.250	1350	S18.005	20.000	375	S18.004	20.522	375	522
SS.137	21.700	1.704	1350	S18.006	19.996	225	S18.005	19.996	375	
SS.148	22.250	1.500	1050	S22.000	20.750	225				
SS.136	21.500	1.556	1050	S18.007	19.944	300	S18.006	19.944	225	
							S22.000	20.000	225	
SS.135	20.750	1.500	1050	S23.000	19.250	225				
SS.134	20.900	1.835	1350	S18.008	19.065	375	S18.007	19.400	300	260
							S23.000	19.065	225	
SS.124	21.250	2.443	1350	S16.008	18.807	375	S16.007	19.750	225	793
							S18.008	18.807	375	
SS.123	21.200	1.500	1050	S24.000	19.700	225				
SS.122	20.850	2.441	1350	S16.009	18.409	450	S16.008	18.409	375	
							S24.000	19.350	225	716
SS.121	20.250	1.500	1050	S25.000	18.750	300				
SS.120	20.750	2.417	1500	S16.010	18.333	525	S16.009	18.333	450	
							S25.000	18.333	300	
SS.119	21.000	1.500	1050	S26.000	19.500	300				
SS.118	20.500	2.312	1500	S16.011	18.188	525	S16.010	18.188	525	
							S26.000	18.188	300	
SS.103	19.850	1.900	1500	S15.013	17.950	675	S15.012	17.950	450	
							S16.011	17.950	525	
SS.102	20.000	2.083	1500	S15.014	17.917	675	S15.013	17.917	675	
SS.101	20.500	2.587	1500	S15.015	17.913	300	S15.014	17.913	675	
SS.100	19.000	1.210	1050	S15.016	17.790	300	S15.015	17.790	300	
SS.002	19.000	1.442	1050	S1.018	17.558	300	S1.017	17.558	300	
							S15.016	17.558	300	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
SS.001	19.000	1.601	1050	S1.019	17.399	300	S1.018	17.399	300	
SS.200	19.750	2.385	1200	S1.020	17.365	300	S1.019	17.365	300	
SS.201	19.500	2.369	1200	S1.021	17.131	300	S1.020	17.131	300	
SDrainge Ditch	18.500	1.602	0		OUTFALL		S1.021	16.898	300	

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S1.000	o	225	SS.036	30.000	28.500	1.275	1050
S1.001	o	225	SS.035	29.500	28.000	1.275	1050
S1.002	o	225	SS.034	29.650	27.728	1.697	1200
S2.000	o	225	SS.037	29.250	27.750	1.275	1050
S1.003	o	300	SS.033	29.250	27.412	1.538	1200
S1.004	o	300	SS.032	28.100	26.600	1.200	1050
S1.005	o	300	SS.031	28.050	26.290	1.460	1050
S3.000	o	225	SS.041	30.000	28.500	1.275	1050
S3.001	o	225	SS.040	29.150	27.650	1.275	1050
S3.002	o	225	SS.039	29.000	27.500	1.275	1050
S3.003	o	300	SS.038	27.500	26.000	1.200	1050
S1.006	o	375	SS.030	28.000	25.619	2.006	1350
S1.007	o	375	SS.029	25.200	23.625	1.200	1350
S1.008	o	450	SS.028	24.000	22.350	1.200	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S1.000	61.085	122.2	SS.035	29.500	28.000	1.275	1050
S1.001	45.380	166.8	SS.034	29.650	27.728	1.697	1200
S1.002	20.705	65.5	SS.033	29.250	27.412	1.613	1200
S2.000	56.415	166.9	SS.033	29.250	27.412	1.613	1200
S1.003	51.655	63.6	SS.032	28.100	26.600	1.200	1050
S1.004	6.205	20.0	SS.031	28.050	26.290	1.460	1050
S1.005	10.685	15.9	SS.030	28.000	25.619	2.081	1350
S3.000	45.635	53.7	SS.040	29.150	27.650	1.275	1050
S3.001	5.890	39.3	SS.039	29.000	27.500	1.275	1050
S3.002	66.465	44.3	SS.038	27.500	26.000	1.275	1050
S3.003	63.645	167.0	SS.030	28.000	25.619	2.081	1350
S1.006	74.710	37.5	SS.029	25.200	23.625	1.200	1350
S1.007	66.585	52.2	SS.028	24.000	22.350	1.275	1350
S1.008	7.600	100.0	SS.018	24.500	22.274	1.776	1350

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S4.000	o	225	SS.025	29.350	27.850	1.275	1050
S4.001	o	300	SS.024	28.750	27.250	1.200	1050
S4.002	o	300	SS.023	29.050	26.904	1.846	1200
S4.003	o	300	SS.022	29.150	26.849	2.001	1200
S5.000	o	225	SS.026	29.350	27.850	1.275	1050
S4.004	o	300	SS.021	29.250	26.807	2.143	1200
S4.005	o	300	SS.020	28.050	26.483	1.267	1050
S6.000	o	225	SS.019	28.050	26.550	1.275	1050
S4.006	o	300	SS.027	27.750	26.250	1.200	1050
S1.009	o	450	SS.018	24.500	22.274	1.776	1350
S7.000	o	225	SS.015	28.350	26.850	1.275	1050
S7.001	o	225	SS.014	26.500	25.000	1.275	1050
S7.002	o	225	SS.013	25.750	24.250	1.275	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S4.000	62.150	103.6	SS.024	28.750	27.250	1.275	1050
S4.001	57.765	167.0	SS.023	29.050	26.904	1.846	1200
S4.002	9.150	166.4	SS.022	29.150	26.849	2.001	1200
S4.003	7.000	166.7	SS.021	29.250	26.807	2.143	1200
S5.000	61.775	59.2	SS.021	29.250	26.807	2.218	1200
S4.004	54.075	166.9	SS.020	28.050	26.483	1.267	1050
S4.005	12.460	53.5	SS.027	27.750	26.250	1.200	1050
S6.000	52.900	176.3	SS.027	27.750	26.250	1.275	1050
S4.006	82.705	25.4	SS.018	24.500	23.000	1.200	1350
S1.009	15.190	20.0	SS.017	23.500	21.515	1.536	1500
S7.000	53.690	29.0	SS.014	26.500	25.000	1.275	1050
S7.001	23.365	31.2	SS.013	25.750	24.250	1.275	1050
S7.002	20.825	27.8	SS.012	25.000	23.500	1.275	1050

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S7.003	o	225	SS.012	25.000	23.500	1.275	1050
S8.000	o	225	SS.016	26.350	24.850	1.275	1050
S7.004	o	225	SS.011	24.250	22.750	1.275	1050
S1.010	o	600	SS.017	23.500	20.000	2.900	1500
S1.011	o	225	SS.009	22.500	19.996	2.279	1500
S9.000	o	225	SS.067	23.550	22.050	1.275	1050
S1.012	o	300	SS.008	22.000	19.960	1.740	1200
S1.013	o	300	SS.007	21.050	19.550	1.200	1050
S10.000	o	225	SS.066	21.600	20.100	1.275	1050
S1.014	o	300	SS.006	20.900	19.400	1.200	1050
S11.000	o	225	SS.065	26.550	25.050	1.275	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S7.003	22.925	30.6	SS.011	24.250	22.750	1.275	1050
S8.000	65.800	31.3	SS.011	24.250	22.750	1.275	1050
S7.004	37.670	20.1	SS.017	23.500	20.875	2.400	1500
S1.010	1.000	250.0	SS.009	22.500	19.996	1.904	1500
S1.011	9.000	250.0	SS.008	22.000	19.960	1.815	1200
S9.000	57.850	27.7	SS.008	22.000	19.960	1.815	1200
S1.012	61.075	149.0	SS.007	21.050	19.550	1.200	1050
S1.013	8.820	58.8	SS.006	20.900	19.400	1.200	1050
S10.000	61.865	88.4	SS.006	20.900	19.400	1.275	1050
S1.014	85.230	86.0	SS.005	20.100	18.409	1.391	1500
S11.000	47.175	37.7	SS.064	25.300	23.800	1.275	1050

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S11.001	o	300	SS.064	25.300	23.800	1.200	1050
S11.002	o	300	SS.063	25.700	23.435	1.965	1200
S11.003	o	300	SS.062	25.400	23.327	1.773	1200
S11.004	o	300	SS.061	23.150	21.651	1.199	1050
S11.005	o	300	SS.060	22.600	21.101	1.199	1050
S12.000	o	225	SS.059	21.750	20.250	1.275	1050
S11.006	o	375	SS.058	22.100	20.110	1.615	1350
S11.007	o	375	SS.057	22.000	19.500	2.125	1350
S11.008	o	225	SS.056	22.000	19.494	2.281	1350
S11.009	o	225	SS.055	21.650	19.453	1.972	1200
S13.000	o	225	SS.054	22.500	21.000	1.275	1050
S13.001	o	225	SS.053	21.800	20.300	1.275	1050
S11.010	o	300	SS.052	21.350	19.296	1.754	1200
S14.000	o	225	SS.051	25.250	23.750	1.275	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S11.001	60.975	167.1	SS.063	25.700	23.435	1.965	1200
S11.002	18.105	167.6	SS.062	25.400	23.327	1.773	1200
S11.003	45.565	27.2	SS.061	23.150	21.651	1.199	1050
S11.004	23.415	42.6	SS.060	22.600	21.101	1.199	1050
S11.005	31.960	53.3	SS.058	22.100	20.501	1.299	1350
S12.000	23.370	166.9	SS.058	22.100	20.110	1.765	1350
S11.006	3.235	170.3	SS.057	22.000	20.091	1.534	1350
S11.007	1.000	166.7	SS.056	22.000	19.494	2.131	1350
S11.008	8.145	198.7	SS.055	21.650	19.453	1.972	1200
S11.009	26.290	167.5	SS.052	21.350	19.296	1.829	1200
S13.000	39.400	56.3	SS.053	21.800	20.300	1.275	1050
S13.001	32.000	31.9	SS.052	21.350	19.296	1.829	1200
S11.010	64.775	166.9	SS.044	20.750	18.908	1.542	1350
S14.000	66.775	29.7	SS.050	23.000	21.500	1.275	1050

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S14.001	o	225	SS.050	23.000	21.500	1.275	1050
S14.002	o	300	SS.049	22.750	21.250	1.200	1050
S14.003	o	300	SS.048	21.750	20.250	1.200	1050
S14.004	o	300	SS.047	21.550	20.050	1.200	1050
S14.005	o	300	SS.046	21.450	19.950	1.200	1050
S14.006	o	300	SS.045	21.350	19.850	1.200	1050
S11.011	o	450	SS.044	20.750	18.908	1.392	1350
S11.012	o	450	SS.043	20.600	18.873	1.277	1350
S11.013	o	450	SS.042	20.000	18.351	1.199	1350
S1.015	o	525	SS.005	20.100	18.259	1.316	1500
S1.016	o	525	SS.004	19.750	17.650	1.575	1500
S1.017	o	300	SS.003	19.750	17.646	1.804	1500
S15.000	o	225	SS.116	24.500	23.000	1.275	1050
S15.001	o	225	SS.115	24.000	22.500	1.275	1050
S15.002	o	225	SS.114	22.500	21.000	1.275	1050
S15.003	o	300	SS.113	22.350	20.850	1.200	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S14.001	16.115	64.5	SS.049	22.750	21.250	1.275	1050
S14.002	102.940	102.9	SS.048	21.750	20.250	1.200	1050
S14.003	12.055	60.3	SS.047	21.550	20.050	1.200	1050
S14.004	11.810	118.1	SS.046	21.450	19.950	1.200	1050
S14.005	9.950	99.5	SS.045	21.350	19.850	1.200	1050
S14.006	50.410	53.5	SS.044	20.750	18.908	1.542	1350
S11.011	5.895	168.4	SS.043	20.600	18.873	1.277	1350
S11.012	67.565	129.4	SS.042	20.000	18.351	1.199	1350
S11.013	13.400	145.7	SS.005	20.100	18.259	1.391	1500
S1.015	41.275	250.2	SS.004	19.750	18.094	1.131	1500
S1.016	1.000	250.0	SS.003	19.750	17.646	1.579	1500
S1.017	8.300	94.3	SS.002	19.000	17.558	1.142	1050
S15.000	32.225	64.5	SS.115	24.000	22.500	1.275	1050
S15.001	51.410	34.3	SS.114	22.500	21.000	1.275	1050
S15.002	20.405	136.0	SS.113	22.350	20.850	1.275	1050
S15.003	17.275	115.2	SS.112	22.200	20.700	1.200	1050

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S15.004	o	300	SS.112	22.200	20.700	1.200	1050
S15.005	o	300	SS.111	22.100	20.600	1.200	1050
S15.006	o	375	SS.110	22.000	20.351	1.274	1350
S15.007	o	375	SS.109	21.900	20.082	1.443	1350
S15.008	o	375	SS.108	21.700	19.884	1.441	1350
S15.009	o	375	SS.107	21.400	19.547	1.478	1350
S15.010	o	375	SS.106	20.800	19.105	1.320	1350
S15.011	o	450	SS.105	20.150	18.455	1.245	1350
S15.012	o	450	SS.104	19.500	18.150	0.900	1350
S16.000	o	300	SS.132	24.800	23.300	1.200	1050
S16.001	o	300	SS.131	24.300	22.800	1.200	1050
S16.002	o	300	SS.130	24.700	22.695	1.705	1200
S16.003	o	300	SS.129	23.000	21.500	1.200	1050
S16.004	o	300	SS.128	23.000	20.000	2.700	1200
S16.005	o	225	SS.127	22.000	19.996	1.779	1200
S17.000	o	225	SS.133	22.750	21.250	1.275	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S15.004	17.390	173.9	SS.111	22.100	20.600	1.200	1050
S15.005	24.945	100.2	SS.110	22.000	20.351	1.349	1350
S15.006	40.395	150.2	SS.109	21.900	20.082	1.443	1350
S15.007	29.710	150.1	SS.108	21.700	19.884	1.441	1350
S15.008	50.560	150.0	SS.107	21.400	19.547	1.478	1350
S15.009	66.345	150.1	SS.106	20.800	19.105	1.320	1350
S15.010	49.475	76.1	SS.105	20.150	18.455	1.320	1350
S15.011	45.460	149.0	SS.104	19.500	18.150	0.900	1350
S15.012	45.915	229.6	SS.103	19.850	17.950	1.450	1500
S16.000	99.775	199.6	SS.131	24.300	22.800	1.200	1050
S16.001	17.485	166.5	SS.130	24.700	22.695	1.705	1200
S16.002	51.262	42.9	SS.129	23.000	21.500	1.200	1050
S16.003	6.610	165.3	SS.128	23.000	21.460	1.240	1200
S16.004	1.000	250.0	SS.127	22.000	19.996	1.704	1200
S16.005	4.695	247.1	SS.126	21.850	19.977	1.648	1200
S17.000	35.995	28.3	SS.126	21.850	19.977	1.648	1200

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S16.006	o	225	SS.126	21.850	19.977	1.648	1200
S16.007	o	225	SS.125	21.350	19.850	1.275	1050
S18.000	o	225	SS.147	24.750	23.250	1.275	1050
S18.001	o	225	SS.146	23.250	21.750	1.275	1050
S19.000	o	225	SS.145	23.750	22.250	1.275	1050
S18.002	o	300	SS.144	22.750	21.250	1.200	1050
S18.003	o	300	SS.143	22.650	21.150	1.200	1050
S20.000	o	225	SS.140	23.950	22.450	1.275	1050
S21.000	o	225	SS.142	21.750	20.750	0.775	1050
S21.001	o	225	SS.141	22.150	20.624	1.301	1050
S18.004	o	375	SS.139	22.250	20.567	1.308	1350
S18.005	o	375	SS.138	22.250	20.000	1.875	1350
S18.006	o	225	SS.137	21.700	19.996	1.479	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S16.006	14.795	116.5	SS.125	21.350	19.850	1.275	1050
S16.007	10.740	107.4	SS.124	21.250	19.750	1.275	1350
S18.000	40.355	26.9	SS.146	23.250	21.750	1.275	1050
S18.001	32.660	65.3	SS.144	22.750	21.250	1.275	1050
S19.000	30.445	30.4	SS.144	22.750	21.250	1.275	1050
S18.002	9.125	91.3	SS.143	22.650	21.150	1.200	1050
S18.003	49.280	84.5	SS.139	22.250	20.567	1.383	1350
S20.000	51.236	27.2	SS.139	22.250	20.567	1.458	1350
S21.000	21.005	166.7	SS.141	22.150	20.624	1.301	1050
S21.001	9.570	167.9	SS.139	22.250	20.567	1.458	1350
S18.004	7.585	168.6	SS.138	22.250	20.522	1.353	1350
S18.005	1.000	250.0	SS.137	21.700	19.996	1.329	1350
S18.006	12.970	249.4	SS.136	21.500	19.944	1.331	1050

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S22.000	o	225	SS.148	22.250	20.750	1.275	1050
S18.007	o	300	SS.136	21.500	19.944	1.256	1050
S23.000	o	225	SS.135	20.750	19.250	1.275	1050
S18.008	o	375	SS.134	20.900	19.065	1.460	1350
S16.008	o	375	SS.124	21.250	18.807	2.068	1350
S24.000	o	225	SS.123	21.200	19.700	1.275	1050
S16.009	o	450	SS.122	20.850	18.409	1.991	1350
S25.000	o	300	SS.121	20.250	18.750	1.200	1050
S16.010	o	525	SS.120	20.750	18.333	1.892	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S22.000	30.300	40.4	SS.136	21.500	20.000	1.275	1050
S18.007	60.880	111.9	SS.134	20.900	19.400	1.200	1350
S23.000	30.865	166.8	SS.134	20.900	19.065	1.610	1350
S18.008	49.875	193.3	SS.124	21.250	18.807	2.068	1350
S16.008	59.645	149.9	SS.122	20.850	18.409	2.066	1350
S24.000	40.750	116.4	SS.122	20.850	19.350	1.275	1350
S16.009	19.115	250.0	SS.120	20.750	18.333	1.967	1500
S25.000	24.140	57.9	SS.120	20.750	18.333	2.117	1500
S16.010	36.055	250.0	SS.118	20.500	18.188	1.787	1500

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S26.000	o	300	SS.119	21.000	19.500	1.200	1050
S16.011	o	525	SS.118	20.500	18.188	1.787	1500
S15.013	o	675	SS.103	19.850	17.950	1.225	1500
S15.014	o	675	SS.102	20.000	17.917	1.408	1500
S15.015	o	300	SS.101	20.500	17.913	2.287	1500
S15.016	o	300	SS.100	19.000	17.790	0.910	1050
S1.018	o	300	SS.002	19.000	17.558	1.142	1050
S1.019	o	300	SS.001	19.000	17.399	1.301	1050
S1.020	o	300	SS.200	19.750	17.365	2.085	1200
S1.021	o	300	SS.201	19.500	17.131	2.069	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S26.000	19.850	15.1	SS.118	20.500	18.188	2.012	1500
S16.011	39.355	165.4	SS.103	19.850	17.950	1.375	1500
S15.013	8.315	250.0	SS.102	20.000	17.917	1.408	1500
S15.014	1.000	250.0	SS.101	20.500	17.913	1.912	1500
S15.015	36.935	300.3	SS.100	19.000	17.790	0.910	1050
S15.016	69.575	299.9	SS.002	19.000	17.558	1.142	1050
S1.018	47.735	300.2	SS.001	19.000	17.399	1.301	1050
S1.019	10.120	300.0	SS.200	19.750	17.365	2.085	1200
S1.020	70.060	300.0	SS.201	19.500	17.131	2.069	1200
S1.021	70.060	300.0	SDrainge Ditch	18.500	16.898	1.302	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.021	SDrainge Ditch	18.500	16.898	16.898	0	0

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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	20.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	6
Number of Online Controls	6	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	18.800	Storm Duration (mins)	30
Ratio R	0.250		

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Online Controls for Storm

Hydro-Brake® Manhole: SS.009, DS/PN: S1.011, Volume (m³): 4.3

Design Head (m) 1.750 Hydro-Brake® Type Md4 Invert Level (m) 19.996
Design Flow (l/s) 14.2 Diameter (mm) 117

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.4	1.200	11.7	3.000	18.5	7.000	28.2
0.200	8.8	1.400	12.6	3.500	20.0	7.500	29.2
0.300	8.9	1.600	13.5	4.000	21.3	8.000	30.2
0.400	7.8	1.800	14.3	4.500	22.6	8.500	31.1
0.500	7.8	2.000	15.1	5.000	23.9	9.000	32.0
0.600	8.3	2.200	15.8	5.500	25.0	9.500	32.9
0.800	9.5	2.400	16.5	6.000	26.1		
1.000	10.7	2.600	17.2	6.500	27.2		

Hydro-Brake® Manhole: SS.056, DS/PN: S11.008, Volume (m³): 3.5

Design Head (m) 1.750 Hydro-Brake® Type Md4 Invert Level (m) 19.494
Design Flow (l/s) 3.4 Diameter (mm) 58

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.5	1.200	2.9	3.000	4.5	7.000	6.9
0.200	1.3	1.400	3.1	3.500	4.9	7.500	7.2
0.300	1.4	1.600	3.3	4.000	5.2	8.000	7.4
0.400	1.7	1.800	3.5	4.500	5.6	8.500	7.6
0.500	1.9	2.000	3.7	5.000	5.9	9.000	7.9
0.600	2.0	2.200	3.9	5.500	6.1	9.500	8.1
0.800	2.3	2.400	4.1	6.000	6.4		
1.000	2.6	2.600	4.2	6.500	6.7		

Hydro-Brake® Manhole: SS.003, DS/PN: S1.017, Volume (m³): 3.6

Design Head (m) 1.750 Hydro-Brake® Type Md4 Invert Level (m) 17.646
Design Flow (l/s) 28.0 Diameter (mm) 165

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.0	1.200	23.2	3.000	36.7	7.000	56.1
0.200	14.2	1.400	25.1	3.500	39.7	7.500	58.1
0.300	21.4	1.600	26.8	4.000	42.4	8.000	60.0
0.400	21.4	1.800	28.5	4.500	45.0	8.500	61.9
0.500	19.2	2.000	30.0	5.000	47.4	9.000	63.6
0.600	18.2	2.200	31.5	5.500	49.8	9.500	65.4
0.800	19.2	2.400	32.9	6.000	52.0		
1.000	21.3	2.600	34.2	6.500	54.1		

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Hydro-Brake® Manhole: SS.127, DS/PN: S16.005, Volume (m³): 2.3

Design Head (m) 1.250 Hydro-Brake® Type Md4 Invert Level (m) 19.996
Design Flow (l/s) 2.5 Diameter (mm) 54

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.3	1.200	2.5	3.000	3.9	7.000	6.0
0.200	1.1	1.400	2.7	3.500	4.3	7.500	6.2
0.300	1.2	1.600	2.9	4.000	4.5	8.000	6.4
0.400	1.4	1.800	3.0	4.500	4.8	8.500	6.6
0.500	1.6	2.000	3.2	5.000	5.1	9.000	6.8
0.600	1.8	2.200	3.4	5.500	5.3	9.500	7.0
0.800	2.0	2.400	3.5	6.000	5.6		
1.000	2.3	2.600	3.7	6.500	5.8		

Hydro-Brake® Manhole: SS.137, DS/PN: S18.006, Volume (m³): 2.4

Design Head (m) 1.500 Hydro-Brake® Type Md4 Invert Level (m) 19.996
Design Flow (l/s) 3.5 Diameter (mm) 61

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.7	1.200	3.2	3.000	5.0	7.000	7.7
0.200	1.5	1.400	3.4	3.500	5.4	7.500	7.9
0.300	1.6	1.600	3.7	4.000	5.8	8.000	8.2
0.400	1.8	1.800	3.9	4.500	6.2	8.500	8.5
0.500	2.1	2.000	4.1	5.000	6.5	9.000	8.7
0.600	2.2	2.200	4.3	5.500	6.8	9.500	8.9
0.800	2.6	2.400	4.5	6.000	7.1		
1.000	2.9	2.600	4.7	6.500	7.4		

Hydro-Brake® Manhole: SS.101, DS/PN: S15.015, Volume (m³): 4.4

Design Head (m) 1.750 Hydro-Brake® Type Md4 Invert Level (m) 17.913
Design Flow (l/s) 21.6 Diameter (mm) 145

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.8	1.200	17.9	3.000	28.4	7.000	43.3
0.200	12.2	1.400	19.4	3.500	30.7	7.500	44.9
0.300	16.0	1.600	20.7	4.000	32.8	8.000	46.3
0.400	14.6	1.800	22.0	4.500	34.8	8.500	47.8
0.500	13.3	2.000	23.2	5.000	36.6	9.000	49.2
0.600	13.3	2.200	24.3	5.500	38.4	9.500	50.5
0.800	14.7	2.400	25.4	6.000	40.1		
1.000	16.4	2.600	26.4	6.500	41.8		

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Storage Structures for Storm

Tank or Pond Manhole: SS.009, DS/PN: S1.011

Invert Level (m) 19.996

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	930.0	1.750	930.0

Tank or Pond Manhole: SS.056, DS/PN: S11.008

Invert Level (m) 19.494

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	275.0	1.750	275.0

Tank or Pond Manhole: SS.003, DS/PN: S1.017

Invert Level (m) 17.646

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	600.0	1.750	600.0

Tank or Pond Manhole: SS.127, DS/PN: S16.005

Invert Level (m) 19.996

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	240.0	1.250	240.0

Tank or Pond Manhole: SS.137, DS/PN: S18.006

Invert Level (m) 19.996

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	320.0	1.500	320.0

Tank or Pond Manhole: SS.101, DS/PN: S15.015

Invert Level (m) 17.913

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	600.0	2.750	600.0

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2
Climate Change (%) 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
S1.000	15 Winter	2	0%					
S1.001	15 Winter	2	0%					
S1.002	15 Winter	2	0%					
S2.000	15 Winter	2	0%					
S1.003	15 Winter	2	0%					
S1.004	15 Winter	2	0%					
S1.005	15 Winter	2	0%					
S3.000	15 Winter	2	0%					
S3.001	15 Winter	2	0%					
S3.002	15 Winter	2	0%					
S3.003	15 Winter	2	0%					
S1.006	15 Winter	2	0%					
S1.007	15 Winter	2	0%					
S1.008	15 Winter	2	0%	2/15 Summer				
S4.000	15 Winter	2	0%					
S4.001	15 Winter	2	0%					
S4.002	15 Winter	2	0%					
S4.003	15 Winter	2	0%					
S5.000	15 Winter	2	0%					
S4.004	15 Winter	2	0%					
S4.005	15 Winter	2	0%					
S6.000	15 Winter	2	0%					
S4.006	15 Winter	2	0%					
S1.009	15 Winter	2	0%					
S7.000	15 Winter	2	0%					
S7.001	15 Winter	2	0%					
S7.002	15 Winter	2	0%					
S7.003	15 Winter	2	0%					
S8.000	15 Winter	2	0%					
S7.004	15 Winter	2	0%					
S1.010	1440 Winter	2	0%	2/15 Summer				
S1.011	1440 Winter	2	0%	2/15 Winter				
S9.000	15 Winter	2	0%					
S1.012	15 Winter	2	0%					
S1.013	15 Winter	2	0%					
S10.000	15 Winter	2	0%					
S1.014	15 Winter	2	0%					
S11.000	15 Winter	2	0%					

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
S11.001	15 Winter	2	0%					
S11.002	15 Winter	2	0%					
S11.003	15 Winter	2	0%					
S11.004	15 Winter	2	0%					
S11.005	15 Winter	2	0%					
S12.000	15 Winter	2	0%	2/15 Summer				
S11.006	15 Summer	2	0%					
S11.007	1440 Winter	2	0%	2/120 Summer				
S11.008	1440 Winter	2	0%	2/30 Summer				
S11.009	15 Winter	2	0%					
S13.000	15 Winter	2	0%					
S13.001	15 Winter	2	0%					
S11.010	15 Winter	2	0%					
S14.000	15 Winter	2	0%					
S14.001	15 Winter	2	0%					
S14.002	15 Winter	2	0%					
S14.003	15 Winter	2	0%					
S14.004	15 Winter	2	0%					
S14.005	15 Winter	2	0%					
S14.006	15 Winter	2	0%					
S11.011	15 Winter	2	0%					
S11.012	15 Winter	2	0%					
S11.013	15 Winter	2	0%					
S1.015	15 Winter	2	0%					
S1.016	1440 Winter	2	0%	2/15 Winter				
S1.017	1440 Winter	2	0%	2/30 Winter				
S15.000	15 Winter	2	0%					
S15.001	15 Winter	2	0%					
S15.002	15 Winter	2	0%	2/15 Winter				
S15.003	15 Winter	2	0%					
S15.004	15 Winter	2	0%					
S15.005	15 Winter	2	0%					
S15.006	15 Winter	2	0%					
S15.007	15 Winter	2	0%					
S15.008	15 Winter	2	0%					
S15.009	15 Winter	2	0%					
S15.010	15 Winter	2	0%					
S15.011	1440 Winter	2	0%	2/240 Winter				
S15.012	1440 Winter	2	0%	2/15 Summer				
S16.000	15 Winter	2	0%					
S16.001	15 Winter	2	0%					
S16.002	15 Winter	2	0%					
S16.003	15 Winter	2	0%					
S16.004	1440 Winter	2	0%	2/120 Winter				
S16.005	1440 Winter	2	0%	2/60 Winter				
S17.000	15 Winter	2	0%					
S16.006	15 Winter	2	0%					
S16.007	15 Winter	2	0%					
S18.000	15 Winter	2	0%					

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
S18.001	15 Winter	2	0%					
S19.000	15 Winter	2	0%					
S18.002	15 Winter	2	0%					
S18.003	15 Winter	2	0%					
S20.000	15 Winter	2	0%					
S21.000	15 Winter	2	0%	2/15 Winter				
S21.001	15 Winter	2	0%	2/15 Summer				
S18.004	15 Winter	2	0%	2/15 Winter				
S18.005	1440 Winter	2	0%	2/15 Summer				
S18.006	1440 Winter	2	0%	2/30 Summer				
S22.000	15 Winter	2	0%					
S18.007	15 Winter	2	0%					
S23.000	15 Winter	2	0%					
S18.008	15 Winter	2	0%					
S16.008	1440 Winter	2	0%	2/960 Winter				
S24.000	15 Winter	2	0%					
S16.009	1440 Winter	2	0%	2/240 Winter				
S25.000	1440 Winter	2	0%	2/360 Winter				
S16.010	1440 Winter	2	0%	2/240 Winter				
S26.000	15 Winter	2	0%					
S16.011	1440 Winter	2	0%	2/120 Winter				
S15.013	1440 Winter	2	0%	2/120 Summer				
S15.014	1440 Winter	2	0%	2/60 Winter				
S15.015	1440 Winter	2	0%	2/15 Summer				
S15.016	1440 Winter	2	0%					
S1.018	1440 Winter	2	0%					
S1.019	1440 Winter	2	0%					
S1.020	1440 Winter	2	0%					
S1.021	1440 Winter	2	0%					

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S1.000	SS.036	28.639	-0.086	0.000	0.66	0.0	30.1	OK
S1.001	SS.035	28.221	-0.004	0.000	1.00	0.0	38.2	OK
S1.002	SS.034	27.866	-0.087	0.000	0.69	0.0	40.4	OK
S2.000	SS.037	27.884	-0.091	0.000	0.63	0.0	24.2	OK
S1.003	SS.033	27.587	-0.125	0.000	0.63	0.0	83.4	OK
S1.004	SS.032	26.775	-0.125	0.000	0.64	0.0	89.0	OK
S1.005	SS.031	26.433	-0.157	0.000	0.46	0.0	94.3	OK
S3.000	SS.041	28.575	-0.150	0.000	0.23	0.0	15.9	OK
S3.001	SS.040	27.734	-0.141	0.000	0.29	0.0	16.0	OK
S3.002	SS.039	27.608	-0.117	0.000	0.46	0.0	34.6	OK
S3.003	SS.038	26.187	-0.113	0.000	0.69	0.0	56.3	OK
S1.006	SS.030	25.823	-0.171	0.000	0.57	0.0	176.1	OK
S1.007	SS.029	23.875	-0.125	0.000	0.77	0.0	200.4	OK
S1.008	SS.028	22.830	0.030	0.000	1.19	0.0	201.2	SURCHARGED
S4.000	SS.025	27.964	-0.111	0.000	0.49	0.0	24.1	OK

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S4.001	SS.024	27.392	-0.158	0.000	0.44	0.0	36.2	OK
S4.002	SS.023	27.074	-0.130	0.000	0.59	0.0	36.3	OK
S4.003	SS.022	27.046	-0.103	0.000	0.60	0.0	36.7	OK
S5.000	SS.026	27.958	-0.117	0.000	0.45	0.0	29.6	OK
S4.004	SS.021	27.028	-0.079	0.000	0.87	0.0	70.5	OK
S4.005	SS.020	26.659	-0.124	0.000	0.64	0.0	77.2	OK
S6.000	SS.019	26.705	-0.070	0.000	0.77	0.0	29.0	OK
S4.006	SS.027	26.422	-0.128	0.000	0.62	0.0	132.1	OK
S1.009	SS.018	22.546	-0.178	0.000	0.68	0.0	332.5	OK
S7.000	SS.015	26.926	-0.149	0.000	0.24	0.0	22.7	OK
S7.001	SS.014	25.081	-0.144	0.000	0.27	0.0	23.5	OK
S7.002	SS.013	24.330	-0.145	0.000	0.27	0.0	24.4	OK
S7.003	SS.012	23.583	-0.142	0.000	0.29	0.0	25.3	OK
S8.000	SS.016	24.931	-0.144	0.000	0.27	0.0	24.7	OK
S7.004	SS.011	22.857	-0.118	0.000	0.45	0.0	50.2	OK
S1.010	SS.017	20.918	0.318	0.000	0.17	0.0	40.6	SURCHARGED
S1.011	SS.009	20.917	0.696	0.000	0.37	0.0	10.0	SURCHARGED
S9.000	SS.067	22.135	-0.140	0.000	0.30	0.0	28.4	OK
S1.012	SS.008	20.094	-0.166	0.000	0.40	0.0	34.4	OK
S1.013	SS.007	19.674	-0.176	0.000	0.36	0.0	34.7	OK
S10.000	SS.066	20.222	-0.103	0.000	0.55	0.0	29.3	OK
S1.014	SS.006	19.602	-0.098	0.000	0.77	0.0	88.6	OK
S11.000	SS.065	25.108	-0.167	0.000	0.15	0.0	12.1	OK
S11.001	SS.064	23.951	-0.149	0.000	0.48	0.0	39.4	OK
S11.002	SS.063	23.591	-0.144	0.000	0.53	0.0	39.3	OK
S11.003	SS.062	23.439	-0.188	0.000	0.29	0.0	59.0	OK
S11.004	SS.061	21.795	-0.156	0.000	0.46	0.0	69.7	OK
S11.005	SS.060	21.266	-0.135	0.000	0.58	0.0	80.6	OK
S12.000	SS.059	20.514	0.039	0.000	0.32	0.0	11.9	SURCHARGED
S11.006	SS.058	20.485	0.000	0.000	1.04	0.0	85.4	OK
S11.007	SS.057	20.275	0.400	0.000	0.11	0.0	9.9	SURCHARGED
S11.008	SS.056	20.274	0.555	0.000	0.08	0.0	2.3	SURCHARGED
S11.009	SS.055	19.547	-0.131	0.000	0.24	0.0	9.0	OK
S13.000	SS.054	21.099	-0.126	0.000	0.39	0.0	25.6	OK
S13.001	SS.053	20.404	-0.121	0.000	0.43	0.0	37.3	OK
S11.010	SS.052	19.525	-0.071	0.000	0.79	0.0	64.9	OK
S14.000	SS.051	23.826	-0.149	0.000	0.24	0.0	22.6	OK
S14.001	SS.050	21.599	-0.126	0.000	0.40	0.0	22.8	OK
S14.002	SS.049	21.410	-0.140	0.000	0.53	0.0	55.8	OK
S14.003	SS.048	20.412	-0.138	0.000	0.56	0.0	63.1	OK
S14.004	SS.047	20.270	-0.080	0.000	0.89	0.0	70.2	OK
S14.005	SS.046	20.185	-0.065	0.000	0.97	0.0	76.9	OK
S14.006	SS.045	20.026	-0.124	0.000	0.64	0.0	92.2	OK
S11.011	SS.044	19.326	-0.032	0.000	1.00	0.0	148.4	OK
S11.012	SS.043	19.114	-0.209	0.000	0.56	0.0	148.1	OK
S11.013	SS.042	18.684	-0.117	0.000	0.88	0.0	149.9	OK
S1.015	SS.005	18.634	-0.150	0.000	0.85	0.0	227.1	OK
S1.016	SS.004	18.437	0.262	0.000	0.20	0.0	35.8	SURCHARGED

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S1.017	SS.003	18.436	0.490	0.000	0.29	0.0	21.4	SURCHARGED
S15.000	SS.116	23.076	-0.149	0.000	0.24	0.0	14.8	OK
S15.001	SS.115	22.602	-0.123	0.000	0.41	0.0	35.5	OK
S15.002	SS.114	21.231	0.006	0.000	1.03	0.0	41.7	SURCHARGED
S15.003	SS.113	21.012	-0.138	0.000	0.56	0.0	49.2	OK
S15.004	SS.112	20.907	-0.093	0.000	0.81	0.0	58.5	OK
S15.005	SS.111	20.786	-0.114	0.000	0.70	0.0	69.4	OK
S15.006	SS.110	20.556	-0.170	0.000	0.57	0.0	84.8	OK
S15.007	SS.109	20.309	-0.148	0.000	0.67	0.0	97.1	OK
S15.008	SS.108	20.128	-0.131	0.000	0.74	0.0	112.3	OK
S15.009	SS.107	19.818	-0.104	0.000	0.86	0.0	131.6	OK
S15.010	SS.106	19.332	-0.148	0.000	0.68	0.0	143.4	OK
S15.011	SS.105	19.239	0.334	0.000	0.08	0.0	19.2	SURCHARGED
S15.012	SS.104	19.236	0.636	0.000	0.10	0.0	19.2	SURCHARGED
S16.000	SS.132	23.455	-0.145	0.000	0.47	0.0	35.5	OK
S16.001	SS.131	22.963	-0.137	0.000	0.57	0.0	41.9	OK
S16.002	SS.130	22.821	-0.174	0.000	0.37	0.0	58.8	OK
S16.003	SS.129	21.732	-0.068	0.000	0.95	0.0	58.6	OK
S16.004	SS.128	20.521	0.221	0.000	0.11	0.0	6.1	SURCHARGED
S16.005	SS.127	20.521	0.300	0.000	0.07	0.0	1.6	SURCHARGED
S17.000	SS.133	21.327	-0.148	0.000	0.25	0.0	23.6	OK
S16.006	SS.126	20.096	-0.106	0.000	0.53	0.0	22.6	OK
S16.007	SS.125	19.969	-0.106	0.000	0.54	0.0	22.9	OK
S18.000	SS.147	23.296	-0.179	0.000	0.09	0.0	8.9	OK
S18.001	SS.146	21.877	-0.098	0.000	0.59	0.0	36.0	OK
S19.000	SS.145	22.314	-0.161	0.000	0.18	0.0	15.8	OK
S18.002	SS.144	21.447	-0.103	0.000	0.75	0.0	59.5	OK
S18.003	SS.143	21.342	-0.108	0.000	0.73	0.0	82.7	OK
S20.000	SS.140	22.525	-0.150	0.000	0.24	0.0	22.6	OK
S21.000	SS.142	20.978	0.003	0.000	0.27	0.0	9.9	SURCHARGED
S21.001	SS.141	20.958	0.109	0.000	0.41	0.0	13.7	SURCHARGED
S18.004	SS.139	20.946	0.004	0.000	1.01	0.0	106.5	SURCHARGED
S18.005	SS.138	20.775	0.400	0.000	0.12	0.0	11.4	SURCHARGED
S18.006	SS.137	20.775	0.554	0.000	0.09	0.0	2.6	SURCHARGED
S22.000	SS.148	20.830	-0.145	0.000	0.27	0.0	20.9	OK
S18.007	SS.136	20.094	-0.150	0.000	0.49	0.0	49.4	OK
S23.000	SS.135	19.333	-0.142	0.000	0.29	0.0	10.8	OK
S18.008	SS.134	19.267	-0.173	0.000	0.56	0.0	73.7	OK
S16.008	SS.124	19.251	0.069	0.000	0.11	0.0	16.1	SURCHARGED
S24.000	SS.123	19.818	-0.107	0.000	0.53	0.0	24.4	OK
S16.009	SS.122	19.244	0.385	0.000	0.11	0.0	17.4	SURCHARGED
S25.000	SS.121	19.242	0.192	0.000	0.04	0.0	5.5	SURCHARGED
S16.010	SS.120	19.240	0.383	0.000	0.09	0.0	23.3	SURCHARGED
S26.000	SS.119	19.588	-0.212	0.000	0.19	0.0	46.6	OK
S16.011	SS.118	19.237	0.524	0.000	0.09	0.0	28.3	SURCHARGED
S15.013	SS.103	19.233	0.608	0.000	0.14	0.0	47.4	SURCHARGED
S15.014	SS.102	19.231	0.639	0.000	0.15	0.0	47.2	SURCHARGED
S15.015	SS.101	19.231	1.018	0.000	0.32	0.0	18.8	SURCHARGED

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S15.016	SS.100	17.903	-0.186	0.000	0.31	0.0	18.8	OK
S1.018	SS.002	17.732	-0.126	0.000	0.64	0.0	38.1	OK
S1.019	SS.001	17.595	-0.103	0.000	0.76	0.0	38.1	OK
S1.020	SS.200	17.537	-0.128	0.000	0.62	0.0	38.1	OK
S1.021	SS.201	17.303	-0.128	0.000	0.62	0.0	38.1	OK

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Appendix E – 1 in 100 Year Design Sheets

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	100	Add Flow / Climate Change (%)	20
M5-60 (mm)	18.800	Minimum Backdrop Height (m)	0.200
Ratio R	0.250	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Inverts

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	1.493	8-12	6.051	12-16	1.364

Total Area Contributing (ha) = 8.908

Total Pipe Volume (m³) = 298.341

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S1.000	61.085	0.500	122.2	0.173	5.00	0.0	0.600	o	225
S1.001	45.380	0.272	166.8	0.073	0.00	0.0	0.600	o	225
S1.002	20.705	0.316	65.5	0.018	0.00	0.0	0.600	o	225
S2.000	56.415	0.338	166.9	0.140	5.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.86	28.500	0.173	0.0	0.0	4.7	1.18	47.0	28.1
S1.001	50.00	6.61	28.000	0.246	0.0	0.0	6.7	1.01	40.1	40.0
S1.002	50.00	6.82	27.728	0.264	0.0	0.0	7.1	1.62	64.3	42.9
S2.000	50.00	5.93	27.750	0.140	0.0	0.0	3.8	1.01	40.1	22.7

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S1.003	51.655	0.812	63.6	0.140	0.00	0.0	0.600	o	300
S1.004	6.205	0.310	20.0	0.040	0.00	0.0	0.600	o	300
S1.005	10.685	0.671	15.9	0.040	0.00	0.0	0.600	o	300
S3.000	45.635	0.850	53.7	0.090	5.00	0.0	0.600	o	225
S3.001	5.890	0.150	39.3	0.000	0.00	0.0	0.600	o	225
S3.002	66.465	1.500	44.3	0.124	0.00	0.0	0.600	o	225
S3.003	63.645	0.381	167.0	0.157	0.00	0.0	0.600	o	300
S1.006	74.710	1.994	37.5	0.197	0.00	0.0	0.600	o	375
S1.007	66.585	1.275	52.2	0.194	0.00	0.0	0.600	o	375
S1.008	7.600	0.076	100.0	0.000	0.00	0.0	0.600	o	450
S4.000	62.150	0.600	103.6	0.138	5.00	0.0	0.600	o	225
S4.001	57.765	0.346	167.0	0.088	0.00	0.0	0.600	o	300
S4.002	9.150	0.055	166.4	0.000	0.00	0.0	0.600	o	300
S4.003	7.000	0.042	166.7	0.000	0.00	0.0	0.600	o	300
S5.000	61.775	1.043	59.2	0.168	5.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.003	50.00	7.26	27.412	0.544	0.0	0.0	14.7	1.97	139.6	88.4
S1.004	50.00	7.29	26.600	0.584	0.0	0.0	15.8	3.53	249.5	94.9
S1.005	50.00	7.33	26.290	0.624	0.0	0.0	16.9	3.96	279.9	101.4
S3.000	50.00	5.43	28.500	0.090	0.0	0.0	2.4	1.79	71.1	14.6
S3.001	50.00	5.47	27.650	0.090	0.0	0.0	2.4	2.09	83.3	14.6
S3.002	50.00	6.03	27.500	0.214	0.0	0.0	5.8	1.97	78.3	34.8
S3.003	50.00	6.91	26.000	0.371	0.0	0.0	10.0	1.21	85.8	60.3
S1.006	50.00	7.75	25.619	1.192	0.0	0.0	32.3	2.97	327.8	193.7
S1.007	50.00	8.20	23.625	1.386	0.0	0.0	37.5	2.51	277.5	225.2
S1.008	50.00	8.26	22.350	1.386	0.0	0.0	37.5	2.03	323.4	225.2
S4.000	50.00	5.81	27.850	0.138	0.0	0.0	3.7	1.28	51.1	22.4
S4.001	50.00	6.60	27.250	0.226	0.0	0.0	6.1	1.21	85.8	36.7
S4.002	50.00	6.72	26.904	0.226	0.0	0.0	6.1	1.22	86.0	36.7
S4.003	50.00	6.82	26.849	0.226	0.0	0.0	6.1	1.22	85.9	36.7
S5.000	50.00	5.60	27.850	0.168	0.0	0.0	4.5	1.70	67.7	27.3

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S4.004	54.075	0.324	166.9	0.065	0.00	0.0	0.600	o	300
S4.005	12.460	0.233	53.5	0.050	0.00	0.0	0.600	o	300
S6.000	52.900	0.300	176.3	0.167	5.00	0.0	0.600	o	225
S4.006	82.705	3.250	25.4	0.210	0.00	0.0	0.600	o	300
S1.009	15.190	0.760	20.0	0.000	0.00	0.0	0.600	o	450
S7.000	53.690	1.850	29.0	0.128	5.00	0.0	0.600	o	225
S7.001	23.365	0.750	31.2	0.005	0.00	0.0	0.600	o	225
S7.002	20.825	0.750	27.8	0.005	0.00	0.0	0.600	o	225
S7.003	22.925	0.750	30.6	0.005	0.00	0.0	0.600	o	225
S8.000	65.800	2.100	31.3	0.140	5.00	0.0	0.600	o	225
S7.004	37.670	1.875	20.1	0.000	0.00	0.0	0.600	o	225
S1.010	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	600
S1.011	9.000	0.036	250.0	0.000	0.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S4.004	50.00	7.56	26.807	0.459	0.0	0.0	12.4	1.21	85.8	74.6
S4.005	50.00	7.66	26.483	0.509	0.0	0.0	13.8	2.15	152.3	82.7
S6.000	50.00	5.90	26.550	0.167	0.0	0.0	4.5	0.98	39.0	27.1
S4.006	50.00	8.10	26.250	0.886	0.0	0.0	24.0	3.13	221.2	144.0
S1.009	50.00	8.31	22.274	2.272	0.0	0.0	61.5	4.56	725.6	369.2
S7.000	50.00	5.37	26.850	0.128	0.0	0.0	3.5	2.44	96.9	20.8
S7.001	50.00	5.53	25.000	0.133	0.0	0.0	3.6	2.35	93.5	21.6
S7.002	50.00	5.67	24.250	0.138	0.0	0.0	3.7	2.49	99.1	22.4
S7.003	50.00	5.83	23.500	0.143	0.0	0.0	3.9	2.38	94.4	23.2
S8.000	50.00	5.47	24.850	0.140	0.0	0.0	3.8	2.35	93.3	22.7
S7.004	50.00	6.05	22.750	0.283	0.0	0.0	7.7	2.93	116.6	46.0
S1.010	50.00	8.32	20.000	2.555	0.0	0.0	69.2	1.54	434.2	415.2
S1.011	50.00	5.18	19.996	0.000	14.2	0.0	2.4	0.82	32.7	14.2

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S9.000	57.850	2.090	27.7	0.161	5.00	0.0	0.600	o	225
S1.012	61.075	0.410	149.0	0.054	0.00	0.0	0.600	o	300
S1.013	8.820	0.150	58.8	0.000	0.00	0.0	0.600	o	300
S10.000	61.865	0.700	88.4	0.167	5.00	0.0	0.600	o	225
S1.014	85.230	0.991	86.0	0.188	0.00	0.0	0.600	o	300
S11.000	47.175	1.250	37.7	0.068	5.00	0.0	0.600	o	225
S11.001	60.975	0.365	167.1	0.186	0.00	0.0	0.600	o	300
S11.002	18.105	0.108	167.6	0.000	0.00	0.0	0.600	o	300
S11.003	45.565	1.676	27.2	0.141	0.00	0.0	0.600	o	300
S11.004	23.415	0.550	42.6	0.076	0.00	0.0	0.600	o	300
S11.005	31.960	0.600	53.3	0.077	0.00	0.0	0.600	o	300
S12.000	23.370	0.140	166.9	0.077	5.00	0.0	0.600	o	225
S11.006	3.235	0.019	170.3	0.000	0.00	0.0	0.600	o	375

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S9.000	50.00	5.39	22.050	0.161	0.0	0.0	4.4	2.50	99.3	26.2
S1.012	50.00	6.18	19.960	0.215	14.2	0.0	8.7	1.29	90.9	52.0
S1.013	50.00	6.25	19.550	0.215	14.2	0.0	8.7	2.05	145.2	52.0
S10.000	50.00	5.74	20.100	0.167	0.0	0.0	4.5	1.39	55.3	27.1
S1.014	50.00	7.09	19.400	0.570	14.2	0.0	18.3	1.70	119.9	109.7
S11.000	50.00	5.37	25.050	0.068	0.0	0.0	1.8	2.14	84.9	11.0
S11.001	50.00	6.21	23.800	0.254	0.0	0.0	6.9	1.21	85.8	41.3
S11.002	50.00	6.45	23.435	0.254	0.0	0.0	6.9	1.21	85.6	41.3
S11.003	50.00	6.71	23.327	0.395	0.0	0.0	10.7	3.03	214.0	64.2
S11.004	50.00	6.87	21.651	0.471	0.0	0.0	12.8	2.42	170.8	76.5
S11.005	50.00	7.11	21.101	0.548	0.0	0.0	14.8	2.16	152.6	89.0
S12.000	50.00	5.39	20.250	0.077	0.0	0.0	2.1	1.01	40.1	12.5
S11.006	50.00	7.15	20.110	0.625	0.0	0.0	16.9	1.39	153.0	101.6

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S11.007	1.000	0.006	166.7	0.000	0.00	0.0	0.600	o	375
S11.008	8.145	0.041	198.7	0.000	0.00	0.0	0.600	o	225
S11.009	26.290	0.157	167.5	0.061	0.00	0.0	0.600	o	225
S13.000	39.400	0.700	56.3	0.145	5.00	0.0	0.600	o	225
S13.001	32.000	1.004	31.9	0.076	0.00	0.0	0.600	o	225
S11.010	64.775	0.388	166.9	0.149	0.00	0.0	0.600	o	300
S14.000	66.775	2.250	29.7	0.128	5.00	0.0	0.600	o	225
S14.001	16.115	0.250	64.5	0.000	0.00	0.0	0.600	o	225
S14.002	102.940	1.000	102.9	0.236	0.00	0.0	0.600	o	300
S14.003	12.055	0.200	60.3	0.050	0.00	0.0	0.600	o	300
S14.004	11.810	0.100	118.1	0.050	0.00	0.0	0.600	o	300
S14.005	9.950	0.100	99.5	0.050	0.00	0.0	0.600	o	300
S14.006	50.410	0.942	53.5	0.117	0.00	0.0	0.600	o	300
S11.011	5.895	0.035	168.4	0.000	0.00	0.0	0.600	o	450
S11.012	67.565	0.522	129.4	0.000	0.00	0.0	0.600	o	450
S11.013	13.400	0.092	145.7	0.000	0.00	0.0	0.600	o	450

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S11.007	50.00	7.16	19.500	0.625	0.0	0.0	16.9	1.40	154.7	101.6
S11.008	50.00	5.15	19.494	0.000	3.4	0.0	0.6	0.92	36.7	3.4
S11.009	50.00	5.58	19.453	0.061	3.4	0.0	2.3	1.01	40.1	14.0
S13.000	50.00	5.38	21.000	0.145	0.0	0.0	3.9	1.75	69.5	23.6
S13.001	50.00	5.61	20.300	0.221	0.0	0.0	6.0	2.33	92.5	35.9
S11.010	50.00	6.49	19.296	0.431	3.4	0.0	12.4	1.21	85.8	74.1
S14.000	50.00	5.46	23.750	0.128	0.0	0.0	3.5	2.41	95.8	20.8
S14.001	50.00	5.63	21.500	0.128	0.0	0.0	3.5	1.63	64.9	20.8
S14.002	50.00	6.73	21.250	0.364	0.0	0.0	9.9	1.55	109.5	59.1
S14.003	50.00	6.83	20.250	0.414	0.0	0.0	11.2	2.03	143.4	67.3
S14.004	50.00	6.97	20.050	0.464	0.0	0.0	12.6	1.45	102.2	75.4
S14.005	50.00	7.07	19.950	0.514	0.0	0.0	13.9	1.58	111.4	83.5
S14.006	50.00	7.46	19.850	0.631	0.0	0.0	17.1	2.15	152.3	102.5
S11.011	50.00	7.53	18.908	1.062	3.4	0.0	29.4	1.56	248.7	176.6
S11.012	50.00	8.16	18.873	1.062	3.4	0.0	29.4	1.79	284.0	176.6
S11.013	50.00	8.29	18.351	1.062	3.4	0.0	29.4	1.68	267.6	176.6

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S1.015	41.275	0.165	250.2	0.000	0.00	0.0	0.600	o	525
S1.016	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	525
S1.017	8.300	0.088	94.3	0.000	0.00	0.0	0.600	o	300
S15.000	32.225	0.500	64.5	0.083	5.00	0.0	0.600	o	225
S15.001	51.410	1.500	34.3	0.136	0.00	0.0	0.600	o	225
S15.002	20.405	0.150	136.0	0.050	0.00	0.0	0.600	o	225
S15.003	17.275	0.150	115.2	0.050	0.00	0.0	0.600	o	300
S15.004	17.390	0.100	173.9	0.065	0.00	0.0	0.600	o	300
S15.005	24.945	0.249	100.2	0.078	0.00	0.0	0.600	o	300
S15.006	40.395	0.269	150.2	0.115	0.00	0.0	0.600	o	375
S15.007	29.710	0.198	150.1	0.097	0.00	0.0	0.600	o	375
S15.008	50.560	0.337	150.0	0.129	0.00	0.0	0.600	o	375
S15.009	66.345	0.442	150.1	0.181	0.00	0.0	0.600	o	375
S15.010	49.475	0.650	76.1	0.122	0.00	0.0	0.600	o	375
S15.011	45.460	0.305	149.0	0.132	0.00	0.0	0.600	o	450
S15.012	45.915	0.200	229.6	0.040	0.00	0.0	0.600	o	450
S16.000	99.775	0.500	199.6	0.219	5.00	0.0	0.600	o	300

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.015	50.00	8.78	18.259	1.632	17.6	0.0	47.7	1.41	305.6	286.3
S1.016	50.00	8.79	17.650	1.632	17.6	0.0	47.7	1.41	305.7	286.3
S1.017	50.00	5.09	17.646	0.000	28.0	0.0	4.7	1.62	114.5	28.0
S15.000	50.00	5.33	23.000	0.083	0.0	0.0	2.2	1.63	64.9	13.5
S15.001	50.00	5.71	22.500	0.219	0.0	0.0	5.9	2.24	89.2	35.6
S15.002	50.00	6.02	21.000	0.269	0.0	0.0	7.3	1.12	44.5	43.7
S15.003	50.00	6.21	20.850	0.319	0.0	0.0	8.6	1.46	103.5	51.8
S15.004	50.00	6.46	20.700	0.384	0.0	0.0	10.4	1.19	84.1	62.4
S15.005	50.00	6.72	20.600	0.462	0.0	0.0	12.5	1.57	111.0	75.1
S15.006	50.00	7.18	20.351	0.577	0.0	0.0	15.6	1.48	163.0	93.8
S15.007	50.00	7.51	20.082	0.674	0.0	0.0	18.3	1.48	163.1	109.5
S15.008	50.00	8.08	19.884	0.803	0.0	0.0	21.7	1.48	163.1	130.5
S15.009	50.00	8.83	19.547	0.984	0.0	0.0	26.6	1.48	163.1	159.9
S15.010	50.00	9.23	19.105	1.106	0.0	0.0	30.0	2.08	229.6	179.7
S15.011	50.00	9.68	18.455	1.238	0.0	0.0	33.5	1.66	264.5	201.2
S15.012	50.00	10.26	18.150	1.278	0.0	0.0	34.6	1.34	212.7	207.7
S16.000	50.00	6.50	23.300	0.219	0.0	0.0	5.9	1.11	78.4	35.6

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S16.001	17.485	0.105	166.5	0.043	0.00	0.0	0.600	o	300
S16.002	51.262	1.195	42.9	0.123	0.00	0.0	0.600	o	300
S16.003	6.610	0.040	165.3	0.000	0.00	0.0	0.600	o	300
S16.004	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	300
S16.005	4.695	0.019	247.1	0.000	0.00	0.0	0.600	o	225
S17.000	35.995	1.273	28.3	0.131	5.00	0.0	0.600	o	225
S16.006	14.795	0.127	116.5	0.000	0.00	0.0	0.600	o	225
S16.007	10.740	0.100	107.4	0.000	0.00	0.0	0.600	o	225
S18.000	40.355	1.500	26.9	0.050	5.00	0.0	0.600	o	225
S18.001	32.660	0.500	65.3	0.178	0.00	0.0	0.600	o	225
S19.000	30.445	1.000	30.4	0.088	5.00	0.0	0.600	o	225
S18.002	9.125	0.100	91.3	0.050	0.00	0.0	0.600	o	300
S18.003	49.280	0.583	84.5	0.159	0.00	0.0	0.600	o	300
S20.000	51.236	1.883	27.2	0.127	5.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S16.001	50.00	6.74	22.800	0.262	0.0	0.0	7.1	1.22	85.9	42.6
S16.002	50.00	7.09	22.695	0.385	0.0	0.0	10.4	2.41	170.2	62.6
S16.003	50.00	7.18	21.500	0.385	0.0	0.0	10.4	1.22	86.3	62.6
S16.004	50.00	7.20	20.000	0.385	0.0	0.0	10.4	0.99	70.0	62.6
S16.005	50.00	5.09	19.996	0.000	2.5	0.0	0.4	0.83	32.9	2.5
S17.000	50.00	5.24	21.250	0.131	0.0	0.0	3.5	2.47	98.2	21.3
S16.006	50.00	5.45	19.977	0.131	2.5	0.0	4.0	1.21	48.1	24.3
S16.007	50.00	5.59	19.850	0.131	2.5	0.0	4.0	1.26	50.1	24.3
S18.000	50.00	5.27	23.250	0.050	0.0	0.0	1.4	2.53	100.7	8.1
S18.001	50.00	5.60	21.750	0.228	0.0	0.0	6.2	1.62	64.4	37.0
S19.000	50.00	5.21	22.250	0.088	0.0	0.0	2.4	2.38	94.6	14.3
S18.002	50.00	5.69	21.250	0.366	0.0	0.0	9.9	1.65	116.4	59.5
S18.003	50.00	6.17	21.150	0.525	0.0	0.0	14.2	1.71	121.0	85.3
S20.000	50.00	5.34	22.450	0.127	0.0	0.0	3.4	2.52	100.1	20.6

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S21.000	21.005	0.126	166.7	0.065	5.00	0.0	0.600	o	225
S21.001	9.570	0.057	167.9	0.000	0.00	0.0	0.600	o	225
S18.004	7.585	0.045	168.6	0.000	0.00	0.0	0.600	o	375
S18.005	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	375
S18.006	12.970	0.052	249.4	0.000	0.00	0.0	0.600	o	225
S22.000	30.300	0.750	40.4	0.116	5.00	0.0	0.600	o	225
S18.007	60.880	0.544	111.9	0.190	0.00	0.0	0.600	o	300
S23.000	30.865	0.185	166.8	0.061	5.00	0.0	0.600	o	225
S18.008	49.875	0.258	193.3	0.102	0.00	0.0	0.600	o	375
S16.008	59.645	0.398	149.9	0.203	0.00	0.0	0.600	o	375
S24.000	40.750	0.350	116.4	0.136	5.00	0.0	0.600	o	225

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S21.000	50.00	5.35	20.750	0.065	0.0	0.0	1.8	1.01	40.2	10.6
S21.001	50.00	5.51	20.624	0.065	0.0	0.0	1.8	1.01	40.0	10.6
S18.004	50.00	6.26	20.567	0.717	0.0	0.0	19.4	1.39	153.8	116.5
S18.005	50.00	6.28	20.000	0.717	0.0	0.0	19.4	1.14	126.1	116.5
S18.006	50.00	5.26	19.996	0.000	3.5	0.0	0.6	0.82	32.7	3.5
S22.000	50.00	5.24	20.750	0.116	0.0	0.0	3.1	2.06	82.1	18.8
S18.007	50.00	5.95	19.944	0.306	3.5	0.0	9.0	1.49	105.0	53.9
S23.000	50.00	5.51	19.250	0.061	0.0	0.0	1.7	1.01	40.1	9.9
S18.008	50.00	6.59	19.065	0.469	3.5	0.0	13.4	1.30	143.5	80.4
S16.008	50.00	7.26	18.807	0.803	6.0	0.0	22.9	1.48	163.2	137.7
S24.000	50.00	5.56	19.700	0.136	0.0	0.0	3.7	1.21	48.1	22.1

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
S16.009	19.115	0.076	250.0	0.000	0.00	0.0	0.600	o	450
S25.000	24.140	0.417	57.9	0.348	5.00	0.0	0.600	o	300
S16.010	36.055	0.144	250.0	0.068	0.00	0.0	0.600	o	525
S26.000	19.850	1.312	15.1	0.259	5.00	0.0	0.600	o	300
S16.011	39.355	0.238	165.4	0.102	0.00	0.0	0.600	o	525
S15.013	8.315	0.033	250.0	0.000	0.00	0.0	0.600	o	675
S15.014	1.000	0.004	250.0	0.000	0.00	0.0	0.600	o	675
S15.015	36.935	0.123	300.3	0.000	0.00	0.0	0.600	o	300
S15.016	69.575	0.232	299.9	0.000	0.00	0.0	0.600	o	300
S1.018	47.735	0.159	300.2	0.000	0.00	0.0	0.600	o	300
S1.019	10.120	0.034	300.0	0.000	0.00	0.0	0.600	o	300
S1.020	70.060	0.234	300.0	0.000	0.00	0.0	0.600	o	300
S1.021	70.060	0.234	300.0	0.000	0.00	0.0	0.600	o	300

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S16.009	50.00	7.51	18.409	0.939	6.0	0.0	26.6	1.28	203.8	159.8
S25.000	50.00	5.19	18.750	0.348	0.0	0.0	9.4	2.07	146.4	56.5
S16.010	50.00	7.93	18.333	1.355	6.0	0.0	37.9	1.41	305.7	227.4
S26.000	50.00	5.08	19.500	0.259	0.0	0.0	7.0	4.06	287.2	42.1
S16.011	50.00	8.31	18.188	1.716	6.0	0.0	47.7	1.74	376.5	286.0
S15.013	50.00	10.34	17.950	2.994	6.0	0.0	82.3	1.65	591.5	493.7
S15.014	50.00	10.35	17.917	2.994	6.0	0.0	82.3	1.65	591.5	493.7
S15.015	50.00	5.68	17.913	0.000	21.6	0.0	3.6	0.90	63.8	21.6
S15.016	50.00	6.97	17.790	0.000	21.6	0.0	4.3	0.90	63.8	25.9
S1.018	50.00	7.85	17.558	0.000	49.6	0.0	9.9	0.90	63.8	59.5
S1.019	50.00	8.04	17.399	0.000	49.6	0.0	9.9	0.90	63.8	59.5
S1.020	50.00	9.33	17.365	0.000	49.6	0.0	9.9	0.90	63.8	59.5
S1.021	50.00	10.62	17.131	0.000	49.6	0.0	9.9	0.90	63.8	59.5

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SS.036	30.000	1.500	1050	S1.000	28.500	225				
SS.035	29.500	1.500	1050	S1.001	28.000	225	S1.000	28.000	225	
SS.034	29.650	1.922	1200	S1.002	27.728	225	S1.001	27.728	225	
SS.037	29.250	1.500	1050	S2.000	27.750	225				
SS.033	29.250	1.838	1200	S1.003	27.412	300	S1.002	27.412	225	
							S2.000	27.412	225	
SS.032	28.100	1.500	1050	S1.004	26.600	300	S1.003	26.600	300	
SS.031	28.050	1.760	1050	S1.005	26.290	300	S1.004	26.290	300	
SS.041	30.000	1.500	1050	S3.000	28.500	225				
SS.040	29.150	1.500	1050	S3.001	27.650	225	S3.000	27.650	225	
SS.039	29.000	1.500	1050	S3.002	27.500	225	S3.001	27.500	225	
SS.038	27.500	1.500	1050	S3.003	26.000	300	S3.002	26.000	225	
SS.030	28.000	2.381	1350	S1.006	25.619	375	S1.005	25.619	300	
							S3.003	25.619	300	
SS.029	25.200	1.575	1350	S1.007	23.625	375	S1.006	23.625	375	
SS.028	24.000	1.650	1350	S1.008	22.350	450	S1.007	22.350	375	
SS.025	29.350	1.500	1050	S4.000	27.850	225				
SS.024	28.750	1.500	1050	S4.001	27.250	300	S4.000	27.250	225	
SS.023	29.050	2.146	1200	S4.002	26.904	300	S4.001	26.904	300	
SS.022	29.150	2.301	1200	S4.003	26.849	300	S4.002	26.849	300	
SS.026	29.350	1.500	1050	S5.000	27.850	225				
SS.021	29.250	2.443	1200	S4.004	26.807	300	S4.003	26.807	300	
							S5.000	26.807	225	
SS.020	28.050	1.567	1050	S4.005	26.483	300	S4.004	26.483	300	
SS.019	28.050	1.500	1050	S6.000	26.550	225				
SS.027	27.750	1.500	1050	S4.006	26.250	300	S4.005	26.250	300	
							S6.000	26.250	225	
SS.018	24.500	2.226	1350	S1.009	22.274	450	S1.008	22.274	450	
							S4.006	23.000	300	576
SS.015	28.350	1.500	1050	S7.000	26.850	225				
SS.014	26.500	1.500	1050	S7.001	25.000	225	S7.000	25.000	225	
SS.013	25.750	1.500	1050	S7.002	24.250	225	S7.001	24.250	225	
SS.012	25.000	1.500	1050	S7.003	23.500	225	S7.002	23.500	225	
SS.016	26.350	1.500	1050	S8.000	24.850	225				
SS.011	24.250	1.500	1050	S7.004	22.750	225	S7.003	22.750	225	
							S8.000	22.750	225	
SS.017	23.500	3.500	1500	S1.010	20.000	600	S1.009	21.515	450	1365
							S7.004	20.875	225	500
SS.009	22.500	2.504	1500	S1.011	19.996	225	S1.010	19.996	600	
SS.067	23.550	1.500	1050	S9.000	22.050	225				
SS.008	22.000	2.040	1200	S1.012	19.960	300	S1.011	19.960	225	
							S9.000	19.960	225	
SS.007	21.050	1.500	1050	S1.013	19.550	300	S1.012	19.550	300	
SS.066	21.600	1.500	1050	S10.000	20.100	225				
SS.006	20.900	1.500	1050	S1.014	19.400	300	S1.013	19.400	300	
							S10.000	19.400	225	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SS.065	26.550	1.500	1050	S11.000	25.050	225				
SS.064	25.300	1.500	1050	S11.001	23.800	300	S11.000	23.800	225	
SS.063	25.700	2.265	1200	S11.002	23.435	300	S11.001	23.435	300	
SS.062	25.400	2.073	1200	S11.003	23.327	300	S11.002	23.327	300	
SS.061	23.150	1.499	1050	S11.004	21.651	300	S11.003	21.651	300	
SS.060	22.600	1.499	1050	S11.005	21.101	300	S11.004	21.101	300	
SS.059	21.750	1.500	1050	S12.000	20.250	225				
SS.058	22.100	1.990	1350	S11.006	20.110	375	S11.005	20.501	300	316
							S12.000	20.110	225	
SS.057	22.000	2.500	1350	S11.007	19.500	375	S11.006	20.091	375	591
SS.056	22.000	2.506	1350	S11.008	19.494	225	S11.007	19.494	375	
SS.055	21.650	2.197	1200	S11.009	19.453	225	S11.008	19.453	225	
SS.054	22.500	1.500	1050	S13.000	21.000	225				
SS.053	21.800	1.500	1050	S13.001	20.300	225	S13.000	20.300	225	
SS.052	21.350	2.054	1200	S11.010	19.296	300	S11.009	19.296	225	
							S13.001	19.296	225	
SS.051	25.250	1.500	1050	S14.000	23.750	225				
SS.050	23.000	1.500	1050	S14.001	21.500	225	S14.000	21.500	225	
SS.049	22.750	1.500	1050	S14.002	21.250	300	S14.001	21.250	225	
SS.048	21.750	1.500	1050	S14.003	20.250	300	S14.002	20.250	300	
SS.047	21.550	1.500	1050	S14.004	20.050	300	S14.003	20.050	300	
SS.046	21.450	1.500	1050	S14.005	19.950	300	S14.004	19.950	300	
SS.045	21.350	1.500	1050	S14.006	19.850	300	S14.005	19.850	300	
SS.044	20.750	1.842	1350	S11.011	18.908	450	S11.010	18.908	300	
							S14.006	18.908	300	
SS.043	20.600	1.727	1350	S11.012	18.873	450	S11.011	18.873	450	
SS.042	20.000	1.649	1350	S11.013	18.351	450	S11.012	18.351	450	
SS.005	20.100	1.841	1500	S1.015	18.259	525	S1.014	18.409	300	
							S11.013	18.259	450	
SS.004	19.750	2.100	1500	S1.016	17.650	525	S1.015	18.094	525	444
SS.003	19.750	2.104	1500	S1.017	17.646	300	S1.016	17.646	525	
SS.116	24.500	1.500	1050	S15.000	23.000	225				
SS.115	24.000	1.500	1050	S15.001	22.500	225	S15.000	22.500	225	
SS.114	22.500	1.500	1050	S15.002	21.000	225	S15.001	21.000	225	
SS.113	22.350	1.500	1050	S15.003	20.850	300	S15.002	20.850	225	
SS.112	22.200	1.500	1050	S15.004	20.700	300	S15.003	20.700	300	
SS.111	22.100	1.500	1050	S15.005	20.600	300	S15.004	20.600	300	
SS.110	22.000	1.649	1350	S15.006	20.351	375	S15.005	20.351	300	
SS.109	21.900	1.818	1350	S15.007	20.082	375	S15.006	20.082	375	
SS.108	21.700	1.816	1350	S15.008	19.884	375	S15.007	19.884	375	
SS.107	21.400	1.853	1350	S15.009	19.547	375	S15.008	19.547	375	
SS.106	20.800	1.695	1350	S15.010	19.105	375	S15.009	19.105	375	
SS.105	20.150	1.695	1350	S15.011	18.455	450	S15.010	18.455	375	
SS.104	19.500	1.350	1350	S15.012	18.150	450	S15.011	18.150	450	
SS.132	24.800	1.500	1050	S16.000	23.300	300				
SS.131	24.300	1.500	1050	S16.001	22.800	300	S16.000	22.800	300	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SS.130	24.700	2.005	1200	S16.002	22.695	300	S16.001	22.695	300	
SS.129	23.000	1.500	1050	S16.003	21.500	300	S16.002	21.500	300	
SS.128	23.000	3.000	1200	S16.004	20.000	300	S16.003	21.460	300	1460
SS.127	22.000	2.004	1200	S16.005	19.996	225	S16.004	19.996	300	
SS.133	22.750	1.500	1050	S17.000	21.250	225				
SS.126	21.850	1.873	1200	S16.006	19.977	225	S16.005	19.977	225	
							S17.000	19.977	225	
SS.125	21.350	1.500	1050	S16.007	19.850	225	S16.006	19.850	225	
SS.147	24.750	1.500	1050	S18.000	23.250	225				
SS.146	23.250	1.500	1050	S18.001	21.750	225	S18.000	21.750	225	
SS.145	23.750	1.500	1050	S19.000	22.250	225				
SS.144	22.750	1.500	1050	S18.002	21.250	300	S18.001	21.250	225	
							S19.000	21.250	225	
SS.143	22.650	1.500	1050	S18.003	21.150	300	S18.002	21.150	300	
SS.140	23.950	1.500	1050	S20.000	22.450	225				
SS.142	21.750	1.000	1050	S21.000	20.750	225				
SS.141	22.150	1.526	1050	S21.001	20.624	225	S21.000	20.624	225	
SS.139	22.250	1.683	1350	S18.004	20.567	375	S18.003	20.567	300	
							S20.000	20.567	225	
							S21.001	20.567	225	
SS.138	22.250	2.250	1350	S18.005	20.000	375	S18.004	20.522	375	522
SS.137	21.700	1.704	1350	S18.006	19.996	225	S18.005	19.996	375	
SS.148	22.250	1.500	1050	S22.000	20.750	225				
SS.136	21.500	1.556	1050	S18.007	19.944	300	S18.006	19.944	225	
							S22.000	20.000	225	
SS.135	20.750	1.500	1050	S23.000	19.250	225				
SS.134	20.900	1.835	1350	S18.008	19.065	375	S18.007	19.400	300	260
							S23.000	19.065	225	
SS.124	21.250	2.443	1350	S16.008	18.807	375	S16.007	19.750	225	793
							S18.008	18.807	375	
SS.123	21.200	1.500	1050	S24.000	19.700	225				
SS.122	20.850	2.441	1350	S16.009	18.409	450	S16.008	18.409	375	
							S24.000	19.350	225	716
SS.121	20.250	1.500	1050	S25.000	18.750	300				
SS.120	20.750	2.417	1500	S16.010	18.333	525	S16.009	18.333	450	
							S25.000	18.333	300	
SS.119	21.000	1.500	1050	S26.000	19.500	300				
SS.118	20.500	2.312	1500	S16.011	18.188	525	S16.010	18.188	525	
							S26.000	18.188	300	
SS.103	19.850	1.900	1500	S15.013	17.950	675	S15.012	17.950	450	
							S16.011	17.950	525	
SS.102	20.000	2.083	1500	S15.014	17.917	675	S15.013	17.917	675	
SS.101	20.500	2.587	1500	S15.015	17.913	300	S15.014	17.913	675	
SS.100	19.000	1.210	1050	S15.016	17.790	300	S15.015	17.790	300	
SS.002	19.000	1.442	1050	S1.018	17.558	300	S1.017	17.558	300	
							S15.016	17.558	300	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
SS.001	19.000	1.601	1050	S1.019	17.399	300	S1.018	17.399	300	
SS.200	19.750	2.385	1200	S1.020	17.365	300	S1.019	17.365	300	
SS.201	19.500	2.369	1200	S1.021	17.131	300	S1.020	17.131	300	
SDrainge Ditch	18.500	1.602	0		OUTFALL		S1.021	16.898	300	

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S1.000	o	225	SS.036	30.000	28.500	1.275	1050
S1.001	o	225	SS.035	29.500	28.000	1.275	1050
S1.002	o	225	SS.034	29.650	27.728	1.697	1200
S2.000	o	225	SS.037	29.250	27.750	1.275	1050
S1.003	o	300	SS.033	29.250	27.412	1.538	1200
S1.004	o	300	SS.032	28.100	26.600	1.200	1050
S1.005	o	300	SS.031	28.050	26.290	1.460	1050
S3.000	o	225	SS.041	30.000	28.500	1.275	1050
S3.001	o	225	SS.040	29.150	27.650	1.275	1050
S3.002	o	225	SS.039	29.000	27.500	1.275	1050
S3.003	o	300	SS.038	27.500	26.000	1.200	1050
S1.006	o	375	SS.030	28.000	25.619	2.006	1350
S1.007	o	375	SS.029	25.200	23.625	1.200	1350
S1.008	o	450	SS.028	24.000	22.350	1.200	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S1.000	61.085	122.2	SS.035	29.500	28.000	1.275	1050
S1.001	45.380	166.8	SS.034	29.650	27.728	1.697	1200
S1.002	20.705	65.5	SS.033	29.250	27.412	1.613	1200
S2.000	56.415	166.9	SS.033	29.250	27.412	1.613	1200
S1.003	51.655	63.6	SS.032	28.100	26.600	1.200	1050
S1.004	6.205	20.0	SS.031	28.050	26.290	1.460	1050
S1.005	10.685	15.9	SS.030	28.000	25.619	2.081	1350
S3.000	45.635	53.7	SS.040	29.150	27.650	1.275	1050
S3.001	5.890	39.3	SS.039	29.000	27.500	1.275	1050
S3.002	66.465	44.3	SS.038	27.500	26.000	1.275	1050
S3.003	63.645	167.0	SS.030	28.000	25.619	2.081	1350
S1.006	74.710	37.5	SS.029	25.200	23.625	1.200	1350
S1.007	66.585	52.2	SS.028	24.000	22.350	1.275	1350
S1.008	7.600	100.0	SS.018	24.500	22.274	1.776	1350

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S4.000	o	225	SS.025	29.350	27.850	1.275	1050
S4.001	o	300	SS.024	28.750	27.250	1.200	1050
S4.002	o	300	SS.023	29.050	26.904	1.846	1200
S4.003	o	300	SS.022	29.150	26.849	2.001	1200
S5.000	o	225	SS.026	29.350	27.850	1.275	1050
S4.004	o	300	SS.021	29.250	26.807	2.143	1200
S4.005	o	300	SS.020	28.050	26.483	1.267	1050
S6.000	o	225	SS.019	28.050	26.550	1.275	1050
S4.006	o	300	SS.027	27.750	26.250	1.200	1050
S1.009	o	450	SS.018	24.500	22.274	1.776	1350
S7.000	o	225	SS.015	28.350	26.850	1.275	1050
S7.001	o	225	SS.014	26.500	25.000	1.275	1050
S7.002	o	225	SS.013	25.750	24.250	1.275	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S4.000	62.150	103.6	SS.024	28.750	27.250	1.275	1050
S4.001	57.765	167.0	SS.023	29.050	26.904	1.846	1200
S4.002	9.150	166.4	SS.022	29.150	26.849	2.001	1200
S4.003	7.000	166.7	SS.021	29.250	26.807	2.143	1200
S5.000	61.775	59.2	SS.021	29.250	26.807	2.218	1200
S4.004	54.075	166.9	SS.020	28.050	26.483	1.267	1050
S4.005	12.460	53.5	SS.027	27.750	26.250	1.200	1050
S6.000	52.900	176.3	SS.027	27.750	26.250	1.275	1050
S4.006	82.705	25.4	SS.018	24.500	23.000	1.200	1350
S1.009	15.190	20.0	SS.017	23.500	21.515	1.536	1500
S7.000	53.690	29.0	SS.014	26.500	25.000	1.275	1050
S7.001	23.365	31.2	SS.013	25.750	24.250	1.275	1050
S7.002	20.825	27.8	SS.012	25.000	23.500	1.275	1050

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S7.003	o	225	SS.012	25.000	23.500	1.275	1050
S8.000	o	225	SS.016	26.350	24.850	1.275	1050
S7.004	o	225	SS.011	24.250	22.750	1.275	1050
S1.010	o	600	SS.017	23.500	20.000	2.900	1500
S1.011	o	225	SS.009	22.500	19.996	2.279	1500
S9.000	o	225	SS.067	23.550	22.050	1.275	1050
S1.012	o	300	SS.008	22.000	19.960	1.740	1200
S1.013	o	300	SS.007	21.050	19.550	1.200	1050
S10.000	o	225	SS.066	21.600	20.100	1.275	1050
S1.014	o	300	SS.006	20.900	19.400	1.200	1050
S11.000	o	225	SS.065	26.550	25.050	1.275	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S7.003	22.925	30.6	SS.011	24.250	22.750	1.275	1050
S8.000	65.800	31.3	SS.011	24.250	22.750	1.275	1050
S7.004	37.670	20.1	SS.017	23.500	20.875	2.400	1500
S1.010	1.000	250.0	SS.009	22.500	19.996	1.904	1500
S1.011	9.000	250.0	SS.008	22.000	19.960	1.815	1200
S9.000	57.850	27.7	SS.008	22.000	19.960	1.815	1200
S1.012	61.075	149.0	SS.007	21.050	19.550	1.200	1050
S1.013	8.820	58.8	SS.006	20.900	19.400	1.200	1050
S10.000	61.865	88.4	SS.006	20.900	19.400	1.275	1050
S1.014	85.230	86.0	SS.005	20.100	18.409	1.391	1500
S11.000	47.175	37.7	SS.064	25.300	23.800	1.275	1050

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S11.001	o	300	SS.064	25.300	23.800	1.200	1050
S11.002	o	300	SS.063	25.700	23.435	1.965	1200
S11.003	o	300	SS.062	25.400	23.327	1.773	1200
S11.004	o	300	SS.061	23.150	21.651	1.199	1050
S11.005	o	300	SS.060	22.600	21.101	1.199	1050
S12.000	o	225	SS.059	21.750	20.250	1.275	1050
S11.006	o	375	SS.058	22.100	20.110	1.615	1350
S11.007	o	375	SS.057	22.000	19.500	2.125	1350
S11.008	o	225	SS.056	22.000	19.494	2.281	1350
S11.009	o	225	SS.055	21.650	19.453	1.972	1200
S13.000	o	225	SS.054	22.500	21.000	1.275	1050
S13.001	o	225	SS.053	21.800	20.300	1.275	1050
S11.010	o	300	SS.052	21.350	19.296	1.754	1200
S14.000	o	225	SS.051	25.250	23.750	1.275	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S11.001	60.975	167.1	SS.063	25.700	23.435	1.965	1200
S11.002	18.105	167.6	SS.062	25.400	23.327	1.773	1200
S11.003	45.565	27.2	SS.061	23.150	21.651	1.199	1050
S11.004	23.415	42.6	SS.060	22.600	21.101	1.199	1050
S11.005	31.960	53.3	SS.058	22.100	20.501	1.299	1350
S12.000	23.370	166.9	SS.058	22.100	20.110	1.765	1350
S11.006	3.235	170.3	SS.057	22.000	20.091	1.534	1350
S11.007	1.000	166.7	SS.056	22.000	19.494	2.131	1350
S11.008	8.145	198.7	SS.055	21.650	19.453	1.972	1200
S11.009	26.290	167.5	SS.052	21.350	19.296	1.829	1200
S13.000	39.400	56.3	SS.053	21.800	20.300	1.275	1050
S13.001	32.000	31.9	SS.052	21.350	19.296	1.829	1200
S11.010	64.775	166.9	SS.044	20.750	18.908	1.542	1350
S14.000	66.775	29.7	SS.050	23.000	21.500	1.275	1050

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S14.001	o	225	SS.050	23.000	21.500	1.275	1050
S14.002	o	300	SS.049	22.750	21.250	1.200	1050
S14.003	o	300	SS.048	21.750	20.250	1.200	1050
S14.004	o	300	SS.047	21.550	20.050	1.200	1050
S14.005	o	300	SS.046	21.450	19.950	1.200	1050
S14.006	o	300	SS.045	21.350	19.850	1.200	1050
S11.011	o	450	SS.044	20.750	18.908	1.392	1350
S11.012	o	450	SS.043	20.600	18.873	1.277	1350
S11.013	o	450	SS.042	20.000	18.351	1.199	1350
S1.015	o	525	SS.005	20.100	18.259	1.316	1500
S1.016	o	525	SS.004	19.750	17.650	1.575	1500
S1.017	o	300	SS.003	19.750	17.646	1.804	1500
S15.000	o	225	SS.116	24.500	23.000	1.275	1050
S15.001	o	225	SS.115	24.000	22.500	1.275	1050
S15.002	o	225	SS.114	22.500	21.000	1.275	1050
S15.003	o	300	SS.113	22.350	20.850	1.200	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S14.001	16.115	64.5	SS.049	22.750	21.250	1.275	1050
S14.002	102.940	102.9	SS.048	21.750	20.250	1.200	1050
S14.003	12.055	60.3	SS.047	21.550	20.050	1.200	1050
S14.004	11.810	118.1	SS.046	21.450	19.950	1.200	1050
S14.005	9.950	99.5	SS.045	21.350	19.850	1.200	1050
S14.006	50.410	53.5	SS.044	20.750	18.908	1.542	1350
S11.011	5.895	168.4	SS.043	20.600	18.873	1.277	1350
S11.012	67.565	129.4	SS.042	20.000	18.351	1.199	1350
S11.013	13.400	145.7	SS.005	20.100	18.259	1.391	1500
S1.015	41.275	250.2	SS.004	19.750	18.094	1.131	1500
S1.016	1.000	250.0	SS.003	19.750	17.646	1.579	1500
S1.017	8.300	94.3	SS.002	19.000	17.558	1.142	1050
S15.000	32.225	64.5	SS.115	24.000	22.500	1.275	1050
S15.001	51.410	34.3	SS.114	22.500	21.000	1.275	1050
S15.002	20.405	136.0	SS.113	22.350	20.850	1.275	1050
S15.003	17.275	115.2	SS.112	22.200	20.700	1.200	1050

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S15.004	o	300	SS.112	22.200	20.700	1.200	1050
S15.005	o	300	SS.111	22.100	20.600	1.200	1050
S15.006	o	375	SS.110	22.000	20.351	1.274	1350
S15.007	o	375	SS.109	21.900	20.082	1.443	1350
S15.008	o	375	SS.108	21.700	19.884	1.441	1350
S15.009	o	375	SS.107	21.400	19.547	1.478	1350
S15.010	o	375	SS.106	20.800	19.105	1.320	1350
S15.011	o	450	SS.105	20.150	18.455	1.245	1350
S15.012	o	450	SS.104	19.500	18.150	0.900	1350
S16.000	o	300	SS.132	24.800	23.300	1.200	1050
S16.001	o	300	SS.131	24.300	22.800	1.200	1050
S16.002	o	300	SS.130	24.700	22.695	1.705	1200
S16.003	o	300	SS.129	23.000	21.500	1.200	1050
S16.004	o	300	SS.128	23.000	20.000	2.700	1200
S16.005	o	225	SS.127	22.000	19.996	1.779	1200
S17.000	o	225	SS.133	22.750	21.250	1.275	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S15.004	17.390	173.9	SS.111	22.100	20.600	1.200	1050
S15.005	24.945	100.2	SS.110	22.000	20.351	1.349	1350
S15.006	40.395	150.2	SS.109	21.900	20.082	1.443	1350
S15.007	29.710	150.1	SS.108	21.700	19.884	1.441	1350
S15.008	50.560	150.0	SS.107	21.400	19.547	1.478	1350
S15.009	66.345	150.1	SS.106	20.800	19.105	1.320	1350
S15.010	49.475	76.1	SS.105	20.150	18.455	1.320	1350
S15.011	45.460	149.0	SS.104	19.500	18.150	0.900	1350
S15.012	45.915	229.6	SS.103	19.850	17.950	1.450	1500
S16.000	99.775	199.6	SS.131	24.300	22.800	1.200	1050
S16.001	17.485	166.5	SS.130	24.700	22.695	1.705	1200
S16.002	51.262	42.9	SS.129	23.000	21.500	1.200	1050
S16.003	6.610	165.3	SS.128	23.000	21.460	1.240	1200
S16.004	1.000	250.0	SS.127	22.000	19.996	1.704	1200
S16.005	4.695	247.1	SS.126	21.850	19.977	1.648	1200
S17.000	35.995	28.3	SS.126	21.850	19.977	1.648	1200

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S16.006	o	225	SS.126	21.850	19.977	1.648	1200
S16.007	o	225	SS.125	21.350	19.850	1.275	1050
S18.000	o	225	SS.147	24.750	23.250	1.275	1050
S18.001	o	225	SS.146	23.250	21.750	1.275	1050
S19.000	o	225	SS.145	23.750	22.250	1.275	1050
S18.002	o	300	SS.144	22.750	21.250	1.200	1050
S18.003	o	300	SS.143	22.650	21.150	1.200	1050
S20.000	o	225	SS.140	23.950	22.450	1.275	1050
S21.000	o	225	SS.142	21.750	20.750	0.775	1050
S21.001	o	225	SS.141	22.150	20.624	1.301	1050
S18.004	o	375	SS.139	22.250	20.567	1.308	1350
S18.005	o	375	SS.138	22.250	20.000	1.875	1350
S18.006	o	225	SS.137	21.700	19.996	1.479	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S16.006	14.795	116.5	SS.125	21.350	19.850	1.275	1050
S16.007	10.740	107.4	SS.124	21.250	19.750	1.275	1350
S18.000	40.355	26.9	SS.146	23.250	21.750	1.275	1050
S18.001	32.660	65.3	SS.144	22.750	21.250	1.275	1050
S19.000	30.445	30.4	SS.144	22.750	21.250	1.275	1050
S18.002	9.125	91.3	SS.143	22.650	21.150	1.200	1050
S18.003	49.280	84.5	SS.139	22.250	20.567	1.383	1350
S20.000	51.236	27.2	SS.139	22.250	20.567	1.458	1350
S21.000	21.005	166.7	SS.141	22.150	20.624	1.301	1050
S21.001	9.570	167.9	SS.139	22.250	20.567	1.458	1350
S18.004	7.585	168.6	SS.138	22.250	20.522	1.353	1350
S18.005	1.000	250.0	SS.137	21.700	19.996	1.329	1350
S18.006	12.970	249.4	SS.136	21.500	19.944	1.331	1050

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S22.000	o	225	SS.148	22.250	20.750	1.275	1050
S18.007	o	300	SS.136	21.500	19.944	1.256	1050
S23.000	o	225	SS.135	20.750	19.250	1.275	1050
S18.008	o	375	SS.134	20.900	19.065	1.460	1350
S16.008	o	375	SS.124	21.250	18.807	2.068	1350
S24.000	o	225	SS.123	21.200	19.700	1.275	1050
S16.009	o	450	SS.122	20.850	18.409	1.991	1350
S25.000	o	300	SS.121	20.250	18.750	1.200	1050
S16.010	o	525	SS.120	20.750	18.333	1.892	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S22.000	30.300	40.4	SS.136	21.500	20.000	1.275	1050
S18.007	60.880	111.9	SS.134	20.900	19.400	1.200	1350
S23.000	30.865	166.8	SS.134	20.900	19.065	1.610	1350
S18.008	49.875	193.3	SS.124	21.250	18.807	2.068	1350
S16.008	59.645	149.9	SS.122	20.850	18.409	2.066	1350
S24.000	40.750	116.4	SS.122	20.850	19.350	1.275	1350
S16.009	19.115	250.0	SS.120	20.750	18.333	1.967	1500
S25.000	24.140	57.9	SS.120	20.750	18.333	2.117	1500
S16.010	36.055	250.0	SS.118	20.500	18.188	1.787	1500

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S26.000	o	300	SS.119	21.000	19.500	1.200	1050
S16.011	o	525	SS.118	20.500	18.188	1.787	1500
S15.013	o	675	SS.103	19.850	17.950	1.225	1500
S15.014	o	675	SS.102	20.000	17.917	1.408	1500
S15.015	o	300	SS.101	20.500	17.913	2.287	1500
S15.016	o	300	SS.100	19.000	17.790	0.910	1050
S1.018	o	300	SS.002	19.000	17.558	1.142	1050
S1.019	o	300	SS.001	19.000	17.399	1.301	1050
S1.020	o	300	SS.200	19.750	17.365	2.085	1200
S1.021	o	300	SS.201	19.500	17.131	2.069	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
S26.000	19.850	15.1	SS.118	20.500	18.188	2.012	1500
S16.011	39.355	165.4	SS.103	19.850	17.950	1.375	1500
S15.013	8.315	250.0	SS.102	20.000	17.917	1.408	1500
S15.014	1.000	250.0	SS.101	20.500	17.913	1.912	1500
S15.015	36.935	300.3	SS.100	19.000	17.790	0.910	1050
S15.016	69.575	299.9	SS.002	19.000	17.558	1.142	1050
S1.018	47.735	300.2	SS.001	19.000	17.399	1.301	1050
S1.019	10.120	300.0	SS.200	19.750	17.365	2.085	1200
S1.020	70.060	300.0	SS.201	19.500	17.131	2.069	1200
S1.021	70.060	300.0	SDrainge Ditch	18.500	16.898	1.302	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.021	SDrainge Ditch	18.500	16.898	16.898	0	0

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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	20.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	6
Number of Online Controls	6	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	18.800	Storm Duration (mins)	30
Ratio R	0.250		

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Online Controls for Storm

Hydro-Brake® Manhole: SS.009, DS/PN: S1.011, Volume (m³): 4.3

Design Head (m) 1.750 Hydro-Brake® Type Md4 Invert Level (m) 19.996
Design Flow (l/s) 14.2 Diameter (mm) 117

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.4	1.200	11.7	3.000	18.5	7.000	28.2
0.200	8.8	1.400	12.6	3.500	20.0	7.500	29.2
0.300	8.9	1.600	13.5	4.000	21.3	8.000	30.2
0.400	7.8	1.800	14.3	4.500	22.6	8.500	31.1
0.500	7.8	2.000	15.1	5.000	23.9	9.000	32.0
0.600	8.3	2.200	15.8	5.500	25.0	9.500	32.9
0.800	9.5	2.400	16.5	6.000	26.1		
1.000	10.7	2.600	17.2	6.500	27.2		

Hydro-Brake® Manhole: SS.056, DS/PN: S11.008, Volume (m³): 3.5

Design Head (m) 1.750 Hydro-Brake® Type Md4 Invert Level (m) 19.494
Design Flow (l/s) 3.4 Diameter (mm) 58

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.5	1.200	2.9	3.000	4.5	7.000	6.9
0.200	1.3	1.400	3.1	3.500	4.9	7.500	7.2
0.300	1.4	1.600	3.3	4.000	5.2	8.000	7.4
0.400	1.7	1.800	3.5	4.500	5.6	8.500	7.6
0.500	1.9	2.000	3.7	5.000	5.9	9.000	7.9
0.600	2.0	2.200	3.9	5.500	6.1	9.500	8.1
0.800	2.3	2.400	4.1	6.000	6.4		
1.000	2.6	2.600	4.2	6.500	6.7		

Hydro-Brake® Manhole: SS.003, DS/PN: S1.017, Volume (m³): 3.6

Design Head (m) 1.750 Hydro-Brake® Type Md4 Invert Level (m) 17.646
Design Flow (l/s) 28.0 Diameter (mm) 165

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.0	1.200	23.2	3.000	36.7	7.000	56.1
0.200	14.2	1.400	25.1	3.500	39.7	7.500	58.1
0.300	21.4	1.600	26.8	4.000	42.4	8.000	60.0
0.400	21.4	1.800	28.5	4.500	45.0	8.500	61.9
0.500	19.2	2.000	30.0	5.000	47.4	9.000	63.6
0.600	18.2	2.200	31.5	5.500	49.8	9.500	65.4
0.800	19.2	2.400	32.9	6.000	52.0		
1.000	21.3	2.600	34.2	6.500	54.1		

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Hydro-Brake® Manhole: SS.127, DS/PN: S16.005, Volume (m³): 2.3

Design Head (m) 1.250 Hydro-Brake® Type Md4 Invert Level (m) 19.996
Design Flow (l/s) 2.5 Diameter (mm) 54

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.3	1.200	2.5	3.000	3.9	7.000	6.0
0.200	1.1	1.400	2.7	3.500	4.3	7.500	6.2
0.300	1.2	1.600	2.9	4.000	4.5	8.000	6.4
0.400	1.4	1.800	3.0	4.500	4.8	8.500	6.6
0.500	1.6	2.000	3.2	5.000	5.1	9.000	6.8
0.600	1.8	2.200	3.4	5.500	5.3	9.500	7.0
0.800	2.0	2.400	3.5	6.000	5.6		
1.000	2.3	2.600	3.7	6.500	5.8		

Hydro-Brake® Manhole: SS.137, DS/PN: S18.006, Volume (m³): 2.4

Design Head (m) 1.500 Hydro-Brake® Type Md4 Invert Level (m) 19.996
Design Flow (l/s) 3.5 Diameter (mm) 61

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.7	1.200	3.2	3.000	5.0	7.000	7.7
0.200	1.5	1.400	3.4	3.500	5.4	7.500	7.9
0.300	1.6	1.600	3.7	4.000	5.8	8.000	8.2
0.400	1.8	1.800	3.9	4.500	6.2	8.500	8.5
0.500	2.1	2.000	4.1	5.000	6.5	9.000	8.7
0.600	2.2	2.200	4.3	5.500	6.8	9.500	8.9
0.800	2.6	2.400	4.5	6.000	7.1		
1.000	2.9	2.600	4.7	6.500	7.4		

Hydro-Brake® Manhole: SS.101, DS/PN: S15.015, Volume (m³): 4.4

Design Head (m) 1.750 Hydro-Brake® Type Md4 Invert Level (m) 17.913
Design Flow (l/s) 21.6 Diameter (mm) 145

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.8	1.200	17.9	3.000	28.4	7.000	43.3
0.200	12.2	1.400	19.4	3.500	30.7	7.500	44.9
0.300	16.0	1.600	20.7	4.000	32.8	8.000	46.3
0.400	14.6	1.800	22.0	4.500	34.8	8.500	47.8
0.500	13.3	2.000	23.2	5.000	36.6	9.000	49.2
0.600	13.3	2.200	24.3	5.500	38.4	9.500	50.5
0.800	14.7	2.400	25.4	6.000	40.1		
1.000	16.4	2.600	26.4	6.500	41.8		

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Storage Structures for Storm

Tank or Pond Manhole: SS.009, DS/PN: S1.011

Invert Level (m) 19.996

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	930.0	1.750	930.0

Tank or Pond Manhole: SS.056, DS/PN: S11.008

Invert Level (m) 19.494

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	275.0	1.750	275.0

Tank or Pond Manhole: SS.003, DS/PN: S1.017

Invert Level (m) 17.646

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	600.0	1.750	600.0

Tank or Pond Manhole: SS.127, DS/PN: S16.005

Invert Level (m) 19.996

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	240.0	1.250	240.0

Tank or Pond Manhole: SS.137, DS/PN: S18.006

Invert Level (m) 19.996

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	320.0	1.500	320.0

Tank or Pond Manhole: SS.101, DS/PN: S15.015

Invert Level (m) 17.913

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	600.0	2.750	600.0

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 100
Climate Change (%) 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
S1.000	15 Winter	100	0%	100/15 Summer	100/15 Winter			2
S1.001	15 Winter	100	0%	100/15 Summer	100/15 Winter			3
S1.002	15 Winter	100	0%	100/15 Summer				
S2.000	15 Winter	100	0%	100/15 Summer				
S1.003	15 Winter	100	0%	100/15 Summer				
S1.004	15 Winter	100	0%	100/15 Summer				
S1.005	15 Winter	100	0%	100/15 Summer				
S3.000	15 Winter	100	0%	100/15 Winter				
S3.001	15 Winter	100	0%	100/15 Summer				
S3.002	15 Winter	100	0%	100/15 Summer				
S3.003	15 Winter	100	0%	100/15 Summer	100/15 Summer			3
S1.006	15 Winter	100	0%	100/15 Summer				
S1.007	15 Winter	100	0%	100/15 Summer	100/15 Summer			4
S1.008	15 Winter	100	0%	100/15 Summer				
S4.000	15 Winter	100	0%	100/15 Summer				
S4.001	15 Winter	100	0%	100/15 Summer				
S4.002	15 Winter	100	0%	100/15 Summer				
S4.003	15 Winter	100	0%	100/15 Summer				
S5.000	15 Winter	100	0%	100/15 Summer				
S4.004	15 Winter	100	0%	100/15 Summer				
S4.005	15 Winter	100	0%	100/15 Summer				
S6.000	15 Winter	100	0%	100/15 Summer				
S4.006	15 Winter	100	0%	100/15 Summer				
S1.009	15 Winter	100	0%	100/15 Summer				
S7.000	15 Winter	100	0%					
S7.001	15 Winter	100	0%					
S7.002	15 Winter	100	0%					
S7.003	15 Winter	100	0%					
S8.000	15 Winter	100	0%					
S7.004	15 Winter	100	0%	100/15 Summer				
S1.010	1440 Winter	100	0%	100/15 Summer				
S1.011	1440 Winter	100	0%	100/15 Summer				
S9.000	15 Winter	100	0%					
S1.012	15 Winter	100	0%	100/15 Summer				
S1.013	15 Winter	100	0%	100/15 Summer				
S10.000	15 Winter	100	0%	100/15 Summer				
S1.014	15 Winter	100	0%	100/15 Summer	100/15 Winter			1
S11.000	15 Winter	100	0%					

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
S11.001	15 Winter	100	0%	100/15 Summer				
S11.002	15 Winter	100	0%	100/15 Summer				
S11.003	15 Winter	100	0%					
S11.004	15 Winter	100	0%	100/15 Summer				
S11.005	15 Winter	100	0%	100/15 Summer				
S12.000	1440 Winter	100	0%	100/15 Summer				
S11.006	1440 Winter	100	0%	100/15 Summer				
S11.007	1440 Winter	100	0%	100/15 Summer				
S11.008	1440 Winter	100	0%	100/15 Summer				
S11.009	15 Winter	100	0%	100/15 Summer				
S13.000	15 Winter	100	0%	100/15 Summer				
S13.001	15 Winter	100	0%	100/15 Summer				
S11.010	15 Winter	100	0%	100/15 Summer				
S14.000	15 Winter	100	0%					
S14.001	15 Winter	100	0%	100/15 Summer				
S14.002	15 Winter	100	0%	100/15 Summer	100/15 Winter			1
S14.003	15 Winter	100	0%	100/15 Summer	100/15 Winter			3
S14.004	15 Winter	100	0%	100/15 Summer	100/15 Winter			3
S14.005	15 Winter	100	0%	100/15 Summer				
S14.006	15 Winter	100	0%	100/15 Summer				
S11.011	15 Winter	100	0%	100/15 Summer				
S11.012	15 Winter	100	0%	100/15 Summer				
S11.013	1440 Winter	100	0%	100/15 Summer				
S1.015	1440 Winter	100	0%	100/15 Summer				
S1.016	1440 Winter	100	0%	100/15 Summer				
S1.017	1440 Winter	100	0%	100/15 Summer				
S15.000	15 Winter	100	0%	100/15 Summer				
S15.001	15 Winter	100	0%	100/15 Summer				
S15.002	15 Winter	100	0%	100/15 Summer	100/15 Summer			5
S15.003	15 Summer	100	0%	100/15 Summer				
S15.004	30 Winter	100	0%	100/15 Summer	100/15 Summer			4
S15.005	30 Winter	100	0%	100/15 Summer	100/15 Summer			4
S15.006	15 Winter	100	0%	100/15 Summer	100/15 Winter			3
S15.007	15 Winter	100	0%	100/15 Summer	100/15 Winter			1
S15.008	30 Winter	100	0%	100/15 Summer	100/15 Winter			3
S15.009	15 Winter	100	0%	100/15 Summer	100/15 Winter			2
S15.010	15 Winter	100	0%	100/15 Summer				
S15.011	1440 Winter	100	0%	100/15 Summer				
S15.012	1440 Winter	100	0%	100/15 Summer	100/15 Winter			16
S16.000	15 Winter	100	0%	100/15 Summer				
S16.001	15 Winter	100	0%	100/15 Summer				
S16.002	15 Winter	100	0%					
S16.003	15 Winter	100	0%	100/15 Summer				
S16.004	1440 Winter	100	0%	100/15 Summer				
S16.005	1440 Winter	100	0%	100/15 Summer				
S17.000	15 Winter	100	0%					
S16.006	15 Winter	100	0%	100/15 Summer				
S16.007	15 Winter	100	0%	100/15 Summer				
S18.000	15 Winter	100	0%					

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
S18.001	15 Winter	100	0%	100/15 Summer	100/15 Summer			3
S19.000	15 Winter	100	0%	100/15 Summer				
S18.002	15 Winter	100	0%	100/15 Summer	100/15 Winter			1
S18.003	15 Winter	100	0%	100/15 Summer				
S20.000	15 Winter	100	0%					
S21.000	1440 Winter	100	0%	100/15 Summer				
S21.001	1440 Winter	100	0%	100/15 Summer				
S18.004	1440 Winter	100	0%	100/15 Summer				
S18.005	1440 Winter	100	0%	100/15 Summer				
S18.006	1440 Winter	100	0%	100/15 Summer				
S22.000	15 Winter	100	0%	100/15 Summer				
S18.007	15 Winter	100	0%	100/15 Summer				
S23.000	15 Winter	100	0%	100/15 Summer	100/15 Summer			4
S18.008	15 Winter	100	0%	100/15 Summer	100/15 Winter			1
S16.008	15 Winter	100	0%	100/15 Summer				
S24.000	15 Winter	100	0%	100/15 Summer				
S16.009	15 Winter	100	0%	100/15 Summer				
S25.000	15 Winter	100	0%	100/15 Summer	100/15 Winter			1
S16.010	1440 Winter	100	0%	100/15 Summer				
S26.000	1440 Winter	100	0%	100/15 Winter				
S16.011	1440 Winter	100	0%	100/15 Summer				
S15.013	1440 Winter	100	0%	100/15 Summer	100/360 Winter			6
S15.014	1440 Winter	100	0%	100/15 Summer				
S15.015	1440 Winter	100	0%	100/15 Summer				
S15.016	1440 Winter	100	0%					
S1.018	1440 Winter	100	0%					
S1.019	960 Winter	100	0%					
S1.020	1440 Winter	100	0%					
S1.021	1440 Winter	100	0%					

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S1.000	SS.036	30.001	1.276	0.00	1.08	0.0	49.2	SURCHARGED
S1.001	SS.035	29.501	1.276	0.000	1.67	0.0	64.0	SURCHARGED
S1.002	SS.034	28.980	1.027	0.000	1.20	0.0	70.4	SURCHARGED
S2.000	SS.037	28.993	1.018	0.000	1.18	0.0	45.5	FLOOD RISK
S1.003	SS.033	28.638	0.926	0.000	1.03	0.0	135.9	SURCHARGED
S1.004	SS.032	27.760	0.860	0.000	1.05	0.0	146.3	SURCHARGED
S1.005	SS.031	27.426	0.836	0.000	0.76	0.0	156.0	SURCHARGED
S3.000	SS.041	28.795	0.070	0.000	0.56	0.0	38.0	SURCHARGED
S3.001	SS.040	28.624	0.749	0.000	0.61	0.0	33.3	SURCHARGED
S3.002	SS.039	28.591	0.866	0.000	0.87	0.0	65.8	SURCHARGED
S3.003	SS.038	27.502	1.202	0.000	1.26	0.0	103.4	SURCHARGED
S1.006	SS.030	27.049	1.055	0.000	0.95	0.0	295.4	SURCHARGED
S1.007	SS.029	25.204	1.204	0.000	1.25	0.0	327.0	SURCHARGED
S1.008	SS.028	23.247	0.447	0.000	1.94	0.0	327.2	SURCHARGED
S4.000	SS.025	28.788	0.713	0.000	0.95	0.0	47.0	SURCHARGED

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S4.001	SS.024	28.424	0.874	0.000	0.80	0.0	65.5	SURCHARGED
S4.002	SS.023	28.235	1.031	0.000	1.14	0.0	69.7	SURCHARGED
S4.003	SS.022	28.193	1.044	0.000	1.19	0.0	72.8	SURCHARGED
S5.000	SS.026	28.750	0.675	0.000	0.89	0.0	58.3	SURCHARGED
S4.004	SS.021	28.159	1.052	0.000	1.54	0.0	125.1	SURCHARGED
S4.005	SS.020	27.453	0.670	0.000	1.17	0.0	141.2	SURCHARGED
S6.000	SS.019	27.788	1.013	0.000	1.49	0.0	56.0	FLOOD RISK
S4.006	SS.027	27.196	0.646	0.000	1.09	0.0	232.9	SURCHARGED
S1.009	SS.018	22.916	0.192	0.000	1.13	0.0	556.4	SURCHARGED
S7.000	SS.015	26.976	-0.099	0.000	0.59	0.0	54.5	OK
S7.001	SS.014	25.136	-0.089	0.000	0.66	0.0	56.6	OK
S7.002	SS.013	24.385	-0.090	0.000	0.66	0.0	59.2	OK
S7.003	SS.012	23.642	-0.083	0.000	0.71	0.0	61.6	OK
S8.000	SS.016	24.986	-0.089	0.000	0.66	0.0	59.3	OK
S7.004	SS.011	23.179	0.204	0.000	1.05	0.0	116.0	SURCHARGED
S1.010	SS.017	21.969	1.369	0.000	0.32	0.0	77.3	SURCHARGED
S1.011	SS.009	21.969	1.748	0.000	0.55	0.0	14.8	SURCHARGED
S9.000	SS.067	22.194	-0.081	0.000	0.71	0.0	68.3	OK
S1.012	SS.008	21.180	0.920	0.000	0.78	0.0	67.4	SURCHARGED
S1.013	SS.007	20.966	1.116	0.000	0.65	0.0	63.5	FLOOD RISK
S10.000	SS.066	21.563	1.238	0.000	0.94	0.0	50.3	FLOOD RISK
S1.014	SS.006	20.900	1.200	0.000	1.38	0.0	159.7	SURCHARGED
S11.000	SS.065	25.144	-0.131	0.000	0.36	0.0	29.0	OK
S11.001	SS.064	24.417	0.317	0.000	1.27	0.0	103.4	SURCHARGED
S11.002	SS.063	23.812	0.077	0.000	1.36	0.0	100.6	SURCHARGED
S11.003	SS.062	23.550	-0.077	0.000	0.74	0.0	147.5	OK
S11.004	SS.061	22.680	0.729	0.000	1.12	0.0	170.4	SURCHARGED
S11.005	SS.060	21.990	0.589	0.000	1.40	0.0	194.8	SURCHARGED
S12.000	SS.059	21.146	0.671	0.000	0.06	0.0	2.2	SURCHARGED
S11.006	SS.058	21.145	0.660	0.000	0.23	0.0	18.7	SURCHARGED
S11.007	SS.057	21.144	1.269	0.000	0.20	0.0	18.6	SURCHARGED
S11.008	SS.056	21.144	1.425	0.000	0.11	0.0	3.3	SURCHARGED
S11.009	SS.055	20.939	1.261	0.000	0.46	0.0	17.0	SURCHARGED
S13.000	SS.054	21.925	0.700	0.000	0.77	0.0	50.6	SURCHARGED
S13.001	SS.053	21.543	1.018	0.000	0.80	0.0	69.4	FLOOD RISK
S11.010	SS.052	20.905	1.309	0.000	1.61	0.0	131.9	SURCHARGED
S14.000	SS.051	23.876	-0.099	0.000	0.58	0.0	54.2	OK
S14.001	SS.050	22.908	1.183	0.000	0.83	0.0	47.9	FLOOD RISK
S14.002	SS.049	22.751	1.201	0.000	1.05	0.0	111.9	SURCHARGED
S14.003	SS.048	21.751	1.201	0.00	1.02	0.0	114.5	SURCHARGED
S14.004	SS.047	21.551	1.201	0.000	1.64	0.0	129.8	SURCHARGED
S14.005	SS.046	21.372	1.122	0.000	1.71	0.0	135.3	FLOOD RISK
S14.006	SS.045	21.135	0.985	0.000	1.08	0.0	155.5	FLOOD RISK
S11.011	SS.044	20.048	0.690	0.000	1.87	0.0	277.4	SURCHARGED
S11.012	SS.043	19.816	0.493	0.000	1.04	0.0	273.8	SURCHARGED
S11.013	SS.042	19.482	0.681	0.000	0.20	0.0	33.5	SURCHARGED
S1.015	SS.005	19.479	0.695	0.000	0.23	0.0	61.1	SURCHARGED
S1.016	SS.004	19.470	1.295	0.000	0.33	0.0	60.9	FLOOD RISK

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S1.017	SS.003	19.469	1.523	0.000	0.37	0.0	27.2	FLOOD RISK
S15.000	SS.116	23.695	0.470	0.000	0.52	0.0	31.8	SURCHARGED
S15.001	SS.115	23.590	0.865	0.000	0.84	0.0	71.5	SURCHARGED
S15.002	SS.114	22.508	1.283	0.000	2.08	0.0	84.0	FLOOD RISK
S15.003	SS.113	22.301	1.151	0.000	0.96	0.0	85.1	FLOOD RISK
S15.004	SS.112	22.202	1.202	0.000	1.28	0.0	92.4	FLOOD RISK
S15.005	SS.111	22.105	1.205	0.000	1.21	0.0	119.9	FLOOD RISK
S15.006	SS.110	22.000	1.274	0.000	0.90	0.0	133.0	FLOOD RISK
S15.007	SS.109	21.900	1.443	0.000	1.02	0.0	147.1	FLOOD RISK
S15.008	SS.108	21.703	1.444	0.000	1.12	0.0	169.1	FLOOD RISK
S15.009	SS.107	21.400	1.478	0.000	1.33	0.0	204.3	FLOOD RISK
S15.010	SS.106	20.692	1.212	0.000	1.09	0.0	231.7	FLOOD RISK
S15.011	SS.105	20.003	1.098	0.000	0.15	0.0	36.5	FLOOD RISK
S15.012	SS.104	19.999	1.399	0.000	0.18	0.0	34.6	FLOOD RISK
S16.000	SS.132	23.828	0.228	0.000	1.10	0.0	83.4	SURCHARGED
S16.001	SS.131	23.155	0.055	0.000	1.28	0.0	93.9	SURCHARGED
S16.002	SS.130	22.912	-0.083	0.000	0.83	0.0	133.5	OK
S16.003	SS.129	22.034	0.234	0.000	2.19	0.0	134.2	SURCHARGED
S16.004	SS.128	21.123	0.823	0.000	0.20	0.0	11.6	SURCHARGED
S16.005	SS.127	21.123	0.902	0.000	0.10	0.0	2.4	SURCHARGED
S17.000	SS.133	21.390	-0.085	0.000	0.61	0.0	56.6	OK
S16.006	SS.126	21.044	0.842	0.000	1.09	0.0	46.1	SURCHARGED
S16.007	SS.125	20.924	0.849	0.000	1.08	0.0	45.4	SURCHARGED
S18.000	SS.147	23.327	-0.148	0.000	0.22	0.0	21.4	OK
S18.001	SS.146	23.253	1.278	0.000	1.27	0.0	76.7	FLOOD RISK
S19.000	SS.145	22.905	0.430	0.000	0.38	0.0	34.0	SURCHARGED
S18.002	SS.144	22.750	1.200	0.000	1.47	0.0	116.7	FLOOD RISK
S18.003	SS.143	22.568	1.118	0.000	1.47	0.0	167.2	FLOOD RISK
S20.000	SS.140	22.573	-0.102	0.000	0.57	0.0	54.3	OK
S21.000	SS.142	21.631	0.656	0.000	0.05	0.0	1.8	FLOOD RISK
S21.001	SS.141	21.630	0.781	0.000	0.05	0.0	1.8	SURCHARGED
S18.004	SS.139	21.630	0.688	0.000	0.20	0.0	21.1	SURCHARGED
S18.005	SS.138	21.628	1.253	0.000	0.23	0.0	21.0	SURCHARGED
S18.006	SS.137	21.628	1.407	0.000	0.13	0.0	3.7	FLOOD RISK
S22.000	SS.148	21.563	0.588	0.000	0.60	0.0	46.0	SURCHARGED
S18.007	SS.136	21.384	1.140	0.000	1.01	0.0	100.6	FLOOD RISK
S23.000	SS.135	20.758	1.283	0.000	1.63	0.0	61.1	FLOOD RISK
S18.008	SS.134	20.901	1.461	0.000	1.00	0.0	133.0	FLOOD RISK
S16.008	SS.124	20.841	1.659	0.000	1.31	0.0	199.9	SURCHARGED
S24.000	SS.123	20.492	0.567	0.000	1.11	0.0	50.8	SURCHARGED
S16.009	SS.122	20.163	1.304	0.000	1.48	0.0	242.1	SURCHARGED
S25.000	SS.121	20.251	1.201	0.000	0.88	0.0	114.1	FLOOD RISK
S16.010	SS.120	20.005	1.147	0.000	0.17	0.0	44.4	SURCHARGED
S26.000	SS.119	20.002	0.202	0.000	0.03	0.0	7.7	SURCHARGED
S16.011	SS.118	20.000	1.287	0.000	0.17	0.0	55.0	SURCHARGED
S15.013	SS.103	19.995	1.370	0.000	0.26	0.0	85.9	FLOOD RISK
S15.014	SS.102	19.993	1.401	0.000	0.28	0.0	85.6	FLOOD RISK
S15.015	SS.101	19.993	1.780	0.000	0.40	0.0	23.5	SURCHARGED

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
S15.016	SS.100	17.918	-0.171	0.000	0.38	0.0	23.5	OK
S1.018	SS.002	17.812	-0.045	0.000	0.85	0.0	50.7	OK
S1.019	SS.001	17.699	0.000	0.000	1.01	0.0	50.4	OK
S1.020	SS.200	17.574	-0.091	0.000	0.83	0.0	50.7	OK
S1.021	SS.201	17.341	-0.091	0.000	0.83	0.0	50.7	OK

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Appendix F – Foul Sewer Design Sheets

Cork City Council Planning Department. For Inspection Purposes Only!

FOUL SEWERAGE DESIGN

Design Criteria for Foul - Main

Pipe Sizes	STANDARD	Manhole Sizes	STANDARD
Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	0.00	Minimum Backdrop Height (m)	0.200
Flow Per Person (l/per/day)	446.00	Maximum Backdrop Height (m)	1.500
Persons per House	1.00	Min Design Depth for Optimisation (m)	1.200
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	500

Designed with Level Inverts

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F1.000	72.805	1.213	60.0	0.000	12	0.0	1.500	o	150
F2.000	52.285	0.871	60.0	0.000	12	0.0	1.500	o	150
F1.001	42.140	0.281	150.0	0.000	12	0.0	1.500	o	225
F1.002	10.295	0.069	150.0	0.000	0	0.0	1.500	o	225
F3.000	41.085	0.685	60.0	0.000	6	0.0	1.500	o	150
F3.001	9.070	0.151	60.0	0.000	0	0.0	1.500	o	150
F3.002	76.245	0.508	150.1	0.000	10	0.0	1.500	o	150
F1.003	10.680	0.071	150.4	0.000	0	0.0	1.500	o	225

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	28.150	0.000	0.0	12	0.0	14	0.42	1.13	20.0	0.4
F2.000	27.400	0.000	0.0	12	0.0	14	0.42	1.13	20.0	0.4
F1.001	26.529	0.000	0.0	36	0.0	27	0.41	0.94	37.2	1.1
F1.002	26.248	0.000	0.0	36	0.0	27	0.41	0.94	37.2	1.1
F3.000	27.000	0.000	0.0	6	0.0	11	0.34	1.13	20.0	0.2
F3.001	26.315	0.000	0.0	6	0.0	11	0.34	1.13	20.0	0.2
F3.002	26.164	0.000	0.0	16	0.0	21	0.34	0.71	12.6	0.5
F1.003	25.656	0.000	0.0	52	0.0	32	0.46	0.93	37.2	1.6

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F4.000	56.155	0.936	60.0	0.000	7	0.0	1.500	o	150
F1.004	54.785	0.274	199.9	0.000	6	0.0	1.500	o	225
F1.005	6.345	0.032	198.3	0.000	1	0.0	1.500	o	225
F1.006	7.365	0.092	80.1	0.000	0	0.0	1.500	o	225
F5.000	14.205	0.250	56.8	0.000	6	0.0	1.500	o	150
F5.001	5.350	0.100	53.5	0.000	0	0.0	1.500	o	150
F5.002	4.750	0.150	31.7	0.000	0	0.0	1.500	o	150
F5.003	65.900	1.500	43.9	0.000	4	0.0	1.500	o	150
F5.004	69.425	0.463	149.9	0.000	2	0.0	1.500	o	150
F1.007	61.695	2.213	27.9	0.000	9	0.0	1.500	o	225
F6.000	44.825	1.250	35.9	0.000	3	0.0	1.500	o	150
F6.001	71.360	0.476	149.9	0.000	8	0.0	1.500	o	150
F1.008	16.220	0.081	200.0	0.000	0	0.0	1.500	o	225
F1.009	69.425	0.347	200.1	0.000	12	0.0	1.500	o	225

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F4.000	27.400	0.000	0.0	7	0.0	11	0.36	1.13	20.0	0.2
F1.004	25.585	0.000	0.0	65	0.0	38	0.45	0.81	32.2	2.0
F1.005	25.311	0.000	0.0	66	0.0	38	0.45	0.81	32.4	2.0
F1.006	25.279	0.000	0.0	66	0.0	31	0.62	1.28	51.0	2.0
F5.000	27.650	0.000	0.0	6	0.0	10	0.35	1.16	20.6	0.2
F5.001	27.400	0.000	0.0	6	0.0	10	0.35	1.20	21.2	0.2
F5.002	27.300	0.000	0.0	6	0.0	9	0.42	1.56	27.6	0.2
F5.003	27.150	0.000	0.0	10	0.0	12	0.45	1.32	23.4	0.3
F5.004	25.650	0.000	0.0	12	0.0	18	0.31	0.71	12.6	0.4
F1.007	25.187	0.000	0.0	87	0.0	27	0.98	2.18	86.6	2.7
F6.000	24.700	0.000	0.0	3	0.0	7	0.32	1.47	25.9	0.1
F6.001	23.450	0.000	0.0	11	0.0	17	0.30	0.71	12.6	0.3
F1.008	22.974	0.000	0.0	98	0.0	47	0.51	0.81	32.2	3.0
F1.009	22.893	0.000	0.0	110	0.0	49	0.53	0.81	32.2	3.4

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F7.000	31.825	0.750	42.4	0.000	2	0.0	1.500	o	150
F7.001	12.860	0.350	36.7	0.000	0	0.0	1.500	o	150
F8.000	49.600	0.827	60.0	0.000	7	0.0	1.500	o	150
F7.002	36.115	1.400	25.8	0.000	4	0.0	1.500	o	225
F7.003	56.885	1.823	31.2	0.000	5	0.0	1.500	o	225
F1.010	15.075	0.450	33.5	0.000	0	0.0	1.500	o	225
F1.011	55.210	1.550	35.6	0.000	9	0.0	1.500	o	225
F1.012	57.955	0.950	61.0	0.000	2	0.0	1.500	o	225
F1.013	8.760	0.150	58.4	0.000	0	0.0	1.500	o	225
F9.000	58.900	0.982	60.0	0.000	8	0.0	1.500	o	150
F1.014	34.470	0.172	200.4	0.000	3	0.0	1.500	o	225
F10.000	45.415	2.200	20.6	0.000	8	0.0	1.500	o	150
F10.001	4.060	0.100	40.6	0.000	0	0.0	1.500	o	150

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F7.000	27.100	0.000	0.0	2	0.0	6	0.26	1.35	23.8	0.1
F7.001	26.350	0.000	0.0	2	0.0	6	0.28	1.45	25.6	0.1
F8.000	26.200	0.000	0.0	7	0.0	11	0.36	1.13	20.0	0.2
F7.002	25.373	0.000	0.0	13	0.0	11	0.55	2.27	90.1	0.4
F7.003	23.973	0.000	0.0	18	0.0	14	0.57	2.06	81.9	0.6
F1.010	22.150	0.000	0.0	128	0.0	34	1.03	1.99	79.0	4.0
F1.011	21.700	0.000	0.0	137	0.0	36	1.03	1.93	76.6	4.2
F1.012	20.150	0.000	0.0	139	0.0	41	0.86	1.47	58.5	4.3
F1.013	19.200	0.000	0.0	139	0.0	41	0.87	1.50	59.8	4.3
F9.000	19.750	0.000	0.0	8	0.0	12	0.37	1.13	20.0	0.2
F1.014	18.768	0.000	0.0	150	0.0	58	0.58	0.81	32.2	4.6
F10.000	23.550	0.000	0.0	8	0.0	9	0.54	1.93	34.2	0.2
F10.001	21.350	0.000	0.0	8	0.0	11	0.43	1.38	24.3	0.2

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F10.002	23.085	1.154	20.0	0.000	4	0.0	1.500	o	150
F11.000	47.130	0.786	60.0	0.000	8	0.0	1.500	o	150
F11.001	8.205	0.137	59.9	0.000	0	0.0	1.500	o	150
F10.003	45.575	0.304	149.9	0.000	6	0.0	1.500	o	225
F10.004	3.380	0.023	150.0	0.000	0	0.0	1.500	o	225
F10.005	32.370	0.216	149.9	0.000	4	0.0	1.500	o	225
F12.000	26.085	0.435	60.0	0.000	2	0.0	1.500	o	150
F10.006	61.620	0.308	200.1	0.000	6	0.0	1.500	o	225
F13.000	43.105	1.400	30.8	0.000	6	0.0	1.500	o	150
F13.001	15.450	0.400	38.6	0.000	0	0.0	1.500	o	150
F13.002	102.580	1.000	102.6	0.000	12	0.0	1.500	o	150
F13.003	11.650	0.150	77.7	0.000	2	0.0	1.500	o	225
F13.004	8.775	0.100	87.8	0.000	0	0.0	1.500	o	225
F13.005	12.375	0.150	82.5	0.000	0	0.0	1.500	o	225
F13.006	50.100	0.550	91.1	0.000	6	0.0	1.500	o	225

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F10.002	21.250	0.000	0.0	12	0.0	11	0.62	1.96	34.7	0.4
F11.000	19.900	0.000	0.0	8	0.0	12	0.37	1.13	20.0	0.2
F11.001	19.114	0.000	0.0	8	0.0	12	0.37	1.13	20.0	0.2
F10.003	18.977	0.000	0.0	26	0.0	23	0.37	0.94	37.2	0.8
F10.004	18.673	0.000	0.0	26	0.0	23	0.37	0.94	37.2	0.8
F10.005	18.650	0.000	0.0	30	0.0	25	0.39	0.94	37.2	0.9
F12.000	19.750	0.000	0.0	2	0.0	6	0.24	1.13	20.0	0.1
F10.006	18.434	0.000	0.0	38	0.0	30	0.38	0.81	32.2	1.2
F13.000	22.750	0.000	0.0	6	0.0	9	0.43	1.58	28.0	0.2
F13.001	21.350	0.000	0.0	6	0.0	10	0.39	1.41	25.0	0.2
F13.002	20.950	0.000	0.0	18	0.0	20	0.40	0.86	15.3	0.6
F13.003	19.950	0.000	0.0	20	0.0	18	0.43	1.30	51.8	0.6
F13.004	19.800	0.000	0.0	20	0.0	18	0.41	1.23	48.7	0.6
F13.005	19.700	0.000	0.0	20	0.0	18	0.42	1.26	50.3	0.6
F13.006	19.550	0.000	0.0	26	0.0	21	0.44	1.20	47.8	0.8

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F10.007	8.925	0.045	200.0	0.000	0	0.0	1.500	o	225
F10.008	64.164	0.321	199.9	0.000	4	0.0	1.500	o	225
F10.009	65.075	0.325	200.2	0.000	10	0.0	1.500	o	225
F1.015	53.550	0.268	199.8	0.000	0	0.0	1.500	o	225
F14.000	25.615	0.427	60.0	0.000	31	0.0	1.500	o	150
F14.001	19.880	0.133	149.5	0.000	31	0.0	1.500	o	150
F1.016	38.880	0.194	200.4	0.000	16	0.0	1.500	o	225
F15.000	47.490	0.792	60.0	0.000	10	0.0	1.500	o	150
F15.001	32.585	0.543	60.0	0.000	12	0.0	1.500	o	150
F15.002	10.225	0.051	200.0	0.000	0	0.0	1.500	o	225
F15.003	52.920	0.265	199.7	0.000	5	0.0	1.500	o	225
F16.000	31.030	0.517	60.0	0.000	17	0.0	1.500	o	150
F16.001	58.455	0.292	200.2	0.000	4	0.0	1.500	o	225

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F10.007	18.126	0.000	0.0	64	0.0	38	0.45	0.81	32.2	2.0
F10.008	18.082	0.000	0.0	68	0.0	39	0.45	0.81	32.2	2.1
F10.009	17.761	0.000	0.0	78	0.0	42	0.47	0.81	32.2	2.4
F1.015	17.436	0.000	0.0	228	0.0	72	0.65	0.81	32.2	7.1
F14.000	19.000	0.000	0.0	31	0.0	23	0.57	1.13	20.0	1.0
F14.001	18.573	0.000	0.0	62	0.0	40	0.51	0.72	12.6	1.9
F1.016	17.168	0.000	0.0	306	0.0	84	0.70	0.81	32.2	9.5
F15.000	21.650	0.000	0.0	10	0.0	13	0.40	1.13	20.0	0.3
F15.001	20.858	0.000	0.0	22	0.0	19	0.52	1.13	20.0	0.7
F15.002	20.315	0.000	0.0	22	0.0	23	0.32	0.81	32.2	0.7
F15.003	20.264	0.000	0.0	27	0.0	25	0.34	0.81	32.2	0.8
F16.000	21.400	0.000	0.0	17	0.0	17	0.48	1.13	20.0	0.5
F16.001	20.883	0.000	0.0	21	0.0	22	0.32	0.81	32.2	0.7

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F15.004	50.335	0.252	199.7	0.000	8	0.0	1.500	o	225
F15.005	4.590	0.023	200.0	0.000	0	0.0	1.500	o	225
F17.000	52.460	0.874	60.0	0.000	12	0.0	1.500	o	150
F18.000	18.215	0.304	59.9	0.000	8	0.0	1.500	o	150
F18.001	6.665	0.111	60.0	0.000	0	0.0	1.500	o	150
F17.001	53.960	0.270	199.9	0.000	8	0.0	1.500	o	225
F17.002	12.860	0.064	200.0	0.000	0	0.0	1.500	o	225
F15.006	10.400	0.052	200.0	0.000	0	0.0	1.500	o	225
F15.007	53.655	0.268	200.0	0.000	0	0.0	1.500	o	225
F19.000	53.190	0.887	60.0	0.000	8	0.0	1.500	o	150
F20.000	54.195	2.000	27.1	0.000	6	0.0	1.500	o	150
F20.001	24.155	1.000	24.2	0.000	0	0.0	1.500	o	150
F20.002	20.825	0.725	28.7	0.000	0	0.0	1.500	o	150
F20.003	31.500	0.525	60.0	0.000	0	0.0	1.500	o	150

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F15.004	19.999	0.000	0.0	56	0.0	36	0.43	0.81	32.2	1.7
F15.005	19.747	0.000	0.0	56	0.0	36	0.43	0.81	32.2	1.7
F17.000	20.750	0.000	0.0	12	0.0	14	0.42	1.13	20.0	0.4
F18.000	20.650	0.000	0.0	8	0.0	12	0.37	1.13	20.0	0.2
F18.001	20.346	0.000	0.0	8	0.0	12	0.37	1.13	20.0	0.2
F17.001	19.876	0.000	0.0	28	0.0	26	0.35	0.81	32.2	0.9
F17.002	19.606	0.000	0.0	28	0.0	26	0.35	0.81	32.2	0.9
F15.006	19.542	0.000	0.0	84	0.0	43	0.48	0.81	32.2	2.6
F15.007	19.490	0.000	0.0	84	0.0	43	0.48	0.81	32.2	2.6
F19.000	20.108	0.000	0.0	8	0.0	12	0.37	1.13	20.0	0.2
F20.000	26.650	0.000	0.0	6	0.0	9	0.45	1.69	29.8	0.2
F20.001	24.650	0.000	0.0	6	0.0	9	0.46	1.79	31.6	0.2
F20.002	23.650	0.000	0.0	6	0.0	9	0.44	1.64	29.0	0.2
F20.003	22.925	0.000	0.0	6	0.0	11	0.34	1.13	20.0	0.2

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F21.000	54.590	1.500	36.4	0.000	6	0.0	1.500	o	150
F20.004	39.150	1.250	31.3	0.000	0	0.0	1.500	o	225
F15.008	61.200	0.306	200.0	0.000	8	0.0	1.500	o	225
F15.009	10.585	0.115	92.0	0.000	0	0.0	1.500	o	225
F22.000	15.620	0.260	60.1	0.000	6	0.0	1.500	o	150
F22.001	6.000	0.100	60.0	0.000	0	0.0	1.500	o	150
F22.002	73.595	0.840	87.6	0.000	18	0.0	1.500	o	225
F23.000	18.930	0.316	59.9	0.000	15	0.0	1.500	o	150
F22.003	49.855	0.249	200.2	0.000	4	0.0	1.500	o	225
F15.010	56.560	0.283	199.9	0.000	1	0.0	1.500	o	225
F15.011	16.540	0.083	199.3	0.000	16	0.0	1.500	o	225
F24.000	22.865	0.381	60.0	0.000	42	0.0	1.500	o	150

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F21.000	23.900	0.000	0.0	6	0.0	9	0.40	1.46	25.7	0.2
F20.004	22.400	0.000	0.0	12	0.0	11	0.50	2.06	81.7	0.4
F15.008	19.221	0.000	0.0	112	0.0	50	0.53	0.81	32.2	3.5
F15.009	18.915	0.000	0.0	112	0.0	41	0.69	1.20	47.6	3.5
F22.000	20.250	0.000	0.0	6	0.0	11	0.34	1.13	20.0	0.2
F22.001	19.990	0.000	0.0	6	0.0	11	0.34	1.13	20.0	0.2
F22.002	19.890	0.000	0.0	24	0.0	20	0.44	1.23	48.8	0.7
F23.000	19.366	0.000	0.0	15	0.0	16	0.46	1.13	20.0	0.5
F22.003	19.050	0.000	0.0	43	0.0	31	0.40	0.81	32.2	1.3
F15.010	18.800	0.000	0.0	156	0.0	59	0.58	0.81	32.2	4.8
F15.011	18.517	0.000	0.0	172	0.0	62	0.60	0.81	32.3	5.3
F24.000	19.500	0.000	0.0	42	0.0	26	0.63	1.13	20.0	1.3

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Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	DWF (l/s)	k (mm)	HYD SECT	DIA (mm)
F24.001	37.695	0.251	150.0	0.000	0	0.0	1.500	o	225
F15.012	32.440	0.162	200.0	0.000	0	0.0	1.500	o	225
F1.017	6.590	0.033	199.7	0.000	0	0.0	1.500	o	225
F1.018	56.780	0.284	199.9	0.000	0	0.0	1.500	o	225
F1.019	4.800	0.024	200.0	0.000	0	0.0	1.500	o	225

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ DWF (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F24.001	19.119	0.000	0.0	42	0.0	29	0.43	0.94	37.2	1.3
F15.012	18.434	0.000	0.0	214	0.0	69	0.64	0.81	32.2	6.6
F1.017	16.974	0.000	0.0	520	0.0	112	0.81	0.81	32.2	16.1
F1.018	16.941	0.000	0.0	520	0.0	112	0.81	0.81	32.2	16.1
F1.019	16.657	0.000	0.0	520	0.0	112	0.81	0.81	32.2	16.1

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Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
FF.021	30.000	1.850	1200	F1.000	28.150	150				
FF.022	28.250	0.850	1050	F2.000	27.400	150				
FF.020	29.500	2.971	1200	F1.001	26.529	225	F1.000	26.937	150	333
							F2.000	26.529	150	
FF.019	29.600	3.352	1200	F1.002	26.248	225	F1.001	26.248	225	
FF.025	28.850	1.850	1200	F3.000	27.000	150				
FF.024	29.050	2.735	1200	F3.001	26.315	150	F3.000	26.315	150	
FF.023	29.125	2.961	1200	F3.002	26.164	150	F3.001	26.164	150	
FF.018	29.400	3.744	1200	F1.003	25.656	225	F1.002	26.179	225	524
							F3.002	25.656	150	
FF.026	29.250	1.850	1200	F4.000	27.400	150				
FF.017	29.250	3.665	1200	F1.004	25.585	225	F1.003	25.585	225	
							F4.000	26.464	150	804
FF.016	28.050	2.739	1200	F1.005	25.311	225	F1.004	25.311	225	
FF.015	28.000	2.721	1200	F1.006	25.279	225	F1.005	25.279	225	
FF.031	29.500	1.850	1200	F5.000	27.650	150				
FF.030	29.250	1.850	1200	F5.001	27.400	150	F5.000	27.400	150	
FF.029	29.150	1.850	1200	F5.002	27.300	150	F5.001	27.300	150	
FF.028	29.000	1.850	1200	F5.003	27.150	150	F5.002	27.150	150	
FF.027	27.500	1.850	1200	F5.004	25.650	150	F5.003	25.650	150	
FF.014	28.000	2.813	1200	F1.007	25.187	225	F1.006	25.187	225	
							F5.004	25.187	150	
FF.033	26.550	1.850	1200	F6.000	24.700	150				
FF.032	25.300	1.850	1200	F6.001	23.450	150	F6.000	23.450	150	
FF.013	25.750	2.776	1200	F1.008	22.974	225	F1.007	22.974	225	
							F6.001	22.974	150	
FF.012	25.200	2.307	1200	F1.009	22.893	225	F1.008	22.893	225	
FF.037	28.850	1.750	1200	F7.000	27.100	150				
FF.036	28.100	1.750	1200	F7.001	26.350	150	F7.000	26.350	150	
FF.038	28.050	1.850	1200	F8.000	26.200	150				
FF.035	27.750	2.377	1200	F7.002	25.373	225	F7.001	26.000	150	552
							F8.000	25.373	150	
FF.034	26.350	2.377	1200	F7.003	23.973	225	F7.002	23.973	225	
FF.011	24.000	1.850	1200	F1.010	22.150	225	F1.009	22.546	225	396
							F7.003	22.150	225	
FF.010	23.550	1.850	1200	F1.011	21.700	225	F1.010	21.700	225	
FF.009	22.000	1.850	1200	F1.012	20.150	225	F1.011	20.150	225	
FF.008	21.050	1.850	1200	F1.013	19.200	225	F1.012	19.200	225	
FF.039	21.600	1.850	1200	F9.000	19.750	150				
FF.007	20.900	2.132	1200	F1.014	18.768	225	F1.013	19.050	225	282
							F9.000	18.768	150	
FF.056	25.400	1.850	1200	F10.000	23.550	150				
FF.055	23.200	1.850	1200	F10.001	21.350	150	F10.000	21.350	150	
FF.054	23.100	1.850	1200	F10.002	21.250	150	F10.001	21.250	150	
FF.058	21.750	1.850	1200	F11.000	19.900	150				
FF.057	22.400	3.286	1200	F11.001	19.114	150	F11.000	19.114	150	

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Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
FF.053	22.550	3.573	1200	F10.003	18.977	225	F10.002	20.096	150	1044
							F11.001	18.977	150	
FF.052	21.850	3.177	1200	F10.004	18.673	225	F10.003	18.673	225	
FF.051	21.800	3.150	1200	F10.005	18.650	225	F10.004	18.650	225	
FF.059	21.600	1.850	1200	F12.000	19.750	150				
FF.050	21.350	2.916	1200	F10.006	18.434	225	F10.005	18.434	225	
							F12.000	19.315	150	806
FF.049	24.600	1.850	1200	F13.000	22.750	150				
FF.048	23.100	1.750	1200	F13.001	21.350	150	F13.000	21.350	150	
FF.047	22.700	1.750	1200	F13.002	20.950	150	F13.001	20.950	150	
FF.046	21.700	1.750	1200	F13.003	19.950	225	F13.002	19.950	150	
FF.045	21.550	1.750	1200	F13.004	19.800	225	F13.003	19.800	225	
FF.044	21.450	1.750	1200	F13.005	19.700	225	F13.004	19.700	225	
FF.043	21.300	1.750	1200	F13.006	19.550	225	F13.005	19.550	225	
FF.042	20.750	2.624	1200	F10.007	18.126	225	F10.006	18.126	225	
							F13.006	19.000	225	874
FF.041	20.500	2.418	1200	F10.008	18.082	225	F10.007	18.082	225	
FF.040	20.000	2.239	1200	F10.009	17.761	225	F10.008	17.761	225	
FF.006	20.600	3.164	1200	F1.015	17.436	225	F1.014	18.596	225	1160
							F10.009	17.436	225	
FF.061	20.850	1.850	1200	F14.000	19.000	150				
FF.060	20.850	2.277	1200	F14.001	18.573	150	F14.000	18.573	150	
FF.005	20.850	3.682	1200	F1.016	17.168	225	F1.015	17.168	225	
							F14.001	18.440	150	1197
FF.074	23.000	1.350	1050	F15.000	21.650	150				
FF.073	24.000	3.142	1200	F15.001	20.858	150	F15.000	20.858	150	
FF.072	24.500	4.185	1200	F15.002	20.315	225	F15.001	20.315	150	
FF.071	24.800	4.536	1200	F15.003	20.264	225	F15.002	20.264	225	
FF.076	23.250	1.850	1200	F16.000	21.400	150				
FF.075	22.850	1.967	1200	F16.001	20.883	225	F16.000	20.883	150	
FF.070	24.630	4.631	1200	F15.004	19.999	225	F15.003	19.999	225	
							F16.001	20.591	225	592
FF.069	24.300	4.553	1200	F15.005	19.747	225	F15.004	19.747	225	
FF.079	22.600	1.850	1200	F17.000	20.750	150				
FF.081	22.000	1.350	1050	F18.000	20.650	150				
FF.080	22.200	1.854	1200	F18.001	20.346	150	F18.000	20.346	150	
FF.078	22.250	2.374	1200	F17.001	19.876	225	F17.000	19.876	150	
							F18.001	20.235	150	284
FF.077	24.000	4.394	1200	F17.002	19.606	225	F17.001	19.606	225	
FF.068	24.250	4.708	1200	F15.006	19.542	225	F15.005	19.724	225	182
							F17.002	19.542	225	
FF.067	24.700	5.210	1200	F15.007	19.490	225	F15.006	19.490	225	
FF.088	21.950	1.842	1200	F19.000	20.108	150				
FF.086	28.500	1.850	1200	F20.000	26.650	150				
FF.085	26.500	1.850	1200	F20.001	24.650	150	F20.000	24.650	150	
FF.084	25.500	1.850	1200	F20.002	23.650	150	F20.001	23.650	150	

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Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
FF.083	24.750	1.825	1200	F20.003	22.925	150	F20.002	22.925	150	
FF.087	25.750	1.850	1200	F21.000	23.900	150				
FF.082	24.250	1.850	1200	F20.004	22.400	225	F20.003	22.400	150	
							F21.000	22.400	150	
FF.066	23.000	3.779	1200	F15.008	19.221	225	F15.007	19.221	225	
							F19.000	19.221	150	
							F20.004	21.150	225	1929
FF.065	21.350	2.435	1200	F15.009	18.915	225	F15.008	18.915	225	
FF.092	21.750	1.500	1050	F22.000	20.250	150				
FF.091	21.750	1.760	1200	F22.001	19.990	150	F22.000	19.990	150	
FF.090	21.700	1.810	1200	F22.002	19.890	225	F22.001	19.890	150	
FF.093	20.850	1.484	1050	F23.000	19.366	150				
FF.089	20.900	1.850	1200	F22.003	19.050	225	F22.002	19.050	225	
							F23.000	19.050	150	
FF.064	21.250	2.450	1200	F15.010	18.800	225	F15.009	18.800	225	
							F22.003	18.801	225	1
FF.063	20.880	2.363	1200	F15.011	18.517	225	F15.010	18.517	225	
FF.095	20.850	1.350	1050	F24.000	19.500	150				
FF.094	20.850	1.731	1200	F24.001	19.119	225	F24.000	19.119	150	
FF.062	20.750	2.316	1200	F15.012	18.434	225	F15.011	18.434	225	
							F24.001	18.868	225	434
FF.004	20.500	3.526	1200	F1.017	16.974	225	F1.016	16.974	225	
							F15.012	18.272	225	1298
FF.003	20.500	3.559	1200	F1.018	16.941	225	F1.017	16.941	225	
FF.002	19.750	3.093	1200	F1.019	16.657	225	F1.018	16.657	225	
F	0.000		0		OUTFALL		F1.019	16.633	225	

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F1.000	o	150	FF.021	30.000	28.150	1.700	1200
F2.000	o	150	FF.022	28.250	27.400	0.700	1050
F1.001	o	225	FF.020	29.500	26.529	2.746	1200
F1.002	o	225	FF.019	29.600	26.248	3.127	1200
F3.000	o	150	FF.025	28.850	27.000	1.700	1200
F3.001	o	150	FF.024	29.050	26.315	2.585	1200
F3.002	o	150	FF.023	29.125	26.164	2.811	1200
F1.003	o	225	FF.018	29.400	25.656	3.519	1200
F4.000	o	150	FF.026	29.250	27.400	1.700	1200
F1.004	o	225	FF.017	29.250	25.585	3.440	1200
F1.005	o	225	FF.016	28.050	25.311	2.514	1200
F1.006	o	225	FF.015	28.000	25.279	2.496	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F1.000	72.805	60.0	FF.020	29.500	26.937	2.413	1200
F2.000	52.285	60.0	FF.020	29.500	26.529	2.821	1200
F1.001	42.140	150.0	FF.019	29.600	26.248	3.127	1200
F1.002	10.295	150.0	FF.018	29.400	26.179	2.996	1200
F3.000	41.085	60.0	FF.024	29.050	26.315	2.585	1200
F3.001	9.070	60.0	FF.023	29.125	26.164	2.811	1200
F3.002	76.245	150.1	FF.018	29.400	25.656	3.594	1200
F1.003	10.680	150.4	FF.017	29.250	25.585	3.440	1200
F4.000	56.155	60.0	FF.017	29.250	26.464	2.636	1200
F1.004	54.785	199.9	FF.016	28.050	25.311	2.514	1200
F1.005	6.345	198.3	FF.015	28.000	25.279	2.496	1200
F1.006	7.365	80.1	FF.014	28.000	25.187	2.588	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F5.000	o	150	FF.031	29.500	27.650	1.700	1200
F5.001	o	150	FF.030	29.250	27.400	1.700	1200
F5.002	o	150	FF.029	29.150	27.300	1.700	1200
F5.003	o	150	FF.028	29.000	27.150	1.700	1200
F5.004	o	150	FF.027	27.500	25.650	1.700	1200
F1.007	o	225	FF.014	28.000	25.187	2.588	1200
F6.000	o	150	FF.033	26.550	24.700	1.700	1200
F6.001	o	150	FF.032	25.300	23.450	1.700	1200
F1.008	o	225	FF.013	25.750	22.974	2.551	1200
F1.009	o	225	FF.012	25.200	22.893	2.082	1200
F7.000	o	150	FF.037	28.850	27.100	1.600	1200
F7.001	o	150	FF.036	28.100	26.350	1.600	1200
F8.000	o	150	FF.038	28.050	26.200	1.700	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F5.000	14.205	56.8	FF.030	29.250	27.400	1.700	1200
F5.001	5.350	53.5	FF.029	29.150	27.300	1.700	1200
F5.002	4.750	31.7	FF.028	29.000	27.150	1.700	1200
F5.003	65.900	43.9	FF.027	27.500	25.650	1.700	1200
F5.004	69.425	149.9	FF.014	28.000	25.187	2.663	1200
F1.007	61.695	27.9	FF.013	25.750	22.974	2.551	1200
F6.000	44.825	35.9	FF.032	25.300	23.450	1.700	1200
F6.001	71.360	149.9	FF.013	25.750	22.974	2.626	1200
F1.008	16.220	200.0	FF.012	25.200	22.893	2.082	1200
F1.009	69.425	200.1	FF.011	24.000	22.546	1.229	1200
F7.000	31.825	42.4	FF.036	28.100	26.350	1.600	1200
F7.001	12.860	36.7	FF.035	27.750	26.000	1.600	1200
F8.000	49.600	60.0	FF.035	27.750	25.373	2.227	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F7.002	o	225	FF.035	27.750	25.373	2.152	1200
F7.003	o	225	FF.034	26.350	23.973	2.152	1200
F1.010	o	225	FF.011	24.000	22.150	1.625	1200
F1.011	o	225	FF.010	23.550	21.700	1.625	1200
F1.012	o	225	FF.009	22.000	20.150	1.625	1200
F1.013	o	225	FF.008	21.050	19.200	1.625	1200
F9.000	o	150	FF.039	21.600	19.750	1.700	1200
F1.014	o	225	FF.007	20.900	18.768	1.907	1200
F10.000	o	150	FF.056	25.400	23.550	1.700	1200
F10.001	o	150	FF.055	23.200	21.350	1.700	1200
F10.002	o	150	FF.054	23.100	21.250	1.700	1200
F11.000	o	150	FF.058	21.750	19.900	1.700	1200
F11.001	o	150	FF.057	22.400	19.114	3.136	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F7.002	36.115	25.8	FF.034	26.350	23.973	2.152	1200
F7.003	56.885	31.2	FF.011	24.000	22.150	1.625	1200
F1.010	15.075	33.5	FF.010	23.550	21.700	1.625	1200
F1.011	55.210	35.6	FF.009	22.000	20.150	1.625	1200
F1.012	57.955	61.0	FF.008	21.050	19.200	1.625	1200
F1.013	8.760	58.4	FF.007	20.900	19.050	1.625	1200
F9.000	58.900	60.0	FF.007	20.900	18.768	1.982	1200
F1.014	34.470	200.4	FF.006	20.600	18.596	1.779	1200
F10.000	45.415	20.6	FF.055	23.200	21.350	1.700	1200
F10.001	4.060	40.6	FF.054	23.100	21.250	1.700	1200
F10.002	23.085	20.0	FF.053	22.550	20.096	2.304	1200
F11.000	47.130	60.0	FF.057	22.400	19.114	3.136	1200
F11.001	8.205	59.9	FF.053	22.550	18.977	3.423	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F10.003	o	225	FF.053	22.550	18.977	3.348	1200
F10.004	o	225	FF.052	21.850	18.673	2.952	1200
F10.005	o	225	FF.051	21.800	18.650	2.925	1200
F12.000	o	150	FF.059	21.600	19.750	1.700	1200
F10.006	o	225	FF.050	21.350	18.434	2.691	1200
F13.000	o	150	FF.049	24.600	22.750	1.700	1200
F13.001	o	150	FF.048	23.100	21.350	1.600	1200
F13.002	o	150	FF.047	22.700	20.950	1.600	1200
F13.003	o	225	FF.046	21.700	19.950	1.525	1200
F13.004	o	225	FF.045	21.550	19.800	1.525	1200
F13.005	o	225	FF.044	21.450	19.700	1.525	1200
F13.006	o	225	FF.043	21.300	19.550	1.525	1200
F10.007	o	225	FF.042	20.750	18.126	2.399	1200
F10.008	o	225	FF.041	20.500	18.082	2.193	1200
F10.009	o	225	FF.040	20.000	17.761	2.014	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F10.003	45.575	149.9	FF.052	21.850	18.673	2.952	1200
F10.004	3.380	150.0	FF.051	21.800	18.650	2.925	1200
F10.005	32.370	149.9	FF.050	21.350	18.434	2.691	1200
F12.000	26.085	60.0	FF.050	21.350	19.315	1.885	1200
F10.006	61.620	200.1	FF.042	20.750	18.126	2.399	1200
F13.000	43.105	30.8	FF.048	23.100	21.350	1.600	1200
F13.001	15.450	38.6	FF.047	22.700	20.950	1.600	1200
F13.002	102.580	102.6	FF.046	21.700	19.950	1.600	1200
F13.003	11.650	77.7	FF.045	21.550	19.800	1.525	1200
F13.004	8.775	87.8	FF.044	21.450	19.700	1.525	1200
F13.005	12.375	82.5	FF.043	21.300	19.550	1.525	1200
F13.006	50.100	91.1	FF.042	20.750	19.000	1.525	1200
F10.007	8.925	200.0	FF.041	20.500	18.082	2.193	1200
F10.008	64.164	199.9	FF.040	20.000	17.761	2.014	1200
F10.009	65.075	200.2	FF.006	20.600	17.436	2.939	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F1.015	o	225	FF.006	20.600	17.436	2.939	1200
F14.000	o	150	FF.061	20.850	19.000	1.700	1200
F14.001	o	150	FF.060	20.850	18.573	2.127	1200
F1.016	o	225	FF.005	20.850	17.168	3.457	1200
F15.000	o	150	FF.074	23.000	21.650	1.200	1050
F15.001	o	150	FF.073	24.000	20.858	2.992	1200
F15.002	o	225	FF.072	24.500	20.315	3.960	1200
F15.003	o	225	FF.071	24.800	20.264	4.311	1200
F16.000	o	150	FF.076	23.250	21.400	1.700	1200
F16.001	o	225	FF.075	22.850	20.883	1.742	1200
F15.004	o	225	FF.070	24.630	19.999	4.406	1200
F15.005	o	225	FF.069	24.300	19.747	4.328	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F1.015	53.550	199.8	FF.005	20.850	17.168	3.457	1200
F14.000	25.615	60.0	FF.060	20.850	18.573	2.127	1200
F14.001	19.880	149.5	FF.005	20.850	18.440	2.260	1200
F1.016	38.880	200.4	FF.004	20.500	16.974	3.301	1200
F15.000	47.490	60.0	FF.073	24.000	20.858	2.992	1200
F15.001	32.585	60.0	FF.072	24.500	20.315	4.035	1200
F15.002	10.225	200.0	FF.071	24.800	20.264	4.311	1200
F15.003	52.920	199.7	FF.070	24.630	19.999	4.406	1200
F16.000	31.030	60.0	FF.075	22.850	20.883	1.817	1200
F16.001	58.455	200.2	FF.070	24.630	20.591	3.814	1200
F15.004	50.335	199.7	FF.069	24.300	19.747	4.328	1200
F15.005	4.590	200.0	FF.068	24.250	19.724	4.301	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F17.000	o	150	FF.079	22.600	20.750	1.700	1200
F18.000	o	150	FF.081	22.000	20.650	1.200	1050
F18.001	o	150	FF.080	22.200	20.346	1.704	1200
F17.001	o	225	FF.078	22.250	19.876	2.149	1200
F17.002	o	225	FF.077	24.000	19.606	4.169	1200
F15.006	o	225	FF.068	24.250	19.542	4.483	1200
F15.007	o	225	FF.067	24.700	19.490	4.985	1200
F19.000	o	150	FF.088	21.950	20.108	1.692	1200
F20.000	o	150	FF.086	28.500	26.650	1.700	1200
F20.001	o	150	FF.085	26.500	24.650	1.700	1200
F20.002	o	150	FF.084	25.500	23.650	1.700	1200
F20.003	o	150	FF.083	24.750	22.925	1.675	1200
F21.000	o	150	FF.087	25.750	23.900	1.700	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F17.000	52.460	60.0	FF.078	22.250	19.876	2.224	1200
F18.000	18.215	59.9	FF.080	22.200	20.346	1.704	1200
F18.001	6.665	60.0	FF.078	22.250	20.235	1.865	1200
F17.001	53.960	199.9	FF.077	24.000	19.606	4.169	1200
F17.002	12.860	200.0	FF.068	24.250	19.542	4.483	1200
F15.006	10.400	200.0	FF.067	24.700	19.490	4.985	1200
F15.007	53.655	200.0	FF.066	23.000	19.221	3.554	1200
F19.000	53.190	60.0	FF.066	23.000	19.221	3.629	1200
F20.000	54.195	27.1	FF.085	26.500	24.650	1.700	1200
F20.001	24.155	24.2	FF.084	25.500	23.650	1.700	1200
F20.002	20.825	28.7	FF.083	24.750	22.925	1.675	1200
F20.003	31.500	60.0	FF.082	24.250	22.400	1.700	1200
F21.000	54.590	36.4	FF.082	24.250	22.400	1.700	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F20.004	o	225	FF.082	24.250	22.400	1.625	1200
F15.008	o	225	FF.066	23.000	19.221	3.554	1200
F15.009	o	225	FF.065	21.350	18.915	2.210	1200
F22.000	o	150	FF.092	21.750	20.250	1.350	1050
F22.001	o	150	FF.091	21.750	19.990	1.610	1200
F22.002	o	225	FF.090	21.700	19.890	1.585	1200
F23.000	o	150	FF.093	20.850	19.366	1.334	1050
F22.003	o	225	FF.089	20.900	19.050	1.625	1200
F15.010	o	225	FF.064	21.250	18.800	2.225	1200
F15.011	o	225	FF.063	20.880	18.517	2.138	1200
F24.000	o	150	FF.095	20.850	19.500	1.200	1050
F24.001	o	225	FF.094	20.850	19.119	1.506	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F20.004	39.150	31.3	FF.066	23.000	21.150	1.625	1200
F15.008	61.200	200.0	FF.065	21.350	18.915	2.210	1200
F15.009	10.585	92.0	FF.064	21.250	18.800	2.225	1200
F22.000	15.620	60.1	FF.091	21.750	19.990	1.610	1200
F22.001	6.000	60.0	FF.090	21.700	19.890	1.660	1200
F22.002	73.595	87.6	FF.089	20.900	19.050	1.625	1200
F23.000	18.930	59.9	FF.089	20.900	19.050	1.700	1200
F22.003	49.855	200.2	FF.064	21.250	18.801	2.224	1200
F15.010	56.560	199.9	FF.063	20.880	18.517	2.138	1200
F15.011	16.540	199.3	FF.062	20.750	18.434	2.091	1200
F24.000	22.865	60.0	FF.094	20.850	19.119	1.581	1200
F24.001	37.695	150.0	FF.062	20.750	18.868	1.657	1200

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PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F15.012	o	225	FF.062	20.750	18.434	2.091	1200
F1.017	o	225	FF.004	20.500	16.974	3.301	1200
F1.018	o	225	FF.003	20.500	16.941	3.334	1200
F1.019	o	225	FF.002	19.750	16.657	2.868	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH DIAM., L*W (mm)
F15.012	32.440	200.0	FF.004	20.500	18.272	2.003	1200
F1.017	6.590	199.7	FF.003	20.500	16.941	3.334	1200
F1.018	56.780	199.9	FF.002	19.750	16.657	2.868	1200
F1.019	4.800	200.0	F	0.000	16.633		0

Free Flowing Outfall Details for Foul - Main

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
F1.019	F	0.000	16.633	0.000	0	0

Simulation Criteria for Foul - Main

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

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Appendix G – Storm Water Longitudinal Sections

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MH Name	SS.035	SS.036	
Hor Scale 1150 Ver Scale 500 Datum (m) 17.000			
PN		S1.000	
Dia (mm)		225	
Slope (1:X)		122.2	
Cover Level (m)	29.500	30.000	
Invert Level (m)		28.000	28.500
Length (m)		61.085	

MH Name	SS.033	SS.034	SS.035	
Hor Scale 1150 Ver Scale 500 Datum (m) 17.000				
PN		S1.002	S1.001	
Dia (mm)		225	225	
Slope (1:X)		65.5	166.8	
Cover Level (m)	29.250	29.650	29.500	
Invert Level (m)		27.412	27.728	27.728	28.000
Length (m)		20.705	45.380	

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MH Name	SS.030			SS.033	
Hor Scale 1150 Ver Scale 500 Datum (m) 16.000					
PN				S1.003	
Dia (mm)				300	
Slope (1:X)				63.6	
Cover Level (m)	28.000	28.050	28.100	29.250	
Invert Level (m)		25.619	26.290	26.600	26.600	27.412
Length (m)				51.655	

MH Name	SS.029	SS.030	
Hor Scale 1150 Ver Scale 500 Datum (m) 14.000			
PN		S1.006	
Dia (mm)		375	
Slope (1:X)		37.5	
Cover Level (m)	25.200	28.000	
Invert Level (m)		23.625	25.619
Length (m)		74.710	

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MH Name	SS.008		SS.018		SS.029	
Hor Scale 1150 Ver Scale 500 Datum (m) 11.000		9.000	7.004	4.006		
PN			S1.009		S1.007	
Dia (mm)			450		375	
Slope (1:X)			20.0		52.2	
Cover Level (m)	22.000	22.500	24.500	24.000	25.200	
Invert Level (m)		19.960 19.996	21.515 22.274	22.350 22.350	23.625	
Length (m)			15.190		66.585	

MH Name	SS.006		SS.008	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		10.000		9.000
PN			S1.012	
Dia (mm)			300	
Slope (1:X)			149.0	
Cover Level (m)	20.900	21.050	22.000	
Invert Level (m)		19.400 19.550	19.550 19.960	
Length (m)			61.075	

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MH Name	SS.005	SS.006	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		11.013	10.000
PN		S1.014	
Dia (mm)		300	
Slope (1:X)		86.0	
Cover Level (m)	20.100	20.900	
Invert Level (m)		18.409	19.400
Length (m)		85.230	

MH Name	SS.001	SS.002		SS.005	
Hor Scale 1150 Ver Scale 500 Datum (m) 7.000		15.016			11.013
PN		S1.018		S1.015	
Dia (mm)		300		525	
Slope (1:X)		300.2		250.2	
Cover Level (m)	19.000	19.000	19.750	20.100	
Invert Level (m)		17.399	17.558	17.646 18.094	18.259
Length (m)		47.735		41.275	

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MH Name	SS.201	SS.200		
Hor Scale 1150 Ver Scale 500 Datum (m)7.000				
PN		S1.020		
Dia (mm)		300		
Slope (1:X)		300.0		
Cover Level (m)	19.500	19.750	19.000	
Invert Level (m)	17.131	17.365	17.365 17.399	
Length (m)		70.060		

MH Name	SDrainge Ditch	SS.201	
Hor Scale 1150 Ver Scale 500 Datum (m)7.000			
PN		S1.021	
Dia (mm)		300	
Slope (1:X)		300.0	
Cover Level (m)	18.500	19.500	
Invert Level (m)	16.898	17.131	
Length (m)		70.060	

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MH Name	SS.033	SS.037	
Hor Scale 1150 Ver Scale 500 Datum (m)17.000		1.002	
PN		S2.000	
Dia (mm)		225	
Slope (1:X)		166.9	
Cover Level (m)	29.250	29.250	
Invert Level (m)		27.412	27.750
Length (m)		56.415	

MH Name	SS.039		SS.041	
Hor Scale 1150 Ver Scale 500 Datum (m)17.000				
PN			S3.000	
Dia (mm)			225	
Slope (1:X)			53.7	
Cover Level (m)	29.000	29.150	30.000	
Invert Level (m)		27.650	27.650 28.500	
Length (m)			45.635	

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MH Name	SS.038	SS.039	
Hor Scale 1150 Ver Scale 500 Datum (m) 16.000			
PN		S3.002	
Dia (mm)		225	
Slope (1:X)		44.3	
Cover Level (m)	27.500	29.000	
Invert Level (m)		26.000	27.500
Length (m)		66.465	

MH Name	SS.030	SS.038	
Hor Scale 1150 Ver Scale 500 Datum (m) 15.000		1.005	
PN		S3.003	
Dia (mm)		300	
Slope (1:X)		167.0	
Cover Level (m)	28.000	27.500	
Invert Level (m)		25.619	26.000
Length (m)		63.645	

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MH Name	SS.024	SS.025	
Hor Scale 1150 Ver Scale 500 Datum (m) 17.000			
PN		S4.000	
Dia (mm)		225	
Slope (1:X)		103.6	
Cover Level (m)	28.750	29.350	
Invert Level (m)		27.250	27.850
Length (m)		62.150	

MH Name	SS.021			SS.024	
Hor Scale 1150 Ver Scale 500 Datum (m) 17.000		5.000			
PN				S4.001	
Dia (mm)				300	
Slope (1:X)				167.0	
Cover Level (m)	29.250	29.150	29.050	28.750	
Invert Level (m)		26.849	26.849	26.904	27.250
Length (m)				57.765	

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MH Name	SS.027		SS.021	
Hor Scale 1150 Ver Scale 500 Datum (m)16.000		6.000		5.000
PN			S4.004	
Dia (mm)			300	
Slope (1:X)			166.9	
Cover Level (m)	27.750	28.050	29.250	
Invert Level (m)		26.250 26.483	26.483 26.807	
Length (m)			54.075	

MH Name	SS.018	SS.027	
Hor Scale 1150 Ver Scale 500 Datum (m)14.000		1.008	6.000
PN		S4.006	
Dia (mm)		300	
Slope (1:X)		25.4	
Cover Level (m)	24.500	27.750	
Invert Level (m)		23.000	26.250
Length (m)		82.705	

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MH Name	SS.021	SS.026	
Hor Scale 1150 Ver Scale 500 Datum (m)17.000		4.003	
PN		S5.000	
Dia (mm)		225	
Slope (1:X)		59.2	
Cover Level (m)	29.250	29.350	
Invert Level (m)		26.807	27.850
Length (m)		61.775	

MH Name	SS.027	SS.019	
Hor Scale 1150 Ver Scale 500 Datum (m)16.000		4.005	
PN		S6.000	
Dia (mm)		225	
Slope (1:X)		176.3	
Cover Level (m)	27.750	28.050	
Invert Level (m)		26.250	26.550
Length (m)		52.900	

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MH Name	SS.012	SS.013	SS.014	SS.015	
Hor Scale 1150 Ver Scale 500 Datum (m) 14.000					
PN		S7.002	S7.001	S7.000	
Dia (mm)		225	225	225	
Slope (1:X)		27.8	31.2	29.0	
Cover Level (m)	25.000	25.750	26.500	28.350	
Invert Level (m)		23.500	24.250 / 24.250	25.000 / 25.000	26.850
Length (m)		20.825	23.365	53.690	

MH Name	SS.017	SS.011	SS.012	
Hor Scale 1150 Ver Scale 500 Datum (m) 11.000		1.009	8.000	
PN		S7.004	S7.003	
Dia (mm)		225	225	
Slope (1:X)		20.1	30.6	
Cover Level (m)	23.500	24.250	25.000	
Invert Level (m)		20.875	22.750 / 22.750	23.500
Length (m)		37.670	22.925	

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MH Name	SS.011	SS.016	
Hor Scale 1150 Ver Scale 500 Datum (m) 13.000		7.003	
PN		S8.000	
Dia (mm)		225	
Slope (1:X)		31.3	
Cover Level (m)	24.250	26.350	
Invert Level (m)		22.750	24.850
Length (m)		65.800	

MH Name	SS.008	SS.067	
Hor Scale 1150 Ver Scale 500 Datum (m) 10.000		1.011	
PN		S9.000	
Dia (mm)		225	
Slope (1:X)		27.7	
Cover Level (m)	22.000	23.550	
Invert Level (m)		19.960	22.050
Length (m)		57.850	

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MH Name	SS.006	SS.066	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		1.013	
PN		S10.000	
Dia (mm)		225	
Slope (1:X)		88.4	
Cover Level (m)	20.900	21.600	
Invert Level (m)		19.400	20.100
Length (m)		61.865	

MH Name	SS.064	SS.065	
Hor Scale 1150 Ver Scale 500 Datum (m) 14.000			
PN		S11.000	
Dia (mm)		225	
Slope (1:X)		37.7	
Cover Level (m)	25.300	26.550	
Invert Level (m)		23.800	25.050
Length (m)		47.175	

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MH Name	SS.062	SS.063	SS.064	
Hor Scale 1150 Ver Scale 500 Datum (m) 13.000				
PN		S11.002	S11.001	
Dia (mm)		300	300	
Slope (1:X)		167.6	167.1	
Cover Level (m)	25.400	25.700	25.300	
Invert Level (m)		23.327 23.435	23.435	23.800
Length (m)		18.105	60.975	

MH Name	SS.057	SS.060	SS.061	SS.062	
Hor Scale 1150 Ver Scale 500 Datum (m) 11.000		12.000			
PN		S11.005	S11.004	S11.003	
Dia (mm)		300	300	300	
Slope (1:X)		53.3	42.6	27.2	
Cover Level (m)	22.000	22.600	23.150	25.400	
Invert Level (m)		20.501 21.101	21.101 21.651	21.651 23.327	
Length (m)		31.960	23.415	45.565	

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MH Name	SS.044	SS.052	SS.055		
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		14.006	13.001		
PN		S11.010	S11.009		
Dia (mm)		300	225		
Slope (1:X)		166.9	167.5		
Cover Level (m)	20.750	21.350	21.650	22.000	
Invert Level (m)		18.908	19.296 19.296	19.453 19.494	
Length (m)		64.775	26.290		

MH Name	SS.005		SS.043		
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		1.014		14.006	
PN			S11.012		
Dia (mm)			450		
Slope (1:X)			129.4		
Cover Level (m)	20.100	20.000	20.600	20.750	
Invert Level (m)		18.259 18.351	18.351 18.873	18.908	
Length (m)			67.565		

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MH Name	SS.058	SS.059	
Hor Scale 1150 Ver Scale 500 Datum (m) 10.000		11.005	
PN		S12.000	
Dia (mm)		225	
Slope (1:X)		166.9	
Cover Level (m)	22.100	21.750	
Invert Level (m)		20.110 20.250	
Length (m)		23.370	

MH Name	SS.052	SS.053	SS.054	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		11.009		
PN		S13.001	S13.000	
Dia (mm)		225	225	
Slope (1:X)		31.9	56.3	
Cover Level (m)	21.350	21.800	22.500	
Invert Level (m)		19.296 20.300	20.300 21.000	
Length (m)		32.000	39.400	

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MH Name	SS.049	SS.050	SS.051	
Hor Scale 1150 Ver Scale 500 Datum (m) 12.000				
PN		S14.001	S14.000	
Dia (mm)		225	225	
Slope (1:X)		64.5	29.7	
Cover Level (m)	22.750	23.000	25.250	
Invert Level (m)		21.250 21.500	21.500 23.750	
Length (m)		16.115	66.775	

MH Name	SS.048	SS.049	
Hor Scale 1150 Ver Scale 500 Datum (m) 10.000			
PN		S14.002	
Dia (mm)		300	
Slope (1:X)		102.9	
Cover Level (m)	21.750	22.750	
Invert Level (m)	20.250	21.250	
Length (m)		102.940	

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MH Name	SS.044	SS.045				
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		11.010				
PN		S14.006				
Dia (mm)		300				
Slope (1:X)		53.5				
Cover Level (m)	20.750	21.350	21.450	21.550	21.750	
Invert Level (m)		18.908	19.850 19.850	19.950 19.950	20.050 20.050	20.250
Length (m)		50.410				

MH Name	SS.113	SS.114	SS.115	SS.116	
Hor Scale 1150 Ver Scale 500 Datum (m) 11.000					
PN		S15.002	S15.001	S15.000	
Dia (mm)		225	225	225	
Slope (1:X)		136.0	34.3	64.5	
Cover Level (m)	22.350	22.500	24.000	24.500	
Invert Level (m)		20.850 21.000	21.000 22.500	22.500 23.000	
Length (m)		20.405	51.410	32.225	

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MH Name	SS.109	SS.110	SS.111	SS.112	SS.113	
Hor Scale 1150 Ver Scale 500 Datum (m) 10.000						
PN		S15.006	S15.005	S15.004	S15.003	
Dia (mm)		375	300	300	300	
Slope (1:X)		150.2	100.2	173.9	115.2	
Cover Level (m)	21.900	22.000	22.100	22.200	22.350	
Invert Level (m)		20.082 / 20.351	20.351 / 20.600	20.600 / 20.700	20.700 / 20.850	
Length (m)		40.395	24.945	17.390	17.275	

MH Name	SS.107	SS.108	SS.109	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000				
PN		S15.008	S15.007	
Dia (mm)		375	375	
Slope (1:X)		150.0	150.1	
Cover Level (m)	21.400	21.700	21.900	
Invert Level (m)		19.547 / 19.884	19.884 / 20.082	
Length (m)		50.560	29.710	

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MH Name	SS.106	SS.107	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000			
PN		S15.009	
Dia (mm)		375	
Slope (1:X)		150.1	
Cover Level (m)	20.800	21.400	
Invert Level (m)		19.105 / 19.547	
Length (m)		66.345	

MH Name	SS.104	SS.105	SS.106	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000				
PN		S15.011	S15.010	
Dia (mm)		450	375	
Slope (1:X)		149.0	76.1	
Cover Level (m)	19.500	20.150	20.800	
Invert Level (m)		18.150 / 18.455	18.455 / 19.105	
Length (m)		45.460	49.475	

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MH Name	SS.100	SS.101		SS.104	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000				16.011	
PN		S15.015		S15.012	
Dia (mm)		300		450	
Slope (1:X)		300.3		229.6	
Cover Level (m)	19.000	20.500	19.850	19.500	
Invert Level (m)	17.790	17.913	17.950	17.950	18.150
Length (m)		36.935		45.915	

MH Name	SS.002	SS.100	
Hor Scale 1150 Ver Scale 500 Datum (m) 7.000		1.017	
PN		S15.016	
Dia (mm)		300	
Slope (1:X)		299.9	
Cover Level (m)	19.000	19.000	
Invert Level (m)	17.558	17.790	
Length (m)		69.575	

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MH Name	SS.131	SS.132	
Hor Scale 1150 Ver Scale 500 Datum (m) 12.000			
PN		S16.000	
Dia (mm)		300	
Slope (1:X)		199.6	
Cover Level (m)	24.300	24.800	
Invert Level (m)	22.800	23.300	
Length (m)		99.775	

MH Name	SS.125	SS.126			SS.130	SS.131	
Hor Scale 1150 Ver Scale 500 Datum (m) 11.000				17.000			
PN		S16.006			S16.002	S16.001	
Dia (mm)		225			300	300	
Slope (1:X)		116.5			42.9	166.5	
Cover Level (m)	21.350	21.850	22.000	23.000	24.700	24.300	
Invert Level (m)	19.850	19.977	19.996	21.500	21.500 22.695	22.695 22.800	
Length (m)		14.795			51.262	17.485	

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MH Name	SS.120	SS.122	SS.124		
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		25.000	24.000	18.008	
PN		S16.009	S16.008		
Dia (mm)		450	375		
Slope (1:X)		250.0	149.9		
Cover Level (m)	20.750	20.850	21.250	21.350	
Invert Level (m)		18.333 18.409	18.409 18.807	19.750 19.850	
Length (m)		19.115	59.645		

MH Name	SS.103	SS.118	SS.120	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		15.012	26.000	25.000
PN		S16.011	S16.010	
Dia (mm)		525	525	
Slope (1:X)		165.4	250.0	
Cover Level (m)	19.850	20.500	20.750	
Invert Level (m)		17.950 18.188	18.188 18.333	
Length (m)		39.355	36.055	

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MH Name	SS.126	SS.133	
Hor Scale 1150 Ver Scale 500 Datum (m) 10.000		16.005	
PN		S17.000	
Dia (mm)		225	
Slope (1:X)		28.3	
Cover Level (m)	21.850	22.750	
Invert Level (m)		19.977 21.250	
Length (m)		35.995	

MH Name	SS.143		SS.146	SS.147	
Hor Scale 1150 Ver Scale 500 Datum (m) 11.000		19.000			
PN			S18.001	S18.000	
Dia (mm)			225	225	
Slope (1:X)			65.3	26.9	
Cover Level (m)	22.650	22.750	23.250	24.750	
Invert Level (m)		21.150 21.250	21.250 21.750	21.750 23.250	
Length (m)			32.660	40.355	

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MH Name	SS.136			SS.143	
Hor Scale 1150 Ver Scale 500 Datum (m) 10.000		22.000		20.000	
PN				S18.003	
Dia (mm)				300	
Slope (1:X)				84.5	
Cover Level (m)	21.500	21.700	22.250	22.650	
Invert Level (m)		19.944 19.996	20.567	20.567 21.150	
Length (m)				49.280	

MH Name	SS.134	SS.136	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		23.000	22.000
PN		S18.007	
Dia (mm)		300	
Slope (1:X)		111.9	
Cover Level (m)	20.900	21.500	
Invert Level (m)		19.400	19.944
Length (m)		60.880	

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MH Name	SS.124	SS.134	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		16.007	23.000
PN		S18.008	
Dia (mm)		375	
Slope (1:X)		193.3	
Cover Level (m)	21.250	20.900	
Invert Level (m)		18.807	19.065
Length (m)		49.875	

MH Name	SS.144	SS.145	
Hor Scale 1150 Ver Scale 500 Datum (m) 11.000		18.001	
PN		S19.000	
Dia (mm)		225	
Slope (1:X)		30.4	
Cover Level (m)	22.750	23.750	
Invert Level (m)		21.250	22.250
Length (m)		30.445	

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MH Name	SS.139	SS.140	
Hor Scale 1150 Ver Scale 500 Datum (m) 11.000		28.003	
PN		S20.000	
Dia (mm)		225	
Slope (1:X)		27.2	
Cover Level (m)	22.250	23.950	
Invert Level (m)		20.567	22.450
Length (m)		51.236	

MH Name	SS.139		SS.142	
Hor Scale 1150 Ver Scale 500 Datum (m) 10.000		28.008		
PN			S21.000	
Dia (mm)			225	
Slope (1:X)			166.7	
Cover Level (m)	22.250	22.150	21.750	
Invert Level (m)		20.567 20.624	20.624 20.750	
Length (m)			21.005	

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MH Name	SS.136	SS.148	
Hor Scale 1150 Ver Scale 500 Datum (m) 10.000		18.006	
PN		S22.000	
Dia (mm)		225	
Slope (1:X)		40.4	
Cover Level (m)	21.500	22.250	
Invert Level (m)		20.000	20.750
Length (m)		30.300	

MH Name	SS.134	SS.135	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		18.007	
PN		S23.000	
Dia (mm)		225	
Slope (1:X)		166.8	
Cover Level (m)	20.900	20.750	
Invert Level (m)		19.065	19.250
Length (m)		30.865	

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MH Name	SS.122	SS.123	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		16.008	
PN		S24.000	
Dia (mm)		225	
Slope (1:X)		116.4	
Cover Level (m)	20.850	21.200	
Invert Level (m)	19.350	19.700	
Length (m)		40.750	

MH Name	SS.120	SS.121	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		16.009	
PN		S25.000	
Dia (mm)		300	
Slope (1:X)		57.9	
Cover Level (m)	20.750	20.250	
Invert Level (m)	18.333	18.750	
Length (m)		24.140	

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MH Name	SS.118	SS.119	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		16.010	
PN		S26.000	
Dia (mm)		300	
Slope (1:X)		15.1	
Cover Level (m)	20.500	21.000	
Invert Level (m)		18.188 19.500	
Length (m)		19.850	

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Appendix H – Foul Sewer Longitudinal Sections

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MH Name	FF.020	FF.021	
Hor Scale 1150 Ver Scale 500 Datum (m)17.000		2.000	
PN		F1.000	
Dia (mm)		150	
Slope (1:X)		60.0	
Cover Level (m)	29.500	30.000	
Invert Level (m)		26.937	28.150
Length (m)		72.805	

MH Name	FF.017			FF.020	
Hor Scale 1150 Ver Scale 500 Datum (m)16.000		4.000	3.002		2.000
PN				F1.001	
Dia (mm)				225	
Slope (1:X)				150.0	
Cover Level (m)	29.250	29.400	29.600	29.500	
Invert Level (m)		25.585	25.656 26.179	26.248 26.248	26.529
Length (m)				42.140	

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MH Name	FF.014			FF.017	
Hor Scale 1150 Ver Scale 500 Datum (m)16.000		5.004			4.000
PN				F1.004	
Dia (mm)				225	
Slope (1:X)				199.9	
Cover Level (m)	28.000	28.000	28.050	29.250	
Invert Level (m)		25.279	25.311	25.311 25.585	
Length (m)				54.785	

MH Name	FF.012	FF.013	FF.014	
Hor Scale 1150 Ver Scale 500 Datum (m)14.000		6.001		5.004
PN		F1.008	F1.007	
Dia (mm)		225	225	
Slope (1:X)		200.0	27.9	
Cover Level (m)	25.200	25.750	28.000	
Invert Level (m)		22.893	22.974 22.974	25.187
Length (m)		16.220	61.695	

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MH Name	FF.010	FF.011	FF.012	
Hor Scale 1150 Ver Scale 500 Datum (m) 12.000			7.003	
PN		F1.010	F1.009	
Dia (mm)		225	225	
Slope (1:X)		33.5	200.1	
Cover Level (m)	23.550	24.000	25.200	
Invert Level (m)		21.700 22.150	22.546 22.893	
Length (m)		15.075	69.425	

MH Name	FF.009	FF.010	
Hor Scale 1150 Ver Scale 500 Datum (m) 10.000			
PN		F1.011	
Dia (mm)		225	
Slope (1:X)		35.6	
Cover Level (m)	22.000	23.550	
Invert Level (m)		20.150 21.700	
Length (m)		55.210	

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MH Name	FF.006	FF.007		FF.009	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		10.009	9.000		
PN		F1.014		F1.012	
Dia (mm)		225		225	
Slope (1:X)		200.4		61.0	
Cover Level (m)	20.600	20.900	21.050	22.000	
Invert Level (m)		18.596	18.768 19.050	19.200 20.150	
Length (m)		34.470		57.955	

MH Name	FF.003		FF.005	FF.006	
Hor Scale 1150 Ver Scale 500 Datum (m) 7.000			15.012	14.001	10.009
PN			F1.016	F1.015	
Dia (mm)			225	225	
Slope (1:X)			200.4	199.8	
Cover Level (m)	20.500	20.500	20.850	20.600	
Invert Level (m)		16.974	16.974 17.168	17.168 17.436	
Length (m)			38.880	53.550	

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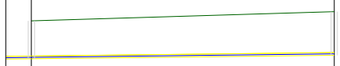
MH Name	F		FF.003	
Hor Scale 1150 Ver Scale 500 Datum (m)7.000				
PN			F1.018	
Dia (mm)			225	
Slope (1:X)			199.9	
Cover Level (m)	0.000	19.750	20.500	
Invert Level (m)		16.657	16.941 16.657	
Length (m)			56.780	

MH Name	FF.020	FF.022	
Hor Scale 1150 Ver Scale 500 Datum (m)17.000			
PN		F2.000	
Dia (mm)		150	
Slope (1:X)		60.0	
Cover Level (m)	29.500	28.250	
Invert Level (m)		26.529 27.400	
Length (m)		52.285	

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MH Name	FF.023		FF.025	
Hor Scale 1150 Ver Scale 500 Datum (m)16.000				
PN			F3.000	
Dia (mm)			150	
Slope (1:X)			60.0	
Cover Level (m)	29.125	29.050	28.850	
Invert Level (m)		26.164 26.315	26.315 27.000	
Length (m)			41.085	

MH Name	FF.018	FF.023	
Hor Scale 1150 Ver Scale 500 Datum (m)16.000			
PN		F3.002	
Dia (mm)		150	
Slope (1:X)		150.1	
Cover Level (m)	29.400	29.125	
Invert Level (m)		25.656 26.164	
Length (m)		76.245	

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MH Name	FF.017	FF.026	
Hor Scale 1150 Ver Scale 500 Datum (m)16.000		1.003	
PN		F4.000	
Dia (mm)		150	
Slope (1:X)		60.0	
Cover Level (m)	29.250	29.250	
Invert Level (m)		26.464	27.400
Length (m)		56.155	

MH Name	FF.027	FF.028			FF.031	
Hor Scale 1150 Ver Scale 500 Datum (m)16.000						
PN		F5.003			F5.000	
Dia (mm)		150			150	
Slope (1:X)		43.9			56.8	
Cover Level (m)	27.500	29.000	29.150	29.250	29.500	
Invert Level (m)		25.650	27.150	27.300	27.400	27.650
Length (m)		65.900			14.205	

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MH Name	FF.014	FF.027	
Hor Scale 1150 Ver Scale 500 Datum (m)15.000		1.006	
PN		F5.004	
Dia (mm)		150	
Slope (1:X)		149.9	
Cover Level (m)	28.000	27.500	
Invert Level (m)		25.187	25.650
Length (m)		69.425	

MH Name	FF.032	FF.033	
Hor Scale 1150 Ver Scale 500 Datum (m)13.000			
PN		F6.000	
Dia (mm)		150	
Slope (1:X)		35.9	
Cover Level (m)	25.300	26.550	
Invert Level (m)		23.450	24.700
Length (m)		44.825	

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MH Name	FF.013	FF.032	
Hor Scale 1150 Ver Scale 500 Datum (m)13.000		1.007	
PN		F6.001	
Dia (mm)		150	
Slope (1:X)		149.9	
Cover Level (m)	25.750	25.300	
Invert Level (m)		22.974	23.450
Length (m)		71.360	

MH Name	FF.034	FF.035		FF.037	
Hor Scale 1150 Ver Scale 500 Datum (m)15.000			8.000		
PN		F7.002		F7.000	
Dia (mm)		225		150	
Slope (1:X)		25.8		42.4	
Cover Level (m)	26.350	27.750	28.100	28.850	
Invert Level (m)		23.973	25.373 26.000	26.350 26.350	27.100
Length (m)		36.115		31.825	

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MH Name	FF.011	FF.034	
Hor Scale 1150 Ver Scale 500 Datum (m)13.000		1.009	
PN		F7.003	
Dia (mm)		225	
Slope (1:X)		31.2	
Cover Level (m)	24.000	26.350	
Invert Level (m)		22.150	23.973
Length (m)		56.885	

MH Name	FF.035	FF.038	
Hor Scale 1150 Ver Scale 500 Datum (m)15.000		7.001	
PN		F8.000	
Dia (mm)		150	
Slope (1:X)		60.0	
Cover Level (m)	27.750	28.050	
Invert Level (m)		25.373	26.200
Length (m)		49.600	

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MH Name	FF.007	FF.039	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		1.013	
PN		F9.000	
Dia (mm)		150	
Slope (1:X)		60.0	
Cover Level (m)	20.900	21.600	
Invert Level (m)		18.768	19.750
Length (m)		58.900	

MH Name	FF.053	FF.054	FF.056	
Hor Scale 1150 Ver Scale 500 Datum (m) 11.000		11.001		
PN		F10.002	F10.000	
Dia (mm)		150	150	
Slope (1:X)		20.0	20.6	
Cover Level (m)	22.550	23.100	25.400	
Invert Level (m)		20.096	21.250 21.350	23.550
Length (m)		23.085	45.415	

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MH Name	FF.050	FF.051	FF.053	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		12.000		11.001
PN		F10.005	F10.003	
Dia (mm)		225	225	
Slope (1:X)		149.9	149.9	
Cover Level (m)	21.350	21.800	22.550	
Invert Level (m)		18.434	18.650 18.673	18.977
Length (m)		32.370	45.575	

MH Name	FF.041	FF.050	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		13.006	12.000
PN		F10.006	
Dia (mm)		225	
Slope (1:X)		200.1	
Cover Level (m)	20.500	20.750 21.350	
Invert Level (m)		18.082 18.126 18.126	18.434
Length (m)		61.620	

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MH Name	FF.040	FF.041	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000			
PN		F10.008	
Dia (mm)		225	
Slope (1:X)		199.9	
Cover Level (m)	20.000	20.500	
Invert Level (m)		17.761	18.082
Length (m)		64.164	

MH Name	FF.006	FF.040	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		1.014	
PN		F10.009	
Dia (mm)		225	
Slope (1:X)		200.2	
Cover Level (m)	20.600	20.000	
Invert Level (m)		17.436	17.761
Length (m)		65.075	

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MH Name	FF.053		FF.058	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		10.002		
PN			F11.000	
Dia (mm)			150	
Slope (1:X)			60.0	
Cover Level (m)	22.550	22.400	21.750	
Invert Level (m)		19.114	19.114	19.900
Length (m)			47.130	

MH Name	FF.050	FF.059	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		10.005	
PN		F12.000	
Dia (mm)		150	
Slope (1:X)		60.0	
Cover Level (m)	21.350	21.600	
Invert Level (m)		19.315	19.750
Length (m)		26.085	

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MH Name	FF.047	FF.048	FF.049	
Hor Scale 1150 Ver Scale 500 Datum (m)11.000				
PN		F13.001	F13.000	
Dia (mm)		150	150	
Slope (1:X)		38.6	30.8	
Cover Level (m)	22.700	23.100	24.600	
Invert Level (m)		20.950 21.350	21.350 22.750	
Length (m)		15.450	43.105	

MH Name	FF.046	FF.047	
Hor Scale 1150 Ver Scale 500 Datum (m)10.000			
PN		F13.002	
Dia (mm)		150	
Slope (1:X)		102.6	
Cover Level (m)	21.700	22.700	
Invert Level (m)		19.950 20.950	
Length (m)		102.580	

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MH Name	FF.042	FF.043				
Hor Scale 1150 Ver Scale 500 Datum (m)8.000		10.006				
PN		F13.006				
Dia (mm)		225				
Slope (1:X)		91.1				
Cover Level (m)	20.750	21.300	21.450	21.550	21.700	
Invert Level (m)		19.000	19.550 19.550	19.700 19.700	19.800 19.800	19.950
Length (m)		50.100				

MH Name	FF.005	FF.060	FF.061	
Hor Scale 1150 Ver Scale 500 Datum (m)8.000		1.015		
PN		F14.001	F14.000	
Dia (mm)		150	150	
Slope (1:X)		149.5	60.0	
Cover Level (m)	20.850	20.850	20.850	
Invert Level (m)		18.440 18.573	18.573 19.000	
Length (m)		19.880	25.615	

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MH Name	FF.071		FF.073	FF.074	
Hor Scale 1150 Ver Scale 500 Datum (m) 11.000					
PN			F15.001	F15.000	
Dia (mm)			150	150	
Slope (1:X)			60.0	60.0	
Cover Level (m)	24.800	24.500	24.000	23.000	
Invert Level (m)		20.264 20.315	20.315 20.858	20.858 21.650	
Length (m)			32.585	47.490	

MH Name	FF.069	FF.070	FF.071	
Hor Scale 1150 Ver Scale 500 Datum (m) 11.000		16.001		
PN		F15.004	F15.003	
Dia (mm)		225	225	
Slope (1:X)		199.7	199.7	
Cover Level (m)	24.300	24.630	24.800	
Invert Level (m)	19.747	19.999	19.999 20.264	
Length (m)		50.335	52.920	

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MH Name	FF.066	FF.067			
Hor Scale 1150 Ver Scale 500 Datum (m) 10.000		20.004 19.000		17.002	
PN		F15.007			
Dia (mm)		225			
Slope (1:X)		200.0			
Cover Level (m)	23.000	24.700	24.250	24.300	
Invert Level (m)		19.221	19.490 19.490	19.542	19.747
Length (m)		53.655			

MH Name	FF.064		FF.066	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		22.003		20.004 19.000
PN			F15.008	
Dia (mm)			225	
Slope (1:X)			200.0	
Cover Level (m)	21.250	21.350	23.000	
Invert Level (m)		18.800 18.915	18.915 19.221	
Length (m)			61.200	

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MH Name	FF.062	FF.063	FF.064	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		24.001		22.003
PN		F15.011	F15.010	
Dia (mm)		225	225	
Slope (1:X)		199.3	199.9	
Cover Level (m)	20.750	20.880	21.250	
Invert Level (m)		18.434	18.517 / 18.517	18.800
Length (m)		16.540	56.560	

MH Name	FF.004	FF.062	
Hor Scale 1150 Ver Scale 500 Datum (m) 7.000		1.016	24.001
PN		F15.012	
Dia (mm)		225	
Slope (1:X)		200.0	
Cover Level (m)	20.500	20.750	
Invert Level (m)		18.272	18.434
Length (m)		32.440	

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MH Name	FF.070	FF.075	FF.076	
Hor Scale 1150 Ver Scale 500 Datum (m) 11.000		15.003		
PN		F16.001	F16.000	
Dia (mm)		225	150	
Slope (1:X)		200.2	60.0	
Cover Level (m)	24.630	22.850	23.250	
Invert Level (m)		20.591	20.883 / 20.883	21.400
Length (m)		58.455	31.030	

MH Name	FF.078	FF.079	
Hor Scale 1150 Ver Scale 500 Datum (m) 10.000		18.001	
PN		F17.000	
Dia (mm)		150	
Slope (1:X)		60.0	
Cover Level (m)	22.250	22.600	
Invert Level (m)		19.876	20.750
Length (m)		52.460	

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MH Name	FF.068		FF.078	
Hor Scale 1150 Ver Scale 500 Datum (m)10.000		15.005		18.001
PN			F17.001	
Dia (mm)			225	
Slope (1:X)			199.9	
Cover Level (m)	24.250	24.000	22.250	
Invert Level (m)		19.542 19.606	19.606 19.876	
Length (m)			53.960	

MH Name	FF.078		FF.081	
Hor Scale 1150 Ver Scale 500 Datum (m)10.000		17.000		
PN			F18.000	
Dia (mm)			150	
Slope (1:X)			59.9	
Cover Level (m)	22.250	22.200	22.000	
Invert Level (m)		20.346 20.346	20.650	
Length (m)			18.215	

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MH Name	FF.066	FF.088	
Hor Scale 1150 Ver Scale 500 Datum (m)10.000		20.004 15.007	
PN		F19.000	
Dia (mm)		150	
Slope (1:X)		60.0	
Cover Level (m)	23.000	21.950	
Invert Level (m)		19.221 20.108	
Length (m)		53.190	

MH Name	FF.083	FF.084	FF.085	FF.086	
Hor Scale 1150 Ver Scale 500 Datum (m)14.000					
PN		F20.002	F20.001	F20.000	
Dia (mm)		150	150	150	
Slope (1:X)		28.7	24.2	27.1	
Cover Level (m)	24.750	25.500	26.500	28.500	
Invert Level (m)		22.925 23.650	23.650 24.650	24.650 26.650	
Length (m)		20.825	24.155	54.195	

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MH Name	FF.066	FF.082	FF.083	
Hor Scale 1150 Ver Scale 500 Datum (m) 10.000		19.007	21.000	
PN		F20.004	F20.003	
Dia (mm)		225	150	
Slope (1:X)		31.3	60.0	
Cover Level (m)	23.000	24.250	24.750	
Invert Level (m)		21.150	22.400	22.400	22.925	
Length (m)		39.150	31.500	

MH Name	FF.082	FF.087	
Hor Scale 1150 Ver Scale 500 Datum (m) 13.000		20.003	
PN		F21.000	
Dia (mm)		150	
Slope (1:X)		36.4	
Cover Level (m)	24.250	25.750	
Invert Level (m)		22.400	23.900	
Length (m)		54.590	

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MH Name	FF.089	FF.090		FF.092	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		23.000			
PN		F22.002		F22.000	
Dia (mm)		225		150	
Slope (1:X)		87.6		60.1	
Cover Level (m)	20.900	21.700	21.750	21.750	
Invert Level (m)		19.050	19.890	19.990	20.250	
Length (m)		73.595		15.620	

MH Name	FF.064	FF.089	
Hor Scale 1150 Ver Scale 500 Datum (m) 9.000		15.009	23.000
PN		F22.003	
Dia (mm)		225	
Slope (1:X)		200.2	
Cover Level (m)	21.250	20.900	
Invert Level (m)		18.801	19.050	
Length (m)		49.855	

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MH Name	FF.089	FF.093	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		22.002	
PN		F23.000	
Dia (mm)		150	
Slope (1:X)		59.9	
Cover Level (m)	20.900	20.850	
Invert Level (m)		19.050	19.366
Length (m)		18.930	

MH Name	FF.062	FF.094	FF.095	
Hor Scale 1150 Ver Scale 500 Datum (m) 8.000		15.011		
PN		F24.001	F24.000	
Dia (mm)		225	150	
Slope (1:X)		150.0	60.0	
Cover Level (m)	20.750	20.850	20.850	
Invert Level (m)		18.868	19.119	19.119 19.500
Length (m)		37.695	22.865	

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Appendix J – Petrol Interceptor Details

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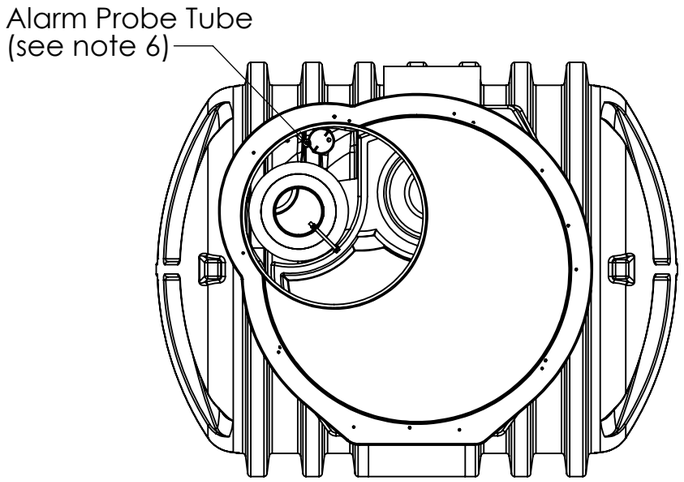
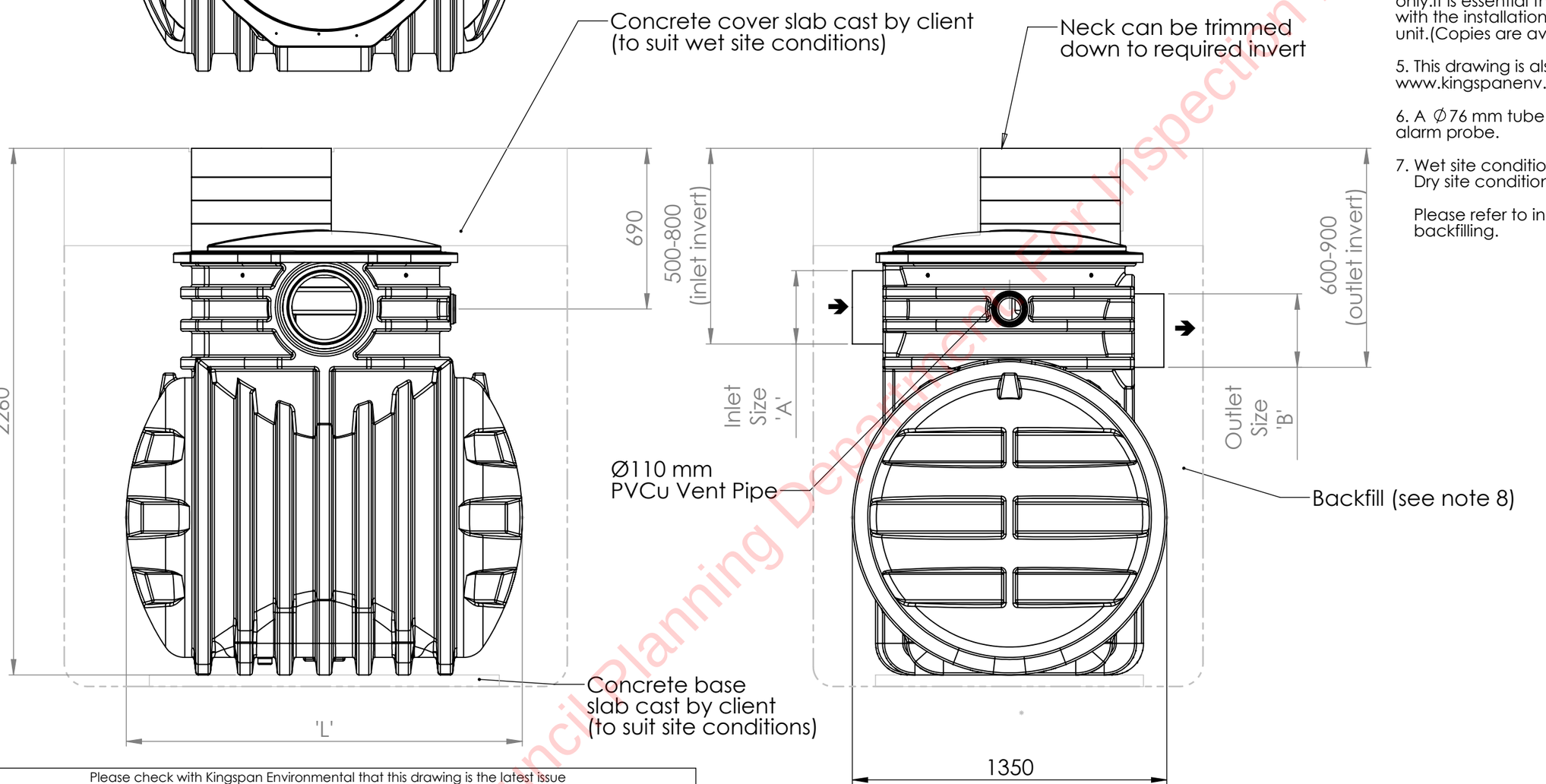
Unit Ref No	Nominal Flow	Dim L (mm)	Approx Empty Weight (kgs)	Fall across unit	Inlet Size 'A'	Outlet Size 'B'
NSBP003	3 L/s	1700	180	100	Ø160 mm	Ø160 mm
NSBP004	4 L/s	1700	180	100	Ø315 mm	Ø315 mm
NSBP006	6 L/s	1700	180	100		

** Inlet/Outlet size
A must equal B**





Notes:-

1. Inlet/Outlet pipes are plain pipe ∅315 mm PVCu. The standard EN 858 states minimum connection sizes, units ordered with different sized connections are not fully compliant with the standard.

2. Extension necks for deeper inverts can be provided. These can be cut in 200 mm sections. Max 2.0m Invert recommended. Please ask our sales department for further details.

3. All units require appropriate cover and frame to suit applied loadings.

4. This drawing should be used for dimensional information only.It is essential that this drawing is read in conjunction with the installation guidelines supplied with the unit.(Copies are available from our sales dept.).

5. This drawing is also available on our website www.kingspanenv.com.

6. A ∅76 mm tube (internal) is supplied to house an oil alarm probe.

7. Wet site conditions - Concrete Backfill
Dry site conditions - Pea Shingle Backfill

Please refer to installation manual for details of correct backfilling.

Please check with Kingspan Environmental that this drawing is the latest issue				
Issue	Date	Drawn by	Approved by	Description
07	15/12/11	S.Gill		CC1020
06	15/12/10	S.Gill		CC 934
05	24/03/10	S.Gill		CC817
04	24/02/10	S.Gill		CC794
03	23/02/10	S.Gill		Table Edited
02	23/09/09	S.Gill		Drawing Description Changed
01	19/03/09	S.Gill		Initial Release

All dimensions in mm

Scale: Not to scale

Y:\engineering\Drawing Data\02 - Sales Drawings\DS\DS - 09\DS0993 NSBP003-NSBP006 Class 1 Bypass Seperator Sales Drawing

Material : n/a	Tolerance : n/a
Finish : n/a	Thickness : n/a
Weight : Kgs n/a	Surface Area : n/a

Drawing : NSBP003,004 & 006 Sales Drawing

Drg No: DSO993

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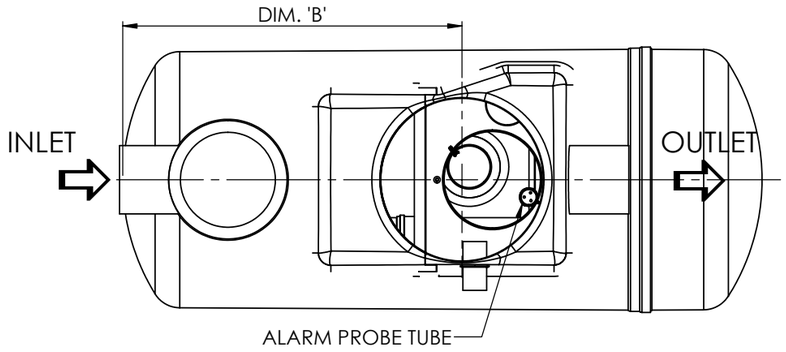
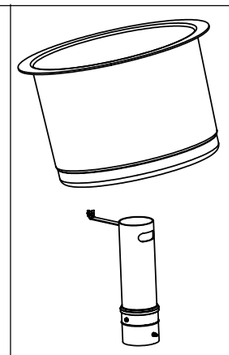
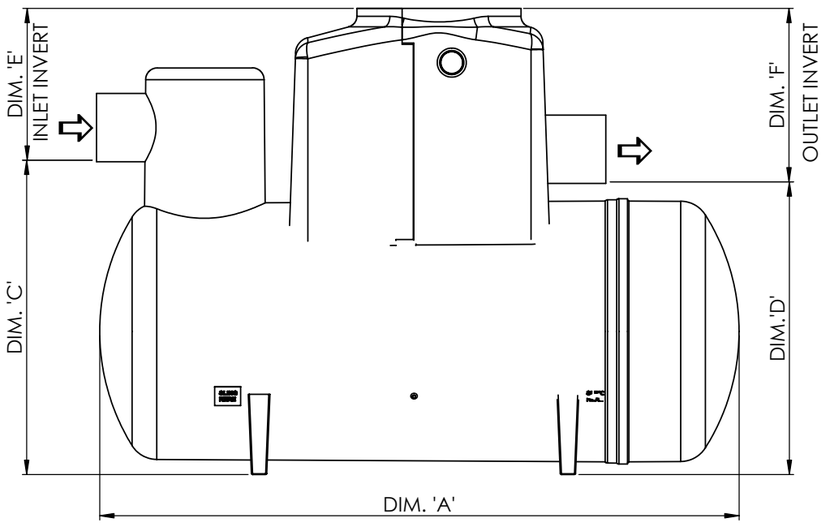
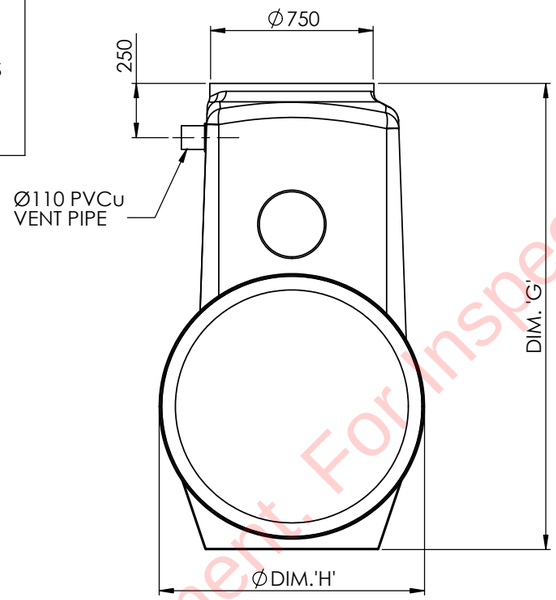




EXTENSION PARTS (IF REQUIRED) INCLUDED IN PRODUCT CODE

NOTES
1. UNITS ARE SUPPLIED WITH THE STANDARD (MINIMUM) PIPEWORK SIZE, AND ORIENTATION SHOWN ON THE DRAWING. THE STANDARD EN858-1 STATES MINIMUM CONNECTION SIZES, UNITS ORDERED WITH DIFFERENT SIZE CONNECTIONS MAY NOT BE FULLY COMPLIANT WITH THE STANDARD. PLEASE CONSULT OUR SALES DEPARTMENT FOR DETAILS OF AVAILABLE OPTIONS, BUT PLEASE NOTE WE DO NOT ALTER INTERNAL PIPEWORK.
2. ALL UNITS SUPPLIED ARE CLASS 1 AND INCLUDE A COALESCER.
3. EXTENSION PARTS FOR DEEPER INVERTS CAN BE PROVIDED FOR ON SITE ASSEMBLY.
4. ALL UNITS REQUIRE APPROPRIATE CONCRETE BASE, COVER AND FRAME TO SUIT APPLIED LOADINGS.
5. THIS DRAWING SHOULD BE USED FOR DIMENSIONAL INFORMATION ONLY.
6. A Ø76mm TUBE IS SUPPLIED TO HOUSE AN OIL ALARM PROBE.





UNIT	NOMINAL FLOW (l/sec.)	DIM.'A'	DIM.'B'	DIM.'C'	DIM.'D'	DIM.'E'	DIM.'F'	DIM.'G'	DIM.'H'	STD. PIPE Ø	APPROX. EMPTY WEIGHT (kg)	FALL ACROSS UNIT
NSBE010	10.0	2070	1095	1450	1350	700	800	2150	1220	315	160	100
NSBE015	15.0	2950	1560	1450	1350	700	800	2150	1220	315	200	100
NSBE020	20.0	3893	2016	1450	1350	700	800	2150	1220	375	220	100
NSBE025	25.0	3575	1900	1680	1580	700	800	2380	1420	375	300	100
NSBE030	30.0	4265	2263	1680	1580	700	800	2380	1420	450	325	100

Please check with Kingspan Environmental that this drawing is the latest issue

Issue	Date	Drawn by	Approved by	Description
05	24.06.13	T.Kelly		CC1131 - Case Feet Changed
04	13.02.13	T.Kelly		CC981 Phase 2 - NSBE025 & 030 Added

All dimensions in mm

Scale: Not to scale

R:\Drawing Data\02 - Sales Drawings\DS\DS - 11\DS1155

Material : Various	Tolerance :
Finish :	Thickness : n/a
Weight :	Surface Area :

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Drawing : DS1155

NSBE010 - NSBE030 Bypass Separators

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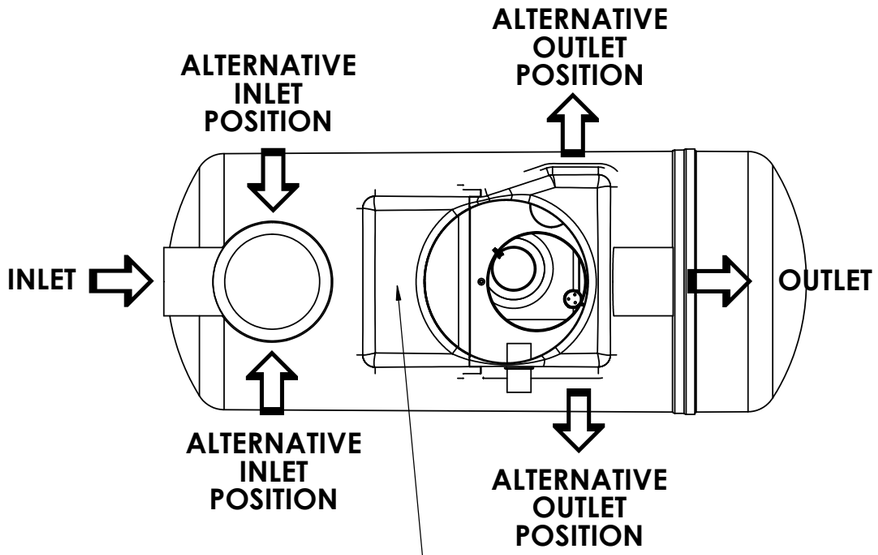
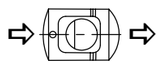
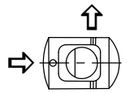
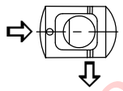
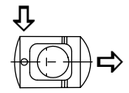
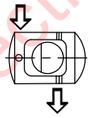
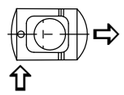
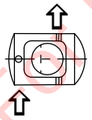


Please Note:-
Due to the physically small size of the NSBE010, the inlet pipe, all orientation options, is fitted directly into this turret.

Pipe Orientation Options		
OPTION A 	OPTION B 	OPTION C 
OPTION D 	OPTION E	OPTION F 
OPTION G 	OPTION H 	OPTION K

Material : Various	Tolerance (unless stated) :	**Drawing : DS1155** Page 2 of 2
Finish :	Thickness : n/a	NSBE010 - 030 BYPASS SEPARATORS
Weight : 229.91 Kg	Surface Area : m²	
Modelled By :		

All Dimensions In mm | Scale: Do Not Scale | Third Angle Projection

R:\Drawing Data\02 - Sales Drawings\DS\DS - 11\DS1155

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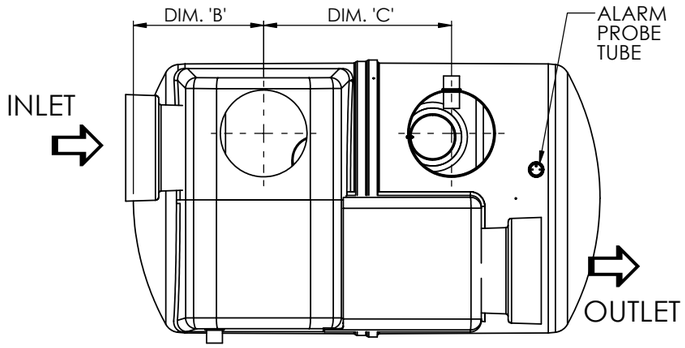
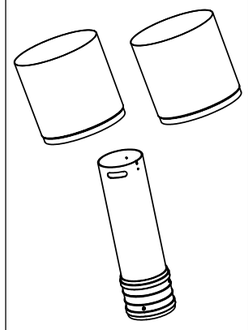
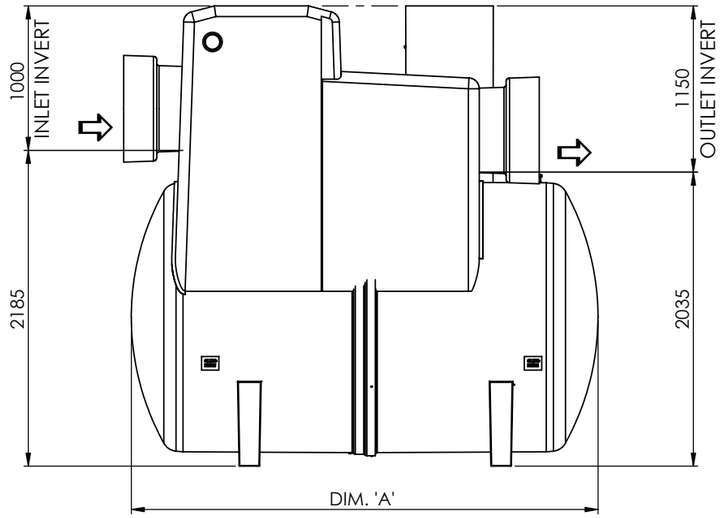
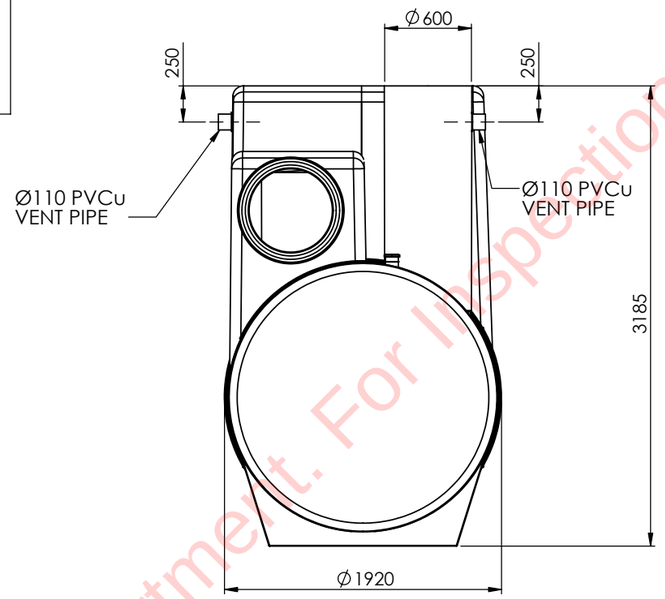




EXTENSION PARTS (IF REQUIRED) INCLUDED IN PRODUCT CODE

NOTES
1. UNITS ARE SUPPLIED WITH THE STANDARD (MINIMUM) PIPEWORK SIZE, AND ORIENTATION SHOWN ON THE DRAWING. THE STANDARD EN858-1 STATES MINIMUM CONNECTION SIZES, UNITS ORDERED WITH DIFFERENT SIZE CONNECTIONS MAY NOT BE FULLY COMPLIANT WITH THE STANDARD. PLEASE CONSULT OUR SALES DEPARTMENT FOR DETAILS OF AVAILABLE OPTIONS, BUT PLEASE NOTE WE DO NOT ALTER INTERNAL PIPEWORK.
2. ALL UNITS SUPPLIED ARE CLASS 1 AND INCLUDE A COALESCER.
3. EXTENSION PARTS FOR DEEPER INVERTS CAN BE PROVIDED FOR ON SITE ASSEMBLY.
4. ALL UNITS REQUIRE APPROPRIATE CONCRETE BASE, COVER AND FRAME TO SUIT APPLIED LOADINGS.
5. THIS DRAWING SHOULD BE USED FOR DIMENSIONAL INFORMATION ONLY.
6. A Ø76mm TUBE IS SUPPLIED TO HOUSE AN OIL ALARM PROBE.





UNIT	NOMINAL FLOW (l/sec.)	DIM.'A'	DIM.'B'	DIM.'C'	STD. PIPE Ø	APPROX. EMPTY WEIGHT (kg)	FALL ACROSS UNIT
NSBE040	40.0	3230	902	1300	500	713	150
NSBE050	50.0	3960	1243	1325	600	782	150

Please Check with Environmental Treatment Systems Limited For The Latest Issue Of This Drawing

Issue	Date	Drawn by	Approved by	Description
01	03.03.14	T.Kelly		CC981 Phase 3 - Sales Release

All Dimensions In mm | Scale: Do Not Scale | Third Angle Projection

R:\Drawing Data\02 - Sales Drawings\DS\DS - 12\DS1224

Material : Various | Tolerance (unless stated) :
Finish : | Thickness : n/a
Weight : 608.07 Kg | Surface Area : m²
Modelled By : Name

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Drawing : DS1224

NSBE040 & NSBE050 Bypass Separators

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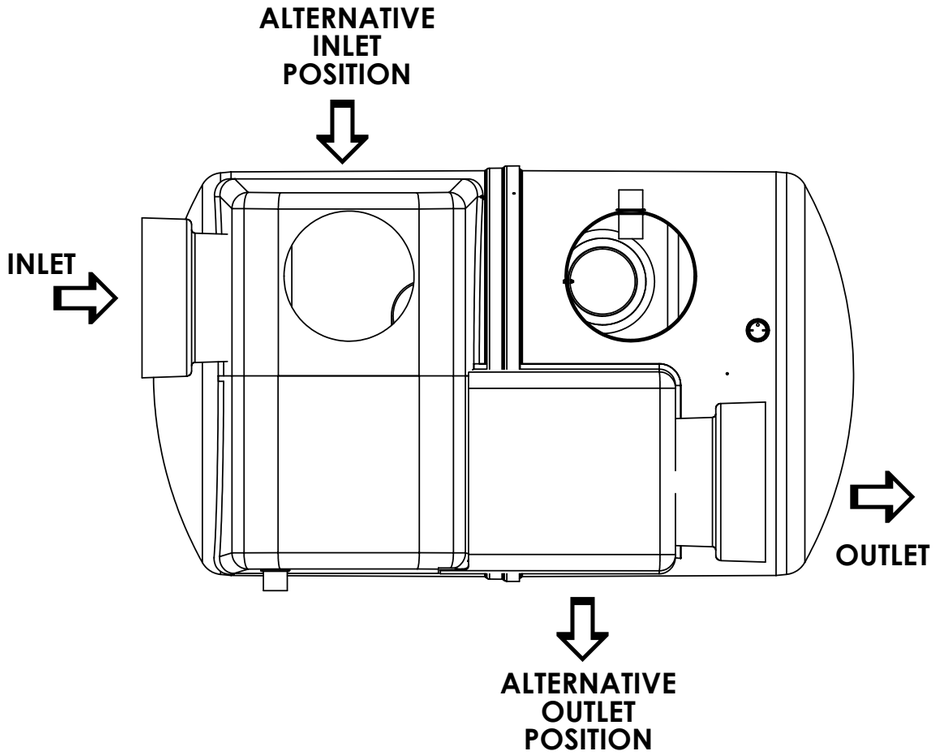

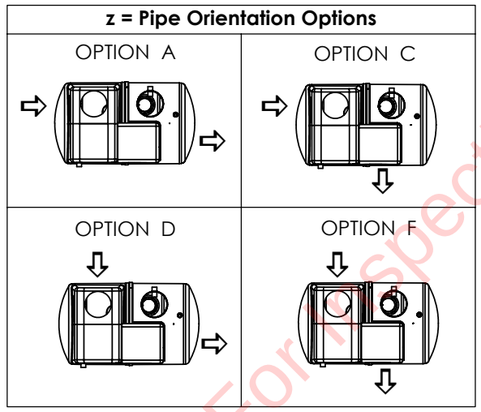

Material : Various	Tolerance (unless stated) :	**Drawing : DS1224** Page 2 of 2
Finish :	Thickness : n/a	
Weight : 608.07 Kg	Surface Area : m²	**NSBE040 & NSBE050 Bypass Separators**
Modelled By : Name		

All Dimensions In mm	Scale: Do Not Scale	Third Angle Projection	Kingspan Environmental reserve the right to alter the details of this drawing without prior notice. This drawing is copyright and may not be reproduced or used without the written permission of Kingspan Environmental	Kingspan Environmental

R:\Drawing Data\02 - Sales Drawings\DS\DS - 12\DS1224

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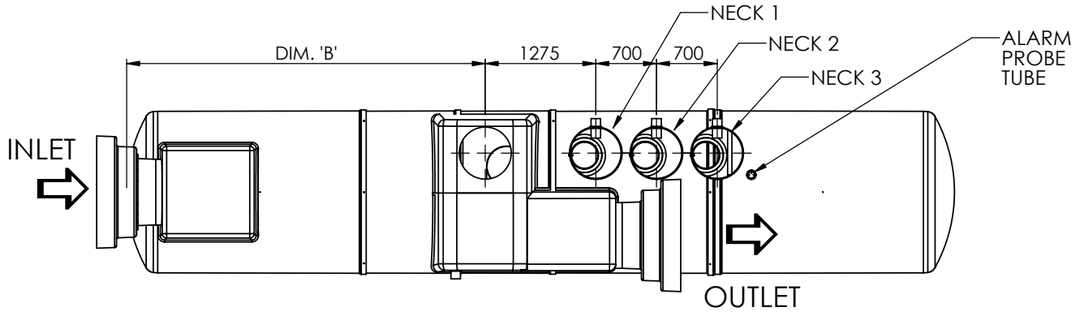

NOTES
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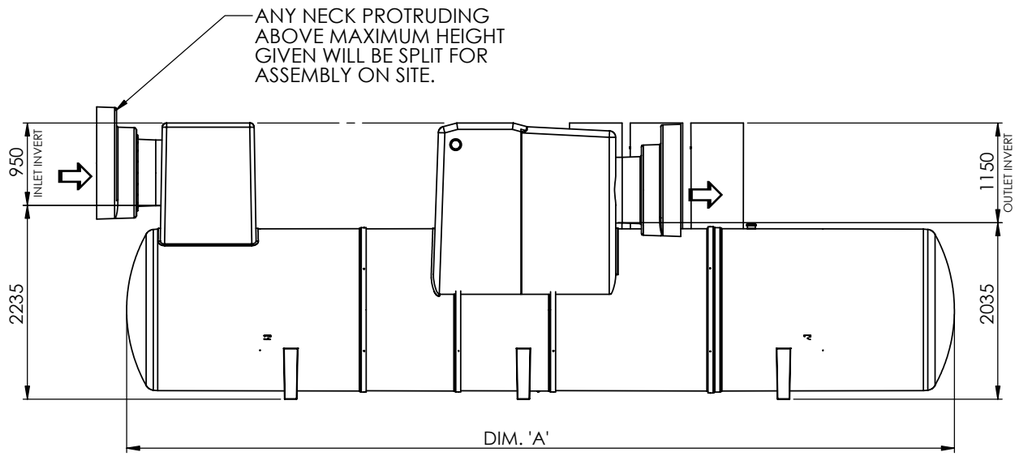
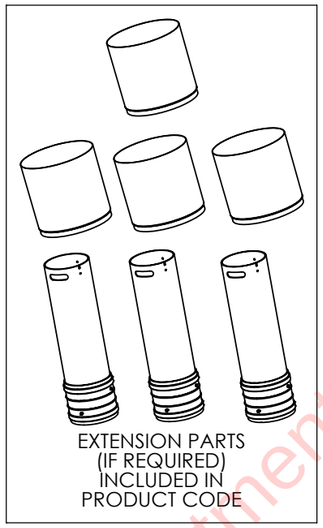
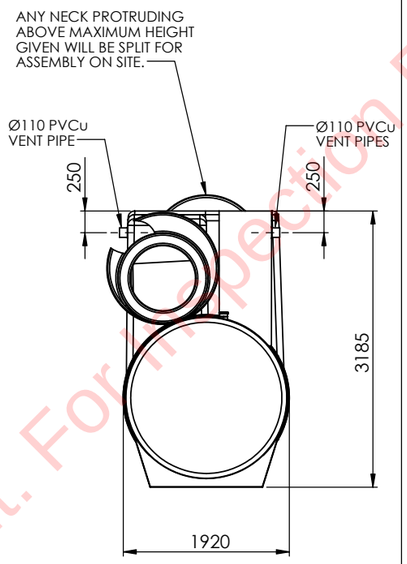
5. THIS DRAWING SHOULD BE USED FOR DIMENSIONAL INFORMATION ONLY.
6. A Ø76mm TUBE IS SUPPLIED TO HOUSE AN OIL ALARM PROBE.







UNIT	NOMINAL FLOW (l/sec.)	DIM.'A'	DIM.'B'	STD. PIPE Ø	NECK 1 FITTED	NECK 2 FITTED	NECK 3 FITTED	APPROX. EMPTY WEIGHT (kg)	FALL ACROSS UNIT
NSBE075	75.0	5841	2333	675	✓	✓		1122	200
NSBE100	100.0	7661	3122	750	✓	✓		1300	200
NSBE125	125.0	9548	4136	750	✓	✓	✓	1560	200

Please Check with Environmental Treatment Systems Limited For The Latest Issue Of This Drawing

Issue	Date	Drawn by	Approved by	Description
01	03.03.14	T.Kelly		CC981 Phase 3 - Sales Issue

All Dimensions In mm | Scale: Do Not Scale | Third Angle Projection

R:\Drawing Data\02 - Sales Drawings\DS\DS - 12\DS1225

Material : Unfilled Spray | Tolerance (unless stated) : ±0.5mm
Finish : n/a | Thickness : 3mm
Weight : 4.62kg Min | Surface Area : EXT 2.02 m²
Modelled By :

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Drawing : DS1225

NSBE075 - NSBE125 Bypass Separators

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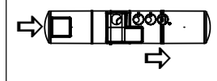
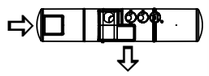
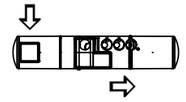
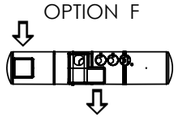
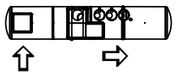
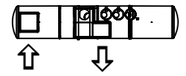
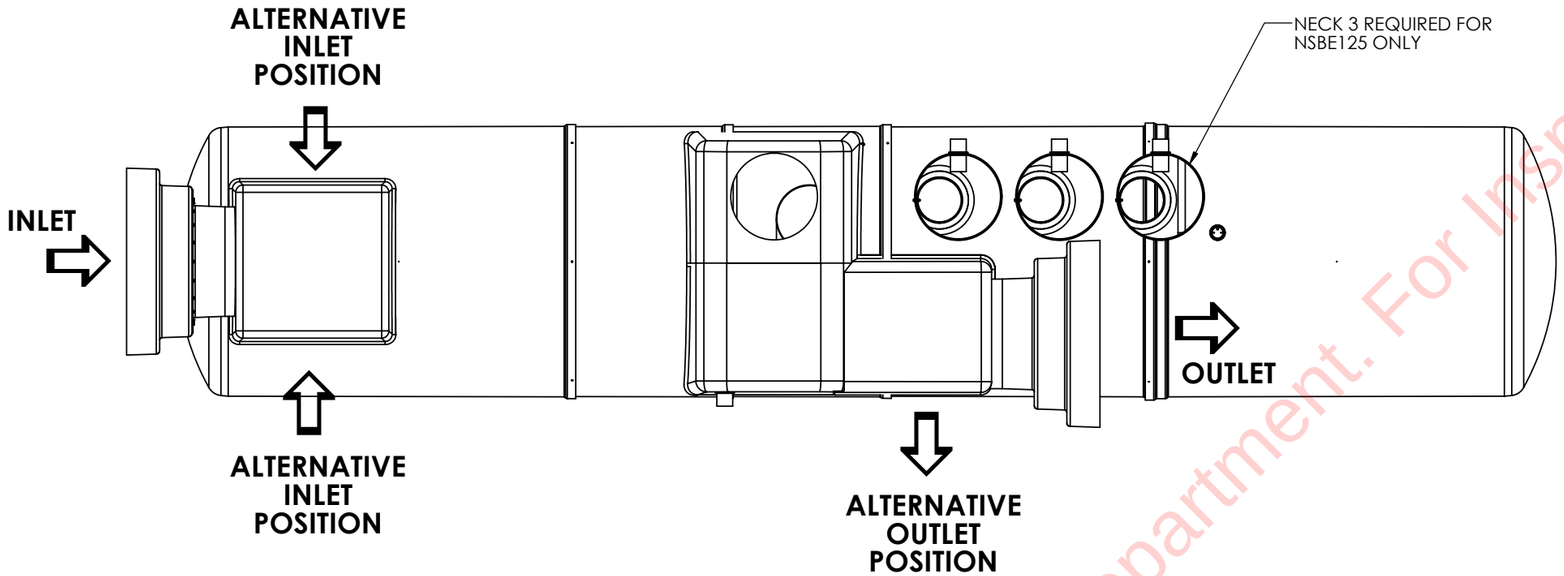
z = Pipe Orientation Options		
OPTION A 	OPTION C 	OPTION D 
OPTION F 	OPTION G 	OPTION K 



Material : Various	Tolerance (unless stated) :	**Drawing : DS1225** Page 2 of 2
Finish :	Thickness : n/a	
Weight : 1345.87 Kg	Surface Area : m²	**NSBE075 - NSBE125 Bypass Separators**
Modelled By :		

All Dimensions In mm	Scale: Do Not Scale	Third Angle Projection	Kingspan Environmental reserve the right to alter the details of this drawing without prior notice. This drawing is copyright and may not be reproduced or used without the written permission of Kingspan Environmental	Kingspan Environmental

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Appendix K – Hydrobrake Details

Hydro-Brake® Flow Control

Modelling Guide

Unit Selection Design Guide

Overview

Hydro-Brake® Flow Controls restrict the flow in surface/storm water or foul/combined sewer systems by inducing a vortex flow pattern in the water passing through the device, having the effect of increasing back-pressure.

Their 'hydrodynamic' rather than 'physical restriction' based operation provides flow regulation whilst maintaining larger clearances than most other types of flow control, making them less susceptible to blockage. Their unique "S"-shaped head-flow characteristic also enables them to pass greater flows at lower heads, which can enable more efficient use of upstream storage facilities.

This document provides guidance relating to the selection and use of Hydro-Brake® Flow Controls for use in surface/storm water and foul/combined sewer systems.

The information provided here is intended for the purposes of general guidance only - individual application requirements may differ. If in doubt, or to enquire about new product additions, please contact HRD Technologies Ltd.

STH Range of Hydro-Brake® Flow Controls

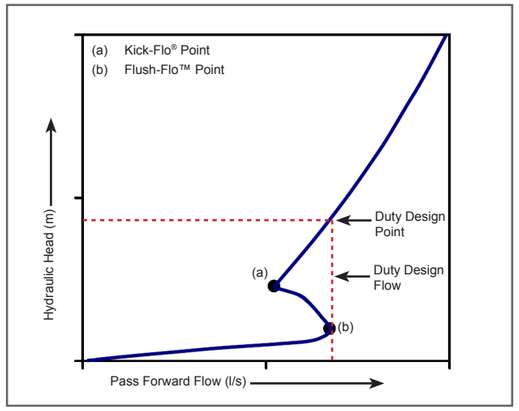
BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE No 08/4599

See back cover for details.

Hydraulic Characteristics and Specification

Hydro-Brake® Flow Controls should be selected such that the duty/design flow is not exceeded at any point on the head-flow curve, see illustration right. If this is not achievable using the initially selected unit, it may be appropriate to select an alternative option (see selection guidance overleaf).

While the primary aim of a flow control is to provide a particular flow rate at a given upstream head (giving a design/duty point), it is important to note that secondary opportunities, such as potential for optimised storage use, derive from consideration of the full hydraulic characteristic. It is therefore important to ensure that the same flow control, or one confirmed to provide equivalent hydraulic performance, is implemented in any final installation.



Typical Hydro-Brake® Head Versus Flow Characteristics

To ensure correct implementation a multiple design-point specification, defining the main hydraulic features of the selected flow control, can be provided by HRD Technologies Ltd. This should include at least the following information:

- outlet size and model of Hydro-Brake® Flow Control
- definition of the duty/design point (head and flow)
- definition of the Flush-Flo™ point (head and flow)
- definition of the Kick-Flo® point (head and flow)

To ensure that a drainage system performs as designed, it is strongly recommended that this information is reproduced on any technical specifications.

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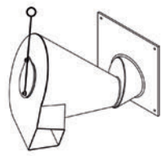
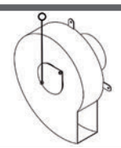
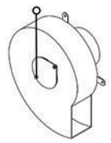
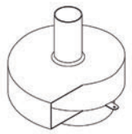
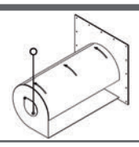
Hydro-Brake® Flow Control Models Supported in Micro Drainage

The Table below provides a summary of the Hydro-Brake® Flow Control models currently supported by the Micro Drainage programs, including details of unit styles, applications and design/installation considerations. Advice regarding unit selection is provided in subsequent sections.

WinDes® Reference Code	Style / Typical Shape	Application	Design / Installation Notes
Md1 Md2 Md4 Md14	**Conical** 	Foul / combined and surface / storm water.	With the exception of the Md14, conical units require benching into the intake (the Md14 has a piped intake). They generally require larger manholes than equivalent sump-type units.
Md5 Md6 Md7 Md12	**Sump-Type** 	Surface / storm water only.	Sump-type units require the provision of a sump to accommodate the flow control. As this will always be full of water, sump-type units are unsuitable for use in foul / combined systems.
Md13	**Sump-Type** BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE No 08/4599 STH Range of Hydro-Brake® Flow Controls 	Surface / storm water only.	The Md13 (STH) unit will always have an outlet size in excess of 75 mm and can always be fitted to a 225 mm diameter outlet pipe or larger.
Md8 Md9 Md11	**Vertical Discharge** 	Foul / combined and surface / storm water.	Vertical discharge units require a chamber design to accommodate the vertically directed outlet. They do not have S-shaped head / discharge curves and are for special applications only - please refer to HRD Technologies Ltd for advice.
Md10	**Tubular** 	Foul / combined and surface / storm water.	Tubular units require benching into the intake. They do not have S-shaped head / discharge curves and are for special applications only - please refer to HRD Technologies Ltd for advice.

Note: For system modelling using other software packages, HRD Technologies Ltd can provide individual unit head / flow characteristics in an appropriate format.

General Advice

Selection of the most appropriate Hydro-Brake® Flow Control for a particular application depends on a number of considerations, including the type of sewer system, the hydraulic characteristic of the device, device clearances and overall physical dimensions. The Micro Drainage programs provide outputs for hydraulic characteristic and outlet size.

The table opposite provides general selection guidance taking into account the considerations of type of sewer system, device clearances and overall physical dimensions. This should be considered along with other information provided here and in conjunction with the advice contained within the software design program that is being used.

The Table should be followed from the top, using the left hand column for surface/storm water applications and the right hand column for foul/combined applications. The 'general comments' provided are relevant to both applications.

HRD Technologies Ltd offer a free design service and can assist with unit selection.

General Guidance on Unit Selection

Surface / Storm Water Applications	Foul / Combined Applications
1) Select sump-type Md13 (STH) initially. This is a British Board of Agrément (BBA) approved product that is currently only available in certain sizes – if a size is not available for the specified duty/design point go to 2) otherwise use Md13 (STH). The Md13 (STH) has a minimum outlet size in excess of 75 mm and can always be fitted to a 225 mm diameter outlet pipe (or greater).	1) Select conical-type Md4 (CX) initially provided the required outlet >150 mm. If the required manhole/chamber size is too large go to 2) otherwise use Md4 (CX).
2) Select sump-type Md6 (SXH) initially provided the required outlet >75 mm (please seek advice if outlet <75 mm). If required outlet >200 mm go to 3) otherwise use Md6 (SXH).	2) Select conical-type Md2 (CH) provided the required outlet >150 mm. If the required manhole/chamber size is too large go to 3) otherwise use Md2 (CH).
3) Select sump-type Md5 (SH) or Md12 (SMXH) provided the required outlet >75 mm (please seek advice if outlet <75 mm). If required outlet >250 mm (Md5 - SH) or >300 mm (Md12 - SMXH) go to 4) otherwise use Md5 (SH) /Md12 (SMXH).	3) Select conical-type Md1 (C) provided the required outlet >429 mm. If the required manhole/chamber size is too large go to 4) otherwise use Md1 (C).
4) Select conical-type Md4 (CX) provided the required outlet >100 mm. This unit does not require a sump arrangement but requires benching into the intake. If the required manhole/chamber size is too large go to 5), otherwise use Md4 (CX).	4) Vertical discharge units Md8 (SV), Md9 (SMV) and Md11 (SXV) can be considered if their outlets are >150 mm. Their physical dimensions should be considered - the Md9 (SMV) is typically used when the diameter of the Md8 (SV) and Md11 (SXV) >200 to 250 mm. If none of these units are suitable go to 5).
5) Select conical-type Md2 (CH) unit provided the required outlet >100 mm. This unit does not require a sump arrangement but requires benching into the intake. If the required manhole/chamber size is too large go to 6), otherwise use Md2 (CH).	5) Select tubular-type Md10 (TH) provided the required outlet >333 mm. This is sometimes the only option that will meet a certain head/discharge relationship (eg. low head, low flow situations). It should only be used when there is no other alternative.
6) Select conical-type Md1 (C) provided the required outlet >285 mm. This unit does not require a sump arrangement but requires benching into the intake. If the required manhole/chamber size is too large go to 7), otherwise use Md1 (C).	For design assistance for any Hydro-Brake® Flow Control please call: **01-4013964** or **e-mail: enquiries@hrdtec.com**
7) Select sump-type Md7 (SMH) provided the required outlet >75 mm. If the required outlet >300 mm then go to 8), otherwise use Md7 (SMH).	
8) Vertical discharge units Md8 (SV), Md9 (SMV) and Md11 (SXV) can be considered provided the required outlet >75 mm. Their physical dimensions should be considered - the Md9 (SMV) is typically used when the diameter of the Md8 (SV) and Md11 (SXV) >200 to 250 mm. If none of these units are suitable go to 9).	
9) Select tubular-type Md10 (TH) provided the required outlet >222 mm. This is sometimes the only option that will meet a certain head/discharge relationship (eg. low head, low flow situations). It should only be used when there is no other alternative.	
General Comments: The minimum sizes quoted for Hydro-Brake® Flow Controls represent sizes based on experience as offering significant reduction in risk of blockage and hence maintenance and derive from general practice in flow control selection in the UK and Ireland. Sizes below the minimum recommended can be specified though it should be recognised these might incur increased risks of blockage and associated maintenance. Sizes above the maximum recommended can also be specified though may require oversized manholes/chambers. For the larger units, refer to HRD Technologies Ltd for advice.	

The information provided here is intended for the purposes of general guidance only - individual application requirements may differ. **If in doubt, please contact HRD Technologies Ltd.**

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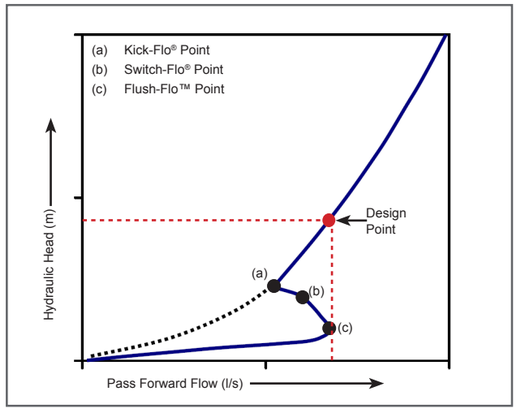
STH Type Hydro-Brake® Flow Control with BBA Approval

Now included in Win*Des*® W.12.6!

The new STH type Hydro-Brake® Flow Control range has a unique head / discharge performance curve which introduces a very important feature - the Switch-Flo® Point. This point illustrates the unique performance feature of the STH range which can lead to further savings in upstream storage, whilst also enabling increased inlet / outlet size to further reduce the risk of blockage.



Typical STH Head Versus Flow Characteristics

Kick-Flo® (a) - the point at which the vortex has initiated and at which the curve begins to return back to follow the orifice curve and reach the same design point or desired head / flow condition.

NEW Switch-Flo® (b) - marks the transition between the Kick-Flo® and Flush-Flo™, from vortex initiation to stabilisation. This point adds a new layer of resolution to the Hydro-Brake® curve that has implications to upstream storage savings.

Flush-Flo™ (c) - the point at which the vortex begins to initiate and have a throttling effect. This point on the Hydro-Brake® curve is usually much nearer to the maximum design flow (Design Point), than other vortex flow controls leading to more water passing through the unit during the earlier stages of a storm, thus reducing the amount of water that needs to be stored upstream.

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE No 08/4599

STH Range of
Hydro-Brake® Flow Controls

The STH Hydro-Brake® Flow Control is the only vortex flow control available today that has been given the prestigious BBA Approval Certificate. The BBA assessment procedure entails rigorous assessment of production and manufacturing standards, and confirms that the hydraulic performance of the Hydro-Brake® Flow Control matches the data given to designers by HRD Technologies with their head / discharge curves.

A worked example showing the steps to model a Hydro-Brake® Flow Control and associated Stormcell® Storage System within Micro Drainage Win*Des*® is available on our website:

www.hrdtec.com

Take a Look at Our New Stormwater Web Resource

Engineering Nature's Way™

www.engineeringnaturesway.co.uk

Engineering Nature's Way is a brand new resource for people working with Sustainable Drainage and flood management in the UK.

The site provides an opportunity to share news, opinion, information and best practice for people working in local and central Government; developers, consulting engineers and contractors. Do you have something to share? We would be delighted to receive your contributions.

turning water around ...®

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MES2974 BALLINCOLLIG HOUSING

Ballincollig, Co. Cork

FOUL WATER PUMP SUMP – PROPOSAL

Killian Rusk BEng MIEI

MES2974_Report_050325

05/03/2025

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Company no. 97677. VAT no. 4735884D. Company directors: Donal Molloy (Managing), Dolores Molloy. Secretary: Donal Molloy

Molloy Environmental Systems is a trade name of Molloy Precast Products Limited, a leading wastewater engineering and manufacturing company established in 1979 registered and located in Ireland with a presence throughout Ireland and the UK.

1 Introduction

This report details a proposal for the installation of a foul water pump sump for a proposed housing development in Ballincollig, Co. Cork. This pump sump is designed as per part 5 of the Irish Water Code of Practice for wastewater infrastructure.

2 Design Criteria

The design conditions are as follows:

Hydraulic load:	548 housing units	446litres/unit* = 244,408 litres
Rising main length:	600m	
Static head:	12.1m (includes the pump sump)	
Total head:	22.68m	
Flow rate:	7.96 l/s	
Rising main:	110mm HDPE SDR17	
Inlet pipe:	250mm	
Inlet invert	2.867m below ground level	

*Assumes 2.7 persons per house with a load of 150 l/person/day and a 10% allowance for infiltration

3 Hydraulic Calculation

Please see attached friction loss calculation sheet and pump datasheet for pump details. The velocities were maintained between 0.75 and 1.8m/s within the rising main.

The levels within the pump sump are set to pump approximately 1,400 litres per discharge. Assuming the daily hydraulic load is concentrated over a 10-hour period the hourly flow rate would be 24.44 m^3 per hour. This would equate to approximately 17.46 starts per hour (circa 8.73 starts per pump per hour). This pump will run for approx. 2.93 minutes per discharge (1400 litres/cycle/7.96l/s = 176 seconds; or 2.93 minutes).

Minimum emergency holding storage sizing for equivalent 548 no. houses:

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House Category	Storage hours req. for each category	No. of house in this category	Req. storage volume (litres)
0-250	24 hrs storage	250	111,500
250-333	18 hrs storage	83	27,764
334-1667	12 hrs storage	215	47,945
1668-333	10 hrs storage	0	0
Total		548	187,209

4 Proposed Tankage

This proposal consists of approximately 200,000 litres of emergency storage (>24hr capacity), which is made up of the available capacity in the pump sump and isolation chamber. The entire emergency storage is created between the pump's cut in level and the inlet invert level. A summary of the tankage is as follows:

- 1 no. isolation chamber
- 1 no. precast concrete pump sump
- 1 no. holding tank
- 1 no. precast concrete valve chamber
- 1 no. precast concrete meter chamber

4.1 Buoyancy check

The below buoyancy check includes for a water table at ground level and empty tanks. Density of materials are as follows:

Material	Density (kN/m^3)	Legend
Concrete	24	D_c
Stone	20	D_{st}
Soil	18	D_s
Water	10	D_w

PUMP SUMP

Component		Total Volume (m^3)		Weight (kg)	Provided Force (kN)
Tank		19.50		12,800	125.57
Risers		1.21		1,231	12.08
Overburden (stone)		1.20		2,868	28.14
Total	V_p	21.905		16899	165.78
Minimum required force to prevent floatation (FOS of	F_r=	257.87	kN	$F_r=V_pX1.2X9.81$	
Difference between req. and provided force	F_d=	92.09	kN	$F_d=F_r-F_p$	
Required volume of concrete to prevent flotation	C_v=	6.58	m^3	$C_v=(F_d/(D_c-D_w)$	
Comments	7m3 of concrete should be placed evenly around the toe of the tank.				

Holding tank

Component		Total Volume (m^3)		Weight (kg)	Provided Force (kN)
Tank		269.95		120,485	1181.95
Risers		15.03		11,722	114.99
Overburden (stone)		263.00		526,000	5160.06
Total	V_p	547.98		658,206	6457.00
Minimum required force to prevent floatation (FOS of	F_r=	6450.77	kN	$F_r=V_pX1.2X9.81$	
Difference between req. and provided force	F_d=	-6.23	kN	$F_d=F_r-F_p$	
Required volume of concrete to prevent flotation	C_v=	-0.45	m^3	$C_v=(F_d/(D_c-D_w)$	
Comments	Sufficient force is available to counteract uplift, therefore no anti-flotation measures are required.				

VALVE CHAMBER

Component		Total Volume (m^3)		Weight (kg)	Provided Force (kN)
Tank		7.30		7,709	75.63
Risers		0.29		344	3.37
Overburden (stone)		1.04		2,497	24.50
Total	V_p	8.623		10,550	103.50
Minimum required force to prevent floatation (FOS of	F_r=	101.51	kN	$F_r=V_pX1.2X9.81$	
Difference between req. and provided force	F_d=	-1.99	kN	$F_d=F_r-F_p$	
Required volume of concrete to prevent flotation	C_v=	-0.14	m^3	$C_v=(F_d/(D_c-D_w)$	
Comments	Sufficient force is available to counteract uplift, therefore no anti-flotation measures are required.				

METER CHAMBER

Component		Total Volume (m^3)		Weight (kg)	Provided Force (kN)
Tank		3.41		3,410	33.45
Risers		0.12		190	1.86
Overburden (stone)		0.58		1,395	13.68
Total	V_p	4.11		4,995	49.00
Minimum required force to prevent floatation (FOS of	F_r=	48.38	kN	$F_r=V_pX1.2X9.81$	
Difference between req. and provided force	F_d=	-0.62	kN	$F_d=F_r-F_p$	
Required volume of concrete to prevent flotation	C_v=	-0.04	m^3	$C_v=(F_d/(D_c-D_w)$	
Comments	Sufficient force is available to counteract uplift, therefore no anti-flotation measures are required.				

ISOLATION CHAMBER

Component		Total Volume (m^3)		Weight (kg)	Provided Force (kN)
Tank		9.00		7,600	74.56
Total	V_p	9.00		7,600	74.56
Minimum required force to prevent floatation (FOS of	F_r=	105.95	kN	$F_r=V_pX1.2X9.81$	
Difference between req. and provided force	F_d=	31.39	kN	$F_d=F_r-F_p$	
Required volume of concrete to prevent flotation	C_v=	2.24	m^3	$C_v=(F_d/(D_c-D_w)$	
Comments	2.5m3 of concrete should be placed evenly around the joints of the tank.				

4.2 Isolation Chamber

This isolation chamber houses a penstock valve connected to the inlet.

- 1.5m diameter precast concrete chamber
- Overflow to holding tank with stainless steel baffle
- The precast concrete unit shall conform to BS 5911-4 and IS EN 1917. Joints shall provide equivalent water resistance as required in IS EN1992 – Part 3 (2006). The tank joints should be surrounded with not less than 150mm thickness of C20/25 to IS EN 206, 20mm aggregate size to IS EN 12620

4.3 Pump Sump

The pump sump should follow the following specifications:

- Precast concrete 5.8m deep 1.9m diameter pump sump
- Precast concrete 45-degree benching
- The precast concrete unit shall conform to BS 5911-4 and IS EN 1917. The tank should be backfilled with 500mm width of Clause 808 material, compacted in 300mm layers.

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- For odour control should be installed as per STD-WW-34 (to be supplied and installed by others)
- The proposed pumps are 2 no. 4 pole Flygt NP3102 4.5kW foul submersible pumps (or similar).
- Pumps to be equipped with an automatic decoupling arrangement complete with twin stainless steel guide rails, easy lift, etc
- Automatic selection rotation of the duty/standby to be provided on an hours run basis with manual over-ride
- Pumps to be ex rated in accordance to hazardous area classification for foul wastewater
- Pumps to be operated as duty/standby
- The proposed pumps have an 100mm discharge connection
- The design should limit the number of starts to 10 per hour per pump
- Pumps to be labelled at the top of pump sump and in kiosk
- Pumps to be equipped with certified stainless-steel lifting chain (IS EN 818-Part 7 (2009), suitably sized, with large links at 1m centres
- DN100 EN598 ductile iron pipework within the wet well to be bracketed using stainless steel brackets
- Motors to include stator over temperature protection which automatically re-set when temperature returns to normal
- High level float switch
- An ultrasonic level sensor is used to communicate adjustable set points for pump unit cut in and cut out as well as top level liquid level cut in and low-level over-ride cut out to the control panel (Pulsar Ultra Lite with snore function)
- Knife gate valve with spindle on backflow pipe to holding tank

4.4 Emergency overflow and storage

A separate emergency overflow tank (holding tank) is required to create 24 hours emergency storage. This together with the storage above the cut in level is used to create this storage.

- 1 no. sectional precast concrete holding tank by Carlow Concrete Tanks (a sample tank construction is included in the appendix)
- The precast concrete unit shall conform to BS 5911-4 and IS EN 1917. Joints shall provide equivalent water resistance as required in IS EN1992 – Part 3 (2006). The tank should be backfilled with 500mm width of Clause 808 material, compacted in 300mm layers.
- A 250mm dia. high level overflow is to be provided
- A 250mm dia. return pipe feeding back to the pump sump fitted with a proprietary non-return valve within the wet well chamber

4.5 Valve Chamber

A separate valve chamber is required and should have the following specifications:

- The precast concrete unit shall conform to BS 5911-4 and IS EN 1917. The tank should be backfilled with 500mm width of Clause 808 material, compacted in 300mm layers. Ductile iron pipework complete with bends, valves, fittings, etc. to link all fittings
- A gate valve for each pump mounted horizontally
- A non-return valve for each pump mounted horizontally
- A gate valve mounted vertically equipped with a Bauer coupling linked to the rising main for pumping out of the rising main
- The chamber should be equipped with a drain to allow draining of the chamber into the pump sump

4.6 Meter Chamber

A separate meter chamber is required and should have the following specifications:

- The precast concrete unit shall conform to BS 5911-4 and IS EN 1917. The tank should be backfilled with 500mm width of Clause 808 material, compacted in 300mm layers.1 no. magnetic flow meter (DN100 Siemens Mag 5100)
- Ductile iron pipework complete with fittings, etc. to link valve chamber to rising main

4.7 Control Kiosk

Control kiosk measuring 2.2m wide by 1.2m deep by 2m high shall be installed. This kiosk will have multiple locks to LPS 1175, SR3 or IS EN16257. An isolation station shall be provided within 2m of the pump sump to house connections. A small, galvanised steel kiosk shall be installed next to the control kiosk to house a 15m hose reel.

4.8 Control Panel

The following will be provided on the main control panel and within the control kiosk.

Control panel to be constructed to Form 2 in line with WIMES Electrical Specification and incorporate the following:

• Separate distribution board for an electrical heater, light, 220v and 110v waterproof socket	• Trip Indicator
• DOL operation	• Control Relays
• Duty standby assist operation	• Terminal Block
• 16amp 220v socket – sockets to be wall mounted	• Ammeters
• MCCBs with door interlocks	• Hour run meters
• Contactor	• Generator change-over switch
• Ventilation Fan, Filter and Stat	• Ultrasonic

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• Hand/Off/Auto Selector Switch	• Flow meter
• Start Switch	• Dial out GSM for – high water, pump trip, power loss
• Stop Button	• Separate to the GSM please include for terminals for the above alarms (for future connection to a telemetry system)
• Run Indicator	• Adequate 3 phase power supply to be provided by others
Separate distribution board for an electrical heater, light, 220v and 110v waterproof	Trip Indicator

5 Access

C250 galvanised steel lift assist covers will be provided for the following components:

Pump sump: 1 no. 1,400 X 800mm clear opening

Valve chamber: 1 no. 1,400 X 800mm clear opening

All covers should be as follows:

- lockable, fabricated from steel, galvanised to IS EN 1461 (2009) with non-slip surface and finished flush with roof slab of chamber
- Hinged with recessed padlock
- Each leaf to have assistance to ensure a lifting effort of 25kg
- Double, hinged access covers to be provided with inert gas charged or hydraulic operated springs suitable for solo lift

The meter chamber & holding tank is to be equipped with D400 800mm by 700mm ductile iron hinged covers.

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6 Septicity in Rising Mains

Modern foul pumping station rising mains typically are HDPE and will not suffer from corrosion. However, protection of the upstream sewer, WWTP and reduce malodourous conditions at the outfall dictate the need to mitigate the production of Hydrogen Sulphide, H_2S, where sewage retention times in the rising main are longer than 6 hours.

The development detailed in this report is planned to release in multiple phases but phase 1 must be large enough to avoid septicity.

1. Min. units to avoid septicity = 53 units (Calc 1 below)
2. Completed estate – 548 Houses (Calc 2 below)

6.1 Calc 1

Anti-septicity calculations were carried out to ensure the suitability of the proposed system. See below calculations based on proposed loadings.

	Units	Full Release
Rising main internal diameter	mm	96.8
Rising main length	m	600
Low level Pump Sump volume	m3	1.4
Volume per day Vd	m3	23.638
Design Pump Flow Rate lit/sec	L/s	7.96
Volume of rising main incl. sump low level volume	m3	5.8156
Longest retention time 24/(Vm/Vd) RTt	Hr	5.904694371
Mean Retention time (RTt+1)/2 Rtm	Hr	2.952347186

Estimated volume pumped per day	V_d
Volume retained in the rising main + pump sump	V_m
Longest retention time	$RT_t = \frac{24}{(V_m/V_d)}$
Mean retention time	$Rtm = \frac{(RT_t+1)}{2}$

Based on the provided site characteristics, there will be less than 6 hours retention in the rising main and below pump cut-in level in the pump sump. Therefore, a temporary anti-septicity dosing system is **not** required.

6.2 Calc 2

Anti-septicity calculations were carried out to ensure the suitability of the proposed system. See below calculations based on proposed loadings.

	Units	Full Release
Rising main internal diameter	mm	96.8
Rising main length	m	600
Low level Pump Sump volume	m3	1.4
Volume per day Vd	m3	244.44
Design Pump Flow Rate lit/sec	L/s	7.96
Volume of rising main incl. sump low level volume	m3	5.8156
Longest retention time 24/(Vm/Vd) RTt	Hr	0.571074456
Mean Retention time (RTt+1)/2 Rtm	Hr	0.285537228

Estimated volume pumped per day	V_d
Volume retained in the rising main + pump sump	V_m
Longest retention time	$RT_t = \frac{24}{(V_m/V_d)}$
Mean retention time	$Rtm = \frac{(RT_t+1)}{2}$

Based on the provided site characteristics, there will be less than 6 hours retention in the rising main and below pump cut-in level in the pump sump. Therefore, a temporary anti-septicity dosing system is **not** required.

7 System Guarantee

Molloy Environmental Systems provides a 2-year warranty to remedy any fault in products provided:

- That the fault is due to defects in design, materials or workmanship
- That the fault is reported to Molloy Environmental Systems during the guarantee period
- That the product has been used only under the conditions described in the care and maintenance instructions, and in applications for which it is intended
- That all service and repair is carried out by Molloy environmental personnel as per the maintenance requirements
- Therefore, this warrantee does not apply to faults resulting from lack of maintenance, inadequate civil works, repair works carried out improperly or normal wear and tear

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- Furthermore, Molloy Environmental Systems disclaims any liability in case of physical injuries, material or economic damages for those mentioned above.

8 Maintenance Requirements

Operator's Inspection and maintenance duties

It is the responsibility of the owner to:

- Ensure the pump sump is operated and maintained in proper order
- Familiarise himself/herself with this operation and maintenance manual
- Familiarise himself/herself with operation safety instructions
- Ensure the system is serviced
- Ensure any faults are dealt with in a timely manner

The operation of the pump sump is the owner's responsibility. The general duties would involve.

Daily

- General visual check to see if alarm beacon is flashing

Annually

- Arrange for tests and a full service of pump and control equipment by Molloy Environmental System

Please contact me if you require any additional information.

Yours sincerely,

K. Rusk

Killian Rusk BEng MIEI

Environmental Process Engineer

Molloy Environmental Systems

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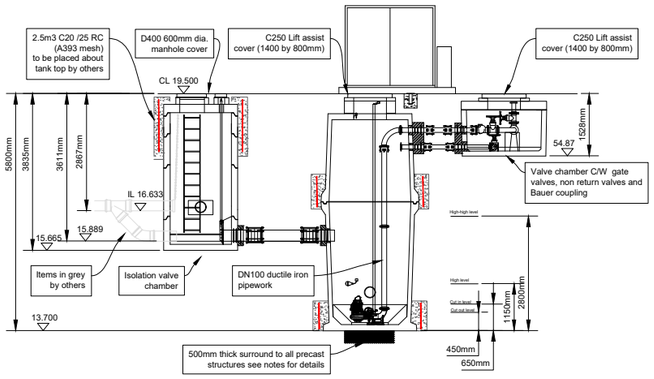
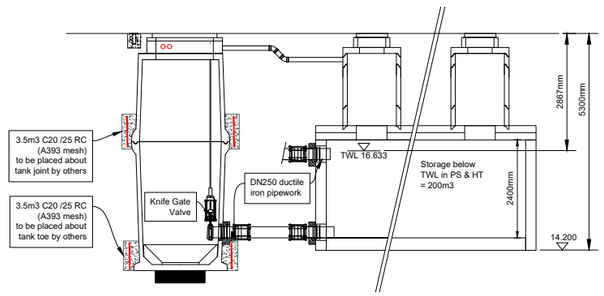


SECTION through A-A



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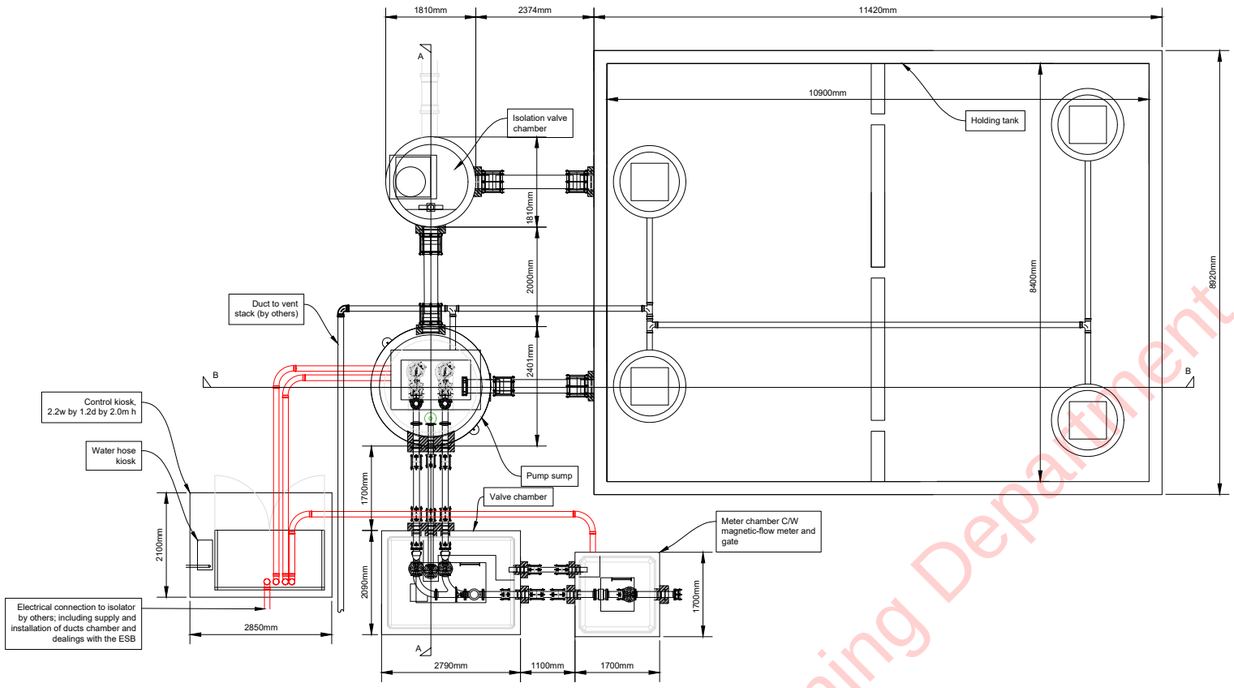

PLAN

Tank lifting limitations:
Max chain angle < 60°

< 60° ✓ > 60° ✗

Damage caused by incorrect lifting is the responsibility of others

Notes:

- Backfill around each precast concrete component shall be placed so that a 500mm width of Clause 808 material, compacted in 300mm layers is provided to ensure adequate support beneath any structures or structural surrounds.
- Free draining granular material, 500mm wide, shall be provided round the wet well close to ground level of the unit
- Observe all safety regulations in regard to excavation and lifting requirements. Never leave opening uncovered or unattended at any time
- Specify any specific requirements prior to ordering. All civil works by customer
- Do not scale from this drawing. Only for illustration purposes

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F: 057 9326060 W: www.molloyprecast.com

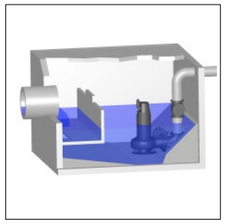
Title: Ballincollig Housing proposed foul water pump station

Drg. no.: MES2974_FPS_030325

Date: 03/03/2025

Drawn by: KR

Cork City Council Planning Department. For Inspection Purposes Only!



Friction loss calculation

Pumped fluid
Water, pure

Static head
12.1

Layout
Wet well installation

Flow
7.96 l/s

Number of pumps
1

Calculation model
Colebrook-White

Viscosity
1.569 mm²/s

Nature of system
Single head pump

Type	Ø (mm)	? or L	Qty.	v (m/s)	k (mm)	ΔH (m)
Ø = Diameter v = Velocity k = Pipe roughness ΔH = Head loss						
Common discharge side pipe - Metal / Ductile iron cement lining						
PN 16 / DN 100 (118x4x4 mm) / K factor for Wastewater acc. DWA-A110						
Pipe length	102	14 m	1	0.9741	0.25	0.179
Discharge Connection	102	0.3	1	0.9741		0.01451
Elbows	102	0.9	3	0.9741		0.04353
Inlet	102	1	1	0.9741		0.04837
Non-return valves	102	0.9	1	0.9741		0.04353
Outlet	102	1	1	0.9741		0.04837
T-piece	102	0.4	1	0.9741		0.01935
Valve	102	0.3	1	0.9741		0.01451
Total friction head						**0.4112**
Common discharge side pipe - Plastic / PE100 (HDPE) PE 4710						
SDR 17 (PN 10) / DN 100 (110x6,6 mm) / K factor for Wastewater acc. DWA-A110						
Pipe length	96.8	600 m	1	1.082	0.25	10.04
Discharge Connection	96.8	0.3	1	1.082		0.01789
Elbows	96.8	0.6	2	1.082		0.03578
Inlet	96.8	1	1	1.082		0.05963
T-piece	96.8	0.4	1	1.082		0.02385
Total friction head						**10.17**
Friction loss head						10.58 m
Total static head						12.1 m
Total head						**22.68 m**

Project	**Created by**	**Last update**	3/5/2025
Block	**Created on** 3/5/2025		

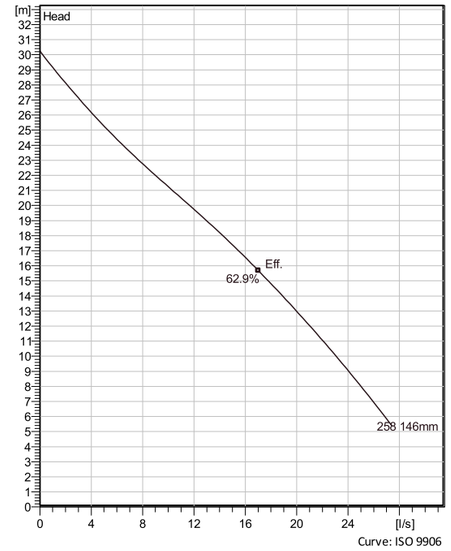
NP 3102 SH 3~ Adaptive 258

Patented self cleaning semi-open channel impeller, ideal for pumping in most waste water applications. Modular based design with high adaptation grade.

FLYGT a xylem brand

Technical specification

Curves according to: Water, pure Water, pure [100%], 4 °C, 999.9 kg/m³, 1.5692 mm²/s



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances.
Please consult your local Flygt representative for performance guarantees.

Configuration

Motor number
N3102.910 18-10-2AS-W IE3 4.5KW

Installation type
P - Semi permanent, Wet

Impeller diameter
146 mm

Discharge diameter
80 mm

Pump information

Impeller diameter
146 mm

Discharge diameter
80 mm

Inlet diameter
100 mm

Maximum operating speed
3000 rpm

Number of blades
2

Max. fluid temperature
40 °C

Material

Impeller
Grey cast iron

Stator housing material
Grey cast iron

Project	Xylect-20143778	**Created by**	
Block		**Created on** 3/5/2025	**Last update** 3/5/2025

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NP 3102 SH 3~ Adaptive 258

Technical specification

FLYGT a xylem brand

Motor - General

Motor number N3102.910 18-10-2AS-W IE3 4.5KW	**Phases** 3~	**Rated speed** 3000 rpm	**Rated power** 4.5 kW
Approval EN	**Number of poles** 2	**Rated current** 8.5 A	**Stator variant** 71
Frequency 50 Hz	**Rated voltage** 400 V	**Insulation class** H	**Type of Duty** S1
Version code 910			

Motor - Technical

Power factor - 1/1 Load 0.86	**Motor efficiency - 1/1 Load** 89.1 %	**Total moment of inertia** 0.0102 kg m²	**Starts per hour max.** 30
Power factor - 3/4 Load 0.81	**Motor efficiency - 3/4 Load** 89.5 %	**Starting current, direct starting** 64 A	
Power factor - 1/2 Load 0.71	**Motor efficiency - 1/2 Load** 88.0 %	**Starting current, star-delta** 21.3 A	

Project	Xylect-20143778	**Created by**			
Block		**Created on**	3/5/2025	**Last update**	3/5/2025

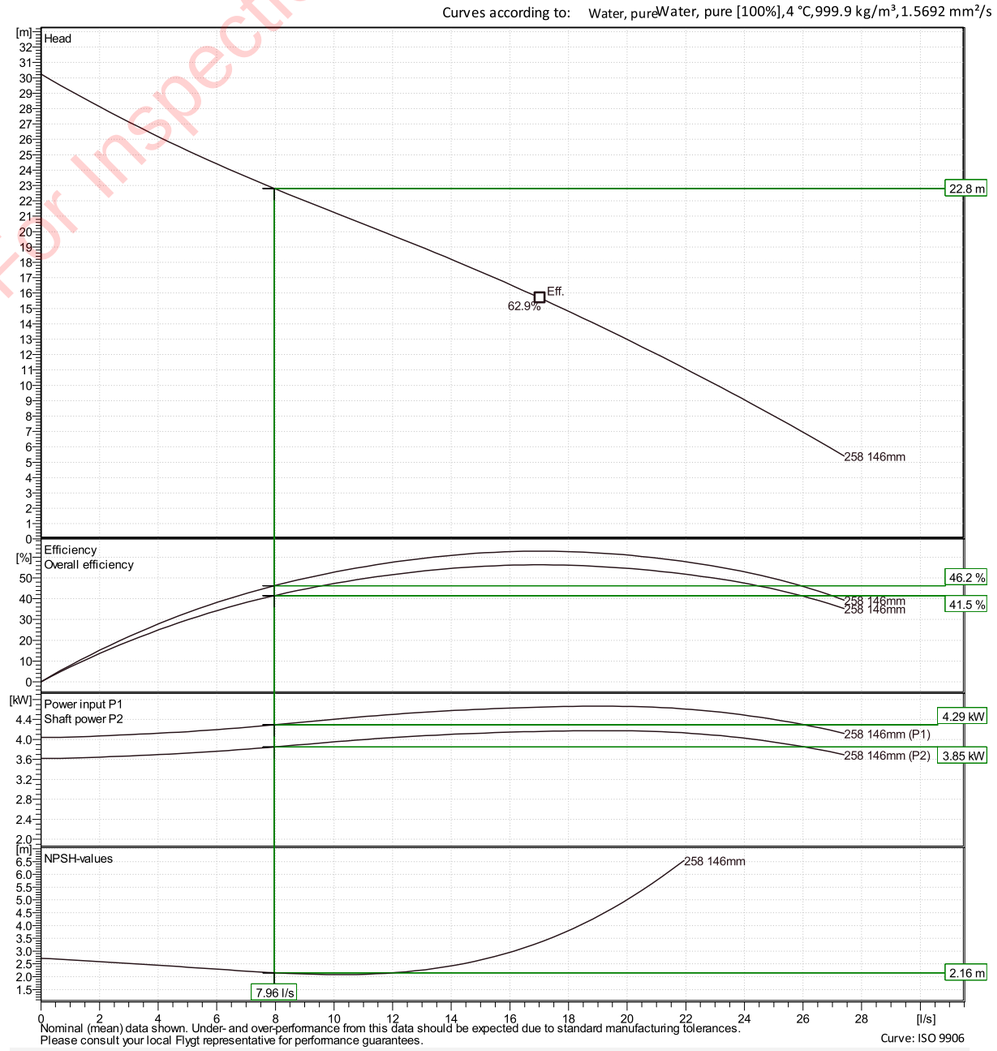
NP 3102 SH 3~ Adaptive 258

Performance curve

FLYGT a xylem brand

Duty point

Flow 7.96 l/s	**Head** 22.8 m



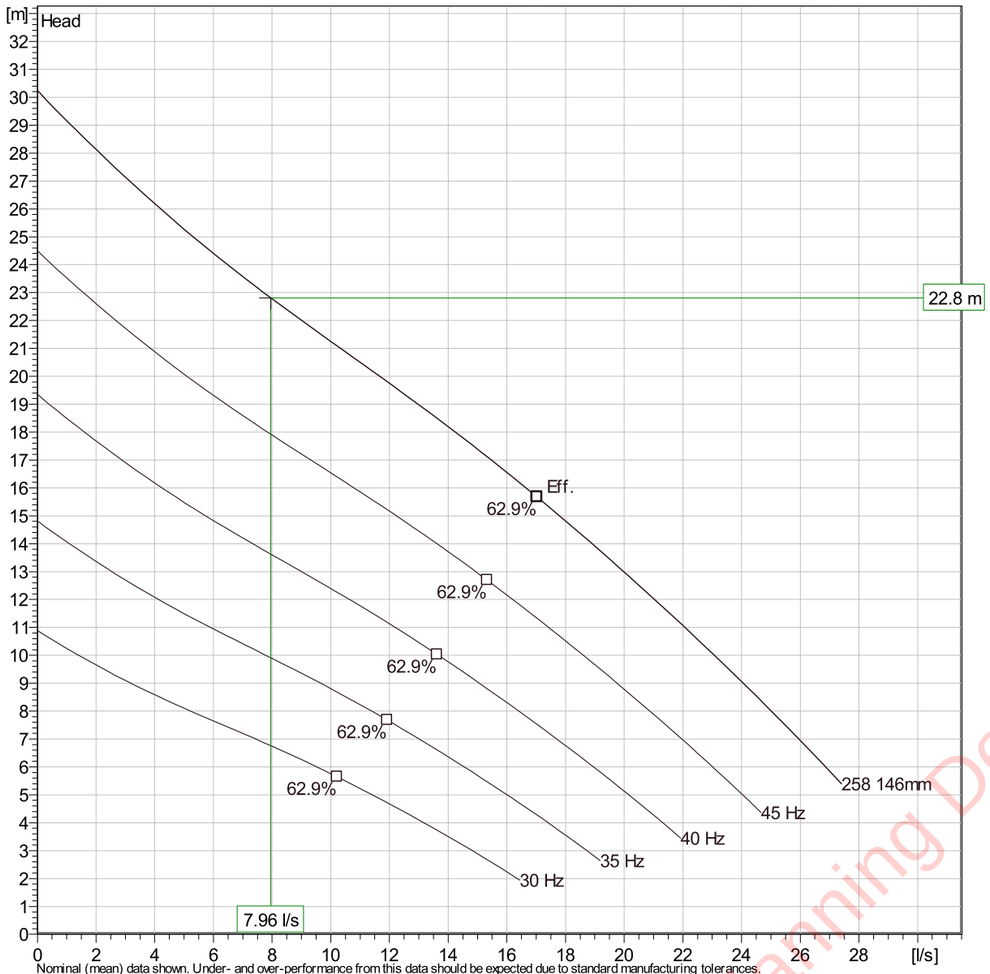
	Xylect-20143778				
		Created on	**3/5/2025**	**Last update**	3/5/2025

Cork City Council Planning Department. For Inspection Purposes Only!

NP 3102 SH 3~ Adaptive 258

Duty Analysis

Curves according to: Water, pure [100%] ; 4°C; 999.9kg/m³; 1.5692mm²/s



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances.
Please consult your local Flygt representative for performance guarantees.

Operating characteristics

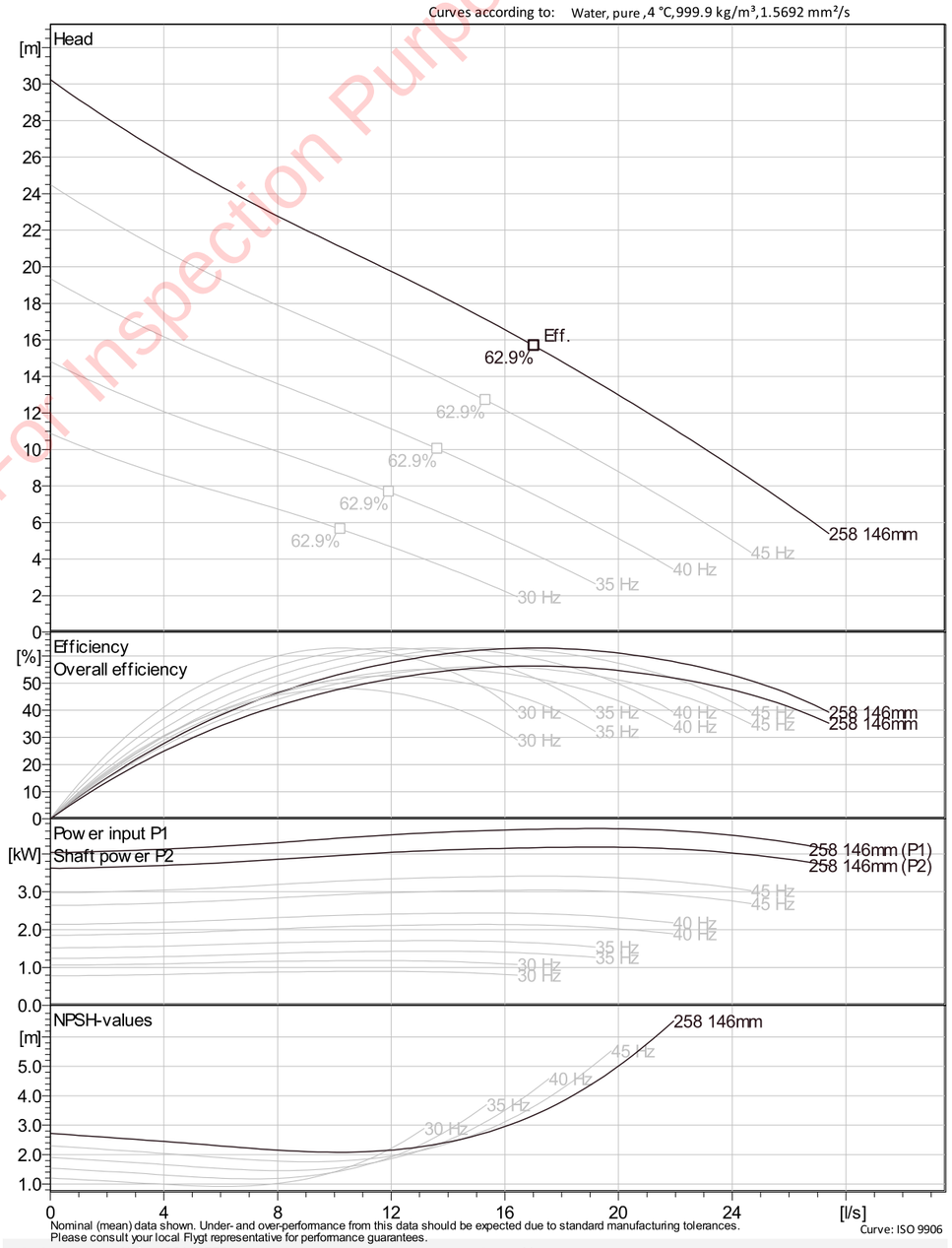
Pumps / Systems	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Spec. Energy	NPSHre
	l/s	m	kW	l/s	m	kW		kWh/m³	m
1	7.96	22.8	3.85	7.96	22.8	3.85	46.2 %	0.15	2.16

Project		**Created by**			
Block	Xylect-20143778	**Created on**	3/5/2025	**Last update**	3/5/2025

NP 3102 SH 3~ Adaptive 258

VFD Curve

Curves according to: Water, pure ,4 °C,999.9 kg/m³,1.5692 mm²/s



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances.
Please consult your local Flygt representative for performance guarantees.

Curve: ISO 9906

Project	Xylect-20143778	**Created by**			
Block		**Created on**	3/5/2025	**Last update**	3/5/2025

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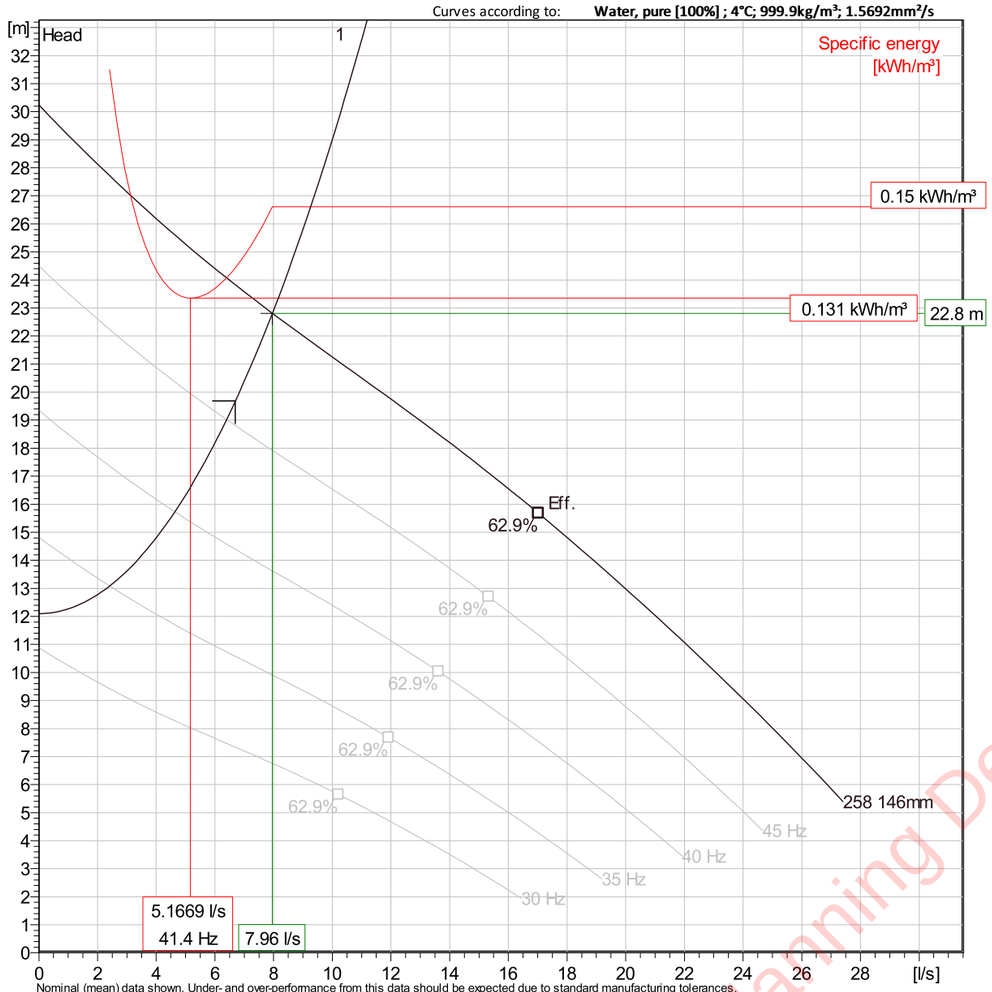
NP 3102 SH 3~ Adaptive 258

VFD Analysis



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances.
Please consult your local Flygt representative for performance guarantees.

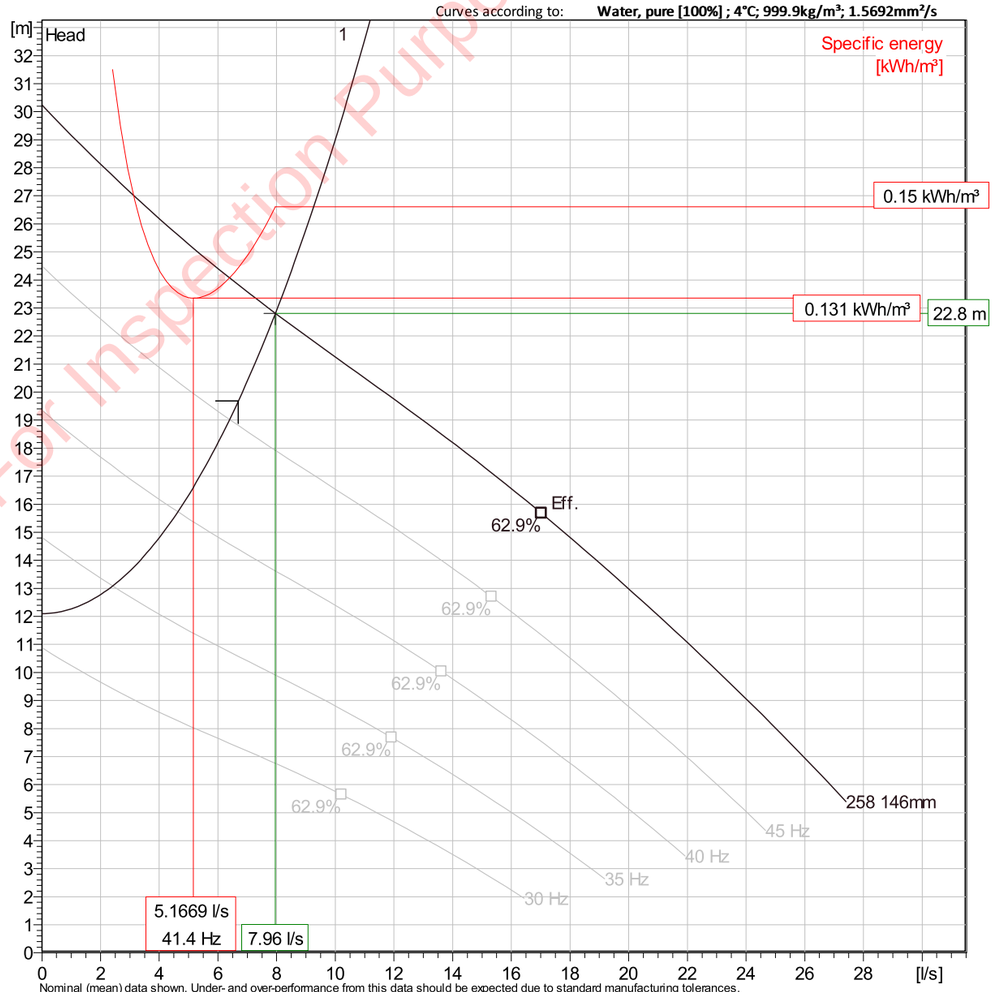
Operating Characteristics

Pumps / Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific energy	NPSHre
		l/s	m	kW	l/s	m	kW		kWh/m³	m
1	50 Hz	7.96	22.8	3.85	7.96	22.8	3.85	46.2 %	0.15	2.16
1	45 Hz	6.4	19	2.78	6.4	19	2.78	43 %	0.136	1.87
1	40 Hz	4.63	15.7	1.92	4.63	15.7	1.92	37.2 %	0.133	1.62
1	35 Hz	2.41	13.1	1.26	2.41	13.1	1.26	24.5 %	0.177	1.41

Project	Xylect-20143778	**Created by**			
Block		**Created on**	3/5/2025	**Last update**	3/5/2025

NP 3102 SH 3~ Adaptive 258

VFD Analysis



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances.
Please consult your local Flygt representative for performance guarantees.

Operating Characteristics

Pumps / Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific energy	NPSHre
		l/s	m	kW	l/s	m	kW		kWh/m³	m
1	30 Hz									

Project	Xylect-20143778	**Created by**			
Block		**Created on**	3/5/2025	**Last update**	3/5/2025

Program version: 75.0 - 06/11/2024 (Build 274)
Data version: 15/02/2025 09:55
User group(s): Xylem:Iran - EXT

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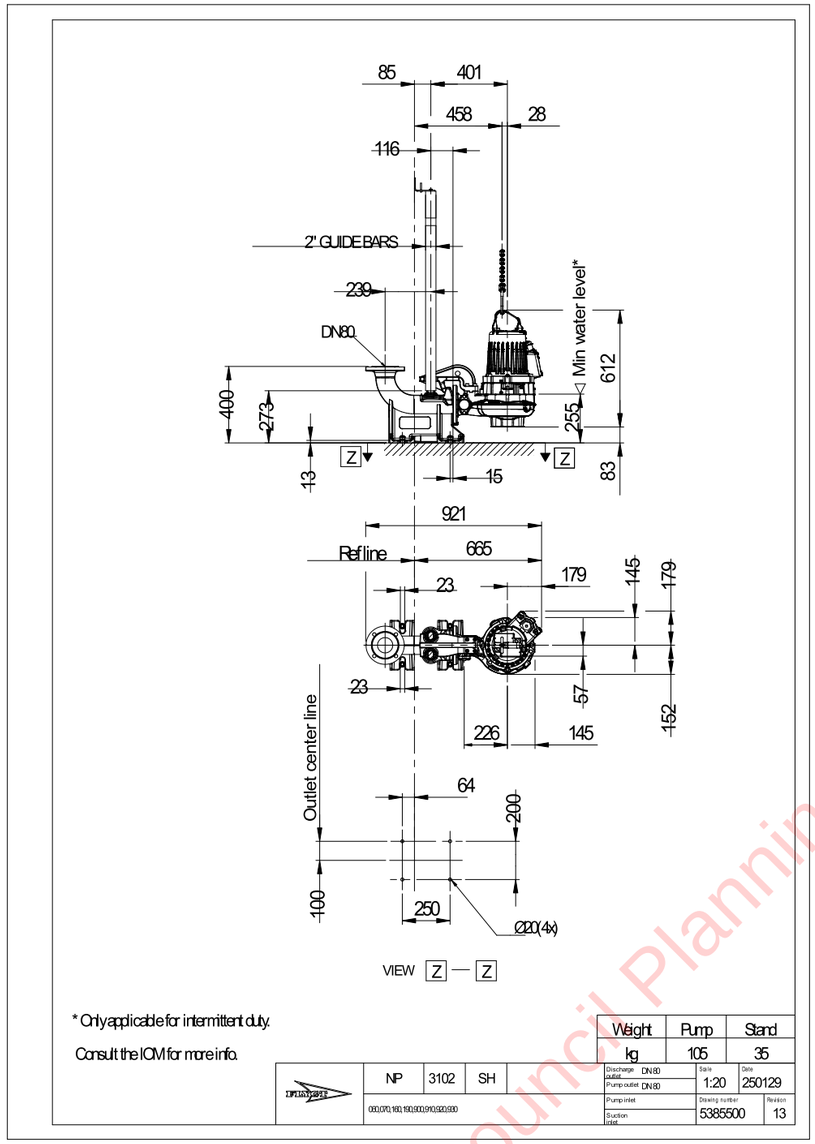
NP 3102 SH 3~ Adaptive 258

Dimensional drawing



* Only applicable for intermittent duty.

Consult the IOM for more info.

Weight	Pump	Stand
kg	105	35

NP	3102	SH	Discharge outlet: DN80	Scale: 1:20	Date: 250129	
00|01|10|11|00|01|10|11			Pump outlet: DN80			
			Pump inlet:	Drawing number: 5385500	Revision: 13	
			Suction inlet:			

Project	Xylect-20143778	**Created by**			
Block		**Created on**	3/5/2025	**Last update**	3/5/2025

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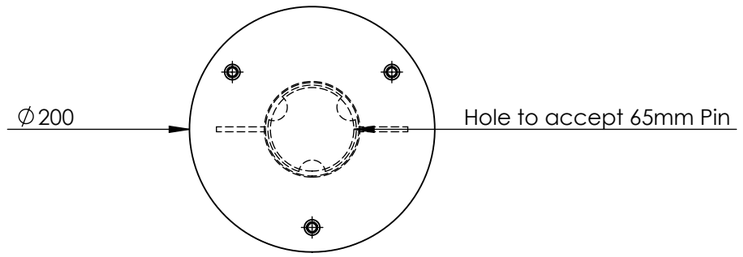
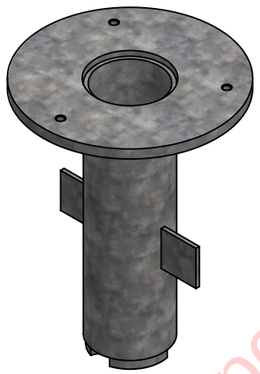
"500kg WLL Flush Mounted Davit Socket"

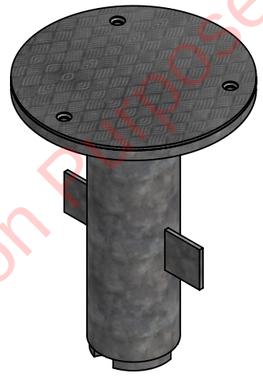
Finish Ref; Galvanised



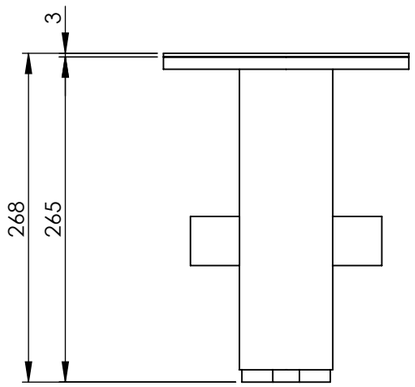
Plan View



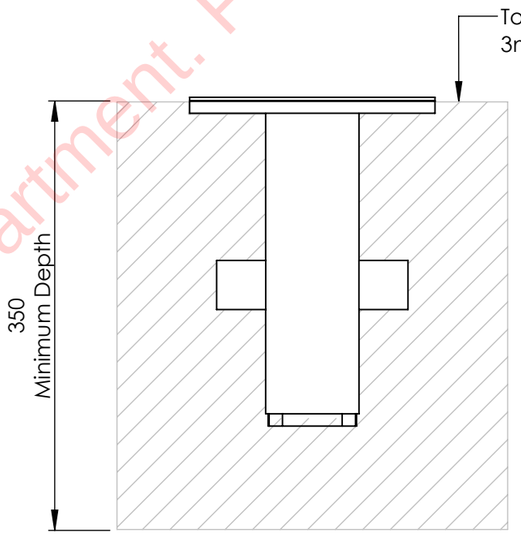
Isometric View
(Cover Plate Removed)

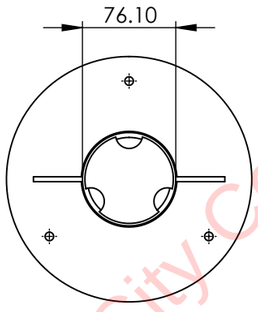


Isometric View



Front Elevation





Underside Elevation

General Notes / Revisions

Mild Steel construction with a galvanised finish to BSEN 1461

Supplied with cover plate

DRAWING APPROVAL

Drawing reviewed and approved ☐
Drawing reviewed with comments ☐
Drawing reviewed and rejected ☐

Name; _____

Signed; _____ Date; _____

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DO NOT SCALE OFF THIS DRAWING

Drawing No.	TAE-100-01		
Description	500kg WLL Davit Socket		
Revision	B		
Drawn By	C.Hannant		
Scale	1:5 @ A3	Sheet	1 of 1
Date	02/03/2020		

Client Information

Core Product
T Allen Engineering Services Ltd
Stonebroom
DE55 6LQ

T Allen Engineering Services ltd
Unit 11 Stonebroom Industrial Estate
Stonebroom, Alfreton, DE55 6LQ
T: 01773 590 000
E: engineering@t-allen.co.uk
www.t-allen.net

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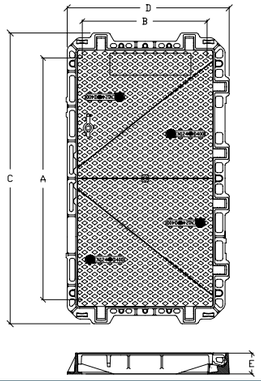
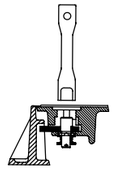
MULTILEAF

DATA SHEET
0075 REV 00

STANDARD COVERS



Stainless Steel Turnbuckle Locking System



GROUP 4
Carriageways of roads, hard shoulders and parking areas, for all types of road vehicles

FEATURES

- **Material - ductile iron cover and frame**
- **Double triangular (2 or 4) hinged covers with mono-block frame, welded frame on the 1200 x 600 and 1300 x 800 covers and frames**
- **Covers are prevented from closing by a restriction at the hinge**
- **Cover parts hinge back to 110°and lock at 90° which prevent it from freely closing**
- **Covers are removable from the frame vertically**
- **Non-rock covers by means of 3 point suspension**
- **Covers interlock with the last cover being locked by a stainless steel turnbuckle locking mechanism**
- **Opening effort < 30kN (except B0848)**
- **Can be opened by one operator**
- **Large access point to underground services**
- **Ergonomic friendly**
- **Used for the NDP regional broadband rollout**

Weights and dimensions are subject to change and foundry tolerances

OPTIONS

- **Customised cover markings e.g. company logo or local authority crest**
- **Unique locking and handling keys for specific requirements**

TO SPECIFY

Multileaf Covers and Frame or similar approved to be manufactured in ductile iron and in compliance with EN124 D400. Overall dimension (C x D x E – refer to table)mm. Frame opening (A x B – refer to table)mm. Unit shall consist of hinged triangular covers that are locked into position when closed. When the covers are in the open position they should be prevented from freely closing by incorporating a restriction at the hinge. When the covers are in an open position clear access must be given to the frame opening from two adjacent sides of the frame. Unit shall be locked by means of a stainless steel turnbuckle locking mechanism. A third party test report showing compliance with the full requirements of EN124 shall be provided.

TECHNICAL DATA

Frame Opening (mm) A x B	Frame Overall (mm) C x D	Frame Height (mm) E	No. of Covers	Total Kg	Ref
600 x 450	745 x 600	100	2	73	B0822
600 x 600	745 x 770	100	2	85	B0818
1200 x 600	1400 x 780	100	4	162	B0841
800 x 700	945 x 872	100	2	130	B0846
900 x 600	1102 x 764	100	4	135	B0859
1060 x 700	1255 x 884	100	4	192	B0820.5
1200 x 750	1400 x 930	120	4	260	B0830
1300 x 800	1500 x 980	100	4	247	B0845
900 x 900	1084 x 1100	150	2	208	B0848

Birr, County Offaly, Ireland
Tel: 057 91 23100
www.ejco.com

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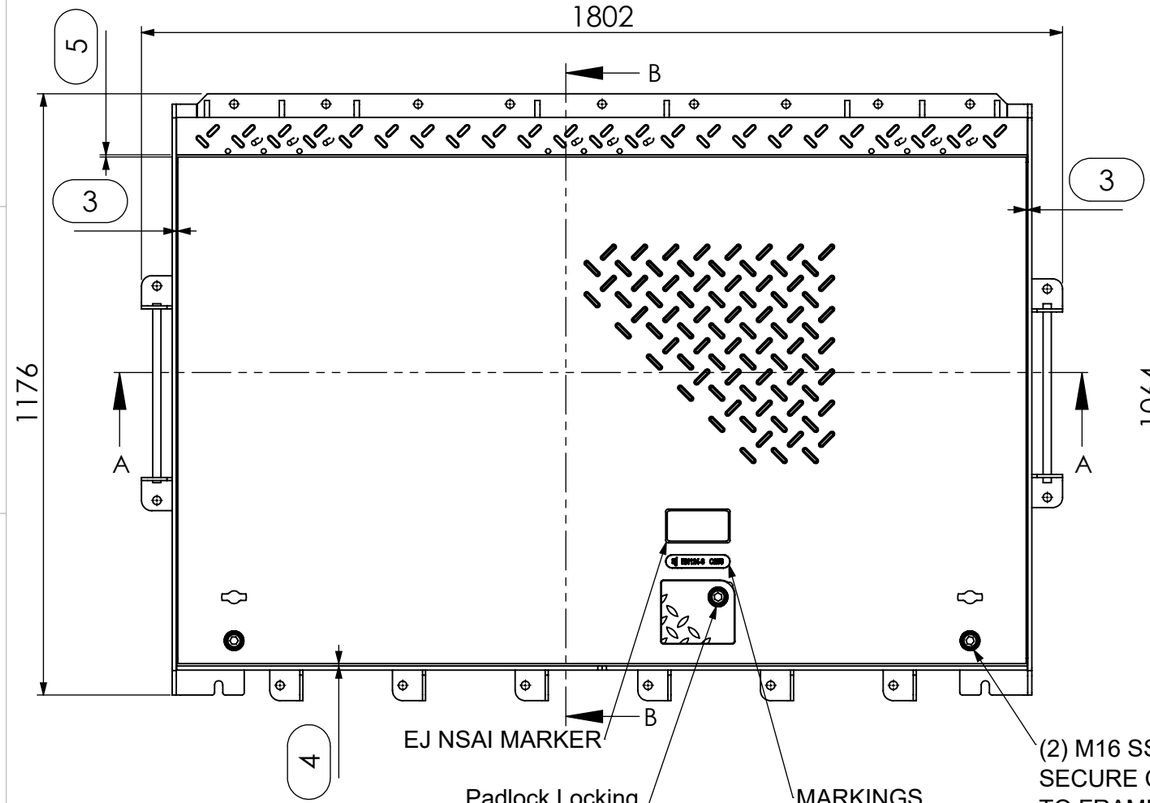
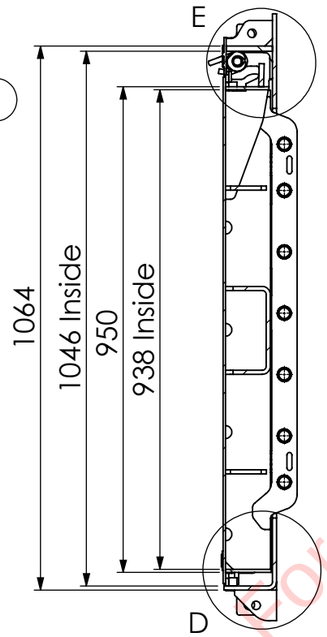
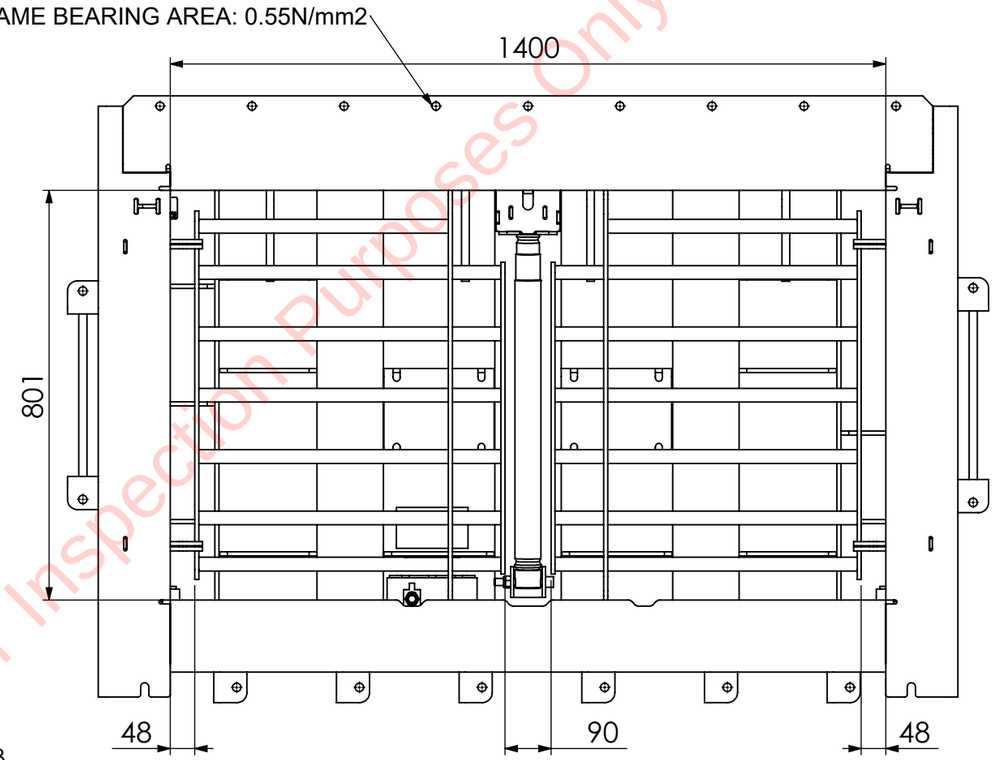
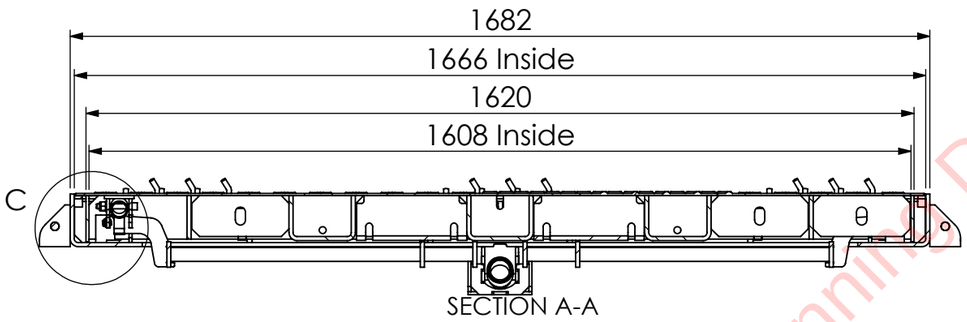


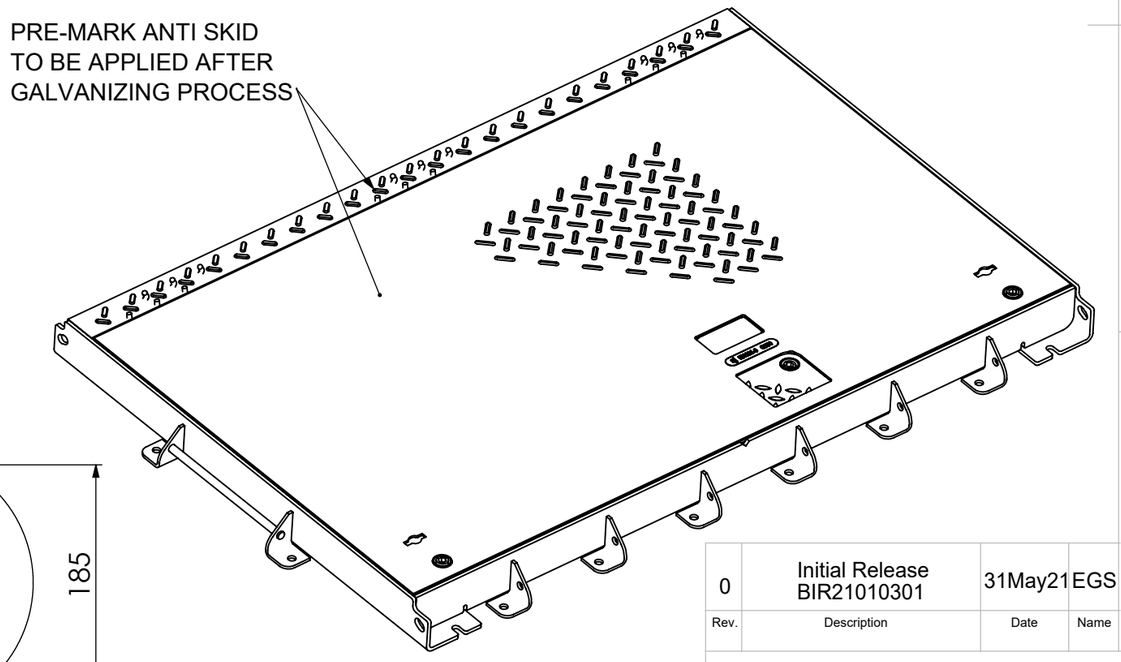


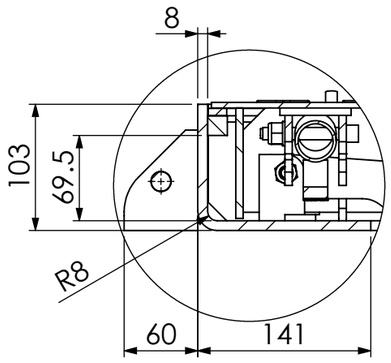
SECTION B-B



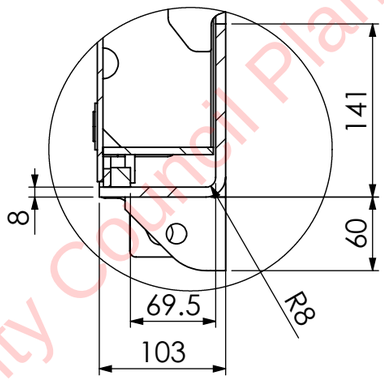


SECTION A-A

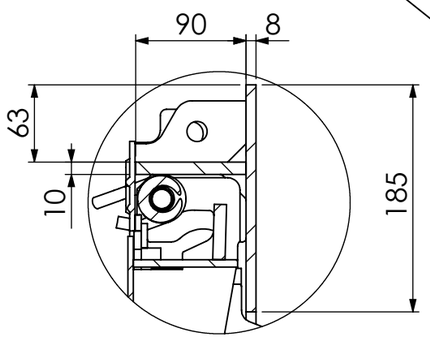




DETAIL C
SCALE 1 : 5



DETAIL D
SCALE 1 : 5



DETAIL E
SCALE 1 : 5

Rev.	Description	Date	Name
0	Initial Release BIR21010301	31May21	EGS

EJ
Birr, Co. Offaly,
Ireland.
Tel: ++353 5791 23100
Fax: ++353 5791 21726
E-mail: ireland.info@ejco.com

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS

DRAWN BY/DATE:	EGS	31May21
MATERIAL/WEIGHT:	.....	320.31Kg

TITLE: FLUSH FIT GENERAL ASSEMBLY EN124-3 C250 - 1400X800 OPE

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DWG NO.	Revision	Do Not Scale	A3
717174	0	SHEET: 1 OF 2	

Cork City Council Planning Department
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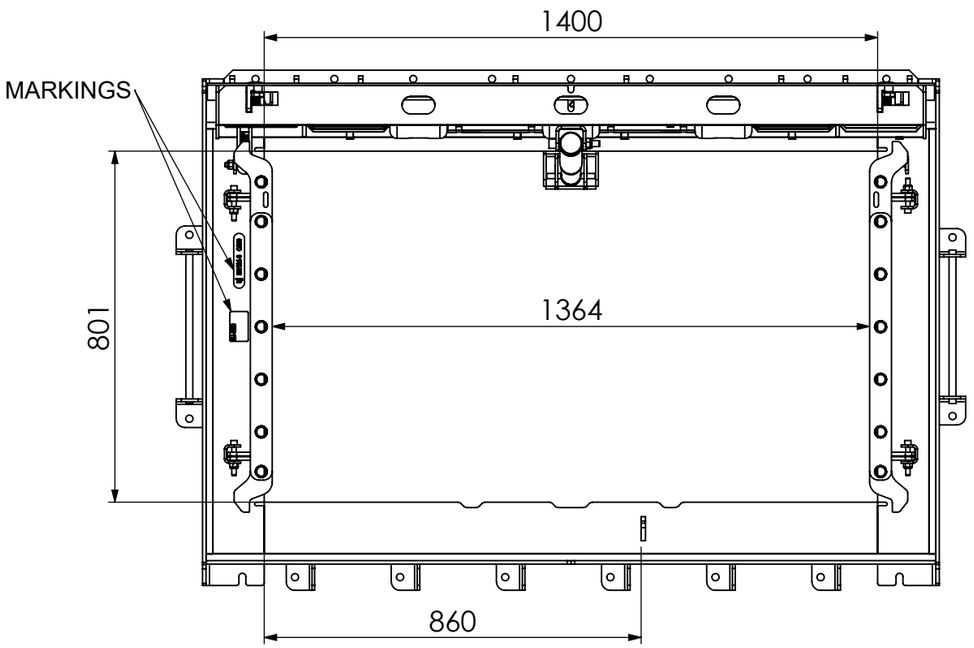
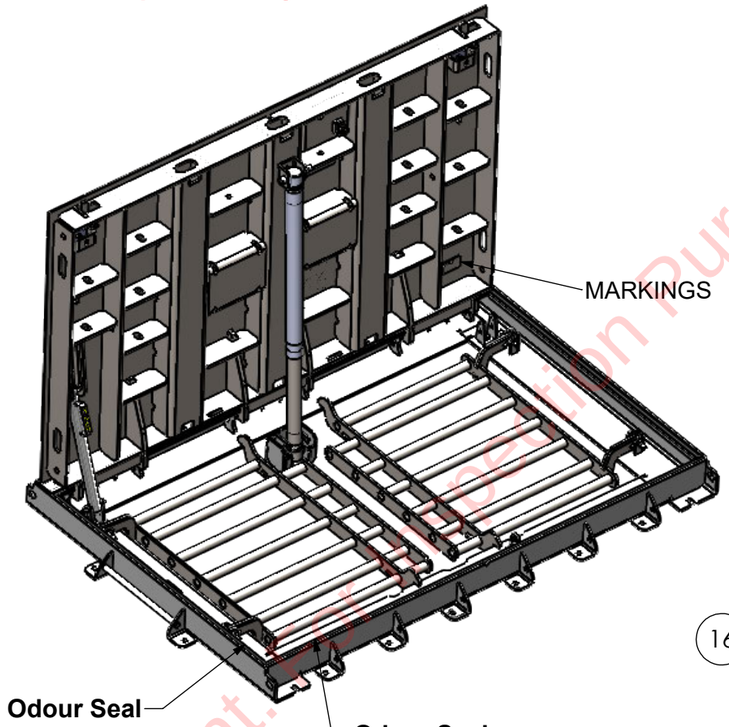
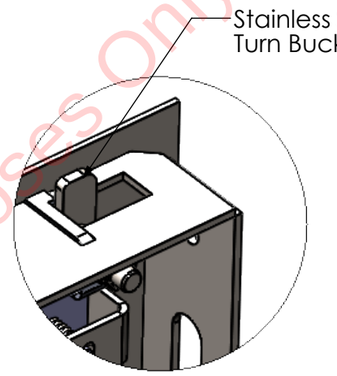


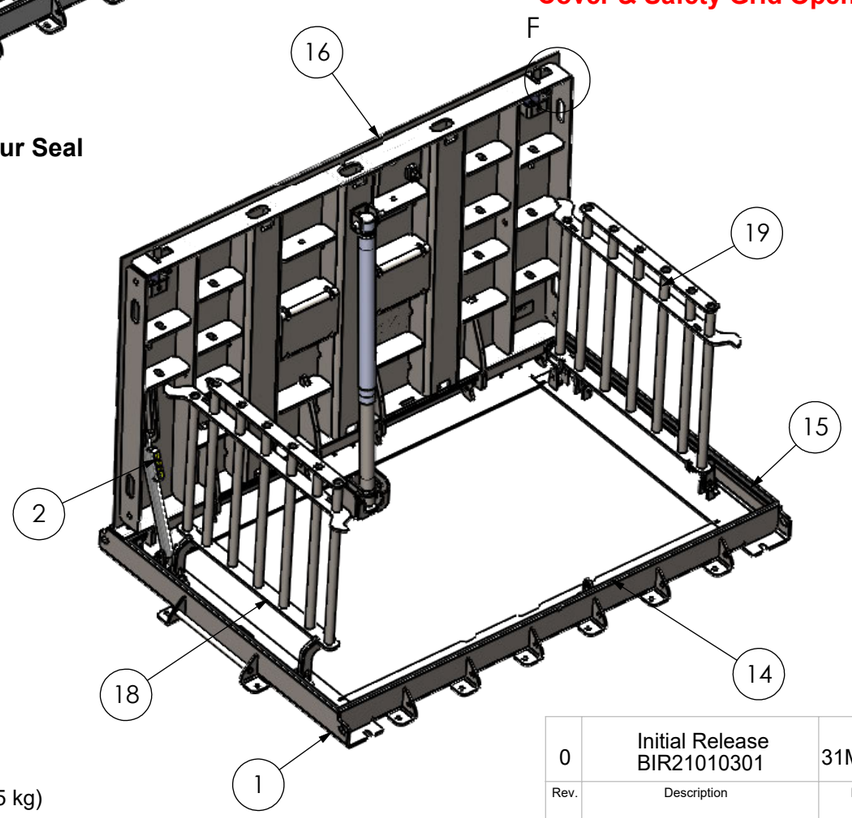
Cover Open & Safety Grid Close





DETAIL F
SCALE 1 : 4

Cover & Safety Grid Open



ITEM NO.	PART NUMBER	DESCRIPTION	Weight	QTY.
1	717174-001_0	Fabricated Frame Assembly	108.36	1
2	711470-400	Stay Bar Assembly	0.97	1
3	CA 740-0020	BS Keyway blanking plate assembly	0.170	2
4	712431_0	Stainless Turnbuckle Cam	0.10	2
5	M16_Nylon	Nylon Washer	0.01	2
6	shcs_ss_M16_80	Socket Head Cap Screw	0.17	2
7	M16_SS_half	M16 Stainless Half Nut	0.02	4
8	CA 270-0018_1	Padlock Cover	0.912	1
9	shcs_SS_M10_070	Socket Head Cap Screw	0.05	5
10	M10_SS_Flat	M10 Stainless Steel Flat washer	0.00	1
11	M10_SS_Nyloc	M10 Stainless Nyloc	0.01	5
12	712654-003_1	spring assembly qty 3 springs	0.61	2
13	712654-003_1	spring assembly qty 3 springs	0.61	1
14	8115-15x6_1665	Odour Seal	0.19	2
15	8115-15x6_970	Odour Seal	0.11	2
16	717174-035_0	Fabricated Cover Assembly	174.19	1
17	J073_0	Turn Buckle Spring	0.01	4
18	717174-020_0	Jail Bar Safety Grid Assembly	14.75	1
19	717174-021_0	Jail Bar Safety Grid Assembly	14.75	1
20	ZC7265-3600N-002	Mechanical Strut Shaft	2.03	1
21	ZC7265-3600N-001	Meachanical Strut Tube	0.42	1
22	4106-SS-14_110	Round Bar	0.10	1
23	shcs_SS_M14_100	Socket head cap screw	0.02	1
24	M14_SS_Nyloc	M14 Stainless Steel Nyloc	0.03	1

SPECIFICATION

Hinged and assisted cover
One man operation (cover lifting effort less than 25 kg)
Polychloroprene Seal to prevent odour escape
Cover and frame are 250**kN** resistance
Cover surface includes anti-skid pattern
Axis and bolts in stainless steel 316
Torsion springs in stainless steel grade 316
Material: mild steel to S235 JR - NF EN 10025
Hot dip galvanization according to NF EN ISO 1461
Average Thickness of galvanisation = **70µm**

Rev.	Description	Date	Name
0	Initial Release BIR21010301	31May21	EGS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS

DRAWN BY/DATE:	EGS	31May21
MATERIAL/WEIGHT:	.....	320.31Kg

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EJ
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E-mail: ireland.info@ejco.com

TITLE: FLUSH FIT GENERAL ASSEMBLY
EN124-3 C250 - 1400X800 OPE

DWG NO.	Revision	Do Not Scale	A3
717174	0	SHEET: 2 OF 2	

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Part of the Radius Systems Group

RADIUS Systems

Resilient Seated Gate Valve, EcoValve

Zasuwa klinowa z miękkim uszczelnieniem, EcoValve

DN40 - DN300 (EPDM) PN 10/16

Pressure tests

Water tests according to standard:
EN 1074-1, 2:2002
EN 12266-1:2012
- leak tightness 1,5 x PN
- seat tightness 1,1 x PN

Testy ciśnieniowe

Próby wodą zgodnie z normą:
PN-EN 1074-1, 2:2002
PN-EN 12266-1:2012
- wytrzymałość korpusu 1,5 x PN
- szczelność zamknięcia 1,1 x PN

Application

Drinking water, wastewater treatment plants and other non-aggressive media with temp. max 70 ° C

Zastosowanie

Woda pitna, ścieki komunalne oczyszczone i inne nieagresywne media o temp. max 70°C

Technical Details

Face to Face in accordance to:
BS 5163 (EN 558-1 Series 3)
Maximum Working Pressure PFA:
16 bar / PN16
Working temperature:
Maximum +70°C
Construction complies to:
EN 1074-1&2, EN 1171
Certification:
WRAS, Hygienic Certificate PZH
Flange Type:
EN 1092-2 PN10 & PN16
Coating:
250 µm FBE coating, external and internal

Dane techniczne

Długość zabudowy:
BS 5163 (EN 558-1 Series 3)
Dopuszczalne ciśnienie robocze PFA:
16 bar / PN16
Temperatura robocza:
Maksymalnie +70°C
Konstrukcja zgodna z:
PN-EN 1074-1&2, PN-EN 1171
Certyfikaty:
WRAS, Atest higieniczny PZH
Kołnierze:
PN-EN 1092-2 PN10 & PN16
Powłoka ochronna:
Farba epoksydowa nakładana elektrostatycznie o min. grubości 250 µm

Design features

- Integral ductile iron wedge, fully EPDM encapsulated
- Superior stem packing with three O-rings and a dust seal
- Rugged construction of ductile iron with stainless steel stem SS316 and nut wedge made of aluminum bronze
- Special seal in the bonnet achieving perfect top seal when valve is full open.
- Integrated guide shoes on the Wedge

Cechy konstrukcyjne

- W pełni ogumowany (EPDM) klin pełno przelotowy z żeliwa sferoidalnego
- Trzy pierścienie uszczelniające na trzpieniu oraz uszczelka przeciwpyłowa
- Wzmocniona konstrukcja z żeliwa sferoidalnego z trzpieniem ze stali nierdzewnej SS316 oraz nakrętką klina z brązu aluminiowego.
- Profilowane główne uszczelnienie zasuwy
- Wkładki ślizgowe w klinie.

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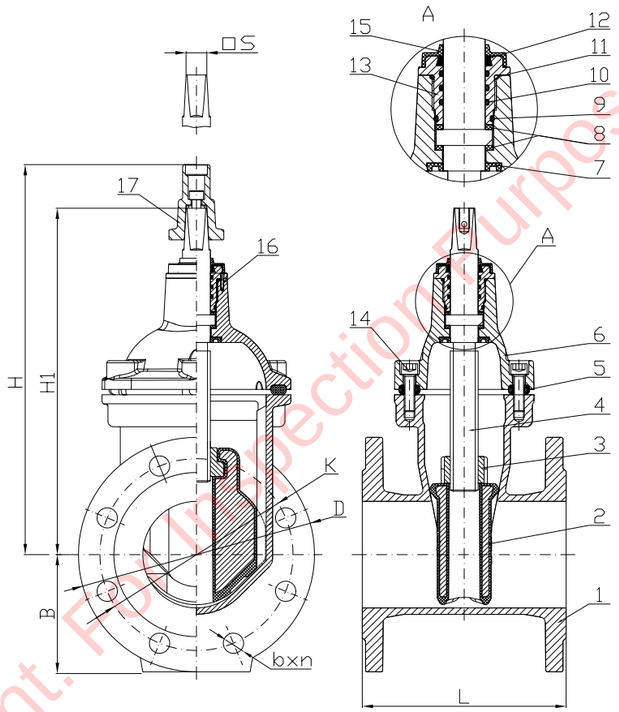
RADIUS Systems



Notes: - Lifting eye-bolts standard from DN300

Uwagi: - Dla DN300 i powyżej – śruby z uchem dla ułatwienia transportu i montażu w standardzie

No	Part Name Nazwa części	Material Materiał
1	Body Korpus	Ductile Iron EN-GJS-500-7 Żeliwo sferoidalne EN-GJS-500-7
2	Wedge Klin	D.I., EPDM encapsulated EN-GJS-500-7 Żeliwo sferoidalne EN-GJS-500-7 guma EPDM
3	Wedge Nut Nakrętka klina	Aluminium-Bronze CuAl10Ni5Fe4 Brąz aluminiowy CuAl10Ni5Fe4
4	Stem Trzpień	Stainless Steel X5CrNiMo17-12-2 / 1.4401 / 316 Stal nierdzewna X5CrNiMo17-12-2 / 1.4401 / 316
5	Bonnet Gasket Uszczelka pokrywy	Elastomer EPDM Elastomer EPDM
6	Bonnet Pokrywa	Ductile Iron EN-GJS-500-7 Żeliwo sferoidalne EN-GJS-500-7
7	Main seal Profilowane uszczelnienie zasuwy	Elastomer EPDM Elastomer EPDM
8	Bottom Washer Łożysko ślizgowe	Plastic PTFE Tworzywo sztuczne PTFE
9	Bush O-ring Seal Pierścień uszczelniający O-ring	Elastomer EPDM Elastomer EPDM
10	Stem O-ring Seal Pierścień uszczelniający O-ring	Elastomer EPDM Elastomer EPDM
11	O-ring Seal Pierścień uszczelniający O-ring	Elastomer EPDM Elastomer EPDM
12	Dust Seal Uszczelka czyszcząco-zgarniająca	Elastomer NBR Elastomer NBR
13	Gland Bush Wymienna tuleja uszczelniająca	H.T. dezincification resistant Brass Mosiądz odporny na odcynkowanie
14	Bonnet Screws Śruby pokrywy	Stainless Steel X5CrNiMo17-12-2 / 1.4401 / 316 Stal nierdzewna X5CrNiMo17-12-2 / 1.4401 / 316
15	Bonnet Dust Seal Główna uszczelka przeciwpyłowa	Elastomer NBR Elastomer NBR
16	Set Screw Śruba montażowa	Stainless Steel X5CrNiMo17-12-2 / 1.4401 / 316 Stal nierdzewna X5CrNiMo17-12-2 / 1.4401 / 316
17	Cap-Top Nasadka na trzpień	Ductile Iron EN-GJS-500-7 Żeliwo sferoidalne EN-GJS-500-7

Dimension (mm & kg)

Wymiary (mm & kg)

Group	DN	50	80	100	150	200	250	300
AW55	*PN16 CC	AD0892	AD0894	AD0895	AD0897	AD0898	AD0899	AD0900
	**PN16 ACC	AD0905	AD0907	AD0908	AD0910	AD0911	AD0912	AD0913
L		178	203	229	267	292	330	356
H1		218	277	325	395	482	572	662
H		264	319	367	437	552	642	732
B		75	95	102	134	165	196	225
K PN16		125	160	180	240	295	355	410
b x n PN16		19x4	19x8	19x8	23x8	23x12	27x12	27x12
D		165	200	220	285	340	405	460
Stem Top Square Kwadrat trzpienia □S		14,3	17,3	19,3	19,3	24,3	27,3	27,3
Turns to open/close Liczba obrotów		6,5	8,5	10,5	15,5	17	21,5	25,5
Weight kg Waga kg		9,6	13,4	18,2	32,2	57,1	79	110,8

Notes:
- *Clockwise or **anti-clockwise to close

Uwagi:
- Zamykanie w *prawo lub w **lewo

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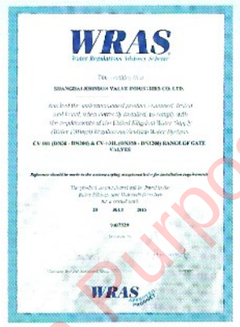
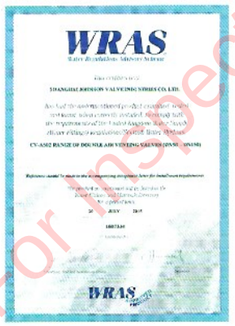
JOHNSON VALVE

- Water Valves, Fittings, Fire Hydrants & Pipeline Accessories to BS, DIN, AWWA Standards

SHANGHAI JOHNSON VALVE
INDUSTRIES CO.LIMITED





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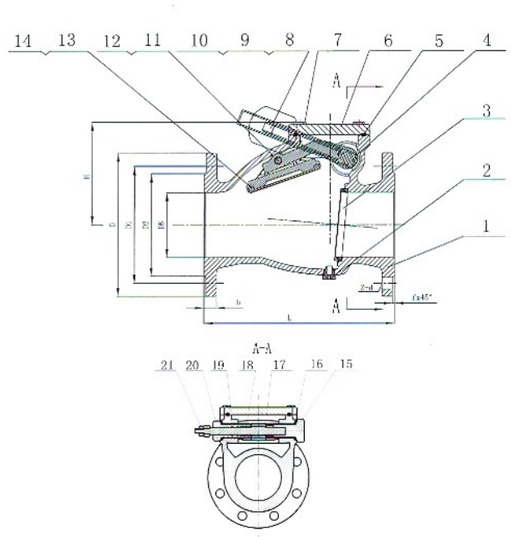
Ductile Iron Swing Check Valves

Model No. CV-103 for BS5153
CV-303 for DIN3202 F6



Design to BS5153, DIN3202 F6
Face to face dimension to BS5153 (Model CV-103), and DIN3202 F6 (Model CV-303)
Flange and drilling to BS4504 PN10/PN16, DIN2501 PN10/PN16
Tests: hydraulic test to BS6755 Part 1
Use: for potable water, sewage and neutral liquids to Maximum 70℃
Coating: fusion bonded epoxy coating internally and externally minimum 250 microns

Metal Seat Type:
Model No. CV-103MS (CV-303MS) : metal seated without lever and weight
CV-103MS-L (CV-303MS-L): metal seated with lever and weight
CV-103MS-LG (CV-303MS-LG): metal seated with lever/weight and guard
Rubber Seat Type:
Model No. CV-103RE (CV-303RE): rubber seated without lever and weight
CV-103RE-L (CV-303RE-L): rubber seated with lever and weight
CV-103RE-LG (CV-303RE-LG): rubber seated with lever/weight and guard

Components :

No.	Name	Material
1	Body	Ductile Iron, BS EN1563 EN-GJS-500-7
2	Drain Plug	Stainless Steel
3	Body Seal Ring	Brass, BS EN12165 CW617N, or Bronze, BS EN1982 CC491K
4	Hinge	Ductile Iron, BS EN1563 EN-GJS-500-7
5	O-ring	Rubber, EPDM
6	Bonnet	Ductile Iron, BS EN1563 EN-GJS-500-7
7	Bonnet Bolts	Stainless Steel
8	Lever	Ductile Iron, BS EN1563 EN-GJS-500-7
9	Weight	Ductile Iron, BS EN1563 EN-GJS-500-7
10	Lever Screw	Stainless Steel
11	Hinge Pin	Stainless Steel
12	Clip	Stainless Steel
13	Disc	Ductile Iron, BS EN1563 EN-GJS-500-7
14	Disc Seal Ring	Brass, BS EN12165 CW617N, or Bronze, BS EN1982 CC491K
15, 20	Side Plug	Forged Brass, BS EN12165 CW617N, or Ductile Iron, BS EN1563 EN-GJS-500-7
16	Bonnet Gasket	Rubber, EPDM
17	Washer	Stainless Steel
18	Shaft	Stainless Steel, BS EN10088-3
19	O-ring	Rubber, EPDM
21	Nut	Stainless Steel

Dimensions (mm)

DN	L (BS5153)	L (DIN3202 F6)	D	D1	D2	b	f	Z-Φd	H
50	203	200	165	125	102	19	3	4-Φ18	120
65	216	240	185	145	122	19	3	4-Φ18	130
80	241	260	200	160	138	19	3	8-Φ18	140
100	292	300	220	180	158	19	3	8-Φ18	160
125	330	350	250	210	188	19	3	8-Φ18	180
150	356	400	285	240	212	19	3	8-Φ22	200
200	495	500	340	295	268	20	3	12–Φ22	250
250	622	600	405	355	320	22	3	12–Φ26	290
300	698	700	460	410	378	24.5	4	12–Φ26	330

MODEL MU

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

GENERAL DESCRIPTION

The ORBINOX model MU is a flush bottom 4 sided sealing penstock. The gates are suitable for different types of applications with a highly versatile flow control for waste water treatment plants, irrigation, hydraulic works and hydro-electric power plants.
From sizes 150 mm x 150 mm to 1200 mm x 1200 mm, the MU model has a unique self adjusting seal design that can achieve minimal equal seating and unseating (bidirectional) leakage rates. Sizes 1300 mm x 1300 mm up to 4000 mm x 4000 mm are available in both uni-directional (only suitable for seating water heads) and bi-directional configurations. The maximum leakage rate is lower than the maximum allowable recommended by DIN 19569-4 (class 5) and AWWA C561 under normal conditions.
ORBINOX also designs and manufactures the MU model penstock in larger sizes and for more demanding service conditions.
For more information please contact an ORBINOX representative.

DESIGN STANDARD

The MU penstock is manufactured in general accordance to DIN 19569-4. Other standards such as AWWA C561 and BS 7775 are also available.
The standard MU model is manufactured in stainless steel which has a higher corrosion resistance in many applications which results into a longer life cycle with little or no maintenance. Other materials of construction are available upon request, such as AISI 904L, Duplex stainless, etc.

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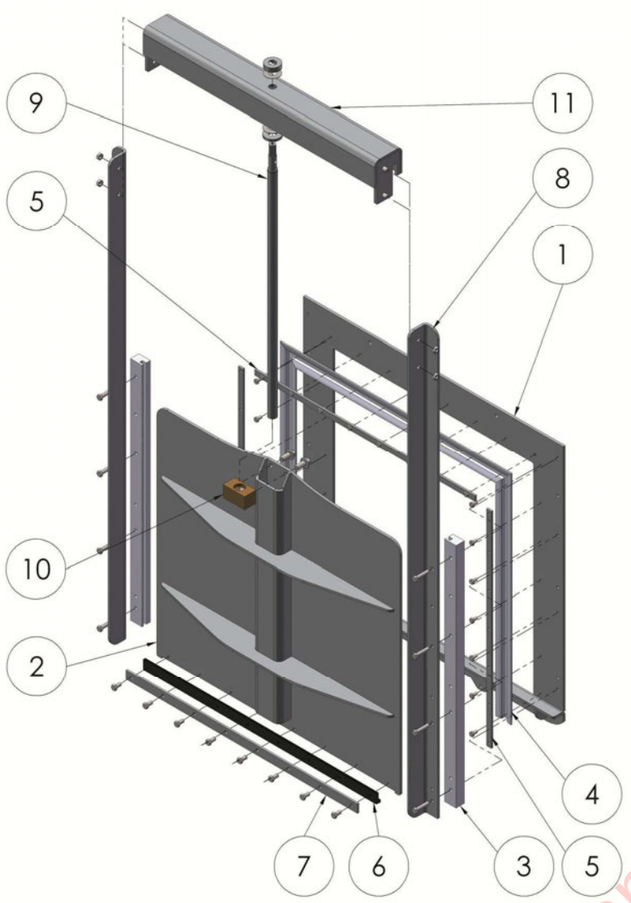
MODEL MU

ORBINOX
VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

STANDARD MATERIALS OF CONSTRUCTION

From 150 mm x 150 mm to 1200 mm x 1200 mm



ITEM	DESCRIPTION	MATERIAL (standard)
1	Frame	Stainless Steel Type 304L or 316L (1.4306 or 1.4404)
2	Slide	Stainless Steel Type 304L or 316L (1.4306 or 1.4404)
3	Guides	High Molecular Weight Polyethylene (HMWPE)
4	Seal	EPDM
5	Seal Retainer	Stainless Steel Type 304L or 316L (1.4306 or 1.4404)
6	Bottom Seal	EPDM
7	Bottom Seal Retainer	Stainless Steel Type 304L or 316L (1.4306 or 1.4404)
8	Frame Guide	Stainless Steel Type 304L or 316L (1.4306 or 1.4404)
9	Stem	Stainless Steel
10	Stem Nut	Bronze
11	Yoke	Stainless Steel Type 304L or 316L (1.4306 or 1.4404)

NOTE: For materials other than the above, please consult an ORBINOX representative

Reserves the right to change specifications without notice

ORBINOX S.A. Pol. Ind. s/n-20270 ANOETA (Spain) Tel.: +34 943 698030 - Fax: +34 943 653066 e-mail:orbinox@orbinox.com **www.orbinox.com**
CANADA, USA, BRAZIL, CHILE, PERU, SPAIN, UK, FRANCE, GERMANY, INDIA, CHINA, SOUTH EAST ASIA

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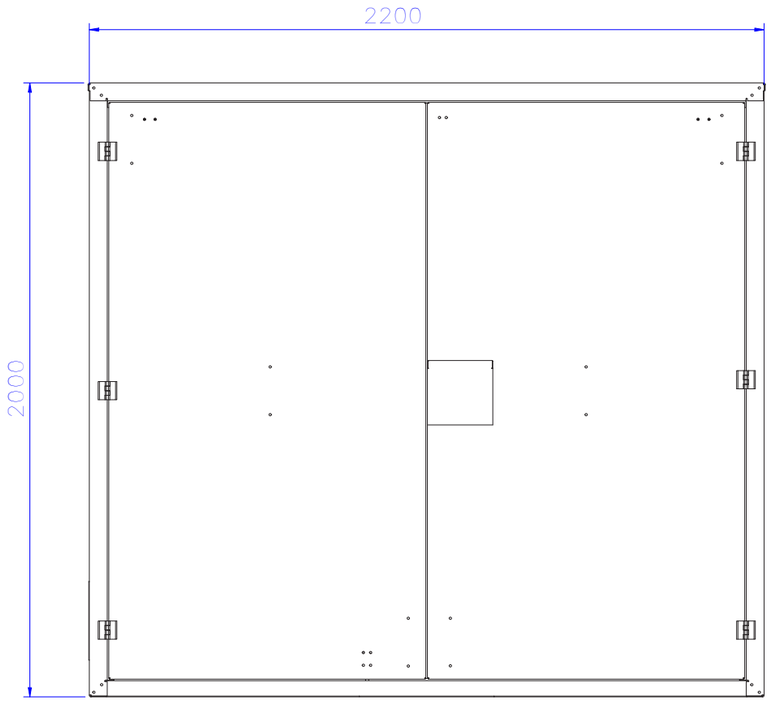

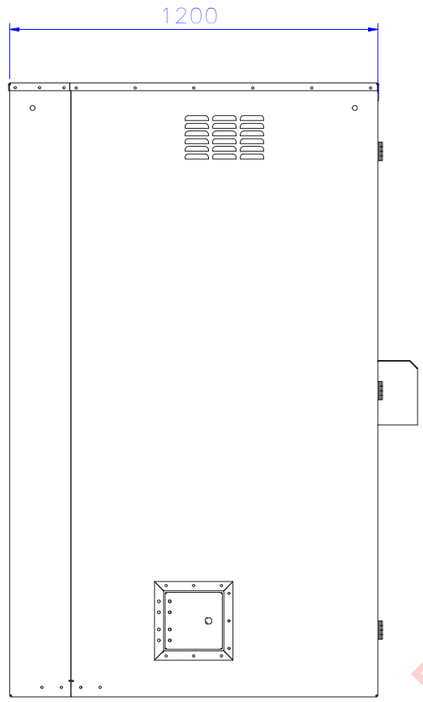

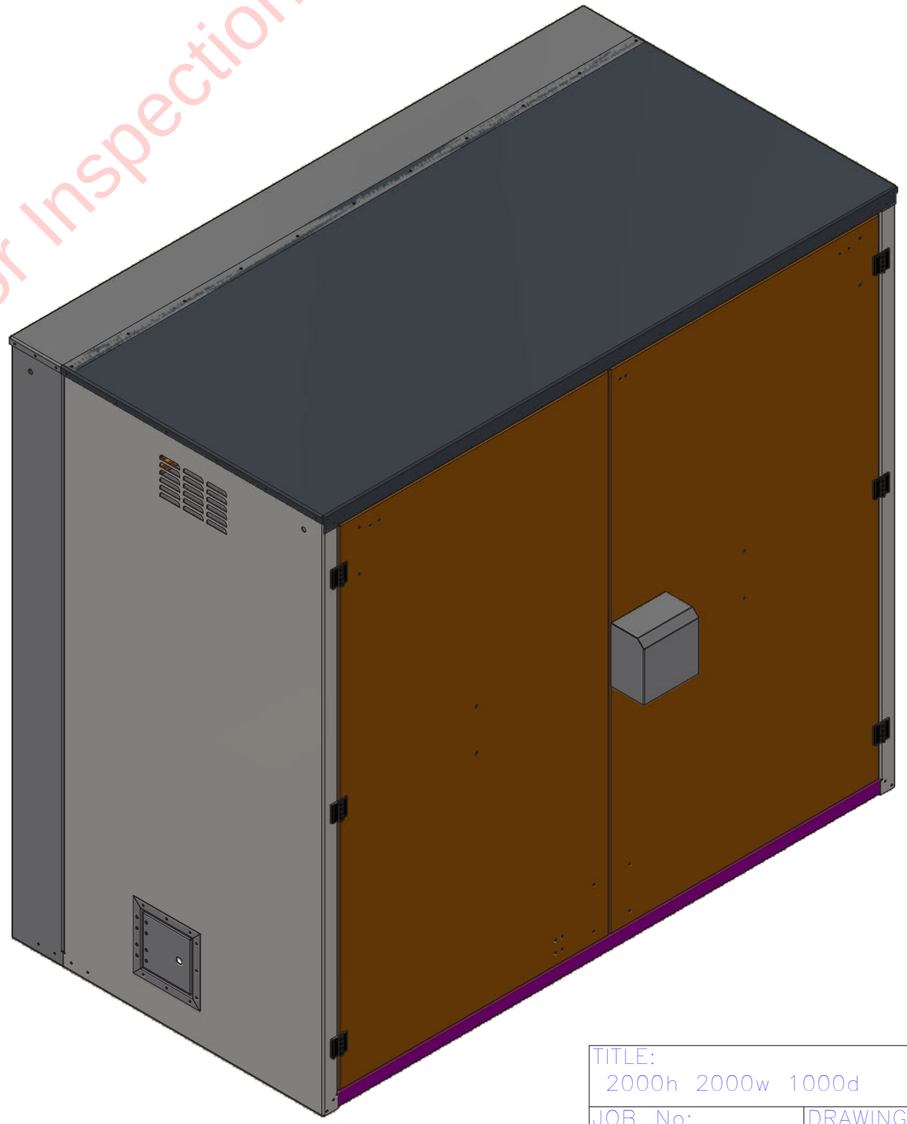

2200W 2000H 1200D

3mm Galvanised Steel
Vented High & Low
Double door hinged 90°
Fully lockable door hasp, 3 point locking system
Door Stays
Generator Hatch
Lock Cover
90° Door stays
IP Rated
Finish in Moss Grenn (RAL6005)

TITLE: 2000h 2000w 1000d	
JOB No: EPS	DRAWING QTY: 1 OF 4
DRAWN BY: JL	DRAWN DATE: 23/03/2020
APPROVED BY:	APPROVED DATE:

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APPENDIX 2-5 Green & Blue Infrastructure/Landscape Design Rationale Report – Simon Ronan Landscape Architecture

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PROPOSED RESIDENTIAL DEVELOPMENT
GREENFIELD, BALLINCOLLIG, CORK CITY

LANDSCAPE AND GREEN INFRASTRUCTURE REPORT

July 2025

SR LA

SIMON RONAN LANDSCAPE ARCHITECTS

Dublin Office
25 Glengarrif Parade
Phibsborough

Cork Office
Levis Quay
Skibbereen

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01.
LANDSCAPE VISION

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Landscape Vision

Ecological Connectivity

The protection and enhancement of the sites existing natural features will inform the character of planting and sense of place it derives from. In turn, there will be a net gain for bio-diversity by planting native tree species, coupled with plants selected form a list of pollinator friendly species and maintained to increase the availability of flowering plants in the shoulder months.

+

Pedestrian Connectivity

Pedestrian Orientated Scheme promotes walking and cycling at its heart and the provision of amenities to support these drivers have been allowed for. Increased permeability to and through the site from north to south and east to west by providing public access at potential existing links unlocking key connectors in the local context.

+

SUDS connectivity

Sustainable Drainage Systems are a collection of water management practices that aim to align modern drainage systems with natural water processes. Integration of SuDS make urban drainage systems more compatible with components of the natural water cycle such as storm surge overflows, soil percolation, and bio-filtration, mitigating the effect human development may have on the natural water cycle, particularly surface runoff and water pollution trends.

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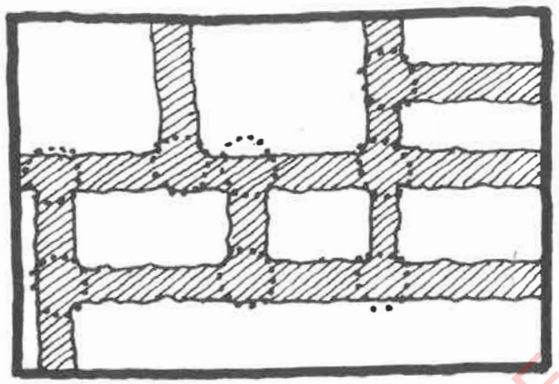
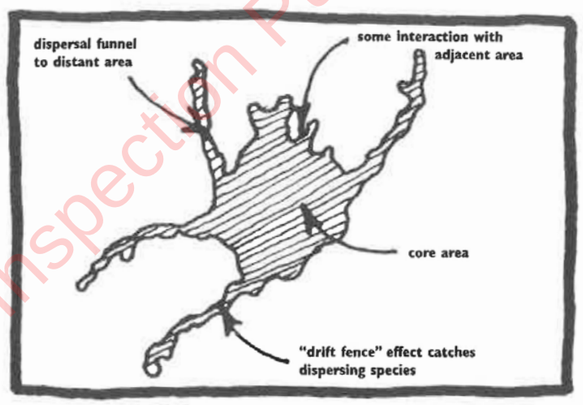
Ecological connectivity

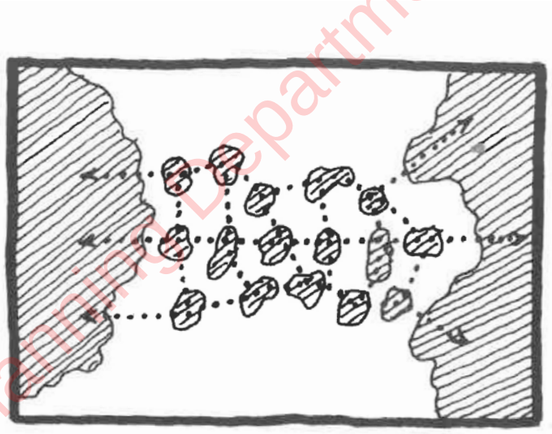
This project embraces sustainable practices such as habitat restoration and the implementation of wildlife corridors, fostering a thriving ecosystem that supports a wide array of plant and animal species, ensuring a balanced and resilient environment for future generations.



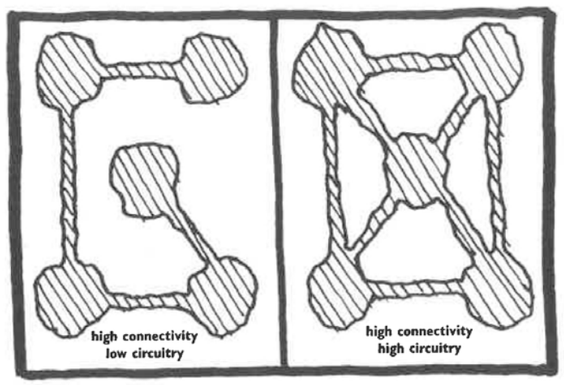
Intersection Effect



Ecologically "optimum" Patch Shape



Cluster of Stepping Stones



Network Connectivity & Circuitry

Ecological First Principles

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Ecological connectivity

Blackthorn

Blackthorn

Wild Crab Apple

Elder

Holly

SR LA
SIMON RONAN LANDSCAPE ARCHITECTS

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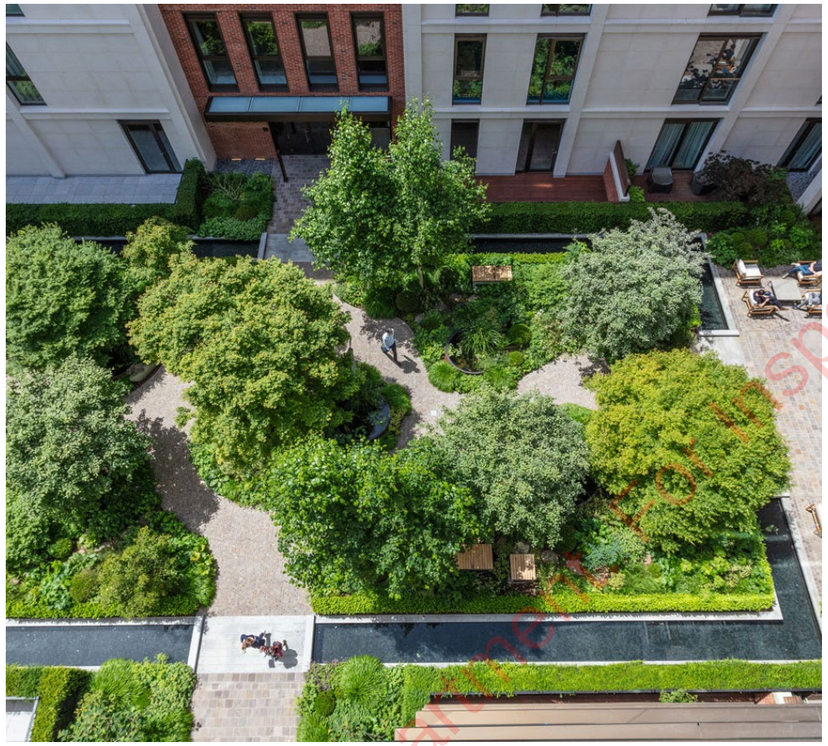
Pedestrian Connectivity

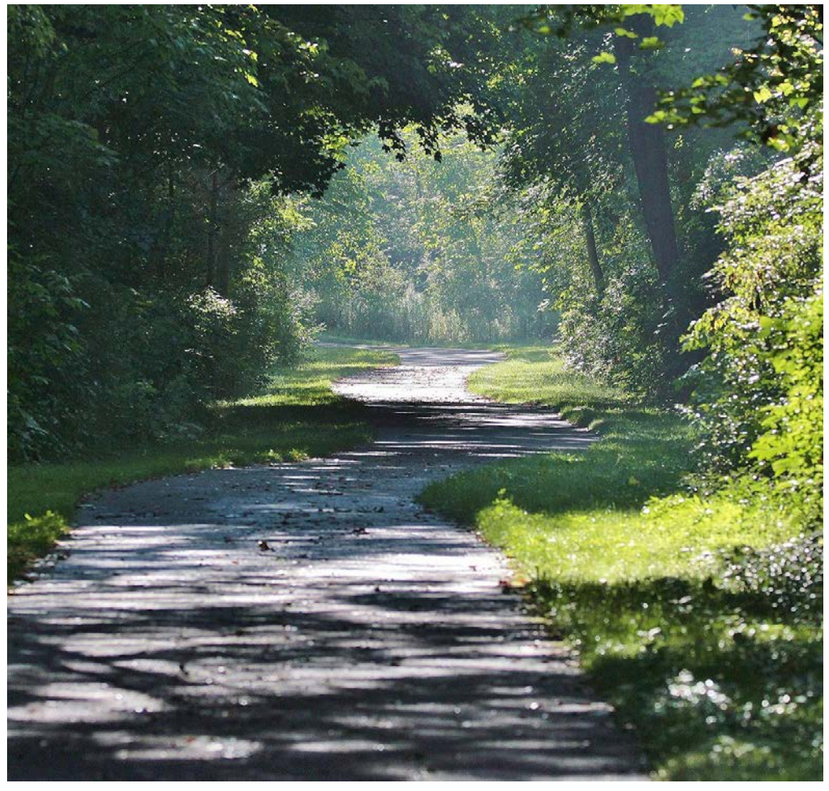
Creating a vibrant network that encourages social interactions, enhances accessibility, and fosters a sense of community.



Pedestrian friendly Spaces

Universal Design

Scenic cycle lanes



Pedestrian walkways in the nature

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Leveraging Existing Green Infrastructure

FOLLY PEEPING OVER HEDGE ROW

SEATING OPPORTUNITIES ON EDGE TO ENCOURAGE INTERACTIONS

EXERCISE STATION

PEDESTRIAN ROUTE THROUGH HEDGE WITH TREE CANOPY RETAINED TO CREATE CONNECTIONS

RETAINED + ENHANCED HEDGEROW

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02. CONTEXT ANALYSIS

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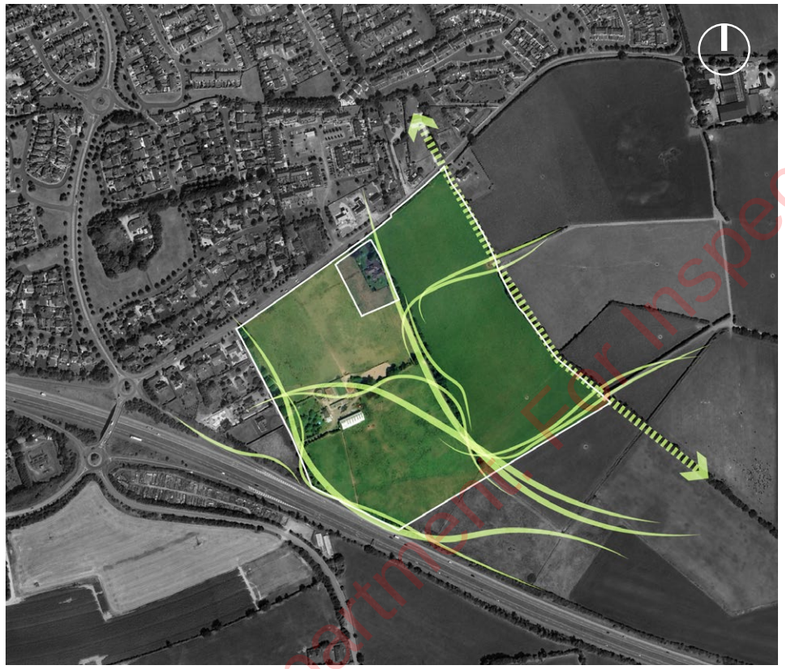
Site Analysis

Site Boundary

Located between N22 and Greenfields Road vehicular routes, the site is well connected and accessible. Flanked by agrucultural fields towards the south and east, there is an opportunity to reinforce the vegetation at its boundary conditions.

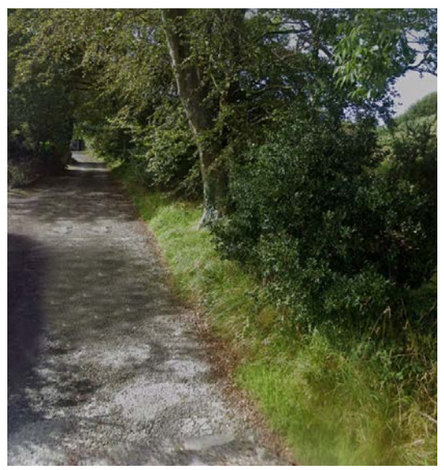
Ecological Links



Understanding the site and its existing ecological characters provide clues as to how the landscape should be developed. The existing characteristics should be retained, enhanced and protected as a parkland setting in which multiple landscape types can define different spatial arrangements.

Existing Vegetation

The sites greatest natural assets are its existing ecologies. The design works to protect and celebrate these as part of its character. Furthermore, the design is enhanced with additional tree planting to all boundaries and its internal space, creating a variety of spatial experiences.



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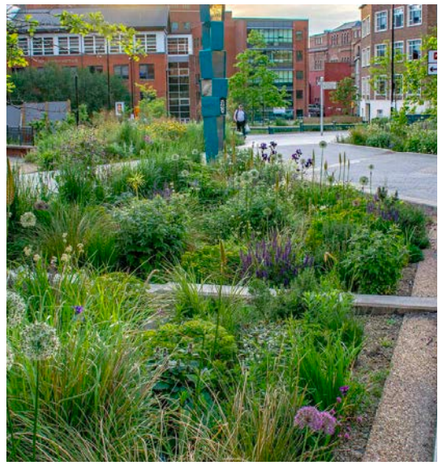
Site Analysis

Topography

Thoughtful integration of the site's topographical features can enhance both aesthetics and functionality, creating a landscape that aligns with the natural contours and promotes ecological balance.

Micro-climate

The site has positive aspects to take advantage of solar gain.



Connectivity

The site connects very well with key destinations and transport. It promotes walking and cycling at its heart and the provision of amenities to support these drivers haven allowed for as has connectivity to the wider community and a sense of welcomeness for all.

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Site Analysis - Open Space Context

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03. LANDSCAPE MASTERPLAN

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Landscape Masterplan

Legend

1. Connections
2. Open Space
3. Rear Gardens
4. Shared Surface
5. Cycleway & Pedestrian Connection

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Landscape Zoning

1. Paths - Link

2.Green Link

3.Multipurpose open space

4. Playground

5. Seating

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Landscape Infrastructure: Ecology + Biodiversity

SWIFT

BAT

SWALLOW

HAWTHORN

WILD CRAB APPLE

BLACKTHORN

ELDER

HAZEL

HOLLY

BLACKTHORN

EARTHWORM

DRAGON FLY

BUTTERFLY

BUMBLE BEE

CADDIS FLY

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Tree Plan

Trees number is significantly improved to create a richer environment. Carbon Sequestration is a key element of the design. Utilizing green spaces to capture carbon, reduce urban heat islands, and enhance air quality.

Legend

- Existing Trees To Be Retained - Tot.n 40
- Existing Trees To Be Removed - Tot.n 14
- Proposed Trees - Tot.n 778

Quercus robur - n.36
Pinus sylvestris - n.6
Platanus × hispanica - n.176
Sorbus aucuparia n.192
Betula pendula - n.368

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Net Biodiversity Gain

Planting schemes designed to support native pollinators and promote year-round ecological health.

Legend

- Meadow & Pollinator Friendly Plants
- Existing Hedgerow To Be Retained
- Existing Hedgerow To Be Removed
- Proposed Native Hedgerow
- Existing Trees To Be Retained - Tot.n 40
- Existing Trees To Be Removed - Tot.n 14
- Proposed Trees - Tot.n 778

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Hedgerow Treatment

The landscape design objective is to retain as much existing hedgerow as possible.

The hedgerow is a vital element for wildlife and ecology.

Legend

- Existing Hedgerow To Be Retained
- Existing Hedgerow To Be Removed
- Proposed Native Hedgerow

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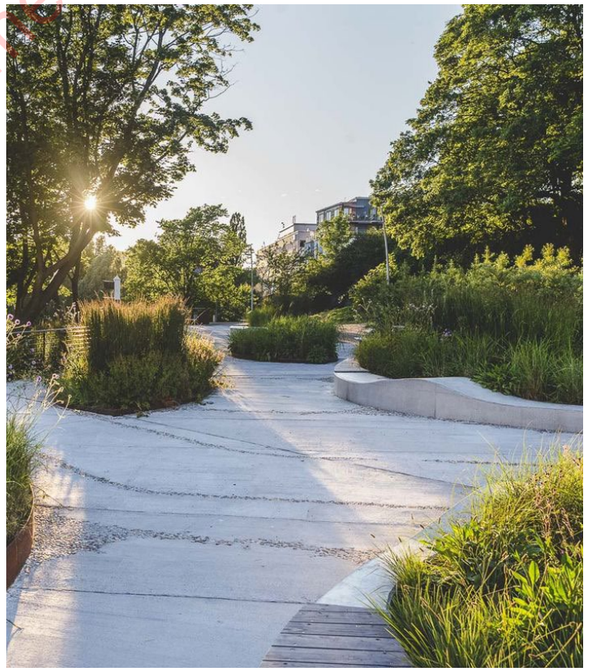
SUDS connectivity

Sustainable Drainage Systems are a collection of water management practices that aim to align modern drainage systems with natural water processes. Integration of SuDS make urban drainage systems more compatible with components of the natural water cycle such as storm surge overflows, soil percolation, and bio-filtration, mitigating the effect human development may have on the natural water cycle, particularly surface runoff and water pollution trends. In the context of this masterplan area, the provision of the following sustainable drainage systems, along with the construction of separate foul and surface water networks, will result in a significant improvement on the public drainage system from current conditions.

SUDs GREEN ROOF
SUDs RAIN GARDEN
SUDs INFILTRATION BASIN
SUDs FILTER DRAIN

Reference Image



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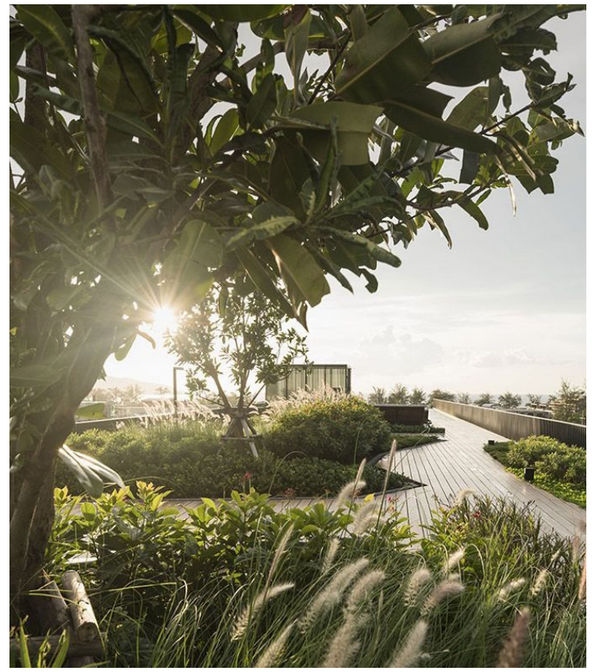

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SUDS - Tree Pits

Tree Pits

Typically, street and footpath surfaces shall be impermeable surfacing, with finishes of bitumen, stone pavers, concrete. To provide interception storage of surface water from these impermeable surfaces, they shall be drained to Bio-retention tree pits via a series of road gulleys and linear drains.

A

TYPE A:

Covered tree pit with connecting trench. – Typical Soil Volume = 6m3 excluding trench and 8.5m3 including trench – Drained Area typically 30-50m2 per individual tree pit

B

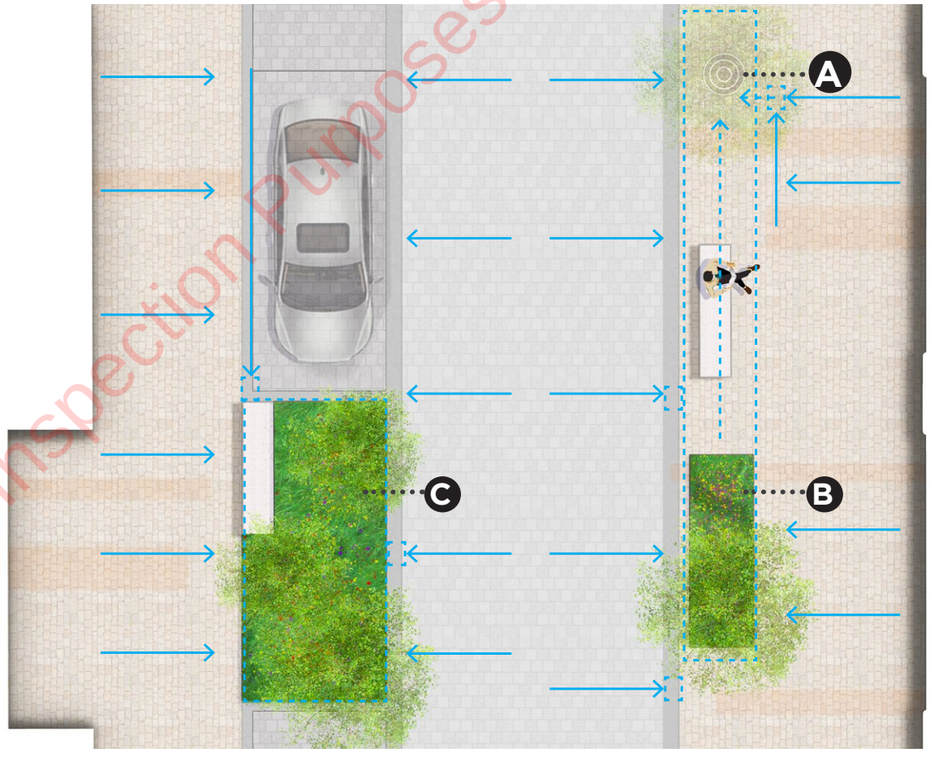
TYPE B:

Open tree pit with connecting trench. – Typical Soil Volume = 5.7m3 excluding trench and 7.5m3 including trench – Drained Area typically 30-50m2 per individual tree pit

C

TYPE C:

Standalone open tree pit. – Typical Soil Volume = 15m3 – Drained Area typically 60-90m2



SUDS approach

SUDS street planting

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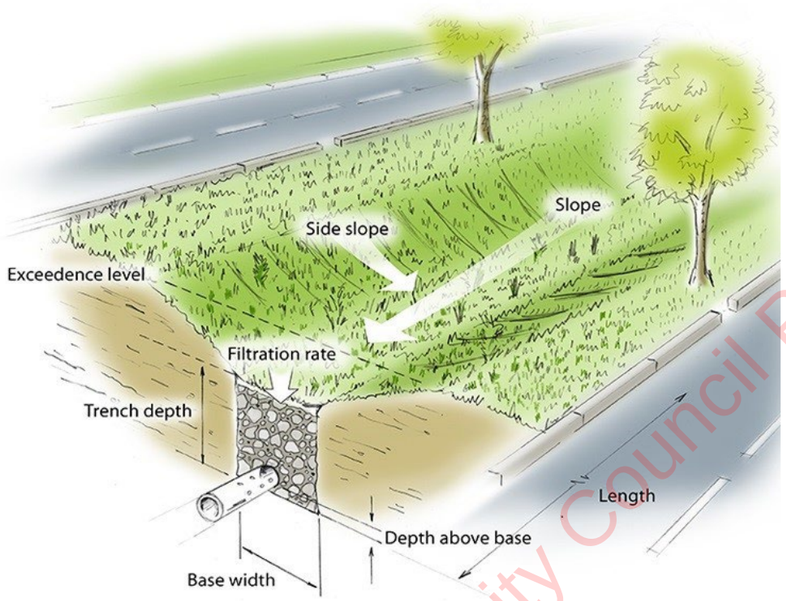
SUDS – Swales

Swales are shallow, vegetated channels designed to convey, filter, and infiltrate surface water runoff in a sustainable and visually integrated way. Swales are increasingly used as part of SuDS (Sustainable Drainage Systems) to manage stormwater locally, reduce peak flows, and improve water quality before discharge into watercourses or attenuation systems.

Typically located along roadsides, footpaths, or in communal green spaces, swales slow down runoff from impermeable surfaces, allowing water to percolate gradually into the ground or be conveyed towards attenuation ponds. The use of native grasses and herbaceous plants enhances infiltration, stabilizes soil, and provides ecological benefits.

Swales are particularly effective in Ireland's climate, where frequent rainfall requires robust and passive drainage solutions. Their design must account for local hydrology, soil permeability, and integration with site gradients. Swales also offer aesthetic and educational value, contributing to the character of residential open spaces while aligning with Irish planning policies that promote nature-based water management.



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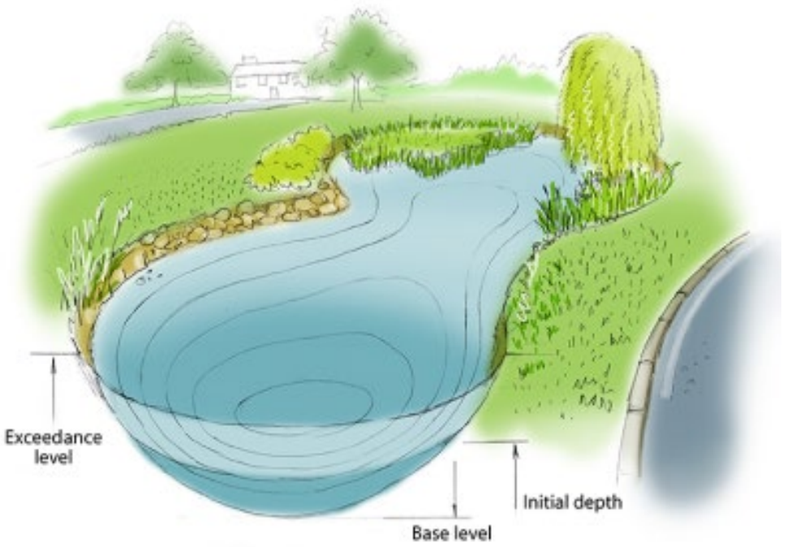
SUDS - Attenuation Ponds

Attenuation ponds are integral components of sustainable drainage systems (SuDS) in residential developments, particularly in Ireland's temperate, high-rainfall climate. These engineered basins are designed to temporarily store surface runoff during storm events and release it at a controlled rate into the receiving drainage system or watercourse. By slowing the flow of water, attenuation ponds reduce peak discharge, help prevent downstream flooding, and promote the settling of sediments and pollutants.

When well-integrated, they can contribute to biodiversity, with planting strategies that support native species and seasonal interest.



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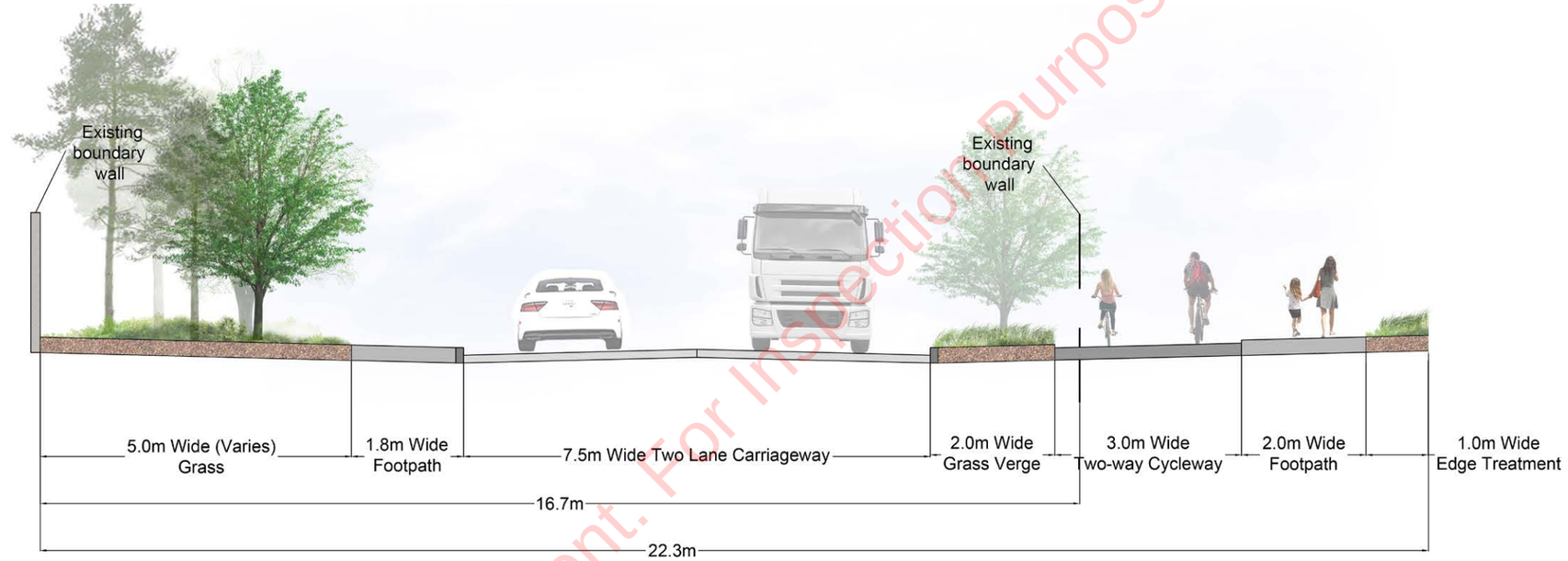
Landscape Infrastructure: Integrated Mobility

The following street section illustrates the interface of the various threads of pedestrian and vehicular mobility.



SECTION A-A

Planting

Footpath

Verge planting

Cycleway detail

Planted edge treatement

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Landscape Strategies - Circulation

Legend

- Vehicular Connection
- Cycleway
- Pedestrian Connection

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Landscape Components - Pedestrian Paths & Cycleways

The proposed design incorporates a well-connected network of pedestrian paths and cycleways, ensuring safe, accessible, and efficient movement throughout the site. These routes are designed to seamlessly integrate with surrounding spaces, promoting active travel while enhancing the overall user experience. Strategic planting and subtle level changes provide natural wayfinding and separation between pedestrians and cyclists, creating a comfortable and visually engaging journey.

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Landscape Character Area - Courtyards

The proposed courtyard design integrates seating seamlessly within the landscape, creating a welcoming and functional space for users. Meadow-mounded planting is strategically incorporated to enhance biodiversity and mitigate the urban heat island effect, while smaller planted islands introduce visual interest and define movement through the space. The combination of these elements fosters a dynamic and sustainable outdoor environment.

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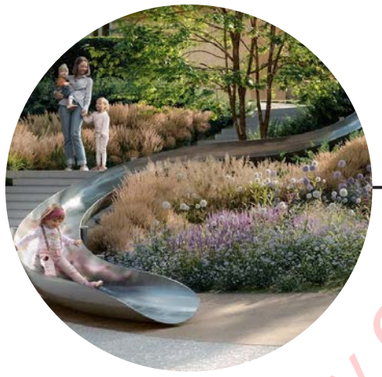
Landscape Character Area - Courtyards

Natural Circulation

Lush Greenery

Integrative Playscape



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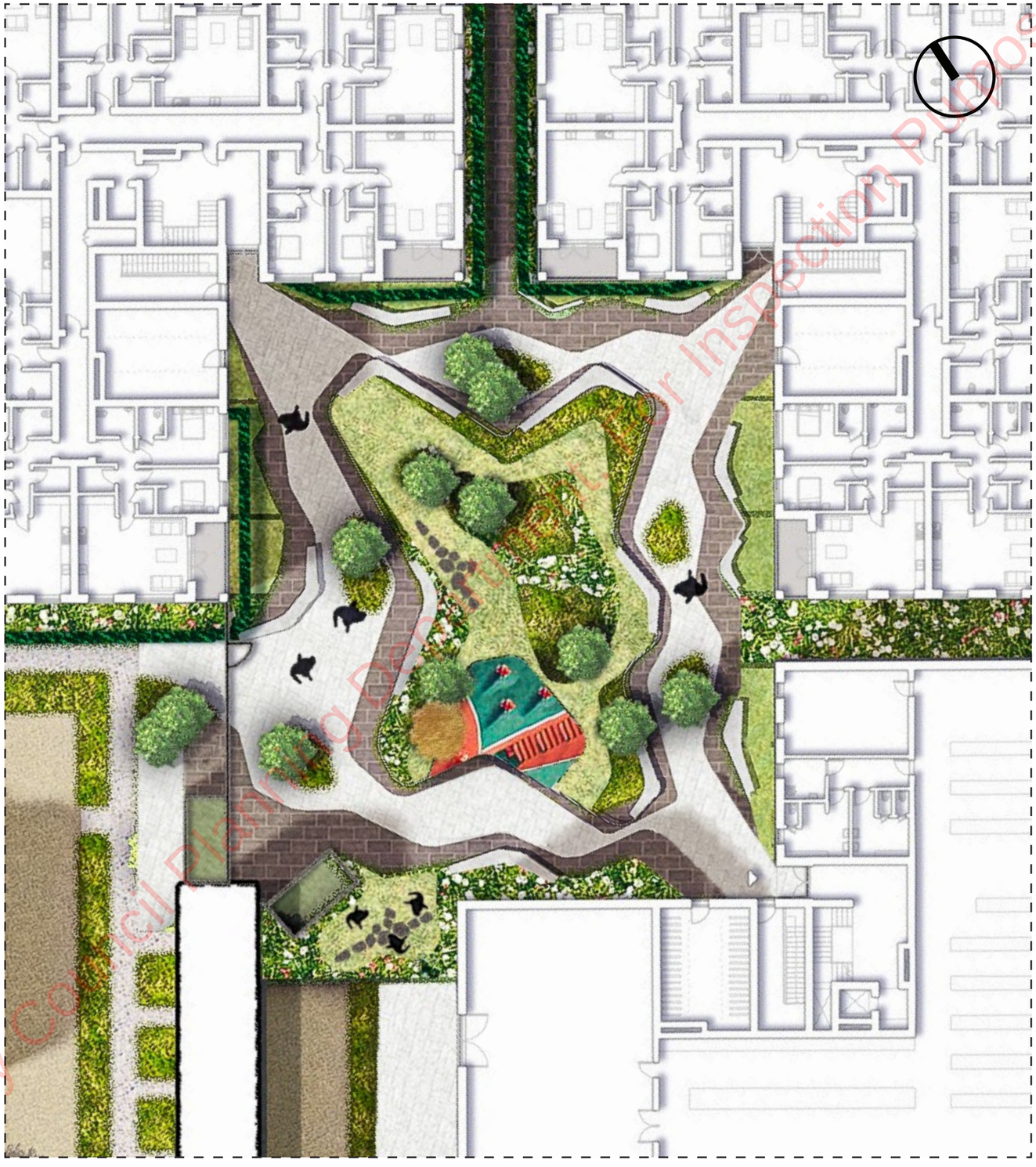
Landscape Character Area - Courtyard 1

Planted Entry

Integrative Seating

Planted Islands



Playscape

High Quality Paving

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Landscape Character Area - Courtyard 2

Vibrant Planting Mix

Integrative Seating

Planted Islands

Expressive Paving

Integrative Playscape

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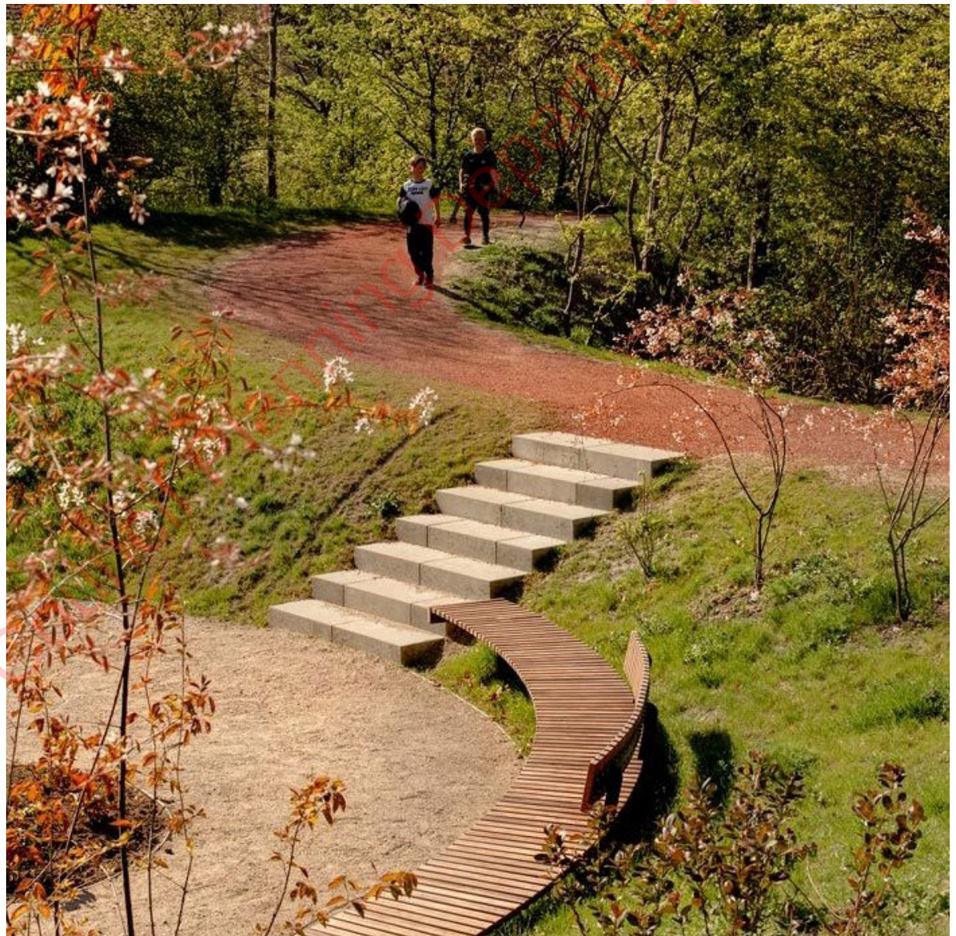
Landscape Character Area
Greenway

The landscape design is fundamentally pedestrian-oriented, prioritizing the comfort and accessibility of residents as they navigate through the neighbourhood, green spaces and central open areas. This will be achieved by incorporating a network of well-defined pathways, boardwalks and cycle lanes that provide safe and inviting routes for walking, jogging, and cycling.



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Landscape Character Area - Greenway

Planted Street Buffer

Greenway

Seating Plaza

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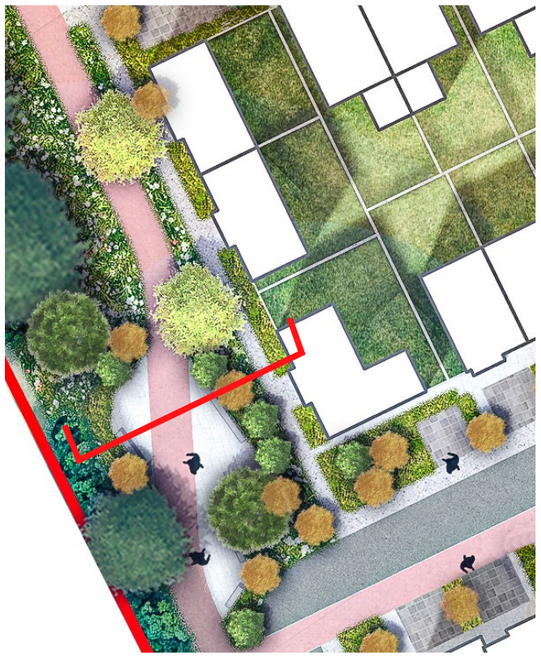
Greenway Section



PLANTING GREENWAY PLANTING SIDEWALK

Edge Condition Planting

Integration of Landscape Materials

Dense Vegetation for Privacy

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Focal Area - Central Space

Playscape

Existing Hedgerow

Sunken Lawns

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Central Space Section

DRIVEWAY ROAD SUNKEN LAWN EXISTING HEDGEROW SUNKEN LAWN ROAD DRIVEWAY

Edge Condition
Planting

Sunken Attenuation
Basin

Meadow and
Existing Hedgerow

Planting at
Sunken Lawn

Edge Condition
Planting

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Play Strategy

Play Strategy

The proposed playgrounds within this development are designed to create accessible, inclusive, and multifunctional spaces that align with best practices in urban planning and landscape architecture. Key features of the playgrounds include:

Accessibility

The playgrounds are strategically located within walking distance of the majority of residences, ensuring compliance with Table 5.2 hierarchy and accessibility standards of the Cork County Council Draft Recreation and Amenity Policy.

Designed with permeability in mind, the play areas are integrated into a network of well-defined pedestrian and cycle routes, connecting seamlessly to nearby public open spaces, community amenities, and the broader green infrastructure.

Legible and inviting entrances ensure that the playgrounds are safe and easy to navigate, encouraging frequent use by residents of all ages and abilities.

Network Creation

The playgrounds are embedded within a cohesive green infrastructure network, acting as key nodes that connect local greenspaces to larger ecological and recreational corridors.

Thoughtful design links these spaces effectively to the wider environment, creating opportunities for wildlife corridors and greenway extensions that integrate doorstep play with the surrounding countryside.

Quantity and Quality

The playgrounds are designed to provide sufficient and proportionate public open space that meets the recreational needs of the community while preserving natural features and supporting biodiversity.

Additional open space is provided in key areas, enhancing heritage and landscape value while meeting specific nature conservation requirements.

Legend

- Dedicated Play - Tot 3
- Kickabout Area - Tot 5
- Natural Play | Play Along the Way

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Play Strategy

The proposed playgrounds promote health and wellbeing by integrating active travel routes, inclusive play opportunities, and social spaces that encourage physical activity, mental wellness, and community engagement.

Health and Wellbeing

Playgrounds are located along a network of active travel routes, promoting walking, cycling, and jogging, and encouraging healthier lifestyles. The design accommodates children of all ages, with a variety of play equipment and features suitable for toddlers, school-aged children, and teens. Parents and older residents are provided with seating and passive reflection areas, creating spaces for both activity and relaxation. Amenities are universally accessible, promoting inclusivity and positive mental health through social connectivity, enjoyment, and interaction.

Multifunctionality and Flexibility

Play areas are designed to be multifunctional and adaptable, offering year-round opportunities for active and passive recreation. Features such as open lawns for free play, nature-inspired climbing structures, and event spaces ensure that the playgrounds can serve a diverse range of uses and users.

Opportunities for community involvement, such as spaces for food growing or small events, further enhance the sense of belonging and identity.

Natural Surveillance and Sunlight

All playgrounds are well-overlooked by surrounding residences, enhancing safety through natural surveillance while fostering a sense of security and community ownership.

The layout optimizes sunlight exposure to encourage year-round outdoor use and maximize comfort for users.

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Playscapes

The landscape design incorporates a variety of play strategies to encourage active engagement and exploration for all ages. Sunken kickabout lawns provide open, flexible spaces for informal sports and social play, while 'play along the way' elements within woodland areas offer a more immersive and nature-based experience. Designated playgrounds cater to structured play, incorporating diverse equipment and inclusive features to support a range of abilities. Together, these play opportunities create a dynamic and engaging environment that fosters physical activity, creativity, and social interaction.

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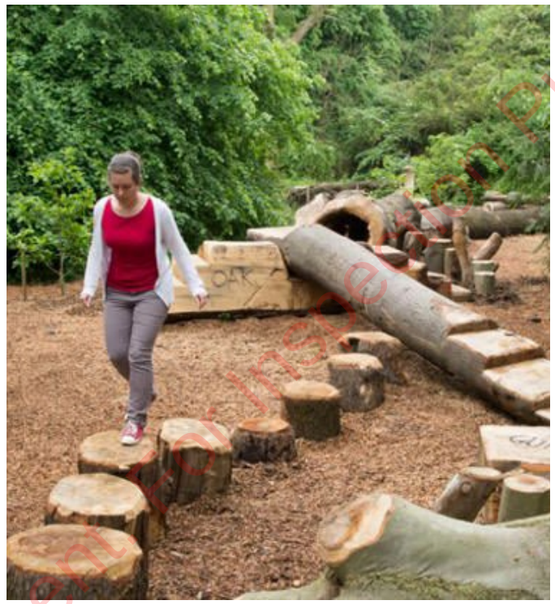
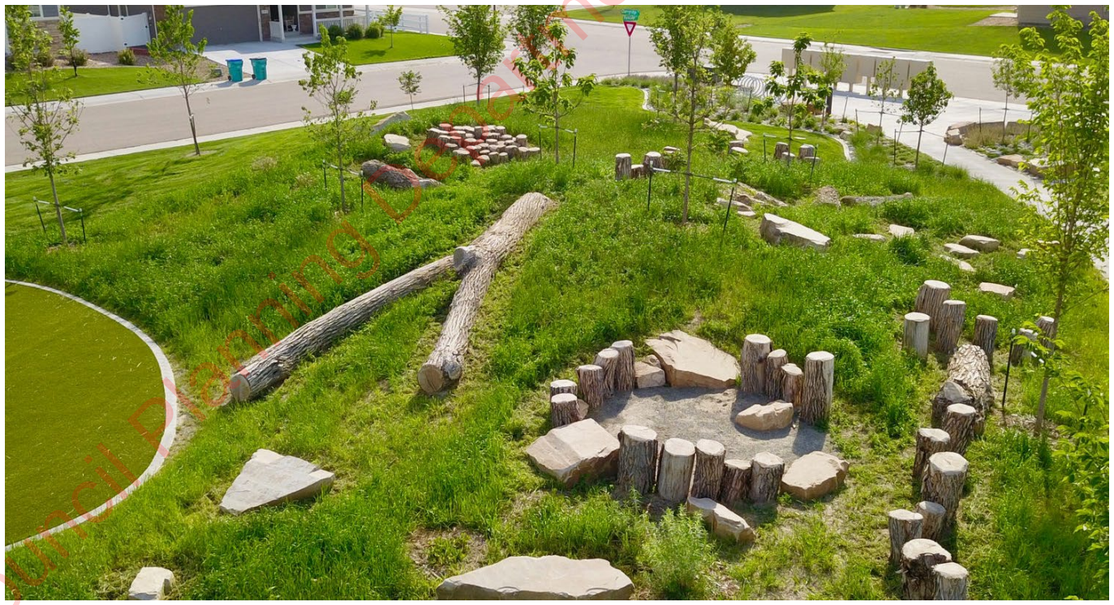
Playscapes - Natural Play





Natural playscapes, embedded within the landscape, use elements like rocks, logs, water and plants to create play environments that blend seamlessly with nature. These spaces encourage imaginative and unstructured play, fostering children's physical, cognitive and emotional development while deepening their connection to the natural world.

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Focal Area - Sunken Lawn

Sunken Lawn

Buffer Planting

Natural Play

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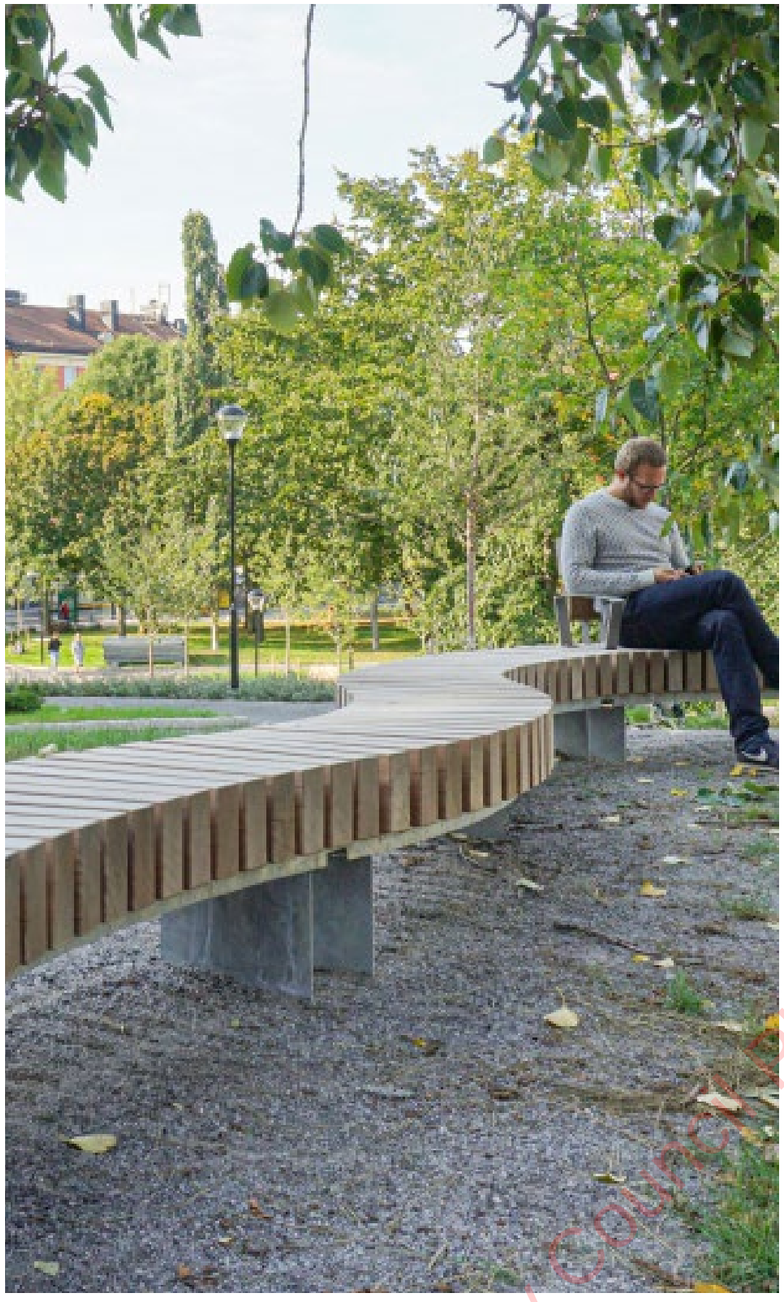
Outdoor Seating



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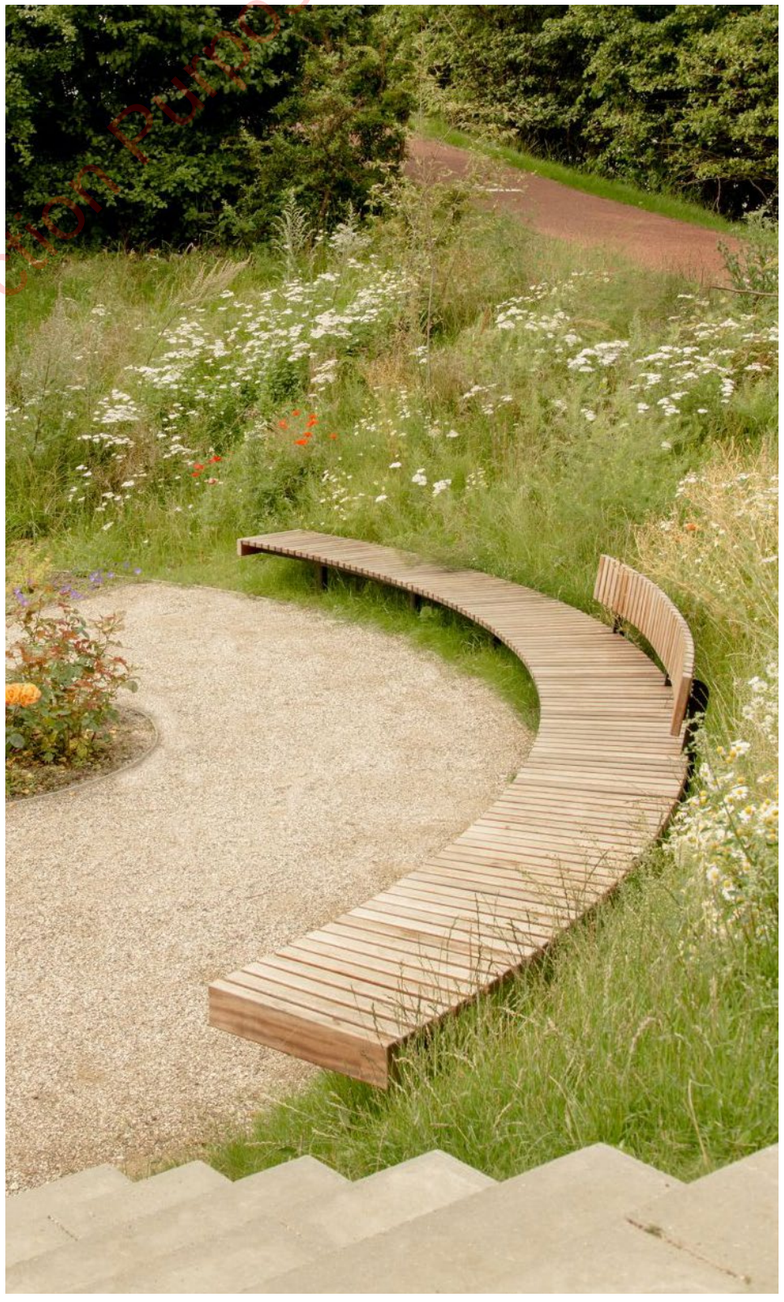

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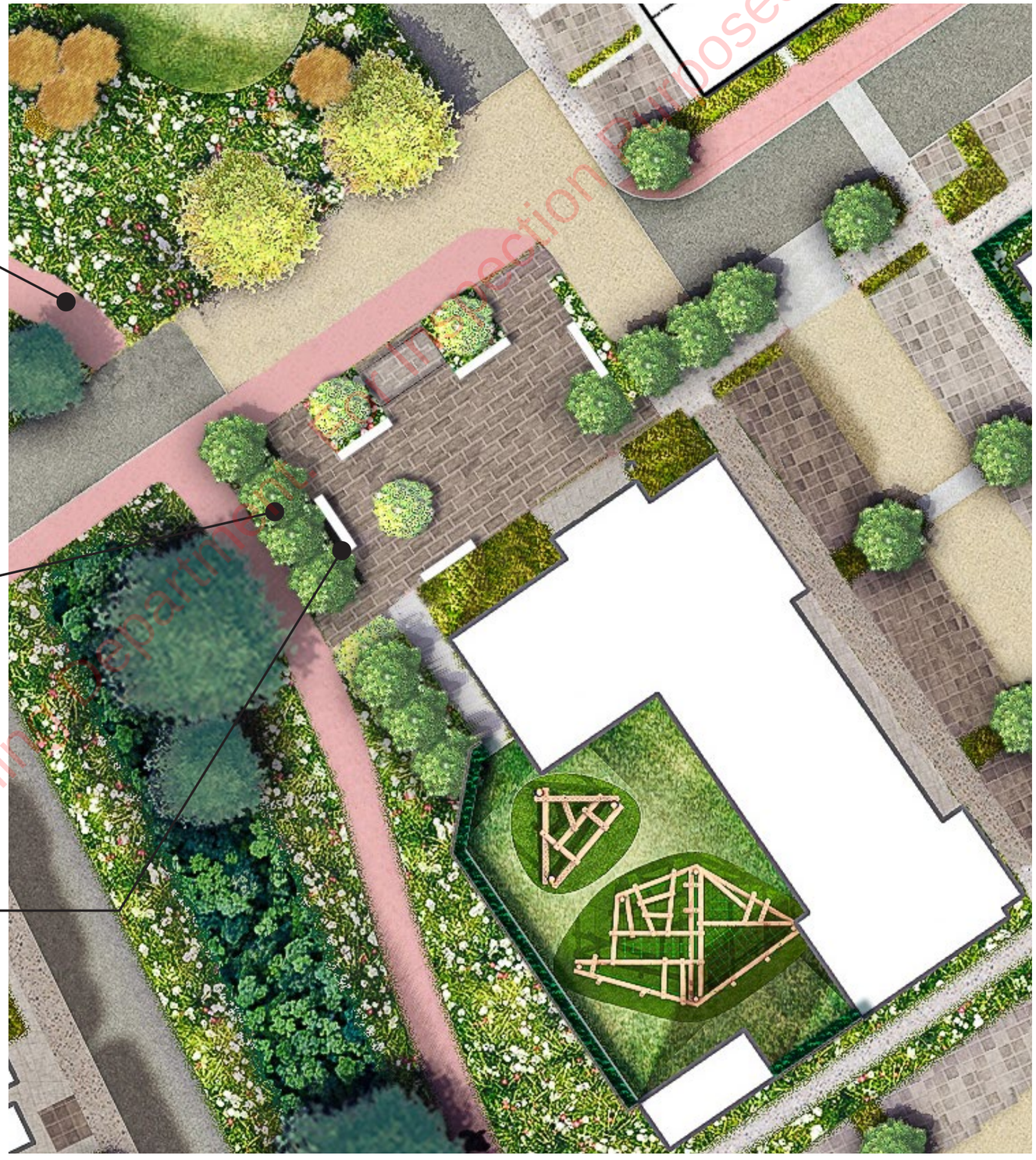
Focal Area - Creche Plaza

Greenway Connection

Buffer Edge

Shaded Seating



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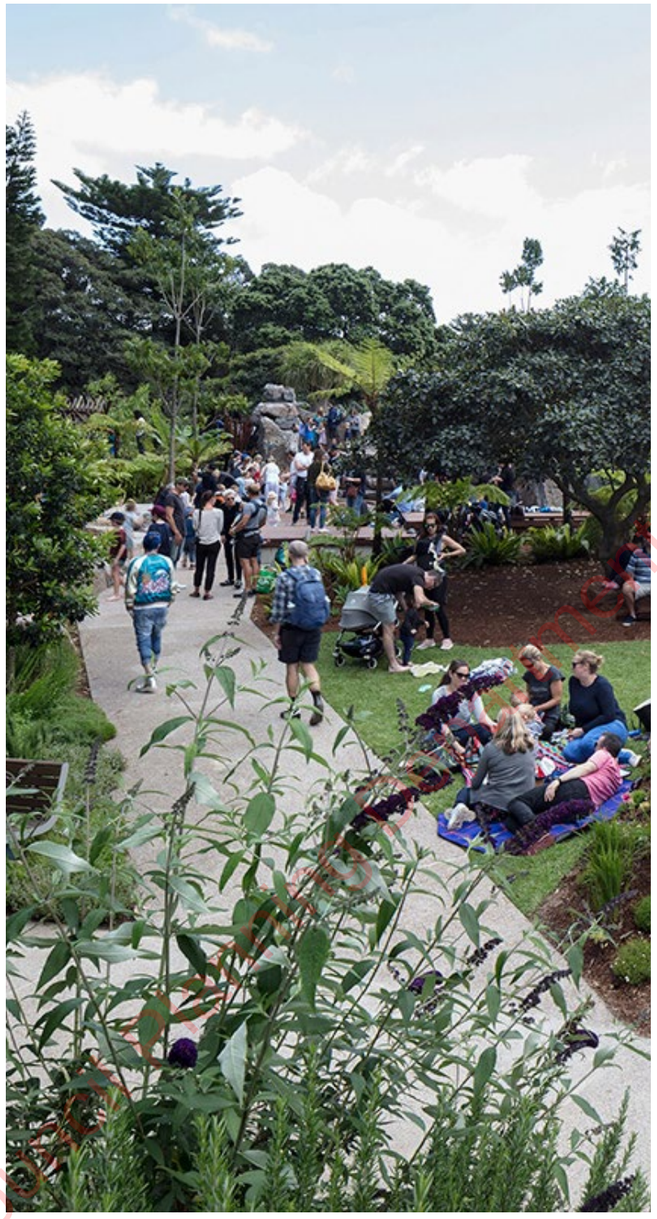
Social Spaces



The development integrates social spaces within the green landscapes and open areas to encourage community connection. Designed with seating areas and plazas nestled among the trees, these gathering spots provide residents with opportunities to come together and interact. By creating accessible spaces for socializing, the design aims to foster a sense of community while allowing residents to enjoy the natural surroundings.

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04.
LANDSCAPE PALETTES

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Planting strategy - Tree Planting

Native trees are from Tree Council approved nurseries.

Wild flower seed mix purchased from an authentic Irish source.

Shade loving plants for Woodlands

Shade loving plants for Woodlands

Woodland Tree Planting

Informed by the existing and formative tree planting and a native palette the tree planting will bleed into the site and grade out form north to south.

Pinus sylvestris
Scots Pine

Sorbus aucuparia
Mountain Ash

Corylus avellana
Hazel

Bulbs to add seasonal interest

Native trees planting including birches and pines

Street Trees + Small Feature Trees

Specimen tree planting will provide year long interest and beauty - landmarks in the landscape, to celebrate and identify with.

Salix pentandra
Willows

Quercus robur
Oak

Pinus sylvestris
Scots Pine

Shade loving plants for Woodlands

Woodlands with ferns understory

Wildflower & Shrub Planting

To enhance bio-diverse credentials wildflower planting will occupy edges and large swathes of the sites periphery along with shade tolerant understory planting.

Quercus petraea
Oak (Sessile)

Betula pendula
Birch (silver)

Platanus x hispanica
London Plane

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Plant Palette

Viburnum opulus
Guelder rose

Betula pubescens
Birch (downy)

Arbutus unedo
Arbutus (strawberry)

Juniperus communis
Juniper

Crataegus monogyna
Hawthorn

Ilex aquifolium
Holly

Populus tremula
Aspen

Prunus spinosa
Blackthorn

Ligustrum vulgares
Wild Privet

Prunus padus
Cherry (Bird)

Malus sylvestris
Crab Apple

Prunus avium
Cherry (Wild)

Molinia caerulea subsp. arundinacea
purple moor-grass

Euonymous eoropaeus
Spindle

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The Pollinator Plan

The pollinator plan 2021-2025 has greatly influenced the planting palette and soft landscape strategy. This, combined with a selection of native plant species, will define the landscape design. Planting will educate and define public paths, distinguishing them from communal or private spaces.

Native Meadow

Meadows managed in the following way will allow bloom throughout the pollinator season. A further benefit is that bumblebees are provided with an undisturbed area for nesting. Over a number of years, the area will become more and more flower-rich with local species that are adapted to the site's conditions.

Perennial Flowers For Pollinators

Incorporate pollinator friendly perennial plants into the local community to provide food for pollinators from spring through to autumn.

Pollinator friendly perennial plants are excellent sources of pollen and nectar. They are much more attractive to bees when planted in blocks rather than as single plants. Having a pollinator friendly perennial bed is an excellent way to provide food for pollinators across their lifecycle.

Flowering Trees And Shrubs

Incorporate a mix of pollinator friendly trees and shrubs into the local community that will flower throughout the season. An orchard can be a wonderful addition for pollinators and the community.

It is important to priorities increasing native plants (trees, shrubs, wildflowers) across the landscape to provide food for pollinators.

Annual Flowers For Pollinators

Work with local authorities to ensure a component of annual planting in parks is with pollinator friendly annual plants - single rather than double flowered varieties.

You should always try to select scented, single-flowered varieties. The block planting of these can be an excellent source of food for pollinators.

Pollinator Friendly Urban Planters

Identify some urban planters or hanging baskets where the standard annual bedding mix could be replaced by perennial pollinator friendly plants.

Training

Facilitate or execute local training sessions on pollinators and how to conserve them. Resources will be available for interested parties to deliver training on topics such as creating nest sites for wild pollinators, identifying common pollinator species, participating in the AllIreland Bumblebee Monitoring Scheme, and collecting, storing, and using local wildflower seed to improve areas managed as small grassy meadows in parks, schools, along greenways, and so on.

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The Pollinator Plan

Hedgerows For Pollinators

Flowering hedgerows with hazel, willow, blackthorn, and hawthorn provide food for wild bees as they emerge from hibernation in spring. Bramble is a good source of ood in the summer, and ivy in the fall. Bumblebees frequently nest in long grass around the foot of hedgerows.

Clover Lawns

Identify small areas where grass could be entirely replaced with a permanent clover mix. Red and white clovers will provide colour, and are a very important food source for bees.

Eliminate The Use Of Pesticides

Identify some instances where pesticide use may be eliminated. This could refer to streets or locations where your group is willing to take on manual weed management. The majority of herbicides are applied along edging or at tree bases where mowers cannot reach. Identify sections of south-facing edging that could not be sprayed to give solitary bee nesting sites.

Awareness

Advocate for the All-Ireland Pollinator Plan among local companies, urging them to create pollinator-friendly outdoor areas or provide sponsorship for local initiatives that support pollinators.

Bee Hotels For Pollinators

Incorporate a limited number of solitary bee nest boxes into the community to attract cavity nesting solitary bees. Bee hotels can be valuable and effective awareness-raising tools, however actions 13 and 14 are superior methods for creating nest sites. In terms of reducing the chance of disease and predators harming the bees, a number of little hotels outperforms one large one.

Signage

Install informative signs elucidating the significance of pollinators and detailing local efforts in accordance with the All-Ireland Pollinator Plan. Signage templates are available for download on the website.

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Hedgerow Management

Trimming Hedgerows

Existing hedges that are of good structural condition require maintenance by periodic trimming. Teagasc recommends that hedges be cut periodically every 3-5 years, leaving the hedge as high as possible and allowing standard trees to grow up through it at intervals (www.teagasc.com, 2 February 2007).

This is supported by studies of hedgerow management on the fruiting yields of Whitethorn in lowland Britain (Croxton & Sparks 2002, Sparks & Martin 1999). There is evidence, however, to suggest that allowing Whitethorn to go for long periods without management (beyond the 3-5 year rotation) will actually increase its fruit yields, but will compromise its stock-proof structure as it becomes a tree.

It is suggested that some Crataegus is left to grow up as standards in the hedge while maintaining the rest of the hedge at the desired height. Such a diversification of the hedge structure will increase the niches available to wildlife, especially birds, and thereby enhance biodiversity.

Teagasc also recommends trimming hedgerows in a triangular shape to allow the maximum amount of light to reach the hedge base, especially on the shadier north side of a hedge, thus allowing it to remain thick, and therefore stock-proof, at the base. The consequences of allowing the woody component to grow wide at the base on the already squeezed herb species of the hedge margin have not been fully explored and this recommendation may need to be re-evaluated.

Hedgerows should not be cut during their active growth period since the practice involves the removal of the most productive parts of the hedge, thereby reducing its vigor. In addition, Sections 19-22 of the Wildlife (Amendment) Act of 2000 give directives for the protection of birds, many of which nest in hedgerows. The cutting of hedges during the nesting season may destroy both eggs and young, threatening bird populations, and the Act indicates that hedges should not be cut between the 1st March and the 31st of August.

The best time to cut the hedge is in the winter months when the plants are dormant. This reduces stress to the shrubs and improves their recovery period, while avoiding disturbance to nesting birds. Unless safety is an issue, hedges do not need to be cut more than once every 3-5 years, while varying the height at which the hedge is cut will diversify its structure, improving its value to wildlife.

Management of Hedge Margins & the Hedge-Bottom Flora

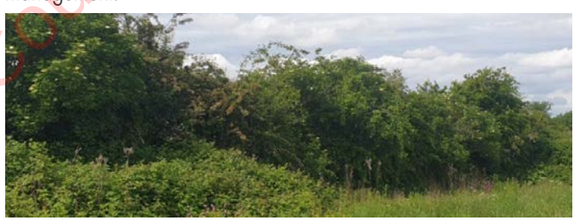
All hedgerows in the should be managed at widths between 4 and 9 metres with the retention of wide margins as an ameliorating buffer between the hedgerow flora and the adjacent land use. In stock-rearing areas, this can be accomplished by fencing animals away from the hedgerow using post-and-wire fences. While this may be more difficult to encourage in tillage areas, where farmers need to cultivate a maximum amount of land to meet slipping profit gains, financial incentives such as REPS could encourage them to leave wider margins between the fields under cultivation and hedgerows. It has been suggested that this practice can reduce the effects of nutrient runoff and herbicide drift on the hedge-bottom flora

(Cummins & French 1994)

Rejuvenating overgrown or "escaped" hedgerows

Overgrown or "escaped" hedgerows have lost their function as a fence and, in stock-rearing areas, are reinforced with wire fencing. Oftentimes the fencing is strung up along the remaining hedge shrubs and trees and fixed to their stems. This practice contributes to further deterioration of the hedge. Gaps in the base allow grazing and trampling of the hedge-bank, causing further structural deterioration as well as loss of biodiversity as herbs and seedlings are trampled or grazed. This trend can be reversed, however. Fencing the stock away from the hedgerow and replanting or allowing natural regeneration to take place, coupled with sensitive management, can return the hedge to its former function as a barrier. Some of the older shrubs of escaped hedges can be cut off just above ground level or laid (provided that they will not be grazed) to produce thick new growth, or they can be left as standards, while encouraging new growth at the base.

It is not enough just to protect the hedgerows from further loss; their quality also needs to be improved through sensitive and effective management.



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Hedgerow Management

Laying or Coppicing

Hedges are largely human-made features of the countryside, with much of Ireland's network established over the last 100 years. Many of the stems are at the end of their natural life span and since most hedgerow species (especially whitethorn) don't reproduce well in the shade many of our hedgerows are dying out. Also, a lot of hedges no longer fulfil their basic function as barriers to stock having become gappy or bare at the base.

Hedge laying rejuvenates the hedge by taking advantage of the broadleaf tree species' ability to re-grow after being cut back. Hedge laying is the art of cutting hedgerow stems partly through near ground level so that they will bend without breaking and will continue to grow in the shape of a stock-proof barrier. New growth comes from the cut stump rejuvenating the hedge and thickening up the base. If carried out regularly (approx. every 20-30 years), this process can extend the life span of most hedgerow species almost indefinitely.

The technique of hedge laying was widespread in Ireland in the middle of the 20th century but the practice has largely died out. The revival of interest in hedgerows through agri-environmental schemes has resulted in a resurgence in this valuable traditional country craft. The benefit of hedge laying is that it retains a nesting and foraging habitat for wildlife, whereas coppicing or cutting suspends these habitats until re-growth occurs. The cost of professional hedge laying is also shared over the years as the hedge is sequentially laid in small sections.

Hedge laying is a system that should be part of the annual (winter) maintenance. E.g. If you have 1000m of hedge suitable for laying, then every winter you should lay or get laid 50m to 100m and after 10-15 years the length is completed and you start again at the beginning. This perpetual management process protects habitats and ensures resources are available for wildlife.

It is the systematic nature of the process that ensures the both health of the hedge and that the work is not arduous, never working on stems more than 15 years old. It also maintains the skill itself as it is learned over time and handed on by the hedge managers.

It is also advised to use some of the woody material to make log piles, for example, in awkward corners or shrubby areas. The rotting wood benefits decomposers and provides a foraging and hiding spot for other wildlife.

Foulkes and Murray found evidence of past hedge-laying in their surveys of midland Irish counties, and Westmeath had the highest proportion of laid hedges, suggesting that the practice may have been well-developed that county.

The practice has been revived in Britain as an ecologically friendly means to rejuvenate an overgrown hedgerow, and this practice should be encouraged across Ireland.

The following is a rough outline or guide to laying an overgrown hedgerow but in all instances a qualified hedge layer should be employed to carry out the work:

1. Clearing

Clear around the bottom of the hedge to give yourself room to work. Get rid of any broken glass and rubbish. Clean away dead rotting timber from the hedge litter. Take note of old wire fencing – billhooks can bounce off it.

2. Selecting pleachers

Pleachers are the stems that are cut and laid. Cut out all dead wood and all growth that is out of line with the hedge. Keep sufficient spare pleachers until you are certain they are not needed. Always remove elder. It grows vigorously and suppresses other plants, but cannot be laid properly. Whenever there is a choice between young and old pleachers, lay the young ones because they regenerate better.

Try to use relatively evenly spaced pleachers.

3. Preliminary trimming

Trim excess brush from the nearside of the hedge, ie the side opposite the stock, cutting back to the line of the hedge.

4. Laying the pleachers

Stems (pleachers) are cut at the base, 70-80% of the way through, keeping the cuts as low as possible to the ground.

Stems (pleachers) are laid at an angle of 45 degrees running up the slope, producing a hedge approximately 1.2m in height. Always lay a hedge uphill if the ground slopes to get better transpiration of moisture so the sap rises and the hedge remains living. Stems (pleachers) are left attached to the cut stump by a long living hinge and woven into each othe

The first group of pleachers cannot be laid into the standing hedge alongside. They should be cut and laid out to one side so that they are available to fill the gap left when the last pleachers of the adjacent section are laid. Make sure the pleacher you are about to lay is not tangled in the rest of the hedge. Cut so that the trimmed stump will be at between 3-10cm above the ground. If you are forced to cut higher than this, cut a notch in the stump to encourage low resprouting.

Cut through far enough that the pleacher will lower into place without forcing, but leave sufficient cambium and sapwood uncut to allow the pleacher to survive.

When laying, try to keep the angle even. This is not always possible because the stems (pleachers) are multiple shapes. As stems are woven in, you have to work out the shape as you lay the hedge down. Each piece has got to fit into the piece below. So when looking at a standing stem you've got to work out the shape and where it's going to fall into the hedge. It's all got to knit together.

When you lay it down sometimes you get pieces that stick up. You can make cuts on the stems higher up to flex the hedge into the shape you want. These also act as points from which the hedge grows. Those cuts will send up shoots, thickening the hedge at the same time.

Don't lay the hedge directly down on the line of the cut base. Roll the hedge back slightly from the ground cuts. This is to allow light to get into the hedge and for the hedge to rejuvenate and re-shoot up along the cut face. If the hedge is too far forward on top of the cuts, shading suppresses new growth. Exposure of the cuts to sunlight maximises regeneration.

The hinges are fairly strong but if they get enough wind or enough movement, they will start to tear. You don't want it rocking around, so especially on a windy site, in order to hold the laid hedge in place, a gawlog or hooked pin cut from the hedge can be used. It hooks over a stem in the hedge and is hammered down to pin the hedge in place. Alternatively, stakes can be used every half metre woven in with hazel rods (binders) to hold in place. Don't tie stems down with bailer twine because it doesn't rot down and it will strangle the stems, resulting in losses.

It is good practice to leave some mature trees or straight stems (pleachers) uncut within the hedge. The structure of the laid hedge is ideal for nesting thrushes, blackbirds, and robins. Preferably smaller trees like whitethorn or cherry because large broadleaved trees such as beech oak and sycamore cause shading.

5. Staking

Stakes should be about 4cm diameter and long enough to be knocked 50cm into the ground but still project about 10cm above the top of the hedge.

Put the stakes in as you go so that the brushy tops of the pleachers can be woven in between the stakes as you lay them.

6. Binding

Binding or heathering is done on most hedges to keep the pleachers in place and strengthen the newly-laid hedge. Binders should be about

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Hedgerow Management

3m long and about 25mm in diameter. Hazel is best. Sweet chestnut, elm and willow are adequate.

7. Trimming

Trim the tops of the stakes after binding a section of hedge, then trim off all the spriggy bits sticking out of the hedge on the far side and even up its overall shape.

8. Season

October to March, i.e. outside the breeding season for birds and while tree growth is relatively inactive but avoid during frosty spells.

Planting of new Hedges

Oliver Rackham has stated in The History of the Countryside that "tree-planting is not (synonymous with) conservation; it is an admission that conservation has failed (1986)." The rate of hedgerow loss in Fingal and the neglected status of those remaining, means that existing hedges will need better protection to encourage their growth and spread, while many new hedges may need to be planted in order to ensure the long term sustainability of the resource. If so, incentives will have to be made to

encourage new hedge planting throughout the county as very little is being done at the present time. In the interests of conservation, native trees and shrubs of local provenance should be used when planting a new hedge, as research has found that these are most likely to prosper under local conditions with better growth, flowering, and resistance to disease (Jones, et al. 2001). The origin of the planting material should always be questioned since much of the current supply comes from Continental sources which may erode the unique genetic makeup of Ireland's indigenous populations, or even fail to thrive in Ireland's oceanic climate (Hubert & Cundall 2006).

It is essential that you purchase native trees of Irish provenance (grown from seed collected in Ireland, ideally local to your area). The Tree Council describe all 28 native Irish tree species on their website, click here to read more. Native, Irish provenance trees are better adapted to our climate and therefore have more resilience to ecological shocks and stressors. They are also more suitable as food sources because their nutritional quality and flowering time match the seasonal needs of Irish wildlife. Including pollinator-friendly trees in your species mix also benefits insects such as bees, butterflies, moths, and hoverflies. Ireland's native pollinators are in decline due to agricultural intensification (reduced flower-rich areas and increased use of chemicals), urban land-use change, and other environmental pressures.

Plant bare-root stock (whips) from October-March in a double staggered row with 30-40cm in between rows, larger trees should be planted 10-15 metres apart. Double staggered rows are wider and provide more shelter and habitat for wildlife than single row hedges.

Planting early, before January, will allow the plant roots to develop before spring. However, in clay soils, it is best to avoid waterlogged periods (this causes root rot) and wait till after frost periods to avoid frost heave (this causes root exposure).

Leave a nature-friendly margin on each side of the hedgerow, where possible. The wider and wilder your grass or wildflower margin is, the more suitable it is for ground-nesting birds and foraging wildlife. Hedge margins are essential networks for nature by improving food availability and protecting wildlife from predation.

Do not use chemical sprays and slurry as these have a negative effect on plant diversity and wildlife, counteracting the positive effect of less intensively managed hedgerows and wilder hedge margins. They reduce the health of wildlife and remove their food source, thus limiting their ability to recover from shocks and stressors and raise young.

Species to Use in Planting Schemes

Many planting schemes purporting to use native species often contain a mixture of native and exotic species, and this is especially noticeable in motorway plantings throughout Fingal. Local provenance is seldom used, and many of these plantings may fail to perform well. In the planting of new hedgerows, non-native and potentially invasive species such as Beech (Fagus sylvatica), Cherry-Laurel (Prunus laurocerasus), Snowberry (Symphoricarpos albus), and Sycamore (Acer pseudoplatanus) should be avoided at all costs. They are of limited value to wildlife, while their aggressive tendencies and heavy shading may overwhelm the native species, eventually leading to gaps in the hedgerow. As mentioned in the previous section, local provenance should be used wherever possible to protect the unique genetic diversity of the indigenous stock and to improve overall performance. The support or establishment of nurseries producing planting stock from sources within the county should be developed, perhaps in collaboration with the Irish Seed Savers Association and Crann, the Tree Council of Ireland, or Coillte, the Irish Forestry Company. Additional funding may also be developed through such a partnership.

The creation of a mixed hedge with three or more fruiting native species and a diversified structure with well-spaced standard trees tends to be the most beneficial to wildlife. An accompanying drain beside the hedge will also benefit the shrubs to be planted, as well as the hedge-bottom flora and wildlife. In areas that are waterlogged forlong periods of time, Blackthorn, Alder, Guelder Rose, Ash, Pedunculate Oak (Quercus robur) and native Willows (such as Salix cinerea) may be used, as all are tolerant of water-logging.. Listed below are native species that make excellent hedging material and their use should be encouraged in planting new hedges, including those around homes and businesses.

Native shrubs/small trees tolerant of heavy pruning (to no less than 1.5m):

Whitethorn (Crataegus monogyna)

Blackthorn (Prunus spinosa)

Spindle (Euonymus europaeus)

Holly (Ilex aquifolium)

Wild Privet (Ligustrum vulgare)

Yew (Taxus baccata)

Gorse (Ulex europaeus)

Tall, native shrubs/small trees tolerant of infrequent trimming or coppicing (to 2 metres

or more):

Hazel (Corylus avellana)

Crab apple (Malus sylvestris)

Willows (Salix caprea, Salix cinerea)

Guelder Rose (Viburnum opulus)

Wych Elm (Ulmus glabra)

Native standard trees (should be allowed to grow tall in the hedge)

Those marked with an * can also be coppiced

Alder (Alnus glutinosa)*

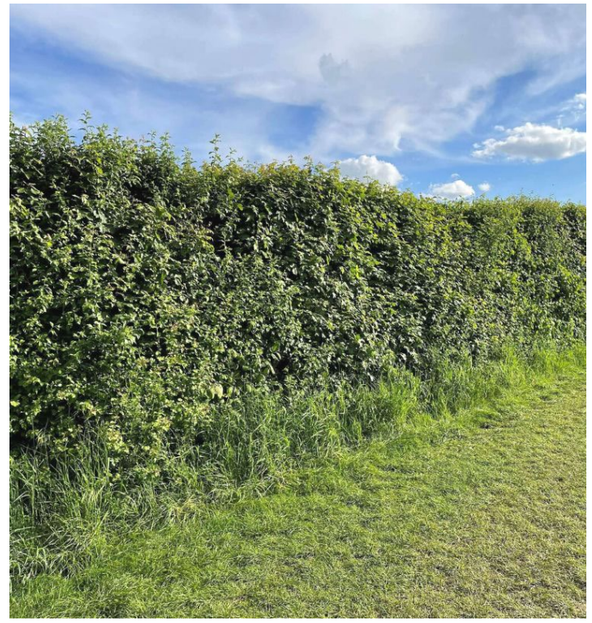
Birch (Betula pendula) -does not trim or coppice well

Ash (Fraxinus excelsior)* - may become a very large tree

Wild Cherry (Prunus avium)*

Oak (Quercus robur)* - becomes a very large tree

Whitebeam (Sorbus hibernica)*



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XX APPENDIX

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X1 Outline Soft Landscape Specification

1. Specifications for supply.

1.0 Schedule of supply:

The nursery stock material will be delivered following consultation between the Landscape Architect, landscape contractor and the selected nursery, and the Engineer. Delivery will be at all times by means of covered vehicles, and all plant material will be clearly labeled. The source of origin must be from the selected nursery as no other additional stock from other nurseries will be permitted without prior inspection and approval.

1.1 Programme of Works

The planting works shall be executed at the earliest opportunity.

1.2 Nursery stock:

All plant material shall be good quality nursery stock, free from fungal, bacterial or viral infection, aphids, red spider or other insect pests and any physical damage. It shall comply with the requirements of B.S. 3936: Parts 1-10: 1965 Specification for Nursery Stock, where applicable.

All plants shall have been nursery grown in accordance with good practice and shall be supplied through the normal channels of the wholesale nursery trade. They shall have the habit of growth that is normal for the species. Country of origin must be shown in all cases for species grown from seed.

Unless otherwise stated, the plant materials shall be supplied in accordance with the following codes where stated:

1+0 1 Year old seedling
1+1 1 Year old seedling lined out for 1 year
1+2 1 Year old seedling lined out for 2 years
1+1+1 1 Year old seedling lined out for 1 year, lifted and lined out for one further year
1u1 1 Year old seedling undercut then 1 more year in seedbed.
1u2 1 Year old seedling undercut then 2 more years in seedbed.
0/1 1 Year old Hardwood cutting
0/2 2 Year old Hardwood cutting
2X Twice transplanted tree
3X Three times transplanted tree
4X Four times transplanted tree
P9 Containerised plant in 9cm pot

1.3 Species:
All plants supplied shall be exactly true to name as shown in the plant schedules. Unless stipulated, varieties with variegated and/or coloured leaves will not be accepted, and any plant found to be of this type upon leafing out shall be replaced by the contractor at his/her own expense.
Bundles of plants shall be marked in conformity with B.S. 3936: Part 1: 1965 and B.S. 3936: part 4: 1966. The nursery supplier shall replace any plants which, on leafing out, are found not to conform to the labels. Definitions of all terms used are in accordance with the following British Standards: -

B.S. No. 3936: Part 1: 1965 entitled "Nursery Stock-Trees and Shrubs"

B.S. No. 3936: Part 4: 1966 entitled " Nursery Stock-Forest Trees"

B.S. No. 3936: 1967 entitled "Specification for Nursery Stock"

2.0 Tree specifications:

Trees shall have a sturdy, reasonably straight stem, and a well-defined straight and upright central leader, with branches growing out of the stem with reasonable symmetry. The crown and root systems shall be well formed. Roots shall be in reasonable balance with the crown and shall be conductive to successful transplantation.

2.1 Standard trees shall have a clear stem 1.70m in height from ground level to the lowest branch, a minimum girth of 8cm measured at 1.00m above ground level and a total height of 2.75-3.00 m.

2.2 Light Standard trees have a clear stem 1.30m in height from ground level to the lowest branch, a minimum girth of 6cm measured at 1.00m above ground level and a total height of 1.80-2.40m.

2.3 Select standard trees shall have a clear stem 1.70 m in height from ground level to the lowest branch, a minimum girth of 10 cm. Measured at 1.00.m. above ground level and a total height of 3.0 to 3.5 metres.

2.4 Heavy standard trees shall have a clear stem 1.80-1.90m in height from ground level to the lowest branch, a minimum girth of 14 cm. measured at 1.00.m. above ground level and a total height of 4.0 to 4.5 metres. All trees shall have been undercut a minimum of three times.

2.5 Extra Heavy standard trees shall have a clear stem 2.0m in height from ground level to the lowest branch, a minimum girth of 16 cm. measured at 1.00.m. above ground level and a total height of 4.5 to 5 metres. All trees shall have been undercut a minimum of three times.

2.6 Semi-mature trees shall have a clear stem 2.0m in height from ground level to the lowest branch, a minimum girth, as specified in the Bill of Quantities, measured at 1.00.m. above ground level and a total height of min. 5 metres. All trees shall have been undercut a minimum of three times.

All standards shall be clearly labeled.

2.7 Feathered Trees 180-240cm
Feathered trees shall be not less than four years old, and shall have been transplanted at least three times. Trees of species not listed in BS 3936: Part 4: shall be sturdy, with a balanced root and shoot development. Size shall conform to the schedules.
Trees shall be well furnished with lateral fibrous roots, and shall be lifted without severance of major roots. Roots shall be of the habit normal for the species, without deformation. Transplants shall be wrapped in polythene in bundles of 50 no. and clearly labeled from the time of lifting until planting to conserve moisture.

2.8 Feathered Transplants 120-150cm
Transplants shall be not less than two years old, and shall have been transplanted at least once. Trees of species not listed in B.S. 3936: Part 4: shall be sturdy, with a balanced root and shoot development. Size shall conform to the schedules.
Trees shall be well furnished with lateral fibrous roots, and shall be lifted without severance of major roots. Roots shall be of the habit normal for the species, without deformation. Transplants shall be wrapped in polythene in bundles of 50 no. and clearly labeled from the time of lifting until planting to conserve moisture.

2.9 Feathered Transplants 90-120 cms, 60-90 cm, 40-60 cm, 30-40 cm
Transplants shall be not less than one year old. Trees of species not listed in B.S. 3936: Part 4: shall be sturdy, with a balanced root and shoot development. Size shall

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conform to the schedules. Trees shall be well furnished with lateral fibrous roots, and shall be lifted without severance of major roots. Roots shall be of the habit normal for the species, without deformation. Transplants shall be wrapped in polythene in bundles of 50 no. and clearly labeled from the time of lifting until planting to conserve moisture.

2.10 Shrubs

(1) Containerised Shrubs shall be of the size specified in the schedules, with several stems originating from or near ground level and of reasonable bushiness, healthy, vigorous and with a sound root system. Pots or containers shall be appropriate to the size of shrub supplied and clearly labeled. Shrubs shall not be pot bound or with girdled or restricted roots.

(2) Bare Root Shrubs shall be of size specified in the schedules, with several stems originating from or near ground level, with reasonable bushiness, healthy, and vigorous. They shall be well furnished with fibrous roots and shall be lifted without severence of major roots. All bare root shrubs shall be wrapped in polythene in bundles of 50 no. and clearly labeled from the time of lifting until planting to conserve moisture.

2.11 Container Grown Conifers:
Conifers shall be of the size specified in the schedules, with one main stem originating from or near ground level and of reasonable bushiness and health, with a well-grown, root system. Pots or containers, where required, shall be appropriate to the size of plant supplied and clearly labeled. Plants shall not be pot bound, or with deformed or restricted roots.

2.12 Protection:
The interval between the lifting of stock at the nursery and planting on site is to be kept to an absolute minimum. Plants shall be protected from drying out and from damage in transport. All stock awaiting transport shall be protected from the wind and frost and from drying out.
Protection shall include for the supply of stock to site to a suitable heeling-in/ storage area prior to planting. The landscape contractor shall allow for liaison with the site engineer to arrange the heeling-in area/ storage. The contractor shall continue to be entirely responsible for the maintenance of this stock to ensure that at the time of planting the stock complies with the requirements for the supply of nursery stock as per clause 1.0 thereof. No responsibility for the maintenance of the stock will attach to the site engineer whilst the stock is protected on site. No time limit shall attach to the period of protection.

In the event of the Landscape Architect being dissatisfied with the care and attention given to the stocks, following heeling-in, he shall notify the Landscape Contractor who shall take steps to ensure careful heeling-in procedures.

The preparation of the heeling-in area and its subsequent maintenance is the sole responsibility of the Landscape Contractor.

2.13 Damage
On completion of lifting of plants in the nursery, any broken shoots or severed roots shall be pruned, areas of damaged bark neatly pared back to sound tissue.

2.14 Inspections
The Landscape Architect will inspect the hardy nursery stock on the selected nursery during the execution of the works. Only plants selected and approved in the landscape contractors selected nursery will be accepted on the site.

2.15 Delivery and heeling in
All plants will be delivered on a phased basis as called up in advance in agreement with the Engineer, Landscape Architect and the appointed Landscape Contractor. In the event of the Landscape Architect being dissatisfied with the care and attention given to the stocks, following heeling-in, he shall notify the Landscape Contractor who shall take steps to ensure careful heeling-in procedures.

The preparation of the heeling-in area and its subsequent maintenance is the sole responsibility of the Landscape Contractor.

3.0 Specifications for site operations:

3.1 Setting out:
Setting out shall be in accordance with site meetings with the Landscape Architect, and the drawings listed in the preliminaries. No planting works shall take place when the soil /fill is in a waterlogged condition.

3.2 Finished grading:
All planting pits and topsoiled areas disturbed by the landscape contractor shall be left in an even state, with all soil clumps broken up and stones of greater than 50mm diameter shall be removed.

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4.0 Specifications for Planting and Plant Materials

4.1.1 Staking/Protection:

2m high willow wrap to be installed around each tree for protection of bark

4.1.2 Canes:

Bamboo canes or similar approved shall be used to provide spot spraying location markers for small plants including Pinus, species. The canes are not to be attached to the plants.

4.2 Tree ties:

For standard and select standards, tree ties shall be of rubber, PVC or proprietary fabric laminate composition and shall be strong and durable enough to hold the tree securely in all weather conditions for a period of three years. They shall be flexible enough to allow proper tightening of the tie. Ties shall be min. 25mm wide for 120cms height trees and min. 38mm for larger sizes. They shall be fitted with a simple collar spacer to prevent chafing. Two ties per tree shall be applied to standards; for staked transplants, one tie per tree is required.

Ties shall be nailed to the stake with one galvanised nail.

4.3 Protection:

The interval between the lifting of stock at the heeling-in area and planting on site is to be kept to an absolute minimum. Plants shall be protected from drying out and from damage in transport. All stock awaiting planting on site shall be stored in a sheltered place protected from the wind and frost and from drying out.

All transplants shall be wrapped in polythene from the time of lifting to conserve moisture. Except when heeled-in, they shall be protected in polythene at all times until planted into their final position on site.

4.4 Damage:

On completion of planting any broken branches shall be pruned, areas of damaged bark neatly pared back to sound tissue.

4.5 Watering / / Fertilisers:

All bare rooted light standards and select standards shall be soaked in water overnight, on site, before planting in a liquid solution containing "Alginure" at the recommended dilution rate. Fertilisers shall conform to BS 5581: 1981. In the case of granular fertiliser being added to plantings, it must be mixed through and incorporated into the base of the planting hole and covered over in order to avoid roots of plants coming in direct contact.

4.6 Setting out:

Setting out shall be in accordance with site meetings with the Landscape Architect. Transplants in mixtures shall be planted in staggered rows. Species shall be planted in groups, as indicated in the planting drawings.

No planting shall take place until all planting holes (with ameliorants) have been inspected and approved by the Landscape Architect, or a person appointed by him as a representative, to ensure accordance with the specifications. No planting shall take place when ground conditions are frozen or waterlogged. All planting holes shall be opened and closed on the same day.

4.7 Tree planting:

Trees shall be planted at the same depth as in the nursery, indicated by the soil mark on the stem of the tree. They shall be planted in the centre of the planting pit and planted upright. Stones or other rubbish over 75mm shall be removed. Supply and drive the stake 800mm into the ground for standards, 500mm for other transplants. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position. Drainage layer to specification CL505.

4.7.1.Select Standards/Standards

Excavate tree pits to 800mm x 800mm x 600mm deep, or as approved. The base of the pit shall be broken up to a depth of 200mm and glazed sides roughened. F.Y.M. at the rate of 0.047 cu.m.(equivalent to 60mm deep) and 100gms of 0.10.20 shall be applied to each tree pit prior to planting. Farm manure shall consist predominantly of faecal matter and shall be free of loose, dry straw and undigested hay. It shall be free of surplus liquid effluent. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position. Drainage layer to specification CL505.

4.7.2 Heavy and Extra Heavy Standards

Excavate tree pits in soft landscape to 1000mm x 1000mm x 800mm deep, or as approved. The base of the pit shall be broken up to a depth of 200mm and glazed sides roughened. F.Y.M. at the rate of 0.047 cu.m. (equivalent to 60mm deep) and 100gms of 0.10.20 shall be applied to each tree pit prior to planting. Farm manure shall consist predominantly of faecal matter and shall be free of loose, dry straw and undigested hay. It shall be free of surplus liquid effluent. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position. Drainage layer to specification CL505.

4.7.2 Semi-mature trees

Excavate tree pits to 1200mm x 1200mm x 1000mm deep, or as approved. The base of the pit shall be broken up to a depth of 200mm and glazed sides roughened. F.Y.M. at the rate of 0.047 cu.m. (equivalent to 60mm deep) and 100gms of 0.10.20 shall be applied to each tree pit prior to planting. Farm manure shall consist predominantly of faecal matter and shall be free of loose, dry straw and undigested hay. It shall be free of surplus liquid effluent. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position. Drainage layer to specification CL505.

4.7.3.Light Standard Trees

Excavate tree pits to 500mmx500mmx500xx deep, or as approved. The base of the pit shall be broken up to a depth of 80mm and glazed sides roughened. F.Y.M. at the rate of 0.047 cu.m. (equivalent to 60mm deep) and 100gms of 0.10.20 shall be applied to each tree pit prior to planting. Farm manure shall consist predominantly of faecal matter and shall be free of loose, dry straw and undigested hay. It shall be free of surplus liquid effluent. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position. Drainage layer to specification CL505.

4.8 Feathered Trees 180-240cm, container grown conifers (>2l)

Excavate tree pits to 400mm x400mm x 400 mm deep, or as approved (slit or notch planting are not acceptable planting methods). The base of the pit shall be broken up to a depth of 80mm and glazed sides roughened. Trees shall be planted at the same depth as in the nursery and backfilled with compound fertiliser 0.10.20 at the rate of 50gm per tree and 0.020m3 of Mushroom Compost or similar approved. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position. Drainage layer to specification CL505.

4.9 Feathered Whips 120-150 cm:

Excavate tree pit to depth of 300mm x 300mm x 300mm deep, or as approved (slit or notch planting are not acceptable planting methods). Excavation to be achieved by machine digging or augering methods, approved by the Landscape Architect. The base to be broken up to a depth of 60mm and glazed sides roughened. Whips to be planted at same size as in the nursery. Apply 60gm 0.10.20 and 0.020m3 of Mushroom Compost or similar approved.per tree pit to plants. Stakes 1.2m high x 37mm dia. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position. Drainage layer to specification CL505.

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X1 Outline Soft Landscape Specification

4.10 Feathered Whips and Transplants 90-120cm, 60-90 cm, 40-60cm, 30-40cm, container grown conifers (<2l size) and container grown shrubs (<2l size):

Excavate planting hole to a depth of 300mm x 300mm x 300mm deep; the base to be broken to a depth of 50mm and glazed sides roughened (slit or notch planting are not acceptable planting methods). Excavation to be achieved by machine digging or augering methods, approved by the Landscape Architect. Apply 30gm 0.10.20.per planting pit. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position.

4.11 C. G. Shrubs / C. G. Wall Shrubs / C.G. Climbers:

Excavate planting hole to a depth of 300mm x 300mm x

300mm deep; the base to be broken to a depth of 50mm and glazed sides roughened. The following products are to be supplied and incorporated in to the bottom 100mm of topsoil at the base of the planting pit and in to the topsoil for backfilling around each plant: (1)Seanure soilbuilder as supplied by Farmura @ 1.5Kg per cu.m of topsoil, (2) clean and friable green waste compost @ 25 Kg per cu.m of topsoil and (3) Sierrablen Flora 15:9:9 slow release fertiliser @ 70 grams per m2 Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position.

4.12 Grassing

All grass areas to be ripped with a tractor mounted tine prior to rotovating. The contractor shall grade off all areas to smooth flowing contours, removing all stones greater than 10mm diameter and tip off site. All hollows to be filled in. Roll all areas with a roller as approved. Following the completion of final grading and raking, the area is to be left fallow for a period of 14 days. Spray with 'Basta' at recommended rates, and seed with fine grass mix at a rate of 35gr/Sq.m together with fertilizer 10:10:20 at a rate of 50gr/Sq.m use Coburns Irish premier low maintenance mixture or other as approved by the Landscape Architect.

4.12.1 Grass cutting

Grass cutting shall be carried out during the three year maintenance period and is defined into three categories:

4.12.2 Regular grass cutting

Shall be carried out to the frequencies indicated in the Bill of Quantities. Attention to neat and tidy cutting shall be required to all areas. Sightlines, as set out with the Engineer, at junctions and roundabouts must be kept clear of vegetation at all times.

GENERAL

Upon completion of planting, all pits shall be raked over lightly to leave an even surface and neat appearance. All stones greater than 50mm dia. to be removed. Provision should be made for the watering of light and select standards during periods of prolonged drought in the first year following planting.

4.13 Inspections:

The Landscape Architect will inspect the site with the Landscape Contractor during the execution of the works and following maintenance visits.

4.14 Presentation of certificates:

The Landscape Contractor shall present for the Landscape Architect's inspection, all seed and fertiliser bags, together with their markings. If requested, the contractor shall furnish the Landscape Architect with receipts of purchase for these respective materials.

4.15 Spraying:

1) Following planting of embankments, slopes etc., weed free circles to be formed around individual plants, as directed, using an approved broad-spectrum contact herbicide, as approved by the landscape architect, in mid-spring following planting. Herbicide to be applied using controlled drop applicator containing a dye to indicate areas sprayed. In areas where grass is excessively long, such grass will be strimmed off and collected prior to spraying. The contractor shall be responsible for keeping the ground (1m diameter circle) around all planted material weed free by means of herbicidal application, using approved sprays, during the course of the contract. Weeds to be removed include grasses ,broad-leaved annual and perennial weeds and all noxious weeds.

2) Selective spot spraying will be carried out to all grassed areas, whether planted or unplanted through the application of contact herbicide to control broad-leaved annual and perennial weeds, including thistle, dock and ragwort. Contact herbicide to be approved by the landscape architect prior to application. Herbicide to be applied using controlled drop applicator containing a dye to indicate areas sprayed. The contractor shall allow for the removal of gorse by cutting, as required prior to spraying to ensure its eradication from all grassed areas for the duration of the contract.

3) The boundary hedgerows shall be kept weed free by herbicidal application by forming a 300mm wide spayed strip along the full length of each respective hedgerow. Approved herbicide (broad-spectrum contact herbicide) to be applied using controlled drop applicator containing a dye to indicate areas sprayed. Spraying of planted areas on roundabouts is also included in this spraying application.

4) Such routine spraying (1, 2 and 3 above) shall be carried out during maintenance visits over the three-year period. No spraying shall take place during adverse weather conditions or at times not recommended by the manufacturer.

4.16 Cutting back:

Plants for cutting back/tip pruning shall be cut back after inspection by the Landscape Architect. This work to be carried out initially following planting for plants suffering from wind damage.

4.17 Mulching

Mulching may be considered as an optional factor that may be implemented. Mulch shall be from coniferous trees. It shall be shredded, but not pulverised, so that no dimension exceeds 75mm. Bark shall have been composted for a min. of 3mths. In the case of areas requiring mulch the depth of bark shall measure 30 mm.

4.18 Ground finish:

Upon completion of planting, all ground finish shall include for the removal of stones greater than 50mm excavated during the course of the digging for planting purposes.

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X2 The Pollinator Plants - Maintenace

Perennial planting schemes

Pollinator friendly perennial plants are excellent sources of pollen and nectar. They are much more

attractive to bees when planted in blocks rather than as single plants. Having a pollinator friendly

perennial bed is an excellent way to provide food for pollinators across their lifecycle.

Perennials can be used to great effect in traffic islands and public spaces, providing a strong visual

impact and giving a good display of flowers over a long period. Pollinator friendly perennial planting

should be designed to provide a food source from spring through to autumn. In addition they are:

- Low maintenance

- Easy to establish

- Have strong visual impact

- More cost effective than bedding schemes over the long term

- Less maintenance than lawn mowing

- Provide a natural style of planting

- Provide habitat and nesting materials for birds and insects

Maintenance:

Good ground preparation is essential to minimise maintenance in the future.

- Removal of all root weeds before planting such as scutch grass, bindweed etc. will reduce

weeding later on. Sometimes it is best to leave the site fallow for a season to sort out any

issues.

- The soil must be well drained and not compacted, and have good nutritional content.

Organic material can be added. There is usually no need to add fertiliser.

- Plants ideally should contain a slow release fertiliser in the pot and should be watered well

before planting.

- In the first few months after planting beds will have to be weeded by hand as hoeing can

damage spreading plants. This should be done regularly, maybe three or four times in year

one depending on the weed population. When the perennials have established and provided

dense cover, the frequency of weeding can be reduced.

- In year two and onwards, weed the beds at the beginning of and end of the growing season,

and spot check for the odd weed in between.

- Watering may have to be taken into consideration during dry spells.

- Leave dead stems on plants for the winter as they provide protection for the plants, offer

food and habitat and nesting materials for wildlife, prevent weed seeds from germinating

and increase the organic matter.

- The dead foliage can be removed in spring by mass pruning to approx. 10cm height when

there is new growth appearing. Some plants like Grasses & Thymes will look good without

pruning back.

- Organic matter like compost can be added to keep the soil in good condition.

Planting time:

March-April is the best time for planting as the plants will have plenty time to root in before

summer. If planted in June then weeds will have already established and they will be easy to

remove, but the plants have less time to root in and provide ground coverage.

Life span of perennial planting:

The life span of a well planted and well maintained perennial scheme is 10 to 12 years, maybe

longer, which is about the same as a shrub bed. Small amount of replacements may be required

depending on the site but in general the plants are trouble free.

Thanks to Young Nurseries who voluntarily provided suggested perennial plant lists and example

costings.

Best Practice in the Use of Pesticides

In additional to the honeybee who lives in hives, we also have 20 different types of bumblebees and

77 different types of solitary bees in Ireland. Bumblebees and solitary bees live entirely in the wild.

We need healthy populations of all these bees to carry out pollination if we want to have

wildflowers in the landscape, be able to grow our own fruits and vegetables, or buy affordable,

locally grown apples or strawberries in our shops. Bees and other pollinators can only survive in a

landscape that provides them with food, shelter and safety throughout the year. Already, one third

of our 98 bee species are threatened with extinction from Ireland.

Insecticides pose the greatest direct hazard to insect pollinators. However, herbicides use is having a

much greater negative impact on pollinators because it is so widely used.

Herbicides, Fungicides and Plant Growth Regulators typically have little or no toxicity to pollinators,

but many of the plants we spray as weeds are vital sources of food for pollinators, especially in early

spring. Pollinators need a range of flowers to feed on from spring through to autumn. The overuse of

these chemicals is making it very difficult for them to find enough food to survive in our landscape.

Pesticides should be used sparingly and only when absolutely necessary, such as in the treatment

of invasive species like Japanese Knotweed

Do's

- Check the label and select pesticides that are less harmful to pollinators

- Always read, understand and follow the product label instructions fully

- Treat only the target area

- Spot treat rather than use blanket sprays

- Follow the buffer zone instructions on the product label

- Leave areas of pollinator-friendly habitat free from all pesticides. These include areas of

clover or wildflowers, the base of hedgerows, and any natural areas.

- Minimize spray drift to non-target areas by:

o Using equipment that reduces drift

o Checking the weather forecast before application and be mindful of changing

conditions.

o Ensure that you spray when the wind is blowing away from beehives and pollinatorfriendly habitat.

Don'ts

- Do not apply pesticides to bees or other pollinating insects

- Do not spray flower-rich areas (including weeds) when flowers are in bloom and providing

food for bees. Plants that we might consider weeds like dandelions, vetches, clovers, deadnettles and knapweed are important food sources as they provide high quality pollen and

nectar for bees.

- Do not apply pesticides to areas that have been identified as important nesting areas for

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X3 Outline Hard Landscape Specification

PAVING & KERBS

FOOTPATHS

General: Public footpaths, roadways, kerbs etc. shall be constructed in accordance with the requirements of the Dublin City Council Roads Dept.

Accuracy of Levels and Alignment: The levels of paths and paving shall be carefully set out and frequently checked. All care shall be taken to ensure that the correct cross sections are maintained. The finished face of paths shall be formed so as to provide adequate fall and satisfactory run off to surface water outlets, gullies, etc. Cross-falls of paths shall be carried without break across verges and kerbs to prevent ponding of water between back of kerb and

path.

Sub-Base: Granular material shall comply with Clause 804 of the D.o.E. Specification for Roadwork's and shall be spread uniformly over the formation and compacted by vibrator roller. Rolling shall continue until there is no movement under the roller. The finished surface of the compacted sub-base shall be parallel to the proposed finished surface of the footpath. The surface levels for each layer shall not deviate from the design levels by more than +15mm or –15mm.

For sub-base thickness in paved areas see area engineers spec. and attached following schedule. Each contractor shall do all necessary tests to ensure a well compacted, plain even surface on all areas with traffic movement. If paving shows settling after 1 year which normally is related to an insufficient depth and compaction of the sub-base the contractor shall rebuilt the failed area to his own cost.

Use of Surfaces by Construction Traffic:

Constructional traffic used on pavements under construction shall be suitable in relation to the courses it traverses so that damage is not caused to the sub-grade. Where damage is caused to the formation of the sub- grade in strength or level the damaged area shall be excavated for an area and depth which shall be determined by the Architect and this area shall be filled to the required levels with crushed rock of 50mm maximum size. The degree of compaction for this area shall be the same as that specified for the remainder of the formation. All this excavation and making good of damaged areas shall be carried out at the expense of the Contractor. Where damage is caused to the sub-base, the damaged area shall be made good as noted above, using the material of which the sub-base is composed. The wheels or tracks of plant moving over the various pavement courses shall be kept free from deleterious materials.

MODULAR PAVING

Concrete Pavers Precast concrete pavers shall conform to the requirements of BS 6717 Part 1.

Ensure that sub-bases are suitably accurate and to specified gradients before being laid.

Sample: Before placing orders submit representative samples for approval.

Ensure that delivered materials match sample.

Laying Generally:

1. Laying Specification

1.1 Paving blocks/bricks shall be laid to the requirements of Part 3: 1997, BS 7533,

except that the lip onto gully gratings is modified to 5 - 6 mm.

Note, in particular, the following requirements of Part 3.

i. The difference in level between two adjacent blocks shall not exceed 2 mm.

ii. The finished pavement surface shall not deviate more than 10 mm under a 3m

straight edge.

iii. The accuracy of cutting a block should be such that the resulting joint should not

exceed 5 mm.

iv. The surface course should be between

(a) 3 - 6 mm above drainage channels

(b) 5 - 10 mm above gullies (*BRL modify this to 5 - 7 mm above gullies to

reduce "trips")

v. The surface course should be inspected soon after completion and at regular

intervals thereafter - additional sand should be brushed in where necessary.

1.2 The surface course for chamfered units should be 3 - 5 mm above the kerb to

facilitate surface drainage. The surface course for non-chamfered units should be 2 mm above the kerb to facilitate surface drainage.

1.3 When paving units need to be trimmed, pieces with a dimension less than 50 mm

should not be used.

2. Drainage Channels

2.1 Where paving blocks are used in a channel, they shall be laid on freshly mixed moist 3:1 sand-cement mortar. The mortar should have thickness between 10 mm and 40 mm. Vertical joints should be filled with 3:1 wet sand-cement mix.

2.2 Mortar, which has been mixed for over 2 hours, should be discarded.

2.3 The mortar should be laid on a previously prepared concrete base as per construction drawing detail. Select blocks/paviors vertically from at least 3 separate packs in rotation, or as recommended by manufacturer, to avoid colour banding. Lay blocks/paviors on a well graded sand bed and vibrate to produce a thoroughly interlocked paving of even overall appearance with sharp sand filled joints and accurate to line, level and profile. Refill joints once a week three weeks after first fill. Commencing from an edge restraint lay blocks/paviors hand tight with a joint width of 2-3mm for pedestrian use and 3-5 mm for areas with traffic. Maintain an open working face and do not use mechanical force to obtain tight joints. Place blocks/pavers squarely with minimum disturbance to bedding. Supply blocks/paviors to laying face over newly laid paving but stack at least 1 m back from laying face. Do not allow plant to traverse areas of uncompacted paving. Continually check alignment of pavers with string lines as work proceeds to ensure maintenance of accurate bond.Infill at edge restraints as work proceeds. Wherever the type of bond and angle of edging permit, avoid very small infill pieces at edges by breaking bond on the next course in from the edge, using cut blocks/pavers not less than 1/3 full size. Cut stones shall be rectangular or trapezoidal; the smallest point shall be a minimum of 35mm. (May be pavers have to be turned by 90 deg.)Half stones shall be cut at manufacture. Thoroughly compact blocks/pavers with vibrating plate compactor as laying proceeds but after infilling at edges. Apply the same compacting effort over the whole surface.

Do not compact within 1 m of the working face. Do not leave uncompacted areas of paving at the end of working periods, except within 1 m of unrestrained edges. Checks paving after compacting first few metres, then at frequent intervals to ensure that surface levels are as specified; if they are not, lift blocks/pavers and relay. Brush sharp sand into joints, revibrate surface and repeat as required to completely fill joints. Make sure that paving is held by a kerb on both sides before vibration to avoid uneven joints. Avoid damaging kerb haunching and adjacent work during vibration. Do not begin vibration until kerbs have matured. The paving pattern will be stretcher bond, make sure that the joints will be in straight line after vibrating. Also ensure joints are off equal width.

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X3 Outline Hard Landscape Specification

The block pavement shall have a surface regularity/ flatness tolerance of less than 10 mm under a 3 m straight edge.

Sample: Before placing orders submit representative samples for approval.

Ensure that delivered materials match sample.

PRECAST CONCRETE FLAGS

Pre-cast Concrete Flags:

1. Precast concrete flags shall be laid to the requirements of BS 7533 Part 4.

Note the following selected items from BS 7533, Part 4.

•The difference in level between two adjacent flags should not exceed 3 mm.

•The top surface of the paving units should stand 3 - 6 mm above the drainage channel.

•A 30 - 50 mm (compacted thickness) of the sand laying course is given as suitable (for narrow joints)

2. Flags should be laid with narrow joints (2 - 5 mm).Joints should be filled with dried sand (conforming to table 4 of the code), or as determined by the Landscape Architect.

KERBS

Kerbing General: Kerb radii shall be in accordance with Architects and Engineers drawings. Use radius kerbs for all new kerbs.

Laying Generally:

Natural stone and precast concrete kerbs shall meet the requirements of BS 435 and

BS 7263-1.

1. Precast concrete kerbs shall be laid to the requirements of BS 7533, Part 6.

2. Units shall be laid on fresh concrete or mortar bed and adjusted to line and level.

3. Concrete for foundations and haunching shall be to BS 5328.

4. Bedding mortar shall be freshly mixed, moist 3:1 sand-cement between 12 and 40

mm thick.

5. Kerbs shall be backed with concrete as per drawing.

6. Radius kerbs shall be used on radii of 12 m or less.

7. Kerbs should not deviate from the required level by more than 6mm.

8. Kerbs should not deviate by more than 3 mm under a 3 m straight edge.

9. Open-jointed kerbs should have joints of 2 - 4 mm wide.

Mortar jointed kerbs should have joints of 7 - 10 mm wide filled completely with 3:1

sand-cement mortar, and finished to give a smooth flush joint or as specified by the

Landscape Architect.

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X4 Programme for Implementation, Maintenance + Defects Period

5.0 Maintenance:

5.1 Period:

The Contractor shall be responsible for aftercare of the completed works for an agreed amount of time from the date of completion of planting. The period is to be negotiated btween Hones (The Developer) and the City Council.

5.2 Organisation:

The aftercare programme will be organised as follows:-

(1) Scheduled operations, in whose timing the contractor will be permitted some flexibility and which will be the basis of payment to the Contractor.

(2) Performance standards, which the Contractor is required to meet at all times, and on which his performance will be assessed.

(3) Critical dates, by which time scheduled operations, shall have been completed, and at which performance will be assessed.

5.3 Performance standards:

Shrub, woodland and hedgerow planting to be maintained in accordance with specifications e.g. spraying, firming, tree tie adjustment. Weeds shall not cover more than 20% of the ground surface within planting areas and the maintained 1m diameter weed free circles at any time, and neither shall they exceed 100mm in height. Weeds shall be treated before they establish.

Within grass areas noxious and competitive weeds shall not be allowed to establish and all perennial weeds shall be spot treated at each maintenance visit, 3 times per year.

5.4 Watering:

The contractor is responsible for the survival of all plants during the maintenance period. Apply water to moisten full depth of root run using proprietary irrigation system. Avoid washing or compaction of the soil surface. The Landscape Contractor is responsible for informing the Landscape Architect if the plants require watering. A minimum of 16 no. waterings year1, 8 no. year 2, 4 no. year 3. Prior notification to the landscape architect and a record of attendance will be requested for each visit. Spot checks will be made to ensure full compliance with this condition.

5.5 PROGRAMME

Year One (After Planting):

5.5.1 By end of May (Year One):

Application of herbicide agreed with Landscape Architect to all planting areas. Protect all plants. Hand weed all large weeds too close to nursery stock for safe treatment. Strim long grass prior to spray application. Provision for 1 no. visit for spot weed control application to areas where perennial weeds are apparent in the grass sward. Tip prune, firm plants. Grass cutting. All necessary cultural/husbandry methods to be completed in order to leave the sites in a clean, orderly and tidy manner. Water select standard trees.

Critical date: 30 May (Year One)

5.5.2 By end August (Year One):

Application of herbicide agreed with Landscape Architect to all planting areas. Protect all plants. Hand weed all large weeds too close to nursery stock for safe treatment. Provision for 1 no. visit for spot weed control application to areas where perennial weeds are apparent in the grass sward. All necessary cultural/husbandry methods to be completed in order to leave the sites in a clean, orderly and tidy manner. Grass cutting. All necessary cultural/husbandry methods to be completed in order to leave the sites in a clean, orderly and tidy manner. Water select standard trees.

Critical Date: 30 August (Year One)

5.5.3 October (Year One):

Remove dead plants after Landscape Architect's inspection.

5.5.4 November (Year One):

Replacement planting. Tree care shall mean pruning deciduous trees including those of hedgerow form when dormant to promote open frame works in the crown. Remove all suckers and dead branches, and branches that are encroaching on to footpaths should be cut back to point of branching.

5.5.5 By end December:

Application of herbicide agreed with Landscape Architect to all planting areas. Grass cutting. All necessary cultural/husbandry methods to be completed in order to leave the sites in a clean, orderly and tidy manner. Water extra heavy standard trees, standard trees.

Critical Date: 30 December (Year One).

5.5.6 Year 2

As year 1.

5.5.7 Year 3

As year 1 . Hedgerow to be fully pruned at end of season.

5.5.8 Sweeping and Cleaning

Sweeping shall mean sweeping of the footpaths, playing courts, car parks and the schools road network and removal of all grit rubbish moss and leaves, keeping the hard landscaped areas of the site in a neat and tidy manner. Number of sweepings per annum -12no.

Cleaning shall mean the removal of paper, plastic bags and all other rubbish from grassed areas, roads, car parks, playing courts, shrubbery's, hedging etc. or any part of the school grounds. This operation shall be carried out twice a month.

All dirt and rubbish to be removed off site to a tip to be provided by the Landscape contractor.

Autumn leaves shall be swept on a weekly basis from end of October to mid-November (three weeks). Any additional cleaning and sweeping deemed necessary, during the year, and requested by the school for any part of the schools grounds will be paid for at a pro rata basis to the rates for the programmed maintenance schedule.

5.5.9 Other Maintenance Works

All grassed areas are to be edged 3 times a year using a machine and are not to be sprayed.

Carry out any other maintenance to ensure the works are kept in a satisfactory state during the defects liability period.

5.6 Grass Cutting

Grass cutting shall be deemed to include for:

[a] Removal of lodged grass.

[b] Removal and disposal of grass cuttings from adjoining roads and paving.

[c] Removal and disposal of stones and other obstructions from area of grass to be cut.

The pitches and other high profile grassed areas, eg. the schools entrance are to be Fine cut. Fine cutting shall mean mowing to 25mm high. This operation is to be carried out in each location shown on the landscape drawings and in locations as directed on site by a representative of The Department Of Education and Science. A rough schedule is as follows-

March: 1cut

April: 3 cuts

May: 4 cuts

June: 4 cuts

July: 4 cuts

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X4 Programme for Implementation, Maintenance + Defects Period

August: 4 cuts

September: 4 cuts

October: 4 cuts

November - February: 1 cut

Total 29 cuts

Fine cutting shall be deemed to include for grass cut to 25mm high evenly over the whole area, with cuttings left evenly spread over the surfaces. Grass not to exceed 50mm between cuts.

Other grass areas of which are less high profile are to be cut 16 times a year. These will include the grassed areas around the woodland areas, in between the pitches and any grassed area hidden from the main road by the school.

Areas indicated as wildflower mix shall be cut three times per annum. Cuts shall be carried out at specified times as agreed with landscape architect and recommended by the wildflower seed producer. Remove cuttings after each cut and remove offsite to tip.

Leave cuttings evenly spread. This operation is to be carried out in each location shown on the landscape drawings and in locations as directed on site by a representative of the Board Of Management.

At every second grass cut, grass shall be trimmed from around the base of walls and fences, back of footpaths and kerbs, litter bins, sluice valves and hydrant markers, trees, shrubberies poles and public lighting columns etc., and kept in a neat and tidy condition.

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X5 Maintenance Schedule

This program is guideline only and times of operations may very on approval by landscape architecture.

ONGOING REQUIREMENTS:	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Lawn grass cutting (min 24 cuts)		*	**	**	***	***	***	***	***	**	**	
Edging to lawn grass areas				*								
Rough Grass							*					
Fertilizer application to lawn grass area					*					*		
Native Hedgerow pruning/cutting (once every tree years,)		*										
Deciduous Hedge pruning/cutting									*			
Evergreen Hedge pruning/cutting		*							*			
Shrubs pruning and feeding				*		*			*			
Weed control of hedge and shrub planting area		*	*	*	*	*	*	*	*	*	*	
Tree pruning											*	*
Removal of tree stakes (3-5 years)				*								
Mulch top-up tree circles/squares						*				*		
Watering of new trees (or after 3 weeks of no rain)				*	*	*	*	*				
Trimming of scrub areas												*
Weed control of scrub areas				*					*			
Application of residual weed killer to footpaths, cycle paths				*								

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SR LA
SIMON RONAN LANDSCAPE ARCHITECTS

LRD Opinion Written Response Prepared by SRLA

Discipline:	**Landscape Architect**	**Date**	**28.05.25**
Company	SIMON RONAN LANDSCAPE ARCHITECT LTD. LEVIS QUAY, SKIBBEREEN, CO.CORK, IRELAND A94A431, PHONE 00353 (0)860563434 • E-MAIL SIMON@SIMONRONAN.COM		
Project	**Planning Reference: LRD25-03 for Greenfield, Ballincollig**		

Council Request	Date of Response	Response	
13. Landscape Design/Open Space Strategy/Trees Further consideration and amendment of the proposed landscape strategy take account of the issues/requirements of the Senior Parks & Landscape Officer and the Tree Officer (see attached reports in this regard – Appendix C).	07.07.2025	S.Ronan Response: Noted, the comments of the Senior Parks & Landscape Officer and the Tree Officer and they are addressed below.	
25a. A detailed Landscape Masterplan which takes into account the issues raised in the above section and within the reports of the Senior Parks & Landscape Officer, the Tree Officer, the Biodiversity Officer and the City Architect's Section (in relation to the Maglin Distributor Road planting) to include amongst other items and considerations: -A Hardscape & Softscape Plan including materials and species number type and size prioritising the use of native species.	07.07.2025	S.Ronan Response: A detail landscape masterplan has been drawn. Please refer to the following drawings for detailed hardscape and softscape information: • Landscape Plan L-501 1 of 12 - Landscape Plan L-512 12 of 12. • L-100 Landscape Masterplan The majority of the plants in the planting plan are native. Please refer to L-002_Plant Schedule for list of species and size which prioritise native species. Furthermore, see L-902 Soft Landscape Details.	
-Boundary treatment details for all parts of the site (i.e. overall and individual site boundaries) and omission of any paladin fencing proposed.	07.07.2025	S.Ronan Response: Please refer to L-200 Boundary Treatment Plan as we have not proposed any paladin fencing in this scheme.	
- Parking area to the south fronting the public open space should be bounded by low soft landscaping.	07.07.2025	S.Ronan Response: Noted, we have added a 2m strip of low planting to the south of the carpark, please refer to L-100 landscape.	

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SR LA
SIMON RONAN LANDSCAPE ARCHITECTS

LRD Opinion Written Response Prepared by SRLA

Discipline:	**Landscape Architect**	**Date**	**28.05.25**
Company	SIMON RONAN LANDSCAPE ARCHITECT LTD. LEVIS QUAY, SKIBBEREEN, CO.CORK, IRELAND A94A431, PHONE 00353 (0)860563434 • E-MAIL SIMON@SIMONRONAN.COM		
Project	**Planning Reference: LRD25-03 for Greenfield, Ballincollig**		

Council Request	Date of Response	Response	
- Creche open space area should be suitably demarcated where visible.		S.Ronan Response: The creche open space area is suitably demarcated with a layer of fencing and privacy hedge- creating an effective and aesthetic solution. Please refer to L-100 Landscape Masterplan.	
-Full details of the size, species, and quantities of any trees proposed should be submitted with particular attention paid to the appropriate landscaping of the Maglin Distributor Road/S.A.C.	07.07.2025	S.Ronan Response: Please refer to L-002_Plant Schedule which includes full details on sizing and species planted. Also refer to Landscape Plan L-501 1 of 12 - Landscape Plan L-512 12 of 12.which has the quantities. With regards to the Distributor road we have replaced the Tilia cordata with Platanus x hispanica as per the city Architect's comments.	
-The removal of Taxus from the planting palette.	07.07.2025	S.Ronan Response: Noted, Taxus has been removed from page 45 of the landscape report.	
-The identification of defect period and maintenance periods. The species selected should be appropriate for long term retention in the given locations.	07.07.2025	S.Ronan Response: Please refer to pages 59 through 61 of the landscape report for the maintenance specification and schedule. The maintenance and defects period is two years from completion.	

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Project	Planning Reference: LRD25-03 for Greenfield, Ballincollig		

Council Request	Date of Response	Response	
-The integration of informal non-equipped design solutions in play provision which could take advantage of the site features.	07.07.2025	S.Ronan Response: The landscape design incorporates a variety of play strategies to encourage active engagement and exploration for all ages. Sunken kickabout lawns provide open, flexible spaces for informal sports and social play, while 'play along the way' elements within treelined spaces offer a more immersive and nature-based experience. Please refer to Landscape Plan L-501 1 of 12 - Landscape Plan L-512 12 of 12.which has indicates informal play elements. On page 38 of landscape report, natural play description and reference imagery depicts integration of landscape elements found in nature which can be repurposed to provide non-equipped or informal play opportunities such as logs and stepping stone elements.	Example below:
-Clarification of the sunken areas for SuDs provision in the central landscape areas as to whether they are large enough for informal kickabout and possible redesign of the same.	07.07.2025	S.Ronan Response: The sunken lawns act as informal play features. It offers the opportunity to interact with topography as landscape enriching elements to run up and down grass banks. The sloped edge decreases the chances of a ball flying out into the road.	
-Possible redesign of the treatment of the public open space and semi-private/private open space within the courtyard areas – including the access arrangements to same.	07.07.2025	S.Ronan Response: No reason has been given for the redesign of the courtyards. Both the design team and the client feel that the courtyards are more than adequately designed. Perhaps if more detail on the issues was given, we could have addressed the comment. With regards access to the courtyards, we have added a low, 1.1 metal railing and hedge to discourage members of the public from walking into the communal courtyard. However, we do not think that the courtyard should be locked, as it would impede use by the residents.	

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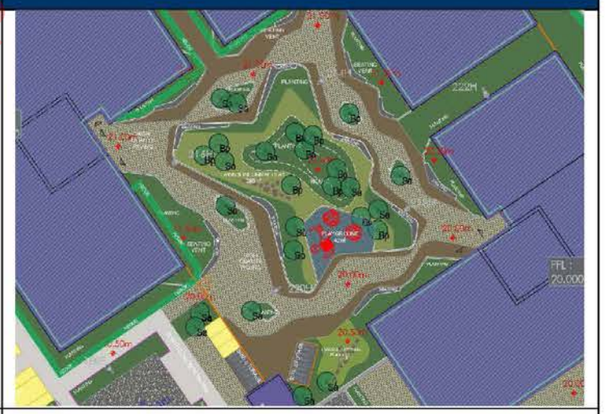
Project	Planning Reference: LRD25-03 for Greenfield, Ballincollig		

Council Request	Date of Response	Response	
-Provision of private patio spaces for ground floor duplex/apartment units – including the landscaped delineation of the boundaries to same.	07.07.2025	S.Ronan Response: What is the comment here? Is it: a) There are not enough patio spaces b) That the boundary to those spaces are not described adequately Please refer to our detail landscape plans which clearly describe the extent of the patio spaces which comply to national apartment design guidelines and the boundaries of which are indicated on same.	
05. Emer O'Callaghan, Senior Parks & Landscape Officer, Parks & Recreations: -Condition survey of all hedgerows – no indication of retention of the easter boundary hedgerow. The retention of hedgerow is welcome.	07.07.2025	S.Ronan Response: Regarding the condition survey of all hedgerows, this is found within the ecologists' submission. Regarding the retention of the eastern boundary hedgerow- this is being retained, as shown on page 18 of the landscape report and L-100 Landscape Masterplan For further clarification: Linear meters of native hedgerow removed: 100m Linear meters of native hedgerow retained: 1213m Linear meters of native hedgerow planted: 435m	

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Project	**Planning Reference: LRD25-03 for Greenfield, Ballincollig**		

Council Request	Date of Response	Response	
-Central open space is bisected by hedgerows – which negates the potential for open space usability and informal plan.	07.07.2025	S.Ronan Response: The landscape proposal of a sunken lawn and dedicated playscape to the north of the hedge in the central open space as well as a sunken lawn to the south creates open space usability. The dedicated play has a hedgerow edge which simultaneously preserves ecological measures and creates a safe buffer to the street. To the south, the sunken lawn can double as a kickabout area with wildflower planting surrounding it- children can play in the meadow as an additional level of enrichment. We argue that the hedge enhances the open space rather than negating its usability.	
-Apartment blocks – provision of play as per the design guidelines for new apartments – indicated for one block and not the other	07.07.2025	S.Ronan Response: There is 800 sqm of formal and informal play across the two apartment courtyards. The play provision includes dedicated play equipment such as climbing frames, etc. along with informal play elements such as mounds, stepping stones, and logs. All of the play areas are well overlooked. This fully complies to the Design Standards for New Apartments, 2020. Please refer to Landscape Plan L-501 1 of 12 - Landscape Plan L-512 12 of 12. for details of play elements within the courtyards.	

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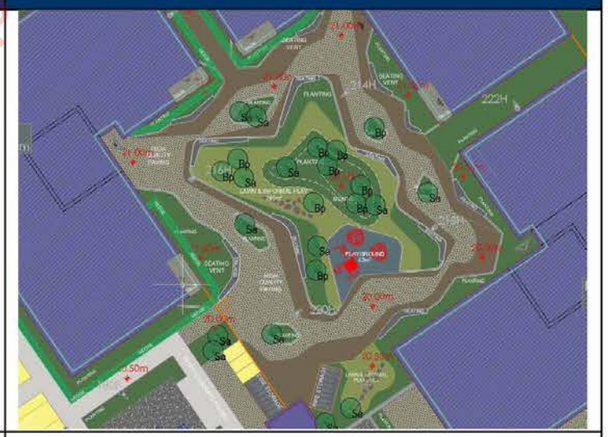
Project	**Planning Reference: LRD25-03 for Greenfield, Ballincollig**		

Council Request	Date of Response	Response	
			
-SUDs – design detail required and locations – maintenance plans will be required – eg. Tree planting pits, swales, etc.	07.07.2025	S.Ronan Response: Refer to engineer's specifications for maintenance of SUDs features. The landscape design has been fully coordinated with the below-ground SUDs features.	
-Local play – natural play with innovative design but no fixed equipment. Location of playground seems to be in different locations in different drawing.	07.07.2025	S.Ronan Response: The play diagram is fully coordinated, please refer to page 35 of landscape report.	
-Plaza is indicated for central open space as well as multipurpose open space and playground – can this be clarified.	07.07.2025	S.Ronan Response: The creche plaza includes shrub planting, tree planting, and seating around the entrance to the creche. This plaza is positioned at a key intersections within the masterplan and will be constructed using robust, high quality materials. Please refer to Landscape Plan L-501 1 of 12 - Landscape Plan L-512 12 of 12 for a detailed outline of the design.	

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Project	**Planning Reference: LRD25-03 for Greenfield, Ballincollig**		

Council Request	Date of Response	Response	
Information required: Schedule of landscape implementation – works to be completed prior to occupancy.	07.07.2025	S.Ronan Response: Please refer to Architect's Phasing Plan.	
-Management and maintenance plans for agrees Landscape Design.	07.07.2025	S.Ronan Response: Please refer to pages 59 through 61 of the landscape report for the maintenance and defects period as well as maintenance schedule.	
3. Planning Authority Comments *3.1 Parks and Recreation:* -Play provision – informal non-equipped design solutions if imaginatively and practically conceived – taking advantage of site features, may be suitable and adequate to meet children's play needs.	07.07.2025	S.Ronan Response: "The landscape design incorporates a variety of play strategies to encourage active engagement and exploration for all ages. Sunken kickabout lawns provide open, flexible spaces for informal sports and social play, while 'play along the way' elements within woodland areas offer a more immersive and nature-based experience (…)" excerpt from page 37 of landscape report. Subsequently, on page 38, natural play description and reference imagery depicts integration of landscape elements found in nature which can be repurposed to provide non-equipped or informal play opportunities such as logs and stepping stone elements. Please refer to the play strategy diagram on page 35 of the landscape report as well as supplementary text on page 36.	Play Strategy
-SUDs provision has been outlined. The sunken areas for SUDs provision in the central landscape areas – are they large enough for informal kickabout?	07.07.2025	S.Ronan Response: The sunken lawns act as informal play features. It offers the opportunity to interact with topography as landscape enriching elements to run up and down grass banks. The sloped edge decreases the chances of a ball flying out into the road.	
-The issue/concern of the lack of separation of the pubic and semi-private open spaces in the courtyards of the apartments were raised.	07.07.2025	S.Ronan Response: We have included a privacy planting strip and a hedge around the entire edge to the groundfloor apartments. Please refer to Landscape Plan L-501 1 of 12 - Landscape Plan L-512 12 of 12 for a detailed outline of the design.	
-Taxus is to be removed from the planting palette as the fruits are toxic.	07.07.2025	S.Ronan Response: Noted, Taxus has been removed from page 45 of the landscape report planting palette.	
-The defects period and maintenance period are to be identified.	07.07.2025	S.Ronan Response:	

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Project	Planning Reference: LRD25-03 for Greenfield, Ballincollig		

Council Request	Date of Response	Response	
		Please refer to pages 59 through 61 of the landscape report for the maintenance specification and schedule. The maintenance and defects period is two years from completion.	
3.4 Biodiversity: -Would request more detail on the volume of hedgerow retention within the proposed development.	07.07.2025	S.Ronan Response: Regarding the condition survey of all hedgerows, this is found within the ecologists' submission. Regarding the retention of the eastern boundary hedgerow- this is being retained, as shown on page 18 of the landscape report and L-100 Landscape Masterplan For further clarification: Linear meters of native hedgerow removed: 100m Linear meters of native hedgerow retained: 1213m Linear meters of native hedgerow planted: 435m	
Comments: LRD25-03: Greenfield: -The amount of hedgerow retention within the proposed development.	07.07.2025	S.Ronan Response: As above.	
-What type of biodiversity enhancements are being incorporated into the proposed development such as: nest boxes, bat boxes, bee hotels, etc.	07.07.2025	S.Ronan Response: The proposed development incorporates several biodiversity enhancements aimed at supporting local wildlife. These include the installation of nest boxes for birds, bat boxes to encourage roosting, and bee hotels to promote pollinator activity. Additional landscaping with native planting will further enhance habitat opportunities and ecological value across the site. Refer to ecologist's report for further detail.	
2. Enclosure: -Street trees are promoted by DMURS for achieving good street enclosure and the intention is to establish strong avenue of mature trees that will continue for the full length of the SAC. The grass verges are relatively wide, measuring approx.. 5.8m, but this width will allow for planting street trees whilst allowing for the future addition of 3m wide bus lanes. It is advised that details are provided as to the proposed planting distances, planting pits, and how the trees are positioned and protected to withstand the future bus lane construction.	07.07.2025	S.Ronan Response: Please refer to Landscape Plan L-501 1 of 12 - Landscape Plan L-512 12 of 12 for a detailed tree and planting layout including separation distances, etc. Please also refer to L-902 Soft Landscape Details and L-903 Tree Details. Furthermore, please refer to L-002_Plant Schedule for species.	

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Project	**Planning Reference: LRD25-03 for Greenfield, Ballincollig**		

Council Request	Date of Response	Response	
It is also advised that rather than the Tilia Cordata proposed, London Plane trees be considered for aesthetic reasons, their suitability to both the urban environment and the scale of the landscape along the SAC, and for the avoidance of epicormic growth in proximity to the cycle path and road edge.	07.07.2025	Noted, Tilia cordata trees have been replaced to London Plane trees (Platanus x hispanica) in the landscape drawing set as well as the landscape report.	

SIGNED

SIMON RONAN
BSC. HORT. BSC. LA

DIRECTOR SRLA

Cork City Council Planning Department. For Inspection Purposes Only!

PROPOSED RESIDENTIAL DEVELOPMENT
GREENFIELD, BALLINCOLLIG, CORK CITY

LANDSCAPE AND GREEN INFRASTRUCTURE REPORT

July 2025

SR
LA
SIMON RONAN LANDSCAPE ARCHITECTS

Dublin Office
25 Glengarrif Parade
Phibsborough

Cork Office
Levis Quay
Skibbereen

Cork City Council Planning Department: For Inspection Purposes Only!

APPENDIX 2-6 Landscape Masterplan – Simon Ronan Landscape Architecture

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Cork City Council Planning Department

LEGEND

- Phase I boundary.
- 62.85m — Proposed Levels
- Mixed Hedge
- Herbaceous Planting & Shrubs
- Lawn
- Meadow
- Private Garden
- High Quality Paving
- Shared Surface
- Soft Paving
- Greenway Coloured Asphalt
- Gravel Bound Pathway
- In-Situ Concrete Paving
- Road
- Crossing Points
- Fence and Gates
- Estate Rail Fencing
- SUDs Infiltration Basin
- SUDs Raingarden
- SUDs Filter Drain
- SUDs Green Roof
- Existing Trees To Be Retained
- Existing Hedgerow To Be Retained
- Existing Trees to be removed
- Existing Hedgerow To Be Removed
- Proposed Native Hedge
- Proposed Trees
- Proposed Tree Pit

Big Trees

Qr	Quercus robur
Ps	Pinus sylvestris
Ph	Platanus × hispanica

Small Trees

Sa	Sorbus aucuparia
Bp	Betula pendula

REFERENCE: THIS DRAWING IS NOT FOR CONSTRUCTION

SR LA

SIMON RONAN LANDSCAPE ARCHITECTS

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GENERAL LANDSCAPE PLAN L- 100
1:1000@A1

REV/00

PROPOSED RESIDENTIAL DEVELOPMENT
GREENFIELD, BALLINCOLLIG, CORK CITY

PURPOSE OF DRAWING: PLANNING

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ALL DIMENSIONS TO BE CHECKED ON SITE.
NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

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JULY 2025

CHAPTER THREE

LANDSCAPE & VISUAL

APPENDIX 3-1 Tree Survey/Arboist Report – Country Tree Care

Cork County Council Planning Department. For Inspection Purposes Only!

APPENDIX 3-1 Tree Survey/Arboist Report – Country Tree Care

Cork City Council Planning Department. For Inspection Purposes Only!

County Tree Care Ltd
QUALIFIED ARBORISTS
Qualified in Arboriculture & Horticulture
HYDRO HILL,
TOWER, CO. CORK.
TEL: 021 4383762
MOBILE: 087 3328019
www.countytreecare.ie
Email: info@countytreecare.ie

Project Name:

Tree Survey and Arboricultural Assessment at Greenfield, Ballincollig, Cork

Date: 10/07/25

Prepared For:

Murnane & O' Shea Ltd
Link Road Business Centre,
Link Road,
Ballincollig,
Cork

Prepared by:

George Earle BSc Forestry, Dip Arb, MSIF, MArborA,

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1.1: Client Brief

County Tree Care Ltd was asked to carry out a tree survey and arboricultural assessment of trees and hedgerows on a site at Greenfield, Ballincollig, Cork. The tree survey and arboricultural assessment is to be done as part of a planning application process for the development of the site at the above address.

1.2: Site Description

The site located in West side of Ballincollig village on the West side of Cork City. It is 2 Kms from the village square. It is approximately 15.2 ha in size. It is a greenfield site of arable land with a South-easterly aspect. It is presently being used as pasture for equine and cattle. The trees and hedgerows surveyed made up boundaries on the periphery of the site as a whole and boundaries within the site between adjoining fields and dwellings (2) that currently exist. Please note that the boundaries indicated in the maps in this report are for a larger area than the planning site application boundary.

1.3: Methodology

Only trees over 15cm in diameter @ 1.5m were surveyed. Recommendations will be provided based on the survey. Aluminium tree tags were placed on the trees that were surveyed. They number from 921 – 975 and are placed at 1.5m high on the North side of the tree stem. There are four trees not tagged with a metal tag because they are growing on a neighbour's property. The numbers of these trees are 954, 973, 974, 975.The survey methodology follows the recommendations contained within BS: 5837 (2012), Trees in relation to design, demolition and construction. Any tree surgery work to be carried out must follow Industry Best Practice BS: 3998 (2010). The analysis of the trees was undertaken using the VTA method as developed by Mattheck and Breloer (1994). The hedgerows were surveyed in accordance with a Standard Recording Methodology as devised in 2006 as *A Methodology for the recording of hedgerow extent, species composition, structure, and condition in Ireland* (Murray and Foulkes, 2006). Because the hedgerows establish the boundaries of the site mainly, all boundaries were recorded and commented on firstly and subcategorised into what type of boundary.

1.4: Limitations of the survey

This survey should be regarded as a preliminary assessment of the trees and deals with the current condition as identified during this survey only. Any tree whether it has visible

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weakness or not, will fail if the force applied exceeds the strength of the tree or its parts. The details within this survey are based on the condition of the trees during the survey period only. No invasive or destructive evaluation techniques were used, and all findings are based on the knowledge and expertise of the undersigned. Trees are living organisms that are subject to the stresses of climatic extremes and attack from decay fungi and injurious diseases. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the trees in this survey may not arise in the future. By examining the trees, rating their likelihood of causing damage and injury and recommending action to abate the hazard, we act to reduce but not eliminate the risks associated with the trees.

Signed:

1.5: Relevant Legislation

There are no Tree Protection Orders (TPOs) on any of the trees on this site. However, under Section 37 of the Forestry Act: 1946, it is illegal to uproot any tree over ten years old or to cut down any tree of any age (including trees which form part of a hedgerow), unless a Felling Notice has been lodged at the Garda Station nearest to the trees at least 21 days before felling commences. A felling license can be obtained by contacting the Dept of Agriculture, forestry section.

The requirement for a felling licence for the uprooting or cutting down of trees does not apply where:

- The tree in question is a hazel, apple, plum, damson, pear or cherry tree grown for the value of its fruit
- The tree is considered dangerous and hazardous
- A tree in an urban area. An urban area is an area that comprised a city, town or borough specified in Part 2 of Schedule 5 and in Schedule 6 of the Local Government Act 2001 before the enactment of the Local Government Reform Act 2014.
- A tree within 30 metres of a building (other than a wall or temporary structure), but excluding any building built after the trees were planted.
- A tree less than five years of age that came about through natural regeneration and removed from a field as part of the normal maintenance of agricultural land (but not where the tree is standing in a hedgerow)
- A tree uprooted in a nursery for the purpose of transplantation

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- A tree of the willow or poplar species planted and maintained solely for fuel under a short rotation coppice
- Trees outside a forest – the removal of which is specified in a grant of planning permission
- Trees outside a forest – within 10 metres of a public road and which, in the opinion of the owner (being an opinion formed on reasonable grounds), is dangerous to persons using the public road on account of its age or condition
- Trees outside a forest – of the hawthorn or blackthorn species
- Trees outside a forest – in a hedgerow and felled for the purposes of its trimming, provided that the tree does not exceed 20 centimetres in diameter when measured 1.3 metres from the ground
- Trees outside a forest – on an agricultural holding and removed by the owner for use on that holding, provided:
  - It does not form part of a decorative avenue or ring of trees
  - Its volume does not exceed 3 cubic metres, and
  - That the removal of it, by the owner for the foregoing purpose, when taken together with the removal of other such trees by the owner for that purpose, would not result in the total volume of trees, on that holding and removed by the owner for that purpose, exceeds 15 cubic metres in any period of 12 months.

Exceptions

Other exceptions apply in the case of local authority road construction, road safety and electricity supply operations. The Act is administered by the Forest Service, Department of Agriculture, Fisheries and Food. The Felling Section of the Forest Service is based in Johnstown Castle, Co. Wexford (053-9160200 or 1890-200223) Trees may contain bats. Bats are protected under Schedule 5 of the Wildlife Act 1976 and Schedule 1 of the European Communities (Natural Habitats) Regulations 1997. Professional advice from a licenced surveyor should be sought prior to any works commencing on trees.

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Health and Safety

The Health and Safety and Welfare at work Act 2005 is a legal requirement. When planning and carrying out forestry (woodland) operations, the law requires that a number of health and safety duties must be completed.

Safety Statement

This is a written document aimed at minimising exposure to risk or injury or ill-health for all people working around trees.

Tree Protection Orders

The local Government (Planning & Development) Act 1963 provides for the making of Tree Protection Orders (TPOs) by the Planning Authority where it is considered desirable to preserve trees on amenity grounds. This prevents the cutting down, topping, lopping or wilful destruction of trees without the specific consent of the Planning Authority. Such TPOs do not apply to the cutting of trees which are dead or dying or have become dangerous, or to the cutting of trees in compliance with statutory obligations to prevent or abate nuisance.

Dangerous Trees

The Roads Act 1993 requires owners or occupiers of land to take all reasonable steps to ensure that trees or other vegetation on their land are not a hazard to persons using a public road. Local authorities may issue notices to landowners requesting them to maintain or cut back trees and hedges.

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1.6: Terminology

Arboricultural Comments: Refers to the tree's condition and suitability for the site

Common name: Most widely used non botanical name

Co-dominant stems: Two branches assuming the role of leading stems. When growing close together may form a weak attachment (included bark) at their point of contact. Trees with this defect may be in danger of splitting at this weak attachment.

Included Bark: Pattern of development at branch junctions where bark is turned inward rather than pushed out

Crown spread: Measured in meters North, South, East, West

Decay Fungi: Refers to those species of fungi which degrade living wood and which may, depending on the degree of degradation, render the tree structurally unsound

Defects: Refers to cracks, storm damage and any other damage mechanical or biological

Girth: Diameter of the trunk (millimetres) at 1.5m above grade level. MS inserted after this measurement means multi-stemmed

Genus & Species: Refers to the botanical name for the tree

Height: Measured in meters given to the nearest .5m

Monitor: Refers to trees which need to be re-surveyed on a yearly basis to assess their condition. This timescale may be sooner where works or adverse weather conditions have impacted negatively on the trees

Overhaul: A reference to standard tree surgery work which consists of the removal of deadwood, crossing branches and balancing of the crown where appropriate

Recommendations: Indicates surgery work necessary for the retention or, where necessary, removal of the tree

Major deadwood: Dead branch/limb that is between 150mm – 250mm in diameter

Moderate deadwood: Dead branch/limb that is between 100mm – 150mm in diameter

Minor deadwood: Dead branch/limb that is between 50mm – 100mm in diameter

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Basal Cavity: Cavity or opening located at the lower region of the tree at ground level

Stem Cavity: Cavity or opening located on the main stem/trunk of the tree

RPA: Root Protection Area, calculated as a circle with a radius of 12 times the diameter of the stem of the tree measured at 1.5m. The RPA is then represented in m^2

ERC estimated remaining contribution that the tree can make if retained

Tree no: Refers to numbered tag fixed to tree during survey. The trees in this survey were numbered 0921 to 0975 so the first number would be T0921.

Age: Age cannot be exact unless invasive drilling technique are used. Therefore, an estimate is given and categorised as

- Young (Y) - < 15 years old
- Early Mature (EM) -15-25 years old
- Mature (MA) – Tree has reached full maturity, over 25 years old
- Over Mature (OM) – Tree is over mature and showing signs of decline

Physiological Condition and Comments based on a three-tier system:

- Good = Good health and vigour displayed
- Fair = Healthy and reasonable vigour
- Poor = Showing signs of decline, disease or decay

BS 5837: 2012 determines four retention categories following assessment
Retention Category (RC)

- Category **A:** Trees whose retention is most desirable. Those of high quality and in such condition to make a substantial contribution
- Category **B:** Trees whose retention is desirable. Those of moderate quality and value so as to make a significant contribution
- Category **C**: Trees which could be retained. Those of low quality and value but can make a contribution until new planting is established.
- For trees in categories A to C there are further subcategories (1,2,3)
- Subcategories 1,2 and 3 are intended to reflect arboricultural and landscape qualities and cultural values, respectively.
- Category **U**: Trees for removal. Trees that should be removed for reasons of sound arboricultural management

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1.7: Colour Identification of Tree Categories

Tree Class	Colour Code
Class A	
Class B	
Class C	
Class U	

1.8: References

- BS 5837: 2012. Tree in Relation to Design, Demolition and Construction
- BS 3998: 2010. Tree Work Recommendations
- Principles of Tree Hazard Assessment and Management; David Lonsdale
- Mattheck and Breloer (1994). The body language of trees
- Forest Mensuration – A handbook for practitioners
- Native Woodland Information Notes – Woodlands of Ireland
- Ireland's Native Woodlands – John R. Cross & Kevin D Collins
- Neil Foulkes, Janice Fuller, Declan Little, Shawn McCourt, Paul Murphy
  Hedgerow Appraisal System Best Practise Guidance on Hedgerow Surveying, Data collection and appraisal

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1.9: Tree Classification Schedule

Tag No.	Species	Age	Height	Crown Spread	Diameter	Condition	RC	Comments	Recommendations
921	Ash (*Fraxinus excelsior)*	Y	8m	N 4m S 3m E 2m W 5m	40 (X2)	Poor	U	Twin stem @1m, growing on raised stone bank, heavy ivy growth, dieback in upper crown, weak tree, crown heavy over roadway(N), hazard close to the road	Fell tree and remove stump

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Tag No.	Species	Age	Height	Crown Spread	Diameter	RPA (m^2)	Condition	RC	Comments	Recommendations
922	Ash *(Fraxinus excelsior)*	M	13m	N 7m S 6m E 7M W 7m	60cm	163	Good	B1	See below	Remove ivy and re-assess for any structural defects, clean crown of any deadwood, reduce crown by 10%, reduce length of limb on the South by 30%

Further Comments:

Good specimen, main stem growing 70^0 North to 4m then correcting to grow vertically into the crown, large limb growing South from main stem @ .5m, included bark between it and main stem, heavy ivy growth in crown, much callus wood/reaction growth at the base which is a sign of the stress loading experienced as a result of growing on the raised bank, evenly distributed crown with major limbs growing in a balanced crown, dieback in the tips of the upper crown, deadwood seen in lower, mid and upper crown.

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923	Beech *(Fagus sylvatica)*	M	16m	N 8m S 8m E 7m W 9m	100cm	41	Good	A1	Good example of beech with no sign of defect, minor ivy growth on main bole to 2m, good even crown spread, straight bole to 6m, minor deadwood throughout crown, good root support system spread out on bank	Clean crown, remove ivy, thin out by 10% any crossing branches

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924	Larch *(Larix decidua)*	M	11m	N 8 S 4 E 5 W 0	30cm	Poor	C2	Growing closely to T923, bark damage @.5m – 2.5m from horses, onset of decay showing in the sapwood, major limb damage @4m & 5m East side, unbalanced crown impeding beech tree	Retain for the short term, reassess in one year's time

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925	Ash (*Fraxinus Excelsior)*	M	8m	N 4m S 4m E 4m W 3m	70 (X 3)	Poor	C2	Coppiced tree, 3 stems from base, reaction growth at the base of each stem, cambium damage on North side @.5m, heavy ivy growth in crown, good leaf colour and flush crown, minor deadwood in crown	Retain for the short term, reassess in one year's time

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926	Sycamore *(Acer pseudo-Platanus)*	M	12m	N 6m S 7m E 6m W 8m	80cm (X2)	290	Good	A1	Good example, West limb growing from 1m on main stem comprises ¼ of crown, heavy ivy growth on stem, minor deadwood mid and upper crown, some crossing branches	Remove ivy and re-assess for any structural defects, clean crown of deadwood and crossing branches

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927	Ash *Fraxinus excelsior*	EM	8m	N 5m S 5m E 3m W 3m	35cm	Poor	C2	Major basal cavity on East side	Retain for the short term, reassess in one year's time

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928	Beech *Fagus sylvatica*	M	15m	N 9m S 9m E 10M W 9m	100cm	452	Good	A1	Good specimen, straight bole with good taper, fine buttresses on North and East, extensive structural root development indicating shallow rooting, even crown structure, broken limb @3.5m, cracked limb @4m, Minor deadwood	Clean crown of deadwood, thin crown by 15%, reduce crown by 15% to alleviate stress loading from wind pressure

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929	Sycamore *Acer pseudo platanus*	M	9m	N 6m S 5m E 6m W 5m	70cm	222	Good	B2	Aesthetically pleasing, large limb growing from main stem @1m, heavy ivy main stem to 6m, crossing branches in mid and upper crown, minor deadwood in upper crown	Clean crown of any dead wood and crossing branches, remove ivy and re-assess for any structural defects Crown raise to 3m all around

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930	Eucalyptus *Eucalyptus gunnii*	Y	9m	N 5m S 2m E 4m W 4m	35cm	Fair	C2	Lean of 70^0 Growing on a raised bank, stem breaks into many branches @2m, no straight main leading stem, poor example of this species, windthrow potential	Retain for the short term, reassess in one year's time

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931	Apple *Malus domestica* 'Bramleys Seedling'	M	6m	N 6m S 5m E 5.5m W 4M	60cm	163	Good	B1	Windblown, lean of 45^0 East, healthy crown, good leaf colour, no signs of canker which is unusual, dense crown with many crossing branches	Fell to facilitate the development

Note: There are two lines of hornbeam (*Carpinus betulus*) that line the entrance driveway to the existing dwelling at this point. The trees are healthy, 3m in height and crown spread of 2m all around. They are ornamental trees planted for structural landscaping design reasons. These are highlighted with a white outline on the constraints plan.

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932	Sitka spruce *Picea sitchensis*	EM	16m	N 2m S 6M E 2 W 6M	40cm	72	Fair	C2	Crown has not developed well because of compaction on the ground from horses, lower bole cambium damage from horses, wind throw possibility	Fell to facilitate the development

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933	Sitka spruce *Picea sitchensis*	EM	15m	N 1m S 3m E 1m W 3m	30cm	Poor	C2	Growing on a raised bank, poorly developed crown, dense undergrowth, heavy ivy growth on the lower stem, wind throw potential	Retain for the short term, reassess in one year's time

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Tag No.	Species	Age	Height	Crown Spread	Diameter	Condition	RC	Comments	Recommendations
934	Sitka spruce *Picea sitchensis*	EM	13m	N 2m S 0m E 0m W 4m	25cm	Poor	C2	Growing on a raised stone ditch, poorly developed crown, growing close to T935, will never develop properly, shallow rooted and wind throw potential	Retain for the short term, reassess in one year's time

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935	Sitka spruce *Picea sitchensis*	EM	14m	N .5m S 0m E 2m W 4m	32cm	Poor	C2	Poorly developed, growing on a raised ditch, crown overcrowded by T934 & T936, heavy ivy growth on stem to the top of the crown, possibility of wind throw, due to its position on the bank	Retain for the short term, reassess in one year's time

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936	Sitka spruce *Picea sitchensis*	EM	15m	N 0m S 2m E 3m W 4m	38cm	Poor	C2	Growing on a raised ditch, crowded by T935, poorly developed crown on the North, major deadwood South, heavy ivy growth on main stem, possibility of wind throw due to its position	Retain for the short term, reassess in one year's time

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937	Scots pine *Pinus silvestris*	M	15m	N 7m S 7m E 4m W 5m	50cm	50	Good	B2	Growing on a raised bank, good structural root system showing, but this is a sigh of shallow rooting, cambium damage @5m, lower crown poorly formed, T938 is impeding on it, crown has dead wood on East and cambium damage@7m	Remove deadwood and clean crown, remove light ivy growth at base, thin crown by 10%

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938	Monterey cypress *Cupressus macrocarpa*	M	14m	N 2m S 4m E 5m W 4m	80cm	Poor	U	Poor specimen, windblown roughly 30yrs ago, main trunk corrected and grew into T937, crown not developed on North or South, cambium damage@2m from horses, basal decay evident on South on main trunk, rip out @8m, major deadwood in crown	Not contributing aesthetically and will be a hazard, Fell tree

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939	Sycamore *Acer pseudo platanus*	Y	12m	N 5m S 5M E 5M W 5m	65cm	191	Good	B2	Stem not straight, 80^0 lean N, at 5m stem straightens to vertical, heavy ivy growth to 5m on main stem, cambium damage on buttress roots on West side, large limb growing from base South, union looks weak here	Remove large limb at the base on the South, remove ivy and re-assess for structural defects, crown raise to 4m

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940	Sitka spruce *Picea sitchensis*	EM	12m	N 4m S 5m E 3m W 4m	40cm	72	Fair	C2	Heavy ivy on main stem, taper seems to be good, even branch structure from 2m, minor dieback in upper crown, possibility of wind throw due to raised bank position	Remove ivy and re-assess, clean crown of any deadwood or damaged branches, reduce height by 15%, monitor annually for signs of rocking at the base

Note: There is a dead elm (*Ulmus glabra*) on the sod and stone embankment South of T940. This needs to be felled.

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941	Sycamore *Acer pseudo platanus*	Y	9m	N 7m S .5m E .5m W 6m	34cm	55	Fair	C2	Self-seeded, growing out from a group of trees, twin stem at the base, union looks weak, broken branches lower crown West,	Fell tree to facilitate the development

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942	Sycamore *Acer pseudo platanus*	Y	6m	N 1m S 3m E 1m W 4m	15cm	Poor	U	Forming part of a copse of sycamore, an understorey tree of poor quality and little crown development	Fell tree to allow for air and light to enter in around the other adjacent trees

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943	Ash *Fraxinus excelsior*	M	12M	N 2m S 3m E .5m W 5m	90cm (X5)	366	Fair	C2	Coppiced tree, multi-stemmed from the base, poor union on South side @.5m, broken branches @1mNorth, Poor form and crown unbalanced, cambium damage East side,	Fell tree to facilitate the development

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944	Ash *Fraxinus excelsior*	EM	14m	N 3m S 3m E 4m W 3m	40 cm (X 2)	72	Fair	C2	Twin stem at the base, included bark @.5m, cambium damage at this point, poorly developed lower and mid crown because of shading	Fell tree to facilitate the development

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945	Sycamore Acer *pseudo platanus*	M	14m	N 6m S 6m E 7m W 4M	220CM (X 10)	707	Good	B2	Coppiced sycamore with multi stems from the base, healthy tree, cambium damage on outer stem South, rip out branch 1.5m East, poor union East stem .5m, minor deadwood throughout the crown, ivy growth on central stem	Fell tree to facilitate the development

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946	Ash *Fraxinus excelsior*	M	15m	N 6m S 3m E 4m W 2m	115cm (X 6)	598	Fair	C2	Coppiced, multi stem, dead branch @.5m, ivy growth on 3 stems, minor deadwood in mid crown, Epicormic growth on two East stems, Heavy bend on both stems, Poor shape crown	Fell tree to facilitate the development

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Tag No.	Species	Age	Height	Crown Spread	Diameter	Condition	RC	Comments	Recommendations
947	Ash *Fraxinus excelsior*	M	14m	N 8m S .5m E .5m W .5m	30cm	Poor	U	Poorly developed crown, leaning heavily North 60^0 away from T946, unbalanced crown, possible hazard	Fell tree

Note: There are two dead elm trees of medium size that were growing between T947 and T 948 on the ditch. These need to be felled.

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948	Sycamore *Acer pseudo platanus*	EM	8m	N 5m S 4m E 4m W 4m	32cm	48	Good	A1	Good example of sycamore, good crown development and branch structure, no sign of decay or structural defects, ivy growth on main stem into upper crown, sucker growth at base	Fell tree to facilitate the development

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949	Ash *Fraxinus excelsior*	EM	14m	N .5m S 6m E 6m W 5m	60cm (X 2)	163	Fair	C2	Growing on a raised bank, poor crown formation, twin co-dominant stems from base, heavy ivy on main stem, minor dead wood in mid crown, Crown growing heavy to South and West	Remove dense undergrowth around the base and re-assess the union, remove ivy and re-assess for any structural defects, reduce height by 30% to alleviate stress loading at the base

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950	Ash *Fraxinus excelsior*	EM	15m	N 7m S .5m E 7m W 6m	35cm	55	Fair	C2	Heavy ivy growth on main stem, minor deadwood in lower, mid and upper crown, Crown growing heavy to North and East	Remove ivy and re-assess for any signs of pathogen or structural defects, crown reduce by 30%, remove deadwood and clean the crown

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951	Sycamore *Acer pseudo platanus*	EM	14m	N 7m S 4m E 4m W 4.5m	50cm	113	Good	B2	Healthy tree, ivy growth on main stem, deadwood on east 2.5m, large limb growing north from 2m, much weight on the union here, minor deadwood in the crown	Remove ivy and re-assess for any pathogen or structural defect, reduce length of large north limb by 50%, crown raise to 2m

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952	Sycamore *Acer pseudo platanus*	M	14m	N 5m S 6m E 5m W 4m	55cm	137	Good	B1	Healthy tree, good taper on main stem, good buttress root formation, evenly balanced crown, minor deadwood in lower and mid crown, basal sucker growth	Clean crown of deadwood and any damaged or crossing branches that might be seen by a climbing arborist, remove basal sucker, crown raise to 3m

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953	Sycamore *pseudo platanus*	Em	12m	N 5m S 6m E 5m W 4m	40cm	72	Good	B2	Healthy tree, good buttress root formation, ivy growth on main stem, minor deadwood mid crown, balanced crown development, good tapor on main stem	Crown raise to 3m, remove ivy, clean crown of any dead wood and crossing branches

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954	Copper beech *Fagus sylvatica purpurea*	EM	8m	N 7m S 5m E 4m W 7m	70cm	222	Good	B	Neighbour's tree. It was not tagged. A visual assessment was made from the field that borders it on the West. Tree seems healthy, lower crown encroaching into the field on West by 7m	N/A

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955	Ornamental cherry *Prunus kanzan*	EM	6m	N 2m S 2m E 3m W 3m	20cm	18	Good	B2	Ornamental tree, straight stem with no signs of canker, flush cut on main stem @2mSouth, this decreases structural timber quantity in stem, crossing branches in crown,	Tree not native, not serving any purpose in its present setting. No good reason to plant here, not suited to the present location, consider removing the tree, or keep as an ornamental feature in the field corner

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956	Beech *Fagus sylvatica*	M	11m	N 7m S 7m E 7m W 6m	110cm	547	Good	A2	Healthy coppice, growing on raised bank, large bole straight to 2m, breaks into multi stems (8) from 2m, coppiced many years before, epicormic growth on main stem @2m from branches cut back, crossing branches in crown	Clean the crown of any crossing or dead branches, clean epicormic growth on the lower bole, monitor yearly for any signs of rocking at the base

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957	Sycamore *Acer pseudo platanus*	Y	5m	N 4m S 3m E 4m W 3m	22cm	23	Poor	C2	Poorly developed tree forming part of the hedgerow, multiple wounds on North and east side of the main stem @ 1m, from machinery damage	Retain as part of the hedgerow

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958	Sycamore *Acer pseudo platanus*	Y	9m	N 2m S .5m E 1m W 3m	20cm	18	Poor	C2	Cambium damage on West side of main stem @ .2m, .5m, limb cut at base flush cut, disease could enter at this point	Retain as part of the hedgerow

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Tag No.	Species	Age	Height	Crown Spread	Diameter	Condition	RC	Comments	Recommendations
959	Aspen *Populus tremula*	Y	8m	N 3m S .5m E 2m W 1m	20cm	Poor	U	Sapling from T960, lean of 80^0 N away from T960, Will never have enough space to develop and the lean will eventually become a hazard	Fell tree to avoid potential failure in the short term

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960	Aspen *Populus tremula*	EM	13m	N 6m S 3m E 3m W 3m	40cm	72	Fair	B2	Straight stem to 4m, good taper on stem, cambium damage from machinery at the base West side, crown unbalanced growing North, heavy ivy growth on main stem, minor deadwood in crown	Fell tree to facilitate the development

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961	Aspen *Populus tremula*	M	13m	N 6m S 4m E 4m W 6m	55cm	137	Good	B1	Straight stem to 5m Machinery damage to branches 4m N side, Heavy ivy growth on main stem to 9m, Healthy tree with no sign of decay, crown slightly heavier to the N and W, minor deadwood in upper crown	Remove ivy and re-assess for any structural defects or signs of pathogen attack, clean crown of any deadwood or crossing branches

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962	Sycamore *Acer pseudo platanus*	M	8m	N 4m S 4m E 4m W 4M	35cm	55	Fair	C1	Coppiced sycamore, one main leading stem, all other stems of minor significance growing N and E, heavy ivy on main stem and in the crown, balanced crown now growing over laneway on West	Remove ivy and re-assess for any structural defects or signs of pathogen entry, cut back branches over laneway by 2m

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963	Ash *Fraxinus excelsior*	Y	7m	N 4m S 1m E .5m W 1m	15cm	10	Poor	C2	Poorly developed tree, 70^0 away from T964, ivy heavy on the main stem to the top of the crown, branches growing North, into the field, crown development will be restricted by T964 to the East and South	Retain as part of the hedgerow, remove ivy, reduce height to the same height as the adjoining hedgerow (4m)

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964	Sycamore *Acer Pseudo platanus*	EM	7m	N 7m S 5m E 4m W 4m	50cm	113	Good	A2	Growing on a raised bank, straight stem to 3m, limb @2m E on main bole forming ¼ of crown, heavy ivy on main stem into crown, major sucker growth at the base, crossing branches in crown, space for branch development impeded by T963 on the North	Remove ivy and re-assess, remove sucker growth and clean around the base of the tree, clean the crown of any crossing or damaged branches

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965	Ash *Fraxinus excelsior*	EM	8m	N 3m S 4m E 4m W 3m	40cm	72	Fair	C1	Straight stem to 3m Crown has uneven distribution of structural scaffold branches, heavy ivy growth on the main stem to the top, minor deadwood in the upper crown	Remove ivy and re-assess, clean crown of any dead or damaged branches

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966	Sycamore *Acer pseudo platanus*	EM	10m	N 5m S 5m E 5m W 5M	35cm	55	Good	B1	Major ivy growth on main stem from 1m, splits@4.5m into two leaders, crown is evenly distributed, minor weak & crossing branches in crown, it is growing on edge of bank, large structural root system holding the tree in place	Remove ivy and re-assess. Clean crown of any dead or damaged branches, monitor yearly for any signs of rocking at the base that would indicate possible windthrow

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967	Sycamore *Acer pseudo platanus*	M	14m	N 7m S 7m E 7m W 8m	140cm	707	Good	A2	Growing on a raised bank, large buttress roots spreading across the bank, two large main stems at the base that are compressed tightly into included bark, splits into 4 large stems @1.7m, included bark and cambium damage between centre stem and stem on the South, minor deadwood observed in upper crown	Clean the crown of any dead or damaged branches, monitor yearly and watch for signs of rocking at the base that would indicate possible windthrow

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968	Sycamore *Acer pseudo platanus*	M	14m	N 3m S 6m E 2m W 5m	30cm	41	Fair	B2	Leaning South 70^0 away from the centre, ivy growth on the stem @ 4m, branch structure developed strongly on the South side of the stem.	Reduce height by 20% to reduce any stress loading at the base

Comments:
A stem forming part of a coppiced sycamore but large enough to be tagged as a tree in its own right. The tree was coppiced (cut at the base) roughly thirty years ago. There are five stems in total belonging to this one tree/root system. These stems were all tagged numbered from 968 through to 972. The tree divides into these stems at ground level with some of the stems growing from beneath soil level. Each stem is very large, and a more accurate representation of the tree would be to tag each stem individually, measuring and commenting on each individually.

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969	Sycamore *Acer pseudo platanus*	M	14m	N 2m S 6m E 3m W 6m	35cm	55	Good	B1	Growing as part of a coppiced sycamore, leaning 80^0 South, unbalanced crown with heavy growth on the South, sucker growth at the base, some minor deadwood in the crown	Clean the crown of any dead or damaged branches, remove basal sucker, Reduce height by 20% to reduce any stress loading at the base

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970	Sycamore *Acer pseudo platanus*	M	14m	N 6m S 4m E 3m W 5m	35cm	55	Good	B1	Stem forming part of a coppiced sycamore, sucker growth at the base, weak branch growth @ .5, 1, 1.5m , minor deadwood in crown, ivy growth to 6m	Remove ivy, remove basal sucker, reduce height by 20% to reduce stress loading at the base

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971	Sycamore *Acer pseudo platanus*	M	14m	N 6m S .5m E 5m W .5m	30cm	41	Good	B1	Growing as part of a coppiced sycamore, leaning 80^0 North away from the centre, heavy branch growth in crown on the North side leaning into the field	Reduce height by 20% to reduce stress loading at the base

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972	Sycamore *Acer pseudo platanus*	M	14m	N 3m S 1m E 6m W 0m	35cm	55	Good	B1	Growing as part of a coppiced sycamore, lean of 70^0 East, ivy growth on stem, minor deadwood in the crown	Remove any dead or damaged branches, reduce height by 20% to reduce stress loading at the base

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973	Beech *Fagus sylvatica*	Y	5m	N 4m S 3m E 5m W 5m	20cm	18	Fair	B2	Growing on the neighbour's boundary, healthy tree as far as could be seen from outside the premises. Congested in its space with T974	N/A

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974	Ornamental cherry, *Prunus* 'Kanzan'	Y	6m	N 4m S 4m E 5m W 5m	25cm	28	Fair	B2	Growing on the neighbour's boundary, healthy tree as far as could be seen from outside the premises. Congested in its space with T973 & T975	N/A

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975	Sycamore *Acer pseudo platanus*	Y	4m	N 4m S 3m E 4m W 2m	18cm	14	Fair	B2	Growing on the neighbour's boundary, healthy tree as far as could be seen from outside the premises. Congested in its space with T974 & hedgerow plants	N/A

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2.0: Hedgerows

Hedge area	Species	Height (M)	Age	General condition	Comments	Preliminary Recommendations	Cat. Grading
1	Ash (*Fraxinus excelsior*) Beech (*Fagus sylvatica*) Larch (*Larix decidua*) Sycamore (*Acer pseudoplatanus*) Wild rose (*Rosa canina*) Bracken (*Pteridim aquilinum*) Rye grass (*Lolium perenne*) Ivy (*Hedera helix*)	1.5	M	Good	No sign of management, Large sections covered rye grass, and bracken	Strim grass to maintain,	N/A
2	Ligustrum (*Ligustrum ovalifolium*) Elder (*Sambucus nigra)*	3m	M	Poor	Poorly maintained and overgrown	Cut back the sides by 1m, reduce height by 1m	N/A

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	Hawthorn (*Crataegus monogyna*) Ivy (*Hedera helix*) Bramble (*Rubus sp*) Elm (*Ulmus glabra*)						
3	Sycamore (Acer pseudoplatanus) Ash (*Fraxinus excelsior*) Wild rose (*Rosa canina*) Nettle (*Urtica dioica*) Ivy (*Hedera helix*)	2m	M	Poor	Backfilled ditch from construction, poorly maintained, dead elm trees, overgrown stinging nettle and bramble	Fell elm trees, remove any litter at the base of sycamores	N/A
4	Elder (*Sambucus nigra*) Elm (*Ulmus glabra*) Spindle (*Euonymous europaeus*) Gorse (*Ulex sp*) Ash (*Fraxinus excelsior*) Sycamore (*Acer pseudoplatanus*) Ivy (*Hedera helix*)	4m	M	Good	Mature hedge comprised of mature ash and sycamore. These were coppiced in the past and stems are small in diameter and many in number.	Needs to be cut back on the East and West from the field by 3m	N/A

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5	Elder (*Sambucus nigra*) Nettle (*Urtica dioica*) Bramble (*Rubus sp*) Foxglove (*Digitalis purpurea*), Spindle (*Euonymous europaeus*) Blackthorn (*Prunus spinosa*) Ivy (*Hedera helix*)	4m	M	Poor	Poorly maintained hedge. Made up of mature trees with understorey shrubs and ground layer. Overgrown and dense with stinging nettle and bramble	Cut back on East and West by 2m	

No. 6 is a masonry boundary wall

7	Hawthorn (*Crataegus monogyna*) Elder (*Sambucus nigra*) Hazel (*Corylus avellana*) Wild rose (*Rosa canina*) Nettle (*Urtica dioica*)	3m	Y	Good	Healthy hedge, Not maintained in recent years	Cut top and reduce by 1m, Cut sides on North and South by 1m	N/A
8	Hawthorn (*Crataegus monogyna*) Hazel (*Corylus avellana*) Nettle (*Urtica dioica*) Bramble (*Rubus sp*) Foxglove (*Digitalis purpurea*)	3m	Y	Good	Healthy hedge, maintained on a yearly basis	Continue yearly upkeep of the hedge	N/A

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Hedge Area	Species	Height (M)	Age	General condition	Comments	Preliminary recommendations	Cat. grading
9	Blackthorn (*Prunus spinosa*) Goat willow (*Salix caprea*) Common vetch (*Vicia sativa*) Willowherb (*Chamaenerion angustifolium*) Bracken (*Pteridium aquilinum*) Spindle (*Euonymous europaeus*) Sycamore (*Acer pseudoplatanus*) Alder (*Alnus glutinosa*)	4m	M	Good	Overgrown and not maintained as a hedge. Nearby field drainage promoting lusher undergrowth	Cut back lower branches on East and West by 2m	N/A

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10	Alder (*Alnus glutinosa*) Goat willow (*Salix caprea*) Meadowsweet (*Filipendula ulmaria*) Bramble (*Rubus sp*) Bracken (*Pteridium aquilinum*) Vetch (*Vicia sativa*)	4m	M	Good	Overgrown but healthy hedge, natural indigenous species growing in their natural setting	Minor pruning/ side facing of the lower branches to make clearance for any machinery	N/A
11	Goat willow (*Salix caprea*) Rye grass (*Lolium perenne*) Bracken (*Pteridium aquilinum*)	4.5m	EM	Good	Line of early mature willow trees that are large and wide. Lush ground with a high water table promoting good growth of suitable species	Cut back lower branches to make clearance for machinery using the field	N/A
12	Goat willow (*Salix caprea*) Hawthorn (*Crataegus monogyna*)	3m	Y	Fair	Young hedge comprised of predominantly willow sp. Not very strong and sparse in places. Possibly blown in against the wall as seed, light growth of hawthorn in places and elder	Reduce height by 1m, cut back sides by 1m	N/A

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	Elder (*Sambucus nigra*) Wild rose (*Rosa canina*) Bramble (*Rubus sp*)				beginning to come through in places and will be a dominant species in a few years		
13	Hawthorn (*Crataegus monogyna*) Hazel (*Corylus avellana*) Ash (*Fraxinus excelsior*) Sycamore (*Acer pseudoplatanus*) Wild rose (*Rosa canina*) Bramble (*Rubus sp*)	3m	Y	Good	Dense hawthorn hedge, not maintained, ash and sycamore saplings are coming through and will become mature trees, bramble and wild rose and elder also coming through as strong understorey species	Reduce height by 1m, cut back sides by 1m	N/A

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Hedge no.1 (Colour code Light Red on the satellite imagery photos)

The first boundary surveyed begins at the Northwest corner of the site and runs Southeast. It is 140m in length, 1.5m high and 3m wide. It forms a long earth embankment that has low density plant species growing on some sections of it. It starts at the point where T921 is located and ends at the corner of the site of the existing dwelling. There are 9No. trees located on the embankment. It is comprised for the most part (80%) with self-seeded rye grass (*Lolium perenne)* on the Eastern side (field side) and on the West side (laneway) it is densely covered in bracken in one section. This a species of fern (*Pteridium aquilinum*) that has spread over a portion of the bank and covers 50% of the length. Species such as ragwort (*Jacobaea* vulgaris) and bramble (*Rubus* sp) were observed in relatively low quantities. Hawthorn (*Crataegus monogyna*) shrubs (2) are in one section, but these are small @ 1.5m high and 1m wide. Also located on the ditch were low density, self-seeded elm (*Ulmus glabra*) and wild rose (*Rosa canina).*

Ground Flora significance category – 1
Structural significance category – 2
Historical significance category – 2
Species Diversity significance category – 1
Habitat Connectivity significance category – 1
Landscape significance category - 2

Hedge no.2 (Colour code Amber on the satellite imagery photos)

This hedge defines the outer Western border of the existing dwelling alongside the laneway. It has a length of 120m, is 3m in height and is 3m wide. It is an earth embankment that runs as a continuation of hedge no.1 in a South easterly direction to the corner where the land is bordered by the main south link rd.
It is a domestic hedgerow as opposed to a stock proof one. It has been planted with ligustrum (*Ligustrum ovalifolium)* that is intertwined with hawthorn, bramble, elder (S*ambucus nigra)* and self-seeded elm. It has not been maintained and displays an overgrown appearance with the plants falling onto the laneway due to overweight on the stems. There are 9 no. trees growing on this ditch, and one dead tree at the Southeastern end.

Ground Flora significance category – 1
Structural significance category – 2
Historical significance category – 2
Species Diversity significance category – 1
Habitat Connectivity significance category – 1
Landscape significance category - 2

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Hedge no.3 (Colour code Light Green on the satellite imagery photos)
This hedge is an inner boundary between fields. It runs in an East west direction from the show jumping arena at the rear of the dwelling to another boundary hedge that runs at a right angle to it. This hedge is made up primarily of large trees, some that were coppiced adjacent to the arena. It is an earth embankment 2m high, 3m wide and 115m in length. The understorey species are limited. Self seeded sapling of sycamore (*Acer pseudoplatanus*) ash (*Fraxinus excelsior*) and elm (*Ulmus glabra*) were located on the Northern side of the embankment. Species such as wild rose (*Rosa canina*), bramble (Rubus sp) and nettle (*Urtica dioica*) were observed in low quantities. This is a poorly maintained hedge. Rubbish and concrete were seen among the soil, and it looked as though a machine had pushed the bank into place in the sometime in the past twenty years ago because of the creation of the arena alongside it.

Ground Flora significance category – 0
Structural significance category – 2
Historical significance category – 1
Species Diversity significance category – 0
Habitat Connectivity significance category – 1
Landscape significance category - 2

Hedge no.4 (Colour code Dark Red on the satellite imagery photos)

This hedge starts at the corner of the dwelling by the roadside on the Northeast corner. The hedge begins from the corner and runs in a Northwest to Southeast direction. It is 115m in length, 3m wide and 4m high. The hedge is planted on an earth embankment. It comprises of planted species of Griselinia (*Griselinia littoralis*) for the first 60m alongside the dwelling site. It is interplanted with Ornamental cherry (*Prunus kanzan*). At the base species of bramble, and self-seeded elm and elder were seen.
Outside the boundary of the dwelling and beyond the fence line of the neighbour's site the hedge more resembles a natural hedge with sycamore, hawthorn, elm trees interspersed with an understorey of elder (*Sambucus nigra*), gorse (*Ulex* sp) and self-seeded elm and ash. Dense spindle (*Euonymous europaeus*) understorey shrubs were observed towards the Eastern part of the hedge
It is important to note that this hedge contains mature sycamore and ash trees that have been severely coppiced approximately twenty years ago. What remains are small diameter stems that represent a hedgerow and not trees. From a distance it may look as though there are many trees but in fact it is a hedgerow that was cut low to the ground many years ago and now is not maintained.

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Hedge no.5 (Colour code Pink on the satellite imagery photos)

This hedge continues from hedge no.4 after a break in the ditch by a gate. The hedge is 4.5m high, 4m wide and 185m in length. There are 8no. trees in this hedge that were included in the tree survey. The main tree species in the hedge is sycamore that was coppiced approximately twenty years previous. Interspersed with ash, hawthorn and dense elder. It has not been maintained and represents a dense hedge, overgrown and in need of attention. There are dead elms in among the sycamores and these need to be removed. A field layer of stinging nettle (*Urtica dioica*) and foxglove (*Digitalis purpurea*), spindle (*Euonymous europaeus*) and blackthorn (*Prunus spinosa*) were observed growing under the aspen (*Populus tremula*) trees on the South-west side of the hedge. The presence of the blackthorn (*Prunus spinosa*) saplings is a good example of pioneering species that have blown in as seed from afar and germinating in suitable soils and environments.

Ground Flora significance category - 2
Structural significance category – 2
Historical significance category – 1
Species Diversity significance category – 2
Habitat Connectivity significance category – 2
Landscape significance category - 2

Boundary / Wall no.6 (Colour code Pink on the satellite imagery photos)
This is a boundary stone masonry wall built in recent years. It starts at the North-west corner at the point where hedge no.1 begins. It runs in an Easterly direction. It is 195m long, .5m wide and 1.5m high. There are no species of plant growing along this border.

Hedge no.7 (Colour code Black on the satellite imagery photos)

This hedge runs from East to West on the Northern boundary ending at the North-east corner. It is 150m in length, 3m wide and 3m high. It is a dense hedge made up of elder (*Sambucus nigra*), mature hawthorn (*Crataegus monogyna*), and young hazel (*Corylus avellana*). There are field layer species such stinging nettle (*Urtica dioica*) and wild rose (*Rosa canina*) interspersed among the shrubs. Planted as a hedge alongside the wall, it offers privacy and a good stock barrier. It is a fine hedge that has been maintained up until about two or three years ago.

Ground Flora significance category – 1
Structural significance category – 1
Historical significance category – 3
Species Diversity significance category – 1
Habitat Connectivity significance category – 1
Landscape significance category – 1

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Hedge no.8 (Colour code Light Blue on the satellite imagery photos)

This hedge runs from the North-east corner of the site in a South easterly direction. It is 200m in length, 3m wide and 3m high. It is made up almost entirely of hawthorn (*Crataegus monogyna*) interspersed with some self-seeded hazel (*Corylus avellana).* There is an understorey field layer of stinging nettle, bramble (*Rubus* sp) and Foxglove (*Digitalis purpurea*). It is a well-maintained hedge, with clear indication that it is cut by a machine on a yearly basis. It offers a good stock barrier and is a habitat for many different species of animal. There are some breaks in the hedged at different points and these open spaces are being filled with pioneering species such as bramble and nettle. There are two dead elms located among the hedge that should be removed.

Ground Flora significance category – 1
Structural significance category – 2
Species Diversity significance category -1
Historical significance category – 1
Habitat Connectivity category – 2
Landscape significance category - 1

Hedge no.9 (Colour code Orange on the satellite imagery photos)

This hedge continues from no.8 and runs in a South easterly direction. It is a dense hedge comprised of a mix of different species. It is 300m long, 5m wide and 4m high. It is a dense hedge comprised of small trees that fall into the category of a hedge but not maintained or cut back. The species observed were blackthorn (*Prunus spinosa*), goat willow (*Salix caprea*). There is a dense ground layer of mixed flora such as common vetch (*Vicia sativa*), willowherb (*Chamaenerion angustifolium*), bracken (*Pteridium aquilinum*) and understorey species such as spindle (*Euonymous europaeus*), sycamore (*acer pseudoplatanus*) saplings, alder (*Alnus glutinosa*) . The ground is rich and moist here because of a drainage dyke that runs into this side of the field. The understorey and field layer flora are flush and healthy as a result of the moist soil. It would also explain the presence of species such as alder (*Alnus glutinosa*) and willow (*Salix caprea*) as these are species that tolerate and thrive in wet ground conditions.

Ground Flora significance category – 2
Structural significance category – 2
Historical significance category - 1
Species Diversity significance category – 2
Habitat Connectivity significance category – 2
Landscape significance category – 2
[**Note:** Southern 75m (approx.) of Hedge no. 9 is outside the planning site boundary]

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Hedge no.10 (Colour code Yellow on the satellite imagery photos)

Not maintained, this hedge continues from no.9 and runs Southeast. It is 360m in length, 4.5m high and 5m wide. The hedge comprises primarily of alder (*Alnus glutinosa*) and willow (*Salix caprea*). Young trees that would be considered small, they are multi stemmed and form a dense even hedgerow towards the Southeastern corner of the site. The ground is wet under the trees and there is a healthy ground/field layer of mixed flora species such as meadowsweet (*Filipendula ulmaria),* bramble (*Rubus* sp), bracken (*Pteridium aquilinum*), and vetch (*Vicia sativa*).

Ground Flora significance category – 2
Structural significance category – 1
Historical significance category – 1
Species Diversity significance category – 2
Habitat Connectivity significance category – 2
Landscape significance category - 2
[**Note:** Hedge no. 10 is outside the planning site boundary]

Hedge no.11 (Colour code Purple on the satellite imagery photos)

This hedge runs from the South-eastern corner in a South direction. It is not maintained. It is 150m in length, 5m wide and 4.5m high. It is made up of goat willow (*Salix caprea*) small trees that are multi-stemmed and growing together in a line forming a hedge. It is a wet part of the site relatively and the flora is lush here, the grass (*Lolium perenne*) is dense around the base of the trees. There is also a healthy growth of bracken (*Pteridium aquilinum*).

Ground Flora significance category – 1
Structural significance category – 2
Historical significance category – 1
Species Diversity significance category – 1
Habitat Connectivity significance category – 2
Landscape significance category - 2
[**Note:** Hedge no. 11 is outside the planning site boundary]

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Hedge no.12(Colour code Dark Green on the satellite imagery photos)

This hedge starts at the South-eastern corner of the site and runs in an Easterly direction. It is 460m in length, 3m high and 3m wide. It is made up of primarily of goat willow (*Salix caprea*) with some minor appearances of hazel (*Corylus avellana),* hawthorn (*Crataegus monogyna*) and elder (*Sambucus nigra*). It isn't a dense hedge and borders the site with the South Link Road. There are field layer species such as bramble (*Rubus sp*) and wild rose (*Rosa canina*) growing in between the willow trees. It hasn't been maintained and would be an attractive hedge if it was. This hedge is growing on the South side of a fence. The willow is self-seeded and sparse in places, understorey of gorse (Ulex) can be seen to be growing at the base on the South side can.

Ground Flora significance category – 1
Structural significance category – 1
Historical significance category – 2
Species Diversity significance category – 1
Habitat Connectivity significance category – 2
Landscape significance category - 2
[**Note:** Hedge no. 12 is outside the planning site boundary]

Hedge no.13 (Colour code Dark Blue on the satellite imagery photos)

This hedge continues from no.12 and runs in an Easterly direction. It is 3m high and 4m wide and up to 5m in places if the species on the South link road embankment are considered. In places there is self-seeded gorse (*Ulex*) and willow (*Salix caprea*) growing on the South side and where it is adjoined to this makes it wider at certain points. It is made up of dense hawthorn (*Crataegus monogyna*) that was planted as a barrier to the traffic sound on the South Link Road. It is mixed with self-seeded wild rose (*Rosa canina*), bramble (*Rubus* sp). Ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*), and hazel (*Corylus avellana*) saplings are beginning to come up through it now.

Ground Flora significance category – 1
Structural significance category – 2
Historical significance category – 2
Species Diversity significance category – 1
Habitat Connectivity significance category – 1
Landscape significance category - 2
[**Note:** Eastern 195m (approx.) of Hedge no. 13 is outside the planning site boundary]

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2.1: Maps

(Please note that this survey covered a larger areas than the Present Planning Site Boundary)

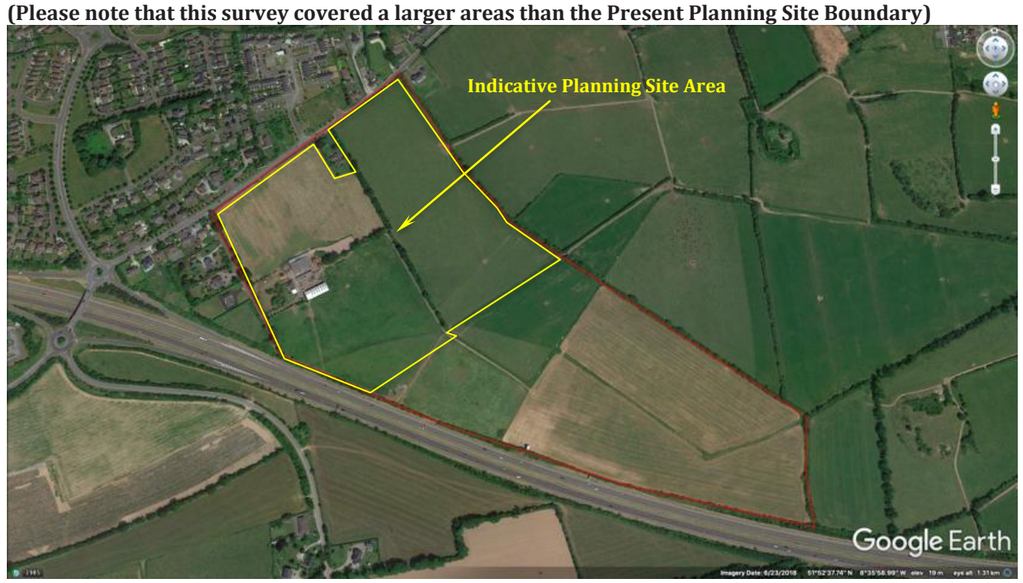

Fig 1: Survey Area (Outlined in Red)

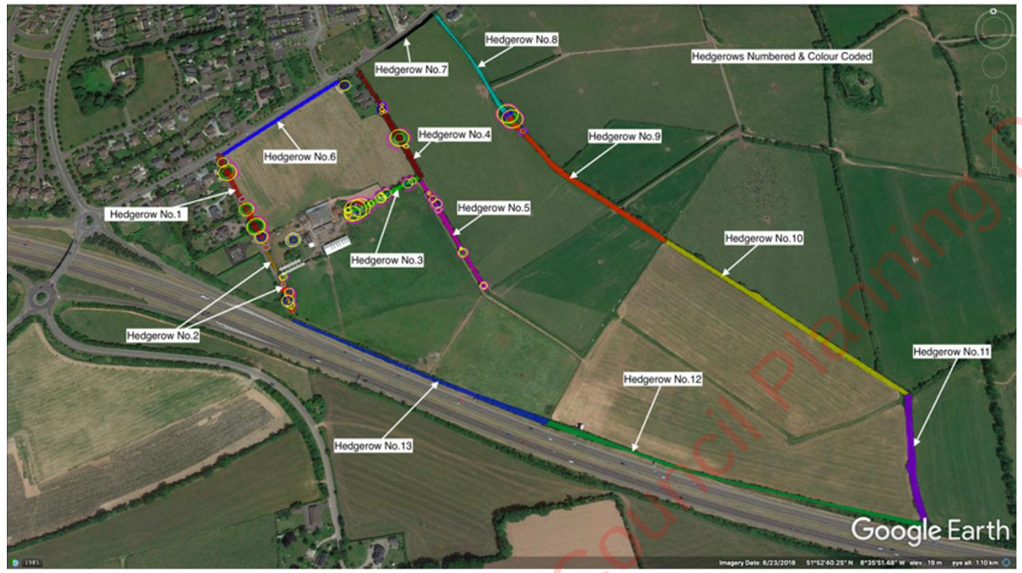

Fig 2: Hedgerows numbered, & Colours

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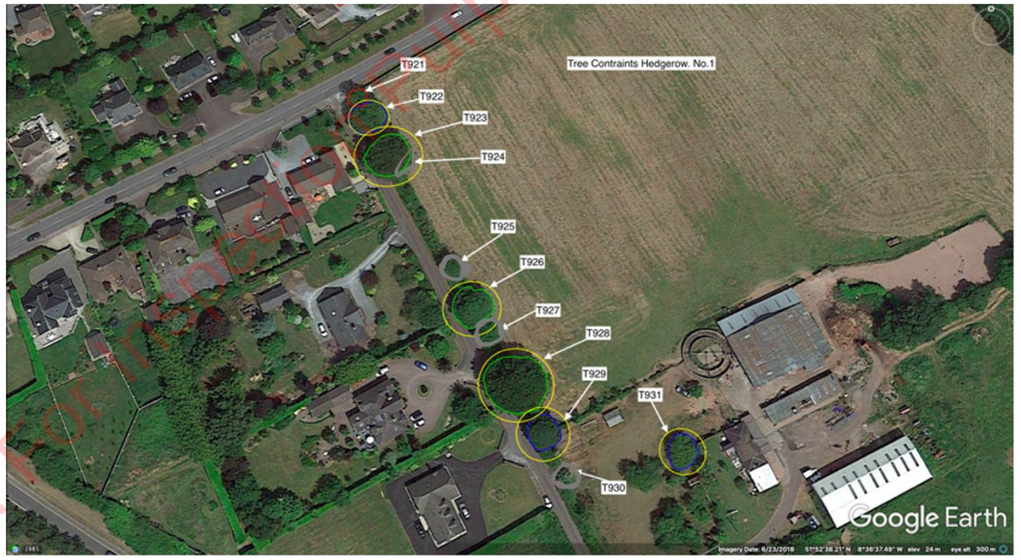

Fig 3: Tree Constraints in Hedgerow No.1

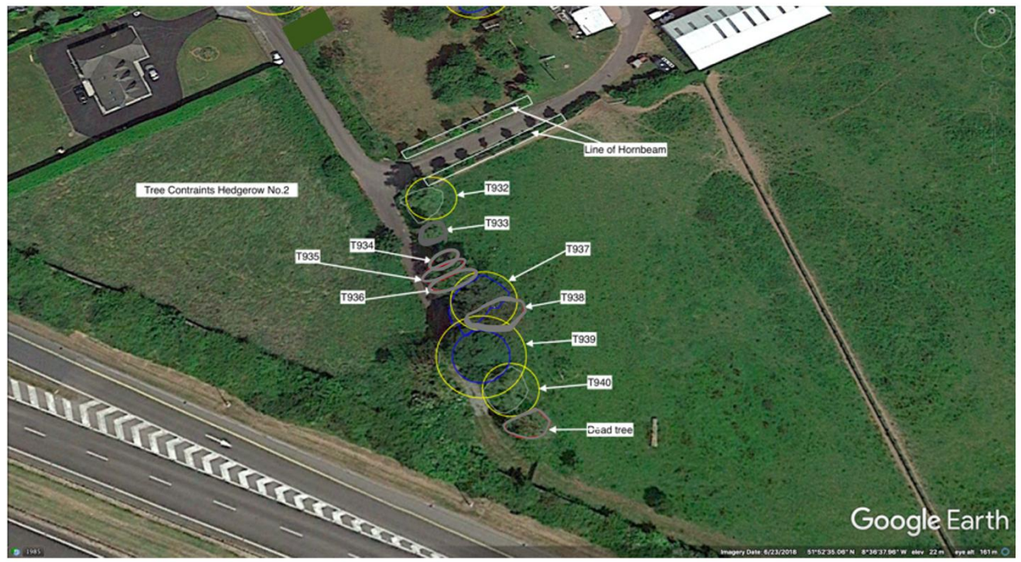

Fig 4: Tree Constraints in Hedgerow No.2

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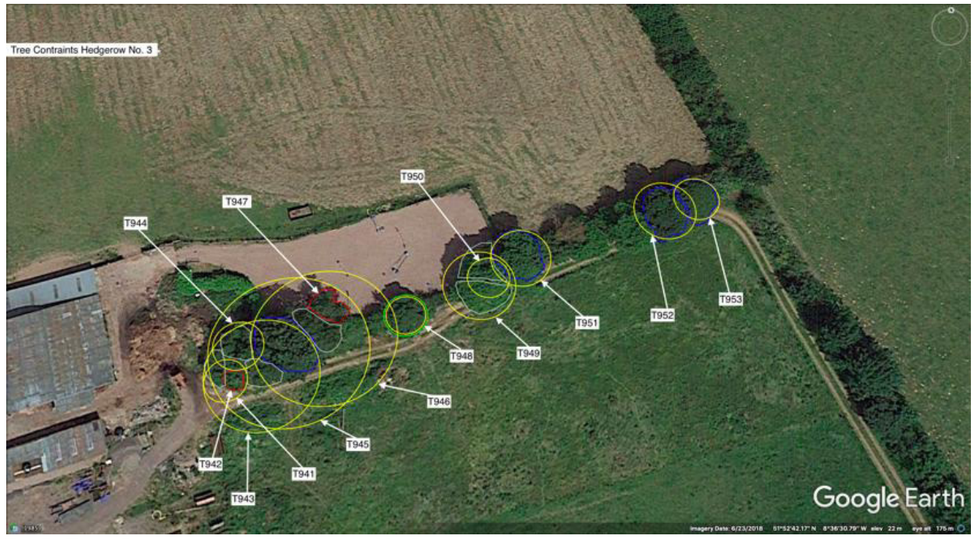

Fig 5: Tree Constraints in Hedgerow No.3

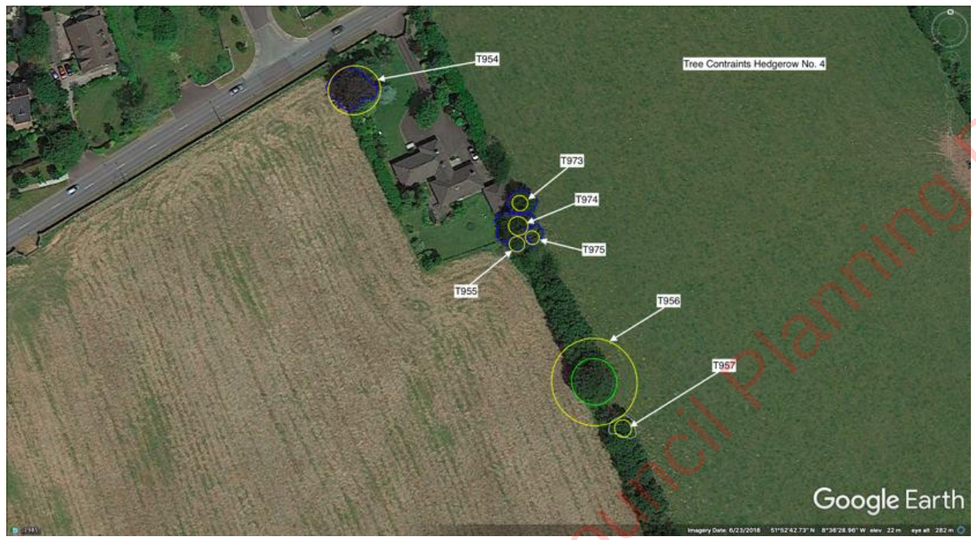

Fig 6: Tree Constraints in Hedgerow No. 4

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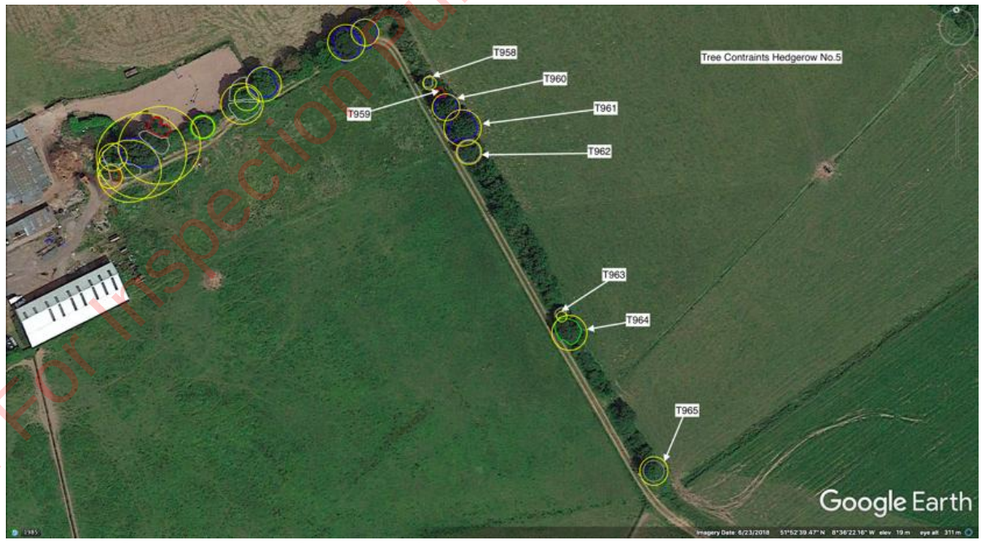

Fig 7: Tree Constraints in Hedgerow No.5

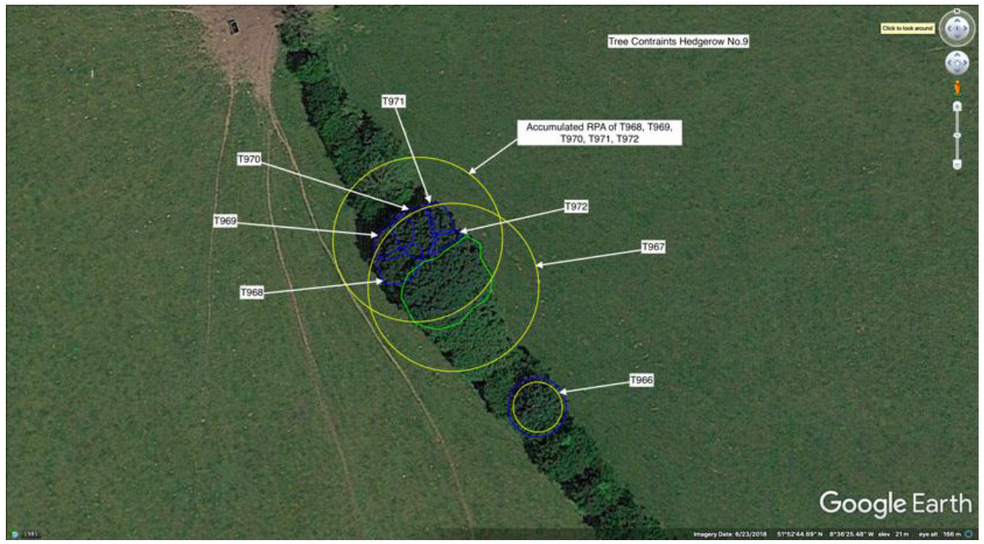

Fig 8: Tree Constraints in Hedgerow No. 9

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2.2: Photographs

Fig 9: T921

Fig 10: T922

Fig 11: T923

Fig 12: T924

Fig 13: T925

Fig 14: T926

Fig 15: T927

Fig 16: T928

Fig 17: T929

Fig 18: T930

Fig 19: T931

Fig 20: T932

Fig 21: T933

Fig 22: T934

Fig 23: T935

Fig 24: T936

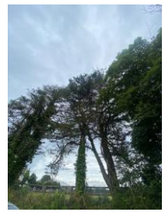
Fig 25: T937

Fig 26: T938

Fig 27: T939

Fig 28: T940

Fig 29: T941

Fig 30: T942

Fig 31: T943

Fig 32: T944

Fig 33: T945

Fig 34: T946

Fig 35: T947

Fig 36: T948

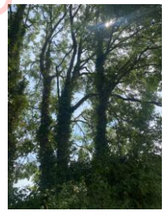
Fig 37: T949

Fig 38: T950

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Fig 39: T951

Fig 4: T952

Fig 41: T953

Fig 42: T954

Fig 43: T955

Fig 44: T956

Fig 45: T957

Fig 46: T958

Fig 47: T959

Fig 48: T960

Fig 49: T961

Fig 50: T962

Fig 51: T963

Fig 52: T964

Fig 53: T965

Fig 54: T966

Fig 55: T967

Fig 56: T968

Fig 57: T969

Fig 58: T970

Fig 59: T971

Fig 60: T972

Fig 61: T973

Fig 62: T974

Fig 63: T975

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Hedgerow Images

Fig 64: H1

Fig 65: H2

Fig 66: H3

Fig 67: H4

Fig 68: H5

Fig 69: H6

Fig 70: H7

Fig 71: H8

Fig 72: H9

Fig 73: H10

Fig 74: H11

Fig 75: H12

Fig 76: H13

2.3: Identification of Preliminary Tree Constraints:

- Please read in conjunction the topographical AutoCAD file 'Tree Constraints Plan' also see Tree Constraints Plan maps in section 2.1

In accordance with BS 5837: 2012, below ground constraints, or root protection areas (RPAs), the surveyed trees have been plotted onto the tree survey plan for the site. These are represented as a circle centred on the base of each tree stem with a radius of 12 times diameter measured at 1.5m above ground level. In this plan the RPA of any tree that might be affected by construction activity is defined by a yellow circle around each tree in the supplied Tree Constraints maps in section 2.1 and in AutoCAD file 'Tree Constraints Plan'.
With reference to BS 5837: 2012, a root protection area (RPA) is defined as 'a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure should be treated as a priority'. 'The default position (when considering design layout in relation to RPAs) should be that structures are located outside the RPAs of trees to be retained'.

BS 5837: 2012 states (4.6.2) that, 'where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced'

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BS 5837: 2012 goes on to state that, 'modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution', and that any deviation from the original circular plot should take into account:

- Morphology and disposition of roots
- Topography and drainage
- Soil type and structure
- The likely tolerance of the tree to root damage / disturbance

Root systems can be damaged in a number of ways as follows:

- Severance of a root will destroy all parts of the root beyond that point. The larger the root severed, the greater the impact on the tree. If the roots are damaged close to the trunk, the anchorage and stability of the tree can be affected.
- The root bark protects the root from decay and is essential for further root growth. If damage to the bark extends around the whole circumference, the root beyond that point will be killed.
- Soil compaction, which may occur from storage of material or passage of heavy equipment over the root area, can restrict and even prevent gaseous diffusion through the soil, and thereby asphyxiate the roots. The roots must have oxygen for survival, growth and effective functioning.
- Lowering the soil level will strip out the mass of roots near the surface
- Raising soil levels will have the same effect as soil compaction
- Incorrect selection and application of herbicide
- Spillage of oils or other harmful materials

Above Ground Constraints:

- The current and ultimate height and spread of the trees, in relation to any new building final position.
- The effect that construction requirements might have on the amenity value of trees, both on and near the site, including pruning to facilitate access and working space. This may be the case with the trees on the entrance driveway and neighbouring trees overhanging branches.
- The requirement to protect the overhanging canopies of trees where they could be damaged by machinery, vehicles, barriers or scaffolding, where it will be necessary to increase the extent of the tree protection barriers to contain the canopy.
- The proposed end use of the space adjacent to the retained trees.

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2.4: Tree Protection Plan

See AutoCAD file 'Tree Protection Plan'

Protection of trees. A protective barrier, 2.3m high and comprising a vertical and horizontal framework of scaffolding, well braced to resist impacts and securely supporting weldmesh panels, (as illustrated in Fig 77 & Fig 78 supplied), shall be erected around the base of all trees to be retained on site. This barrier shall be clearly identified on site by the attachment of all – weather signs of suitable dimension stating: 'CONSTRUCTION EXCLUSION ZONE – NO ACCESS'. The line of this fence shall be at least the distance defined by the defined RPA. No construction traffic, materials or debris will be permitted within this zone of protection.

Access facilitation pruning. If it is deemed appropriate to trim back retained trees to provide adequate access to approved construction works, all such tree works should be undertaken by a competent and suitably qualified tree surgeon. Such works shall remedy any tree related conflict with proposed structures or access in a way that ensure that not less than 70% of live buds are retained within the tree canopy. The aim of the tree works shall be to retain the general form of the tree by a combination of crown thinning, reduction of end weight and the re-forming of the trees crown to create a pleasing and balanced crown. No branch, limb of trunk greater than 100mm diameter shall be cut in the process of reducing end weight.

Temporary surfaces within zone of protection. Where temporary access is to be established within the 'zone of protection' surrounding retained trees, ground surfaces will be protected by a layer of sharp sand, approx. 50mm thick, overlaid with a geotextile membrane on which temporary surface of no fines granular material (compression resistant for example woodchip) at least 150mm thick is laid. Where traffic is turning on this surface, stout planks will be laid over the geotextile membrane and below the granular material.

Demolition within the zone of protection. If it is deemed necessary to carry out demolition works within a construction exclusion zone surrounding retained trees, for example to remove existing paths or kerbs, only pedestrian operated plant or low ground pressure plant that is less than 2 tonnes gross weight fully loaded shall be permitted. Such plant shall only be operated on

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existing hard surfaces, or where temporary surfaces have been established. No excavations within the root protection zone of these retained trees shall be permitted, except only under supervision, with the use of an air spade or by careful use of hand tools in a way that retains, without damage, all exposed roots with a diameter greater than 25mm.

Scaffolding within zone of protection. Where scaffolding is to be established within the 'zone of protection' surrounding retained trees, the existing undisturbed ground surface shall be protected by a layer of sharp sand, approx. 50mm thick, overlaid with a geotextile membrane. Stout planks, such as closely side butted scaffold boards, will be laid over the geotextile membrane and scaffolding will be constructed on these planks with additional stays as directed by a competent person. Adequate protection fencing as illustrated in Fig 77 and Fig 78 will be maintained between scaffolding and adjacent trees.

Construction of hard surfaces close to retained trees. Where permanent surfaces are to be constructed close to retained trees, within the zone of protection as defined by BS 5837: 2012, carefully remove accumulated organic material and loose soil, leaving existing topsoil in situ. Protect the root zone with a layer of sharp sand and geotextile membrane and a three-dimensional cell product as defined by a competent Civil or Structural Engineer. Construct the paved area on this sub-base using established design guidelines and a no fines granular material with a porous surface finish such as pavers or porous bitmac.

Alterations of levels on lands adjoining construction exclusion zones. Where it is deemed appropriate to lower ground levels on land adjoining a root protection zone established around a retained tree, all excavations and the subsequent construction supporting structures shall be managed in a way that excludes access by construction traffic to the construction exclusion zone. Where such alterations result in the lowering of existing surfaces, the existing ground water environment within the root protection zone shall be maintained by the insertion of a root barrier behind proposed supporting structures. This shall consist of a non-porous barrier carefully inserted in a way that maintains the existing soil moisture regime surrounding the retained tree. Where alterations result in the raising of levels, these shall be designed and detailed by a competent Civil of Structural Engineer to ensure no alterations to ground conditions within the root protection zones.

Landscaping within the root protection zone. If it is deemed necessary to carry out landscaping, planting or re-instatement works within a construction exclusion zone surrounding retained trees, only pedestrian operated plant, or low ground pressure plant that is less than 2 tonnes gross weight fully loaded, shall be permitted. Such works should be supervised by a competent Horticulturalist and be timed and designed to ensure that no soil compaction occurs. No excavations within the root protection zone of these trees shall be permitted, except under supervision using an air spade or by carful use of hand tools in a way that retains, without damage, all exposed roots with a diameter greater than 25mm

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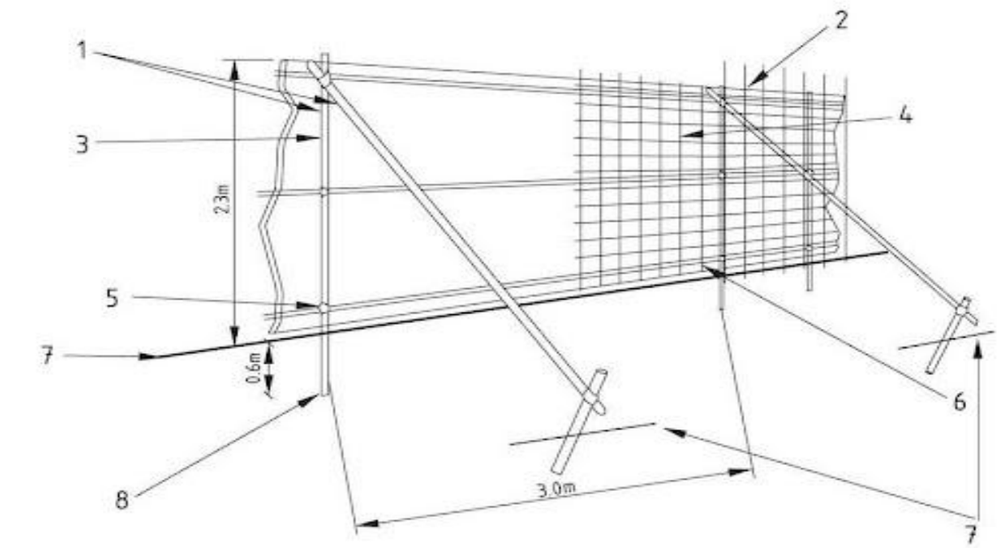

1 Standard scaffold poles
2 Uprights to be driven into the ground
3 Panels secured to uprights with wire ties and where necessary tandard scaffold clamps
4 Weldmesh wired to the uprights and horizontals
5 Standard clamps
6 Wire twisted and secured on inside face of fencing to avoid easy dismantling
7 Ground level
8 Approx. 0.6 m driven into the ground

Fig 77: Temporary Protective Barrier

The protective barrier will be appropriate to the degree and proximity of likely construction works. The default specification of BS 5837: 2012 recommends a vertical and horizontal, scaffold framework, well braced to resist impacts, with vertical tubes at no more than 3m intervals. These should be driven into the ground. Weld mesh panels should be affixed to this framework with scaffold clamps – see Fig 77 and Fig 78. Heras fencing is a reliable option or a similar structure of sturdy, wooden construction would be acceptable. It should typically comprise of the following:

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Figure 3 Examples of above-ground stabilizing systems

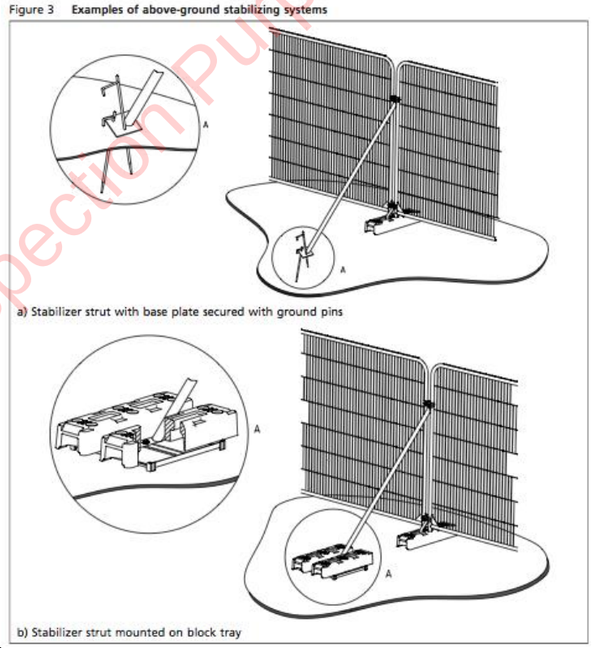

Fig 78: Temporary Protective Fencing

- Temporary protective fencing panels should be weldmesh Heras panels of at least 2.0m in height
- The panels shall stand on rubber or concrete feet
- The panels shall butt together and be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence
- The panels shall be supported on the inner side by stabiliser struts, which shall be clamped to the scaffold framework at a 45^0 angle and extended back into the Construction Exclusion Zone and shall be attached to a base plate, which shall be secured to the ground with pins
- No fixing shall be made to any tree and all possible precautions shall be taken to prevent damage to tree roots when locating posts
- A 600mm x 300mm warning sign reading 'Construction Exclusion Zone Keep Out' shall be fixed to every 10.0 metre length of protection fencing
- On completion of erection, and prior to any demolition or construction works, site preparation, excavation or delivery or plant and materials, the Consulting Arboriculturist shall inspect the Temporary Protective Fencing

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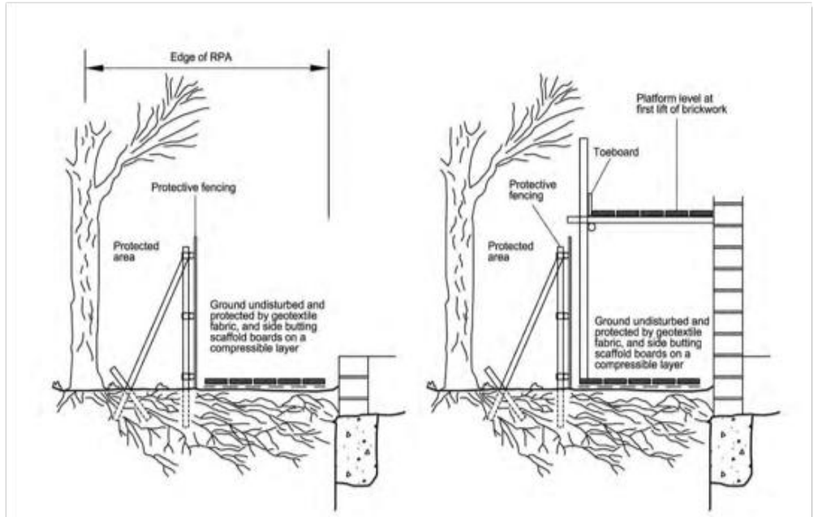

Fig 79: Temporary Protective Scaffold

Temporary surfaces within zone of protection. Where temporary access is to be established within the 'zone of protection' surrounding retained trees, ground surfaces will be protected by a layer of sharp sand, approx. 50mm thick, overlaid with a geotextile membrane on which temporary surface of no fines granular material (compression resistant for example woodchip) at least 150mm thick is laid. Where traffic is turning on this surface, stout planks will be laid over the geotextile membrane and below the granular material.

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2.5: Arboricultural Method Statement

Roadway/Driveway

There are no RPAs of any trees affected apart from the above already mentioned in the tree survey and identified in image A2. However, if the case arises whereby a driveway or roadway must be moved then any proposal for new surfacing within the RPA must be able to demonstrate a minimal impact on soil structure and roots and this includes the ability for movement of water and air in and out of the soil. The use of no-dig cellular confinement systems using porous sub-base and finished surface materials can be acceptable in some circumstances.

Hand dig exploratory holes is suggested to try and locate feeder roots and or determine how much of a root system exists.

Services

If it is unavoidable for new services to be installed in the RPA, conventional excavation techniques are unacceptable. Trenchless installation should be the preferred option but if that's not feasible, any excavation is likely to have to be carried out by hand or by using a compressed air lance under arboricultural supervision. The methodology used must comply with *NJUG Volume 4: Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.*

Plant/Machinery

Piling rigs, cranes and other high and wide plant and machinery have the potential to damage trees and site operations must be planned to take account of retained trees in advance of any potential conflict. Proposed locations and routes on and off the site should be supplied to the project arboriculturist.

Contamination

Accidental spillage of any materials which could cause damage to a tree even if outside of an RPA, including dust.

Barriers and other protection must remain in place until all construction activity is complete and there is no realistic risk of damage to soil surfaces

Fires must be avoided where heat could affect foliage or branches

It is the responsibility of the main contractor or assigned agent to ensure that details regarding tree protection are understood and followed by all site personnel and should be incorporated into site inductions.

The location of site facilities, areas for loading, unloading and storage of materials must be sited to ensure minimal impact on the tree. No discharge of potential contaminants should occur within 10m of any tree on the site or where there is a risk of run off into an RPA

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2.6: Arboricultural Assessment

Total Tree Quantities for the Survey in Their Categories

Retention Category	A High Value	B Moderate Value	C Low Value	U Removal
Quantity	7 (13 %)	22 (40 %)	21 (38 %)	5 (9 %)

Fig 80

Trees To be Felled To Facilitate The Development

Tag/Group No	Coordinates	Category	Colour	Reason	Quantity
931	51.87747 -8.61162	B		Development	1
932	51.87699 -8.61184	C		Development	1
941	51.87776 -8.61060	C		Development	1
943	51.87780 -8.61056	C		Development	1
944	51.87785 -8.61060	C		Development	1
945	51.87783 -8.61054	B		Development	1
946	51.87784 -8.61049	C		Development	1
948	51.87791 -8.61012	A		Development	1
960	51.87808 -8.60899	B		Development	1
				Total	9

Fig 81

Total Tree Quantity in their Categories For Felling Including Arboricultural & Development Reasons

Retention Category	A High Value	B Moderate Value	C Low Value	U Removal
Quantity	1 (1.8 %)	3 (5.5 %)	5 (9 %)	5 (9 %)

Fig 82

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Summary

Fig 80 shows the total tree quantity that was surveyed in their respective categories. Generally, the trees were of a fair – good standard with 38 % categorised as fair (C) and 40% categorised as fair to good (B). 7 no. trees or 13 % were categorised as good. This is reflective of what was seen generally. The site vegetation is typical of the natural countryside setting. There are two hedgerows that have been maintained (no. 7 & 8), all other vegetation surveyed has been neglected with resultant uneven tree growth and densely overgrown understorey areas with some large gaps in the fabric of the hedges. The trees surveyed are native to the region for the most part. The mature hedgerows are a definitive fixture on the boundaries and do well to enclose the site.

5 no. trees are recommended for removal for arboricultural reasons. These are trees that are considered unsafe and not contributing to the site that would justify the retention on safety grounds, see tree classification schedule.

9 no. trees are recommended to be removed to facilitate the development. These trees are located in the centre of the site on the East side of the farm sheds. Fig 81 shows these tree numbers, locations and classification categories. There is only 1 no. tree that is categorised as good (A). This is T948, it is an early mature sycamore (*Acer pseudoplatanus*). A self - seeded non-native specimen.

Tree protection measures are to follow the tree protection plan in section 2.4 of this survey and in the CAD file 'Tree Protection Plan'

Mitigation measures for any tree loss include the planting of 778 no. new trees. These include nearly all native tree species. Pedunculate oak (*Quercus robur*) quantity 36 no., Scots pine (*Pinus sylvestris*) 6 no., small leaved lime (*Tilia cordata*) (non-native) 173 no., Mountain ash (*Sorbus aucuparia*) 191 no., Silver birch (*Betula pendula*) 372 no. This is a very interesting species choice that will add colour mix, size variety, species diversity (conifer/broadleaf) and will contribute greatly to the increased biodiversity on the site.

If you have any questions, please do not hesitate to contact me by telephone, email or post. The details are below.

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DRAWINGS
Tree Constraints Plan
Tree Protection Plan

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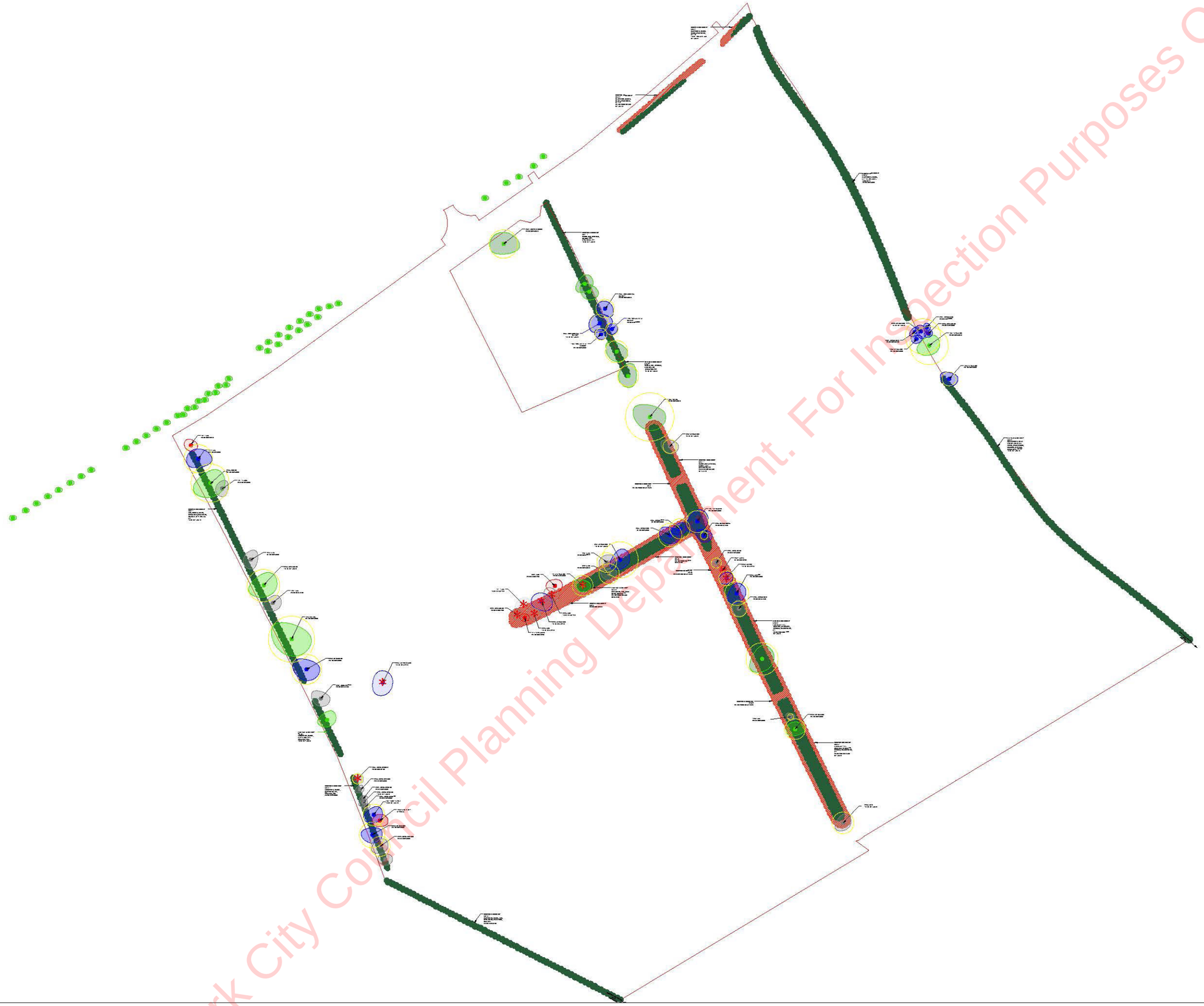

LEGEND

TREE CATEGORISATION

Category A
Tree of high quality with an estimated remaining life expectancy of at least 40 years.

Category B
Tree of high quality with an estimated life expectancy of at least 20 years.

Category C
Tree of low quality with an estimated life expectancy of at least 10 years or young trees with a stem diameter below 150mm.

Category U
Those in such a condition that they can't realistically be considered as living trees in the context of the current land use for longer that 10 years.

KEY

Root Protection Areas (RPA)
The minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the trees viability.

Hedgerow or Group

Reference number for the Tree, Group or Hedgerow
T000

Trees to felled for the Development.

To avoid damage to tree roots, existing ground levels should be retained within the RPA. Intrusion into the soil (other than for piling) within the RPA is generally not acceptable. Topsoil within it should be retained. However in exceptional circumstances manual excavation within the RPA may be acceptable, subject to justification.

PROJECT NAME:
GREENFIELDS

DRAWING TITLE:
TREE CONSTRAINTS PLAN

CLIENT:
-

SURVEYED BY: GE	SURVEYED DATE: 06/07/2025
DRAWN BY: MS	DRAWN DATE: 11/07/2025
CHECKED BY: GE	CHECKED DATE: 11/07/2025
PROJECT N°: -	SCALE: -
DRAWING N°: 01	SHEET N°: 01 OF 01

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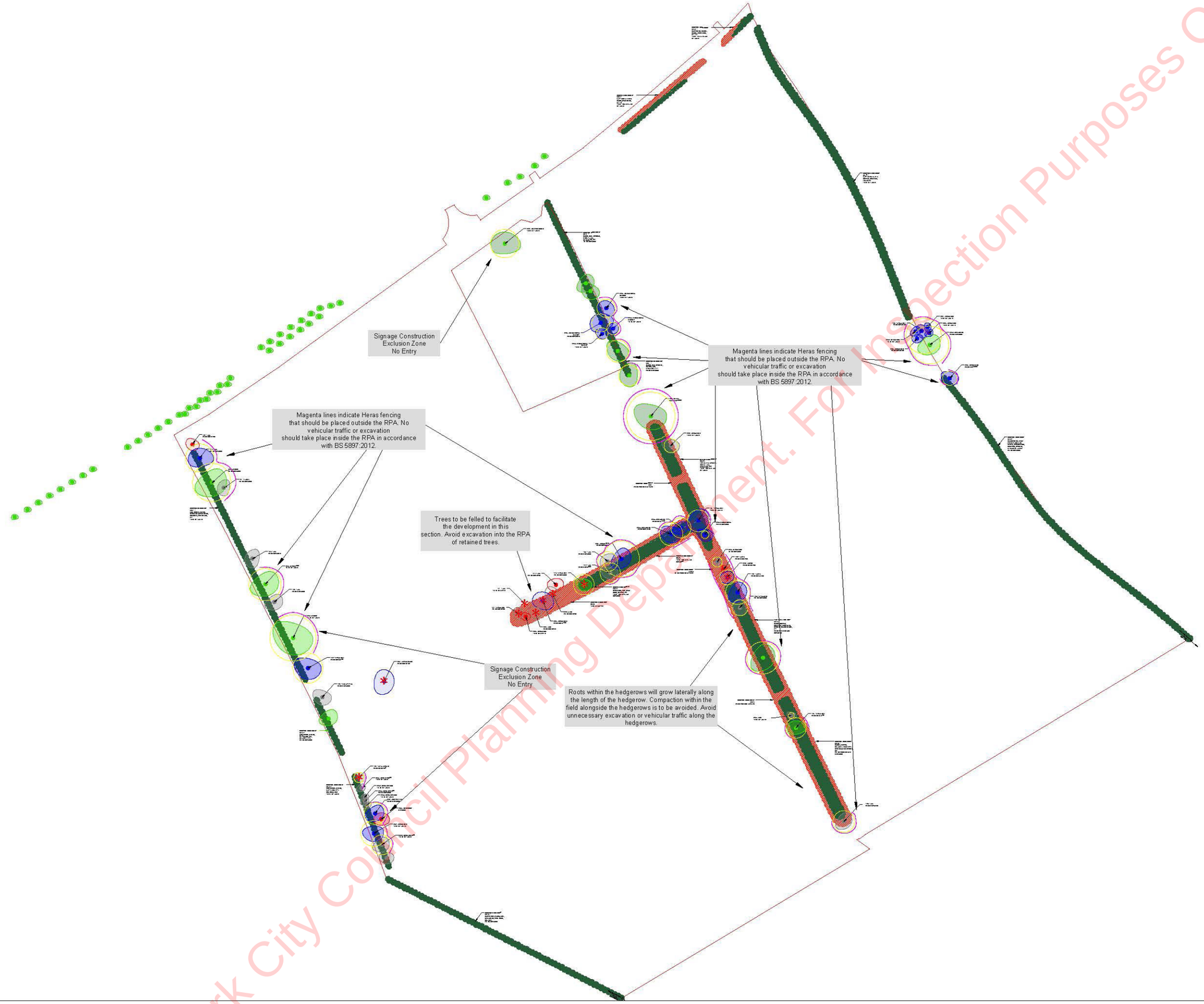

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LEGEND

TREE CATEGORISATION

Category A
Tree of high quality with an estimated remaining life expectancy of at least 40 years.

Category B
Tree of high quality with an estimated life expectancy of at least 20 years.

Category C
Tree of low quality with an estimated life expectancy of at least 10 years or young trees with a stem diameter below 150mm.

Category U
Those in such a condition that they can't realistically be considered as living trees in the context of the current land use for longer that 10 years.

KEY

Root Protection Areas (RPA)
The minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the trees viability.

Hedgerow or Group

Reference number for the Tree, Group or Hedgerow
T000

Heras Fencing
Magenta outline represents Heras Fencing that should be placed in such a way as to protect the tree when construction activity cannot be avoided.

* Felled For The Development.

PROJECT NAME:
GREENFIELDS

DRAWING TITLE:
TREE PROTECTION PLAN

CLIENT:
-

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DRAWN BY: MS	DRAWN DATE: 11/07/2025
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CHAPTER FOUR

MATERIAL ASSETS – TRAFFIC & TRANSPORTATION

APPENDIX 4-1 Permitted Road Works on Maglin Road under Stonecrest Phase 1 Development
APPENDIX 4-2 Site Layout of Proposed Development (Including Proposed Road Works)
APPENDIX 4-3 Traffic Count Data
APPENDIX 4-4 TRICS output result
APPENDIX 4-5 Trip Distribution for the Permitted Developments
APPENDIX 4-6 Trip Generation for the Permitted Development
APPENDIX 4-7 Trip Distribution for the Proposed Development
APPENDIX 4-8 Trip Generation for the Proposed Development

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APPENDIX 4-1 Permitted Road Works on Maglin Road under Stonecrest Phase 1 Development

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Appendix 4A – Permitted Road Works on Maglin Road under Stonecrest Phase 1 Development

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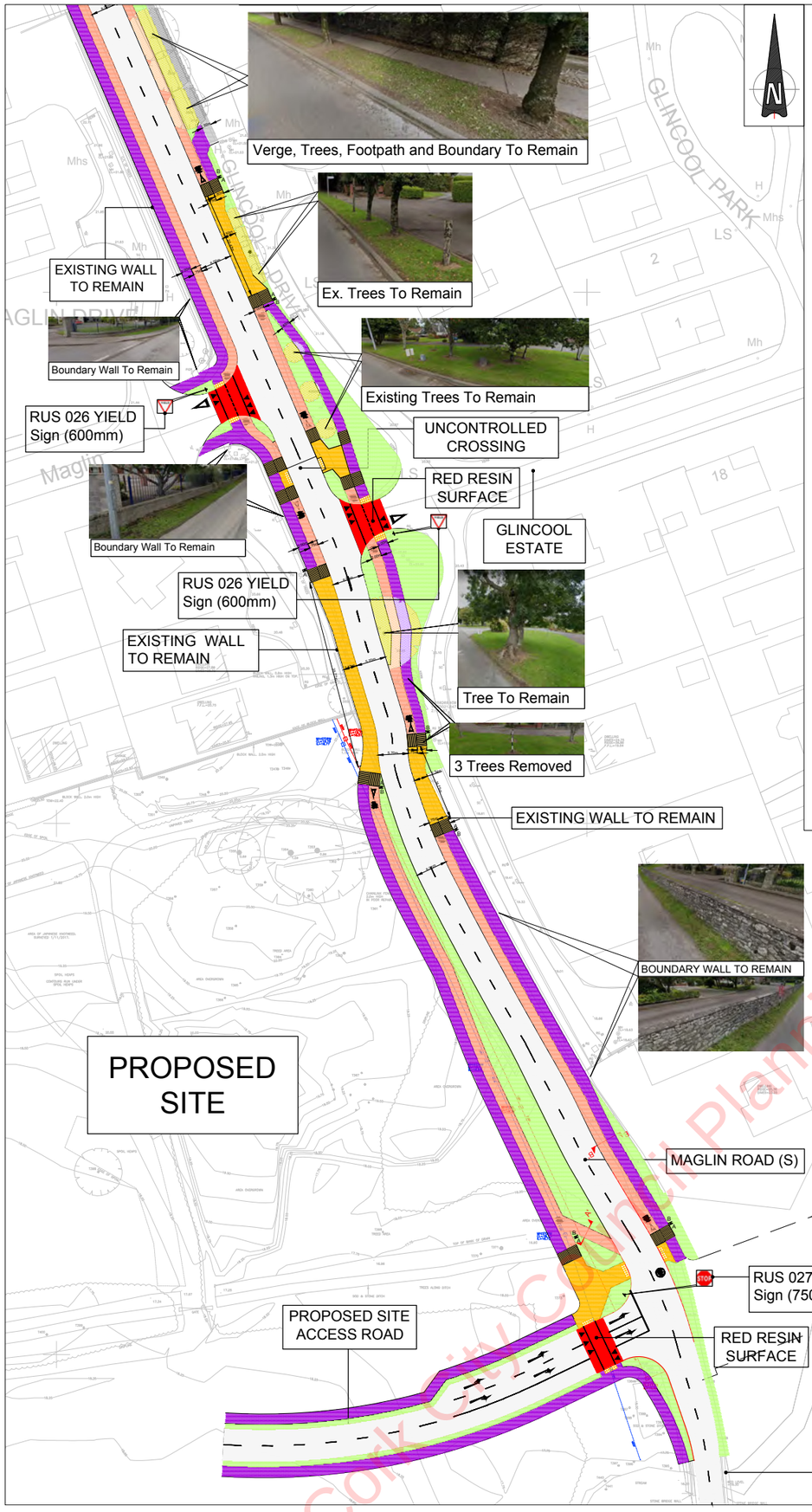

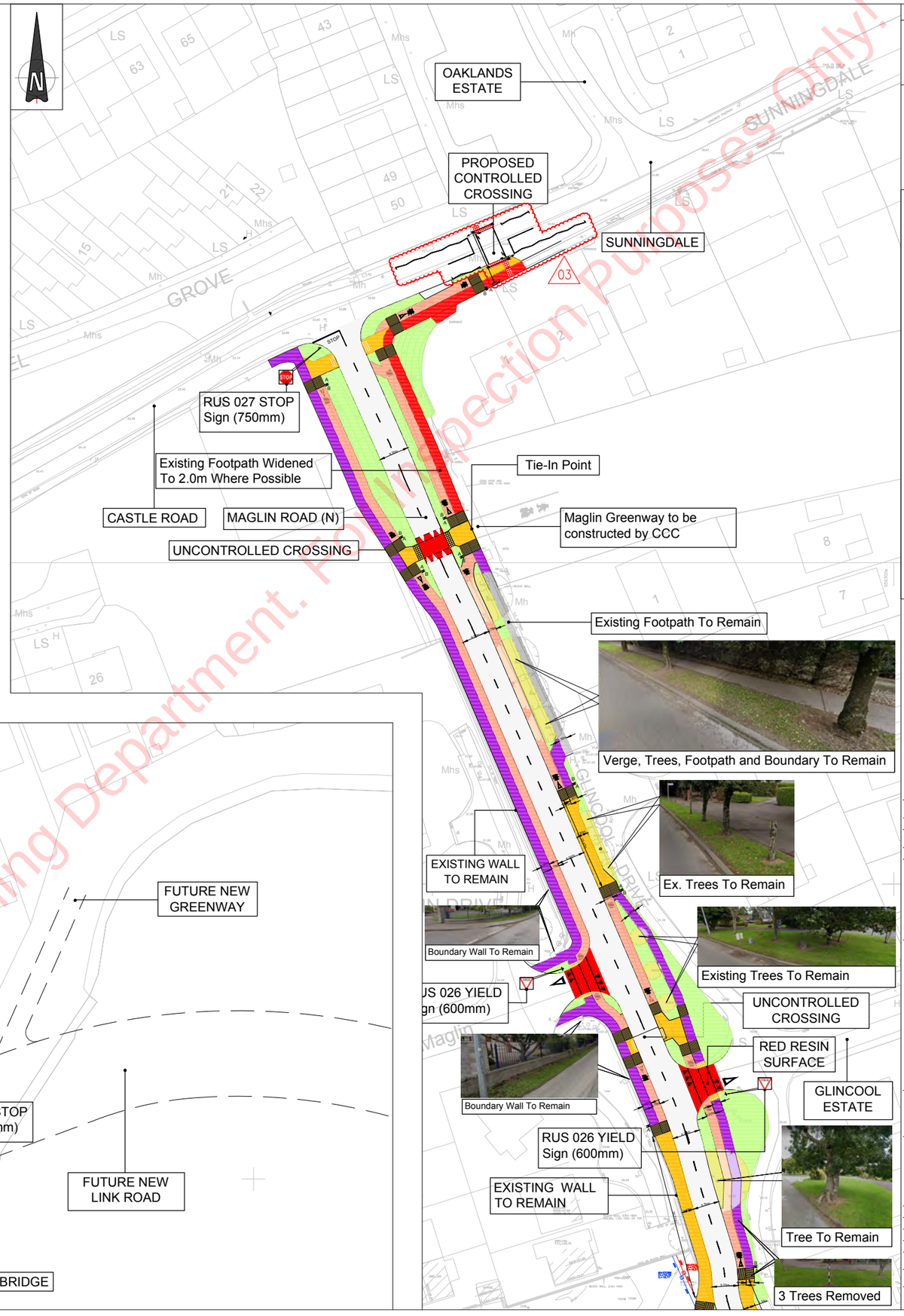

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NOTES

All roads consist of:
- 3.0m wide traffic lanes (minimum)
- 2.0m wide grass verge (on both sides where feasible)
- 2.0m wide cycle track (on both sides where feasible)
- 2.0m wide footpath (on both sides where feasible)

LEGEND

- CYCLE TRACK
- FOOTPATH
- SHARED SURFACE
- GRASS VERGE
- RAISED CROSSING
- CARRIAGEWAY

Sign A: RUS 058 (CR or CL) SEPARATE

Sign B: RUS 58 SHARED SURFACE

RUS 027 STOP

Rev.	Suit.	Description	Drawn	Ch'kd	Date
P03	S3	Poles, chambers controller and mini pillar added at toucan crossing.	RS	TF	11.04.23
P02	S3	Tactile and signage amended	RS	TF	06.04.23
P01	S3	Issued for Tender. Drawing No. was previously Y17304-PL-012_P07.02	RS	TF	24.10.22

Client

STONECREST CONSTRUCTION LTD.

Clients Representative:

BARRY & PARTNERS
consulting engineers
3 Eastgate Road, Eastgate Business Park, Little Island, Co. Cork, Ireland
tel +353 21 475 7800
web www.jbbarry.ie
email cork@jbbarry.ie

Project

RESITENTIAL DEVELOPEMENT AT MAGLIN ROAD, BALLINCOLLIG, CO CORK

Drawing Title

PROPOSED ROAD IMPROVEMENT WORKS

Drawn by :	TD	Date :	24.10.22
Checked by :	TF	Date :	24.10.22
Approved by :	TF	Date :	24.10.22
Internal Project REF :	JBB: 18215		
Scales :	1 / 500 @ A1		
Stage :	TENDER		
Drawing No. :	18215-JBB-00-XX-DR-C-0092	Revision	P03
		Suitability Code	S3

File Name : \\econfsdc03\Projects\Barry's Project Files\18 Projects\18215 - SHD Project at Maglin\00. Work in Progress\02. Drawings\18215-JBB-00-XX-DR-C-0092-Proposed Road Improvement Works_P02.dwg

APPENDIX 4-2 Site Layout of Proposed Development
(Including Proposed Road Works)

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DO NOT SCALE. WORK TO FIGURED DIMENSIONS ONLY.
ALL EXISTING DIMENSIONS TO BE CHECKED ON SITE.
DRAWN ON AUTOCAD R2004 AT DEADY GAHAN ARCHITECTS LTD
LAYERS ON THIS DRAWING COMPLY WITH BS 1192: PART 5

AREAS SCHEDULE	
SITE AREA	15.2 Ha
DEV. AREA	12.1 Ha
NO.UNITS	544
OPEN SPACE	15.3% Usable
DENSITY	45 Unit/Ha

- Character Area 1 - Greenfield View
- Character Area 2 - Castle Park
- Character Area 3 - Beech Green
- Character Area 4 - Sycamore Park
- Character Area 5 - Village Mews

LOCATION OF SITE NOTICE
PROPOSED UNCONTROLLED PEDESTRIAN CROSSING
PROPOSED UNCONTROLLED PEDESTRIAN CROSSING
PROPOSED SUSTAINABLE ACCESS CORRIDOR
PROPOSED 4m WIDE SIGNALISED PEDESTRIAN CROSSING
PEDESTRIAN ENTRANCE
EXISTING ADJOINING PROPERTY
SITE ENTRANCE
PROPOSED LOCATION OF ACTIVE TRAVEL PATHS TO ACCOMMODATE FUTURE ROAD WIDENING
RELOCATED ENTRANCE AND ROADSIDE BOUNDARY OF ADJOINING PROPERTY TO FACILITATE ACTIVE TRAVEL PATHS
LOCATION OF SITE NOTICE
SITE ENTRANCE
PEDESTRIAN ENTRANCE
PROPOSED UNCONTROLLED PEDESTRIAN CROSSING
SITE ENTRANCE
PROPOSED SHOP AT GROUND FLOOR OF BLOCK 3
SITE ENTRANCE
PROPOSED GREENWAY
LOCATION OF SITE NOTICE
LOCATION OF SITE NOTICE
PROPOSED GREENWAY
ACCESS PROVIDED SOUTH TO FUTURE DEVELOPMENT
2.5m HIGH TIMBER NOISE BARRIER

FOR LOCATION OF SITE NOTICES - REFER TO LOCATION MAPS - DWG NO. 20195/P/001 & 20195/P/002

PLEASE REFER TO SRLA LANDSCAPE DRAWINGS FOR DETAILS OF BOUNDARY AND SURFACE TREATMENTS

PLEASE REFER TO ENGINEERS DRAWINGS FOR ROAD DETAILS

Denotes area of land subject to planning application

NORTH

PROPOSED SITE PLAN - MASTERPLAN
SCALE 1:1000 @ A1

date	rev	name	chk	note
18.07.25	P2	GN	EJG	ISSUE FOR PLANNING

DEADY GAHAN ARCHITECTS
EASTGATE VILLAGE, LITTLE ISLAND, CORK
T: 021 4355016 W:WWW.DGARCHITECTS.IE
EMAIL:INFO@DGARCHITECTS.IE

Project
PROPOSED RESIDENTIAL DEVELOPMENT
GREENFIELD,
BALLINCOLLIG, CO. CORK

Drawing title
PROPOSED SITE LAYOUT
MASTERPLAN

Scale	Drawn	Checked	Date
1:1000 @ A1	GN	EJG	23.05.2025
Project No. 20195	Drg. No. 20195/P/003		Revision P2

Information \ Comments — Tender
Planning — Construction

For Inspection Purposes Only
Cork City Council

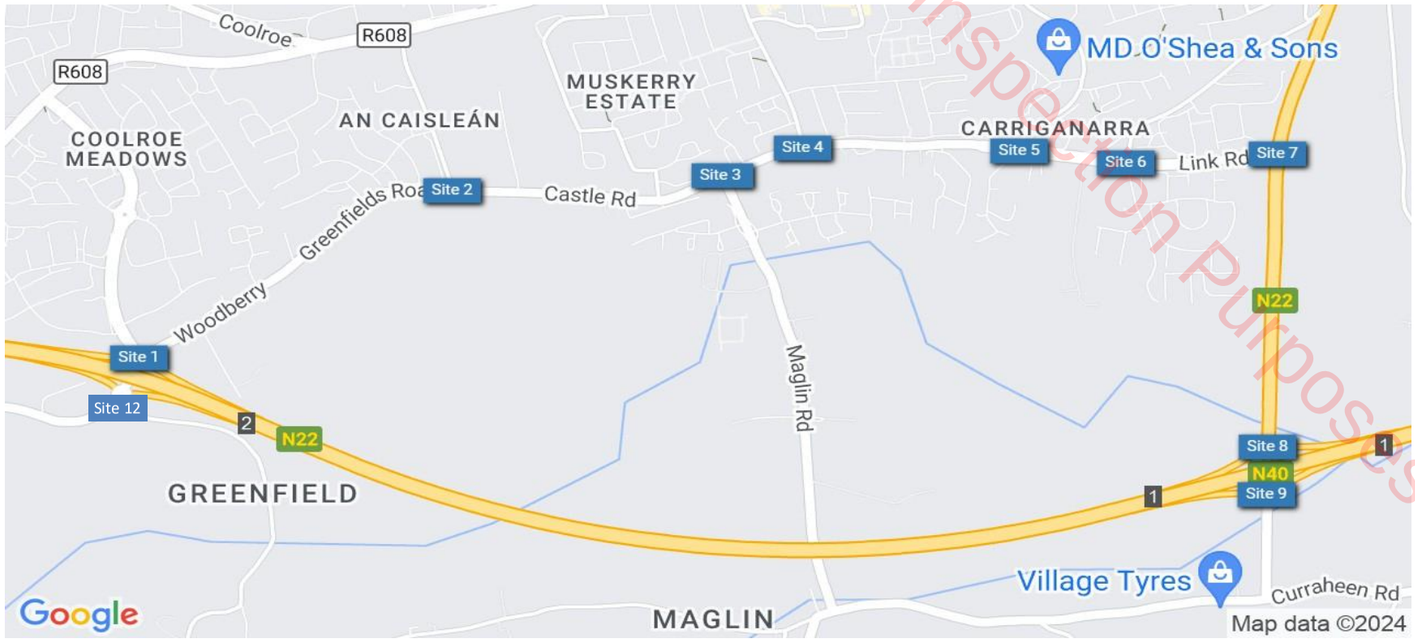
APPENDIX 4-3 Traffic Count Data

Cork City Council Planning Department. For Inspection Purposes Only!

Cork City Council Planning Department. For Inspection Purposes Only!

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Date: Tue 16 Apr 2024



Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 1
Location: Northern Roundabout at Junction 2 of N22 Ballincollig Bypass (Greenfields)
Date: Tue 16-Apr-2024

Arm A - Woodberry
Arm B - N22 ON Ramp
Arm C - L2216
Arm D - N22 OFF Ramp
Arm E - Access to R608

A => A

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	2	0	0	0	0	0	2	2
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	1	0	0	0	0	0	1	1
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	1	0	0	0	0	1	1
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	1	0	0	0	0	1	1
15:00	0	0	1	0	0	0	0	0	1	1
15:15	0	0	1	0	0	0	0	0	1	1
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	2	0	0	0	0	0	2	2
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	2	0	0	0	0	0	2	2
12 TOT	0	0	7	1	0	0	0	0	8	8

A => B

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	15	2	0	0	0	0	17	17
07:15	0	0	21	8	1	0	0	0	30	30.5
07:30	0	0	20	4	0	2	0	0	26	28.6
07:45	0	0	36	10	2	0	0	0	48	49
H/TOT	0	0	92	24	3	2	0	0	121	125.1
08:00	0	0	52	6	0	0	0	0	58	58
08:15	0	0	49	5	2	0	0	0	56	57
08:30	0	0	46	4	0	0	0	0	50	50
08:45	0	0	44	7	0	0	1	0	52	53
H/TOT	0	0	191	22	2	0	1	0	216	218
09:00	0	0	26	2	0	0	0	0	28	28
09:15	0	0	21	3	0	0	0	0	24	24
09:30	0	0	16	1	2	0	0	0	19	20
09:45	0	0	11	5	0	0	0	0	16	16
H/TOT	0	0	74	11	2	0	0	0	87	88
10:00	0	0	13	1	0	1	0	0	15	16.3
10:15	0	0	3	1	0	0	0	0	4	4
10:30	0	0	10	2	1	0	0	0	13	13.5
10:45	0	0	9	0	0	0	0	0	9	9
H/TOT	0	0	35	4	1	1	0	0	41	42.8
11:00	0	0	2	1	0	1	0	0	4	5.3
11:15	0	0	14	6	0	0	0	0	20	20
11:30	0	0	14	4	0	0	1	0	19	20
11:45	0	0	7	2	0	0	0	0	9	9
H/TOT	0	0	37	13	0	1	1	0	52	54.3
12:00	0	0	8	0	0	0	0	0	8	8
12:15	0	0	9	2	1	1	0	0	13	14.8
12:30	0	0	6	4	0	0	0	0	10	10
12:45	0	0	10	2	1	2	0	0	15	18.1
H/TOT	0	0	33	8	2	3	0	0	46	50.9
13:00	0	0	12	3	0	0	0	0	15	15
13:15	0	0	15	2	0	0	0	0	17	17
13:30	0	0	12	3	0	0	0	0	15	15
13:45	0	0	15	5	0	0	0	0	20	20
H/TOT	0	0	54	13	0	0	0	0	67	67
14:00	0	0	18	2	0	0	0	0	20	20
14:15	0	0	24	2	0	0	0	0	26	26
14:30	0	0	16	2	0	0	0	0	18	18
14:45	0	0	10	1	0	0	0	0	11	11
H/TOT	0	0	68	7	0	0	0	0	75	75
15:00	0	0	25	0	0	0	0	0	25	25
15:15	0	1	22	1	0	0	0	0	24	23.4
15:30	0	0	21	9	0	0	0	0	30	30
15:45	0	0	36	2	0	0	0	0	38	38
H/TOT	0	1	104	12	0	0	0	0	117	116.4
16:00	0	1	26	1	0	0	0	0	28	27.4
16:15	0	0	15	4	0	1	0	0	20	21.3
16:30	0	0	15	2	0	1	0	0	18	19.3
16:45	0	0	15	3	0	1	0	0	19	20.3
H/TOT	0	1	71	10	0	3	0	0	85	88.3
17:00	0	0	19	2	0	0	0	0	21	21
17:15	0	0	23	2	0	0	0	0	25	25
17:30	0	0	20	4	0	0	0	0	24	24
17:45	0	0	19	2	0	0	0	0	21	21
H/TOT	0	0	81	10	0	0	0	0	91	91
18:00	0	0	22	3	0	0	0	0	25	25
18:15	0	0	15	3	1	0	0	0	19	19.5
18:30	0	1	15	0	0	0	0	0	16	15.4
18:45	0	0	18	0	0	0	0	0	18	18
H/TOT	0	1	70	6	1	0	0	0	78	77.9
12 TOT	0	3	910	140	11	10	2	0	1076	1094.7

A => C

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	16	4	0	0	0	0	20	20
07:15	0	0	12	6	1	1	0	0	20	21.8
07:30	0	0	14	3	2	0	0	0	19	20
07:45	0	0	17	4	0	0	0	0	21	21
H/TOT	0	0	59	17	3	1	0	0	80	82.8
08:00	0	0	33	7	0	2	0	0	42	44.6
08:15	0	0	31	3	0	0	0	0	34	34
08:30	0	0	29	9	1	0	2	0	41	43.5
08:45	0	0	45	5	0	1	0	0	51	52.3
H/TOT	0	0	138	24	1	3	2	0	168	174.4
09:00	0	0	37	3	0	1	1	0	42	44.3
09:15	0	0	28	1	3	0	0	0	32	33.5
09:30	0	2	21	4	1	1	0	0	29	29.6
09:45	0	0	17	6	0	1	0	0	24	25.3
H/TOT	0	2	103	14	4	3	1	0	127	132.7
10:00	0	0	21	5	1	0	0	0	27	27.5
10:15	0	0	13	1	1	2	0	0	17	20.1
10:30	0	2	18	3	2	0	0	0	25	24.8
10:45	0	1	21	3	3	0	0	0	28	28.9
H/TOT	0	3	73	12	7	2	0	0	97	101.3
11:00	1	0	22	3	2	0	0	0	28	28.2
11:15	0	0	22	6	2	0	0	0	30	31
11:30	0	0	27	1	0	0	0	0	28	28
11:45	0	0	31	4	1	0	0	0	36	36.5
H/TOT	1	0	102	14	5	0	0	0	122	123.7
12:00	0	0	29	1	0	0	1	0	31	32
12:15	0	0	44	2	2	0	1	0	49	51
12:30	0	0	42	7	0	1	1	0	51	53.3
12:45	0	0	30	4	1	0	0	0	35	35.5
H/TOT	0	0	145	14	3	1	3	0	166	171.8
13:00	0	0	20	3	2	0	0	0	25	26
13:15	0	0	34	1	1	0	0	0	36	36.5
13:30	0	0	34	5	1	0	0	0	40	40.5
13:45	0	0	32	4	3	0	0	0	39	40.5
H/TOT	0	0	120	13	7	0	0	0	140	143.5
14:00	0	0	41	2	1	1	0	0	45	46.8
14:15	0	0	30	3	3	0	0	0	36	37.5
14:30	0	0	24	5	1	0	0	0	30	30.5
14:45	0	0	38	2	2	0	0	0	42	43
H/TOT	0	0	133	12	7	1	0	0	153	157.8
15:00	0	0	38	4	1	0	1	0	44	45.5
15:15	0	0	52	5	1	0	0	0	58	58.5
15:30	0	0	43	7	4	0	0	0	54	56
15:45	0	0	56	7	1	0	0	0	64	64.5
H/TOT	0	0	189	23	7	0	1	0	220	224.5
16:00	0	0	82	4	1	0	1	0	88	89.5
16:15	0	0	71	5	1	0	1	0	78	79.5
16:30	0	1	45	4	0	0	0	0	50	49.4
16:45	0	0	64	7	2	0	0	0	73	74
H/TOT	0	1	262	20	4	0	2	0	289	292.4
17:00	0	0	66	11	0	0	1	0	78	79
17:15	0	0	58	7	1	1	0	0	67	68.8
17:30	0	0	73	10	2	0	0	0	85	86
17:45	0	0	73	9	0	1	0	0	83	84.3
H/TOT	0	0	270	37	3	2	1	0	313	318.1
18:00	0	0	52	5	0	1	0	0	58	59.3
18:15	0	0	50	3	0	0	0	0	53	53
18:30	0	0	53	6	1	0	0	0	60	60.5
18:45	0	1	45	1	1	0	0	0	48	47.9
H/TOT	0	1	200	15	2	1	0	0	219	220.7
12 TOT	1	7	1794	215	53	14	10	0	2094	2143.7

A => D

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0

A => E

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	7	1	0	0	0	0	8	8
07:15	0	0	5	1	0	0	0	0	6	6
07:30	0	1	5	2	0	0	0	0	8	7.4
07:45	0	0	11	0	1	0	0	0	12	12.5
H/TOT	0	1	28	4	1	0	0	0	34	33.9
08:00	0	1	10	1	0	0	0	0	12	11.4
08:15	0	0	18	0	2	0	1	0	21	23
08:30	0	0	19	0	0	0	0	0	19	19
08:45	0	0	15	1	0	0	0	0	16	16
H/TOT	0	1	62	2	2	0	1	0	68	69.4
09:00	0	0	11	0	0	0	0	0	11	11
09:15	0	0	21	0	1	0	0	0	22	22.5
09:30	0	0	9	0	0	0	0	0	9	9
09:45	0	0	8	2	0	1	0	0	11	12.3
H/TOT	0	0	49	2	1	1	0	0	53	54.8
10:00	1	0	7	1	0	0	0	0	9	8.2
10:15	0	0	6	1	0	0	0	0	7	7
10:30	0	0	2	3	0	0	0	0	5	5
10:45	0	0	7	0	0	0	0	0	7	7
H/TOT	1	0	22	5	0	0	0	0	28	27.2
11:00	0	0	10	2	0	0	0	0	12	12
11:15	1	0	11	1	0	0	0	0	13	12.2
11:30	0	0	13	0	0	0	0	0	13	13
11:45	0	0	19	1	0	0	0	0	20	20
H/TOT	1	0	53	4	0	0	0	0	58	57.2
12:00	0	0	18	3	0	0	0	0	21	21
12:15	0	0	13	0	0	0	0	0	13	13
12:30	0	0	9	0	0	0	0	0	9	9
12:45	0	0	18	2	1	0	0	0	21	21.5
H/TOT	0	0	58	5	1	0	0	0	64	64.5
13:00	0	0	9	3	0	0	0	0	12	12
13:15	0	1	22	0	0	0	0	0	23	22.4
13:30	0	0	14	1	1	0	1	0	17	18.5
13:45	0	0	10	1	0	0	0	0	11	11
H/TOT	0	1	55	5	1	0	1	0	63	63.9
14:00	0	0	18	0	0	0	0	0	18	18
14:15	0	0	28	0	0	0	0	0	28	28
14:30	0	0	21	0	0	0	0	0	21	21
14:45	0	0	12	2	0	0	0	0	14	14
H/TOT	0	0	79	2	0	0	0	0	81	81
15:00	0	0	24	0	0	0	3	0	27	30
15:15	0	1	20	1	0	1	0	0	23	23.7
15:30	0	0	27	0	0	0	0	0	27	27
15:45	0	0	16	2	0	0	0	0	18	18
H/TOT	0	1	87	3	0	1	3	0	95	98.7
16:00	0	0	48	6	1	0	0	0	55	55.5
16:15	0	0	55	3	0	0	1	0	59	60
16:30	0	0	31	4	0	0	0	0	35	35
16:45	0	0	24	2	0	0	0	0	26	26
H/TOT	0	0	158	15	1	0	1	0	175	176.5
17:00	1	0	37	4	0	0	0	0	42	41.2
17:15	0	0	26	3	0	0	0	0	29	29
17:30	0	0	36	2	0	0	0	0	38	38
17:45	0	0	37	1	0	0	0	0	38	38
H/TOT	1	0	136	10	0	0	0	0	147	146.2
18:00	0	0	29	3	0	0	0	0	32	32
18:15	0	1	27	1	0	0	0	0	29	28.4
18:30	0	0	27	1	0	0	0	0	28	28
18:45	0	0	19	1	0	0	0	0	20	20
H/TOT	0	1	102	6	0	0	0	0	109	108.4
12 TOT	3	5	889	63	7	2	6	0	975	981.7

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 1
Location: Northern Roundabout at Junction 2 of N22 Ballincollig Bypass (Greenfields)
Date: Tue 16-Apr-2024

Arm A - Woodberry
Arm B - N22 ON Ramp
Arm C - L2216
Arm D - N22 OFF Ramp
Arm E - Access to R608

All values in the B => A, B => B, B => C, B => D and B => E tables are 0:

TIME	B => A TOT	B => A PCU	B => B TOT	B => B PCU	B => C TOT	B => C PCU	B => D TOT	B => D PCU	B => E TOT	B => E PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0

Cork City Council Planning Department. For Inspection Purposes Only!

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 1
Location: Northern Roundabout at Junction 2 of N22 Ballincollig Bypass (Greenfields)
Date: Tue 16-Apr-2024

Arm A - Woodberry
Arm B - N22 ON Ramp
Arm C - L2216
Arm D - N22 OFF Ramp
Arm E - Access to R608

C => A

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	15	4	0	0	0	0	19	19
07:15	0	0	23	3	0	1	0	0	27	28.3
07:30	0	0	42	6	1	0	0	0	49	49.5
07:45	0	0	50	14	1	1	1	0	67	69.8
H/TOT	0	0	130	27	2	2	1	0	162	166.6
08:00	0	1	63	11	2	0	0	0	77	77.4
08:15	0	0	80	6	2	0	1	0	89	91
08:30	0	1	91	4	0	2	0	0	98	100
08:45	0	0	64	4	2	0	0	0	70	71
H/TOT	0	2	298	25	6	2	1	0	334	339.4
09:00	0	0	61	12	0	0	0	0	73	73
09:15	0	0	71	5	0	0	1	0	77	78
09:30	0	0	24	2	0	2	0	0	28	30.6
09:45	0	0	26	5	0	0	0	0	31	31
H/TOT	0	0	182	24	0	2	1	0	209	212.6
10:00	0	0	26	5	0	0	0	0	31	31
10:15	1	0	25	4	0	1	1	0	32	33.5
10:30	0	0	27	0	2	1	0	0	30	32.3
10:45	0	0	34	5	0	0	0	0	39	39
H/TOT	1	0	112	14	2	2	1	0	132	135.8
11:00	1	1	22	4	1	1	0	0	30	30.4
11:15	0	0	25	7	1	0	0	0	33	33.5
11:30	0	1	30	9	1	0	0	0	41	40.9
11:45	0	0	32	2	1	0	0	0	35	35.5
H/TOT	1	2	109	22	4	1	0	0	139	140.3
12:00	0	0	39	7	0	1	0	0	47	48.3
12:15	1	0	29	7	1	2	0	0	40	42.3
12:30	0	0	31	4	0	0	0	0	35	35
12:45	0	0	20	7	1	0	0	0	28	28.5
H/TOT	1	0	119	25	2	3	0	0	150	154.1
13:00	0	0	29	4	1	1	0	0	35	36.8
13:15	0	0	24	1	3	0	0	0	28	29.5
13:30	0	0	40	2	1	0	0	0	43	43.5
13:45	0	0	42	0	2	0	0	0	44	45
H/TOT	0	0	135	7	7	1	0	0	150	154.8
14:00	0	1	43	3	1	0	0	0	48	47.9
14:15	0	0	42	1	2	0	0	0	45	46
14:30	0	0	41	2	3	0	0	0	46	47.5
14:45	0	0	44	6	1	1	0	0	52	53.8
H/TOT	0	1	170	12	7	1	0	0	191	195.2
15:00	0	0	42	6	2	0	0	0	50	51
15:15	0	0	57	8	2	0	0	0	67	68
15:30	0	0	37	6	1	1	0	0	45	46.8
15:45	0	0	40	5	0	1	0	0	46	47.3
H/TOT	0	0	176	25	5	2	0	0	208	213.1
16:00	0	0	49	6	1	1	0	0	57	58.8
16:15	0	0	64	12	3	0	0	0	79	80.5
16:30	0	0	75	10	2	0	0	0	87	88
16:45	0	1	58	9	0	0	0	0	68	67.4
H/TOT	0	1	246	37	6	1	0	0	291	294.7
17:00	0	0	64	9	0	0	0	0	73	73
17:15	0	0	64	8	1	0	0	0	73	73.5
17:30	0	0	62	8	0	0	0	0	70	70
17:45	0	0	46	8	1	0	0	0	55	55.5
H/TOT	0	0	236	33	2	0	0	0	271	272
18:00	0	0	43	6	1	1	0	0	51	52.8
18:15	0	0	48	4	0	0	0	0	52	52
18:30	0	0	43	1	0	0	0	0	44	44
18:45	0	0	42	1	0	0	0	0	43	43
H/TOT	0	0	176	12	1	1	0	0	190	191.8
12 TOT	3	6	2089	263	44	18	4	0	2427	2470.4

C => B

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	39	3	0	2	0	0	44	46.6
07:15	0	0	46	3	2	1	0	0	52	54.3
07:30	0	0	75	10	0	0	0	0	85	85
07:45	0	0	87	9	0	1	0	0	97	98.3
H/TOT	0	0	247	25	2	4	0	0	278	284.2
08:00	0	0	95	7	1	1	0	0	104	105.8
08:15	0	0	72	5	5	0	0	0	82	84.5
08:30	0	0	56	9	0	1	0	0	66	67.3
08:45	0	0	36	10	0	1	0	0	47	48.3
H/TOT	0	0	259	31	6	3	0	0	299	305.9
09:00	0	0	46	8	1	1	1	0	57	59.8
09:15	0	0	44	5	0	1	0	0	50	51.3
09:30	0	0	28	1	1	3	0	0	33	37.4
09:45	0	0	22	2	0	0	1	0	25	26
H/TOT	0	0	140	16	2	5	2	0	165	174.5
10:00	0	0	26	0	1	0	0	0	27	27.5
10:15	0	0	19	2	0	0	0	0	21	21
10:30	0	1	16	3	1	0	0	0	21	20.9
10:45	0	0	13	1	1	2	0	0	17	20.1
H/TOT	0	1	74	6	3	2	0	0	86	89.5
11:00	0	0	9	0	0	1	0	0	10	11.3
11:15	0	0	8	1	3	1	0	0	13	15.8
11:30	0	0	19	1	0	2	1	0	23	26.6
11:45	0	0	14	5	0	1	0	0	20	21.3
H/TOT	0	0	50	7	3	5	1	0	66	75
12:00	0	0	12	4	0	2	0	0	18	20.6
12:15	0	0	9	0	3	0	0	0	12	13.5
12:30	0	0	18	3	0	0	0	0	21	21
12:45	0	0	9	2	0	0	0	0	11	11
H/TOT	0	0	48	9	3	2	0	0	62	66.1
13:00	0	0	7	3	1	0	0	0	11	11.5
13:15	0	0	10	5	1	3	0	0	19	23.4
13:30	0	0	13	5	2	1	0	0	21	23.3
13:45	0	0	5	4	1	0	0	0	10	10.5
H/TOT	0	0	35	17	5	4	0	0	61	68.7
14:00	0	0	16	0	0	0	0	0	16	16
14:15	0	0	27	5	0	0	0	0	32	32
14:30	0	0	19	3	2	1	0	0	25	27.3
14:45	0	0	16	2	2	0	0	0	20	21
H/TOT	0	0	78	10	4	1	0	0	93	96.3
15:00	0	0	11	3	1	4	0	0	19	24.7
15:15	0	0	20	4	3	1	1	0	29	32.8
15:30	0	0	11	2	1	1	0	0	15	16.8
15:45	0	0	13	3	0	0	0	0	16	16
H/TOT	0	0	55	12	5	6	1	0	79	90.3
16:00	0	0	8	6	0	0	0	0	14	14
16:15	0	0	18	5	1	0	0	0	24	24.5
16:30	0	0	23	5	1	2	0	0	31	34.1
16:45	0	1	10	3	0	1	0	0	15	15.7
H/TOT	0	1	59	19	2	3	0	0	84	88.3
17:00	0	0	15	2	0	0	0	0	17	17
17:15	0	0	17	4	0	0	0	0	21	21
17:30	0	0	17	4	0	0	1	0	22	23
17:45	0	0	10	0	0	0	0	0	10	10
H/TOT	0	0	59	10	0	0	1	0	70	71
18:00	0	0	23	1	0	0	0	0	24	24
18:15	0	0	15	2	0	0	0	0	17	17
18:30	0	0	20	1	0	0	0	0	21	21
18:45	0	0	14	1	0	0	0	0	15	15
H/TOT	0	0	72	5	0	0	0	0	77	77
12 TOT	0	2	1176	167	35	35	5	0	1420	1486.8

C => C

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	1	1	0	0	0	0	2	2
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	2	1	0	0	0	0	3	3
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	1	0	0	0	0	0	1	1
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	1	0	0	0	0	1	1
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	1	0	0	0	0	1	1
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	1	0	0	0	0	0	1	1
16:30	0	0	0	1	0	0	0	0	1	1
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	1	0	0	0	0	2	2
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	1	0	0	0	0	0	1	1
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	1	0	0	0	0	0	1	1
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
12 TOT	0	0	6	3	0	0	0	0	9	9

C => D

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0

C => E

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	10	2	0	0	0	0	12	12
07:15	0	0	13	1	2	0	0	0	16	17
07:30	0	1	16	3	0	0	0	0	20	19.4
07:45	0	0	25	1	2	2	0	0	30	33.6
H/TOT	0	1	64	7	4	2	0	0	78	82
08:00	0	0	32	5	2	0	0	0	39	40
08:15	0	0	45	9	0	1	2	0	57	60.3
08:30	0	0	46	4	0	0	0	0	50	50
08:45	0	0	55	3	0	0	0	0	58	58
H/TOT	0	0	178	21	2	1	2	0	204	208.3
09:00	0	0	47	5	0	0	0	0	52	52
09:15	0	0	43	4	2	0	0	0	49	50
09:30	0	0	30	1	2	0	1	0	34	36
09:45	0	0	20	3	1	1	0	0	25	26.8
H/TOT	0	0	140	13	5	1	1	0	160	164.8
10:00	0	0	23	5	0	0	0	0	28	28
10:15	0	0	21	3	2	2	1	0	29	33.6
10:30	0	0	31	2	2	0	1	0	36	38
10:45	0	0	16	6	2	0	0	0	24	25
H/TOT	0	0	91	16	6	2	2	0	117	124.6
11:00	0	0	24	4	1	1	0	0	30	31.8
11:15	0	0	32	6	0	0	0	0	38	38
11:30	0	0	17	3	1	0	0	0	21	21.5
11:45	0	0	25	2	0	1	0	0	28	29.3
H/TOT	0	0	98	15	2	2	0	0	117	120.6
12:00	0	0	34	5	1	2	1	0	43	47.1
12:15	0	0	34	0	2	1	0	0	37	39.3
12:30	0	0	37	2	1	2	0	0	42	45.1
12:45	0	0	39	6	0	0	0	0	45	45
H/TOT	0	0	144	13	4	5	1	0	167	176.5
13:00	0	0	62	4	1	0	0	0	67	67.5
13:15	0	0	44	3	1	1	0	0	49	50.8
13:30	0	0	32	8	0	0	0	0	40	40
13:45	0	0	39	1	1	0	0	0	41	41.5
H/TOT	0	0	177	16	3	1	0	0	197	199.8
14:00	0	0	46	4	0	1	0	0	51	52.3
14:15	0	0	43	1	2	3	0	0	49	53.9
14:30	0	0	45	4	1	0	0	0	50	50.5
14:45	0	0	44	6	1	0	0	0	51	51.5
H/TOT	0	0	178	15	4	4	0	0	201	208.2
15:00	0	0	56	6	0	2	0	0	64	66.6
15:15	0	1	68	7	0	0	0	0	76	75.4
15:30	0	0	41	3	1	1	2	0	48	51.8
15:45	0	0	66	2	1	0	0	0	69	69.5
H/TOT	0	1	231	18	2	3	2	0	257	263.3
16:00	0	1	72	11	2	1	0	0	87	88.7
16:15	0	0	86	10	3	0	0	0	99	100.5
16:30	0	0	77	15	2	4	0	0	98	104.2
16:45	0	0	95	6	0	0	0	0	101	101
H/TOT	0	1	330	42	7	5	0	0	385	394.4
17:00	0	0	85	11	2	1	0	0	99	101.3
17:15	0	0	113	9	0	0	0	0	122	122
17:30	0	0	91	9	0	1	0	0	101	102.3
17:45	0	0	100	9	0	0	0	1	110	110
H/TOT	0	0	389	38	2	2	0	1	432	435.6
18:00	0	0	107	2	0	0	0	0	109	109
18:15	0	0	90	3	0	0	0	0	93	93
18:30	0	0	52	6	0	0	0	0	58	58
18:45	0	0	50	0	1	0	0	0	51	51.5
H/TOT	0	0	299	11	1	0	0	0	311	311.5
12 TOT	0	3	2319	225	42	28	8	1	2626	2689.6

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 1
Location: Northern Roundabout at Junction 2 of N22 Ballincollig Bypass (Greenfields)
Date: Tue 16-Apr-2024

Arm A - Woodberry
Arm B - N22 ON Ramp
Arm C - L2216
Arm D - N22 OFF Ramp
Arm E - Access to R608

D => A

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	1	0	0	0	0	0	1	1
07:15	0	0	8	2	0	0	0	0	10	10
07:30	0	0	13	1	1	0	0	0	15	15.5
07:45	0	0	22	5	0	1	0	0	28	29.3
H/TOT	0	0	44	8	1	1	0	0	54	55.8
08:00	0	0	21	6	0	0	0	0	27	27
08:15	0	0	43	2	0	0	0	0	45	45
08:30	0	0	41	1	0	0	0	0	42	42
08:45	0	0	28	1	2	0	0	0	31	32
H/TOT	0	0	133	10	2	0	0	0	145	146
09:00	0	0	30	1	0	1	0	0	32	33.3
09:15	0	0	26	5	0	0	0	0	31	31
09:30	0	0	24	5	1	0	0	0	30	30.5
09:45	0	0	21	3	2	1	0	0	27	29.3
H/TOT	0	0	101	14	3	2	0	0	120	124.1
10:00	0	0	14	3	0	0	0	0	17	17
10:15	0	0	6	1	1	0	0	0	8	8.5
10:30	0	0	10	4	0	0	1	0	15	16
10:45	0	0	11	3	1	0	0	0	15	15.5
H/TOT	0	0	41	11	2	0	1	0	55	57
11:00	0	1	10	3	1	0	0	0	15	14.9
11:15	0	0	9	5	1	0	0	0	15	15.5
11:30	0	0	15	1	0	0	0	0	16	16
11:45	0	0	8	0	0	0	0	0	8	8
H/TOT	0	1	42	9	2	0	0	0	54	54.4
12:00	0	0	20	1	1	0	0	0	22	22.5
12:15	0	0	18	0	0	0	0	0	18	18
12:30	0	0	10	0	0	0	0	0	10	10
12:45	0	0	14	0	0	0	0	0	14	14
H/TOT	0	0	62	1	1	0	0	0	64	64.5
13:00	0	0	16	3	0	0	0	0	19	19
13:15	0	0	9	2	0	0	0	0	11	11
13:30	0	0	15	2	0	0	0	0	17	17
13:45	0	0	13	2	3	0	0	0	18	19.5
H/TOT	0	0	53	9	3	0	0	0	65	66.5
14:00	0	1	20	2	0	1	0	0	24	24.7
14:15	0	0	14	2	0	0	0	0	16	16
14:30	0	0	19	1	0	0	0	0	20	20
14:45	0	0	28	1	2	0	0	0	31	32
H/TOT	0	1	81	6	2	1	0	0	91	92.7
15:00	0	0	21	1	0	0	0	0	22	22
15:15	0	0	12	2	0	0	0	0	14	14
15:30	0	0	19	1	2	0	0	0	22	23
15:45	0	0	16	2	1	0	0	0	19	19.5
H/TOT	0	0	68	6	3	0	0	0	77	78.5
16:00	0	0	15	0	0	0	0	0	15	15
16:15	0	0	15	2	1	0	0	0	18	18.5
16:30	0	0	22	3	2	0	0	0	27	28
16:45	0	0	21	3	0	0	0	0	24	24
H/TOT	0	0	73	8	3	0	0	0	84	85.5
17:00	0	0	12	0	0	0	0	0	12	12
17:15	0	0	19	3	0	0	0	0	22	22
17:30	0	0	16	0	0	0	0	0	16	16
17:45	0	0	24	2	0	0	0	0	26	26
H/TOT	0	0	71	5	0	0	0	0	76	76
18:00	0	0	20	3	0	0	0	0	23	23
18:15	0	0	23	2	1	0	0	0	26	26.5
18:30	0	0	12	1	0	0	0	0	13	13
18:45	0	0	17	0	1	0	0	0	18	18.5
H/TOT	0	0	72	6	2	0	0	0	80	81
12 TOT	0	2	841	93	24	4	1	0	965	982

D => B

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	1	0	0	0	0	0	1	1
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	1	0	0	0	0	0	1	1
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	1	0	0	0	1	1.5
11:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	1	0	1	0	0	0	2	2.5
12:00	0	0	1	0	0	0	0	0	1	1
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	1	0	0	0	0	0	1	1
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	1	0	0	0	0	0	1	1
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
16:00	0	0	0	1	0	0	0	0	1	1
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	1	0	0	0	0	1	1
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	1	0	0	0	0	0	1	1
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	1	0	0	0	0	0	1	1
12 TOT	0	0	8	1	1	0	0	0	10	10.5

D => C

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	1	0	0	0	0	1	1
H/TOT	0	0	0	1	0	0	0	0	1	1
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	1	1	0	0	0	0	2	2
08:30	0	0	1	0	0	0	0	0	1	1
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	2	1	0	0	0	0	3	3
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	1	0	0	0	0	0	1	1
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	1	0	0	1	2.3
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	1	0	1	0	0	0	2	2.5
H/TOT	0	0	1	0	1	1	0	0	3	4.8
11:00	0	0	0	0	0	0	1	0	1	2
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	1	0	0	0	1	0	2	3
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	1	0	0	0	0	0	1	1
12:30	0	0	0	0	1	0	0	0	1	1.5
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	1	0	0	0	2	2.5
13:00	0	0	0	0	1	0	0	0	1	1.5
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	1	0	1	0	0	0	2	2.5
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	1	0	0	0	0	0	1	1
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
15:00	0	0	1	0	0	0	0	0	1	1
15:15	0	0	0	0	1	0	0	0	1	1.5
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	1	0	0	0	2	2.5
16:00	0	0	1	1	0	0	0	0	2	2
16:15	0	0	1	0	0	0	0	0	1	1
16:30	0	0	1	0	0	0	0	0	1	1
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	1	0	0	0	0	4	4
17:00	0	0	2	1	1	0	0	0	4	4.5
17:15	0	0	4	1	0	0	0	0	5	5
17:30	0	0	1	1	0	0	0	0	2	2
17:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	8	3	1	0	0	0	12	12.5
18:00	0	0	2	0	0	0	0	0	2	2
18:15	0	0	1	0	0	0	0	0	1	1
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	5	0	0	0	0	0	5	5
12 TOT	0	0	25	6	5	1	1	0	38	42.8

D => D

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0

D => E

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	1	1	0	0	0	0	2	2
07:15	0	0	4	0	0	0	0	0	4	4
07:30	0	0	0	1	0	0	0	0	1	1
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	5	2	0	0	0	0	7	7
08:00	0	0	1	1	0	0	0	0	2	2
08:15	0	0	2	0	0	0	0	0	2	2
08:30	0	0	3	0	0	0	0	0	3	3
08:45	0	3	4	0	1	0	0	0	8	6.7
H/TOT	0	3	10	1	1	0	0	0	15	13.7
09:00	0	0	4	0	1	0	0	0	5	5.5
09:15	0	0	3	0	0	0	0	0	3	3
09:30	0	0	3	0	0	0	0	0	3	3
09:45	0	1	5	2	0	0	0	0	8	7.4
H/TOT	0	1	15	2	1	0	0	0	19	18.9
10:00	0	0	4	0	0	0	0	0	4	4
10:15	0	0	1	1	0	0	0	0	2	2
10:30	0	0	3	1	0	0	0	0	4	4
10:45	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	10	2	0	0	0	0	12	12
11:00	0	0	1	1	0	0	0	0	2	2
11:15	0	0	2	0	0	0	1	0	3	4
11:30	0	0	2	1	0	0	0	0	3	3
11:45	0	2	4	1	0	0	0	0	7	5.8
H/TOT	0	2	9	3	0	0	1	0	15	14.8
12:00	0	0	8	0	0	0	1	0	9	10
12:15	0	0	3	0	0	0	0	0	3	3
12:30	0	0	4	1	0	0	0	0	5	5
12:45	0	0	5	3	0	0	0	0	8	8
H/TOT	0	0	20	4	0	0	1	0	25	26
13:00	0	1	2	0	0	0	0	0	3	2.4
13:15	0	0	2	1	0	0	0	0	3	3
13:30	0	0	6	1	0	0	0	0	7	7
13:45	0	0	1	0	2	0	0	0	3	4
H/TOT	0	1	11	2	2	0	0	0	16	16.4
14:00	0	0	7	0	0	0	0	0	7	7
14:15	0	2	2	0	0	0	0	0	4	2.8
14:30	0	0	3	0	0	0	0	0	3	3
14:45	0	0	4	0	0	0	0	0	4	4
H/TOT	0	2	16	0	0	0	0	0	18	16.8
15:00	0	0	4	0	0	0	0	0	4	4
15:15	0	1	2	0	0	0	0	0	3	2.4
15:30	0	0	6	0	0	0	0	0	6	6
15:45	0	0	3	0	0	0	0	0	3	3
H/TOT	0	1	15	0	0	0	0	0	16	15.4
16:00	0	0	8	1	0	0	0	0	9	9
16:15	0	0	2	0	0	1	0	0	3	4.3
16:30	0	2	5	2	0	1	0	0	10	10.1
16:45	0	0	5	1	0	0	0	0	6	6
H/TOT	0	2	20	4	0	2	0	0	28	29.4
17:00	0	0	7	1	0	1	0	0	9	10.3
17:15	0	0	1	2	0	0	0	0	3	3
17:30	0	0	3	1	0	0	0	0	4	4
17:45	0	0	5	2	0	0	0	0	7	7
H/TOT	0	0	16	6	0	1	0	0	23	24.3
18:00	0	0	13	0	0	0	0	0	13	13
18:15	0	0	2	0	0	0	0	0	2	2
18:30	0	0	9	2	0	0	0	0	11	11
18:45	0	0	4	0	0	0	0	0	4	4
H/TOT	0	0	28	2	0	0	0	0	30	30
12 TOT	0	12	175	28	4	3	2	0	224	224.7

Cork City Council Planning Department. For Inspection Purposes Only!

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 1
Location: Northern Roundabout at Junction 2 of N22 Ballincollig Bypass (Greenfields)
Date: Tue 16-Apr-2024

Arm A - Woodberry
Arm B - N22 ON Ramp
Arm C - L2216
Arm D - N22 OFF Ramp
Arm E - Access to R608

	E => A										E => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	3	2	0	0	0	0	5	5	0	0	60	7	0	0	0	0	67	67
07:15	0	0	7	0	0	0	0	0	7	7	0	0	75	10	3	0	0	0	88	89.5
07:30	0	0	9	0	0	0	0	0	9	9	0	0	96	12	1	0	0	0	109	109.5
07:45	0	0	13	2	0	0	0	0	15	15	0	2	99	11	4	1	0	0	117	119.1
H/TOT	0	0	32	4	0	0	0	0	36	36	0	2	330	40	8	1	0	0	381	385.1
08:00	0	0	20	1	0	0	0	0	21	21	0	0	109	7	1	2	0	0	119	122.1
08:15	0	0	15	0	0	0	0	0	15	15	0	0	92	12	2	0	0	0	106	107
08:30	0	0	27	2	0	0	0	0	29	29	0	0	62	16	3	1	0	0	82	84.8
08:45	0	0	16	1	0	0	1	0	18	19	0	0	60	8	0	0	2	0	70	72
H/TOT	0	0	78	4	0	0	1	0	83	84	0	0	323	43	6	3	2	0	377	385.9
09:00	0	2	12	2	0	0	0	0	16	14.8	0	0	53	4	2	0	0	0	59	60
09:15	0	0	14	2	0	0	0	0	16	16	0	0	60	4	1	1	0	0	66	67.8
09:30	0	0	8	1	0	0	0	0	9	9	0	0	43	1	2	2	1	0	49	53.6
09:45	1	0	11	0	0	0	0	0	12	11.2	0	1	43	7	0	0	0	0	51	50.4
H/TOT	1	2	45	5	0	0	0	0	53	51	0	1	199	16	5	3	1	0	225	231.8
10:00	0	0	10	1	0	0	0	0	11	11	0	0	34	2	3	0	0	0	39	40.5
10:15	0	2	7	1	0	0	1	0	11	10.8	0	1	28	7	0	1	0	0	37	37.7
10:30	0	1	11	2	0	0	0	0	14	13.4	0	1	22	1	1	0	0	0	25	24.9
10:45	0	0	12	2	1	0	0	0	15	15.5	0	0	24	6	0	1	0	0	31	32.3
H/TOT	0	3	40	6	1	0	1	0	51	50.7	0	2	108	16	4	2	0	0	132	135.4
11:00	1	0	8	1	0	0	0	0	10	9.2	0	0	21	1	0	0	1	0	23	24
11:15	0	0	8	1	0	0	0	0	9	9	0	0	26	6	0	0	0	0	32	32
11:30	0	0	14	2	0	0	0	0	16	16	0	0	22	7	1	0	1	0	31	32.5
11:45	0	0	15	1	0	0	0	0	16	16	0	0	34	2	3	2	0	0	41	45.1
H/TOT	1	0	45	5	0	0	0	0	51	50.2	0	0	103	16	4	2	2	0	127	133.6
12:00	0	0	18	0	0	0	0	0	18	18	0	0	20	2	0	0	0	0	22	22
12:15	0	0	12	0	1	0	1	0	14	15.5	0	0	28	5	0	1	0	0	34	35.3
12:30	0	1	12	0	0	0	0	0	13	12.4	0	0	24	1	0	1	0	0	26	27.3
12:45	0	0	11	1	0	0	0	0	12	12	0	0	16	5	0	0	0	0	21	21
H/TOT	0	1	53	1	1	0	1	0	57	57.9	0	0	88	13	0	2	0	0	103	105.6
13:00	0	0	17	0	0	0	0	0	17	17	0	0	29	3	0	0	0	0	32	32
13:15	0	0	16	3	0	0	0	0	19	19	0	0	24	1	1	1	0	0	27	28.8
13:30	0	0	16	3	0	0	0	0	19	19	0	0	28	1	2	1	0	0	32	34.3
13:45	1	0	16	0	0	0	0	0	17	16.2	0	0	25	5	2	0	0	0	32	33
H/TOT	1	0	65	6	0	0	0	0	72	71.2	0	0	106	10	5	2	0	0	123	128.1
14:00	0	0	6	2	2	0	0	0	10	11	0	0	35	1	1	2	0	0	39	42.1
14:15	0	0	12	1	0	0	0	0	13	13	0	0	28	6	0	0	0	0	34	34
14:30	0	0	18	2	0	0	0	0	20	20	0	0	21	3	1	0	0	0	25	25.5
14:45	0	1	14	1	1	0	0	0	17	16.9	0	0	25	2	0	2	0	0	29	31.6
H/TOT	0	1	50	6	3	0	0	0	60	60.9	0	0	109	12	2	4	0	0	127	133.2
15:00	0	0	14	4	0	1	0	0	19	20.3	0	0	37	2	1	0	0	0	40	40.5
15:15	0	0	11	1	1	0	0	0	13	13.5	0	0	29	0	1	1	0	0	31	32.8
15:30	0	0	17	0	0	0	0	0	17	17	0	0	28	3	2	0	1	0	34	36
15:45	0	0	25	2	0	0	0	0	27	27	0	0	28	1	1	0	0	0	30	30.5
H/TOT	0	0	67	7	1	1	0	0	76	77.8	0	0	122	6	5	1	1	0	135	139.8
16:00	0	0	15	2	0	1	0	0	18	19.3	0	0	34	5	1	0	0	0	40	40.5
16:15	0	0	13	0	0	0	0	0	13	13	0	0	27	3	0	0	0	0	30	30
16:30	0	0	21	2	1	0	0	0	24	24.5	0	0	32	1	0	0	0	0	33	33
16:45	0	0	22	1	0	0	0	0	23	23	0	0	30	2	0	0	0	0	32	32
H/TOT	0	0	71	5	1	1	0	0	78	79.8	0	0	123	11	1	0	0	0	135	135.5
17:00	0	0	14	1	0	0	0	0	15	15	0	0	28	12	0	0	0	0	40	40
17:15	0	1	31	1	0	0	0	0	33	32.4	0	0	35	3	0	0	0	0	38	38
17:30	0	0	22	1	0	0	0	0	23	23	0	0	34	0	0	1	0	0	35	36.3
17:45	0	0	25	2	0	0	0	0	27	27	0	0	30	1	0	0	0	0	31	31
H/TOT	0	1	92	5	0	0	0	0	98	97.4	0	0	127	16	0	1	0	0	144	145.3
18:00	0	0	15	2	0	0	0	0	17	17	0	0	36	1	1	0	0	0	38	38.5
18:15	0	0	10	0	0	0	0	0	10	10	0	0	37	3	0	0	0	0	40	40
18:30	0	0	19	1	0	0	0	0	20	20	0	0	45	2	0	0	0	0	47	47
18:45	0	0	19	1	0	0	0	0	20	20	0	0	27	2	0	0	0	0	29	29
H/TOT	0	0	63	4	0	0	0	0	67	67	0	0	145	8	1	0	0	0	154	154.5
12 TOT	3	8	701	58	7	2	3	0	782	783.9	0	5	1883	207	41	21	6	0	2163	2213.8

	E => C										E => D									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	4	1	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
07:15	0	0	5	1	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
07:30	0	0	10	3	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
07:45	0	0	8	3	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	27	8	0	0	0	0	35	35	0	0	0	0	0	0	0	0	0	0
08:00	0	0	5	1	1	0	0	0	7	7.5	0	0	0	0	0	0	0	0	0	0
08:15	0	0	13	3	0	0	0	0	16	16	0	0	0	0	0	0	0	0	0	0
08:30	0	0	7	6	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
08:45	0	0	20	3	0	0	0	0	23	23	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	45	13	1	0	0	0	59	59.5	0	0	0	0	0	0	0	0	0	0
09:00	0	0	15	1	1	0	0	0	17	17.5	0	0	0	0	0	0	0	0	0	0
09:15	0	0	6	1	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
09:30	0	0	8	1	0	1	0	0	10	11.3	0	0	0	0	0	0	0	0	0	0
09:45	0	0	12	0	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	41	3	1	1	0	0	46	47.8	0	0	0	0	0	0	0	0	0	0
10:00	0	0	4	2	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
10:15	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
10:30	0	0	5	1	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
10:45	0	0	7	1	1	0	0	0	9	9.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	19	4	1	0	0	0	24	24.5	0	0	0	0	0	0	0	0	0	0
11:00	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
11:15	0	0	7	1	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
11:30	0	0	10	2	1	0	0	0	13	13.5	0	0	0	0	0	0	0	0	0	0
11:45	0	0	9	2	1	0	0	0	12	12.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	34	5	2	0	0	0	41	42	0	0	0	0	0	0	0	0	0	0
12:00	0	0	12	1	1	0	0	0	14	14.5	0	0	0	0	0	0	0	0	0	0
12:15	0	0	9	2	1	0	0	0	12	12.5	0	0	0	0	0	0	0	0	0	0
12:30	0	0	9	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
12:45	0	0	10	1	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	40	4	2	0	0	0	46	47	0	0	0	0	0	0	0	0	0	0
13:00	0	0	14	0	0	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0
13:15	0	0	15	2	0	0	0	0	17	17	0	0	0	0	0	0	0	0	0	0
13:30	0	0	14	1	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0
13:45	0	0	22	2	0	0	0	0	24	24	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	65	5	0	0	0	0	70	70	0	0	0	0	0	0	0	0	0	0
14:00	0	0	10	1	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
14:15	0	0	10	2	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
14:30	0	0	10	1	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
14:45	0	0	17	0	1	1	0	0	19	20.8	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	47	4	1	1	0	0	53	54.8	0	0	0	0	0	0	0	0	0	0
15:00	0	0	21	1	1	0	0	0	23	23.5	0	0	0	0	0	0	0	0	0	0
15:15	0	0	14	2	0	0	0	0	16	16	0	0	0	0	0	0	0	0	0	0
15:30	0	0	11	4	0	1	0	0	16	17.3	0	0	0	0	0	0	0	0	0	0
15:45	0	0	15	2	0	0	0	0	17	17	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	61	9	1	1	0	0	72	73.8	0	0	0	0	0	0	0	0	0	0
16:00	0	0	19	0	0	0	0	0	19	19	0	0	0	0	0	0	0	0	0	0
16:15	0	0	23	2	0	0	0	0	25	25	0	0	0	0	0	0	0	0	0	0
16:30	0	0	16	2	1	0	0	0	19	19.5	0	0	0	0	0	0	0	0	0	0
16:45	0	0	22	2	1	0	0	0	25	25.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	80	6	2	0	0	0	88	89	0	0	0	0	0	0	0	0	0	0
17:00	0	0	17	2	1	0	0	0	20	20.5	0	0	0	0	0	0	0	0	0	0
17:15	0	0	20	2	0	0	0	0	22	22	0	0	0	0	0	0	0	0	0	0
17:30	0	0	20	3	1	0	0	0	24	24.5	0	0	0	0	0	0	0	0	0	0
17:45	0	0	31	3	1	0	0	1	36	36.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	88	10	3	0	0	1	102	103.5	0	0	0	0	0	0	0	0	0	0
18:00	0	0	13	2	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0
18:15	0	0	13	0	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
18:30	0	0	21	2	0	0	0	0	23	23	0	0	0	0	0	0	0	0	0	0
18:45	0	0	32	1	0	0	0	0	33	33	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	79	5	0	0	0	0	84	84	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	626	76	14	3	0	1	720	730.9	0	0	0	0	0	0	0	0	0	0

	E => E									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	1	0	0	0	0	0	1	1
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	1	0	0	0	0	0	1	1
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	1	0	0	0	0	0	1	1
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	3	0	0	0	0	0	3	3

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 2
Location: Greenfields Rd/Flynn's Rd/Castle Rd
Date: Tue 16-Apr-2024

Arm A - Castle Rd
Arm B - Greenfields Road
Arm C - Flynn's Road

	A => A										A => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	24	3	0	0	0	0	27	27
07:15	0	0	0	0	0	0	0	0	0	0	0	0	17	4	1	1	0	0	23	24.8
07:30	0	0	0	0	0	0	0	0	0	0	0	1	15	4	2	0	0	0	22	22.4
07:45	0	0	0	0	0	0	0	0	0	0	0	0	32	5	0	0	0	0	37	37
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	88	16	3	1	0	0	109	111.2
08:00	0	0	0	0	0	0	0	0	0	0	0	1	53	7	1	2	0	0	64	66.5
08:15	0	0	0	0	0	0	0	0	0	0	0	0	39	4	1	0	1	0	45	46.5
08:30	0	0	0	0	0	0	0	0	0	0	0	0	41	7	1	0	2	0	51	53.5
08:45	0	0	0	1	0	0	0	0	1	1	0	0	56	7	0	1	0	0	64	65.3
H/TOT	0	0	0	1	0	0	0	0	1	1	0	1	189	25	3	3	3	0	224	231.8
09:00	0	0	0	0	0	0	0	0	0	0	0	0	51	3	0	1	1	0	56	58.3
09:15	0	0	0	0	0	0	0	0	0	0	0	0	34	0	3	0	0	0	37	38.5
09:30	0	0	0	0	0	0	0	0	0	0	0	0	20	1	0	1	0	0	22	23.3
09:45	0	0	0	0	0	0	0	0	0	0	0	0	27	7	0	2	0	0	36	38.6
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	132	11	3	4	1	0	151	158.7
10:00	0	0	0	0	0	0	0	0	0	0	0	0	23	3	0	0	0	0	26	26
10:15	0	0	0	0	0	0	0	0	0	0	0	0	9	3	1	2	0	0	15	18.1
10:30	0	0	1	0	0	0	0	0	1	1	0	0	20	5	1	0	0	0	26	26.5
10:45	0	0	0	0	0	0	0	0	0	0	1	0	29	1	3	0	0	0	34	34.7
H/TOT	0	0	1	0	0	0	0	0	1	1	1	0	81	12	5	2	0	0	101	105.3
11:00	0	0	0	0	0	0	0	0	0	0	0	0	27	5	1	0	0	0	33	33.5
11:15	0	0	0	0	0	0	0	0	0	0	0	0	35	5	1	0	0	0	41	41.5
11:30	0	0	0	0	0	0	0	0	0	0	0	0	37	3	0	0	1	0	41	42
11:45	0	0	0	0	0	0	0	0	0	0	0	0	37	3	0	0	0	0	40	40
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	136	16	2	0	1	0	155	157
12:00	0	0	0	0	0	0	0	0	0	0	0	2	41	5	1	0	0	0	49	48.3
12:15	0	0	0	0	0	0	0	0	0	0	0	0	43	4	1	0	1	0	49	50.5
12:30	0	0	0	0	0	0	0	0	0	0	0	0	38	7	0	0	0	0	45	45
12:45	0	0	0	0	0	0	0	0	0	0	0	0	48	4	2	1	0	0	55	57.3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	2	170	20	4	1	1	0	198	201.1
13:00	0	0	0	0	0	0	0	0	0	0	0	0	25	4	2	0	0	0	31	32
13:15	0	0	0	0	0	0	0	0	0	0	0	2	49	1	1	0	0	0	53	52.3
13:30	0	0	0	0	0	0	0	0	0	0	0	0	42	5	2	0	1	0	50	52
13:45	0	0	0	0	0	0	0	0	0	0	0	0	31	3	2	0	0	0	36	37
H/TOT	0	0	0	0	0	0	0	0	0	0	0	2	147	13	7	0	1	0	170	173.3
14:00	0	0	0	0	0	0	0	0	0	0	0	0	68	2	1	1	0	0	72	73.8
14:15	0	0	0	0	0	0	0	0	0	0	0	0	42	3	1	0	0	0	46	46.5
14:30	0	0	0	0	0	0	0	0	0	0	0	2	41	0	1	0	0	0	44	43.3
14:45	0	0	0	0	0	0	0	0	0	0	0	0	43	4	2	0	0	0	49	50
H/TOT	0	0	0	0	0	0	0	0	0	0	0	2	194	9	5	1	0	0	211	213.6
15:00	0	0	0	0	0	0	0	0	0	0	0	0	63	3	1	0	4	0	71	75.5
15:15	0	0	0	0	0	0	0	0	0	0	0	1	60	3	1	1	0	0	66	67.2
15:30	0	0	0	0	0	0	0	0	0	0	0	1	61	5	2	0	0	0	69	69.4
15:45	0	0	0	0	0	0	0	0	0	0	0	0	53	6	1	0	0	0	60	60.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	2	237	17	5	1	4	0	266	272.6
16:00	0	0	0	0	0	0	0	0	0	0	0	2	108	8	2	0	0	0	120	119.8
16:15	0	0	0	0	0	0	0	0	0	0	0	0	98	8	1	0	2	0	109	111.5
16:30	0	0	0	0	0	0	0	0	0	0	0	0	61	6	0	1	0	0	68	69.3
16:45	0	0	0	0	0	0	0	0	0	0	0	0	66	9	2	0	0	0	77	78
H/TOT	0	0	0	0	0	0	0	0	0	0	0	2	333	31	5	1	2	0	374	378.6
17:00	0	0	0	0	0	0	0	0	0	0	1	0	76	11	0	0	1	0	89	89.2
17:15	0	0	0	0	0	0	0	0	0	0	0	0	73	8	1	0	0	0	82	82.5
17:30	0	0	0	0	0	0	0	0	0	0	0	0	87	7	2	0	0	0	96	97
17:45	0	0	0	0	0	0	0	0	0	0	0	0	77	5	0	1	0	0	83	84.3
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	313	31	3	1	1	0	350	353
18:00	0	0	0	0	0	0	0	0	0	0	0	0	64	7	0	1	0	0	72	73.3
18:15	0	0	0	0	0	0	0	0	0	0	0	1	65	4	0	0	0	0	70	69.4
18:30	0	0	0	0	0	0	0	0	0	0	0	0	71	5	1	0	0	0	77	77.5
18:45	0	0	0	0	0	0	0	0	0	0	0	1	58	3	1	0	0	0	63	62.9
H/TOT	0	0	0	0	0	0	0	0	0	0	0	2	258	19	2	1	0	0	282	283.1
12 TOT	0	0	1	1	0	0	0	0	2	2	2	14	2278	220	47	16	14	0	2591	2639.3

	A => C										B => A									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	3	3	0	0	0	0	6	6	0	0	12	2	0	0	0	0	14	14
07:15	0	0	7	0	0	0	0	0	7	7	0	0	24	3	0	0	0	0	27	27
07:30	1	0	15	3	1	0	0	0	20	19.7	0	0	39	4	0	0	0	0	43	43
07:45	0	0	14	0	1	0	0	0	15	15.5	0	0	49	13	1	2	1	0	66	70.1
H/TOT	1	0	39	6	2	0	0	0	48	48.2	0	0	124	22	1	2	1	0	150	154.1
08:00	0	0	23	0	0	0	2	0	25	27	0	0	57	8	1	0	0	0	66	66.5
08:15	0	0	24	1	0	0	1	0	26	27	0	0	73	5	1	0	0	0	79	79.5
08:30	0	0	22	4	0	0	0	0	26	26	0	0	129	9	1	1	0	0	140	141.8
08:45	0	1	43	3	0	0	0	0	47	46.4	0	0	67	2	4	0	0	0	73	75
H/TOT	0	1	112	8	0	0	3	0	124	126.4	0	0	326	24	7	1	0	0	358	362.8
09:00	0	0	35	3	2	0	0	0	40	41	0	0	49	4	0	0	0	0	53	53
09:15	0	0	21	0	2	0	0	0	23	24	0	0	69	7	0	0	1	0	77	78
09:30	0	0	10	1	0	0	0	0	11	11	0	0	38	4	1	1	0	0	44	45.8
09:45	0	1	20	3	2	0	0	0	26	26.4	0	0	38	6	2	0	0	0	46	47
H/TOT	0	1	86	7	6	0	0	0	100	102.4	0	0	194	21	3	1	1	0	220	223.8
10:00	0	0	12	3	0	0	1	0	16	17	0	0	32	6	0	0	0	0	38	38
10:15	0	0	15	2	0	0	0	0	17	17	1	0	27	4	1	1	0	0	34	35
10:30	0	0	11	2	0	1	0	0	14	15.3	0	0	30	3	1	0	1	0	35	36.5
10:45	0	0	22	0	0	0	0	0	22	22	0	0	36	5	2	0	0	0	43	44
H/TOT	0	0	60	7	0	1	1	0	69	71.3	1	0	125	18	4	1	1	0	150	153.5
11:00	0	0	16	6	0	0	0	0	22	22	1	1	23	6	1	1	0	0	33	33.4
11:15	0	0	21	4	1	0	0	0	26	26.5	0	0	31	8	1	0	0	0	40	40.5
11:30	0	1	15	3	1	0	0	0	20	19.9	0	0	44	4	1	0	0	0	49	49.5
11:45	0	0	25	4	1	0	0	0	30	30.5	0	0	31	3	1	0	0	0	35	35.5
H/TOT	0	1	77	17	3	0	0	0	98	98.9	1	1	129	21	4	1	0	0	157	158.9
12:00	0	0	20	3	0	0	0	0	23	23	0	0	38	6	0	0	0	0	44	44
12:15	0	0	21	1	1	0	0	0	23	23.5	1	0	40	3	2	1	1	0	48	50.5
12:30	0	0	17	3	0	0	0	0	20	20	0	1	36	3	0	0	0	0	40	39.4
12:45	0	0	28	1	1	0	0	0	30	30.5	0	0	25	3	1	0	0	0	29	29.5
H/TOT	0	0	86	8	2	0	0	0	96	97	1	1	139	15	3	1	1	0	161	163.4
13:00	0	0	26	3	0	0	0	0	29	29	0	0	46	4	0	1	0	0	51	52.3
13:15	0	0	16	1	0	0	0	0	17	17	0	0	31	4	1	0	0	0	36	36.5
13:30	0	0	26	4	0	0	0	0	30	30	0	0	43	3	1	0	0	0	47	47.5
13:45	0	0	17	0	0	0	0	0	17	17	1	0	54	4	2	0	0	0	61	61.2
H/TOT	0	0	85	8	0	0	0	0	93	93	1	0	174	15	4	1	0	0	195	197.5
14:00	0	0	18	3	0	0	1	0	22	23	0	0	38	3	2	1	0	0	44	46.3
14:15	0	0	18	2	0	0	0	0	20	20	0	1	44	2	0	0	0	0	47	46.4
14:30	0	0	23	1	1	0	0	0	25	25.5	0	0	37	0	2	0	0	0	39	40
14:45	0	0	26	3	0	0	0	0	29	29	0	1	66	4	4	0	0	0	75	76.4
H/TOT	0	0	85	9	1	0	1	0	96	97.5	0	2	185	9	8	1	0	0	205	209.1
15:00	0	0	42	2	0	1	1	0	46	48.3	0	0	50	2	2	1	0	0	55	57.3
15:15	0	0	30	3	0	0	0	0	33	33	0	0	50	9	1	0	0	0	60	60.5
15:30	0	0	28	1	0	0	0	0	29	29	0	0	46	5	3	0	0	0	54	55.5
15:45	0	0	26	5	0	0	0	0	31	31	0	0	58	7	0	0	0	0	65	65
H/TOT	0	0	126	11	0	1	1	0	139	141.3	0	0	204	23	6	1	0	0	234	238.3
16:00	0	0	40	2	0	1	0	0	43	44.3	0	0	54	3	1	1	0	0	59	60.8
16:15	0	0	31	7	0	0	0	0	38	38	0	0	60	8	3	0	0	0	71	72.5
16:30	0	0	39	1	0	0	0	0	40	40	0	0	73	9	4	0	0	0	86	88
16:45	0	0	42	4	0	0	0	0	46	46	0	0	64	10	0	0	0	0	74	74
H/TOT	0	0	152	14	0	1	0	0	167	168.3	0	0	251	30	8	1	0	0	290	295.3
17:00	0	0	42	3	0	0	0	0	45	45	0	0	55	5	0	0	0	0	60	60
17:15	1	0	46	7	1	0	0	0	55	54.7	0	1	71	3	1	0	0	0	76	75.9
17:30	0	0	29	6	0	0	0	0	35	35	0	0	49	6	0	0	0	0	55	55
17:45	0	0	34	3	0	0	0	0	37	37	0	0	70	5	1	0	0	0	76	76.5
H/TOT	1	0	151	19	1	0	0	0	172	171.7	0	1	245	19	2	0	0	0	267	267.4
18:00	0	0	23	2	0	0	0	0	25	25	0	0	54	6	0	1	0	0	61	62.3
18:15	0	0	43	3	0	0	0	0	46	46	0	0	55	4	1	0	0	0	60	60.5
18:30	0	0	26	2	0	0	0	0	28	28	0	0	49	3	0	0	0	0	52	52
18:45	0	0	17	1	0	0	0	0	18	18	0	0	51	0	0	0	0	0	51	51
H/TOT	0	0	109	8	0	0	0	0	117	117	0	0	209	13	1	1	0	0	224	225.8
12 TOT	2	3	1168	122	15	3	6	0	1319	1333	4	5	2305	230	51	12	4	0	2611	2649.9

	B => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0

Cork City Council Planning Department. For Inspection Purposes Only!

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 2
Location: Greenfields Rd/Flynn's Rd/Castle Rd
Date: Tue 16-Apr-2024

Arm A - Castle Rd
Arm B - Greenfields Road
Arm C - Flynn's Road

	B => C										C => A									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	7	1	0	0	0	0	8	8	0	0	8	3	0	0	1	0	12	13
07:15	0	0	11	5	0	0	0	0	16	16	0	0	13	2	0	0	0	0	15	15
07:30	0	0	19	2	2	1	0	0	24	26.3	1	0	17	5	0	0	0	0	23	22.2
07:45	0	0	31	6	0	0	0	0	37	37	0	0	15	2	2	0	0	0	19	20
H/TOT	0	0	68	14	2	1	0	0	85	87.3	1	0	53	12	2	0	1	0	69	70.2
08:00	0	1	54	10	1	0	0	0	66	65.9	0	0	18	3	0	0	0	0	21	21
08:15	0	0	56	3	0	0	1	0	60	61	0	0	27	0	1	0	0	0	28	28.5
08:30	0	1	60	2	0	1	0	0	64	64.7	0	0	30	3	0	0	0	0	33	33
08:45	0	0	43	3	0	0	0	0	46	46	0	0	28	3	1	0	0	0	32	32.5
H/TOT	0	2	213	18	1	1	1	0	236	237.6	0	0	103	9	2	0	0	0	114	115
09:00	0	0	45	9	0	1	0	0	55	56.3	0	0	17	3	1	0	0	0	21	21.5
09:15	0	0	38	3	0	0	0	0	41	41	0	2	18	5	0	0	0	0	25	23.8
09:30	0	0	26	3	0	0	0	0	29	29	0	0	15	1	0	0	0	0	16	16
09:45	0	0	22	3	0	2	0	0	27	29.6	0	0	11	2	0	0	0	0	13	13
H/TOT	0	0	131	18	0	3	0	0	152	155.9	0	2	61	11	1	0	0	0	75	74.3
10:00	0	0	23	5	0	0	0	0	28	28	0	0	17	5	0	0	0	0	22	22
10:15	0	0	13	2	0	0	2	0	17	19	0	3	12	0	0	0	0	0	15	13.2
10:30	0	0	14	1	1	1	0	0	17	18.8	0	1	19	1	1	0	0	0	22	21.9
10:45	0	0	27	2	0	0	0	0	29	29	1	0	11	3	0	0	0	0	15	14.2
H/TOT	0	0	77	10	1	1	2	0	91	94.8	1	4	59	9	1	0	0	0	74	71.3
11:00	0	1	19	4	1	0	0	0	25	24.9	0	0	12	1	0	0	0	0	13	13
11:15	0	0	15	4	1	0	0	0	20	20.5	0	0	12	4	1	0	0	0	17	17.5
11:30	0	0	19	7	0	0	0	0	26	26	0	0	7	1	0	0	0	1	9	9
11:45	0	1	17	1	0	0	0	0	19	18.4	0	0	16	5	0	0	0	0	21	21
H/TOT	0	2	70	16	2	0	0	0	90	89.8	0	0	47	11	1	0	0	1	60	60.5
12:00	0	0	25	3	0	1	0	0	29	30.3	0	0	11	0	0	0	0	0	11	11
12:15	0	0	24	2	1	1	0	0	28	29.8	0	0	23	1	0	0	0	0	24	24
12:30	0	0	23	2	0	0	0	0	25	25	0	0	15	0	0	0	0	0	15	15
12:45	0	0	15	3	0	0	0	0	18	18	0	0	14	1	0	0	0	0	15	15
H/TOT	0	0	87	10	1	2	0	0	100	103.1	0	0	63	2	0	0	0	0	65	65
13:00	0	0	20	3	1	0	0	0	24	24.5	0	0	23	3	0	0	0	0	26	26
13:15	0	0	17	2	2	0	0	0	21	22	0	0	16	1	0	0	1	0	18	19
13:30	0	0	27	2	0	0	0	0	29	29	0	0	12	2	1	0	1	0	16	17.5
13:45	0	0	28	0	3	0	0	0	31	32.5	0	0	20	0	0	0	0	0	20	20
H/TOT	0	0	92	7	6	0	0	0	105	108	0	0	71	6	1	0	2	0	80	82.5
14:00	0	1	25	3	0	0	0	0	29	28.4	0	0	20	1	2	0	0	0	23	24
14:15	0	0	26	1	2	0	0	0	29	30	0	0	14	2	0	0	0	0	16	16
14:30	0	0	31	3	1	0	0	0	35	35.5	0	0	14	3	0	0	1	0	18	19
14:45	0	0	23	4	0	1	0	0	28	29.3	0	0	32	3	0	0	0	0	35	35
H/TOT	0	1	105	11	3	1	0	0	121	123.2	0	0	80	9	2	0	1	0	92	94
15:00	0	0	24	8	0	0	0	0	32	32	0	0	24	2	1	0	0	0	27	27.5
15:15	0	0	40	3	1	0	0	0	44	44.5	0	0	23	1	1	0	0	0	25	25.5
15:30	0	0	33	2	2	1	0	0	38	40.3	0	0	16	3	0	1	0	0	20	21.3
15:45	0	0	27	1	1	0	0	0	29	29.5	0	0	26	1	2	0	0	0	29	30
H/TOT	0	0	124	14	4	1	0	0	143	146.3	0	0	89	7	4	1	0	0	101	104.3
16:00	0	0	19	3	0	2	0	0	24	26.6	0	0	24	2	0	0	0	0	26	26
16:15	0	0	28	1	0	0	0	0	29	29	0	0	18	2	0	0	0	0	20	20
16:30	0	0	33	5	2	0	0	0	40	41	0	0	21	4	0	0	0	0	25	25
16:45	0	1	34	2	0	0	0	0	37	36.4	0	0	25	4	2	0	0	0	31	32
H/TOT	0	1	114	11	2	2	0	0	130	133	0	0	88	12	2	0	0	0	102	103
17:00	0	0	27	6	0	0	0	0	33	33	0	0	33	2	0	0	0	0	35	35
17:15	0	0	37	5	0	0	0	0	42	42	0	0	22	2	0	1	0	0	25	26.3
17:30	0	0	38	4	0	0	0	0	42	42	0	0	25	2	0	0	0	0	27	27
17:45	0	0	24	6	0	0	0	0	30	30	0	0	22	0	0	0	0	0	22	22
H/TOT	0	0	126	21	0	0	0	0	147	147	0	0	102	6	0	1	0	0	109	110.3
18:00	0	0	26	2	1	0	0	0	29	29.5	0	0	25	3	0	0	0	0	28	28
18:15	0	0	40	3	0	0	0	0	43	43	0	0	18	1	0	0	0	0	19	19
18:30	0	0	23	1	0	0	0	0	24	24	0	1	21	1	0	0	0	0	23	22.4
18:45	0	0	28	1	1	0	0	0	30	30.5	0	0	19	1	0	0	0	0	20	20
H/TOT	0	0	117	7	2	0	0	0	126	127	0	1	83	6	0	0	0	0	90	89.4
12 TOT	0	6	1324	157	24	12	3	0	1526	1553	2	7	899	100	16	2	4	1	1031	1039.8

	C => B										C => C									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	12	3	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0
07:15	0	0	10	11	1	0	0	0	22	22.5	0	0	0	0	0	0	0	0	0	0
07:30	0	0	13	3	1	2	0	0	19	22.1	0	0	0	0	0	0	0	0	0	0
07:45	0	0	16	4	2	0	0	0	22	23	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	51	21	4	2	0	0	78	82.6	0	0	0	0	0	0	0	0	0	0
08:00	0	0	36	3	2	0	0	0	41	42	0	0	0	0	0	0	0	0	0	0
08:15	0	0	21	2	0	0	0	0	23	23	0	0	0	0	0	0	0	0	0	0
08:30	0	0	28	3	0	0	0	0	31	31	0	0	0	0	0	0	0	0	0	0
08:45	0	0	27	6	0	0	0	0	33	33	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	112	14	2	0	0	0	128	129	0	0	1	0	0	0	0	0	1	1
09:00	0	0	13	2	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0
09:15	0	0	19	3	1	0	0	0	23	23.5	0	0	0	0	0	0	0	0	0	0
09:30	0	0	14	2	3	0	0	0	19	20.5	0	0	0	0	0	0	0	0	0	0
09:45	0	0	7	3	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	53	10	4	0	0	0	67	69	0	0	0	0	0	0	0	0	0	0
10:00	0	0	11	4	1	1	0	0	17	18.8	0	0	0	0	0	0	0	0	0	0
10:15	0	0	9	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
10:30	0	0	7	2	2	0	0	0	11	12	0	0	0	0	0	0	0	0	0	0
10:45	0	0	7	1	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	34	7	3	1	0	0	45	47.8	0	0	0	0	0	0	0	0	0	0
11:00	0	0	5	3	2	1	0	0	11	13.3	0	0	0	0	0	0	0	0	0	0
11:15	1	0	11	3	0	0	0	0	15	14.2	0	0	0	0	0	0	0	0	0	0
11:30	0	0	12	1	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
11:45	0	0	12	3	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	40	10	2	1	0	0	54	55.5	0	0	0	0	0	0	0	0	0	0
12:00	0	0	7	0	1	0	1	0	9	10.5	0	0	0	0	0	0	0	0	0	0
12:15	0	0	15	3	0	1	0	0	19	20.3	0	0	0	0	0	0	0	0	0	0
12:30	0	0	16	4	0	1	1	0	22	24.3	0	0	0	0	0	0	0	0	0	0
12:45	0	0	15	2	1	1	0	0	19	20.8	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	53	9	2	3	2	0	69	75.9	0	0	0	0	0	0	0	0	0	0
13:00	0	0	16	6	0	0	0	0	22	22	0	0	0	0	0	0	0	0	0	0
13:15	0	0	20	3	0	0	0	0	23	23	0	0	0	0	0	0	0	0	0	0
13:30	0	0	15	5	1	0	0	0	21	21.5	0	0	0	0	0	0	0	0	0	0
13:45	0	0	18	3	0	0	0	0	21	21	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	69	17	1	0	0	0	87	87.5	0	0	0	0	0	0	0	0	0	0
14:00	0	0	20	1	1	0	0	0	22	22.5	0	0	0	0	0	0	0	0	0	0
14:15	0	0	22	3	0	0	0	0	25	25	0	0	0	0	0	0	0	0	0	0
14:30	0	0	17	4	0	0	0	0	21	21	0	0	0	0	0	0	0	0	0	0
14:45	0	0	11	1	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	70	9	1	0	0	0	80	80.5	0	0	0	0	0	0	0	0	0	0
15:00	0	1	29	0	0	0	0	0	30	29.4	0	0	0	0	0	0	0	0	0	0
15:15	0	0	23	4	0	0	0	0	27	27	0	0	0	0	0	0	0	0	0	0
15:30	0	0	25	8	4	0	0	0	37	39	0	0	0	0	0	0	0	0	0	0
15:45	0	1	42	1	0	0	0	0	44	43.4	0	0	0	0	0	0	0	0	0	0
H/TOT	0	2	119	13	4	0	0	0	138	138.8	0	0	0	0	0	0	0	0	0	0
16:00	0	0	41	4	0	0	1	0	46	47	0	0	0	0	0	0	0	0	0	0
16:15	0	0	29	5	0	1	0	0	35	36.3	0	0	0	0	0	0	0	0	0	0
16:30	0	1	21	0	0	1	0	0	23	23.7	0	0	0	0	0	0	0	0	0	0
16:45	0	0	32	3	0	0	0	0	35	35	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	123	12	0	2	1	0	139	142	0	0	0	0	0	0	0	0	0	0
17:00	0	0	30	2	0	0	0	0	32	32	0	0	0	0	0	0	0	0	0	0
17:15	0	0	30	2	0	1	0	0	33	34.3	0	0	0	0	0	0	0	0	0	0
17:30	0	0	41	2	0	0	0	0	43	43	0	0	0	0	0	0	0	0	0	0
17:45	0	0	36	4	0	0	0	0	40	40	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	137	10	0	1	0	0	148	149.3	0	0	0	0	0	0	0	0	0	0
18:00	0	0	29	3	0	0	0	0	32	32	0	0	0	0	0	0	0	0	0	0
18:15	0	0	17	3	1	0	0	0	21	21.5	0	0	0	0	0	0	0	0	0	0
18:30	0	0	17	2	0	0	0	0	19	19	0	0	0	0	0	0	0	0	0	0
18:45	0	0	17	1	0	0	0	0	18	18	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	80	9	1	0	0	0	90	90.5	0	0	0	0	0	0	0	0	0	0
12 TOT	1	3	941	141	24	10	3	0	1123	1148.4	0	0	1	0	0	0	0	0	1	1

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 3
Location: Castle Rd/Sunningdale/Maglin Rd
Date: Tue 16-Apr-2024

Arm A - Sunningdale
Arm B - Maglin Rd
Arm C - Castle Rd

	A => A										A => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6
07:15	0	0	0	0	0	0	0	0	0	0	0	0	6	1	1	0	0	0	8	8.5
07:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2.5
07:45	0	0	0	0	0	0	0	0	0	0	0	0	5	2	1	0	0	0	8	8.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	18	3	3	0	0	0	24	25.5
08:00	0	0	0	0	0	0	0	0	0	0	0	0	11	1	1	0	0	0	13	13.5
08:15	0	0	0	0	0	0	0	0	0	0	0	0	10	2	0	0	0	0	12	12
08:30	0	0	0	0	0	0	0	0	0	0	0	0	21	2	1	0	0	0	24	24.5
08:45	0	0	0	0	0	0	0	0	0	0	0	0	25	2	0	0	0	0	27	27
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	67	7	2	0	0	0	76	77
09:00	0	0	0	0	0	0	0	0	0	0	0	0	12	0	1	0	1	0	14	15.5
09:15	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	0	0	9	9
09:30	0	0	0	0	0	0	0	0	0	0	0	0	10	3	0	0	0	0	13	13
09:45	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	10	10
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	40	4	1	0	1	0	46	47.5
10:00	0	0	0	0	0	0	0	0	0	0	0	0	12	2	0	0	0	0	14	14
10:15	0	0	0	0	0	0	0	0	0	0	0	0	15	3	0	0	0	0	18	18
10:30	0	0	0	0	0	0	0	0	0	0	0	0	13	3	0	0	0	0	16	16
10:45	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	49	8	0	0	0	0	57	57
11:00	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3
11:15	0	0	0	0	0	0	0	0	0	0	0	0	15	1	0	0	0	0	16	16
11:30	0	0	0	0	0	0	0	0	0	0	0	0	16	1	0	0	0	0	17	17
11:45	0	0	0	0	0	0	0	0	0	0	0	0	14	4	0	0	0	0	18	18
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	48	6	0	0	0	0	54	54
12:00	0	0	0	0	0	0	0	0	0	0	0	0	15	4	0	0	0	0	19	19
12:15	0	0	0	0	0	0	0	0	0	0	0	0	17	2	0	0	0	0	19	19
12:30	0	0	0	0	0	0	0	0	0	0	0	0	18	2	0	0	0	0	20	20
12:45	0	0	0	0	0	0	0	0	0	0	0	0	13	2	0	0	0	0	15	15
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	63	10	0	0	0	0	73	73
13:00	0	0	0	0	0	0	0	0	0	0	0	0	16	2	0	0	0	0	18	18
13:15	0	0	0	0	0	0	0	0	0	0	0	0	11	3	0	0	0	0	14	14
13:30	0	0	0	0	0	0	0	0	0	0	0	0	16	2	1	0	0	0	19	19.5
13:45	0	0	0	0	0	0	0	0	0	0	0	0	14	2	0	0	0	0	16	16
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	57	9	1	0	0	0	67	67.5
14:00	0	0	0	0	0	0	0	0	0	0	0	0	22	3	0	0	0	0	25	25
14:15	0	0	0	0	0	0	0	0	0	0	0	0	12	2	1	0	0	0	15	15.5
14:30	0	0	0	0	0	0	0	0	0	0	0	0	9	2	0	1	0	0	12	13.3
14:45	0	0	0	0	0	0	0	0	0	0	0	0	16	0	2	0	0	0	18	19
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	59	7	3	1	0	0	70	72.8
15:00	0	0	0	0	0	0	0	0	0	0	0	0	25	1	0	0	0	0	26	26
15:15	0	0	0	0	0	0	0	0	0	0	0	0	20	2	0	0	0	0	22	22
15:30	0	0	0	0	0	0	0	0	0	0	0	0	20	5	0	0	0	0	25	25
15:45	0	0	0	0	0	0	0	0	0	0	0	0	22	1	0	0	0	0	23	23
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	87	9	0	0	0	0	96	96
16:00	0	0	0	0	0	0	0	0	0	0	0	0	30	4	0	0	0	0	34	34
16:15	0	0	0	0	0	0	0	0	0	0	0	0	22	1	0	0	0	0	23	23
16:30	0	0	0	0	0	0	0	0	0	0	0	0	29	1	0	0	0	0	30	30
16:45	0	0	0	0	0	0	0	0	0	0	0	0	21	1	0	0	0	0	22	22
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	102	7	0	0	0	0	109	109
17:00	0	0	0	0	0	0	0	0	0	0	0	0	19	4	0	0	0	0	23	23
17:15	0	0	0	0	0	0	0	0	0	0	0	0	28	3	0	0	0	0	31	31
17:30	0	0	0	0	0	0	0	0	0	0	1	0	20	0	0	0	0	0	21	20.2
17:45	0	0	0	0	0	0	0	0	0	0	1	0	24	3	0	0	0	0	28	27.2
H/TOT	0	0	0	0	0	0	0	0	0	0	2	0	91	10	0	0	0	0	103	101.4
18:00	0	0	0	0	0	0	0	0	0	0	1	0	23	3	0	0	0	0	27	26.2
18:15	0	0	0	0	0	0	0	0	0	0	0	0	18	2	0	0	0	0	20	20
18:30	0	0	0	0	0	0	0	0	0	0	0	0	12	1	0	0	0	0	13	13
18:45	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	14	14
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	67	6	0	0	0	0	74	73.2
12 TOT	0	0	0	0	0	0	0	0	0	0	3	0	748	86	10	1	1	0	849	853.9

	A => C										B => A									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	17	3	0	0	0	0	20	20	0	0	3	1	0	0	0	0	4	4
07:15	0	0	20	3	0	0	0	0	23	23	0	0	4	0	1	0	0	0	5	5.5
07:30	0	0	19	4	2	0	0	0	25	26	0	0	11	1	1	0	0	0	13	13.5
07:45	0	0	40	2	1	0	0	0	43	43.5	2	0	16	2	0	0	0	0	20	18.4
H/TOT	0	0	96	12	3	0	0	0	111	112.5	2	0	34	4	2	0	0	0	42	41.4
08:00	0	0	57	8	0	1	1	0	67	69.3	0	0	20	2	1	0	0	0	23	23.5
08:15	0	0	51	7	0	0	0	0	58	58	0	0	19	2	0	0	0	0	21	21
08:30	0	0	62	6	1	0	2	0	71	73.5	0	0	25	2	0	0	0	0	27	27
08:45	0	0	75	10	0	0	0	0	85	85	0	0	26	2	0	0	0	0	28	28
H/TOT	0	0	245	31	1	1	3	0	281	285.8	0	0	90	8	1	0	0	0	99	99.5
09:00	0	0	67	4	2	1	1	0	75	78.3	1	0	26	2	0	0	0	0	29	28.2
09:15	0	0	47	3	3	0	0	0	53	54.5	0	0	21	4	0	0	0	0	25	25
09:30	0	0	31	4	0	0	0	0	35	35	0	0	13	1	0	0	0	0	14	14
09:45	0	1	39	8	2	1	0	0	51	52.7	0	0	14	3	0	0	0	0	17	17
H/TOT	0	1	184	19	7	2	1	0	214	220.5	1	0	74	10	0	0	0	0	85	84.2
10:00	0	0	30	3	0	0	0	0	33	33	1	0	15	0	0	0	0	0	16	15.2
10:15	0	0	25	2	1	1	0	0	29	30.8	0	0	10	3	0	0	0	0	13	13
10:30	0	0	23	6	1	1	0	0	31	32.8	0	0	22	0	0	0	0	0	22	22
10:45	1	0	42	1	2	0	0	0	46	46.2	0	0	15	2	0	0	0	0	17	17
H/TOT	1	0	120	12	4	2	0	0	139	142.8	1	0	62	5	0	0	0	0	68	67.2
11:00	0	0	49	10	0	0	0	0	59	59	0	0	12	0	0	0	0	0	12	12
11:15	0	0	45	8	1	0	0	0	54	54.5	0	0	8	2	0	0	0	0	10	10
11:30	0	1	51	5	1	0	1	0	59	59.9	0	0	15	0	0	0	0	0	15	15
11:45	0	0	52	7	1	0	0	0	60	60.5	0	0	16	0	0	0	0	0	16	16
H/TOT	0	1	197	30	3	0	1	0	232	233.9	0	0	51	2	0	0	0	0	53	53
12:00	0	2	51	5	1	0	0	0	59	58.3	1	0	10	3	1	0	0	0	15	14.7
12:15	0	0	59	7	1	0	0	0	67	67.5	0	0	20	4	0	0	0	0	24	24
12:30	0	0	56	10	0	0	0	0	66	66	0	0	6	2	0	0	0	0	8	8
12:45	0	0	70	3	3	0	0	0	76	77.5	0	0	10	4	0	0	0	0	14	14
H/TOT	0	2	236	25	5	0	0	0	268	269.3	1	0	46	13	1	0	0	0	61	60.7
13:00	0	0	41	7	1	0	0	0	49	49.5	0	0	15	0	1	0	0	0	16	16.5
13:15	0	1	69	4	1	0	0	0	75	74.9	0	0	16	3	0	0	0	0	19	19
13:30	0	0	52	6	0	0	0	0	58	58	0	0	18	0	1	0	0	0	19	19.5
13:45	0	0	49	3	1	0	0	0	53	53.5	0	0	23	3	1	0	0	0	27	27.5
H/TOT	0	1	211	20	3	0	0	0	235	235.9	0	0	72	6	3	0	0	0	81	82.5
14:00	0	0	88	6	0	0	1	0	95	96	0	0	14	1	0	0	0	0	15	15
14:15	0	2	53	1	0	0	0	0	56	54.8	0	0	10	1	0	0	0	0	11	11
14:30	0	0	54	1	1	0	0	0	56	56.5	0	0	18	1	0	0	0	0	19	19
14:45	0	0	60	7	0	0	0	0	67	67	0	0	13	1	0	0	0	0	14	14
H/TOT	0	2	255	15	1	0	1	0	274	274.3	0	0	55	4	0	0	0	0	59	59
15:00	0	0	95	8	0	1	5	0	109	115.3	0	0	20	0	1	0	0	0	21	21.5
15:15	0	0	81	5	1	1	0	0	88	89.8	0	0	19	5	1	0	0	0	25	25.5
15:30	0	1	77	3	1	0	0	0	82	81.9	0	0	17	1	0	0	0	0	18	18
15:45	0	3	73	10	1	0	0	0	87	85.7	0	0	19	0	0	0	0	0	19	19
H/TOT	0	4	326	26	3	2	5	0	366	372.7	0	0	75	6	2	0	0	0	83	84
16:00	0	1	134	6	1	1	0	0	143	144.2	0	0	18	6	0	0	0	0	24	24
16:15	0	0	120	10	0	0	2	0	132	134	0	0	19	3	0	0	0	0	22	22
16:30	0	0	83	8	0	1	0	0	92	93.3	0	0	28	4	0	1	0	0	33	34.3
16:45	0	0	100	11	1	0	0	0	112	112.5	0	0	13	2	0	0	0	0	15	15
H/TOT	0	1	437	35	2	2	2	0	479	484	0	0	78	15	0	1	0	0	94	95.3
17:00	0	1	105	12	0	0	1	0	119	119.4	0	0	22	3	0	0	0	0	25	25
17:15	0	0	107	11	0	0	0	0	118	118	0	0	18	2	0	0	0	0	20	20
17:30	0	0	112	8	2	0	0	0	122	123	0	0	21	1	0	0	0	0	22	22
17:45	0	0	89	4	0	1	0	0	94	95.3	0	0	17	3	0	0	0	0	20	20
H/TOT	0	1	413	35	2	1	1	0	453	455.7	0	0	78	9	0	0	0	0	87	87
18:00	0	0	93	4	0	0	0	0	97	97	0	0	18	2	0	0	0	0	20	20
18:15	0	1	102	6	0	0	0	0	109	108.4	1	0	14	1	0	0	0	0	16	15.2
18:30	0	0	89	2	1	0	0	0	92	92.5	0	0	6	3	0	0	0	0	9	9
18:45	0	1	71	3	1	0	0	0	76	75.9	0	0	19	1	0	0	0	0	20	20
H/TOT	0	2	355	15	2	0	0	0	374	373.8	1	0	57	7	0	0	0	0	65	64.2
12 TOT	1	15	3075	275	36	10	14	0	3426	3461.2	6	0	772	89	9	1	0	0	877	878

	B => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	1	0	0	0	0	1	1
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	1	0	0	0	0	1	1
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	1	0	0	0	0	1	1

Cork City Council Planning Department. For Inspection Purposes Only!

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 3
Location: Castle Rd/Sunningdale/Maglin Rd
Date: Tue 16-Apr-2024

Arm A - Sunningdale
Arm B - Maglin Rd
Arm C - Castle Rd

	B => C										C => A										C => B										C => C									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	3	2	0	0	0	0	5	5	0	0	15	5	0	0	0	0	20	20	0	0	5	2	0	0	1	0	8	9	0	0	0	0	0	0	0	0	0	0
07:15	0	0	9	0	0	0	0	0	9	9	0	0	34	7	0	0	0	0	41	41	0	0	9	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
07:30	0	0	6	4	1	0	0	0	11	11.5	0	0	50	6	0	0	0	0	56	56	0	0	8	6	0	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0
07:45	0	0	8	0	0	0	0	0	8	8	0	0	58	15	2	1	1	0	77	80.3	1	0	12	3	2	0	0	0	18	18.2	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	26	6	1	0	0	0	33	33.5	0	0	157	33	2	1	1	0	194	197.3	1	0	34	11	2	0	1	0	49	50.2	0	0	0	0	0	0	0	0	0	0
08:00	0	0	12	0	1	0	2	0	15	17.5	0	0	73	8	1	0	0	0	82	82.5	0	0	16	4	0	0	0	0	20	20	0	0	0	0	0	0	0	0	0	0
08:15	0	0	24	0	1	0	1	0	26	27.5	0	0	87	5	2	0	0	0	94	95	0	0	17	1	0	0	0	0	18	18	0	0	0	0	0	0	0	0	0	0
08:30	0	0	34	1	0	0	0	0	35	35	0	0	126	9	1	0	0	0	136	136.5	0	0	33	1	0	0	0	0	34	34	0	0	0	0	0	0	0	0	0	0
08:45	0	1	33	1	0	0	0	0	35	34.4	0	0	76	6	5	0	0	0	87	89.5	0	0	32	4	0	0	0	0	36	36	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	103	2	2	0	3	0	111	114.4	0	0	362	28	9	0	0	0	399	403.5	0	0	98	10	0	0	0	0	108	108	0	0	0	0	0	0	0	0	0	0
09:00	0	0	20	1	0	0	0	0	21	21	0	0	56	4	1	0	0	0	61	61.5	0	0	22	3	0	0	0	0	25	25	0	0	0	0	0	0	0	0	0	0
09:15	0	0	16	0	2	0	0	0	18	19	0	2	77	8	0	0	0	0	87	85.8	0	0	7	5	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
09:30	0	0	11	0	0	1	0	0	12	13.3	0	0	72	4	1	0	1	0	78	79.5	0	0	7	2	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
09:45	0	0	15	3	0	0	0	0	18	18	0	0	54	7	2	0	0	0	63	64	0	0	7	2	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	62	4	2	1	0	0	69	71.3	0	2	259	23	4	0	1	0	289	290.8	0	0	43	12	0	0	0	0	55	55	0	0	0	0	0	0	0	0	0	0
10:00	0	0	3	2	0	0	1	0	6	7	0	0	50	7	0	0	0	0	57	57	0	0	8	3	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
10:15	0	0	8	3	0	0	0	0	11	11	0	3	41	5	1	0	0	0	50	48.7	0	0	6	1	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
10:30	0	0	7	2	1	0	0	0	10	10.5	1	1	47	4	1	0	0	0	54	53.1	0	0	9	2	1	0	1	0	13	14.5	0	0	0	0	0	0	0	0	0	0
10:45	0	0	10	0	0	0	0	0	10	10	0	0	50	6	0	0	0	0	56	56	1	0	5	0	1	0	0	0	7	6.7	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	28	7	1	0	1	0	37	38.5	1	4	188	22	2	0	0	0	217	214.8	1	0	28	6	2	0	1	0	38	39.2	0	0	0	0	0	0	0	0	0	0
11:00	0	0	7	2	1	0	0	0	10	10.5	1	1	30	7	1	0	0	0	40	39.1	0	0	12	1	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
11:15	0	0	12	2	0	0	0	0	14	14	0	1	39	11	2	0	0	0	53	53.4	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
11:30	0	0	12	0	1	0	0	0	13	13.5	0	0	44	4	2	0	0	0	50	51	0	1	8	2	0	0	0	0	11	10.4	0	0	0	0	0	0	0	0	0	0
11:45	0	0	12	1	1	0	0	0	14	14.5	1	0	55	10	1	0	0	1	68	67.7	0	0	8	1	1	0	0	0	10	10.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	43	5	3	0	0	0	51	52.5	2	2	168	32	6	0	0	1	211	211.2	0	1	33	4	1	0	0	0	39	38.9	0	0	0	0	0	0	0	0	0	0
12:00	0	0	18	3	0	0	0	0	21	21	0	0	43	5	0	0	0	0	48	48	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
12:15	0	0	8	1	0	0	1	0	10	11	0	0	51	6	0	0	1	0	58	59	0	0	11	1	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
12:30	0	0	12	1	0	0	0	0	13	13	1	0	49	2	0	0	0	0	52	51.2	0	0	11	1	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
12:45	1	0	11	2	0	0	0	0	14	13.2	0	0	42	5	0	0	0	0	47	47	0	0	9	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	49	7	0	0	1	0	58	58.2	1	0	185	18	0	0	1	0	205	205.2	0	0	41	2	0	0	0	0	43	43	0	0	0	0	0	0	0	0	0	0
13:00	0	0	15	3	0	0	0	0	18	18	0	0	50	6	0	0	0	0	56	56	0	0	17	1	0	0	0	0	18	18	0	0	0	0	0	0	0	0	0	0
13:15	1	0	13	0	0	0	0	0	14	13.2	0	0	42	3	0	0	0	0	45	45	0	0	13	1	0	0	1	0	15	16	0	0	0	0	0	0	0	0	0	0
13:30	0	0	11	4	1	0	1	0	17	18.5	0	0	50	4	2	0	1	0	57	59	0	0	15	1	0	0	0	0	16	16	0	0	0	0	0	0	0	0	0	0
13:45	0	0	10	0	0	0	0	0	10	10	1	0	76	4	1	0	0	0	82	81.7	1	0	13	0	1	0	0	0	15	14.7	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	49	7	1	0	1	0	59	59.7	1	0	218	17	3	0	1	0	240	241.7	1	0	58	3	1	0	1	0	64	64.7	0	0	0	0	0	0	0	0	0	0
14:00	0	0	13	1	1	0	0	0	15	15.5	0	0	49	2	1	1	0	0	53	54.8	1	0	15	1	2	0	0	0	19	19.2	0	0	0	0	0	0	0	0	0	0
14:15	0	0	10	3	1	0	0	0	14	14.5	0	1	53	5	0	0	0	0	59	58.4	0	0	11	1	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
14:30	0	0	6	2	1	0	0	0	9	9.5	0	0	58	4	1	0	1	0	64	65.5	0	0	12	3	1	0	0	0	16	16.5	0	0	0	0	0	0	0	0	0	0
14:45	0	0	26	1	0	0	0	0	27	27	0	0	95	6	2	0	0	0	103	104	0	0	13	1	1	0	0	0	15	15.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	55	7	3	0	0	0	65	66.5	0	1	255	17	4	1	1	0	279	282.7	1	0	51	6	4	0	0	0	62	63.2	0	0	0	0	0	0	0	0	0	0
15:00	0	0	19	1	0	0	0	0	20	20	0	0	74	6	3	0	0	0	83	84.5	0	0	17	3	0	1	0	0	21	22.3	0	0	0	0	0	0	0	0	0	0
15:15	0	0	22	1	0	0	0	0	23	23	0	0	59	8	0	0	0	0	67	67	0	0	15	3	0	0	0	0	18	18	0	0	0	0	0	0	0	0	0	0
15:30	0	0	24	3	0	0	0	0	27	27	0	0	59	6	2	1	0	0	68	70.3	0	0	11	2	1	0	0	0	14	14.5	0	0	0	0	0	0	0	0	0	0
15:45	0	0	28	1	0	0	0	0	29	29	0	0	84	6	2	0	0	0	92	93	0	0	15	1	1	0	0	0	17	17.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	93	6	0	0	0	0	99	99	0	0	276	26	7	1	0	0	310	314.8	0	0	58	9	2	1	0	0	70	72.3	0	0	0	0	0	0	0	0	0	0
16:00	0	0	18	0	1	0	0	0	19	19.5	1	0	68	5	0	1	0	0	75	75.5	0	0	21	0	0	0	0	0	21	21	0	0	0	0	0	0	0	0	0	0
16:15	0	0	17	4	0	0	0	0	21	21	0	1	60	9	3	0	0	0	73	73.9	0	0	10	1	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
16:30	0	0	29	1	0	0	0	0	30	30	0	0	80	13	1	0	0	0	94	94.5	0	0	16	0	1	0	0	0	17	17.5	0	0	0	0	0	0	0	0	0	0
16:45	0	0	27	6	0	0	0	0	33	33	0	0	77	9	1	0	0	0	87	87.5	0	0	19	2	1	0	0	0	22	22.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	91	11	1	0	0	0	103	103.5	1	1	285	36	5	1	0	0	329	331.4	0	0	66	3	2	0	0	0	71	72	0	0	0	0	0	0	0	0	0	0
17:00	1	0	27	3	0	0	0	0	31	30.2	0	0	79	7	0	0	0	0	86	86	0	0	19	0	0	0	0	0	19	19	0	0	0	0	0	0	0	0	0	0
17:15	1	0	27	7	1	0	0	0	36	35.7	0	0	74	6	0	1	0	0	81	82.3	0	0	14	1	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0
17:30	1	0	21	5	0	0	0	0	27	26.2	0	0	66	5	0	0	0	0	71	71	0	0	14	3	0	0	0	0	17	17	0	0	0	0	0	0	0	0	0	0
17:45	0	0	32	5	0	0	0	0	37	37	0	0	71	4	0	0	0	0	75	75	0	0	18	1	0	0	0	0	19	19	0	0	0	0	0	0	0	0	0	0
H/TOT	3	0	107	20	1	0	0	0	131	129.1	0	0	290	22	0	1	0	0	313	314.3	0	0	65	5	0	0	0	0	70	70	0	0	0	0	0	0	0	0	0	0
18:00	1	0	10	3	0	0	0	0	14	13.2	0	0	71	3	0	1	0	0	75	76.3	0	0	16	3	0	0	0	0	19	19	0	0	0	0	0	0	0	0	0	0
18:15	1	0	26	3	0	0	0	0	30	29.2	0	0	66	5	0	0	0	0	71	71	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
18:30	0	0	16	1	0	0	0	0	17	17	0	0	55	4	0	0	0	0	59	59	0	1	15	0	0	0	0	0	16	15.4	0	0	0	0	0	0	0	0	0	0
18:45	0	0	14	0	0	0	0	0	14	14	0	0	70	2	0	0	0	0	72	72	1	0	14	3	0	0	0	0	18	17.2	0	0	0	0	0	0	0	0	0	0
H/TOT	2	0	66	7	0	0	0	0	75	73.4	0	0	262	14	0	1	0	0	277	278.3	1	1	55	6	0	0	0	0	63	61.6	0	0	0	0	0	0	0	0	0	0
12 TOT	7	1	772	89	15	1	6	0	891	899.6	6	10	2905	288	42	6	5	1	3263	3286	5	2	630	77	14	1	3	0	732	738.1	0	0	0	0	0	0	0	0	0	0

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 4
Location: Sunningdale/Carriganarra Rd/Station Rd
Date: Tue 16-Apr-2024

Arm A - Carriganarra Road
Arm B - Sunningdale
Arm C - Station Rd

	A => A										A => B										A => C										B => A										B => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	12	3	0	0	0	0	15	15	0	0	5	1	0	0	0	0	6	6	0	0	15	4	0	1	0	0	20	21.3	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	17	3	1	0	0	0	21	21.5	0	0	7	2	0	0	0	0	9	9	0	0	30	6	0	0	0	0	36	36	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	15	4	2	0	0	0	21	22	0	0	8	3	0	1	0	0	12	13.3	0	0	49	6	2	0	0	0	57	58	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	36	5	2	0	0	0	43	44	0	0	10	3	0	0	0	0	13	13	1	0	69	15	2	1	1	0	89	91.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	80	15	5	0	0	0	100	102.5	0	0	30	9	0	1	0	0	40	41.3	1	0	163	31	4	2	1	0	202	206.8	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	39	9	0	0	1	0	49	50	0	0	15	1	0	0	0	0	16	16	0	0	83	8	2	0	0	0	93	94	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	44	5	0	0	0	0	49	49	0	1	21	2	0	0	0	0	24	23.4	0	0	82	5	2	0	0	0	89	90	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	65	9	2	0	2	0	78	81	0	0	32	1	0	0	0	0	33	33	0	0	107	7	1	0	0	0	115	115.5	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	74	9	0	0	0	0	83	83	0	0	35	3	0	0	0	0	38	38	0	0	86	6	4	0	0	0	96	98	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	222	32	2	0	3	0	259	263	0	1	103	7	0	0	0	0	111	110.4	0	0	358	26	9	0	0	0	393	397.5	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	68	3	3	1	2	0	77	81.8	0	0	26	4	0	0	0	0	30	30	0	0	42	7	0	0	0	0	49	49	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	46	4	2	0	0	0	52	53	1	0	39	3	1	0	0	0	44	43.7	1	2	53	10	0	0	0	0	66	64	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0	0	0	31	6	0	0	0	0	37	37	0	0	24	1	0	0	0	0	25	25	0	0	54	3	1	0	1	0	59	60.5	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0	0	1	35	8	1	1	0	0	46	47.2	0	0	19	2	0	0	0	0	21	21	0	0	42	8	2	0	0	0	52	53	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	180	21	6	2	2	0	212	219	1	0	108	10	1	0	0	0	120	119.7	1	2	191	28	3	0	1	0	226	226.5	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	24	3	0	0	0	0	27	27	0	0	33	4	0	0	0	0	37	37	0	0	42	6	0	0	0	0	48	48	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0	30	1	1	1	0	0	33	34.8	0	0	19	2	0	0	0	0	21	21	0	3	38	3	1	0	0	0	45	43.7	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0	20	4	1	0	0	0	25	25.5	0	0	37	3	0	0	0	0	40	40	1	1	36	4	1	0	0	0	43	42.1	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	1	0	34	1	2	0	0	0	38	38.2	0	0	24	2	0	0	0	0	26	26	0	0	37	4	0	0	0	0	41	41	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	108	9	4	1	0	0	123	125.5	0	0	113	11	0	0	0	0	124	124	1	4	153	17	2	0	0	0	177	174.8	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	38	7	0	0	0	0	45	45	0	0	25	2	0	0	0	0	27	27	0	0	25	6	1	0	0	0	32	32.5	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	40	8	1	0	0	0	49	49.5	0	0	36	5	0	0	0	0	41	41	0	2	31	6	2	0	0	0	41	40.8	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	1	56	2	1	0	1	0	61	61.9	0	0	25	3	1	0	0	0	29	29.5	0	0	33	3	2	0	0	0	38	39	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	39	6	1	0	0	0	46	46.5	0	1	36	4	0	0	0	0	41	40.4	1	0	45	8	0	0	0	1	55	54.2	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	173	23	3	0	1	0	201	202.9	0	1	122	14	1	0	0	0	138	137.9	1	2	134	23	5	0	0	1	166	166.5	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	2	51	8	1	0	0	0	62	61.3	0	0	35	3	0	0	0	0	38	38	0	0	33	4	0	0	0	0	37	37	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	44	9	1	0	0	0	54	54.5	0	0	39	3	0	0	0	0	42	42	0	0	36	9	0	0	1	0	46	47	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	50	7	0	0	0	0	57	57	1	0	38	2	0	0	0	0	41	40.2	1	0	32	3	0	0	0	0	36	35.2	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	51	5	3	0	0	0	59	60.5	0	0	25	2	0	0	0	0	27	27	0	0	29	5	0	0	0	0	34	34	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	2	196	29	5	0	0	0	232	233.3	1	0	137	10	0	0	0	0	148	147.2	1	0	130	21	0	0	1	0	153	153.2	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	36	7	1	0	0	0	44	44.5	0	0	34	7	1	0	0	0	42	42.5	0	0	34	5	1	0	0	0	40	40.5	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	1	57	6	0	0	0	0	64	63.4	0	0	29	2	2	0	0	0	33	34	0	0	39	4	0	0	0	0	43	43	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	45	6	0	0	0	0	51	51	0	0	41	4	0	0	0	0	45	45	0	0	45	4	3	0	1	0	53	55.5	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	43	5	1	0	0	0	49	49.5	1	1	23	1	0	2	0	0	28	29.2	1	0	72	3	2	0	0	0	78	78.2	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	181	24	2	0	0	0	208	208.4	1	1	127	14	3	2	0	0	148	150.7	1	0	190	16	6	0	1	0	214	217.2	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	88	9	0	0	1	0	98	99	0	0	35	2	0	0	0	0	37	37	0	0	41	4	1	1	0	0	47	48.8	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	2	45	1	1	0	0	0	49	48.3	0	1	27	2	0	0	0	0	30	29.4	0	0	46	5	0	0	0	0	51	51	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	41	3	2	1	0	0	47	49.3	0	0	21	3	1	0	0	0	25	25.5	0	0	55	5	1	0	1	0	62	63.5	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	53	4	0	0	0	0	57	57	0	0	31	3	0	0	0	0	34	34	0	0	78	5	1	0	0	0	84	84.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	2	227	17	3	1	1	0	251	253.6	0	1	114	10	1	0	0	0	126	125.9	0	0	220	19	3	1	1	0	244	247.8	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	96	7	0	1	5	0	109	115.3	3	0	37	1	0	0	0	0	41	38.6	0	0	58	6	3	0	0	0	67	68.5	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	87	6	1	1	0	0	95	96.8	0	0	39	1	0	0	0	0	40	40	0	0	54	9	2	0	0	0	65	66	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	1	75	5	0	0	0	0	81	80.4	0	0	31	1	0	0	0	0	32	32	0	0	51	5	2	1	0	0	59	61.3	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	3	68	10	1	0	0	0	82	80.7	0	0	33	5	0	0	0	0	38	38	0	0	73	3	2	0	0	0	78	79	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	4	326	28	2	2	5	0	367	373.2	3	0	140	8	0	0	0	0	151	148.6	0	0	236	23	9	1	0	0	269	274.8	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	1	133	6	1	1	0	0	142	143.2	0	0	38	4	0	0	0	0	42	42	0	0	54	9	0	1	0	0	64	65.3	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	104	6	0	0	2	0	112	114	0	1	56	4	0	1	0	0	62	62.7	0	0	43	7	1	0	0	0	51	51.5	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	85	6	0	0	0	0	91	91	0	1	44	2	0	0	0	0	47	46.4	0	0	64	13	2	1	0	0	80	82.3	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	83	10	1	0	0	0	94	94.5	0	0	33	4	0	0	0	0	37	37	0	0	49	6	1	0	0	0	56	56.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	405	28	2	1	2	0	439	442.7	0	2	171	14	0	1	0	0	188	188.1	0	0	210	35	4	2	0	0	251	255.6	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	97	11	0	0	1	0	109	110	1	0	46	3	1	0	0	0	51	50.7	0	0	76	8	0	0	0	0	84	84	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	86	10	0	0	0	0	96	96	0	0	44	6	0	0	0	0	50	50	0	0	51	3	0	0	0	0	54	54	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	102	4	2	0	0	0	108	109	0	0	42	3	0	0	0	0	45	45	0	0	53	5	0	0	0	0	58	58	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	1	0	80	7	0	0	0	0	88	87.2	0	0	47	1	0	0	0	0	48	48	0	0	55	3	0	0	0	0	58	58	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	365	32	2	0	1	0	401	402.2	1	0	179	13	1	0	0	0	194	193.7	0	0	235	19	0	0	0	0	254	254	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	78	5	0	0	0	0	83	83	0	0	47	3	0	0	0	0	50	50	0	0	42	4	0	1	0	0	47	48.3	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	1	87	6	0	0	0	0	94	93.4	0	0	23	0	1	0	0	0	24	24.5	0	0	36	6	0	0	0	0	42	42	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0	75	2	0	0	0	0	77	77	0	0	35	2	0	0	0	0	37	37	0	0	49	6	0	0	0	0	55	55	0	0	0	0	0	0	0	0	0	0
18:45	0	0	1	0	0	0	0	0	1	1	0	1	57	1	0	0	0	0	59	58.4	0	0	36	2	0	0	0	0	38	38	0	0	49	1	0	0	0	0	50	50	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1	0	2	297	14	0	0	0	0	313	311.8	0	0	141	7	1	0	0	0	149	149.5	0	0	176	17	0	1	0	0	194	195.3	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	1	0	0	0	0	0	1	1	2	14	2760	272	36	7	15	0	3106	3138.1	7	6	1485	127	8	4	0	0	1637	1637	6	8	2396	275	45	7	5	1	2743	2770	0	0	0	0	0	0	0	0	0	0

Cork City Council Planning Department. For Inspection Purposes Only!

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 4
Location: Sunningdale/Carriganarra Rd/Station Rd
Date: Tue 16-Apr-2024

Arm A - Carriganarra Road
Arm B - Sunningdale
Arm C - Station Rd

	B => C										C => A									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	2	2	0	0	0	0	4	4	1	0	16	0	0	0	0	0	17	16.2
07:15	0	0	7	1	0	0	0	0	8	8	0	0	15	1	0	0	0	0	16	16
07:30	0	0	9	1	0	0	0	0	10	10	0	0	26	2	1	0	0	0	29	29.5
07:45	0	0	15	2	0	0	0	0	17	17	0	0	20	1	0	0	0	0	21	21
H/TOT	0	0	33	6	0	0	0	0	39	39	1	0	77	4	1	0	0	0	83	82.7
08:00	1	0	13	2	0	0	0	0	16	15.2	0	0	21	3	0	0	0	0	24	24
08:15	0	0	23	1	0	0	0	0	24	24	0	0	20	2	0	0	0	0	22	22
08:30	0	0	29	5	0	0	0	0	34	34	0	0	13	1	0	0	0	0	14	14
08:45	0	0	35	1	1	0	0	0	37	37.5	1	0	14	1	0	0	0	0	16	15.2
H/TOT	1	0	100	9	1	0	0	0	111	110.7	1	0	68	7	0	0	0	0	76	75.2
09:00	0	0	40	0	1	0	0	0	41	41.5	0	0	19	1	0	0	0	0	20	20
09:15	0	0	50	2	0	0	0	0	52	52	0	0	15	0	0	0	0	0	15	15
09:30	0	0	32	2	0	0	0	0	34	34	0	0	23	4	0	0	0	0	27	27
09:45	0	0	25	2	0	0	0	0	27	27	0	0	14	4	0	0	0	0	18	18
H/TOT	0	0	147	6	1	0	0	0	154	154.5	0	0	71	9	0	0	0	0	80	80
10:00	1	0	25	1	0	0	0	0	27	26.2	1	0	20	0	0	0	0	0	21	20.2
10:15	0	0	14	3	0	0	0	0	17	17	0	0	15	2	1	0	0	0	18	18.5
10:30	0	0	28	1	0	0	0	0	29	29	0	0	19	1	2	0	0	0	22	23
10:45	0	0	32	4	0	0	0	0	36	36	0	0	21	3	0	0	0	0	24	24
H/TOT	1	0	99	9	0	0	0	0	109	108.2	1	0	75	6	3	0	0	0	85	85.7
11:00	1	0	18	2	0	0	0	0	21	20.2	0	0	21	5	0	0	0	0	26	26
11:15	0	0	18	6	0	0	0	0	24	24	0	0	19	4	0	0	0	0	23	23
11:30	0	0	26	2	0	0	0	0	28	28	0	0	25	7	1	0	0	0	33	33.5
11:45	0	0	29	2	1	0	0	0	32	32.5	1	0	27	2	1	0	0	0	31	30.7
H/TOT	1	0	91	12	1	0	0	0	105	104.7	1	0	92	18	2	0	0	0	113	113.2
12:00	1	0	21	4	1	0	0	0	27	26.7	0	0	19	3	1	0	0	0	23	23.5
12:15	0	0	34	1	0	0	0	0	35	35	0	0	33	3	1	0	0	0	37	37.5
12:30	0	0	22	0	0	0	0	0	22	22	0	0	18	3	0	0	0	0	21	21
12:45	0	0	23	3	0	0	0	0	26	26	0	0	28	2	0	0	0	0	30	30
H/TOT	1	0	100	8	1	0	0	0	110	109.7	0	0	98	11	2	0	0	0	111	112
13:00	0	0	28	2	0	0	0	0	30	30	0	0	24	1	0	0	0	0	25	25
13:15	0	0	23	2	0	0	0	0	25	25	0	0	32	3	0	0	0	0	35	35
13:30	0	0	26	0	0	0	0	0	26	26	0	0	31	3	1	0	0	0	35	35.5
13:45	0	0	27	2	0	0	0	0	29	29	0	0	36	2	0	0	0	0	38	38
H/TOT	0	0	104	6	0	0	0	0	110	110	0	0	123	9	1	0	0	0	133	133.5
14:00	0	0	18	1	0	0	0	0	19	19	0	0	30	0	0	0	0	0	30	30
14:15	0	1	17	2	0	0	0	0	20	19.4	0	0	27	4	0	0	0	0	31	31
14:30	0	0	23	0	0	0	0	0	23	23	0	0	36	0	0	0	0	0	36	36
14:45	0	0	29	2	1	0	0	0	32	32.5	0	0	22	4	1	0	0	0	27	27.5
H/TOT	0	1	87	5	1	0	0	0	94	93.9	0	0	115	8	1	0	0	0	124	124.5
15:00	0	0	31	0	0	0	0	0	31	31	0	0	25	2	1	0	0	0	28	28.5
15:15	0	0	25	4	0	0	0	0	29	29	0	0	29	1	0	0	0	0	30	30
15:30	0	0	26	1	0	0	0	0	27	27	0	0	22	2	0	0	0	0	24	24
15:45	0	0	28	3	0	0	0	0	31	31	0	0	36	3	0	0	0	0	39	39
H/TOT	0	0	110	8	0	0	0	0	118	118	0	0	112	8	1	0	0	0	121	121.5
16:00	1	0	35	2	0	0	0	0	38	37.2	0	0	35	0	0	0	0	0	35	35
16:15	0	1	29	4	1	0	0	0	35	34.9	0	0	25	6	0	0	0	0	31	31
16:30	0	0	44	5	0	0	0	0	49	49	2	0	19	1	1	0	0	0	23	21.9
16:45	0	0	38	5	0	0	0	0	43	43	0	0	23	3	0	0	0	0	26	26
H/TOT	1	1	146	16	1	0	0	0	165	164.1	2	0	102	10	1	0	0	0	115	113.9
17:00	0	0	29	3	0	0	0	0	32	32	0	0	24	3	0	0	0	0	27	27
17:15	0	0	34	5	0	1	0	0	40	41.3	0	0	30	0	0	0	0	0	30	30
17:30	0	0	36	1	0	0	0	0	37	37	0	0	19	1	0	0	0	0	20	20
17:45	0	0	43	3	0	0	0	0	46	46	0	0	23	0	0	0	0	0	23	23
H/TOT	0	0	142	12	0	1	0	0	155	156.3	0	0	96	4	0	0	0	0	100	100
18:00	0	0	42	1	0	0	0	0	43	43	0	0	33	0	1	0	0	0	34	34.5
18:15	1	0	34	1	0	0	0	0	36	35.2	0	0	28	2	0	0	0	0	30	30
18:30	0	0	31	1	0	0	0	0	32	32	0	0	28	0	0	0	0	0	28	28
18:45	0	0	40	2	0	0	0	0	42	42	1	0	22	1	0	0	0	0	24	23.2
H/TOT	1	0	147	5	0	0	0	0	153	152.2	1	0	111	3	1	0	0	0	116	115.7
12 TOT	6	2	1306	102	6	1	0	0	1423	1421.3	7	0	1140	97	13	0	0	0	1257	1257.9

	C => B										C => C									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	11	0	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
07:15	0	0	7	1	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
07:30	0	0	2	1	1	0	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0
07:45	0	0	8	0	1	0	0	0	9	9.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	28	2	2	0	0	0	32	33	0	0	0	0	0	0	0	0	0	0
08:00	0	0	22	0	0	1	0	0	23	24.3	0	0	0	0	0	0	0	0	0	0
08:15	0	0	15	2	0	0	0	0	17	17	0	0	0	0	0	0	0	0	0	0
08:30	0	0	14	0	0	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0
08:45	0	0	24	3	0	0	0	0	27	27	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	75	5	0	1	0	0	81	82.3	0	0	0	0	0	0	0	0	0	0
09:00	0	0	12	0	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
09:15	0	0	11	0	1	0	0	0	12	12.5	0	0	0	0	0	0	0	0	0	0
09:30	0	0	12	1	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
09:45	0	0	12	0	1	0	0	0	13	13.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	47	1	2	0	0	0	50	51	0	0	0	0	0	0	0	0	0	0
10:00	0	0	20	2	0	0	0	0	22	22	0	0	0	0	0	0	0	0	0	0
10:15	0	0	11	4	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	19	5	0	1	0	0	25	26.3	0	0	0	0	0	0	0	0	0	0
10:45	0	0	17	0	0	0	0	0	17	17	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	67	11	0	1	0	0	79	80.3	0	0	0	0	0	0	0	0	0	0
11:00	0	0	15	3	0	0	0	0	18	18	0	0	0	0	0	0	0	0	0	0
11:15	0	0	18	1	0	0	0	0	19	19	0	0	0	0	0	0	0	0	0	0
11:30	0	0	20	4	0	0	0	0	24	24	0	0	0	0	0	0	0	0	0	0
11:45	0	0	23	5	0	0	0	0	28	28	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	76	13	0	0	0	0	89	89	0	0	0	0	0	0	0	0	0	0
12:00	0	0	22	1	0	0	0	0	23	23	0	0	0	0	0	0	0	0	0	0
12:15	0	0	28	0	0	0	0	0	28	28	0	0	0	0	0	0	0	0	0	0
12:30	0	0	26	6	0	0	0	0	32	32	0	0	0	0	0	0	0	0	0	0
12:45	0	0	31	0	0	0	0	0	31	31	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	107	7	0	0	0	0	114	114	0	0	0	0	0	0	0	0	0	0
13:00	0	0	19	1	0	0	0	0	20	20	0	0	0	0	0	0	0	0	0	0
13:15	0	0	24	1	1	0	0	0	26	26.5	0	0	0	0	0	0	0	0	0	0
13:30	0	0	21	3	1	0	0	0	25	25.5	0	0	0	0	0	0	0	0	0	0
13:45	0	0	22	0	0	0	0	0	22	22	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	86	5	2	0	0	0	93	94	0	0	0	0	0	0	0	0	0	0
14:00	0	0	25	0	0	0	0	0	25	25	0	0	0	0	0	0	0	0	0	0
14:15	0	0	22	2	0	0	0	0	24	24	0	0	0	0	0	0	0	0	0	0
14:30	0	0	26	1	0	0	0	0	27	27	0	0	0	0	0	0	0	0	0	0
14:45	0	0	20	2	1	0	0	0	23	23.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	93	5	1	0	0	0	99	99.5	0	0	0	0	0	0	0	0	0	0
15:00	0	0	24	1	0	0	0	0	25	25	0	0	0	0	0	0	0	0	0	0
15:15	0	0	15	1	0	0	0	0	16	16	0	0	0	0	0	0	0	0	0	0
15:30	0	0	27	3	1	0	0	0	31	31.5	0	0	0	0	0	0	0	0	0	0
15:45	0	0	31	1	0	0	0	0	32	32	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	97	6	1	0	0	0	104	104.5	0	0	0	0	0	0	0	0	0	0
16:00	0	0	39	4	0	0	0	0	43	43	0	0	0	0	0	0	0	0	0	0
16:15	0	0	33	5	0	0	0	0	38	38	0	0	0	0	0	0	0	0	0	0
16:30	0	0	31	4	0	1	0	0	36	37.3	0	0	0	0	0	0	0	0	0	0
16:45	0	1	38	1	0	0	0	0	40	39.4	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	141	14	0	1	0	0	157	157.7	0	0	0	0	0	0	0	0	0	0
17:00	0	0	32	5	0	0	0	0	37	37	0	0	0	0	0	0	0	0	0	0
17:15	0	0	45	5	0	0	0	0	50	50	0	0	0	0	0	0	0	0	0	0
17:30	1	0	34	3	0	0	0	0	38	37.2	0	0	0	0	0	0	0	0	0	0
17:45	0	0	35	0	0	1	0	0	36	37.3	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	146	13	0	1	0	0	161	161.5	0	0	0	0	0	0	0	0	0	0
18:00	1	0	39	2	0	0	0	0	42	41.2	0	0	0	0	0	0	0	0	0	0
18:15	0	0	28	2	0	0	0	0	30	30	0	0	0	0	0	0	0	0	0	0
18:30	0	0	29	1	1	0	0	0	31	31.5	0	0	0	0	0	0	0	0	0	0
18:45	0	0	33	2	1	0	0	0	36	36.5	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	129	7	2	0	0	0	139	139.2	0	0	0	0	0	0	0	0	0	0
12 TOT	2	1	1092	89	10	4	0	0	1198	1206	0	0	0	0	0	0	0	0	0	0

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 5
Location: Carriganarra Rd/Killumney Link Rd/Leo Murphy Link Road/Limeworth
Date: Tue 16-Apr-2024

Arm A - Leo Murphy Link Road
Arm B - Link Rd
Arm C - Limeworth
Arm D - Carriganarra Rd

	A => A										A => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	16	2	4	0	0	0	22	24
07:15	0	0	0	0	0	0	0	0	0	0	0	0	29	10	2	1	0	0	42	44.3
07:30	0	0	0	0	0	0	0	0	0	0	0	0	38	6	4	1	0	0	49	52.3
07:45	0	0	0	0	0	0	0	0	0	0	0	1	38	5	5	0	0	0	49	50.9
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	121	23	15	2	0	0	162	171.5
08:00	0	0	0	0	0	0	0	0	0	0	1	0	49	4	0	1	0	0	55	55.5
08:15	0	0	0	0	0	0	0	0	0	0	0	0	41	5	0	1	0	0	47	48.3
08:30	0	0	0	0	0	0	0	0	0	0	0	0	60	6	0	1	0	0	67	68.3
08:45	0	0	0	0	0	0	0	0	0	0	0	0	77	10	4	1	0	0	92	95.3
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	227	25	4	4	0	0	261	267.4
09:00	0	0	0	0	0	0	0	0	0	0	0	0	60	3	7	1	0	0	71	75.8
09:15	0	0	0	0	0	0	0	0	0	0	0	0	34	6	1	1	0	0	42	43.8
09:30	0	0	0	0	0	0	0	0	0	0	0	0	28	8	2	2	0	0	40	43.6
09:45	0	0	0	0	0	0	0	0	0	0	0	0	34	8	2	1	0	0	45	47.3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	156	25	12	5	0	0	198	210.5
10:00	0	0	0	0	0	0	0	0	0	0	0	0	38	9	4	1	0	0	52	55.3
10:15	0	0	0	0	0	0	0	0	0	0	0	0	34	11	3	0	0	0	48	49.5
10:30	0	0	0	0	0	0	0	0	0	0	0	0	29	7	3	1	0	0	40	42.8
10:45	0	0	0	0	0	0	0	0	0	0	0	0	29	10	3	1	0	0	43	45.8
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	130	37	13	3	0	0	183	193.4
11:00	0	0	0	0	0	0	0	0	0	0	0	0	35	6	3	3	0	0	47	52.4
11:15	0	0	0	0	0	0	0	0	0	0	0	0	40	7	1	0	0	0	48	48.5
11:30	0	0	0	0	0	0	0	0	0	0	0	0	33	5	1	0	0	0	39	39.5
11:45	0	0	0	0	0	0	0	0	0	0	0	0	37	10	2	1	0	0	50	52.3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	145	28	7	4	0	0	184	192.7
12:00	0	0	0	0	0	0	0	0	0	0	0	0	40	2	3	1	0	0	46	48.8
12:15	0	0	0	0	0	0	0	0	0	0	0	0	26	9	1	2	0	0	38	41.1
12:30	0	0	0	0	0	0	0	0	0	0	0	0	45	10	5	0	0	0	60	62.5
12:45	0	0	0	0	0	0	0	0	0	0	1	0	46	2	3	1	0	0	53	55
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	157	23	12	4	0	0	197	207.4
13:00	0	0	0	0	0	0	0	0	0	0	0	0	55	6	1	0	0	0	62	62.5
13:15	0	0	0	0	0	0	0	0	0	0	1	0	34	10	0	0	0	0	45	44.2
13:30	0	0	0	0	0	0	0	0	0	0	0	0	43	4	0	1	0	0	48	49.3
13:45	0	0	0	0	0	0	0	0	0	0	1	0	48	5	0	1	0	0	55	55.5
H/TOT	0	0	0	0	0	0	0	0	0	0	2	0	180	25	1	2	0	0	210	211.5
14:00	0	0	0	0	0	0	0	0	0	0	0	0	44	5	3	0	0	0	52	53.5
14:15	0	0	0	0	0	0	0	0	0	0	0	0	49	8	0	1	0	0	58	59.3
14:30	0	0	0	0	0	0	0	0	0	0	0	0	53	0	4	0	0	0	57	59
14:45	0	0	0	0	0	0	0	0	0	0	0	1	36	4	1	2	0	0	44	46.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	182	17	8	3	0	0	211	218.3
15:00	0	0	0	0	0	0	0	0	0	0	0	0	49	5	0	1	0	0	55	56.3
15:15	0	0	0	0	0	0	0	0	0	0	0	1	39	8	0	0	0	0	48	47.4
15:30	0	0	0	0	0	0	0	0	0	0	0	0	52	9	2	0	0	0	63	64
15:45	0	0	0	0	0	0	0	0	0	0	0	0	47	11	1	1	0	0	60	61.8
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	187	33	3	2	0	0	226	229.5
16:00	0	0	0	0	0	0	0	0	0	0	0	2	74	8	1	0	0	0	85	84.3
16:15	0	0	0	0	0	0	0	0	0	0	0	1	63	4	0	1	0	0	69	69.7
16:30	0	0	0	0	0	0	0	0	0	0	0	1	70	6	0	1	0	0	78	78.7
16:45	0	0	0	0	0	0	0	0	0	0	0	0	51	5	0	1	0	0	57	58.3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	4	258	23	1	3	0	0	289	291
17:00	0	0	0	0	0	0	0	0	0	0	0	1	89	2	0	0	0	0	92	91.4
17:15	0	0	0	0	0	0	0	0	0	0	0	1	61	8	1	0	0	0	71	70.9
17:30	0	0	0	0	0	0	0	0	0	0	0	0	83	5	0	0	0	0	88	88
17:45	0	0	0	0	0	0	0	0	0	0	0	1	48	4	0	0	0	0	53	52.4
H/TOT	0	0	0	0	0	0	0	0	0	0	0	3	281	19	1	0	0	0	304	302.7
18:00	0	0	0	0	0	0	0	0	0	0	0	0	44	4	1	0	0	0	49	49.5
18:15	0	0	0	0	0	0	0	0	0	0	0	0	54	3	0	0	0	0	57	57
18:30	0	0	0	0	0	0	0	0	0	0	0	0	49	0	0	0	0	0	49	49
18:45	0	0	0	0	0	0	0	0	0	0	0	0	30	2	0	0	0	0	32	32
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	177	9	1	0	0	0	187	187.5
12 TOT	0	0	0	0	0	0	0	0	0	0	4	10	2201	287	78	32	0	0	2612	2683.4

	A => C										A => D									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	1	0	0	0	0	0	1	1	0	0	7	2	0	0	0	0	9	9
07:15	0	0	0	2	0	0	0	0	2	2	0	0	9	3	0	0	0	0	12	12
07:30	0	0	0	0	0	0	0	0	0	0	0	0	7	0	3	0	0	0	10	11.5
07:45	0	0	0	0	0	0	0	0	0	0	0	0	12	1	0	0	0	0	13	13
H/TOT	0	0	1	2	0	0	0	0	3	3	0	0	35	6	3	0	0	0	44	45.5
08:00	0	0	1	0	0	0	0	0	1	1	0	0	12	6	0	0	1	0	19	20
08:15	0	0	1	0	0	0	0	0	1	1	0	0	19	4	0	0	0	0	23	23
08:30	0	0	0	0	0	0	0	0	0	0	0	0	26	3	1	0	2	0	32	34.5
08:45	0	0	0	0	0	0	0	0	0	0	0	0	26	4	0	0	0	0	30	30
H/TOT	0	0	2	0	0	0	0	0	2	2	0	0	83	17	1	0	3	0	104	107.5
09:00	0	0	0	0	0	0	0	0	0	0	0	0	26	1	0	1	0	0	28	29.3
09:15	0	0	1	0	0	0	0	0	1	1	0	0	16	3	1	0	0	0	20	20.5
09:30	0	0	1	0	0	0	0	0	1	1	0	0	19	4	0	1	0	0	24	25.3
09:45	0	0	0	0	0	0	0	0	0	0	0	1	12	6	0	0	0	0	19	18.4
H/TOT	0	0	2	0	0	0	0	0	2	2	0	1	73	14	1	2	0	0	91	93.5
10:00	0	0	0	1	0	0	0	0	1	1	0	0	14	3	0	0	0	0	17	17
10:15	0	0	1	0	0	0	0	0	1	1	0	0	12	1	1	1	0	0	15	16.8
10:30	0	0	0	0	0	0	0	0	0	0	0	0	16	3	1	0	0	0	20	20.5
10:45	0	0	1	0	0	0	0	0	1	1	1	0	26	1	2	0	0	0	30	30.2
H/TOT	0	0	2	1	0	0	0	0	3	3	1	0	68	8	4	1	0	0	82	84.5
11:00	0	0	0	0	0	0	0	0	0	0	0	0	20	5	0	0	0	0	25	25
11:15	0	0	0	0	0	0	0	0	0	0	0	0	32	8	1	0	0	0	41	41.5
11:30	0	0	1	1	0	0	0	0	2	2	0	0	28	3	0	0	0	0	31	31
11:45	0	0	0	0	0	0	0	0	0	0	0	0	30	6	1	0	0	0	37	37.5
H/TOT	0	0	1	1	0	0	0	0	2	2	0	0	110	22	2	0	0	0	134	135
12:00	0	0	1	0	0	0	0	0	1	1	0	2	34	6	1	0	0	0	43	42.3
12:15	0	0	0	0	0	0	0	0	0	0	0	0	32	6	0	0	0	0	38	38
12:30	0	0	1	0	0	0	0	0	1	1	1	0	20	7	0	0	0	0	28	27.2
12:45	0	0	3	0	0	0	0	0	3	3	0	0	40	2	2	0	0	0	44	45
H/TOT	0	0	5	0	0	0	0	0	5	5	1	2	126	21	3	0	0	0	153	152.5
13:00	0	0	0	1	0	0	0	0	1	1	0	1	29	5	2	0	0	0	37	37.4
13:15	0	0	1	0	0	0	0	0	1	1	0	0	30	3	1	0	0	0	34	34.5
13:30	0	0	1	0	0	0	0	0	1	1	0	0	37	2	0	1	0	0	40	41.3
13:45	0	0	3	0	0	0	0	0	3	3	0	0	19	3	1	0	0	0	23	23.5
H/TOT	0	0	5	1	0	0	0	0	6	6	0	1	115	13	4	1	0	0	134	136.7
14:00	0	0	0	1	0	0	0	0	1	1	0	0	35	5	0	0	0	0	40	40
14:15	0	0	0	0	0	0	0	0	0	0	1	2	25	4	1	0	0	0	33	31.5
14:30	0	0	0	0	0	0	0	0	0	0	0	0	21	1	1	0	0	0	23	23.5
14:45	0	0	0	0	0	0	0	0	0	0	0	0	27	3	0	0	0	0	30	30
H/TOT	0	0	0	1	0	0	0	0	1	1	1	2	108	13	2	0	0	0	126	125
15:00	0	0	1	0	0	0	0	0	1	1	0	0	36	6	1	1	0	0	44	45.8
15:15	0	0	1	0	0	0	0	0	1	1	0	0	49	4	0	0	0	0	53	53
15:30	0	0	0	0	0	0	0	0	0	0	0	1	40	4	0	0	0	0	45	44.4
15:45	0	0	0	0	0	0	0	0	0	0	0	0	27	8	1	1	0	0	37	38.8
H/TOT	0	0	2	0	0	0	0	0	2	2	0	1	152	22	2	2	0	0	179	182
16:00	0	0	0	0	0	0	0	0	0	0	0	0	68	1	0	0	0	0	69	69
16:15	0	0	3	0	0	0	0	0	3	3	1	0	67	5	0	0	1	0	74	74.2
16:30	0	0	1	0	0	0	0	0	1	1	0	0	51	2	0	0	0	0	53	53
16:45	0	0	0	0	0	0	0	0	0	0	0	0	49	4	1	0	0	0	54	54.5
H/TOT	0	0	4	0	0	0	0	0	4	4	1	0	235	12	1	0	1	0	250	250.7
17:00	0	0	2	0	0	0	0	0	2	2	0	0	50	4	0	0	0	0	54	54
17:15	0	0	0	0	0	0	0	0	0	0	0	0	55	0	1	0	0	0	56	56.5
17:30	0	0	0	0	0	0	0	0	0	0	0	0	50	3	1	0	0	0	54	54.5
17:45	0	0	0	1	0	0	0	0	1	1	0	0	35	2	0	0	0	0	37	37
H/TOT	0	0	2	1	0	0	0	0	3	3	0	0	190	9	2	0	0	0	201	202
18:00	0	0	1	0	0	0	0	0	1	1	0	0	41	4	0	0	0	0	45	45
18:15	0	0	1	0	0	0	0	0	1	1	0	0	38	1	0	0	0	0	39	39
18:30	0	0	1	0	0	0	0	0	1	1	0	0	40	0	0	0	0	0	40	40
18:45	0	0	0	0	0	0	0	0	0	0	0	0	32	0	0	0	0	0	32	32
H/TOT	0	0	3	0	0	0	0	0	3	3	0	0	151	5	0	0	0	0	156	156
12 TOT	0	0	29	7	0	0	0	0	36	36	4	7	1446	162	25	6	4	0	1654	1670.9

Cork City Council Planning Department. For Inspection Purposes Only!

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 5
Location: Carriganarra Rd/Killumney Link Rd/Leo Murphy Link Road/Limeworth
Date: Tue 16-Apr-2024

Arm A - Leo Murphy Link Road
Arm B - Link Rd
Arm C - Limeworth
Arm D - Carriganarra Rd

B => A

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	12	7	0	2	0	0	21	23.6
07:15	0	0	22	7	2	0	0	0	31	32
07:30	0	0	36	10	3	1	0	0	50	52.8
07:45	0	1	61	5	1	0	0	0	68	67.9
H/TOT	0	1	131	29	6	3	0	0	170	176.3
08:00	0	0	54	6	4	1	0	0	65	68.3
08:15	0	0	58	8	2	1	0	0	69	71.3
08:30	0	0	93	8	2	0	0	0	103	104
08:45	0	0	87	6	1	0	0	0	94	94.5
H/TOT	0	0	292	28	9	2	0	0	331	338.1
09:00	0	0	83	4	4	2	1	0	94	99.6
09:15	0	0	64	11	3	1	0	0	79	81.8
09:30	0	0	37	6	1	2	0	0	46	49.1
09:45	1	0	48	11	5	2	0	0	67	71.3
H/TOT	1	0	232	32	13	7	1	0	286	301.8
10:00	0	0	48	9	2	1	0	0	60	62.3
10:15	0	0	38	13	5	1	0	0	57	60.8
10:30	0	0	28	9	1	3	0	0	41	45.4
10:45	0	0	43	8	3	1	0	0	55	57.8
H/TOT	0	0	157	39	11	6	0	0	213	226.3
11:00	0	0	38	8	1	0	0	0	47	47.5
11:15	0	0	36	10	3	0	0	0	49	50.5
11:30	1	0	47	9	4	2	0	0	63	66.8
11:45	0	0	46	11	2	1	1	0	61	64.3
H/TOT	1	0	167	38	10	3	1	0	220	229.1
12:00	0	0	39	7	3	1	0	0	50	52.8
12:15	0	0	50	7	6	0	0	0	63	66
12:30	0	0	42	6	2	2	0	0	52	55.6
12:45	0	0	40	5	3	0	0	0	48	49.5
H/TOT	0	0	171	25	14	3	0	0	213	223.9
13:00	0	0	44	5	2	1	0	0	52	54.3
13:15	0	0	40	9	1	0	0	0	50	50.5
13:30	0	0	47	8	1	0	0	0	56	56.5
13:45	0	0	49	3	1	0	0	0	53	53.5
H/TOT	0	0	180	25	5	1	0	0	211	214.8
14:00	0	0	62	11	0	0	0	0	73	73
14:15	0	0	57	9	6	1	0	0	73	77.3
14:30	0	0	34	8	1	3	0	0	46	50.4
14:45	0	0	45	8	3	1	0	0	57	59.8
H/TOT	0	0	198	36	10	5	0	0	249	260.5
15:00	1	0	76	10	2	0	0	0	89	89.2
15:15	0	0	65	6	3	2	0	0	76	80.1
15:30	0	0	76	9	3	0	0	0	88	89.5
15:45	1	1	60	13	2	0	0	0	77	76.6
H/TOT	2	1	277	38	10	2	0	0	330	335.4
16:00	0	0	73	6	4	1	0	0	84	87.3
16:15	0	1	61	6	2	0	0	0	70	70.4
16:30	0	0	43	8	0	0	0	0	51	51
16:45	0	0	62	8	0	0	0	0	70	70
H/TOT	0	1	239	28	6	1	0	0	275	278.7
17:00	0	1	62	10	1	0	0	0	74	73.9
17:15	0	1	54	5	0	0	0	0	60	59.4
17:30	0	0	53	3	1	0	0	0	57	57.5
17:45	0	0	57	5	0	0	0	0	62	62
H/TOT	0	2	226	23	2	0	0	0	253	252.8
18:00	0	0	55	2	1	0	0	0	58	58.5
18:15	0	0	54	2	0	0	0	0	56	56
18:30	0	1	41	2	0	0	0	0	44	43.4
18:45	0	0	41	3	0	0	0	0	44	44
H/TOT	0	1	191	9	1	0	0	0	202	201.9
12 TOT	4	6	2461	350	97	33	2	0	2953	3039.6

B => B

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0

B => C

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	1	0	0	0	0	0	1	1
08:00	0	0	0	2	0	0	0	0	2	2
08:15	0	0	2	2	0	0	0	0	4	4
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	3	4	0	0	0	0	7	7
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	1	1	0	0	0	0	2	2
09:30	0	0	2	0	0	0	0	0	2	2
09:45	0	0	0	2	0	0	0	0	2	2
H/TOT	0	0	3	3	0	0	0	0	6	6
10:00	0	0	0	1	0	0	0	0	1	1
10:15	0	0	1	0	0	0	0	0	1	1
10:30	0	0	1	0	0	0	0	0	1	1
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	2	1	0	0	0	0	3	3
11:00	0	0	1	0	0	0	0	0	1	1
11:15	0	0	1	0	0	0	0	0	1	1
11:30	0	0	1	0	0	0	0	0	1	1
11:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	4	0	0	0	0	0	4	4
12:00	0	0	0	1	0	0	0	0	1	1
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	1	0	0	0	0	1	1
H/TOT	0	0	0	2	0	0	0	0	2	2
13:00	0	0	3	0	0	0	0	0	3	3
13:15	0	0	2	1	0	0	0	0	3	3
13:30	0	0	2	0	0	0	0	0	2	2
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	7	1	0	0	0	0	8	8
14:00	0	0	1	0	0	0	0	0	1	1
14:15	0	0	3	0	0	0	0	0	3	3
14:30	0	0	1	0	0	0	0	0	1	1
14:45	0	0	3	1	0	0	0	0	4	4
H/TOT	0	0	8	1	0	0	0	0	9	9
15:00	0	0	1	0	0	0	0	0	1	1
15:15	0	0	1	0	0	0	0	0	1	1
15:30	0	0	3	1	0	0	0	0	4	4
15:45	0	0	4	2	0	0	0	0	6	6
H/TOT	0	0	9	3	0	0	0	0	12	12
16:00	0	0	3	0	0	0	0	0	3	3
16:15	0	0	3	1	0	0	0	0	4	4
16:30	0	0	4	0	0	0	0	0	4	4
16:45	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	12	1	0	0	0	0	13	13
17:00	0	0	3	0	0	0	0	0	3	3
17:15	0	0	1	1	0	0	0	0	2	2
17:30	0	0	1	0	0	0	0	0	1	1
17:45	0	0	3	0	0	0	0	0	3	3
H/TOT	0	0	8	1	0	0	0	0	9	9
18:00	0	0	3	0	0	0	0	0	3	3
18:15	0	0	3	0	0	0	0	0	3	3
18:30	0	0	2	0	0	0	0	0	2	2
18:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	9	0	0	0	0	0	9	9
12 TOT	0	0	66	17	0	0	0	0	83	83

B => D

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	9	2	0	0	0	0	11	11
07:15	0	0	12	3	1	0	0	0	16	16.5
07:30	0	0	19	6	0	1	0	0	26	27.3
07:45	0	0	34	5	1	0	0	0	40	40.5
H/TOT	0	0	74	16	2	1	0	0	93	95.3
08:00	0	0	41	4	0	0	0	0	45	45
08:15	0	1	43	4	0	0	0	0	48	47.4
08:30	1	0	64	7	1	0	0	0	73	72.7
08:45	0	0	75	8	0	0	0	0	83	83
H/TOT	1	1	223	23	1	0	0	0	249	248.1
09:00	1	0	61	5	4	0	2	0	73	76.2
09:15	0	0	67	4	1	0	0	0	72	72.5
09:30	0	0	34	2	0	0	0	0	36	36
09:45	0	0	36	3	1	0	0	0	40	40.5
H/TOT	1	0	198	14	6	0	2	0	221	225.2
10:00	0	0	47	4	0	0	0	0	51	51
10:15	0	0	32	2	0	0	0	0	34	34
10:30	0	0	48	4	0	0	0	0	52	52
10:45	0	0	30	3	0	0	0	0	33	33
H/TOT	0	0	157	13	0	0	0	0	170	170
11:00	0	0	42	6	0	0	0	0	48	48
11:15	0	0	51	5	0	0	0	0	56	56
11:30	0	1	47	4	2	0	1	0	55	56.4
11:45	0	1	42	1	0	0	0	0	44	43.4
H/TOT	0	2	182	16	2	0	1	0	203	203.8
12:00	0	0	52	6	0	0	0	0	58	58
12:15	0	0	61	5	1	0	0	0	67	67.5
12:30	0	0	57	1	0	0	0	0	58	58
12:45	0	0	46	7	1	0	0	0	54	54.5
H/TOT	0	0	216	19	2	0	0	0	237	238
13:00	1	0	41	7	1	0	0	0	50	49.7
13:15	0	0	52	3	0	0	0	0	55	55
13:30	0	0	49	9	0	0	0	0	58	58
13:45	1	2	52	3	0	1	0	0	59	58.3
H/TOT	2	2	194	22	1	1	0	0	222	221
14:00	0	0	91	5	0	0	1	0	97	98
14:15	0	1	45	1	1	0	0	0	48	47.9
14:30	0	0	39	5	2	1	0	0	47	49.3
14:45	0	0	48	6	0	0	0	0	54	54
H/TOT	0	1	223	17	3	1	1	0	246	249.2
15:00	2	0	102	1	0	0	5	0	110	113.4
15:15	0	0	77	3	0	1	0	0	81	82.3
15:30	0	0	66	3	0	0	0	0	69	69
15:45	0	3	84	9	1	0	0	0	97	95.7
H/TOT	2	3	329	16	1	1	5	0	357	360.4
16:00	0	2	100	6	1	0	0	0	109	108.3
16:15	0	1	97	6	0	1	1	0	106	107.7
16:30	0	1	82	6	0	0	0	0	89	88.4
16:45	0	0	73	9	0	0	0	0	82	82
H/TOT	0	4	352	27	1	1	1	0	386	386.4
17:00	1	0	95	10	1	0	1	0	108	108.7
17:15	0	0	83	18	0	0	0	0	101	101
17:30	2	0	89	2	0	0	0	0	93	91.4
17:45	0	0	93	6	0	0	0	0	99	99
H/TOT	3	0	360	36	1	0	1	0	401	400.1
18:00	0	0	90	4	0	0	0	0	94	94
18:15	0	1	71	5	1	0	0	0	78	77.9
18:30	0	0	69	4	0	0	0	0	73	73
18:45	0	1	61	3	0	0	0	0	65	64.4
H/TOT	0	2	291	16	1	0	0	0	310	309.3
12 TOT	9	15	2799	235	21	5	11	0	3095	3106.8

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 5
Location: Carriganarra Rd/Killumney Link Rd/Leo Murphy Link Road/Limeworth
Date: Tue 16-Apr-2024

Arm A - Leo Murphy Link Road
Arm B - Link Rd
Arm C - Limeworth
Arm D - Carriganarra Rd

C => A

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	1	0	0	0	0	0	1	1
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	3	0	0	0	0	0	3	3
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	4	0	0	0	0	0	4	4
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	1	0	0	0	0	0	1	1
09:45	0	0	0	1	0	0	0	0	1	1
H/TOT	0	0	1	1	0	0	0	0	2	2
10:00	0	0	1	0	0	0	0	0	1	1
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	1	0	0	0	0	0	1	1
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	2	0	0	0	0	0	2	2
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	1	0	0	0	0	0	1	1
12:30	0	0	0	1	0	0	0	0	1	1
12:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	2	1	0	0	0	0	3	3
13:00	0	0	1	0	0	0	0	0	1	1
13:15	0	0	1	1	0	0	0	0	2	2
13:30	0	0	1	0	0	0	0	0	1	1
13:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	4	1	0	0	0	0	5	5
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	1	0	0	0	0	0	1	1
14:30	0	0	1	0	0	0	0	0	1	1
14:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	3	0	0	0	0	0	3	3
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	1	0	0	0	0	0	1	1
16:00	0	0	2	1	0	0	0	0	3	3
16:15	0	0	1	1	0	0	0	0	2	2
16:30	0	0	1	0	0	0	0	0	1	1
16:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	5	2	0	0	0	0	7	7
17:00	0	0	2	0	0	0	0	0	2	2
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	1	0	0	0	0	0	1	1
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	0	0	0	0	0	3	3
18:00	0	0	1	0	0	0	0	0	1	1
18:15	0	0	0	2	0	0	0	0	2	2
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	4	0	0	0	0	0	4	4
H/TOT	0	0	5	2	0	0	0	0	7	7
12 TOT	0	0	30	7	0	0	0	0	37	37

C => B

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	3	0	0	0	0	0	3	3
07:15	0	0	1	0	0	0	0	0	1	1
07:30	0	0	4	0	0	0	0	0	4	4
07:45	0	0	4	0	0	0	0	0	4	4
H/TOT	0	0	12	0	0	0	0	0	12	12
08:00	0	0	10	0	0	0	0	0	10	10
08:15	0	0	6	0	0	0	0	0	6	6
08:30	0	0	3	0	0	0	0	0	3	3
08:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	20	0	0	0	0	0	20	20
09:00	0	0	1	0	0	0	0	0	1	1
09:15	0	0	3	2	0	0	0	0	5	5
09:30	0	0	1	1	0	0	0	0	2	2
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	5	3	0	0	0	0	8	8
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	2	0	0	0	0	0	2	2
10:30	0	0	2	0	0	0	0	0	2	2
10:45	0	0	0	1	0	0	0	0	1	1
H/TOT	0	0	4	1	0	0	0	0	5	5
11:00	0	0	1	0	0	0	0	0	1	1
11:15	0	0	0	1	0	0	0	0	1	1
11:30	0	0	1	0	0	0	0	0	1	1
11:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	3	1	0	0	0	0	4	4
12:00	0	0	1	0	0	0	0	0	1	1
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	2	0	0	0	0	0	2	2
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	0	0	0	0	0	3	3
13:00	0	0	3	0	0	0	0	0	3	3
13:15	0	0	2	1	0	0	0	0	3	3
13:30	0	0	1	0	0	0	0	0	1	1
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	6	1	0	0	0	0	7	7
14:00	0	0	2	1	0	0	0	0	3	3
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	3	0	1	0	0	0	4	4.5
14:45	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	7	1	1	0	0	0	9	9.5
15:00	0	0	1	1	0	0	0	0	2	2
15:15	0	0	3	2	0	0	0	0	5	5
15:30	0	0	0	1	0	0	0	0	1	1
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	4	4	0	0	0	0	8	8
16:00	0	0	1	0	0	0	0	0	1	1
16:15	0	0	0	1	0	0	0	0	1	1
16:30	0	0	2	1	0	0	0	0	3	3
16:45	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	5	2	0	0	0	0	7	7
17:00	0	0	1	0	0	0	0	0	1	1
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	3	0	0	0	0	0	3	3
17:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	5	0	0	0	0	0	5	5
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	1	0	0	0	0	0	1	1
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
12 TOT	0	0	75	13	1	0	0	0	89	89.5

C => C

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0

C => D

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	1	0	0	0	0	0	1	1
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
08:00	0	0	2	0	0	0	0	0	2	2
08:15	0	0	0	1	0	0	0	0	1	1
08:30	0	0	1	1	0	0	0	0	2	2
08:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	4	2	0	0	0	0	6	6
09:00	0	0	1	0	0	0	0	0	1	1
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	2	0	0	0	0	0	2	2
09:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	4	0	0	0	0	0	4	4
10:00	0	0	0	1	0	0	0	0	1	1
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	1	0	0	0	0	0	1	1
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	1	0	0	0	0	2	2
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	1	1	0	0	0	0	2	2
H/TOT	0	0	1	1	0	0	0	0	2	2
12:00	0	0	1	1	0	0	0	0	2	2
12:15	0	0	1	1	0	0	0	0	2	2
12:30	0	0	1	1	0	0	0	0	2	2
12:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	4	3	0	0	0	0	7	7
13:00	0	0	1	0	0	0	0	0	1	1
13:15	0	0	1	0	0	0	0	0	1	1
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	2	0	0	0	0	0	2	2
14:00	0	0	1	0	0	0	0	0	1	1
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	1	0	0	0	0	0	1	1
14:45	0	0	1	1	0	0	0	0	2	2
H/TOT	0	0	3	1	0	0	0	0	4	4
15:00	0	0	1	0	0	0	0	0	1	1
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	2	0	0	0	0	0	2	2
16:00	0	0	1	0	0	0	0	0	1	1
16:15	0	0	1	0	0	0	0	0	1	1
16:30	0	0	2	0	0	0	0	0	2	2
16:45	0	0	2	0	0	0	0	0	2	2
H/TOT	0	0	6	0	0	0	0	0	6	6
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	1	0	0	0	0	0	1	1
17:30	0	0	1	0	0	0	0	0	1	1
17:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	3	0	0	0	0	0	3	3
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	1	0	0	0	0	0	1	1
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	2	0	0	0	0	0	2	2
12 TOT	0	0	33	8	0	0	0	0	41	41

Cork City Council Planning Department. For Inspection Purposes Only!

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 5
Location: Carriganarra Rd/Killumney Link Rd/Leo Murphy Link Road/Limeworth
Date: Tue 16-Apr-2024

Arm A - Leo Murphy Link Road
Arm B - Link Rd
Arm C - Limeworth
Arm D - Carriganarra Rd

	D => A										D => B										D => C										D => D									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	8	1	0	0	0	0	9	9	0	0	28	5	0	1	0	0	34	35.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	8	2	0	0	0	0	10	10	1	0	35	4	0	0	0	0	40	39.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	23	4	1	0	0	0	28	28.5	0	0	61	6	2	0	0	0	69	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	27	4	1	1	0	0	33	34.8	0	0	70	11	0	0	1	0	82	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	66	11	2	1	0	0	80	82.3	1	0	194	26	2	1	1	0	225	227.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	1	0	53	6	1	0	0	0	61	60.7	0	0	66	5	2	0	0	0	73	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	47	3	1	0	0	0	51	51.5	0	0	53	5	1	0	0	0	59	59.5	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
08:30	0	0	69	4	1	0	0	0	74	74.5	0	0	44	5	0	0	0	0	49	49	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
08:45	0	0	52	3	3	0	0	0	58	59.5	2	0	56	3	1	0	0	0	62	60.9	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	221	16	6	0	0	0	244	246.2	2	0	219	18	4	0	0	0	243	243.4	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
09:00	0	0	18	6	0	0	0	0	24	24	0	0	56	2	0	0	0	0	58	58	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
09:15	0	2	35	7	0	0	0	0	44	42.8	1	0	36	2	0	0	0	0	39	38.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	25	5	1	0	0	0	31	31.5	0	0	54	4	0	0	1	0	59	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	20	3	1	0	0	0	24	24.5	0	0	31	8	0	0	0	0	39	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	2	98	21	2	0	0	0	123	122.8	1	0	177	16	0	0	1	0	195	195.2	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
10:00	1	0	21	3	1	0	0	0	26	25.7	0	0	42	3	0	0	0	0	45	45	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
10:15	0	2	24	4	1	0	0	0	31	30.3	0	1	36	2	1	0	0	0	40	39.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	1	22	5	1	0	0	0	29	28.9	1	0	34	1	2	0	0	0	38	38.2	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
10:45	0	0	20	3	0	0	0	0	23	23	0	0	36	3	0	0	0	0	39	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	1	3	87	15	3	0	0	0	109	107.9	1	1	148	9	3	0	0	0	162	162.1	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
11:00	0	0	24	4	1	0	0	0	29	29.5	0	0	26	5	0	0	0	0	31	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	1	24	7	0	0	0	0	32	31.4	0	1	32	3	1	0	0	0	37	36.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	21	5	2	0	0	0	28	29	0	0	38	5	2	0	0	0	45	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	1	0	27	3	0	0	0	0	31	30.2	2	0	50	7	1	0	0	1	61	59.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	1	1	96	19	3	0	0	0	120	120.1	2	1	146	20	4	0	0	1	174	173.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	15	5	0	0	0	0	20	20	0	0	35	4	1	0	0	0	40	40.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	24	6	1	0	0	0	31	31.5	0	0	42	5	0	0	1	0	48	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	20	3	0	0	0	0	23	23	1	0	33	3	0	0	0	0	37	36.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	23	4	0	0	0	0	27	27	0	0	45	3	0	0	0	0	48	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	82	18	1	0	0	0	101	101.5	1	0	155	15	1	0	1	0	173	173.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	1	0	21	1	1	0	0	0	24	23.7	0	0	30	4	0	0	0	0	34	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	30	4	0	0	0	0	34	34	0	0	44	4	0	0	0	0	48	48	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
13:30	0	0	24	1	2	0	0	0	27	28	0	0	45	6	2	0	1	0	54	56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	40	4	2	0	0	0	46	47	0	1	81	2	0	0	0	0	84	83.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	115	10	5	0	0	0	131	132.7	0	1	200	16	2	0	1	0	220	221.4	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
14:00	0	0	19	1	0	1	0	0	21	22.3	1	0	49	2	0	0	0	0	52	51.2	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
14:15	0	0	30	2	0	0	0	0	32	32	0	0	45	7	1	0	0	0	53	53.5	0	0	0	0	1	0	0	0	1	1.5	0	0	0	0	0	0	0	0	0	0
14:30	0	0	24	1	1	0	0	0	26	26.5	0	0	57	3	0	0	1	0	61	62	0	0	1	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
14:45	0	0	31	4	2	0	0	0	37	38	0	0	76	5	0	0	0	0	81	81	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	104	8	3	1	0	0	116	118.8	1	0	227	17	1	0	1	0	247	247.7	0	0	2	2	1	0	0	0	5	5.5	0	0	0	0	0	0	0	0	0	0
15:00	0	0	31	2	2	0	0	0	35	36	0	0	45	6	1	0	0	0	52	52.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	36	5	1	0	0	0	42	42.5	0	0	54	3	2	0	0	0	59	60	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
15:30	1	0	26	5	2	1	0	0	35	36.5	0	0	48	3	0	0	0	0	51	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	45	1	0	0	0	0	46	46	0	0	59	5	3	0	0	0	67	68.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	138	13	5	1	0	0	158	161	0	0	206	17	6	0	0	0	229	232	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
16:00	0	0	29	7	0	1	0	0	37	38.3	0	0	60	2	0	0	0	0	62	62	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
16:15	0	0	27	4	1	0	0	0	32	32.5	0	0	40	10	0	0	0	0	50	50	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
16:30	0	0	47	5	1	0	0	0	53	53.5	1	0	39	8	2	1	0	0	51	52.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	23	2	1	0	0	0	26	26.5	2	0	43	5	0	0	0	0	50	48.4	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	126	18	3	1	0	0	148	150.8	3	0	182	25	2	1	0	0	213	212.9	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
17:00	0	0	31	3	0	0	0	0	34	34	0	0	52	4	0	0	0	0	56	56	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
17:15	0	0	35	1	0	0	0	0	36	36	0	0	47	4	0	0	0	0	51	51	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
17:30	0	0	25	2	0	0	0	0	27	27	0	0	50	5	0	0	0	0	55	55	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
17:45	0	0	25	3	0	0	0	0	28	28	0	0	44	0	0	0	0	0	44	44	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	116	9	0	0	0	0	125	125	0	0	193	13	0	0	0	0	206	206	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
18:00	0	0	27	1	0	0	0	0	28	28	0	0	56	3	1	1	0	0	61	62.8	0	0	1	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
18:15	0	0	27	2	0	0	0	0	29	29	0	0	41	6	0	0	0	0	47	47	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
18:30	0	0	19	3	0	0	0	0	22	22	0	0	50	3	0	0	0	0	53	53	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
18:45	1	0	26	1	0	0	0	0	28	27.2	0	0	45	1	0	0	0	0	46	46	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	99	7	0	0	0	0	107	106.2	0	0	192	13	1	1	0	0	207	208.8	0	0	4	1	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
12 TOT	6	6	1348	165	33	4	0	0	1562	1575.3	12	3	2239	205	26	3	5	1	2494	2504.5	0	0	28	4	1	0	0	0	33	33.5	0	0	0	0	0	0	0	0	0	0

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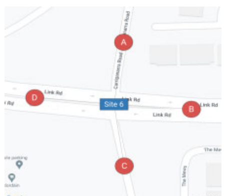

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 6
Location: Killumney Link Rd/Carriganarra Rd/Heathfield estate main link
Date: Tue 16-Apr-2024

Arm A - Carriganarra Rd
Arm B - Link Rd
Arm C - Heathfield estate main link
Arm D - Link Rd

	A => A										A => B										A => C										A => D									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	8	2	0	0	0	0	10	10	0	0	0	1	0	0	0	0	1	1	0	0	5	0	0	0	0	0	5	5
07:15	0	0	0	0	0	0	0	0	0	0	0	0	10	1	0	0	0	0	11	11	0	0	1	0	0	0	0	0	1	1	0	0	6	0	0	0	0	0	6	6
07:30	0	0	0	0	0	0	0	0	0	0	0	0	14	2	0	0	0	0	16	16	0	0	0	0	0	0	0	0	0	0	0	0	10	1	0	0	0	0	11	11
07:45	0	0	0	0	0	0	0	0	0	0	0	0	22	2	0	0	0	0	24	24	0	0	1	0	0	0	0	0	1	1	0	0	20	1	0	0	0	0	21	21
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	54	7	0	0	0	0	61	61	0	0	2	1	0	0	0	0	3	3	0	0	41	2	0	0	0	0	43	43
08:00	0	0	0	0	0	0	0	0	0	0	0	0	32	0	0	0	0	0	32	32	0	0	1	1	0	0	0	0	2	2	0	0	12	3	0	0	0	0	15	15
08:15	0	0	0	0	0	0	0	0	0	0	0	0	14	2	0	0	0	0	16	16	0	0	4	0	0	0	0	0	4	4	0	0	23	1	0	0	0	0	24	24
08:30	0	0	0	0	0	0	0	0	0	0	0	0	23	3	0	0	0	0	26	26	0	0	2	0	0	0	0	0	2	2	0	0	43	3	1	0	0	0	47	47.5
08:45	0	0	0	0	0	0	0	0	0	0	0	0	13	1	0	0	0	0	14	14	0	0	3	0	1	0	0	0	4	4.5	0	0	36	5	0	0	0	0	41	41
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	82	6	0	0	0	0	88	88	0	0	10	1	1	0	0	0	12	12.5	0	0	114	12	1	0	0	0	127	127.5
09:00	0	0	0	0	0	0	0	0	0	0	0	0	22	0	1	0	0	0	23	23.5	0	0	6	0	0	0	0	0	6	6	0	0	36	1	1	0	0	0	38	38.5
09:15	0	0	0	0	0	0	0	0	0	0	0	0	11	3	0	0	0	0	14	14	0	0	1	0	0	0	0	0	1	1	0	0	31	1	0	0	0	0	32	32
09:30	0	0	0	0	0	0	0	0	0	0	0	0	6	1	2	0	0	0	9	10	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	0	0	9	9
09:45	0	0	0	0	0	0	0	0	0	0	0	0	9	1	0	0	0	0	10	10	0	0	1	0	0	0	0	0	1	1	0	0	14	3	1	0	0	0	18	18.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	48	5	3	0	0	0	56	57.5	0	0	8	0	0	0	0	0	8	8	0	0	89	6	2	0	0	0	97	98
10:00	0	0	0	0	0	0	0	0	0	0	0	0	9	2	0	1	0	0	12	13.3	0	0	1	0	0	0	0	0	1	1	0	0	12	3	0	0	0	0	15	15
10:15	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7	7	0	0	0	1	0	0	0	0	1	1	0	0	14	1	1	0	0	0	16	16.5
10:30	0	0	0	0	0	0	0	0	0	0	0	0	5	1	1	0	0	0	7	7.5	0	0	2	0	0	0	0	0	2	2	0	0	7	0	0	0	0	0	7	7
10:45	0	0	0	0	0	0	0	0	0	0	0	0	11	2	0	0	0	0	13	13	0	0	1	0	0	0	0	0	1	1	0	0	12	1	0	0	0	0	13	13
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	32	5	1	1	0	0	39	40.8	0	0	4	1	0	0	0	0	5	5	0	0	45	5	1	0	0	0	51	51.5
11:00	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	0	0	0	8	8	0	0	1	0	0	0	0	0	1	1	0	0	19	1	0	0	0	0	20	20
11:15	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	11	1	0	0	0	0	12	12
11:30	0	0	0	0	0	0	0	0	0	0	0	0	7	1	1	0	0	0	9	9.5	0	0	3	0	0	0	0	0	3	3	0	1	17	1	0	0	0	0	19	18.4
11:45	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6	0	0	2	0	0	0	0	0	2	2	0	0	9	2	0	0	1	0	12	13
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	24	3	1	0	0	0	28	28.5	0	0	6	0	0	0	0	0	6	6	0	1	56	5	0	0	1	0	63	63.4
12:00	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	12	12	0	0	2	0	1	0	0	0	3	3.5	0	0	26	0	0	0	0	0	26	26
12:15	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	5	5	0	0	2	0	0	0	0	0	2	2	0	0	12	2	1	0	0	0	15	15.5
12:30	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	0	0	8	8.5	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	16	16
12:45	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8	0	0	2	0	0	0	0	0	2	2	0	0	15	1	0	0	0	0	16	16
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	31	1	1	0	0	0	33	33.5	0	0	6	0	1	0	0	0	7	7.5	0	0	69	3	1	0	0	0	73	73.5
13:00	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6	0	0	1	0	0	0	0	0	1	1	0	0	19	3	1	0	0	0	23	23.5
13:15	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	2	0	0	0	0	0	2	2	0	0	9	2	0	0	0	0	11	11
13:30	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	1	0	0	9	10.3	0	0	2	0	1	0	0	0	3	3.5	0	0	22	3	0	0	0	0	25	25
13:45	0	0	0	0	0	0	0	0	0	0	0	0	13	2	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0	0	1	24	2	0	0	0	0	27	26.4
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	29	3	0	1	0	0	33	34.3	0	0	5	0	1	0	0	0	6	6.5	0	1	74	10	1	0	0	0	86	85.9
14:00	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	12	12	0	0	1	0	0	0	0	0	1	1	0	0	31	0	0	0	0	0	31	31
14:15	0	0	0	0	0	0	0	0	0	0	0	0	11	1	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	13	13
14:30	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7	7	0	0	1	0	0	0	0	0	1	1	0	0	16	0	0	0	0	0	16	16
14:45	0	0	0	0	0	0	0	0	0	0	0	0	7	2	0	0	0	0	9	9	0	0	5	0	0	0	0	0	5	5	0	0	31	2	0	0	0	0	33	33
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	37	3	0	0	0	0	40	40	0	0	7	0	0	0	0	0	7	7	0	0	91	2	0	0	0	0	93	93
15:00	0	0	0	0	0	0	0	0	0	0	0	0	9	3	0	0	0	0	12	12	0	0	3	0	0	0	0	0	3	3	0	0	25	0	0	0	0	0	25	25
15:15	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	0	0	8	8.5	0	0	0	0	0	0	0	0	0	0	0	0	27	3	0	1	0	0	31	32.3
15:30	0	0	0	0	0	0	0	0	0	0	0	0	13	2	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	0	0	0	24	24
15:45	0	0	0	0	0	0	0	0	0	0	0	0	15	1	0	0	0	0	16	16	0	0	3	0	0	0	0	0	3	3	0	2	37	2	0	0	0	0	41	39.8
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	44	6	1	0	0	0	51	51.5	0	0	6	0	0	0	0	0	6	6	0	2	113	5	0	1	0	0	121	121.1
16:00	0	0	0	0	0	0	0	0	0	0	0	0	11	5	0	0	0	0	16	16	0	0	6	0	0	0	0	0	6	6	0	0	32	2	1	0	0	0	35	35.5
16:15	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	1	0	0	18	19.3	0	0	4	0	0	0	0	0	4	4	0	0	34	1	0	1	0	0	36	37.3
16:30	0	0	0	0	0	0	0	0	0	0	0	0	5	3	1	0	0	0	9	9.5	0	0	2	0	0	0	0	0	2	2	0	0	39	3	0	0	0	0	42	42
16:45	0	0	0	0	0	0	0	0	0	0	0	0	15	4	0	0	0	0	19	19	0	0	4	0	0	0	0	0	4	4	0	0	29	3	0	0	0	0	32	32
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	48	12	1	1	0	0	62	63.8	0	0	16	0	0	0	0	0	16	16	0	0	134	9	1	1	0	0	145	146.8
17:00	0	0	0	0	0	0	0	0	0	0	0	0	8	2	0	0	0	0	10	10	0	0	2	0	0	0	0	0	2	2	1	0	36	5	0	0	1	0	43	43.2
17:15	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	17	17	0	0	5	0	0	0	0	0	5	5	0	0	29	4	0	0	0	0	33	33
17:30	0	0	0	0	0	0	0	0	0	0	0	0	11	1	0	0	0	0	12	12	0	0	6	0	0	0	0	0	6	6	0	0	31	0	0	0	0	0	31	31
17:45	0	0	0	0	0	0	0	0	0	0	0	0	17	3	0	0	0	0	20	20	0	0	4	0	0	0	0	0	4	4	0	0	41	1	0	0	0	0	42	42
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	53	6	0	0	0	0	59	59	0	0	17	0	0	0	0	0	17	17	1	0	137	10	0	0	1	0	149	149.2
18:00	0	0	0	0	0	0	0	0	0	0	0	0	13	3	0	0	0	0	16	16	1	0	3	0	0	0	0	0	4	3.2	0	0	27	0	0	0	0	0	27	27
18:15	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	0	0	0	7	7	1	0	2	0	0	0	0	0	3	2.2	0	1	28	0	0	0	0	0	29	28.4
18:30	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7	7	0	0	1	0	0	0	0	0	1	1	0	0	25	1	0	0	0	0	26	26
18:45	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	12	12	0	0	1	1	0	0	0	0	2	2	0	0	21	1	0	0	0	0	22	22
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	38	4	0	0	0	0	42	42	2	0	7	1	0	0	0	0	10	8.4	0	1	101	2	0	0	0	0	104	103.4
12 TOT	0	0	0	0	0	0	0	0	0	0	0	0	520	61	8	3	0	0	592	599.9	2	0	94	4	3	0	0	0	103	102.9	1	5	1064	71	7	2	2	0	1152	1156.3

Cork City Council Planning Department. For Inspection Purposes Only!

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 6
Location: Killumney Link Rd/Carriganarra Rd/Heathfield estate main link
Date: Tue 16-Apr-2024

Arm A - Carriganarra Rd
Arm B - Link Rd
Arm C - Heathfield estate main link
Arm D - Link Rd

	B => A										B => B										B => C										B => D									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	9	1	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	0	0	0	8	8	0	0	16	8	0	2	0	0	26	28.6
07:15	0	0	5	2	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	9	2	1	0	0	0	12	12.5	0	0	34	11	3	0	0	0	48	49.5
07:30	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	7	4	0	1	0	0	12	13.3	0	1	41	12	2	2	0	0	58	61
07:45	0	0	9	2	2	0	0	0	13	14	0	0	0	0	0	0	0	0	0	0	0	0	6	4	0	0	0	0	10	10	0	0	72	9	3	0	0	0	84	85.5
H/TOT	0	0	33	5	2	0	0	0	40	41	0	0	0	0	0	0	0	0	0	0	0	0	29	11	1	1	0	0	42	43.8	0	1	163	40	8	4	0	0	216	224.6
08:00	0	0	6	2	1	0	0	0	9	9.5	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	0	0	0	7	7	0	0	70	10	3	1	0	0	84	86.8
08:15	0	0	9	1	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	1	0	0	8	9.3	0	1	73	11	2	1	0	0	88	89.7
08:30	0	0	8	1	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	0	0	7	7.5	0	0	130	13	3	0	0	0	146	147.5
08:45	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	4	4	0	0	96	8	0	1	2	0	107	110.3
H/TOT	0	0	33	4	1	0	0	0	38	38.5	0	0	0	0	0	0	0	0	0	0	0	0	20	4	1	1	0	0	26	27.8	0	1	369	42	8	3	2	0	425	434.3
09:00	0	0	5	2	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	0	0	6	7.3	0	0	90	7	7	1	2	0	107	113.8
09:15	0	0	2	2	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	5	5	0	0	68	17	4	1	0	0	90	93.3
09:30	0	0	9	0	2	0	0	0	11	12	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	1	0	0	7	8.3	0	0	52	6	3	2	0	0	63	67.1
09:45	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4.5	0	0	63	12	3	2	0	0	80	84.1
H/TOT	0	0	26	4	2	0	0	0	32	33	0	0	0	0	0	0	0	0	0	0	0	0	18	1	1	2	0	0	22	25.1	0	0	273	42	17	6	2	0	340	358.3
10:00	0	0	4	1	1	0	0	0	6	6.5	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	74	9	2	1	0	0	86	88.3
10:15	0	0	5	1	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	1	0	0	4	5.3	0	0	46	11	4	1	0	0	62	65.3
10:30	0	0	2	1	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	3.5	0	0	66	12	1	3	0	0	82	86.4
10:45	0	0	8	1	2	0	0	0	11	12	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	5	5	0	0	54	10	3	1	0	0	68	70.8
H/TOT	0	0	19	4	3	0	0	0	26	27.5	0	0	0	0	0	0	0	0	0	0	0	0	10	3	1	1	0	0	15	16.8	0	0	240	42	10	6	0	0	298	310.8
11:00	0	0	1	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	11	1	0	0	0	69	69.5
11:15	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	0	0	0	6	6.5	0	0	72	15	3	1	0	0	91	93.8
11:30	0	0	3	2	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	74	12	6	1	0	0	93	97.3
11:45	0	0	8	1	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	0	0	0	7	7	0	1	64	9	2	1	0	0	77	78.7
H/TOT	0	0	18	4	0	0	0	0	22	22	0	0	0	0	0	0	0	0	0	0	0	0	13	2	1	0	0	0	16	16.5	0	1	267	47	12	3	0	0	330	339.3
12:00	0	0	17	1	2	0	0	0	20	21	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	0	0	0	7	7	0	0	67	12	2	1	0	0	82	84.3
12:15	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	87	10	6	0	0	0	103	106
12:30	0	0	6	1	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	3	4.3	0	0	82	6	3	2	0	0	93	97.1
12:45	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	8	0	1	0	0	0	9	9.5	0	0	62	11	3	0	0	0	76	77.5
H/TOT	0	0	36	2	2	0	0	0	40	41	0	0	0	0	0	0	0	0	0	0	0	0	19	1	1	1	0	0	22	23.8	0	0	298	39	14	3	0	0	354	364.9
13:00	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	14	14	0	0	65	10	1	1	0	0	77	78.8
13:15	0	0	10	2	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	9	2	0	0	0	0	11	11	0	0	80	12	1	0	0	0	93	93.5
13:30	0	0	7	1	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	3	3	0	0	83	11	1	0	1	0	96	97.5
13:45	0	0	11	0	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9	0	1	93	8	1	1	1	0	105	107.2
H/TOT	0	0	36	3	0	0	0	0	39	39	0	0	0	0	0	0	0	0	0	0	0	0	34	3	0	0	0	0	37	37	0	1	321	41	4	2	2	0	371	377
14:00	0	0	13	0	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	0	0	0	8	8	0	1	61	13	1	0	1	0	77	77.9
14:15	0	0	10	2	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	0	0	0	5	5.5	0	0	80	10	6	1	0	0	97	101.3
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14:45	0	0	8	2	1	0	0	0	11	11.5	0	0	0	0	0	0	0	0	0	0	0	0	9	1	0	0	0	0	10	10	0	0	76	14	3	1	0	0	94	96.8
H/TOT	0	0	42	6	1	1	0	0	50	51.8	0	0	0	0	0	0	0	0	0	0	0	0	27	5	1	0	0	0	33	33.5	0	1	285	54	13	6	3	0	362	378.7
15:00	0	0	10	1	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8	0	0	84	11	2	0	0	0	97	98
15:15	0	0	11	1	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	9	1	0	0	0	0	10	10	0	0	94	8	3	2	0	0	107	111.1
15:30	0	0	11	1	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	5	1	0	0	0	0	6	6	0	0	106	16	3	0	0	0	125	126.5
15:45	0	0	7	1	1	1	0	0	10	11.8	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	14	14	0	2	121	16	4	0	0	0	143	143.8
H/TOT	0	0	39	4	1	1	0	0	45	46.8	0	0	0	0	0	0	0	0	0	0	0	0	36	2	0	0	0	0	38	38	0	2	405	51	12	2	0	0	472	479.4
16:00	0	0	8	0	0	1	0	0	9	10.3	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9	0	2	100	11	3	1	0	0	117	118.6
16:15	0	0	14	1	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	12	1	0	0	0	0	13	13	0	2	113	9	2	0	1	0	127	127.8
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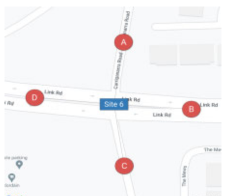
16:45	0	0	12	0	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	13	2	1	0	0	0	16	16.5	0	0	96	12	0	0	0	0	108	108
H/TOT	0	0	45	5	0	1	0	0	51	52.3	0	0	0	0	0	0	0	0	0	0	0	0	40	5	2	0	0	0	47	48	0	5	395	42	5	1	1	0	449	450.8
17:00	0	0	18	1	0	0	0	0	19	19	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	11	11	0	1	110	12	2	0	0	0	125	125.4
17:15	0	0	14	0	0	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0	0	0	16	1	0	0	0	0	17	17	0	1	106	17	0	0	0	0	124	123.4
17:30	0	0	23	0	0	0	0	0	23	23	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	22	22	0	0	111	7	1	0	0	0	119	119.5
17:45	0	0	13	1	0	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0	0	0	15	1	0	0	0	0	16	16	0	0	108	7	0	0	0	0	115	115
H/TOT	0	0	68	2	0	0	0	0	70	70	0	0	0	0	0	0	0	0	0	0	0	0	64	2	0	0	0	0	66	66	0	2	435	43	3	0	0	0	483	483.3
18:00	0	0	21	0	0	0	0	0	21	21	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	14	14	0	0	107	6	1	0	0	0	114	114.5
18:15	0	0	16	0	0	0	0	0	16	16	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	16	16	0	0	84	7	1	0	0	0	92	92.5
18:30	0	0	12	2	0	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	14	14	0	1	94	4	0	0	0	0	99	98.4
18:45	0	0	13	0	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4	0	1	73	6	0	0	0	0	80	79.4
H/TOT	0	0	62	2	0	0	0	0	64	64	0	0	0	0	0	0	0	0	0	0	0	0	48	0	0	0	0	0	48	48	0	2	358	23	2	0	0	0	385	384.8
12 TOT	0	0	457	45	12	3	0	0	517	526.9	0	0	0	0	0	0	0	0	0	0	0	0	358	39	9	6	0	0	412	424.3	0	16	3809	506	108	36	10	0	4485	4586.2



IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 6
Location: Killumney Link Rd/Carriganarra Rd/Heathfield estate main link
Date: Tue 16-Apr-2024

Arm A - Carriganarra Rd
Arm B - Link Rd
Arm C - Heathfield estate main link
Arm D - Link Rd

	C => A										C => B										C => C										C => D									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	1	0	0	0	0	0	1	1	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
07:15	0	0	1	0	0	0	0	0	1	1	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
07:30	0	0	2	0	0	0	0	0	2	2	0	0	20	1	0	0	0	0	21	21	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	0	0	0	6	6.5
07:45	0	0	3	0	0	0	0	0	3	3	0	0	29	1	0	0	0	0	30	30	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8
H/TOT	0	0	7	0	0	0	0	0	7	7	0	0	66	2	0	0	0	0	68	68	0	0	0	0	0	0	0	0	0	0	0	0	13	2	1	0	0	0	16	16.5
08:00	0	0	9	0	0	0	0	0	9	9	0	0	31	1	0	0	0	0	32	32	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	13	13
08:15	1	0	8	1	0	0	0	0	10	9.2	0	0	26	0	0	1	0	0	27	28.3	0	0	0	0	0	0	0	0	0	0	0	0	13	2	0	0	0	0	15	15
08:30	0	0	4	0	0	0	0	0	4	4	0	0	16	1	0	0	0	0	17	17	0	0	0	0	0	0	0	0	0	0	0	0	21	2	0	0	0	0	23	23
08:45	0	0	5	1	1	0	0	0	7	7.5	0	0	11	0	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0	1	0	13	0	0	0	0	0	14	13.2
H/TOT	1	0	26	2	1	0	0	0	30	29.7	0	0	84	2	0	1	0	0	87	88.3	0	0	0	0	0	0	0	0	0	0	1	0	60	4	0	0	0	0	65	64.2
09:00	0	0	1	0	0	0	0	0	1	1	0	0	11	1	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9
09:15	0	0	2	0	0	0	0	0	2	2	0	0	2	1	1	0	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7	7
09:30	0	0	0	0	0	1	0	0	1	2.3	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9
09:45	1	0	1	0	0	0	0	0	2	1.2	0	0	9	0	0	1	0	0	10	11.3	0	0	0	0	0	0	0	0	0	0	1	0	6	3	0	0	0	0	10	9.2
H/TOT	1	0	4	0	0	1	0	0	6	6.5	0	0	30	2	1	1	0	0	34	35.8	0	0	0	0	0	0	0	0	0	0	1	0	31	3	0	0	0	0	35	34.2
10:00	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	0	0	6	7.3	0	0	0	0	0	0	0	0	0	0	0	0	6	2	0	0	0	0	8	8
10:15	0	0	1	0	0	0	0	0	1	1	0	0	4	0	1	0	0	0	5	5.5	0	0	0	0	0	0	0	0	0	0	0	0	7	3	0	0	0	0	10	10
10:30	0	0	0	1	0	0	0	0	1	1	0	0	5	0	1	0	0	0	6	6.5	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4	4
10:45	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	10	10
H/TOT	0	0	1	1	0	0	0	0	2	2	0	0	16	0	2	1	0	0	19	21.3	0	0	0	0	0	0	0	0	0	0	0	0	26	6	0	0	0	0	32	32
11:00	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	5	1	0	0	0	0	6	6
11:15	0	0	0	0	0	0	0	0	0	0	0	0	6	2	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4
11:30	0	0	2	0	1	0	0	0	3	3.5	0	0	2	0	1	1	0	0	4	5.8	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8
11:45	0	0	3	0	0	0	0	0	3	3	0	0	1	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9
H/TOT	0	0	5	0	1	0	0	0	6	6.5	0	0	15	3	1	1	0	0	20	21.8	0	0	0	0	0	0	0	0	0	0	0	0	26	1	0	0	0	0	27	27
12:00	0	0	1	0	0	0	0	0	1	1	0	0	3	1	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6	6.5
12:15	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4
12:30	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4
12:45	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	1	0	0	9	10.3	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	0	0	0	8	8
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	20	2	0	1	0	0	23	24.3	0	0	0	0	0	0	0	0	0	0	0	0	20	1	1	0	0	0	22	22.5
13:00	0	0	3	0	0	0	0	0	3	3	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	9	1	1	0	0	0	11	11.5
13:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	6	3	0	0	0	0	9	9
13:30	0	0	0	1	0	0	0	0	1	1	0	0	6	2	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6
13:45	0	0	3	0	0	0	0	0	3	3	0	0	6	1	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	0	0	0	7	7
H/TOT	0	0	6	1	0	0	0	0	7	7	0	0	20	3	0	0	0	0	23	23	0	0	0	0	0	0	0	0	0	0	0	0	27	5	1	0	0	0	33	33.5
14:00	0	0	0	0	0	0	0	0	0	0	0	0	6	2	1	0	0	0	9	9.5	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7	7
14:15	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3
14:30	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	0	0	7	7.5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
14:45	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	11	1	0	0	0	0	12	12
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	20	3	2	0	0	0	25	26	0	0	0	0	0	0	0	0	0	0	0	0	22	1	0	0	0	0	23	23
15:00	0	0	4	0	0	0	0	0	4	4	0	0	21	3	0	0	0	0	24	24	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	1	0	14	15
15:15	0	0	2	0	0	0	0	0	2	2	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6
15:30	0	0	2	1	0	0	0	0	3	3	0	0	1	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8
15:45	0	0	2	0	0	0	0	0	2	2	0	0	9	5	0	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0	0	0	7	2	0	0	0	0	9	9
H/TOT	0	0	10	1	0	0	0	0	11	11	0	0	34	9	0	0	0	0	43	43	0	0	0	0	0	0	0	0	0	0	0	0	34	2	0	0	1	0	37	38
16:00	0	0	2	0	0	0	0	0	2	2	0	0	10	4	2	0	0	0	16	17	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	0	0	0	8	8
16:15	0	0	1	0	0	0	0	0	1	1	0	0	10	2	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7	7
16:30	0	0	4	0	0	0	0	0	4	4	0	0	9	1	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	7	1	1	0	0	0	9	9.5
16:45	0	0	1	0	0	0	0	0	1	1	0	0	7	2	1	0	0	0	10	10.5	0	0	0	0	0	0	0	0	0	0	0	0	11	1	0	0	0	0	12	12
H/TOT	0	0	8	0	0	0	0	0	8	8	0	0	36	9	3	0	0	0	48	49.5	0	0	0	0	0	0	0	0	0	0	0	0	32	3	1	0	0	0	36	36.5
17:00	0	0	1	0	0	0	0	0	1	1	0	0	7	2	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	13	3	0	0	0	0	16	16
17:15	0	0	4	1	0	0	0	0	5	5	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	7	2	0	0	0	0	9	9
17:30	0	0	2	0	0	0	0	0	2	2	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	1	0	4	0	0	0	0	0	5	4.2
17:45	0	0	1	0	0	0	0	0	1	1	0	0	9	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7	7
H/TOT	0	0	8	1	0	0	0	0	9	9	0	0	30	2	0	0	0	0	32	32	0	0	0	0	0	0	0	0	0	0	1	0	31	5	0	0	0	0	37	36.2
18:00	0	0	3	1	0	0	0	0	4	4	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9
18:15	0	0	2	0	0	0	0	0	2	2	0	0	9	1	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	13	13
18:30	0	0	0	1	0	0	0	0	1	1	0	0	6	1	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8
18:45	0	0	1	0	0	0	0	0	1	1	0	0	9	1	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	9	1	0	0	0	0	10	10
H/TOT	0	0	6	2	0	0	0	0	8	8	0	0	30	3	0	0	0	0	33	33	0	0	0	0	0	0	0	0	0	0	0	0	39	1	0	0	0	0	40	40
12 TOT	2	0	82	8	2	1	0	0	95	95.7	0	0	401	40	9	5	0	0	455	466	0	0	0	0	0	0	0	0	0	0	3	0	361	34	4	0	1	0	403	403.6

Cork City Council Planning Department. For Inspection Purposes Only!

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 6
Location: Killumney Link Rd/Carriganarra Rd/Heathfield estate main link
Date: Tue 16-Apr-2024

Arm A - Carriganarra Rd
Arm B - Link Rd
Arm C - Heathfield estate main link
Arm D - Link Rd

	D => A										D => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	4	0	0	1	0	0	5	6.3	0	0	40	8	4	0	0	0	52	54
07:15	1	0	8	0	0	0	0	0	9	8.2	0	0	53	12	2	1	0	0	68	70.3
07:30	0	0	11	4	0	0	0	0	15	15	0	0	83	6	5	1	0	0	95	98.8
07:45	0	0	16	5	0	0	1	0	22	23	0	1	90	12	6	0	0	0	109	111.4
H/TOT	1	0	39	9	0	1	1	0	51	52.5	0	1	266	38	17	2	0	0	324	334.5
08:00	0	0	31	2	0	0	0	0	33	33	0	0	90	8	1	1	0	0	100	101.8
08:15	0	0	19	1	0	0	0	0	20	20	0	0	69	8	1	1	0	0	79	80.8
08:30	0	0	25	1	0	0	0	0	26	26	0	0	62	9	0	1	0	0	72	73.3
08:45	0	0	21	2	1	0	0	0	24	24.5	0	0	78	9	4	1	0	0	92	95.3
H/TOT	0	0	96	6	1	0	0	0	103	103.5	0	0	299	34	6	4	0	0	343	351.2
09:00	0	0	26	1	1	0	0	0	28	28.5	0	0	68	4	5	1	0	0	78	81.8
09:15	0	0	16	1	0	0	0	0	17	17	0	0	66	8	2	1	0	0	77	79.3
09:30	0	0	15	1	0	0	0	0	16	16	0	0	61	11	2	2	1	0	77	81.6
09:45	0	0	9	2	2	0	0	0	13	14	0	0	45	13	0	1	0	0	59	60.3
H/TOT	0	0	66	5	3	0	0	0	74	75.5	0	0	240	36	9	5	1	0	291	303
10:00	0	0	17	2	1	0	0	0	20	20.5	0	0	55	9	3	1	0	0	68	70.8
10:15	0	1	14	2	1	0	0	0	18	17.9	0	0	50	7	1	0	0	0	58	58.5
10:30	0	0	11	1	0	0	0	0	12	12	0	0	45	8	7	1	0	0	61	65.8
10:45	0	0	15	0	0	0	0	0	15	15	0	0	47	13	2	1	0	0	63	65.3
H/TOT	0	1	57	5	2	0	0	0	65	65.4	0	0	197	37	13	3	0	0	250	260.4
11:00	0	0	9	1	0	0	0	0	10	10	0	0	48	10	3	3	0	0	64	69.4
11:15	0	0	13	3	0	0	0	0	16	16	0	1	55	9	3	0	0	0	68	68.9
11:30	0	0	15	1	0	0	0	0	16	16	0	0	54	9	3	0	0	0	66	67.5
11:45	0	0	24	2	1	0	0	0	27	27.5	0	0	50	16	2	1	0	1	70	72.3
H/TOT	0	0	61	7	1	0	0	0	69	69.5	0	1	207	44	11	4	0	1	268	278.1
12:00	0	0	20	0	0	0	0	0	20	20	0	0	49	7	4	1	0	0	61	64.3
12:15	0	0	10	1	0	0	0	0	11	11	0	0	46	12	1	2	1	0	62	66.1
12:30	1	0	15	2	0	0	0	0	18	17.2	0	0	56	13	5	0	0	0	74	76.5
12:45	0	0	17	0	0	0	0	0	17	17	0	0	71	5	2	1	0	0	79	81.3
H/TOT	1	0	62	3	0	0	0	0	66	65.2	0	0	222	37	12	4	1	0	276	288.2
13:00	0	0	15	4	0	0	0	0	19	19	0	0	57	5	1	0	0	0	63	63.5
13:15	1	0	23	5	0	0	0	0	29	28.2	0	0	49	8	0	0	0	0	57	57
13:30	0	0	17	1	0	0	0	0	18	18	0	0	51	9	2	0	1	0	63	65
13:45	0	1	18	0	0	0	0	0	19	18.4	0	0	68	7	0	2	0	0	77	79.6
H/TOT	1	1	73	10	0	0	0	0	85	83.6	0	0	225	29	3	2	1	0	260	265.1
14:00	1	0	24	2	0	0	0	0	27	26.2	0	0	75	6	3	0	0	0	84	85.5
14:15	0	0	30	1	0	0	0	0	31	31	0	0	52	13	1	1	0	0	67	68.8
14:30	0	0	14	0	0	0	0	0	14	14	0	0	73	2	4	0	0	0	79	81
14:45	0	0	22	0	0	0	0	0	22	22	0	1	57	7	2	2	0	0	69	72
H/TOT	1	0	90	3	0	0	0	0	94	93.2	0	1	257	28	10	3	0	0	299	307.3
15:00	0	0	30	2	0	0	0	0	32	32	0	0	86	9	1	1	0	0	97	98.8
15:15	0	0	24	2	0	0	0	0	26	26	0	1	74	11	2	0	0	0	88	88.4
15:30	0	0	30	1	0	0	0	0	31	31	0	0	72	11	2	0	0	0	85	86
15:45	0	0	18	1	1	0	0	0	20	20.5	0	0	65	14	3	1	0	0	83	85.8
H/TOT	0	0	102	6	1	0	0	0	109	109.5	0	1	297	45	8	2	0	0	353	359
16:00	0	0	52	2	0	0	0	0	54	54	0	1	78	10	1	0	0	0	90	89.9
16:15	0	0	17	2	0	0	0	0	19	19	0	2	82	12	0	1	0	0	97	97.1
16:30	0	1	15	0	0	0	0	0	16	15.4	0	0	85	17	1	2	0	0	105	108.1
16:45	0	0	39	0	0	0	0	0	39	39	0	0	55	10	1	1	0	0	67	68.8
H/TOT	0	1	123	4	0	0	0	0	128	127.4	0	3	300	49	3	4	0	0	359	363.9
17:00	0	0	32	0	0	0	0	0	32	32	0	1	102	7	0	0	0	0	110	109.4
17:15	0	0	25	6	0	0	0	0	31	31	0	1	67	6	1	0	0	0	75	74.9
17:30	0	0	28	6	0	0	0	0	34	34	0	0	95	4	0	0	0	0	99	99
17:45	0	0	20	0	0	0	0	0	20	20	0	1	63	4	0	0	0	0	68	67.4
H/TOT	0	0	105	12	0	0	0	0	117	117	0	3	327	21	1	0	0	0	352	350.7
18:00	0	0	24	1	0	1	0	0	26	27.3	0	0	69	7	2	0	0	0	78	79
18:15	0	0	24	2	0	0	0	0	26	26	0	0	63	4	0	0	0	0	67	67
18:30	0	0	22	3	0	0	0	0	25	25	0	0	65	0	0	0	0	0	65	65
18:45	0	0	18	1	0	0	0	0	19	19	0	0	41	1	0	0	0	0	42	42
H/TOT	0	0	88	7	0	1	0	0	96	97.3	0	0	238	12	2	0	0	0	252	253
12 TOT	4	3	962	77	8	2	1	0	1057	1059.6	0	10	3075	410	95	33	3	1	3627	3714.4

	D => C										D => D									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
07:15	0	0	3	1	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
07:30	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
07:45	0	0	9	2	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	16	3	0	0	0	0	19	19	0	0	0	0	0	0	0	0	0	0
08:00	0	0	5	0	1	0	0	0	6	6.5	0	0	0	0	0	0	0	0	0	0
08:15	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
08:30	0	0	2	1	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
08:45	0	0	11	2	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	22	3	1	0	0	0	26	26.5	0	0	0	0	0	0	0	0	0	0
09:00	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
09:15	0	0	10	1	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
09:30	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
09:45	0	0	5	1	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	26	2	0	0	0	0	28	28	0	0	0	0	0	0	0	0	0	0
10:00	0	0	7	3	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
10:15	0	0	6	3	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
10:30	0	0	8	1	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
10:45	0	0	5	1	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	26	8	0	0	0	0	34	34	0	0	0	0	0	0	0	0	0	0
11:00	0	0	2	1	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
11:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
11:30	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
11:45	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	14	1	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0
12:00	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
12:15	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
12:30	0	0	12	0	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
12:45	0	0	5	1	1	0	0	0	7	7.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	35	1	1	0	0	0	37	37.5	0	0	0	0	0	0	0	0	0	0
13:00	0	0	10	1	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
13:15	0	0	7	1	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
13:30	0	0	4	2	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
13:45	1	0	6	0	0	0	0	0	7	6.2	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	27	4	0	0	0	0	32	31.2	0	0	0	0	0	0	0	0	0	0
14:00	0	0	10	1	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
14:15	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
14:30	0	0	2	0	0	0	1	0	3	4	0	0	0	0	0	0	0	0	0	0
14:45	0	0	5	1	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	24	2	0	0	1	0	27	28	0	0	0	0	0	0	0	0	0	0
15:00	0	0	7	2	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
15:15	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
15:30	0	0	11	1	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
15:45	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	32	3	0	0	0	0	35	35	0	0	0	0	0	0	0	0	0	0
16:00	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
16:15	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
16:30	0	0	13	0	1	0	0	0	14	14.5	0	0	0	0	0	0	0	0	0	0
16:45	1	0	9	0	0	0	0	0	10	9.2	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	37	0	1	0	0	0	39	38.7	0	0	0	0	0	0	0	0	0	0
17:00	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
17:15	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
17:30	0	0	20	0	0	0	0	0	20	20	0	0	0	0	0	0	0	0	0	0
17:45	0	0	11	0	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	49	0	0	0	0	0	49	49	0	0	0	0	0	0	0	0	0	0
18:00	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
18:15	0	0	10	3	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
18:30	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
18:45	0	0	8	1	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	32	4	0	0	0	0	36	36	0	0	0	0	0	0	0	0	0	0
12 TOT	2	0	340	31	3	0	1	0	377	377.9	0	0	0	0	0	0	0	0	0	0

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 7
Location: Killumney Link East Roundabout
Date: Tue 16-Apr-2024

Arm A - N22
Arm B - N22
Arm C - Link Rd

	A => A										A => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	107	25	2	1	0	0	135	137.3
07:15	0	0	0	0	0	0	0	0	0	0	0	0	129	32	1	2	0	0	164	167.1
07:30	0	0	0	0	0	0	0	0	0	0	0	0	127	27	1	5	1	0	161	169
07:45	0	0	0	0	0	0	0	0	0	0	0	1	123	27	4	4	0	0	159	165.6
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	486	111	8	12	1	0	619	639
08:00	0	0	0	0	0	0	0	0	0	0	0	0	129	26	3	4	0	0	162	168.7
08:15	0	0	0	0	0	0	0	0	0	0	0	0	142	19	2	5	0	0	168	175.5
08:30	0	0	0	0	0	0	0	0	0	0	0	0	173	15	4	3	0	0	195	200.9
08:45	0	0	0	0	0	0	0	0	0	0	0	0	139	22	5	2	0	0	168	173.1
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	583	82	14	14	0	0	693	718.2
09:00	0	0	0	0	0	0	0	0	0	0	0	0	133	20	5	4	0	0	162	169.7
09:15	0	0	0	0	0	0	0	0	0	0	0	1	116	26	10	3	2	0	158	168.3
09:30	0	0	0	0	0	0	0	0	0	0	0	0	127	19	3	5	0	0	154	162
09:45	0	0	1	0	0	0	0	0	1	1	0	0	107	17	4	3	0	0	131	136.9
H/TOT	0	0	1	0	0	0	0	0	1	1	0	1	483	82	22	15	2	0	605	636.9
10:00	0	0	0	0	0	0	0	0	0	0	0	0	89	11	3	4	0	0	107	113.7
10:15	0	0	1	0	0	0	0	0	1	1	0	0	94	15	7	2	1	0	119	126.1
10:30	0	0	0	0	0	0	0	0	0	0	0	0	92	11	2	1	1	0	107	110.3
10:45	0	0	0	0	0	0	0	0	0	0	0	3	92	11	0	3	0	0	109	111.1
H/TOT	0	0	1	0	0	0	0	0	1	1	0	3	367	48	12	10	2	0	442	461.2
11:00	0	0	0	0	0	0	0	0	0	0	0	1	86	14	1	9	1	0	112	124.6
11:15	0	0	0	0	0	0	0	0	0	0	0	2	75	13	2	5	1	0	98	105.3
11:30	0	0	0	0	0	0	0	0	0	0	0	1	103	11	3	4	0	0	122	128.1
11:45	0	0	0	0	0	0	0	0	0	0	0	0	96	15	3	8	0	0	122	133.9
H/TOT	0	0	0	0	0	0	0	0	0	0	0	4	360	53	9	26	2	0	454	491.9
12:00	0	0	1	0	0	0	0	0	1	1	1	0	99	21	3	9	0	0	133	145.4
12:15	0	0	0	0	0	0	0	0	0	0	0	1	129	14	11	7	0	1	163	177
12:30	0	0	0	0	0	0	0	0	0	0	0	0	108	20	5	6	0	0	139	149.3
12:45	0	0	0	0	0	0	0	0	0	0	0	0	104	9	4	8	1	0	126	139.4
H/TOT	0	0	1	0	0	0	0	0	1	1	1	1	440	64	23	30	1	1	561	611.1
13:00	0	0	0	0	0	0	0	0	0	0	0	0	108	5	2	4	1	0	120	127.2
13:15	0	0	0	0	0	0	0	0	0	0	0	0	134	19	3	3	1	0	160	166.4
13:30	0	0	0	0	0	0	0	0	0	0	0	0	131	21	2	4	0	0	158	164.2
13:45	0	0	1	0	0	0	0	0	1	1	0	0	134	16	1	8	0	0	159	169.9
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	507	61	8	19	2	0	597	627.7
14:00	0	0	0	0	0	0	0	0	0	0	0	0	132	18	2	4	2	0	158	166.2
14:15	0	0	0	0	0	0	0	0	0	0	0	2	112	13	2	4	0	0	133	138
14:30	0	0	0	0	0	0	0	0	0	0	0	0	119	11	0	5	0	0	135	141.5
14:45	0	0	2	0	0	0	0	0	2	2	0	0	119	14	5	3	2	0	143	151.4
H/TOT	0	0	2	0	0	0	0	0	2	2	0	2	482	56	9	16	4	0	569	597.1
15:00	0	0	0	1	0	0	0	0	1	1	0	0	168	22	3	5	0	0	198	206
15:15	0	0	1	0	0	0	0	0	1	1	0	2	153	18	6	2	1	0	182	187.4
15:30	0	0	0	0	0	0	0	0	0	0	0	0	154	20	4	4	1	0	183	191.2
15:45	0	0	0	0	0	0	0	0	0	0	0	0	169	20	4	0	0	0	193	195
H/TOT	0	0	1	1	0	0	0	0	2	2	0	2	644	80	17	11	2	0	756	779.6
16:00	0	0	0	0	0	0	0	0	0	0	0	0	231	28	3	4	3	0	269	278.7
16:15	0	0	0	0	0	0	0	0	0	0	0	0	211	29	4	3	3	0	250	258.9
16:30	0	0	0	0	0	0	0	0	0	0	0	0	211	15	3	5	1	0	235	244
16:45	0	0	1	0	0	0	0	0	1	1	0	1	172	12	1	4	0	0	190	195.1
H/TOT	0	0	1	0	0	0	0	0	1	1	0	1	825	84	11	16	7	0	944	976.7
17:00	0	0	0	0	0	0	0	0	0	0	0	1	187	20	3	1	0	0	212	214.2
17:15	0	0	0	0	0	0	0	0	0	0	0	0	187	16	3	5	0	0	211	219
17:30	0	0	0	0	0	0	0	0	0	0	0	0	197	16	1	1	0	0	215	216.8
17:45	0	0	0	0	0	0	0	0	0	0	0	0	208	24	1	3	0	0	236	240.4
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	779	76	8	10	0	0	874	890.4
18:00	0	0	0	0	0	0	0	0	0	0	0	0	166	16	0	0	0	0	182	182
18:15	0	0	1	1	0	0	0	0	2	2	0	0	156	11	1	1	0	0	169	170.8
18:30	0	0	0	0	0	0	0	0	0	0	0	0	148	17	3	4	0	0	172	178.7
18:45	0	0	0	0	0	0	0	0	0	0	0	0	147	4	1	0	0	0	152	152.5
H/TOT	0	0	1	1	0	0	0	0	2	2	0	0	617	48	5	5	0	0	675	684
12 TOT	0	0	9	2	0	0	0	0	11	11	1	16	6573	845	146	184	23	1	7789	8113.8

	A => C										B => A									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	3	2	0	0	0	0	5	5	0	0	99	16	4	2	0	0	121	125.6
07:15	0	0	8	3	1	0	0	0	12	12.5	0	1	165	27	5	2	0	0	200	204.5
07:30	0	0	10	4	0	0	0	0	14	14	0	0	175	24	3	6	0	0	208	217.3
07:45	0	0	6	4	0	0	0	0	10	10	0	0	240	25	1	2	0	0	268	271.1
H/TOT	0	0	27	13	1	0	0	0	41	41.5	0	1	679	92	13	12	0	0	797	818.5
08:00	0	0	15	2	0	0	0	0	17	17	0	0	202	24	3	1	1	0	231	234.8
08:15	0	0	13	1	0	0	0	0	14	14	0	0	209	21	2	4	0	0	236	242.2
08:30	0	0	21	3	0	0	0	0	24	24	0	0	191	15	3	4	0	0	213	219.7
08:45	0	0	15	2	0	0	0	0	17	17	0	0	190	17	3	6	0	0	216	225.3
H/TOT	0	0	64	8	0	0	0	0	72	72	0	0	792	77	11	15	1	0	896	922
09:00	0	0	9	1	0	0	0	0	10	10	0	0	150	22	4	5	1	0	182	191.5
09:15	0	0	10	5	0	0	0	0	15	15	0	0	154	11	3	2	2	0	172	178.1
09:30	0	0	8	0	0	1	0	0	9	10.3	0	0	110	21	4	2	1	0	138	143.6
09:45	0	0	14	2	1	0	0	0	17	17.5	0	1	105	14	6	4	0	0	130	137.6
H/TOT	0	0	41	8	1	1	0	0	51	52.8	0	1	519	68	17	13	4	0	622	650.8
10:00	0	0	12	1	0	1	0	0	14	15.3	0	0	108	15	3	9	1	0	136	150.2
10:15	0	0	9	0	0	0	0	0	9	9	0	0	73	13	5	5	0	0	96	105
10:30	0	0	6	2	1	1	0	0	10	11.8	0	0	76	19	3	4	2	0	104	112.7
10:45	0	0	12	2	0	0	0	0	14	14	0	0	83	16	2	8	0	0	109	120.4
H/TOT	0	0	39	5	1	2	0	0	47	50.1	0	0	340	63	13	26	3	0	445	488.3
11:00	0	0	12	2	0	0	0	0	14	14	0	0	104	15	3	5	0	0	127	135
11:15	0	0	16	0	0	0	0	0	16	16	0	0	76	14	3	5	0	0	98	106
11:30	0	0	16	3	1	0	0	0	20	20.5	0	1	101	10	2	6	2	0	122	132.2
11:45	0	0	15	1	0	0	0	0	16	16	0	0	88	14	4	6	0	0	112	121.8
H/TOT	0	0	59	6	1	0	0	0	66	66.5	0	1	369	53	12	22	2	0	459	495
12:00	0	0	21	4	0	0	0	0	25	25	0	0	73	9	3	4	0	0	89	95.7
12:15	0	0	14	2	0	0	0	0	16	16	0	0	81	6	3	8	0	0	98	109.9
12:30	0	0	14	0	0	0	0	0	14	14	0	0	98	9	5	1	0	1	114	117.8
12:45	0	0	14	1	0	0	0	0	15	15	0	0	93	16	5	5	0	0	119	128
H/TOT	0	0	63	7	0	0	0	0	70	70	0	0	345	40	16	18	0	1	420	451.4
13:00	0	0	18	0	0	0	0	0	18	18	0	2	83	21	3	4	0	0	113	118.5
13:15	0	0	18	3	0	0	0	0	21	21	0	0	78	15	2	3	0	0	98	102.9
13:30	0	0	18	1	0	0	0	0	19	19	0	1	107	18	6	8	1	0	141	154.8
13:45	0	0	25	2	0	0	0	0	27	27	0	0	114	15	5	4	3	0	141	151.7
H/TOT	0	0	79	6	0	0	0	0	85	85	0	3	382	69	16	19	4	0	493	527.9
14:00	0	0	18	2	0	0	1	0	21	22	0	0	114	25	4	4	0	0	147	154.2
14:15	0	0	11	2	0	0	0	0	13	13	0	0	96	13	3	8	1	0	121	133.9
14:30	0	0	21	2	1	1	0	0	25	26.8	0	0	110	24	3	5	0	0	142	150
14:45	0	0	20	3	0	0	0	0	23	23	0	1	123	16	4	4	0	0	148	154.6
H/TOT	0	0	70	9	1	1	1	0	82	84.8	0	1	443	78	14	21	1	0	558	592.7
15:00	0	0	13	1	0	0	0	0	14	14	0	0	116	31	6	4	0	0	157	165.2
15:15	0	0	20	1	0	0	0	0	21	21	0	0	131	23	8	7	1	0	170	184.1
15:30	0	0	25	6	0	0	0	0	31	31	0	0	120	20	7	6	0	0	153	164.3
15:45	0	1	40	4	2	0	0	0	47	47.4	0	0	148	26	6	6	1	0	187	198.8
H/TOT	0	1	98	12	2	0	0	0	113	113.4	0	0	515	100	27	23	2	0	667	712.4
16:00	0	0	40	1	0	0	1	0	42	43	0	2	133	27	1	4	0	0	167	171.5
16:15	0	0	35	2	0	0	0	0	37	37	0	0	114	25	3	2	0	0	144	148.1
16:30	0	1	39	3	0	0	0	0	43	42.4	0	1	162	22	1	1	0	0	187	188.2
16:45	0	0	28	6	0	0	0	0	34	34	0	0	117	26	4	1	1	0	149	153.3
H/TOT	0	1	142	12	0	0	1	0	156	156.4	0	3	526	100	9	8	1	0	647	661.1
17:00	0	0	40	2	0	0	0	0	42	42	0	0	134	25	2	0	2	0	163	166
17:15	0	0	22	4	0	0	0	0	26	26	0	1	148	23	2	1	0	0	175	176.7
17:30	0	0	34	3	0	0	0	0	37	37	0	0	141	15	2	2	0	0	160	163.6
17:45	0	0	33	2	0	0	0	0	35	35	0	0	142	17	0	0	1	0	160	161
H/TOT	0	0	129	11	0	0	0	0	140	140	0	1	565	80	6	3	3	0	658	667.3
18:00	0	0	22	1	0	0	0	0	23	23	0	0	137	15	3	1	0	0	156	158.8
18:15	0	0	15	3	0	0	0	0	18	18	0	0	149	12	1	2	0	0	164	167.1
18:30	0	0	23	1	0	0	0	0	24	24	0	0	121	9	1	0	0	1	132	132.5
18:45	0	0	11	2	0	0	0	0	13	13	0	0	98	7	0	1	0	0	106	107.3
H/TOT	0	0	71	7	0	0	0	0	78	78	0	0	505	43	5	4	0	1	558	565.7
12 TOT	0	2	882	104	7	4	2	0	1001	1010.5	0	11	5980	863	159	184	21	2	7220	7553.1

	B => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	1	0	0	0	0	0	1	1
09:00	0	0	1	0	0	0	0	0	1	1
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	1	0	0	0	0	1	1
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	1	0	0	0	0	1	1
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	1	0	0	0	0	0	1	1
12:15	0	0	1	0	0	0	0	0	1	1
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	3	0	0	0	0	0	3	3
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	1	0	0	0	0	0	1	1
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	1	0	0	0	0	0	1	1
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	1	0	0	0	0	0	1	1
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	8	1	0	0	0	0	9	9

Cork City Council Planning Department. For Inspection Purposes Only!

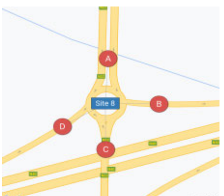
IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 7
Location: Killumney Link East Roundabout
Date: Tue 16-Apr-2024

Arm A - N22
Arm B - N22
Arm C - Link Rd

	B => C										C => A									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	32	8	0	2	0	0	42	44.6	0	0	11	0	0	0	0	0	11	11
07:15	0	0	39	13	3	0	0	0	55	56.5	0	0	22	2	0	0	0	0	24	24
07:30	0	1	50	14	2	3	0	0	70	74.3	0	0	38	2	1	0	0	0	41	41.5
07:45	0	0	79	8	5	0	0	0	92	94.5	0	0	41	5	0	0	0	0	46	46
H/TOT	0	1	200	43	10	5	0	0	259	269.9	0	0	112	9	1	0	0	0	122	122.5
08:00	0	0	70	12	4	1	0	0	87	90.3	0	0	36	3	0	0	0	0	39	39
08:15	0	1	92	11	2	2	0	0	108	111	0	0	44	1	0	0	0	0	45	45
08:30	0	0	141	11	4	0	0	0	156	158	0	0	27	3	0	0	0	0	30	30
08:45	0	0	90	8	4	1	3	0	106	112.3	0	0	23	1	0	0	0	0	24	24
H/TOT	0	1	393	42	14	4	3	0	457	471.6	0	0	130	8	0	0	0	0	138	138
09:00	0	0	64	10	4	3	1	0	82	88.9	0	0	21	0	0	0	0	0	21	21
09:15	0	0	66	13	3	0	0	0	82	83.5	0	0	13	2	1	0	0	0	16	16.5
09:30	0	0	57	6	5	2	0	0	70	75.1	0	0	12	2	1	0	1	0	16	17.5
09:45	0	0	67	10	4	2	0	0	83	87.6	0	0	17	3	0	0	0	0	20	20
H/TOT	0	0	254	39	16	7	1	0	317	335.1	0	0	63	7	2	0	1	0	73	75
10:00	0	0	63	8	2	0	0	0	73	74	0	0	14	3	0	0	0	0	17	17
10:15	0	0	47	14	4	2	0	0	67	71.6	0	0	16	0	0	0	0	0	16	16
10:30	0	0	62	10	2	2	0	0	76	79.6	0	0	11	1	3	0	0	0	15	16.5
10:45	0	0	55	11	4	1	0	0	71	74.3	0	0	14	1	0	0	0	0	15	15
H/TOT	0	0	227	43	12	5	0	0	287	299.5	0	0	55	5	3	0	0	0	63	64.5
11:00	0	0	46	10	1	0	0	0	57	57.5	0	0	6	3	2	0	0	0	11	12
11:15	0	0	65	16	4	1	0	0	86	89.3	0	1	15	3	1	0	0	0	20	19.9
11:30	0	1	65	12	5	1	0	0	84	87.2	0	0	14	1	0	0	0	0	15	15
11:45	0	0	65	9	2	2	0	0	78	81.6	0	0	13	4	1	0	0	0	18	18.5
H/TOT	0	1	241	47	12	4	0	0	305	315.6	0	1	48	11	4	0	0	0	64	65.4
12:00	0	0	73	10	4	0	0	0	87	89	0	0	15	3	0	0	0	0	18	18
12:15	0	0	77	10	6	0	0	0	93	96	0	0	13	3	0	0	0	0	16	16
12:30	0	0	73	7	4	3	0	0	87	92.9	0	0	9	2	0	0	0	0	11	11
12:45	0	0	62	9	3	0	0	0	74	75.5	0	0	11	1	0	0	0	0	12	12
H/TOT	0	0	285	36	17	3	0	0	341	353.4	0	0	48	9	0	0	0	0	57	57
13:00	0	0	69	9	2	1	0	0	81	83.3	0	0	13	2	0	0	0	0	15	15
13:15	0	0	82	16	0	0	0	0	98	98	0	0	13	1	0	0	0	0	14	14
13:30	0	0	77	9	1	0	0	0	87	87.5	0	0	11	2	0	0	0	0	13	13
13:45	0	1	85	5	1	1	1	0	94	96.2	0	0	25	0	0	0	0	0	25	25
H/TOT	0	1	313	39	4	2	1	0	360	365	0	0	62	5	0	0	0	0	67	67
14:00	0	1	68	12	3	0	0	0	84	84.9	0	0	22	3	0	0	0	0	25	25
14:15	0	0	76	12	5	1	0	0	94	97.8	0	0	16	3	0	0	0	0	19	19
14:30	0	0	69	18	2	4	2	0	95	103.2	0	0	20	0	0	0	0	0	20	20
14:45	0	0	77	14	4	1	0	0	96	99.3	0	0	13	3	0	0	0	0	16	16
H/TOT	0	1	290	56	14	6	2	0	369	385.2	0	0	71	9	0	0	0	0	80	80
15:00	0	0	84	11	2	0	0	0	97	98	0	0	35	4	0	0	0	0	39	39
15:15	0	0	88	9	3	2	0	0	102	106.1	0	0	21	3	1	0	0	0	25	25.5
15:30	0	0	100	12	3	0	0	0	115	116.5	0	0	18	2	0	0	0	0	20	20
15:45	0	1	105	14	3	1	0	0	124	126.2	0	0	22	4	1	0	0	0	27	27.5
H/TOT	0	1	377	46	11	3	0	0	438	446.8	0	0	96	13	2	0	0	0	111	112
16:00	0	3	92	10	3	2	0	0	110	112.3	0	0	25	3	1	0	0	0	29	29.5
16:15	0	1	83	7	3	0	0	0	94	94.9	0	0	17	5	0	0	0	0	22	22
16:30	0	0	76	13	0	0	0	0	89	89	0	0	26	7	1	1	0	0	35	36.8
16:45	0	0	88	9	1	0	0	0	98	98.5	0	0	13	3	0	0	0	0	16	16
H/TOT	0	4	339	39	7	2	0	0	391	394.7	0	0	81	18	2	1	0	0	102	104.3
17:00	0	1	107	10	2	0	0	0	120	120.4	0	1	17	2	0	0	0	0	20	19.4
17:15	0	1	107	14	0	0	0	0	122	121.4	0	0	13	1	0	0	0	0	14	14
17:30	0	0	119	5	1	0	0	0	125	125.5	0	0	14	0	0	0	0	0	14	14
17:45	0	0	106	6	0	0	0	0	112	112	0	0	14	0	0	0	0	0	14	14
H/TOT	0	2	439	35	3	0	0	0	479	479.3	0	1	58	3	0	0	0	0	62	61.4
18:00	0	0	121	5	1	0	0	0	127	127.5	0	0	15	1	0	0	0	0	16	16
18:15	0	0	100	4	1	0	0	0	105	105.5	0	0	11	2	0	0	0	0	13	13
18:30	0	1	95	5	0	0	0	0	101	100.4	0	0	15	0	0	0	0	0	15	15
18:45	0	1	84	5	0	0	0	0	90	89.4	0	0	16	0	0	0	0	0	16	16
H/TOT	0	2	400	19	2	0	0	0	423	422.8	0	0	57	3	0	0	0	0	60	60
12 TOT	0	14	3758	484	122	41	7	0	4426	4538.9	0	2	881	100	14	1	1	0	999	1007.1

	C => B										C => C									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	41	12	4	0	0	0	57	59	0	0	0	0	0	0	0	0	0	0
07:15	0	0	49	11	1	1	0	0	62	63.8	0	0	0	0	0	0	0	0	0	0
07:30	0	0	79	6	5	1	0	0	91	94.8	0	0	0	0	0	0	0	0	0	0
07:45	0	1	86	9	5	0	0	0	101	102.9	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	255	38	15	2	0	0	311	320.5	0	0	0	0	0	0	0	0	0	0
08:00	0	0	105	8	2	0	0	0	115	116	0	0	0	0	0	0	0	0	0	0
08:15	0	0	91	9	1	3	0	0	104	108.4	0	0	0	0	0	0	0	0	0	0
08:30	0	0	77	10	0	1	0	0	88	89.3	0	0	0	0	0	0	0	0	0	0
08:45	0	0	81	9	4	1	0	0	95	98.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	354	36	7	5	0	0	402	412	0	0	0	0	0	0	0	0	0	0
09:00	0	0	79	5	6	1	0	0	91	95.3	0	0	0	0	0	0	0	0	0	0
09:15	0	0	69	9	2	1	0	0	81	83.3	0	0	0	0	0	0	0	0	0	0
09:30	0	0	61	10	3	2	0	0	76	80.1	0	0	0	0	0	0	0	0	0	0
09:45	0	0	48	11	0	2	0	0	61	63.6	0	0	0	1	0	0	0	0	1	1
H/TOT	0	0	257	35	11	6	0	0	309	322.3	0	0	0	1	0	0	0	0	1	1
10:00	0	0	54	8	3	3	0	0	68	73.4	0	0	0	0	0	0	0	0	0	0
10:15	0	0	48	7	2	0	0	0	57	58	0	0	0	0	0	0	0	0	0	0
10:30	0	0	42	8	6	1	0	0	57	61.3	0	0	0	0	0	0	0	0	0	0
10:45	0	0	46	14	2	1	0	0	63	65.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	190	37	13	5	0	0	245	258	0	0	0	0	0	0	0	0	0	0
11:00	0	0	51	8	1	3	0	0	63	67.4	0	0	0	0	0	0	0	0	0	0
11:15	0	0	56	9	2	0	0	0	67	68	0	0	0	0	0	0	0	0	0	0
11:30	0	0	44	9	4	1	0	0	58	61.3	0	0	0	0	0	0	0	0	0	0
11:45	0	0	46	13	2	1	0	1	63	65.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	197	39	9	5	0	1	251	262	0	0	0	0	0	0	0	0	0	0
12:00	0	0	53	4	4	0	0	0	61	63	0	0	1	0	0	0	0	0	1	1
12:15	0	0	40	10	1	3	1	0	55	60.4	0	0	0	0	0	0	0	0	0	0
12:30	0	0	62	12	6	0	0	0	80	83	0	0	0	0	0	0	0	0	0	0
12:45	0	0	73	4	2	2	0	0	81	84.6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	228	30	13	5	1	0	277	291	0	0	1	0	0	0	0	0	1	1
13:00	0	0	55	4	1	0	0	0	60	60.5	0	0	0	0	0	0	0	0	0	0
13:15	0	0	38	6	0	0	0	0	44	44	0	0	0	0	0	0	0	0	0	0
13:30	0	0	55	10	2	1	0	0	68	70.3	0	0	0	1	0	0	1	0	2	3
13:45	0	0	63	10	0	2	0	0	75	77.6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	211	30	3	3	0	0	247	252.4	0	0	0	1	0	0	1	0	2	3
14:00	0	0	71	4	4	0	0	0	79	81	0	0	0	0	0	0	0	0	0	0
14:15	0	0	56	11	1	1	0	0	69	70.8	0	0	0	0	0	0	0	0	0	0
14:30	0	0	61	2	4	0	0	0	67	69	0	0	1	0	0	0	0	0	1	1
14:45	0	1	55	6	3	2	0	0	67	70.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	243	23	12	3	0	0	282	291.3	0	0	1	0	0	0	0	0	1	1
15:00	0	0	84	12	1	1	0	0	98	99.8	0	0	0	0	0	0	0	0	0	0
15:15	0	1	61	8	2	0	0	0	72	72.4	0	0	0	0	0	0	0	0	0	0
15:30	0	0	72	12	2	0	0	0	86	87	0	0	0	0	0	0	0	0	0	0
15:45	0	0	65	14	2	1	0	0	82	84.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	282	46	7	2	0	0	338	343.5	0	0	0	0	0	0	0	0	0	0
16:00	0	1	70	18	2	0	0	0	91	91.4	0	0	0	0	0	0	0	0	0	0
16:15	0	1	88	9	0	2	0	0	100	102	0	0	0	0	0	0	0	0	0	0
16:30	0	1	86	14	1	1	0	0	103	104.2	0	0	0	0	0	0	0	0	0	0
16:45	0	0	62	12	2	1	0	0	77	79.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	3	306	53	5	4	0	0	371	376.9	0	0	0	0	0	0	0	0	0	0
17:00	0	0	96	9	0	0	0	0	105	105	0	0	0	0	0	0	0	0	0	0
17:15	0	1	80	6	1	0	0	0	88	87.9	0	0	0	0	0	0	0	0	0	0
17:30	0	0	95	4	0	0	0	0	99	99	0	0	1	0	0	0	0	0	1	1
17:45	0	1	76	7	0	0	0	0	84	83.4	0	0	0	0	0	0	0	0	0	0
H/TOT	0	2	347	26	1	0	0	0	376	375.3	0	0	1	0	0	0	0	0	1	1
18:00	0	0	72	9	2	0	0	0	83	84	0	0	0	0	0	0	0	0	0	0
18:15	0	0	70	5	0	0	0	0	75	75	0	0	0	0	0	0	0	0	0	0
18:30	0	0	64	1	0	0	0	0	65	65	0	0	0	0	0	0	0	0	0	0
18:45	0	0	47	1	0	0	0	0	48	48	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	253	16	2	0	0	0	271	272	0	0	0	0	0	0	0	0	0	0
12 TOT	0	8	3123	409	98	40	1	1	3680	3777.2	0	0	3	2	0	0	1	0	6	7



IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 8
Location: Northern Roundabout at Junction 1 of Cork South Ring Rd/Ballincollig Bypass
Date: Tue 16-Apr-2024

Arm A - N22
Arm B - N40 ON Ramp
Arm C - N22
Arm D - N40 OFF Ramp

	A => A										A => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	126	30	5	0	0	0	161	163.5
07:15	0	0	0	0	0	0	0	0	0	0	0	0	162	40	1	3	0	0	206	210.4
07:30	0	0	0	0	0	0	0	0	0	0	0	0	186	33	6	5	1	0	231	241.5
07:45	0	0	0	0	0	0	0	0	0	0	0	2	168	33	7	3	0	0	213	219.2
H/TOT	0	0	0	0	0	0	0	0	0	0	0	2	642	136	19	11	1	0	811	834.6
08:00	0	0	0	0	0	0	0	0	0	0	0	0	203	29	5	2	0	0	239	244.1
08:15	0	0	0	0	0	0	0	0	0	0	0	0	196	21	3	6	0	0	226	235.3
08:30	0	0	0	0	0	0	0	0	0	0	0	0	203	21	3	3	0	0	230	235.4
08:45	0	0	0	0	0	0	0	0	0	0	0	0	158	26	7	3	0	0	194	201.4
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	760	97	18	14	0	0	889	916.2
09:00	0	0	0	0	0	0	0	0	0	0	0	0	168	19	6	3	0	0	196	202.9
09:15	0	0	0	0	0	0	0	0	0	0	0	1	162	28	9	3	2	0	205	214.8
09:30	0	0	0	0	0	0	0	0	0	0	0	0	159	27	4	8	0	0	198	210.4
09:45	0	0	0	0	0	0	0	0	0	0	0	0	136	23	2	2	0	0	163	166.6
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	625	97	21	16	2	0	762	794.7
10:00	0	0	1	0	0	0	0	0	1	1	0	0	120	14	4	5	0	0	143	151.5
10:15	0	0	0	0	0	0	0	0	0	0	0	0	114	16	8	2	1	0	141	148.6
10:30	0	0	0	0	0	0	0	0	0	0	0	0	103	13	7	2	1	0	126	133.1
10:45	0	0	0	0	0	0	0	0	0	0	0	3	126	19	2	4	0	0	154	158.4
H/TOT	0	0	1	0	0	0	0	0	1	1	0	3	463	62	21	13	2	0	564	591.6
11:00	0	0	0	0	0	0	0	0	0	0	0	1	105	17	1	7	1	0	132	142
11:15	0	0	0	0	0	0	0	0	0	0	0	2	107	16	2	3	1	0	131	135.7
11:30	0	0	0	0	0	0	0	0	0	0	0	1	109	14	6	2	0	0	132	137
11:45	0	0	0	0	0	0	0	0	0	0	0	0	118	25	2	3	0	0	148	152.9
H/TOT	0	0	0	0	0	0	0	0	0	0	0	4	439	72	11	15	2	0	543	567.6
12:00	0	0	1	0	0	0	0	0	1	1	0	0	112	19	6	9	0	1	147	161.7
12:15	0	0	1	0	0	0	0	0	1	1	0	1	133	19	7	3	1	0	164	171.8
12:30	0	0	0	0	0	0	0	0	0	0	0	0	127	23	8	3	0	0	161	168.9
12:45	0	0	0	0	0	0	0	0	0	0	0	0	144	12	5	8	0	0	169	181.9
H/TOT	0	0	2	0	0	0	0	0	2	2	0	1	516	73	26	23	1	1	641	684.3
13:00	0	0	1	0	0	0	0	0	1	1	0	0	125	9	3	5	1	0	143	152
13:15	0	0	2	0	0	0	0	0	2	2	0	0	125	15	3	1	1	0	145	148.8
13:30	0	0	0	0	0	0	0	0	0	0	0	0	140	23	3	4	0	0	170	176.7
13:45	0	0	0	0	0	0	0	0	0	0	0	0	148	22	1	9	0	0	180	192.2
H/TOT	0	0	3	0	0	0	0	0	3	3	0	0	538	69	10	19	2	0	638	669.7
14:00	0	0	1	0	0	0	0	0	1	1	0	0	155	16	3	2	1	0	177	182.1
14:15	0	0	0	0	0	0	0	0	0	0	0	1	118	22	4	3	0	0	148	153.3
14:30	0	0	1	0	0	0	0	0	1	1	0	1	123	10	3	3	0	0	140	144.8
14:45	0	0	0	0	0	0	0	0	0	0	0	1	129	14	6	5	0	0	155	163.9
H/TOT	0	0	2	0	0	0	0	0	2	2	0	3	525	62	16	13	1	0	620	644.1
15:00	0	0	0	0	0	0	0	0	0	0	0	0	161	24	2	2	0	0	189	192.6
15:15	0	0	0	0	0	0	0	0	0	0	0	2	156	20	6	3	0	0	187	192.7
15:30	0	0	1	0	0	0	0	0	1	1	0	0	150	23	5	3	0	0	181	187.4
15:45	0	0	0	0	0	0	0	0	0	0	0	0	155	26	4	2	0	0	187	191.6
H/TOT	0	0	1	0	0	0	0	0	1	1	0	2	622	93	17	10	0	0	744	764.3
16:00	0	0	1	0	0	0	0	0	1	1	0	0	188	26	4	1	0	0	219	222.3
16:15	0	0	1	0	0	0	0	0	1	1	0	1	188	19	2	2	0	0	212	215
16:30	0	0	1	0	0	0	0	0	1	1	0	1	189	20	2	1	0	0	213	214.7
16:45	0	0	0	0	0	0	0	0	0	0	0	0	137	14	2	5	0	0	158	165.5
H/TOT	0	0	3	0	0	0	0	0	3	3	0	2	702	79	10	9	0	0	802	817.5
17:00	0	0	1	0	0	0	0	0	1	1	0	2	194	15	1	1	0	0	213	213.6
17:15	0	0	0	0	0	0	0	0	0	0	0	0	185	19	3	5	0	0	212	220
17:30	0	0	0	0	0	0	0	0	0	0	0	0	184	13	1	0	0	0	198	198.5
17:45	0	0	0	0	0	0	0	0	0	0	0	1	187	20	1	2	0	0	211	213.5
H/TOT	0	0	1	0	0	0	0	0	1	1	0	3	750	67	6	8	0	0	834	845.6
18:00	0	0	0	0	0	0	0	0	0	0	0	0	170	15	2	0	0	0	187	188
18:15	0	0	0	0	0	0	0	0	0	0	0	0	144	9	1	0	0	0	154	154.5
18:30	0	0	1	0	0	0	0	0	1	1	0	0	149	12	3	3	0	0	167	172.4
18:45	0	0	0	0	0	0	0	0	0	0	0	0	126	4	0	0	0	0	130	130
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	589	40	6	3	0	0	638	644.9
12 TOT	0	0	14	0	0	0	0	0	14	14	0	21	7171	947	181	154	11	1	8486	8775.1

	A => C										A => D									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	13	5	1	1	0	0	20	21.8	0	0	0	0	0	0	0	0	0	0
07:15	0	0	19	5	1	0	0	0	25	25.5	0	0	0	0	0	0	0	0	0	0
07:30	0	0	20	2	0	1	0	0	23	24.3	0	0	0	0	0	0	0	0	0	0
07:45	0	0	28	3	1	1	0	0	33	34.8	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	80	15	3	3	0	0	101	106.4	0	0	0	0	0	0	0	0	0	0
08:00	0	0	34	4	1	1	0	0	40	41.8	0	0	0	0	0	0	0	0	0	0
08:15	0	0	44	5	0	3	0	0	52	55.9	0	0	0	0	0	0	0	0	0	0
08:30	0	0	53	5	1	0	0	0	59	59.5	0	0	0	0	0	0	0	0	0	0
08:45	0	0	66	6	1	1	0	0	74	75.8	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	197	20	3	5	0	0	225	233	0	0	0	0	0	0	0	0	0	0
09:00	0	0	37	7	4	2	0	0	50	54.6	0	0	0	0	0	0	0	0	0	0
09:15	0	0	29	7	5	0	0	0	41	43.5	0	0	0	0	0	0	0	0	0	0
09:30	0	0	28	1	2	0	0	0	31	32	0	0	0	0	0	0	0	0	0	0
09:45	0	0	24	6	2	2	0	0	34	37.6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	118	21	13	4	0	0	156	167.7	0	0	0	0	0	0	0	0	0	0
10:00	0	0	13	5	2	3	0	0	23	27.9	0	0	0	0	0	0	0	0	0	0
10:15	0	0	36	7	1	0	0	0	44	44.5	0	0	0	0	0	0	0	0	0	0
10:30	0	0	27	6	1	0	0	0	34	34.5	0	0	0	0	0	0	0	0	0	0
10:45	0	0	18	6	0	0	0	0	24	24	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	94	24	4	3	0	0	125	130.9	0	0	0	0	0	0	0	0	0	0
11:00	0	0	25	5	1	4	0	0	35	40.7	0	0	0	0	0	0	0	0	0	0
11:15	0	0	26	6	2	3	0	0	37	41.9	0	0	0	0	0	0	0	0	0	0
11:30	0	0	32	6	0	3	0	0	41	44.9	0	0	0	0	0	0	0	0	0	0
11:45	0	0	32	3	3	5	0	0	43	51	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	115	20	6	15	0	0	156	178.5	0	0	0	0	0	0	0	0	0	0
12:00	1	0	39	6	2	1	0	0	49	50.5	0	0	0	0	0	0	0	0	0	0
12:15	0	0	39	5	4	5	0	0	53	61.5	0	0	0	0	0	0	0	0	0	0
12:30	0	0	28	6	4	5	0	1	44	52.5	0	0	0	0	0	0	0	0	0	0
12:45	0	0	34	3	1	1	1	0	40	42.8	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	140	20	11	12	1	1	186	207.3	0	0	0	0	0	0	0	0	0	0
13:00	0	0	42	1	0	0	0	0	43	43	0	0	0	0	0	0	0	0	0	0
13:15	0	0	45	8	0	2	0	0	55	57.6	0	0	0	0	0	0	0	0	0	0
13:30	0	0	46	7	1	1	0	0	55	56.8	0	0	0	0	0	0	0	0	0	0
13:45	0	0	47	2	0	1	0	0	50	51.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	180	18	1	4	0	0	203	208.7	0	0	0	0	0	0	0	0	0	0
14:00	0	0	43	8	2	2	1	0	56	60.6	0	0	0	0	0	0	0	0	0	0
14:15	0	0	57	3	0	2	0	0	62	64.6	0	0	0	0	0	0	0	0	0	0
14:30	0	0	48	5	1	2	0	0	56	59.1	0	0	0	0	0	0	0	0	0	0
14:45	0	0	52	5	2	0	2	0	61	64	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	200	21	5	6	3	0	235	248.3	0	0	0	0	0	0	0	0	0	0
15:00	0	0	83	9	1	2	0	0	95	98.1	0	0	0	0	0	0	0	0	0	0
15:15	0	1	66	8	3	1	1	0	80	83.2	0	0	0	0	0	0	0	0	0	0
15:30	0	0	69	9	1	0	1	0	80	81.5	0	0	0	0	0	0	0	0	0	0
15:45	0	0	81	8	2	0	0	0	91	92	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	299	34	7	3	2	0	346	354.8	0	0	0	0	0	0	0	0	0	0
16:00	0	1	109	20	1	3	1	0	135	139.8	0	0	0	0	0	0	0	0	0	0
16:15	0	0	111	19	2	3	5	0	140	149.9	0	0	0	0	0	0	0	0	0	0
16:30	0	0	110	9	2	4	1	0	126	133.2	0	0	0	0	0	0	0	0	0	0
16:45	0	0	107	10	1	1	0	0	119	120.8	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	437	58	6	11	7	0	520	543.7	0	0	0	0	0	0	0	0	0	0
17:00	0	0	83	10	1	0	0	0	94	94.5	0	0	0	0	0	0	0	0	0	0
17:15	0	1	90	7	2	0	0	0	100	100.4	0	0	0	0	0	0	0	0	0	0
17:30	0	0	99	8	0	1	0	0	108	109.3	0	0	0	0	0	0	0	0	0	0
17:45	0	0	103	9	0	1	0	0	113	114.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	375	34	3	2	0	0	415	418.5	0	0	0	0	0	0	0	0	0	0
18:00	0	0	74	10	0	0	0	0	84	84	0	0	0	0	0	0	0	0	0	0
18:15	0	0	81	7	0	1	0	0	89	90.3	0	0	0	0	0	0	0	0	0	0
18:30	0	0	56	4	0	1	0	0	61	62.3	0	0	0	0	0	0	0	0	0	0
18:45	0	0	73	3	1	0	0	0	77	77.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	284	24	1	2	0	0	311	314.1	0	0	0	0	0	0	0	0	0	0
12 TOT	1	3	2519	309	63	70	13	1	2979	3111.9	0	0	0	0	0	0	0	0	0	0

Cork City Council Planning Department. For Inspection Purposes Only!

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 8
Location: Northern Roundabout at Junction 1 of Cork South Ring Rd/Ballincollig Bypass
Date: Tue 16-Apr-2024

Arm A - N22
Arm B - N40 ON Ramp
Arm C - N22
Arm D - N40 OFF Ramp

	B => A										B => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	B => C										B => D									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 8
Location: Northern Roundabout at Junction 1 of Cork South Ring Rd/Ballincollig Bypass
Date: Tue 16-Apr-2024

Arm A - N22
Arm B - N40 ON Ramp
Arm C - N22
Arm D - N40 OFF Ramp

	C => A										C => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	69	16	2	2	0	0	89	92.6	0	0	7	0	0	0	1	0	8	9
07:15	0	1	107	27	5	0	0	0	140	141.9	0	0	16	1	2	0	0	0	19	20
07:30	0	1	145	22	4	6	0	0	178	187.2	0	0	18	3	0	0	0	0	21	21
07:45	0	0	193	22	6	2	0	0	223	228.6	0	0	12	2	3	0	0	0	17	18.5
H/TOT	0	2	514	87	17	10	0	0	630	650.3	0	0	53	6	5	0	1	0	65	68.5
08:00	0	0	151	25	7	2	1	0	186	193.1	0	0	24	7	0	0	0	0	31	31
08:15	0	1	199	24	5	2	0	0	231	235.5	0	0	16	4	2	0	0	0	22	23
08:30	0	0	225	21	4	4	0	0	254	261.2	0	0	18	2	0	0	0	0	20	20
08:45	0	0	177	16	7	6	0	0	206	217.3	0	0	22	5	1	2	0	0	30	33.1
H/TOT	0	1	752	86	23	14	1	0	877	907.1	0	0	80	18	3	2	0	0	103	107.1
09:00	0	0	141	26	7	6	0	0	180	191.3	0	0	16	2	2	1	0	0	21	23.3
09:15	0	0	146	22	5	2	0	0	175	180.1	0	0	16	1	1	0	0	0	18	18.5
09:30	0	0	109	19	6	3	1	0	138	145.9	0	0	4	4	0	0	0	0	8	8
09:45	0	1	133	23	11	4	0	0	172	182.1	0	0	9	3	0	2	0	0	14	16.6
H/TOT	0	1	529	90	29	15	1	0	665	699.4	0	0	45	10	3	3	0	0	61	66.4
10:00	0	0	116	19	3	6	0	0	144	153.3	0	0	10	2	1	0	0	0	13	13.5
10:15	0	0	89	27	9	5	0	0	130	141	0	0	9	1	2	1	0	0	13	15.3
10:30	0	0	108	25	1	4	2	0	140	147.7	0	0	11	3	2	0	0	0	16	17
10:45	0	0	117	24	6	3	0	0	150	156.9	0	0	10	1	0	0	0	0	11	11
H/TOT	0	0	430	95	19	18	2	0	564	598.9	0	0	40	7	5	1	0	0	53	56.8
11:00	0	0	123	23	4	5	0	0	155	163.5	0	0	7	2	0	0	0	0	9	9
11:15	0	0	115	30	5	3	0	0	153	159.4	0	0	6	6	1	0	0	0	13	13.5
11:30	0	2	135	15	7	6	1	0	166	177.1	0	0	6	2	0	1	0	0	9	10.3
11:45	0	0	122	24	6	6	0	0	158	168.8	0	0	10	1	0	0	0	0	11	11
H/TOT	0	2	495	92	22	20	1	0	632	668.8	0	0	29	11	1	1	0	0	42	43.8
12:00	0	0	125	16	6	4	0	0	151	159.2	0	0	9	2	0	0	0	0	11	11
12:15	0	0	140	14	9	3	0	0	166	174.4	0	0	8	3	2	2	0	0	15	18.6
12:30	0	0	143	10	8	3	0	1	165	172.9	0	0	8	2	1	0	0	0	11	11.5
12:45	0	0	132	20	6	3	0	0	161	167.9	0	0	5	2	0	0	0	0	7	7
H/TOT	0	0	540	60	29	13	0	1	643	674.4	0	0	30	9	3	2	0	0	44	48.1
13:00	0	2	125	27	5	3	0	0	162	167.2	0	0	5	1	0	0	0	0	6	6
13:15	0	0	128	24	4	0	0	0	156	158	0	0	6	3	1	0	0	0	10	10.5
13:30	0	1	150	21	3	6	1	0	182	191.7	0	0	6	0	1	0	0	0	7	7.5
13:45	0	1	167	16	3	3	4	0	194	202.8	0	0	10	2	1	0	0	0	13	13.5
H/TOT	0	4	570	88	15	12	5	0	694	719.7	0	0	27	6	3	0	0	0	36	37.5
14:00	0	1	156	30	7	1	0	0	195	199.2	0	0	6	3	0	0	0	0	9	9
14:15	0	0	146	20	9	5	1	0	181	193	0	0	10	0	1	1	0	0	12	13.8
14:30	0	0	148	32	5	7	1	0	193	205.6	0	0	7	1	0	0	0	0	8	8
14:45	0	1	173	24	7	4	0	0	209	217.1	0	0	8	5	0	0	0	0	13	13
H/TOT	0	2	623	106	28	17	2	0	778	814.9	0	0	31	9	1	1	0	0	42	43.8
15:00	0	0	165	32	5	3	0	0	205	211.4	0	0	8	3	3	0	0	0	14	15.5
15:15	0	0	178	29	9	8	0	0	224	238.9	0	0	9	0	1	0	0	0	10	10.5
15:30	0	0	186	27	10	3	0	0	226	234.9	0	0	7	1	1	0	0	0	9	9.5
15:45	0	0	213	32	7	5	1	0	258	269	0	0	8	1	1	0	0	0	10	10.5
H/TOT	0	0	742	120	31	19	1	0	913	954.2	0	0	32	5	6	0	0	0	43	46
16:00	0	5	192	31	4	3	0	0	235	237.9	0	0	7	1	0	0	0	0	8	8
16:15	0	1	180	22	4	3	0	0	210	215.3	0	0	5	1	1	0	0	0	7	7.5
16:30	0	1	186	34	1	0	0	0	222	221.9	0	0	2	3	0	0	0	0	5	5
16:45	0	0	196	29	4	1	1	0	231	235.3	0	0	3	1	2	0	0	0	6	7
H/TOT	0	7	754	116	13	7	1	0	898	910.4	0	0	17	6	3	0	0	0	26	27.5
17:00	0	2	214	38	4	0	0	0	258	258.8	0	0	7	2	1	0	0	0	10	10.5
17:15	0	1	233	23	3	1	0	0	261	263.2	0	0	4	0	0	0	0	0	4	4
17:30	0	0	218	20	2	2	0	0	242	245.6	0	0	8	0	0	0	0	0	8	8
17:45	0	0	216	19	1	0	0	0	236	236.5	0	0	7	0	0	1	0	0	8	9.3
H/TOT	0	3	881	100	10	3	0	0	997	1004.1	0	0	26	2	1	1	0	0	30	31.8
18:00	0	0	229	19	1	0	0	0	249	249.5	0	0	5	2	0	0	0	0	7	7
18:15	0	0	208	12	2	2	0	0	224	227.6	0	0	3	0	0	1	0	0	4	5.3
18:30	0	1	175	12	1	0	0	0	189	188.9	0	0	9	0	0	0	0	0	9	9
18:45	0	1	162	9	0	0	0	0	172	171.4	0	0	5	2	0	0	0	0	7	7
H/TOT	0	2	774	52	4	2	0	0	834	837.4	0	0	22	4	0	1	0	0	27	28.3
12 TOT	0	24	7604	1092	240	150	14	1	9125	9439.6	0	0	432	93	34	12	1	0	572	605.6

	C => C										C => D									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
15:30	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
15:45	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	4	5	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0

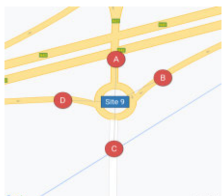
Cork City Council Planning Department. For Inspection Purposes Only!

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 8
Location: Northern Roundabout at Junction 1 of Cork South Ring Rd/Ballincollig Bypass
Date: Tue 16-Apr-2024

Arm A - N22
Arm B - N40 ON Ramp
Arm C - N22
Arm D - N40 OFF Ramp

	D => A										D => B										D => C										D => D									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	63	8	1	1	0	0	73	74.8	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
07:15	0	0	100	13	3	3	0	0	119	124.4	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
07:30	0	0	87	16	1	2	0	0	106	109.1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
07:45	0	0	126	13	0	0	0	0	139	139	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	376	50	5	6	0	0	437	447.3	0	0	0	0	0	0	0	0	0	0	0	0	7	2	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
08:00	0	0	127	9	0	0	0	0	136	136	0	0	0	1	0	0	0	0	1	1	0	0	2	3	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
08:15	0	0	102	8	1	4	0	0	115	120.7	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	3	3.5	0	0	0	0	0	0	0	0	0	0
08:30	0	0	115	6	1	0	0	0	122	122.5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2.5	0	0	0	0	0	0	0	0	0	0
08:45	0	0	96	11	0	2	4	0	113	119.6	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	440	34	2	6	4	0	486	498.8	0	0	0	1	0	0	0	0	1	1	0	0	7	4	2	0	0	0	13	14	0	0	0	0	0	0	0	0	0	0
09:00	0	0	71	4	1	1	1	0	78	80.8	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
09:15	0	0	75	2	2	0	0	0	79	80	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
09:30	0	0	52	8	2	2	2	0	66	71.6	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	44	2	1	1	0	0	48	49.8	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	242	16	6	4	3	0	271	282.2	0	0	1	0	0	0	0	0	1	1	0	0	10	3	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
10:00	0	0	51	3	0	3	1	0	58	62.9	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2.5	0	0	0	0	0	0	0	0	0	0
10:15	0	0	31	5	2	3	0	0	41	45.9	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
10:30	0	0	29	2	2	1	0	0	34	36.3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
10:45	0	0	22	1	0	6	0	0	29	36.8	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	3.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	133	11	4	13	1	0	162	181.9	0	0	0	0	0	0	0	0	0	0	0	0	3	2	1	1	0	0	7	8.8	0	0	0	0	0	0	0	0	0	0
11:00	0	0	26	3	1	1	0	0	31	32.8	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
11:15	0	0	29	1	1	2	0	0	33	36.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	31	5	0	1	1	0	38	40.3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
11:45	0	0	33	1	0	2	0	0	36	38.6	0	0	0	0	0	1	0	0	1	2.3	0	0	2	0	1	0	0	0	3	3.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	119	10	2	6	1	0	138	147.8	0	0	0	0	0	1	0	0	1	2.3	0	0	5	0	1	0	0	0	6	6.5	0	0	0	0	0	0	0	0	0	0
12:00	0	0	18	3	1	1	0	0	23	24.8	0	0	2	0	0	0	0	0	2	2	0	0	3	1	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
12:15	0	0	22	0	0	5	0	0	27	33.5	0	0	0	0	0	0	0	0	0	0	0	0	3	1	1	0	0	0	5	5.5	0	0	0	0	0	0	0	0	0	0
12:30	0	0	26	6	1	0	0	0	33	33.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	24	5	2	2	0	0	33	36.6	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	90	14	4	8	0	0	116	128.4	0	0	2	0	0	0	0	0	2	2	0	0	9	3	1	0	0	0	13	13.5	0	0	0	0	0	0	0	0	0	0
13:00	0	0	30	3	0	2	0	0	35	37.6	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	1	2.3	0	0	0	0	0	0	0	0	0	0
13:15	0	0	27	8	0	3	0	0	38	41.9	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
13:30	0	0	34	5	2	2	0	0	43	46.6	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
13:45	0	0	31	6	3	2	0	0	42	46.1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	122	22	5	9	0	0	158	172.2	0	0	1	0	0	0	0	0	1	1	0	0	7	1	0	1	0	0	9	10.3	0	0	0	0	0	0	0	0	0	0
14:00	0	0	30	5	0	3	0	0	38	41.9	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	3	0	0	0	0	0	0	0	0	0	0
14:15	0	0	26	6	0	4	0	0	36	41.2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
14:30	0	0	34	9	1	2	1	0	47	51.1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
14:45	0	0	29	6	0	2	0	0	37	39.6	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	119	26	1	11	1	0	158	173.8	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	1	0	9	10.5	0	0	0	0	0	0	0	0	0	0
15:00	0	0	35	10	2	0	0	0	47	48	0	0	1	0	0	0	0	0	1	1	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
15:15	0	0	39	6	2	3	1	0	51	56.9	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	3	4.3	0	0	0	0	0	0	0	0	0	0
15:30	0	0	35	6	2	2	0	0	45	48.6	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
15:45	0	1	42	7	0	1	0	0	51	51.7	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	3	1.8	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	151	29	6	6	1	0	194	205.2	0	0	1	0	0	0	0	0	1	1	0	2	9	0	0	1	0	0	12	12.1	0	0	0	0	0	0	0	0	0	0
16:00	0	0	29	6	1	3	0	0	39	43.4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	2.5	0	0	0	0	0	0	0	0	0	0
16:15	0	0	26	7	1	0	0	0	34	34.5	0	0	0	0	0	0	0	0	0	0	0	0	3	2	1	0	0	0	6	6.5	0	0	0	0	0	0	0	0	0	0
16:30	0	0	38	2	0	0	0	0	40	40	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0
16:45	0	0	19	5	1	0	0	0	25	25.5	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	112	20	3	3	0	0	138	143.4	0	0	0	0	0	0	0	0	0	0	0	0	7	5	3	0	0	0	15	16.5	0	0	0	0	0	0	0	0	0	0
17:00	0	0	24	3	0	0	2	0	29	31	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
17:15	0	0	27	8	0	0	0	0	35	35	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
17:30	0	0	28	1	0	0	1	0	30	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	31	3	0	0	0	0	34	34	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	110	15	0	0	3	0	128	131	0	0	1	0	0	0	0	0	1	1	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
18:00	0	0	29	2	2	1	0	0	34	36.3	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
18:15	0	0	30	3	0	0	0	0	33	33	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	3	4.3	0	0	0	0	0	0	0	0	0	0
18:30	0	0	33	2	0	0	0	1	36	36	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
18:45	0	0	20	4	0	1	0	0	25	26.3	0	0	1	0	0	0	0	0	1	1	0	0	3	1	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	112	11	2	2	0	1	128	131.6	0	0	1	0	0	0	0	0	1	1	0	0	8	3	0	1	0	0	12	13.3	0	0	0	0	0	0	0	0	0	0
12 TOT	0	1	2126	258	40	74	14	1	2514	2643.6	0	0	7	1	0	1	0	0	9	10.3	0	2	86	23	9	4	1	0	125	134.5	0	0	0	0	0	0	0	0	0	0



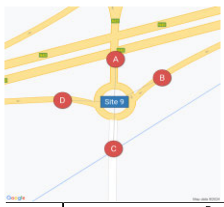
IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 9
Location: Southern Roundabout at Junction 1 of Cork South Ring Rd/Ballincollig Bypass
Date: Tue 16-Apr-2024

Arm A - N22
Arm B - N40 OFF Ramp
Arm C - L2222
Arm D - N40 ON Ramp

	A => A										A => B										A => C										A => D									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	5	5	0	0	9	4	1	1	0	0	15	16.8
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	6	6.5	0	0	17	5	0	0	0	0	22	22
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	4	4	0	0	18	2	0	1	0	0	21	22.3
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	7	7	0	0	24	3	1	0	0	0	28	28.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	3	1	0	0	0	22	22.5	0	0	68	14	2	2	0	0	86	89.6
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	3	0	0	0	0	10	10	0	0	28	3	1	2	0	0	34	37.1
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	2	1	1	0	0	21	22.8	0	0	29	5	0	2	0	0	36	38.6
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	1	1	0	0	0	16	16.5	0	0	41	4	1	0	0	0	46	46.5
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	2	0	0	0	0	16	16	0	0	52	4	1	1	0	0	58	59.8
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	8	2	1	0	0	63	65.3	0	0	150	16	3	5	0	0	174	182
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	0	0	0	0	6	6	0	0	34	7	3	2	0	0	46	50.1
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1	1	0	0	0	13	13.5	0	0	24	6	4	0	0	0	34	36
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	1	3	0	0	0	13	14.5	0	0	18	0	0	0	0	0	18	18
09:45	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	9	0	1	0	0	0	10	10.5	0	0	17	7	1	2	0	0	27	30.1
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	34	3	5	0	0	0	42	44.5	0	0	93	20	8	4	0	0	125	134.2
10:00	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	6	3	2	0	0	0	11	12	0	0	9	3	1	3	0	0	16	20.4
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	6	1	0	0	0	18	18.5	0	0	25	2	0	0	0	0	27	27
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	2	1	0	0	0	11	11.5	0	0	19	5	0	0	0	0	24	24
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	1	0	0	7	8.3	0	0	15	3	0	0	0	0	18	18
H/TOT	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	28	14	4	1	0	0	47	50.3	0	0	68	13	1	3	0	0	85	89.4
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0	0	0	0	10	10	0	0	23	1	1	4	0	0	29	34.7
11:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	5	2	1	0	0	0	8	8.5	0	0	21	4	1	3	0	0	29	33.4
11:30	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	10	2	0	0	0	0	12	12	0	0	21	4	0	3	0	0	28	31.9
11:45	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	9	1	1	0	0	0	11	11.5	0	0	24	1	3	4	0	0	32	38.7
H/TOT	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	29	10	2	0	0	0	41	42	0	0	89	10	5	14	0	0	118	138.7
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	15	4	0	0	0	0	20	19.2	0	0	27	3	2	2	0	0	34	37.6
12:15	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	8	3	2	0	0	0	13	14	0	0	33	4	3	5	0	0	45	53
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9	0	0	20	6	4	5	0	1	36	44.5
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2	1	0	0	0	9	9.5	0	0	30	2	0	1	1	0	34	36.3
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	38	9	3	0	0	0	51	51.7	0	0	110	15	9	13	1	1	149	171.4
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	0	0	0	8	8	0	0	36	0	0	0	0	0	36	36
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1	0	0	0	0	12	12	0	0	37	8	0	3	0	0	48	51.9
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	1	1	0	0	0	11	11.5	0	0	40	4	0	1	0	0	45	46.3
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	3	0	0	0	0	12	12	0	0	40	2	0	1	0	0	43	44.3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	6	1	0	0	0	43	43.5	0	0	153	14	0	5	0	0	172	178.5
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	1	0	8	9	0	0	36	8	2	2	1	0	49	53.6
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	2	0	0	0	0	13	13	0	0	45	1	0	2	0	0	48	50.6
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	3	0	0	0	0	12	12	0	0	40	2	1	2	0	0	45	48.1
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	1	0	0	0	14	14.5	0	0	45	6	2	0	2	0	55	58
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	5	1	0	1	0	47	48.5	0	0	166	17	5	6	3	0	197	210.3
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	1	1	0	0	0	17	17.5	0	0	73	8	0	2	0	0	83	85.6
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	3	2	1	0	0	14	16.3	0	0	62	5	1	1	1	0	70	72.8
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	15	2	1	0	0	0	19	18.9	0	0	55	7	0	0	1	0	63	64
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10	0	0	0	0	0	12	10.8	0	0	68	8	2	0	0	0	78	79
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	48	6	4	1	0	0	62	63.5	0	0	258	28	3	3	2	0	294	301.4
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	24	0	2	1	1	0	29	31.7	0	0	91	20	0	2	0	0	113	115.6
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	5	1	0	3	0	28	31.5	0	0	93	16	2	3	2	0	116	122.9
16:30	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	19	3	1	0	0	0	23	23.5	0	0	95	7	2	4	1	0	109	116.2
16:45	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	29	6	1	0	0	0	36	36.5	0	0	78	6	0	1	0	0	85	86.3
H/TOT	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	1	91	14	5	1	4	0	116	123.2	0	0	357	49	4	10	3	0	423	441
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	2	0	0	0	0	23	23	0	0	66	8	1	0	0	0	75	75.5
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	11	0	0	0	0	0	12	11.4	0	0	79	6	2	0	0	0	87	88
17:30	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	15	1	0	0	0	0	16	16	0	0	85	7	0	1	0	0	93	94.3
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	2	0	0	0	0	22	22	0	0	85	7	0	1	0	0	93	94.3
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	67	5	0	0	0	0	73	72.4	0	0	315	28	3	2	0	0	348	352.1
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	3	0	0	0	0	14	14	0	0	66	9	0	0	0	0	75	75
18:15	0	0	0	0	0	1	0	0	1	2.3	0	0	0	0	0	0	0	0	0	0	0	0	13	2	0	0	0	0	15	15	0	0	68	6	0	1	0	0	75	76.3
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	14	14	0	0	44	4	0	1	0	0	49	50.3
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	2	0	0	0	0	15	15	0	0	60	2	1	0	0	0	63	63.5
H/TOT	0	0	0	0	0	1	0	0	1	2.3	0	0	0	0	0	0	0	0	0	0	0	0	51	7	0	0	0	0	58	58	0	0	238	21	1	2	0	0	262	265.1
12 TOT	0	0	9	1	0	1	0	0	11	12.3	0	0	0	0	0	0	0	0	0	0	1	5	532	90	28	4	5	0	665	685.4	0	0	2065	245	44	69	9	1	2433	2553.7

Cork City Council Planning Department. For Inspection Purposes Only!



IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 9
Location: Southern Roundabout at Junction 1 of Cork South Ring Rd/Ballincollig Bypass
Date: Tue 16-Apr-2024

Arm A - N22
Arm B - N40 OFF Ramp
Arm C - L2222
Arm D - N40 ON Ramp

B => A

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	60	15	0	2	0	0	77	79.6
07:15	0	1	92	25	5	0	0	0	123	124.9
07:30	0	0	132	21	4	6	0	0	163	172.8
07:45	0	0	152	17	6	2	0	0	177	182.6
H/TOT	0	1	436	78	15	10	0	0	540	559.9
08:00	0	0	118	28	6	2	0	0	154	159.6
08:15	0	1	161	18	4	2	0	0	186	190
08:30	0	0	181	19	4	4	0	0	208	215.2
08:45	0	0	133	15	7	6	0	0	161	172.3
H/TOT	0	1	593	80	21	14	0	0	709	737.1
09:00	0	0	110	20	5	6	0	0	141	151.3
09:15	0	0	126	14	4	1	0	0	145	148.3
09:30	0	0	92	19	6	4	1	0	122	131.2
09:45	0	1	113	21	9	3	0	0	147	154.8
H/TOT	0	1	441	74	24	14	1	0	555	585.6
10:00	0	0	101	21	2	6	0	0	130	138.8
10:15	0	0	74	22	7	5	0	0	108	118
10:30	0	0	95	20	1	5	2	0	123	132
10:45	0	0	106	21	5	2	0	0	134	139.1
H/TOT	0	0	376	84	15	18	2	0	495	527.9
11:00	0	0	114	20	3	5	0	0	142	150
11:15	0	0	105	25	5	3	0	0	138	144.4
11:30	0	2	112	14	6	6	1	0	141	151.6
11:45	0	0	114	24	6	6	0	0	150	160.8
H/TOT	0	2	445	83	20	20	1	0	571	606.8
12:00	0	0	110	11	6	4	0	0	131	139.2
12:15	0	0	114	13	7	3	0	0	137	144.4
12:30	0	0	124	10	7	2	0	1	144	150.1
12:45	0	0	121	21	7	3	0	0	152	159.4
H/TOT	0	0	469	55	27	12	0	1	564	593.1
13:00	0	1	118	22	4	3	0	0	148	153.3
13:15	0	1	110	21	4	0	0	0	136	137.4
13:30	0	0	135	18	3	5	1	0	162	171
13:45	0	0	146	17	3	3	4	0	173	182.4
H/TOT	0	2	509	78	14	11	5	0	619	644.1
14:00	0	1	139	24	7	0	0	0	171	173.9
14:15	0	0	126	20	7	7	1	0	161	174.6
14:30	0	0	139	30	5	5	0	0	179	188
14:45	0	1	151	20	4	5	0	0	181	188.9
H/TOT	0	2	555	94	23	17	1	0	692	725.4
15:00	0	0	149	25	5	2	0	0	181	186.1
15:15	0	0	154	23	8	9	0	0	194	209.7
15:30	0	0	167	24	8	2	0	0	201	207.6
15:45	0	0	186	28	6	5	1	0	226	236.5
H/TOT	0	0	656	100	27	18	1	0	802	839.9
16:00	0	5	160	24	4	3	0	0	196	198.9
16:15	0	1	165	19	4	3	0	0	192	197.3
16:30	0	1	154	29	1	0	0	0	185	184.9
16:45	0	0	167	27	4	1	1	0	200	204.3
H/TOT	0	7	646	99	13	7	1	0	773	785.4
17:00	0	0	187	33	3	0	0	0	223	224.5
17:15	0	1	202	20	3	1	0	0	227	229.2
17:30	0	0	188	20	2	2	0	0	212	215.6
17:45	0	0	191	14	1	0	0	0	206	206.5
H/TOT	0	1	768	87	9	3	0	0	868	875.8
18:00	0	0	198	17	1	0	0	0	216	216.5
18:15	0	0	199	9	2	2	0	0	212	215.6
18:30	0	1	164	11	1	0	0	0	177	176.9
18:45	0	1	140	7	0	0	0	0	148	147.4
H/TOT	0	2	701	44	4	2	0	0	753	756.4
12 TOT	0	19	6595	956	212	146	12	1	7941	8237.4

B => B

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0

B => C

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	4	5	0	0	0	0	9	9
07:15	0	0	5	2	0	0	0	0	7	7
07:30	0	0	6	1	1	0	0	0	8	8.5
07:45	0	0	6	1	2	0	0	0	9	10
H/TOT	0	0	21	9	3	0	0	0	33	34.5
08:00	0	0	3	2	0	0	0	0	5	5
08:15	0	0	7	2	0	1	0	0	10	11.3
08:30	0	0	3	1	1	0	0	0	5	5.5
08:45	0	0	6	2	3	0	0	0	11	12.5
H/TOT	0	0	19	7	4	1	0	0	31	34.3
09:00	0	0	7	2	2	1	0	0	12	14.3
09:15	0	0	7	2	3	0	0	0	12	13.5
09:30	0	0	2	2	0	0	0	0	4	4
09:45	0	0	4	1	2	0	0	0	7	8
H/TOT	0	0	20	7	7	1	0	0	35	39.8
10:00	0	0	1	2	4	0	0	0	7	9
10:15	0	0	5	1	0	2	0	0	8	10.6
10:30	0	0	0	1	1	0	0	0	2	2.5
10:45	0	0	4	1	0	0	0	0	5	5
H/TOT	0	0	10	5	5	2	0	0	22	27.1
11:00	0	0	8	3	0	0	0	0	11	11
11:15	0	0	8	1	0	0	0	0	9	9
11:30	0	0	6	2	1	0	0	0	9	9.5
11:45	0	0	5	3	1	2	0	0	11	14.1
H/TOT	0	0	27	9	2	2	0	0	40	43.6
12:00	0	0	4	1	0	0	0	0	5	5
12:15	0	0	8	3	0	0	0	0	11	11
12:30	0	0	5	3	0	0	0	0	8	8
12:45	0	0	7	2	0	0	0	0	9	9
H/TOT	0	0	24	9	0	0	0	0	33	33
13:00	0	0	6	1	1	1	0	0	9	10.8
13:15	0	0	6	5	2	1	1	0	15	18.3
13:30	0	0	11	1	0	0	0	0	12	12
13:45	0	0	9	2	2	0	0	0	13	14
H/TOT	0	0	32	9	5	2	1	0	49	55.1
14:00	0	0	6	4	1	0	0	0	11	11.5
14:15	0	0	8	2	1	0	0	0	11	11.5
14:30	0	0	7	0	2	0	0	0	9	10
14:45	0	0	8	2	1	1	0	0	12	13.8
H/TOT	0	0	29	8	5	1	0	0	43	46.8
15:00	0	0	2	1	0	0	0	0	3	3
15:15	0	0	4	3	0	0	0	0	7	7
15:30	0	0	9	2	0	0	0	0	11	11
15:45	0	0	8	3	0	0	0	0	11	11
H/TOT	0	0	23	9	0	0	0	0	32	32
16:00	0	0	10	2	0	0	0	0	12	12
16:15	0	0	3	1	0	0	0	0	4	4
16:30	0	0	5	0	0	0	0	0	5	5
16:45	0	0	2	1	0	0	0	0	3	3
H/TOT	0	0	20	4	0	0	0	0	24	24
17:00	0	0	0	1	1	1	0	0	3	4.8
17:15	0	0	6	0	0	0	0	0	6	6
17:30	0	0	2	1	0	0	0	0	3	3
17:45	0	0	7	2	0	0	0	0	9	9
H/TOT	0	0	15	4	1	1	0	0	21	22.8
18:00	0	0	8	0	0	0	0	0	8	8
18:15	0	1	10	3	0	0	0	0	14	13.4
18:30	0	0	7	1	0	0	0	0	8	8
18:45	0	0	6	0	0	0	0	0	6	6
H/TOT	0	1	31	4	0	0	0	0	36	35.4
12 TOT	0	1	271	84	32	10	1	0	399	428.4

B => D

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	1	0	0	0	0	0	1	1
10:15	0	0	1	0	0	0	0	0	1	1
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	3	0	0	0	0	0	3	3
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	1	0	0	0	0	0	1	1
11:30	0	0	2	0	0	0	0	0	2	2
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	0	0	0	0	0	3	3
12:00	0	0	1	0	0	0	0	0	1	1
12:15	0	0	1	0	0	0	0	0	1	1
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	2	0	0	0	0	0	2	2
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	1	0	0	0	0	0	0	1	0.4
14:15	0	0	0	1	0	0	0	0	1	1
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	1	1	1	0	0	0	0	3	2.4
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	1	0	0	0	0	0	1	1
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1
16:00	0	0	1	0	0	0	0	0	1	1
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	1	0	0	0	0	1	1
16:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	2	1	0	0	0	0	3	3
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	1	0	0	0	0	0	1	1
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	2	0	0	0	0	0	2	2
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	0	0	0	0	0	3	3
12 TOT	0	1	15	2	0	0	0	0	18	17.4

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 9
Location: Southern Roundabout at Junction 1 of Cork South Ring Rd/Ballincollig Bypass
Date: Tue 16-Apr-2024

Arm A - N22
Arm B - N40 OFF Ramp
Arm C - L2222
Arm D - N40 ON Ramp

C => A

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	16	1	2	0	1	0	20	22
07:15	0	0	28	3	2	0	0	0	33	34
07:30	0	1	36	4	0	0	0	0	41	40.4
07:45	0	0	51	7	3	0	0	0	61	62.5
H/TOT	0	1	131	15	7	0	1	0	155	158.9
08:00	0	0	55	7	1	0	1	0	64	65.5
08:15	0	0	60	7	3	0	0	0	70	71.5
08:30	0	0	67	4	0	0	0	0	71	71
08:45	0	0	62	7	1	2	0	0	72	75.1
H/TOT	0	0	244	25	5	2	1	0	277	283.1
09:00	0	0	42	7	4	1	0	0	54	57.3
09:15	0	0	39	8	2	1	0	0	50	52.3
09:30	0	0	21	4	1	0	0	0	26	26.5
09:45	0	0	29	5	1	2	0	0	37	40.1
H/TOT	0	0	131	24	8	4	0	0	167	176.2
10:00	0	0	22	2	2	0	0	0	26	27
10:15	0	0	24	4	4	1	0	0	33	36.3
10:30	0	0	23	9	2	0	0	0	34	35
10:45	0	0	20	3	1	0	0	0	24	24.5
H/TOT	0	0	89	18	9	1	0	0	117	122.8
11:00	0	0	17	6	1	0	0	0	24	24.5
11:15	0	0	17	11	2	0	0	0	30	31
11:30	0	0	24	3	0	1	0	0	28	29.3
11:45	0	0	20	1	0	0	0	0	21	21
H/TOT	0	0	78	21	3	1	0	0	103	105.8
12:00	0	0	23	7	1	0	0	0	31	31.5
12:15	0	0	29	5	3	2	0	0	39	43.1
12:30	0	0	25	4	2	1	0	0	32	34.3
12:45	0	0	17	3	0	0	0	0	20	20
H/TOT	0	0	94	19	6	3	0	0	122	128.9
13:00	0	1	16	5	0	0	0	0	22	21.4
13:15	0	0	21	6	1	0	0	0	28	28.5
13:30	0	0	23	1	1	1	0	0	26	27.8
13:45	0	1	28	5	1	0	0	0	35	34.9
H/TOT	0	2	88	17	3	1	0	0	111	112.6
14:00	0	0	25	5	2	1	0	0	33	35.3
14:15	0	0	27	2	1	1	0	0	31	32.8
14:30	0	0	16	5	1	0	1	0	23	24.5
14:45	0	0	32	9	2	0	0	0	43	44
H/TOT	0	0	100	21	6	2	1	0	130	136.6
15:00	0	0	27	7	3	0	0	0	37	38.5
15:15	0	0	29	6	2	0	0	0	37	38
15:30	0	0	30	5	3	0	0	0	38	39.5
15:45	0	0	35	4	2	0	0	0	41	42
H/TOT	0	0	121	22	10	0	0	0	153	158
16:00	0	0	35	10	0	0	0	0	45	45
16:15	0	0	28	2	1	0	0	0	31	31.5
16:30	0	0	32	9	0	0	0	0	41	41
16:45	0	0	30	3	2	0	0	0	35	36
H/TOT	0	0	125	24	3	0	0	0	152	153.5
17:00	0	2	35	7	2	0	0	0	46	45.8
17:15	0	0	36	3	0	0	0	0	39	39
17:30	0	0	37	1	0	0	0	0	38	38
17:45	0	0	33	4	0	1	0	0	38	39.3
H/TOT	0	2	141	15	2	1	0	0	161	162.1
18:00	0	0	32	5	0	0	0	0	37	37
18:15	0	0	13	2	0	0	0	0	15	15
18:30	0	0	20	1	0	0	0	0	21	21
18:45	0	0	27	4	0	0	0	0	31	31
H/TOT	0	0	92	12	0	0	0	0	104	104
12 TOT	0	5	1434	233	62	15	3	0	1752	1802.5

C => B

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0

C => C

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0
09:30	0	0	1	0	0	0	0	0	1	1
09:45	0	0	0	0	0	0	1	0	1	2
H/TOT	0	0	1	0	0	0	1	0	2	3
10:00	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	1	0	0	0	1	1.5
11:15	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	1	0	0	0	1	1.5
12:00	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	1	0	1	2
H/TOT	0	0	0	0	0	0	1	0	1	2
14:00	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0
15:00	0	0	1	0	0	0	0	0	1	1
15:15	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	1	0	1	2
15:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	2	0	0	0	1	0	3	4
16:00	0	0	1	0	0	0	0	0	1	1
16:15	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	1	0	1	2
16:45	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	2	0	0	0	1	0	3	4
17:00	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	1	0	1	2
H/TOT	0	0	0	0	0	0	1	0	1	2
18:00	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	1	0	1	2
H/TOT	0	0	0	0	0	0	1	0	1	2
12 TOT	0	0	5	0	1	0	6	0	12	18.5

C => D

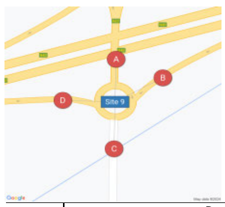
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	5	1	0	0	0	0	6	6
07:15	0	0	2	0	1	0	0	0	3	3.5
07:30	0	0	3	0	0	0	0	0	3	3
07:45	0	0	5	1	0	0	0	0	6	6
H/TOT	0	0	15	2	1	0	0	0	18	18.5
08:00	0	0	10	0	0	0	0	0	10	10
08:15	0	0	5	0	0	0	0	0	5	5
08:30	0	0	17	2	0	0	0	0	19	19
08:45	0	0	9	2	1	0	0	0	12	12.5
H/TOT	0	0	41	4	1	0	0	0	46	46.5
09:00	0	0	11	1	1	0	0	0	13	13.5
09:15	0	0	9	1	0	1	0	0	11	12.3
09:30	0	0	2	1	1	0	1	0	5	6.5
09:45	0	0	5	2	0	1	0	0	8	9.3
H/TOT	0	0	27	5	2	2	1	0	37	41.6
10:00	0	0	10	0	1	0	0	0	11	11.5
10:15	0	0	3	0	1	0	1	0	5	6.5
10:30	0	0	8	0	1	3	0	0	12	16.4
10:45	0	0	7	3	1	0	0	0	11	11.5
H/TOT	0	0	28	3	4	3	1	0	39	45.9
11:00	0	1	4	2	3	0	1	0	11	12.9
11:15	0	0	7	1	0	1	0	0	9	10.3
11:30	0	0	5	3	1	0	0	0	9	9.5
11:45	0	0	7	0	0	0	0	0	7	7
H/TOT	0	1	23	6	4	1	1	0	36	39.7
12:00	0	0	14	3	2	1	0	0	20	22.3
12:15	0	0	7	2	0	2	0	0	11	13.6
12:30	0	0	3	1	0	1	0	0	5	6.3
12:45	0	0	8	1	0	1	0	0	10	11.3
H/TOT	0	0	32	7	2	5	0	0	46	53.5
13:00	0	0	11	0	0	0	0	0	11	11
13:15	0	0	14	2	0	0	0	0	16	16
13:30	0	0	12	2	0	1	0	0	15	16.3
13:45	0	0	8	2	2	1	0	0	13	15.3
H/TOT	0	0	45	6	2	2	0	0	55	58.6
14:00	0	0	7	1	0	1	0	0	9	10.3
14:15	0	0	14	0	0	0	0	0	14	14
14:30	0	0	9	2	1	1	0	0	13	14.8
14:45	0	0	21	2	0	0	0	0	23	23
H/TOT	0	0	51	5	1	2	0	0	59	62.1
15:00	0	0	14	2	0	0	0	0	16	16
15:15	0	1	9	4	1	0	0	0	15	14.9
15:30	0	0	22	1	1	1	0	0	25	26.8
15:45	0	0	24	4	1	0	0	0	29	29.5
H/TOT	0	1	69	11	3	1	0	0	85	87.2
16:00	0	0	28	2	0	0	0	0	30	30
16:15	0	0	17	4	0	1	0	0	22	23.3
16:30	0	0	21	1	0	0	0	0	22	22
16:45	0	0	20	3	2	0	0	0	25	26
H/TOT	0	0	86	10	2	1	0	0	99	101.3
17:00	0	0	18	1	0	0	0	0	19	19
17:15	0	0	23	3	0	0	0	0	26	26
17:30	0	0	15	4	0	1	0	0	20	21.3
17:45	0	0	30	3	0	0	0	0	33	33
H/TOT	0	0	86	11	0	1	0	0	98	99.3
18:00	0	0	33	2	0	0	0	0	35	35
18:15	0	1	22	1	0	0	0	0	24	23.4
18:30	0	0	15	0	0	0	0	0	15	15
18:45	0	0	7	1	0	0	0	0	8	8
H/TOT	0	1	77	4	0	0	0	0	82	81.4
12 TOT	0	3	580	74	22	18	3	0	700	735.6

Cork City Council Planning Department. For Inspection Purposes Only!

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 9
Location: Southern Roundabout at Junction 1 of Cork South Ring Rd/Ballincollig Bypass
Date: Tue 16-Apr-2024

Arm A - N22
Arm B - N40 OFF Ramp
Arm C - L2222
Arm D - N40 ON Ramp



	D => A										D => B										D => C										D => D									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAVAN	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

IDASO

Survey Name: 25032 - Ballincollig Co. Cork
Site: Site 12
Location: N22 ON/Off Slips/L2219 Kilnaglory/L2216 Greenfield
Date: Thu 16-Jan-2025

Arm A - Woodberry
Arm B - N22 Off Slip
Arm C - L2219 Kilnaglory
Arm D - L2216 Greenfield
Arm E - N22 On Slip

	A => A									A => B									A => C									A => D									A => E								
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	0	7	7.5	0	0	5	2	0	0	0	7	7
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	13	4	0	0	0	17	17	0	0	3	1	0	0	0	4	4
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	19	4	1	0	0	25	24.7	0	0	10	2	0	0	0	12	12
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	11	3	0	0	0	14	14	0	0	7	0	1	0	0	8	8.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	3	3	1	0	49	11	2	0	0	63	63.2	0	0	25	5	1	0	0	31	31.5
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	19	4	0	0	0	23	23	0	0	10	1	1	0	0	12	12.5
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	3	0	0	0	22	22	0	0	20	0	1	0	0	21	21.5
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	2.5	0	0	14	3	0	0	0	17	17	0	0	15	0	0	1	1	17	19.3
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	5	5	0	0	24	3	0	0	0	27	27	0	0	30	1	0	0	0	31	31
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	1	0	0	9	9.5	0	0	76	13	0	0	0	89	89	0	0	75	2	2	1	1	81	84.3
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	16	3	0	0	0	19	19	0	1	27	1	1	0	1	31	31.9
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	2.5	0	0	17	0	0	0	0	17	17	0	1	18	3	0	0	0	22	21.4
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3	0	0	11	4	1	0	0	16	16.5	0	0	14	1	0	0	0	15	15
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	5	5	0	0	17	4	1	0	0	22	22.5	0	0	13	2	1	0	0	16	16.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1	1	0	0	12	12.5	0	0	61	11	2	0	0	74	75	0	2	72	7	2	0	1	84	84.8
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	10	1	0	0	0	11	11	0	0	13	1	1	0	0	15	15.5
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	3	0	20	2	1	0	0	26	24.1	0	0	9	3	2	0	0	14	15
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	4	0	0	15	0	2	0	0	17	18	0	0	6	3	1	0	0	10	10.5
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	3	3	1	0	19	3	0	0	0	23	22.2	0	0	10	3	1	0	0	14	14.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	0	9	9	4	0	64	6	3	0	0	77	75.3	0	0	38	10	5	0	0	53	55.5
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	19	3	1	0	0	23	23.5	0	0	11	3	0	0	0	14	14
11:15	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	25	2	0	0	0	27	27	0	0	11	2	1	0	0	14	14.5
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0.2	0	0	28	2	2	1	0	33	35.3	0	2	8	4	2	1	0	17	18.1
11:45	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	3	3	0	0	26	1	1	0	0	28	28.5	0	0	20	1	1	0	1	23	24.5
H/TOT	0	0	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	1	0	4	1	0	0	0	6	5.2	0	0	98	8	4	1	0	111	114.3	0	2	50	10	4	1	1	68	71.1
12:00	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	5	5	0	1	20	2	1	0	0	24	23.9	0	0	11	1	2	0	0	14	15
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2.3	0	4	24	3	0	0	0	31	28.6	0	0	15	3	2	0	0	20	21
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	21	1	1	0	0	23	23.5	0	0	16	2	0	0	0	18	18
12:45	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	4	0	0	20	1	0	0	0	21	21	0	1	19	3	1	0	1	25	25.9
H/TOT	0	0	1	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	9	2	0	1	0	12	13.3	0	5	85	7	2	0	0	99	97	0	1	61	9	5	0	1	77	79.9
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	5	5	0	0	18	1	2	0	0	21	22	0	0	18	3	1	0	0	22	22.5
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	23	2	0	0	0	25	25	0	0	22	1	0	0	0	23	23
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3	0	0	30	2	2	0	0	34	35	0	0	33	2	0	0	0	35	35
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	2	30	3	0	0	0	35	33.8	0	0	26	3	1	1	0	31	32.8
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	11	11	0	2	101	8	4	0	0	115	115.8	0	0	99	9	2	1	0	111	113.3
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	40	1	2	0	0	46	45.2	0	0	20	1	1	0	0	22	22.5
14:15	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	3	4.3	0	0	21	1	0	0	0	22	22	0	0	22	2	0	0	1	25	26
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3	0	0	12	1	0	0	0	13	13	0	0	31	1	1	0	0	33	33.5
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	1	6	7.5	0	0	32	0	2	0	0	34	35	0	0	26	2	0	0	0	28	28
H/TOT	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	9	0	1	1	1	12	14.8	0	3	105	3	4	0	0	115	115.2	0	0	99	6	2	0	1	108	110
15:00	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	30	4	1	0	1	36	37.5	0	0	23	2	1	1	0	27	28.8
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	26	3	0	0	0	29	29	0	0	17	8	1	0	0	26	26.5
15:30	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	26	1	0	0	0	27	27	0	0	27	1	0	0	0	28	28
15:45	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	4	0	0	41	7	1	0	0	49	49.5	0	0	22	4	0	0	0	26	26
H/TOT	0	0	1	2	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	9	9	0	0	123	15	2	0	1	141	143	0	0	89	15	2	1	0	107	109.3
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	0	0	8	8	0	1	69	4	0	0	2	76	77.4	0	0	26	4	1	0	0	31	31.5
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	8	1	0	0	54	54.5	0	0	31	9	0	0	0	40	40
16:30	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	3	0	2	0	0	5	6	0	0	44	6	0	0	1	51	52	0	0	26	6	1	0	0	33	33.5
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	67	10	1	0	0	78	78.5	0	0	22	3	1	0	0	26	26.5
H/TOT	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	11	1	2	0	0	14	15	0	1	225	28	2	0	3	259	262.4	0	0	105	22	3	0	0	130	131.5
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	8	0	0	1	84	85	0	0	28	1	0	0	0	29	29
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	5	5	0	0	51	6	0	1	0	58	59.3	0	0	33	1	0	0	0	34	34
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	3	3.5	0	0	58	4	1	0	0	63	63.5	0	0	41	2	1	0	0	44	44.5
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	0	4	4.5	0	0	68	5	0	0	0	73	73	0	0	31	1	0	0	0	32	32
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	1	2	0	0	12	13	0	0	252	23	1	1	1	278	280.8	0	0	133	5	1	0	0	139	139.5
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	6	6	0	0	50	6	0	0	0	56	56	0	0	44	4	0	0	0	48	48
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	33	2	0	0	0	35	35	0	0	32	1	0	0	0	33	33
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	4	0	0	42	2	0	1	0	45	46.3	0	0	24	2	0	0	0	26	26
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3	0	0	29	1	0	0	0	30	30	0	0	36	0	0	0	0	36	36
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	14	14	0	0	154	11	0	1	0	166	167.3	0	0	136	7	0	0	0	143	143
12 TOT	0	0	6	3	0	0	0	9	9	0	0	0	0	0	0	0	0	0	1	0	103	9	7	2	1	123	129.3	5	11	1393	144	26	3	5	1587	1598.3	0	5	982	107	29	4	5	1132	1153.7

Cork City Council Planning Department. For Inspection Purposes Only!

IDASO

Survey Name: 25032 - Ballincollig Co. Cork
Site: Site 12
Location: N22 ON/Off Slips/L2219 Kilnaglory/L2216 Greenfield
Date: Thu 16-Jan-2025

Arm A - Woodberry
Arm B - N22 Off Slip
Arm C - L2219 Kilnaglory
Arm D - L2216 Greenfield
Arm E - N22 On Slip

B => A

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	16	4	0	1	0	21	22.3
07:15	0	0	22	2	3	0	0	27	28.5
07:30	0	0	20	9	0	2	0	31	33.6
07:45	0	0	30	3	2	0	0	35	36
H/TOT	0	0	88	18	5	3	0	114	120.4
08:00	0	1	37	0	0	0	0	38	37.4
08:15	0	0	50	5	0	0	0	55	55
08:30	0	1	54	2	3	0	0	60	60.9
08:45	0	0	60	5	0	0	1	66	67
H/TOT	0	2	201	12	3	0	1	219	220.3
09:00	0	0	47	2	1	0	0	50	50.5
09:15	0	0	46	6	0	2	0	54	56.6
09:30	0	0	35	4	0	1	1	41	43.3
09:45	0	0	37	3	1	2	1	44	48.1
H/TOT	0	0	165	15	2	5	2	189	198.5
10:00	0	0	34	8	2	1	0	45	47.3
10:15	0	0	33	10	2	0	0	45	46
10:30	0	1	35	11	2	1	1	51	53.7
10:45	0	0	41	6	1	0	0	48	48.5
H/TOT	0	1	143	35	7	2	1	189	195.5
11:00	0	0	29	10	3	0	0	42	43.5
11:15	0	0	39	6	1	2	0	48	51.1
11:30	0	0	36	8	0	0	0	44	44
11:45	0	0	38	4	1	0	1	44	45.5
H/TOT	0	0	142	28	5	2	1	178	184.1
12:00	0	0	45	8	1	0	0	54	54.5
12:15	0	0	39	6	2	1	1	49	52.3
12:30	0	0	42	3	2	1	1	49	52.3
12:45	0	0	52	5	0	2	0	59	61.6
H/TOT	0	0	178	22	5	4	2	211	220.7
13:00	0	1	40	9	0	0	0	50	49.4
13:15	0	0	48	6	1	0	0	55	55.5
13:30	0	1	45	7	0	1	1	55	56.7
13:45	0	0	46	10	0	0	1	57	58
H/TOT	0	2	179	32	1	1	2	217	219.6
14:00	0	0	45	2	1	1	0	49	50.8
14:15	0	1	53	5	0	0	0	59	58.4
14:30	0	0	52	8	2	0	0	62	63
14:45	0	1	62	6	0	0	0	69	68.4
H/TOT	0	2	212	21	3	1	0	239	240.6
15:00	0	0	75	6	0	0	1	82	83
15:15	0	0	74	9	2	1	0	86	88.3
15:30	0	0	83	7	1	0	1	92	93.5
15:45	0	0	99	12	1	2	0	114	117.1
H/TOT	0	0	331	34	4	3	2	374	381.9
16:00	0	0	105	14	3	2	0	124	128.1
16:15	0	1	132	20	2	2	0	157	160
16:30	0	3	110	15	2	1	0	131	131.5
16:45	0	0	100	14	1	0	0	115	115.5
H/TOT	0	4	447	63	8	5	0	527	535.1
17:00	0	0	116	14	0	0	0	130	130
17:15	0	0	129	12	2	1	0	144	146.3
17:30	0	0	108	14	1	0	0	123	123.5
17:45	0	0	92	10	0	0	0	102	102
H/TOT	0	0	445	50	3	1	0	499	501.8
18:00	0	0	97	8	0	1	0	106	107.3
18:15	0	0	114	7	0	1	0	122	123.3
18:30	0	0	58	8	0	0	0	66	66
18:45	0	0	76	2	0	0	0	78	78
H/TOT	0	0	345	25	0	2	0	372	374.6
12 TOT	0	11	2876	355	46	29	11	3328	3393.1

B => B

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0

B => C

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
08:00	0	0	1	0	0	0	0	1	1
08:15	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0
08:45	0	0	2	0	0	0	0	2	2
H/TOT	0	0	3	0	0	0	0	3	3
09:00	0	0	1	0	0	0	0	1	1
09:15	0	0	1	0	0	0	0	1	1
09:30	0	0	0	0	1	0	0	1	1.5
09:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	2	0	1	0	0	3	3.5
10:00	0	0	0	0	0	0	0	0	0
10:15	0	0	1	0	0	0	0	1	1
10:30	0	0	0	0	0	0	0	0	0
10:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	2	0	0	0	0	2	2
11:00	0	0	0	0	0	0	0	0	0
11:15	0	0	1	0	1	0	0	2	2.5
11:30	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	1	0	0	1	1.5
H/TOT	0	0	1	0	2	0	0	3	4
12:00	0	0	0	2	0	0	0	2	2
12:15	0	0	2	0	0	0	0	2	2
12:30	0	0	1	1	0	0	0	2	2
12:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	3	0	0	0	6	6
13:00	0	0	1	0	0	0	0	1	1
13:15	0	0	0	0	0	0	0	0	0
13:30	0	0	1	1	1	0	0	3	3.5
13:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	3	1	1	0	0	5	5.5
14:00	0	0	0	1	0	0	0	1	1
14:15	0	0	0	0	0	0	0	0	0
14:30	0	0	2	0	0	0	0	2	2
14:45	0	0	3	1	0	0	0	4	4
H/TOT	0	0	5	2	0	0	0	7	7
15:00	0	0	1	0	0	0	0	1	1
15:15	0	0	1	0	0	0	0	1	1
15:30	0	0	0	0	1	0	0	1	1.5
15:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	3	0	1	0	0	4	4.5
16:00	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0
16:30	0	0	2	0	0	0	0	2	2
16:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	3	0	0	0	0	3	3
17:00	0	0	0	0	0	0	0	0	0
17:15	0	0	1	0	0	0	0	1	1
17:30	0	0	1	0	0	0	0	1	1
17:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	2	0	0	0	0	2	2
18:00	0	0	2	0	0	0	0	2	2
18:15	0	0	0	0	0	0	0	0	0
18:30	0	0	0	1	1	0	0	2	2.5
18:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	3	1	1	0	0	5	5.5
12 TOT	0	0	30	7	6	0	0	43	46

B => D

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	10	1	0	0	0	11	11
07:15	0	0	16	9	0	0	0	25	25
07:30	0	0	12	0	1	1	0	14	15.8
07:45	0	0	11	2	0	0	0	13	13
H/TOT	0	0	49	12	1	1	0	63	64.8
08:00	0	0	17	3	0	0	0	20	20
08:15	0	0	14	2	2	1	0	19	21.3
08:30	0	0	9	3	0	1	0	13	14.3
08:45	0	0	12	2	1	0	0	15	15.5
H/TOT	0	0	52	10	3	2	0	67	71.1
09:00	0	0	8	2	0	0	0	10	10
09:15	0	0	9	4	1	0	0	14	14.5
09:30	0	0	14	4	1	0	0	19	19.5
09:45	0	0	12	2	0	0	2	16	18
H/TOT	0	0	43	12	2	0	2	59	62
10:00	0	0	11	9	2	2	0	24	27.6
10:15	0	0	12	4	1	0	0	17	17.5
10:30	0	0	12	2	1	1	0	16	17.8
10:45	0	0	8	2	0	1	0	11	12.3
H/TOT	0	0	43	17	4	4	0	68	75.2
11:00	0	0	9	3	2	0	0	14	15
11:15	0	1	12	4	1	1	0	19	20.2
11:30	0	0	14	1	2	1	1	19	22.3
11:45	0	0	13	1	2	0	0	16	17
H/TOT	0	1	48	9	7	2	1	68	74.5
12:00	0	0	10	2	1	0	0	13	13.5
12:15	0	0	16	2	0	0	0	18	18
12:30	0	0	12	3	0	1	0	16	17.3
12:45	0	0	17	6	1	0	0	24	24.5
H/TOT	0	0	55	13	2	1	0	71	73.3
13:00	0	0	23	0	0	0	1	24	25
13:15	0	0	20	3	2	0	0	25	26
13:30	0	0	33	4	1	0	1	39	40.5
13:45	0	0	14	2	0	0	0	16	16
H/TOT	0	0	90	9	3	0	2	104	107.5
14:00	0	0	19	2	1	0	0	22	22.5
14:15	0	0	8	2	1	0	1	12	13.5
14:30	0	0	16	6	1	2	0	25	28.1
14:45	0	1	23	4	3	0	0	31	31.9
H/TOT	0	1	66	14	6	2	1	90	96
15:00	0	0	21	0	2	1	0	24	26.3
15:15	0	0	22	4	1	0	0	27	27.5
15:30	0	0	26	8	1	1	1	37	39.8
15:45	0	0	34	8	1	1	0	44	45.8
H/TOT	0	0	103	20	5	3	1	132	139.4
16:00	0	0	28	5	2	1	1	37	40.3
16:15	0	0	38	7	2	0	1	48	50
16:30	0	0	43	10	1	0	0	54	54.5
16:45	0	0	51	7	3	3	0	64	69.4
H/TOT	0	0	160	29	8	4	2	203	214.2
17:00	0	0	48	13	0	2	0	63	65.6
17:15	0	0	47	2	0	1	0	50	51.3
17:30	0	0	50	2	3	1	0	56	58.8
17:45	0	0	48	5	1	0	0	54	54.5
H/TOT	0	0	193	22	4	4	0	223	230.2
18:00	0	0	42	6	1	2	0	51	54.1
18:15	0	0	44	2	0	1	0	47	48.3
18:30	0	0	34	1	0	0	0	35	35
18:45	0	0	26	0	0	0	0	26	26
H/TOT	0	0	146	9	1	3	0	159	163.4
12 TOT	0	2	1048	176	46	26	9	1307	1371.6

B => E

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	1	0	0	1	1.5
H/TOT	0	0	0	0	1	0	0	1	1.5
08:00	0	0	0	0	0	0	0	0	0
08:15	0	0	1	0	0	0	0	1	1
08:30	0	0	1	0	0	0	0	1	1
08:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	2	0	0	0	0	2	2
09:00	0	0	0	0	0	0	0	0	0
09:15	0	0	0	1	0	0	0	1	1
09:30	0	0	1	0	0	0	0	1	1
09:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	1	0	0	0	2	2
10:00	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0
10:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	1	0	0	0	0	1	1
11:00	0	0	0	0	0	0	0	0	0
11:15	0	0	1	0	0	0	0	1	1
11:30	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	1	1
12:00	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0
13:15	0	0	1	0	0	0	0	1	1
13:30	0	0	1	0	0	0	0	1	1
13:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	2	0	0	0	0	2	2
14:00	0	0	0	0	0	0	0	0	0
14:15	0	0	2	0	0	0	0	2	2
14:30	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	2	0	0	0	0	2	2
15:00	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
17:00	0	0	1	0	0	0	0	1	1
17:15	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	1	1
18:00	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
12 TOT	0	0	10	1	1	0	0	12	12.5

IDASO

Survey Name: 25032 - Ballincollig Co. Cork
Site: Site 12
Location: N22 ON/Off Slips/L2219 Kilnaglory/L2216 Greenfield
Date: Thu 16-Jan-2025

Arm A - Woodberry
Arm B - N22 Off Slip
Arm C - L2219 Kilnaglory
Arm D - L2216 Greenfield
Arm E - N22 On Slip

C => A

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	3	0	0	0	0	3	3
07:15	0	0	1	0	0	0	0	1	1
07:30	0	0	2	0	0	0	0	2	2
07:45	0	0	4	1	0	0	0	5	5
H/TOT	0	0	10	1	0	0	0	11	11
08:00	0	0	3	0	0	0	0	3	3
08:15	0	0	7	0	0	0	0	7	7
08:30	0	0	6	0	0	0	0	6	6
08:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	16	0	0	0	0	16	16
09:00	0	0	5	0	0	0	0	5	5
09:15	0	0	4	0	0	0	0	4	4
09:30	0	0	5	0	0	0	0	5	5
09:45	0	0	0	0	1	0	0	1	1.5
H/TOT	0	0	14	0	1	0	0	15	15.5
10:00	0	0	2	1	0	0	0	3	3
10:15	0	0	1	0	0	0	0	1	1
10:30	0	0	2	0	0	0	0	2	2
10:45	0	0	4	1	1	0	0	6	6.5
H/TOT	0	0	9	2	1	0	0	12	12.5
11:00	0	0	0	0	0	0	0	0	0
11:15	0	0	1	0	0	0	0	1	1
11:30	0	0	0	0	0	0	0	0	0
11:45	0	0	2	0	0	0	0	2	2
H/TOT	0	0	3	0	0	0	0	3	3
12:00	0	0	1	0	0	0	0	1	1
12:15	0	0	0	1	0	0	0	1	1
12:30	1	0	2	0	1	0	0	4	3.7
12:45	0	0	1	0	0	0	0	1	1
H/TOT	1	0	4	1	1	0	0	7	6.7
13:00	0	0	3	0	0	0	0	3	3
13:15	0	0	3	0	0	0	0	3	3
13:30	0	0	4	0	0	0	0	4	4
13:45	0	0	2	1	0	0	0	3	3
H/TOT	0	0	12	1	0	0	0	13	13
14:00	0	0	0	1	0	0	0	1	1
14:15	0	0	3	0	0	1	0	4	5.3
14:30	0	0	3	1	0	0	0	4	4
14:45	0	0	4	0	0	0	0	4	4
H/TOT	0	0	10	2	0	1	0	13	14.3
15:00	0	0	2	1	0	0	0	3	3
15:15	0	0	2	1	0	0	0	3	3
15:30	0	0	2	0	0	0	0	2	2
15:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	7	2	0	0	0	9	9
16:00	0	0	1	0	0	0	0	1	1
16:15	0	0	4	2	1	0	0	7	7.5
16:30	0	0	2	1	0	0	0	3	3
16:45	0	0	3	0	1	0	0	4	4.5
H/TOT	0	0	10	3	2	0	0	15	16
17:00	0	0	1	1	0	0	0	2	2
17:15	0	0	1	0	0	0	0	1	1
17:30	0	0	5	0	0	0	0	5	5
17:45	0	0	2	0	0	0	0	2	2
H/TOT	0	0	9	1	0	0	0	10	10
18:00	0	0	1	1	1	0	0	3	3.5
18:15	0	0	3	0	0	0	0	3	3
18:30	0	0	2	0	0	0	0	2	2
18:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	6	1	1	0	0	8	8.5
12 TOT	1	0	110	14	6	1	0	132	135.5

C => B

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0

C => C

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0
10:30	0	0	1	0	0	0	0	1	1
10:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	1	1
11:00	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
12 TOT	0	0	1	0	0	0	0	1	1

C => D

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	1	0	0	0	1	1
07:15	0	0	1	0	0	0	0	1	1
07:30	0	0	0	0	0	0	0	0	0
07:45	0	0	0	1	0	0	0	1	1
H/TOT	0	0	1	2	0	0	0	3	3
08:00	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0
08:30	0	0	1	1	0	0	0	2	2
08:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	2	1	0	0	0	3	3
09:00	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0
09:30	0	0	1	0	0	0	0	1	1
09:45	0	0	2	0	0	0	0	2	2
H/TOT	0	0	3	0	0	0	0	3	3
10:00	0	0	0	1	0	0	0	1	1
10:15	0	0	0	0	0	0	0	0	0
10:30	0	0	1	1	0	0	0	2	2
10:45	0	0	2	0	0	0	0	2	2
H/TOT	0	0	3	2	0	0	0	5	5
11:00	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0
11:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	1	0	0	0	0	1	1
12:00	0	0	2	1	0	0	0	3	3
12:15	0	0	1	0	0	0	0	1	1
12:30	0	0	0	1	0	0	0	1	1
12:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	2	0	0	0	5	5
13:00	0	0	0	1	0	0	0	1	1
13:15	1	1	1	0	0	0	0	3	1.6
13:30	0	0	3	0	0	0	0	3	3
13:45	0	0	0	1	0	0	0	1	1
H/TOT	1	1	4	2	0	0	0	8	6.6
14:00	0	0	0	0	0	0	0	0	0
14:15	0	0	1	0	0	1	0	2	3.3
14:30	0	0	2	0	0	0	0	2	2
14:45	0	0	2	0	0	0	0	2	2
H/TOT	0	0	5	0	0	1	0	6	7.3
15:00	0	0	1	0	0	0	0	1	1
15:15	0	0	2	1	0	0	0	3	3
15:30	0	0	0	0	0	0	0	0	0
15:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	4	1	0	0	0	5	5
16:00	0	0	0	1	0	0	0	1	1
16:15	0	0	1	0	0	0	0	1	1
16:30	0	0	2	0	0	0	0	2	2
16:45	0	0	4	1	0	0	0	5	5
H/TOT	0	0	7	2	0	0	0	9	9
17:00	0	0	0	3	0	0	0	3	3
17:15	0	0	2	0	0	0	0	2	2
17:30	0	0	1	1	0	0	0	2	2
17:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	4	4	0	0	0	8	8
18:00	0	0	2	0	0	0	0	2	2
18:15	0	0	1	0	0	0	0	1	1
18:30	0	0	1	0	0	0	0	1	1
18:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	5	0	0	0	0	5	5
12 TOT	1	1	42	16	0	1	0	61	60.9

C => E

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0
07:30	0	0	2	0	0	0	0	2	2
07:45	0	0	1	1	0	0	0	2	2
H/TOT	0	0	3	1	0	0	0	4	4
08:00	0	0	1	0	0	0	0	1	1
08:15	0	0	0	0	0	0	0	0	0
08:30	0	0	1	0	0	0	0	1	1
08:45	0	0	2	0	0	0	0	2	2
H/TOT	0	0	4	0	0	0	0	4	4
09:00	0	0	3	0	0	0	0	3	3
09:15	0	0	1	0	0	0	0	1	1
09:30	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	4	0	0	0	0	4	4
10:00	0	0	0	0	0	0	0	0	0
10:15	0	0	1	0	0	0	0	1	1
10:30	0	0	0	0	0	0	0	0	0
10:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	2	0	0	0	0	2	2
11:00	0	0	0	1	0	0	0	1	1
11:15	0	0	2	0	0	0	0	2	2
11:30	0	0	1	0	0	0	0	1	1
11:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	1	0	0	0	4	4
12:00	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0
12:30	0	0	2	0	0	0	0	2	2
12:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	3	0	0	0	0	3	3
13:00	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0
13:30	0	0	2	0	0	0	0	2	2
13:45	0	0	2	0	1	0	0	3	3.5
H/TOT	0	0	4	0	1	0	0	5	5.5
14:00	0	0	2	0	0	1	0	3	4.3
14:15	0	0	1	2	0	0	0	3	3
14:30	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	2	0	1	0	6	7.3
15:00	0	0	1	0	0	0	0	1	1
15:15	0	0	0	0	0	0	0	0	0
15:30	0	0	2	0	1	0	0	3	3.5
15:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	3	0	1	0	0	4	4.5
16:00	0	0	2	0	1	0	0	3	3.5
16:15	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0
16:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	3	0	1	0	0	4	4.5
17:00	0	0	0	0	0	0	0	0	0
17:15	0	0	1	0	0	0	0	1	1
17:30	0	0	1	0	0	0	0	1	1
17:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	3	0	0	0	0	3	3
18:00	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	1	0	0	1	1.5
18:30	0	0	0	1	0	0	0	1	1
18:45	0	0	2	0	0	0	0	2	2
H/TOT	0	0	2	1	1	0	0	4	4.5
12 TOT	0	0	37	5	4	1	0	47	50.3

Cork City Council Planning Department. For Inspection Purposes Only!

IDASO

Survey Name: 25032 - Ballincollig Co. Cork
Site: Site 12
Location: N22 ON/Off Slips/L2219 Kilnaglory/L2216 Greenfield
Date: Thu 16-Jan-2025

Arm A - Woodberry
Arm B - N22 Off Slip
Arm C - L2219 Kilnaglory
Arm D - L2216 Greenfield
Arm E - N22 On Slip

D => A

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	39	6	1	0	0	46	46.5
07:15	0	0	68	9	0	1	0	78	79.3
07:30	0	0	93	19	2	1	0	115	117.3
07:45	0	0	119	13	0	0	1	133	134
H/TOT	0	0	319	47	3	2	1	372	377.1
08:00	0	1	121	10	1	0	0	133	132.9
08:15	0	1	146	9	1	0	3	160	162.9
08:30	0	0	121	11	1	0	0	133	133.5
08:45	0	0	80	11	3	0	0	94	95.5
H/TOT	0	2	468	41	6	0	3	520	524.8
09:00	0	0	92	8	1	1	0	102	103.8
09:15	0	0	88	5	1	0	0	94	94.5
09:30	0	0	53	4	3	0	1	61	63.5
09:45	0	0	43	4	2	0	0	49	50
H/TOT	0	0	276	21	7	1	1	306	311.8
10:00	0	0	39	6	0	0	0	45	45
10:15	0	1	37	2	2	0	1	43	44.4
10:30	0	0	29	8	1	0	0	38	38.5
10:45	0	0	36	1	1	3	0	41	45.4
H/TOT	0	1	141	17	4	3	1	167	173.3
11:00	0	0	28	4	1	0	0	33	33.5
11:15	0	0	40	4	2	0	1	47	49
11:30	0	3	38	8	1	1	0	51	51
11:45	0	0	40	3	0	0	0	43	43
H/TOT	0	3	146	19	4	1	1	174	176.5
12:00	0	0	28	6	2	3	0	39	43.9
12:15	0	0	32	4	0	1	0	37	38.3
12:30	0	0	37	2	0	0	0	39	39
12:45	3	0	35	2	1	0	1	42	41.1
H/TOT	3	0	132	14	3	4	1	157	162.3
13:00	0	0	28	9	0	0	1	38	39
13:15	0	0	35	7	2	0	0	44	45
13:30	0	0	42	5	0	0	0	47	47
13:45	0	0	32	1	0	0	1	34	35
H/TOT	0	0	137	22	2	0	2	163	166
14:00	0	0	54	4	1	1	0	60	61.8
14:15	1	0	41	4	2	1	0	49	50.5
14:30	0	0	30	5	0	0	0	35	35
14:45	0	0	31	4	0	0	0	35	35
H/TOT	1	0	156	17	3	2	0	179	182.3
15:00	0	0	49	3	0	0	0	52	52
15:15	0	0	70	6	1	0	0	77	77.5
15:30	0	0	34	11	1	0	0	46	46.5
15:45	2	0	45	5	2	1	0	55	55.7
H/TOT	2	0	198	25	4	1	0	230	231.7
16:00	0	0	40	12	1	0	0	53	53.5
16:15	0	0	48	5	1	0	0	54	54.5
16:30	0	0	55	10	1	0	0	66	66.5
16:45	0	0	50	6	2	0	0	58	59
H/TOT	0	0	193	33	5	0	0	231	233.5
17:00	0	0	41	8	1	0	0	50	50.5
17:15	1	0	62	5	0	0	0	68	67.2
17:30	0	0	41	5	0	0	0	46	46
17:45	0	0	55	6	0	0	0	61	61
H/TOT	1	0	199	24	1	0	0	225	224.7
18:00	0	1	41	5	0	0	0	47	46.4
18:15	0	0	43	4	0	0	0	47	47
18:30	0	0	36	2	0	0	0	38	38
18:45	0	0	53	5	0	0	0	58	58
H/TOT	0	1	173	16	0	0	0	190	189.4
12 TOT	7	7	2538	296	42	14	10	2914	2953.4

D => B

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0

D => C

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0
07:15	0	0	0	1	0	0	0	1	1
07:30	0	0	1	0	0	0	0	1	1
07:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	1	0	0	0	2	2
08:00	0	0	0	0	0	0	0	0	0
08:15	0	0	2	0	0	0	0	2	2
08:30	0	0	2	0	0	0	0	2	2
08:45	0	0	1	1	0	0	0	2	2
H/TOT	0	0	5	1	0	0	0	6	6
09:00	0	0	0	0	0	0	0	0	0
09:15	0	0	1	0	0	0	0	1	1
09:30	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	1	1
10:00	0	0	1	0	0	0	0	1	1
10:15	1	0	2	0	0	0	0	3	2.2
10:30	0	0	0	1	0	0	0	1	1
10:45	0	0	1	1	0	0	0	2	2
H/TOT	1	0	4	2	0	0	0	7	6.2
11:00	1	0	1	0	0	0	0	2	1.2
11:15	1	0	1	0	0	0	0	2	1.2
11:30	2	0	0	0	0	0	0	2	0.4
11:45	0	0	0	0	0	0	0	0	0
H/TOT	4	0	2	0	0	0	0	6	2.8
12:00	0	0	1	0	0	0	0	1	1
12:15	0	0	0	0	0	0	0	0	0
12:30	1	0	1	0	0	0	0	2	1.2
12:45	5	0	0	2	0	0	0	7	3
H/TOT	6	0	2	2	0	0	0	10	5.2
13:00	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0
13:30	0	0	1	0	0	0	0	1	1
13:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	1	1
14:00	0	0	0	0	0	0	0	0	0
14:15	0	0	1	0	0	0	0	1	1
14:30	0	0	0	0	0	0	0	0	0
14:45	0	0	2	0	0	0	0	2	2
H/TOT	0	0	3	0	0	0	0	3	3
15:00	0	0	1	0	0	0	0	1	1
15:15	0	0	0	0	0	0	0	0	0
15:30	0	0	1	0	0	0	0	1	1
15:45	0	0	0	1	0	0	0	1	1
H/TOT	0	0	2	1	0	0	0	3	3
16:00	0	0	2	0	0	0	0	2	2
16:15	0	0	0	0	0	0	0	0	0
16:30	0	0	3	1	0	0	0	4	4
16:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	5	1	0	0	0	6	6
17:00	0	0	1	0	0	0	0	1	1
17:15	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	1	1
18:00	0	0	1	0	0	0	0	1	1
18:15	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	1	1
12 TOT	11	0	28	8	0	0	0	47	38.2

D => D

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0
08:15	0	0	1	0	0	0	0	1	1
08:30	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	1	1
09:00	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0
09:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	1	0	0	0	0	1	1
10:00	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0
13:30	0	0	1	0	0	0	0	1	1
13:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	1	1
14:00	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0
15:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	1	0	0	0	0	1	1
16:00	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
18:00	0	0	1	0	0	0	0	1	1
18:15	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	1	1
12 TOT	0	0	5	0	0	0	0	5	5

D => E

TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0
08:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	1	0	0	0	0	1	1
09:00	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0
09:45	0	0	0	1	0	0	0	1	1
H/TOT	0	0	0	1	0	0	0	1	1
10:00	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0
12:15	0	1	2	0	0	0	0	3	2.4
12:30	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0
H/TOT	0	1	2	0	0	0	0	3	2.4
13:00	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
14:00	0	3	0	0	0	0	0	3	1.2
14:15	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0
H/TOT	0	3	0	0	0	0	0	3	1.2
15:00	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	1	0	0	1	1.5
16:30	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	1	0	0	1	1.5
17:00	0	0	1	0	0	0	0	1	1
17:15	0	0	0	0	0	0	0	0	0
17:30	0	0	1	0	0	0	0	1	1
17:45	0	0	1	0	0	0	0	1	1
H/TOT	0	0	3	0	0	0	0	3	3
18:00	0	0	0	1	0	0	0	1	1
18:15	0	0	1	0	0	0	0	1	1
18:30	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	1	0	0	0	2	2
12 TOT	0	4	7	2	1	0	0	14	12.1

IDASO

Survey Name: 25032 - Ballincollig Co. Cork
Site: Site 12
Location: N22 ON/Off Slips/L2219 Kilnaglory/L2216 Greenfield
Date: Thu 16-Jan-2025

Arm A - Woodberry
Arm B - N22 Off Slip
Arm C - L2219 Kilnaglory
Arm D - L2216 Greenfield
Arm E - N22 On Slip

E => A, **E => B**, **E => C**, **E => D**, **E => E**

TIME	E=>A P/C	E=>A M/C	E=>A CAR	E=>A LGV	E=>A OGV1	E=>A OGV2	E=>A PSV	E=>A TOT	E=>A PCU	E=>B P/C	E=>B M/C	E=>B CAR	E=>B LGV	E=>B OGV1	E=>B OGV2	E=>B PSV	E=>B TOT	E=>B PCU	E=>C P/C	E=>C M/C	E=>C CAR	E=>C LGV	E=>C OGV1	E=>C OGV2	E=>C PSV	E=>C TOT	E=>C PCU	E=>D P/C	E=>D M/C	E=>D CAR	E=>D LGV	E=>D OGV1	E=>D OGV2	E=>D PSV	E=>D TOT	E=>D PCU	E=>E P/C	E=>E M/C	E=>E CAR	E=>E LGV	E=>E OGV1	E=>E OGV2	E=>E PSV	E=>E TOT	E=>E PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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APPENDIX 4-4 TRICS output result

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Appendix 4D – TRICS Output File

TRIP RATE for Land Use 03 - RESIDENTIAL/K - MIXED PRIV HOUS (FLATS AND HOUSES)
MULTI-MODAL TOTAL PEOPLE
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period
Total People to Total Vehicles ratio (all time periods and directions): 1.77

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	22	178	0.104	22	178	0.402	22	178	0.506
08:00 - 09:00	22	178	0.216	**22**	**178**	**0.608**	**22**	**178**	**0.824**
09:00 - 10:00	22	178	0.197	22	178	0.281	22	178	0.478
10:00 - 11:00	22	178	0.187	22	178	0.225	22	178	0.412
11:00 - 12:00	22	178	0.183	22	178	0.203	22	178	0.386
12:00 - 13:00	22	178	0.230	22	178	0.211	22	178	0.441
13:00 - 14:00	22	178	0.223	22	178	0.217	22	178	0.440
14:00 - 15:00	22	178	0.214	22	178	0.254	22	178	0.468
15:00 - 16:00	**22**	**178**	**0.484**	22	178	0.283	22	178	0.767
16:00 - 17:00	22	178	0.411	22	178	0.257	22	178	0.668
17:00 - 18:00	22	178	0.464	22	178	0.245	22	178	0.709
18:00 - 19:00	22	178	0.435	22	178	0.236	22	178	0.671
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.348			3.422			6.770

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

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TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY

TOTAL VEHICLES

Calculation factor: 1

Estimated TRIP rate value per 1 shown in shaded columns
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS				DEPARTURES				TOTALS			
	No. Days	Ave. PUPILS	Trip Rate	Estimated Trip Rate	No. Days	Ave. PUPILS	Trip Rate	Estimated Trip Rate	No. Days	Ave. PUPILS	Trip Rate	Estimated Trip Rate
00:00 - 01:00												
01:00 - 02:00												
02:00 - 03:00												
03:00 - 04:00												
04:00 - 05:00												
05:00 - 06:00												
06:00 - 07:00	3	63	0.011	0.011	3	63	0.000	0.000	3	63	0.011	0.011
07:00 - 08:00	24	74	0.162	0.162	24	74	0.087	0.087	24	74	0.249	0.249
08:00 - 09:00	**24**	**74**	**0.224**	**0.224**	24	74	0.195	0.195	**24**	**74**	**0.419**	**0.419**
09:00 - 10:00	24	74	0.087	0.087	24	74	0.081	0.081	24	74	0.168	0.168
10:00 - 11:00	24	74	0.029	0.029	24	74	0.020	0.020	24	74	0.049	0.049
11:00 - 12:00	24	74	0.032	0.032	24	74	0.025	0.025	24	74	0.057	0.057
12:00 - 13:00	24	74	0.078	0.078	24	74	0.084	0.084	24	74	0.162	0.162
13:00 - 14:00	24	74	0.056	0.056	24	74	0.081	0.081	24	74	0.137	0.137
14:00 - 15:00	24	74	0.030	0.030	24	74	0.030	0.030	24	74	0.060	0.060
15:00 - 16:00	24	74	0.056	0.056	24	74	0.052	0.052	24	74	0.108	0.108
16:00 - 17:00	24	74	0.102	0.102	24	74	0.112	0.112	24	74	0.214	0.214
17:00 - 18:00	24	74	0.180	0.180	**24**	**74**	**0.228**	**0.228**	24	74	0.408	0.408
18:00 - 19:00	23	76	0.010	0.010	23	76	0.046	0.046	23	76	0.056	0.056
19:00 - 20:00	1	70	0.014	0.014	1	70	0.143	0.143	1	70	0.157	0.157
20:00 - 21:00	1	70	0.000	0.000	1	70	0.000	0.000	1	70	0.000	0.000
21:00 - 22:00												
22:00 - 23:00												
23:00 - 24:00												
Total Rates:			1.071	1.071			1.184	1.184			2.255	2.255

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

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Parameter summary

Trip rate parameter range selected:	25 - 210 (units:)
Survey date date range:	01/01/16 - 06/09/23
Number of weekdays (Monday-Friday):	24
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/K - CAFE

TOTAL VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	4	206	2.061	4	206	1.091	4	206	3.152
07:00 - 08:00	8	183	3.754	8	183	2.730	8	183	6.484
08:00 - 09:00	13	163	3.548	13	163	3.075	13	163	6.623
09:00 - 10:00	14	155	6.532	14	155	5.612	14	155	12.144
10:00 - 11:00	**14**	**155**	**9.430**	**14**	**155**	**8.418**	**14**	**155**	**17.848**
11:00 - 12:00	14	155	7.268	14	155	7.360	14	155	14.628
12:00 - 13:00	14	155	7.774	14	155	7.360	14	155	15.134
13:00 - 14:00	14	155	7.682	14	155	8.004	14	155	15.686
14:00 - 15:00	14	155	5.474	14	155	5.842	14	155	11.316
15:00 - 16:00	14	155	4.646	14	155	4.968	14	155	9.614
16:00 - 17:00	12	166	2.718	12	166	3.573	12	166	6.291
17:00 - 18:00	8	183	2.808	8	183	3.014	8	183	5.822
18:00 - 19:00	4	206	2.061	4	206	2.545	4	206	4.606
19:00 - 20:00	3	191	2.269	3	191	3.141	3	191	5.410
20:00 - 21:00	3	191	0.000	3	191	0.175	3	191	0.175
21:00 - 22:00	1	38	0.000	1	38	5.263	1	38	5.263
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			68.025			72.171			140.196

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

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Parameter summary

Trip rate parameter range selected:	38 - 325 (units: sqm)
Survey date date range:	01/01/16 - 06/06/24
Number of weekdays (Monday-Friday):	13
Number of Saturdays:	1
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

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APPENDIX 4-5 Trip Distribution for the Permitted Developments

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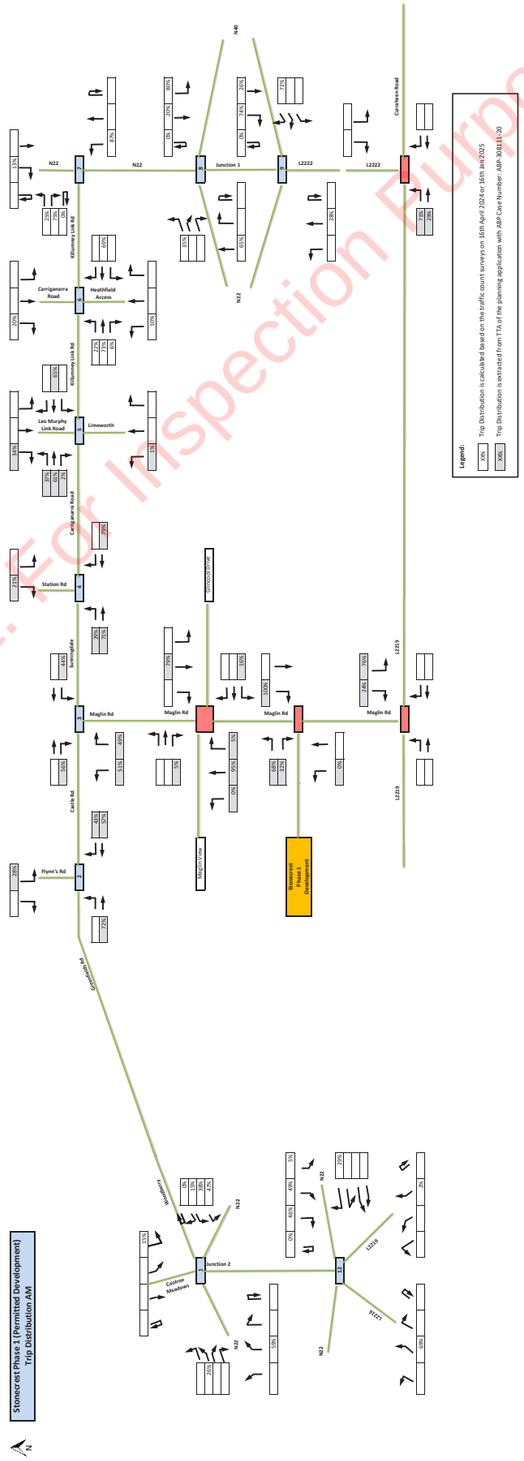
Appendix 4E – Trip Distribution for the Permitted Developments



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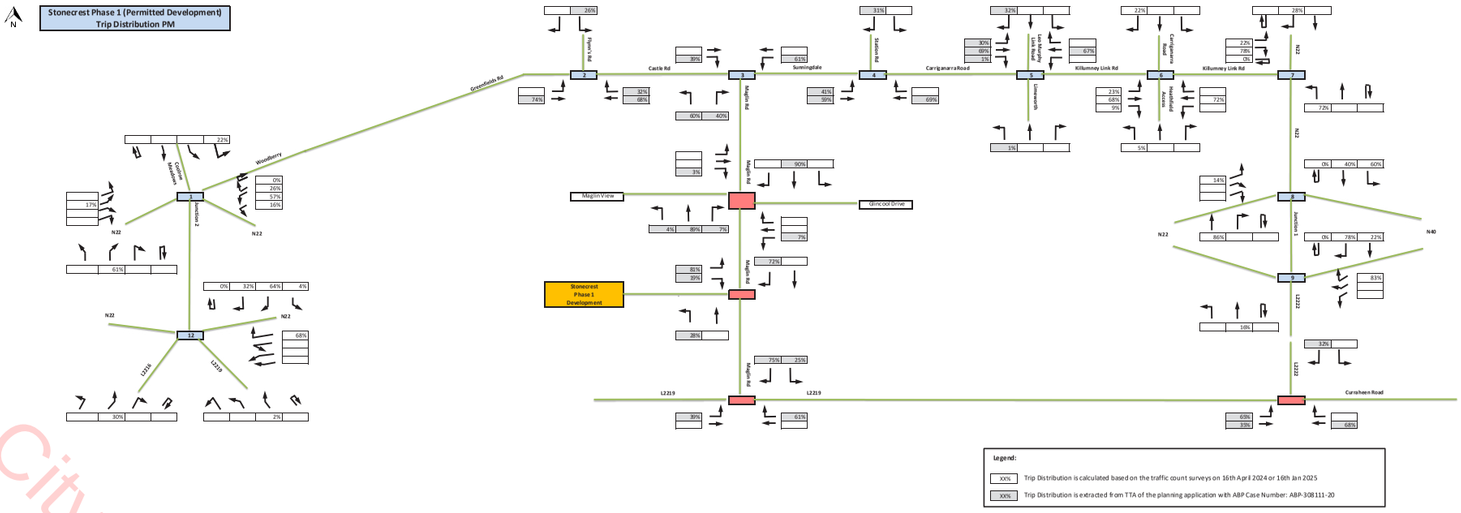

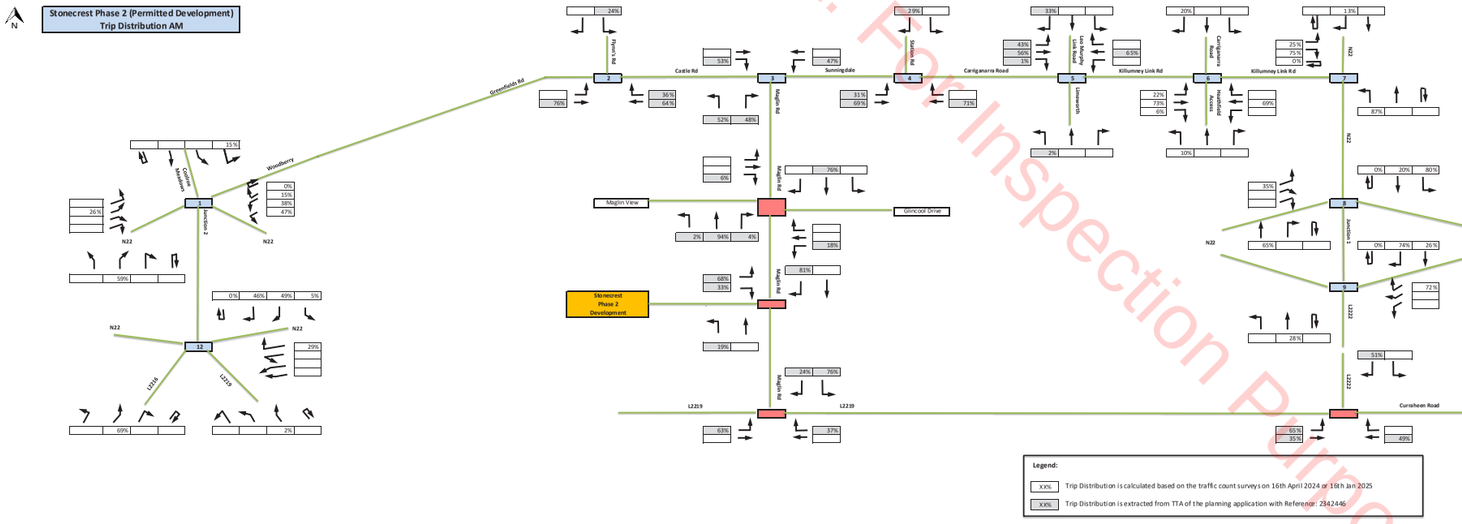

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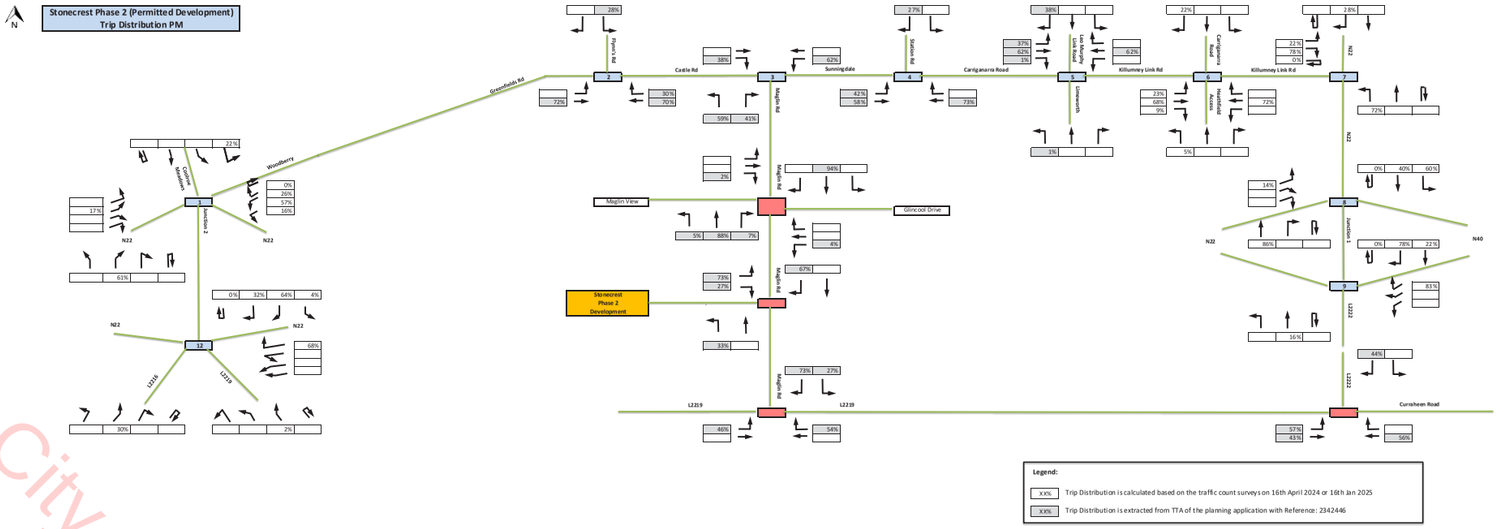

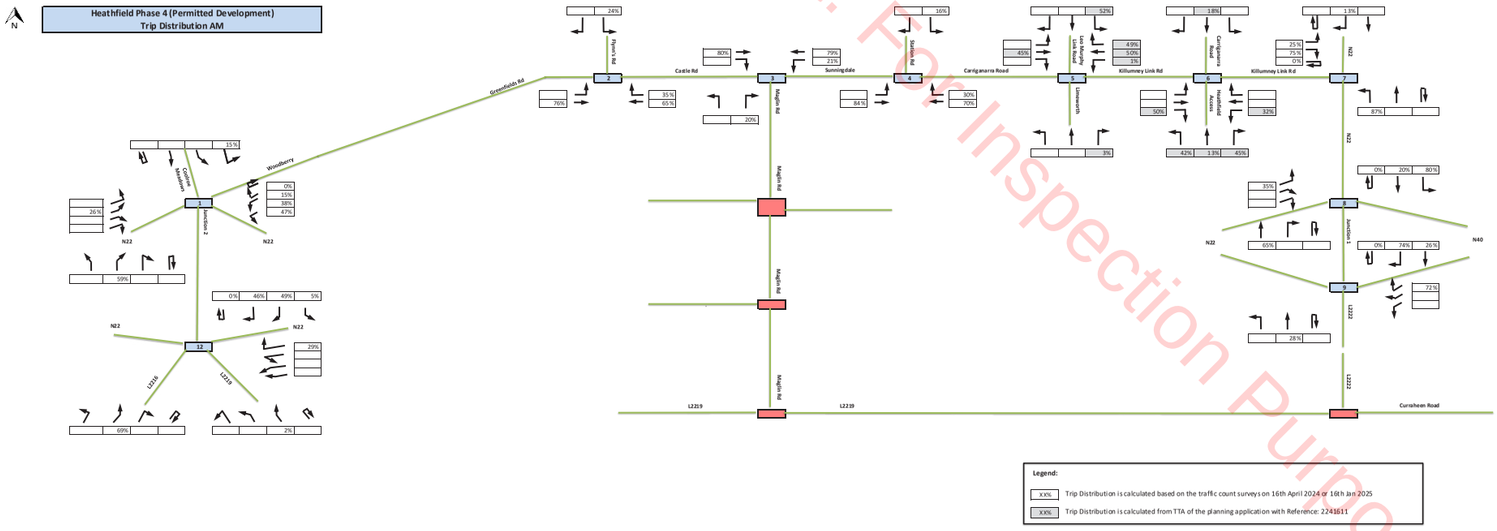

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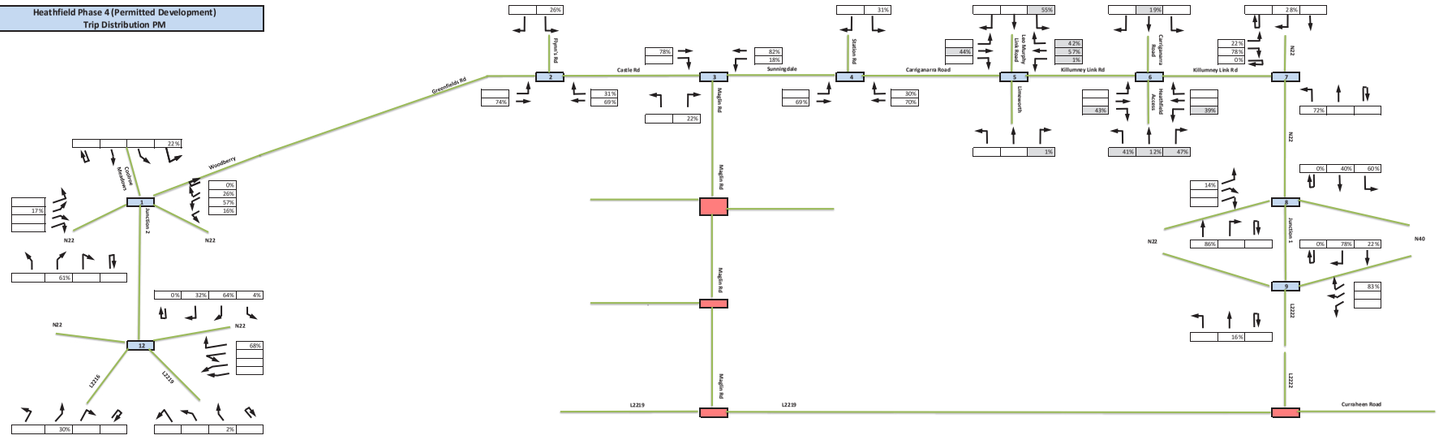
Heathfield Phase 4 (Permitted Development)
Trip Distribution PM



Legend:

XX% Trip Distribution is calculated based on the traffic count surveys on 16th April 2024 or 16th Jan 2025

XX% Trip Distribution is calculated from TTA of the planning application with Reference: 2241611

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APPENDIX 4-6 Trip Generation for the Permitted Developments

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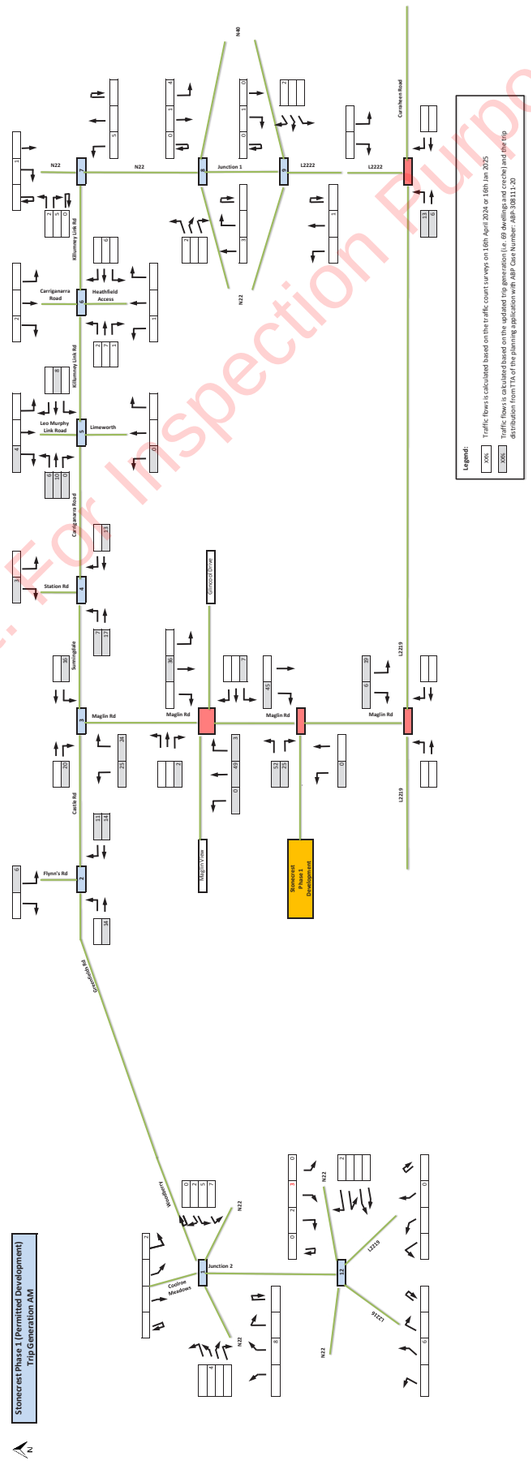
Appendix 4F – Trip Generation for the Permitted Developments



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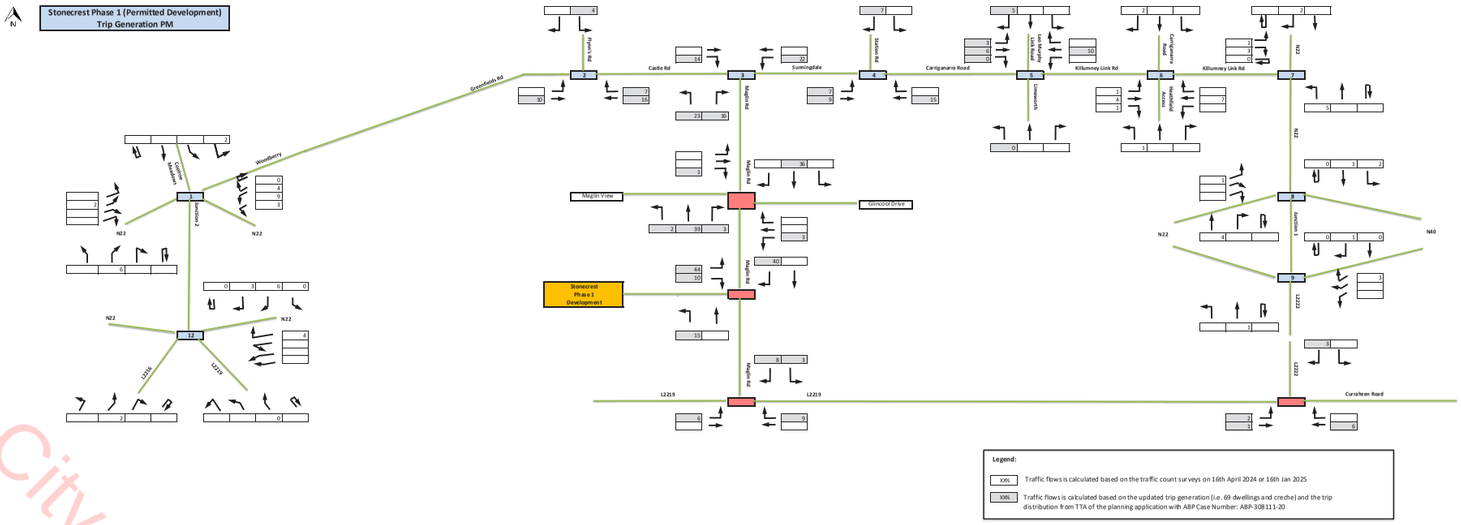

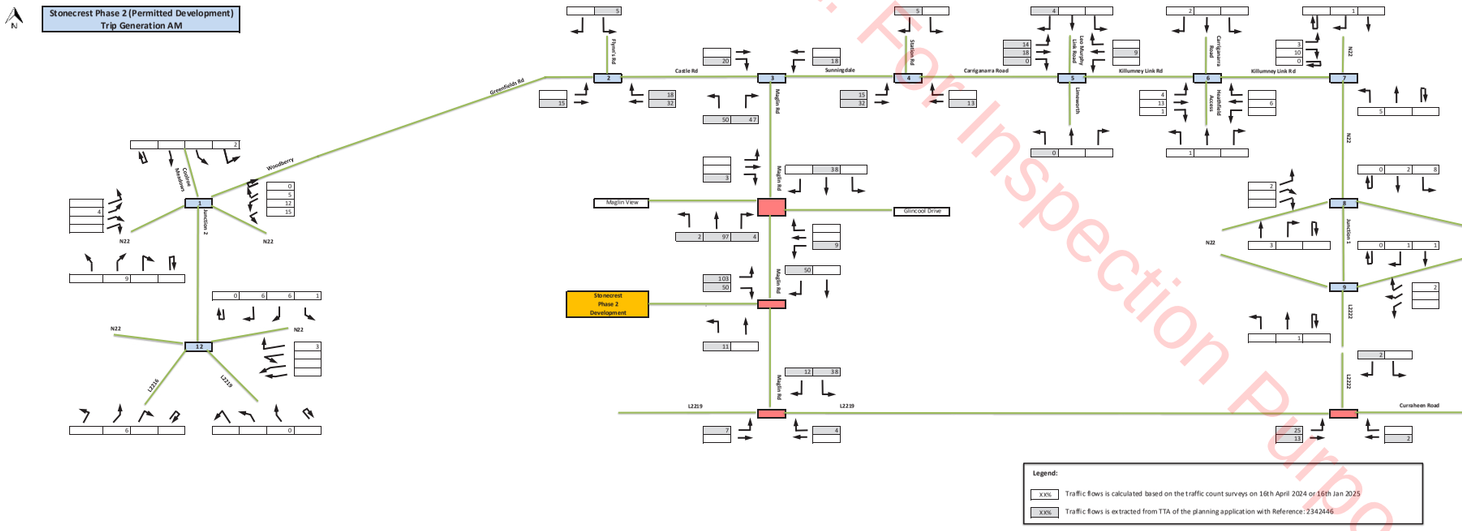

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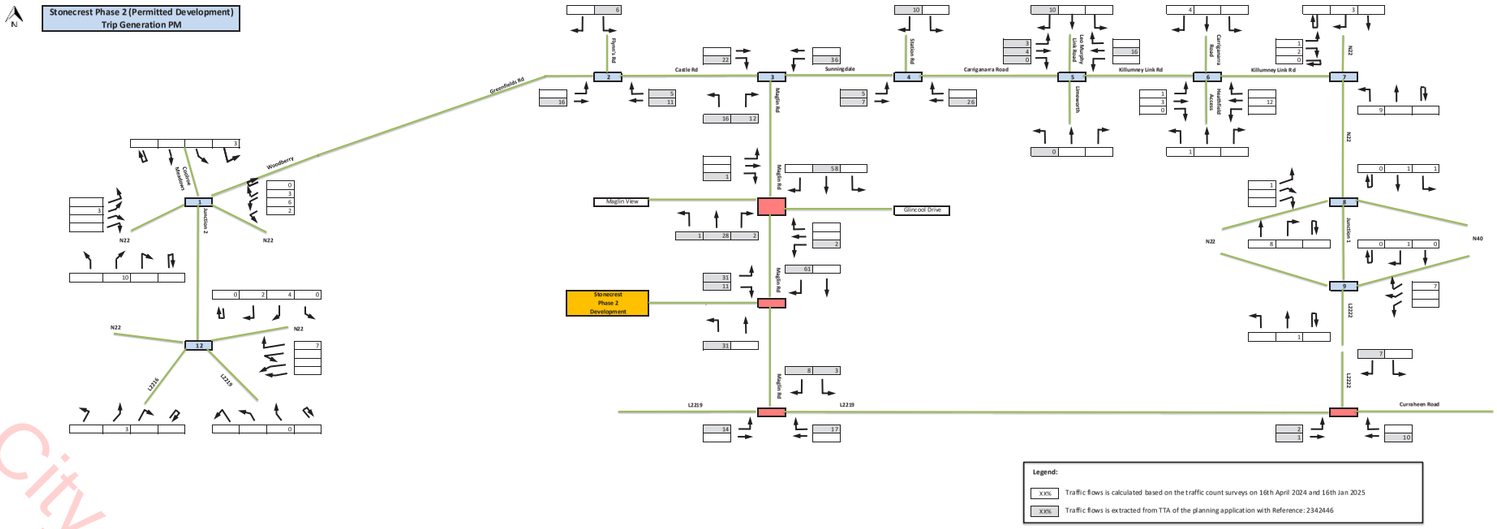

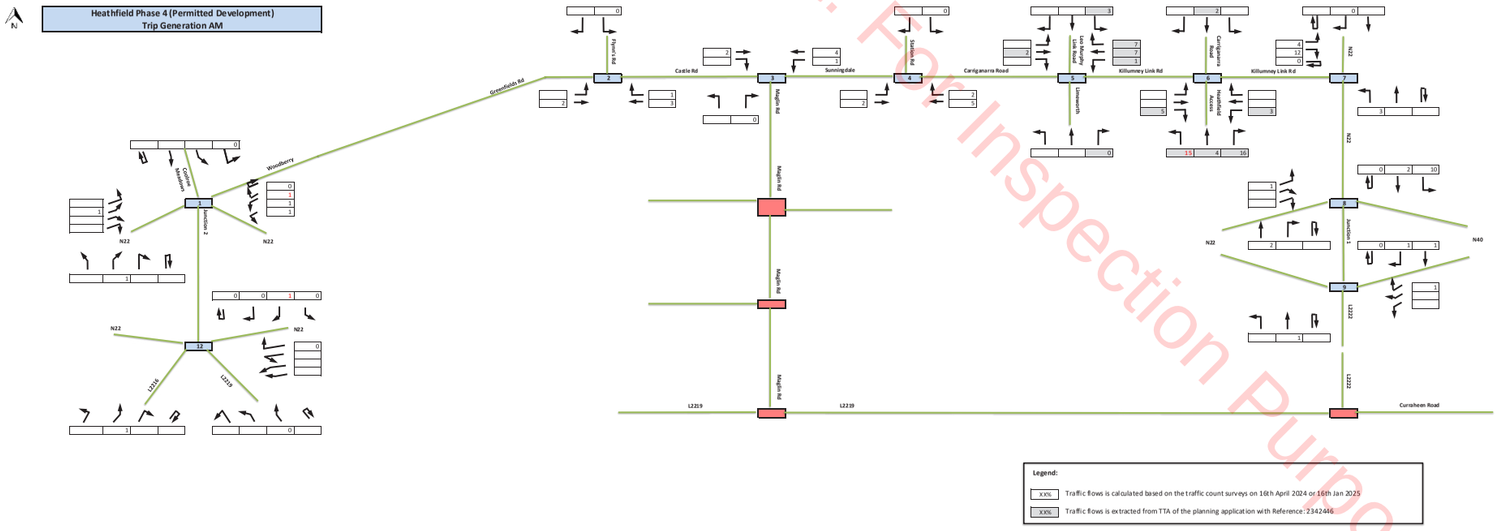

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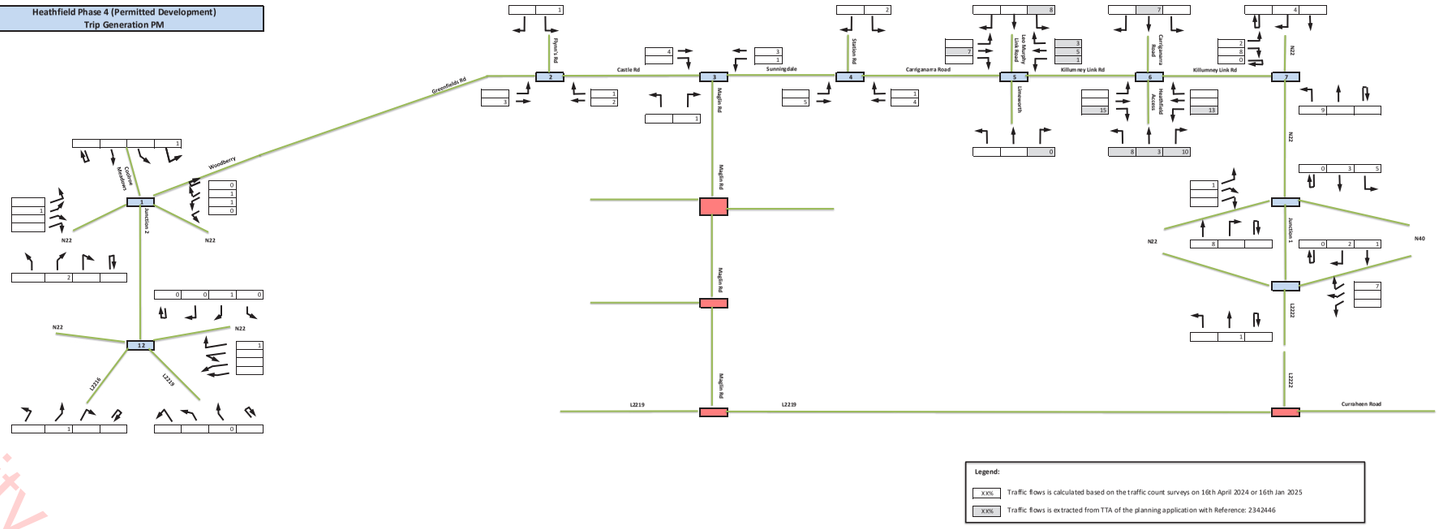
Heathfield Phase 4 (Permitted Development)
Trip Generation PM



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APPENDIX 4-7 Trip Distribution for the Proposed Development

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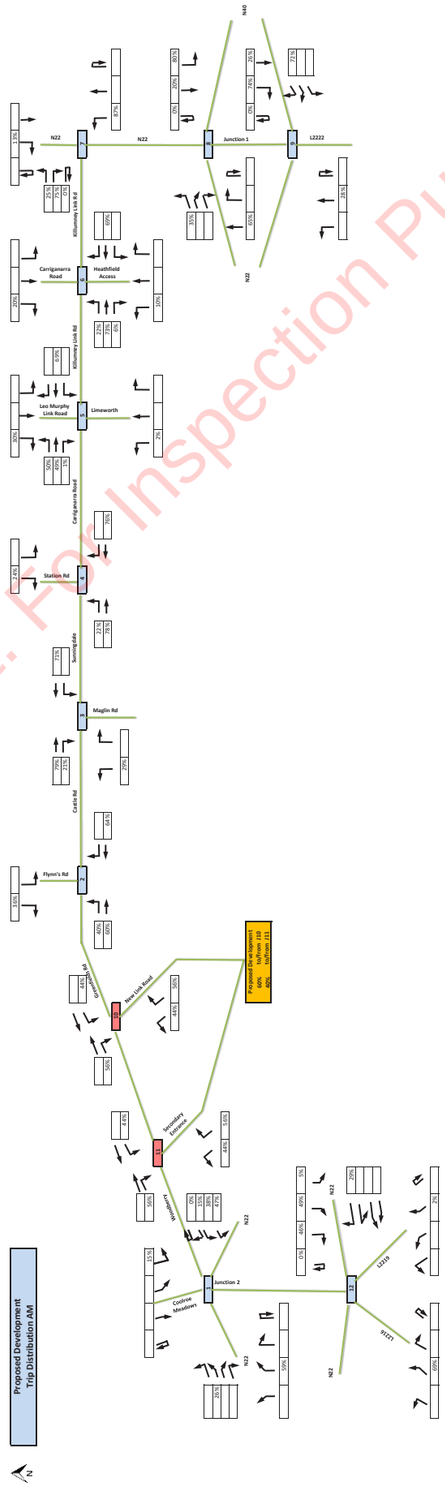
Appendix 4G – Trip Distribution for the Proposed Development



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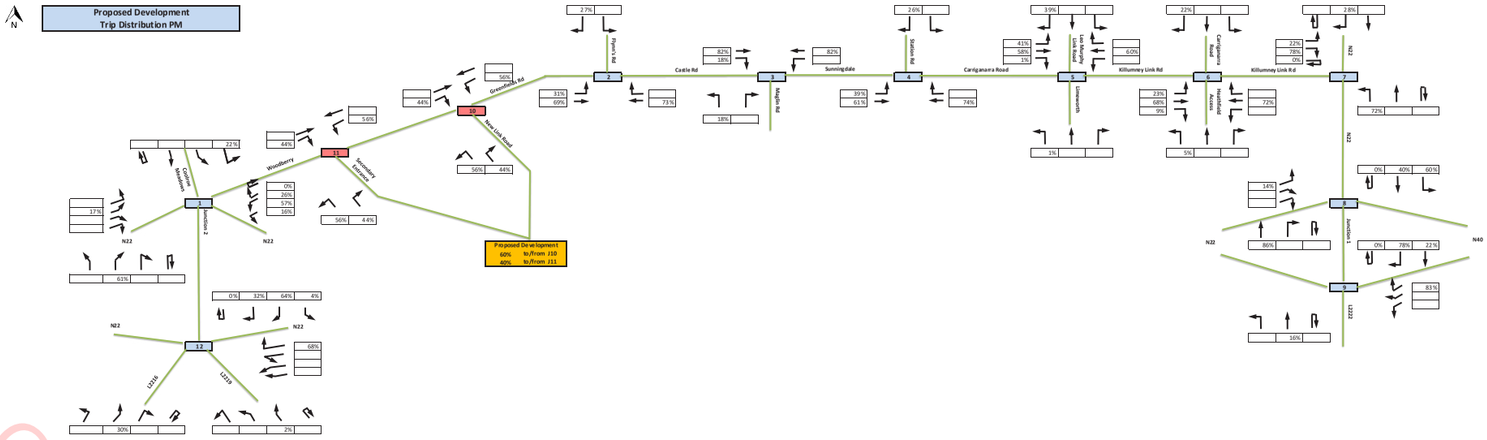

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APPENDIX 4-8 Trip Generation for the Proposed Development

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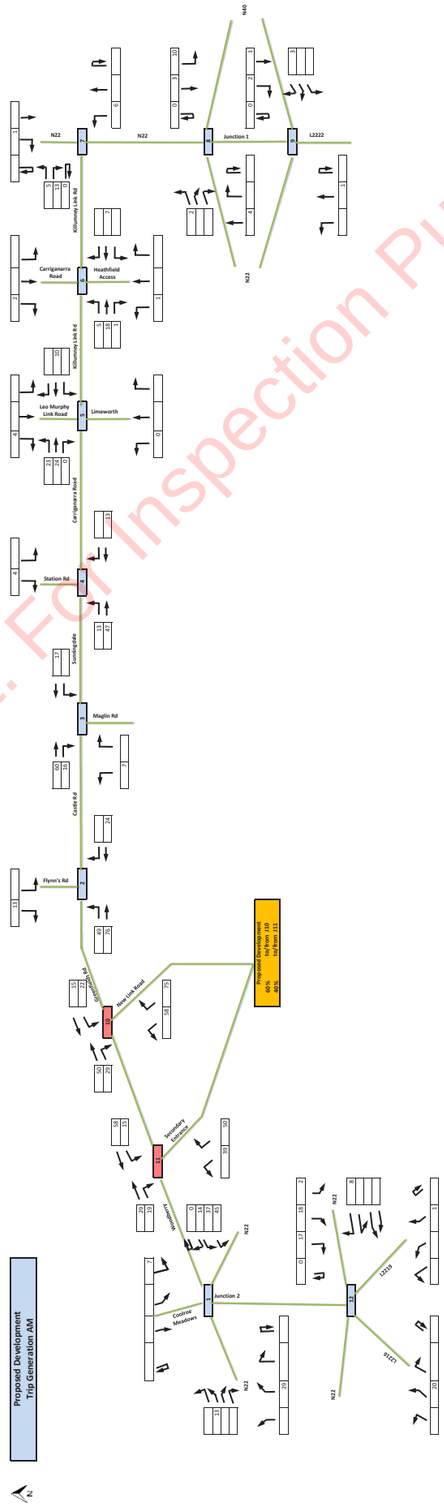
Appendix 4H – Trip Generation for the Proposed Development



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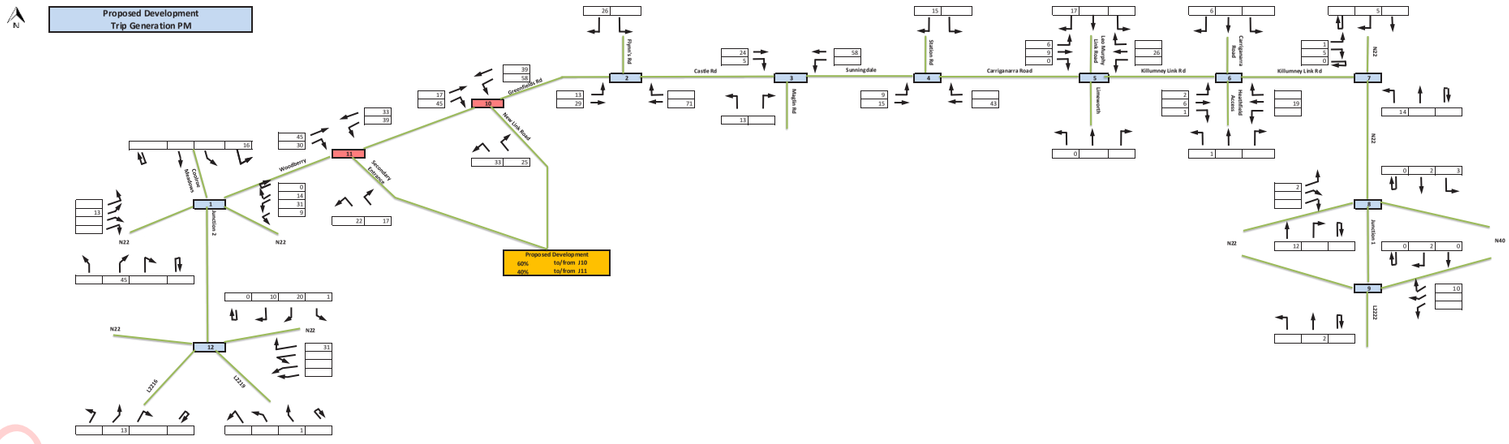

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CHAPTER FIVE

MATERIAL ASSETS – SERVICES, INFRASTRUCTURE & UTILITIES

APPENDIX 5-1 Proposed Surface Water Drainage & Wastewater Layout Drawings - DOSA Consulting Engineers
APPENDIX 5-2 Proposed Water Supply Drawings – DOSA Consulting Engineers
APPENDIX 5-3 Public Lighting Strategy – Molloys Engineering
APPENDIX 5-4 Operational Waste Management Plan – AWN Consulting

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APPENDIX 5-1 Proposed Surface Water Drainage & Wastewater Layout Drawings - DOSA Consulting Engineers

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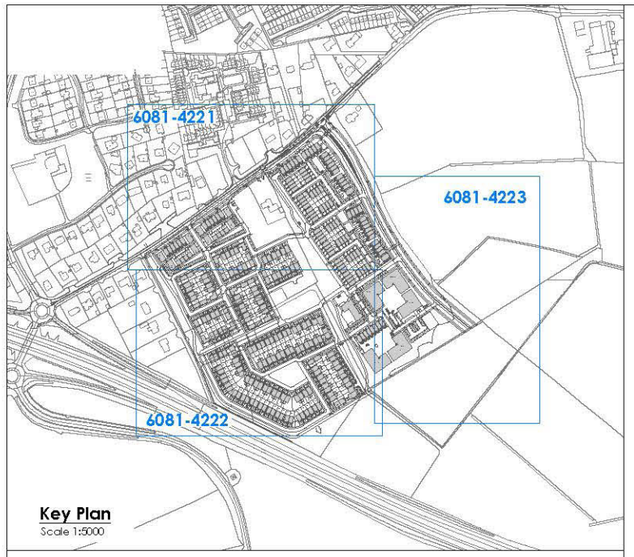

Key Plan
Scale 1:5000

Legend:

Wastewater Details:	Document No. IM-CDS-5030-01	
Denotes 150mm Foul Connection	Waste Water Service Connection Responsibility :	STD-WAW-01
Denotes Foul Pipe	Typical Layout for Sewer within New Developments	STD-WAW-02
Denotes Foul Manhole	Drain & Service Connection Pipework :	STD-WAW-03
FCI01 Denotes Inspection Chamber	Typical Sewer / Service pipe Connection :	STD-WAW-04
Denotes Foul Pipe Concrete-encased	STD-WAW-06 Existing Planting	STD-WAW-06
Denotes Ex. Foul Sewer	Restrictions on new planting adjacent to sewers	STD-WAW-06A
	Trench Backfill & Bearing :	STD-WAW-07
Storm Water Details:	Concrete Bed, Haunch & Surround to Waste Water :	STD-WAW-08
Denotes Connection Pipe	Pre-cast Concrete Manholes :	STD-WAW-10
Denotes Storm Pipe	Backdrop manholes :	STD-WAW-12
Denotes Storm Manhole	Private Side Inspection Chamber :	STD-WAW-13
RG02 Road Gully		
Denotes Ex. Storm Sewer		

Rising Main Details:

Rising Main
Rising Main - Option A
Rising Main - Option B

Note:
Refer to Irish Water Standard Details Drawings Document No. IM-CDS-5030-01
Pipe materials shall comply with Section 3.9 of Irish Waters' Code of Practice.
All works to be constructed to conform with Irish Water's Code of Practice for Wastewater Infrastructure.
Document No. IM-CDS-5030-03.

1. All Foul pipes must be in compliance with Code of Practice for Wastewater Infrastructure - Section 3.13
2. Foul pipe to be 'WorkSpec SN8' shall be structure wall construction Type A manufactured in accordance with EN13476-2, and comprising PVC-U smooth internal and external layer with either a foamed or a recycled PVC-U core.
3. 'WorkSpec SN8' shall be manufactured in accordance with Quality Management system IS EN ISO 9001:2008 and Environmental Quality System IS EN ISO 14001:2004
4. Separation distances must be in compliance with Standard details & Code of Practice for Wastewater Infrastructure.
5. Manhole covers, where located in grass areas, shall be surrounded by a concrete plinth, 200mm all round and 100mm deep formed with C20/25 concrete
6. All new trees/shrubs planting will comply with minimum planting distances as per standard detail STD-WW-06A
7. Stormwater pipe will be a JFC Complipe twin wall SN6/SN8 polyethylene drainage pipe. Complipe is a twin wall polyethylene drainage pipe manufactured from a black high density polyethylene by a twin extrusion process.

Proposed Drainage Layout
Scale 1/500

0 5 10 15 20 25 m
SCALE 1:500

Provision of connection to Existing RWG as requested by Area Engineer

Final Discharge option as per Irish Water Confirmation of Feasibility (COF) and Statement of Design Acceptance. Connection to be constructed by Uisce Eireann as exempted development in accordance with schedule 2, Part 1, Class 58 of Planning & Development Regulations, 2001

Attenuation Tank 05 (22m x 11m x 1.75m deep)

Attenuation Tank 04 (37m x 9.5m x 1.75m deep)

Petrol Interceptor CNSB15s or similar approved

Petrol Interceptor CNSB10s or similar approved

Restricted Outlet 10l/s = 3.50l/sec

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E	K.M.	L.O.T.	L.O.T.	21.07.25	Issued for LRD Planning Application		
REV.	DRAWN	CHKD	APPRVD	DATE	DETAILS		

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CLIENT: Murnane & O'Shea Ltd.

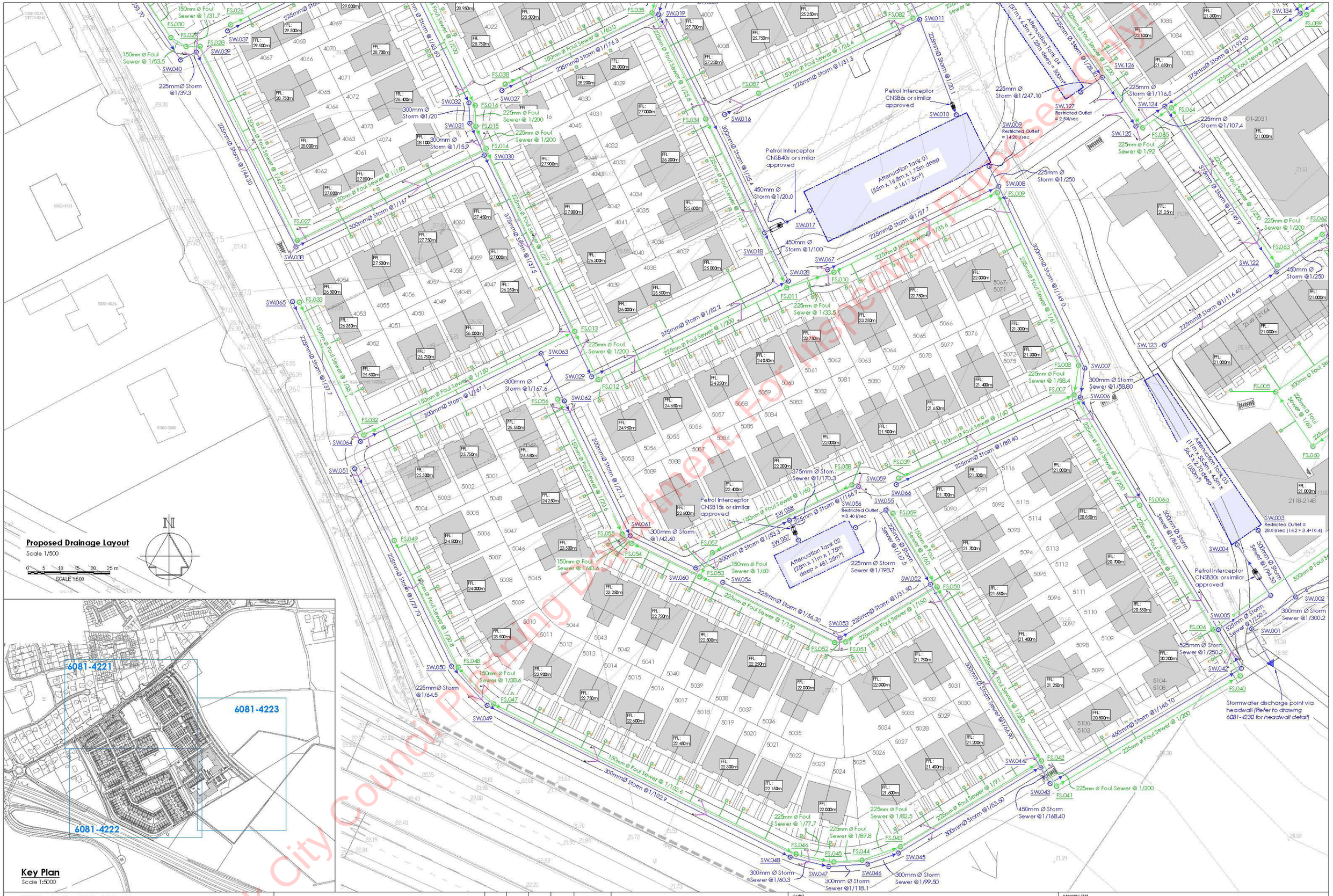
PROJECT: Residential Development at Greenfield, Ballincollig

DRAWING TITLE: Proposed Stormwater & Foul Sewer Layout Plans (1 of 3)

SHEET: A1/ A3

SCALE: 1:500/ 1:1000

PROJECT NO. 6081 _ DRAWING NO. 4221 _ STATUS/ISSUE E



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E	K.M.	L.O.T.	L.O.T.	21.07.25	Issued for LRD Planning Application

CLIENT: Murnane & O'Shea Ltd.

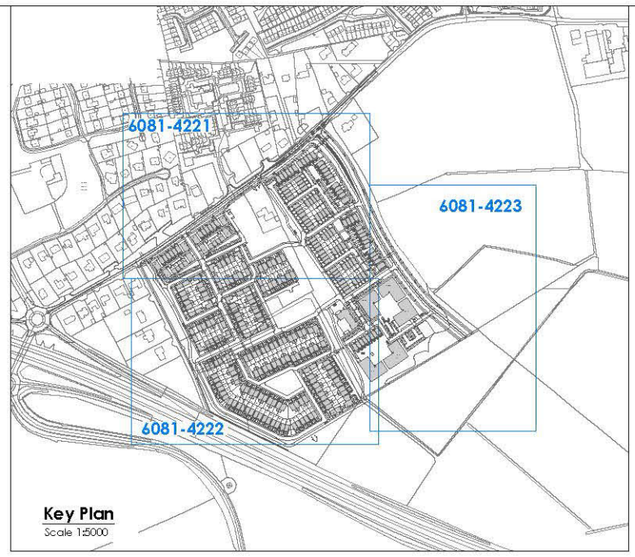
PROJECT: Residential Development at Greenfield, Ballincollig

DRAWING TITLE: Proposed Stormwater & Foul Sewer Layout Plans (2 of 3)

SHEET: A1/ A3

SCALE: 1:500/ 1:1000

PROJECT NO. 6081 _ DRAWING NO. 4222 _ STATUS/ISSUE E



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Petrol Interceptor CNSB80s or similar approved

Pump Station in accordance with Irish Water specifications. Refer to Infrastructure Report for COF Details (Refer to drawing 6081-4225 for details)

3 number 300mm Diameter pipe culverts as per requirement of section 4.7 of MWP Flood risk assessment report (Grated outfalls on either side)

Existing drainage channel to be retained.

Attenuation Tank 06 (80m x 20m x 2.75m deep = 1650m³)

Attenuation Tank 03 (1 in x 55.5m x 4.45m x 35.5 x 2.70 deep = 1350m³)

Stormwater discharge point via headwall (Refer to drawing 6081-4230 for headwall detail)

Proposed Drainage Layout

Scale 1/500

0 5 10 15 20 25 m

SCALE 1:500

Legend:

Wastewater Details:	Document No. IW-CDS-5030-01	
Denotes 150mm Foul Connection	Waste Water Service Connection Responsibility :	STD-WW01
Denotes Foul Pipe	Typical Layout for Sewer within New Developments	STD-WW02
Denotes Foul Manhole	Drain & Service Connection Pipework :	STD-WW03
FD01 Denotes Inspection Chamber	Typical Sewer / Service pipe Connection :	STD-WW04
Denotes Foul Pipe Concrete encased	STD-WW66 Existing Planting	STD-WW06
Denotes Ex. Foul Sewer	Restrictions on new planting adjacent to sewers	STD-WW66A
	Trench Backfill & Bedding :	STD-WW07
Storm Water Details:	Concrete Bed, Haunch & Surround to Waste Water :	STD-WW08
Denotes Connection Pipe	Pre-cast Concrete Manholes :	STD-WW10
Denotes Storm Pipe	Backdrop manholes:	STD-WW12
Denotes Storm Manhole	Private Side Inspection Chamber :	STD-WW13
Road Gully		
Denotes Ex. Storm Sewer		
Rising Main Details:		
Rising Main		
Rising Main - Option A		
Rising Main - Option B		

Note:
Refer to Irish Water Standard Details Drawings Document No. IW-CDS-5030-01
Pipe materials shall comply with Section 3.9 of Irish Water's Code of Practice.
All works to be constructed to conform with Irish Water's Code of Practice for Wastewater Infrastructure Document No. IW-CDS-5030-03.

1. All Foul pipes must be in compliance with Code of Practice for Wastewater Infrastructure - Section 3.13
2. Foul pipe to be 'WavSpec SN8' shall be structure wall construction Type A manufactured in accordance with EN13476-2, and comprising PVC-U smooth internal and external layers with either a foamed or a recycled PVC-U core.
3. 'WavSpec SN8' shall be manufactured in accordance with Quality Management system IS EN ISO 9001: 2008 and Environmental Quality System IS EN ISO 14001:2004
4. Separation distances must be in compliance with Standard details & Code of Practice for Wastewater Infrastructure.
5. Manhole covers, where located in grass areas, shall be surrounded by a concrete plinth, 200mm all round and 100mm deep formed with C20/25 concrete
6. All new trees/shrubs planting will comply with minimum planting distances as per standard detail STD-WW-06A
7. Stormwater pipe will be a JFC Camipipe twin wall SN6/SN8 polyethylene drainage pipe. Camipipe is a twin wall polyethylene drainage pipe manufactured from a black high density polyethylene by a twin extrusion process.

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REV.	DRAWN	CHKD	APPRVD	DATE	DETAILS
E	K.M.	L.O'T.	L.O'T.	21.07.'25	Issued for LRD Planning Appplication

CLIENT: Murnane & O'Shea Ltd.

PROJECT: Residential Dev. at Greenfield, Ballincollig

DRAWING TITLE: Stormwater & Foul Sewer Layout Plans (3 of 3)

SHEET	SCALE	PROJECT NO.	DRAWING NO.	STATUS/ISSUE
A1/ A3	1:500/1:1000	6081	4223	E

APPENDIX 5-2 Proposed Water Supply Drawings – DOSA Consulting Engineers

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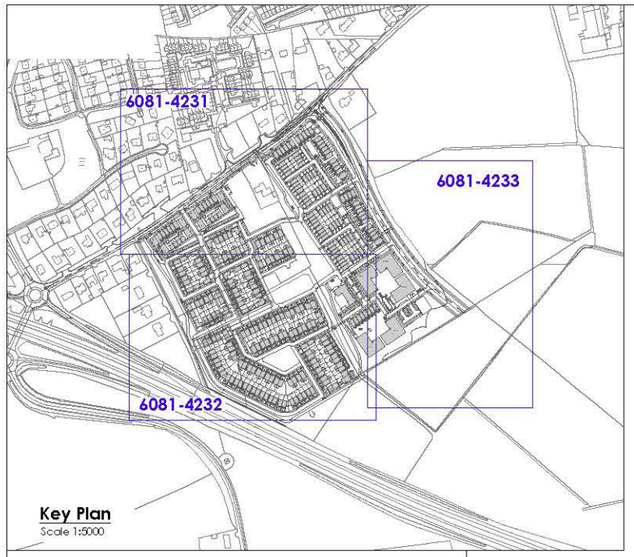

Key Plan
Scale 1:5000

Legend:

Watermain Details:	Document No. IW-CDS-5020-01	
Denotes Connection Pipe (25mm O.D. PE Pipe)	Water Service Connection Responsibility :	STD-W-01
Denotes Connection Pipe (32mm O.D. PE Pipe)	Customer Connection & Boundary Box :	STD-W-03
	Marker Posts & Plates :	STD-W-27
Denotes 110/125mm O.D. HDPE Watermain	General Pipe Connections :	STD-W-04
Denotes 110/125mm O.D. HDPE Watermain loop	General Pipe Connections :	STD-W-05
	General Pipe Connections :	STD-W-07
Denotes 150mm O.D. HDPE Watermain	Trench Backfill and Bedding :	STD-W-13
	Watermain Thrust & Support Blocks :	STD-W-28
Denotes Sluice Valve	Sluice Valve :	STD-W-15
	Marker Posts & Plates :	STD-W-27
Denotes Washout Hydrant	Washout Hydrant :	STD-W-30A
Denotes Non-Return Valve	On Line Hydrant :	STD-W-18
Denotes Fire Hydrant	Off Line Hydrant :	STD-W-19
	Marker Posts & Plates :	STD-W-27
Denotes Air Valve	Air Valve :	STD-W-22
Denotes Water Meter	Meter Chamber :	STD-W-26/26A
	Marker Posts & Plates :	STD-W-27
Denotes Existing Public Watermain		

Note: Refer to Irish Water Standard Details Drawings Document No. IW-CDS-5020-01

1. Mains should extend no more than 1.2m beyond the final Service Connection to mitigate dead-end Mains (Code of Practice for Water Infrastructure - Section 3.5)
2. Service connection pipes should be a minimum of 25mm ouside diameter, 20mm inside diameter, and should be provided with appropriately sized fittings. (Code of Practice for Water Infrastructure - Section 3.8)
3. Separation distances must be in compliance with Standard details & Code of Practice for Water Infrastructure
4. All meters in the manifold shall be tagged to indicate which property is supplied and any unused outlets are to be blanked off.

Proposed Watermain Layout
Scale 1/500

0 5 10 15 20 25 m
SCALE 1:500

N

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D.	K.M.	S.O'G.	L.O'T.	21.07.25	Issued for LRD Planning Application

CLIENT: Murnane & O'Shea Ltd.

PROJECT: Residential Development at Greenfield, Ballincollig

DRAWING TITLE: Proposed Watermain Layout Plan (1 of 3)

SHEET: A1/ A3

SCALE: 1:500/ 1:1000

PROJECT NO. 6081 _ DRAWING NO. 4231 _ STATUS/ISSUE D

Proposed Drainage Layout

Scale 1/500

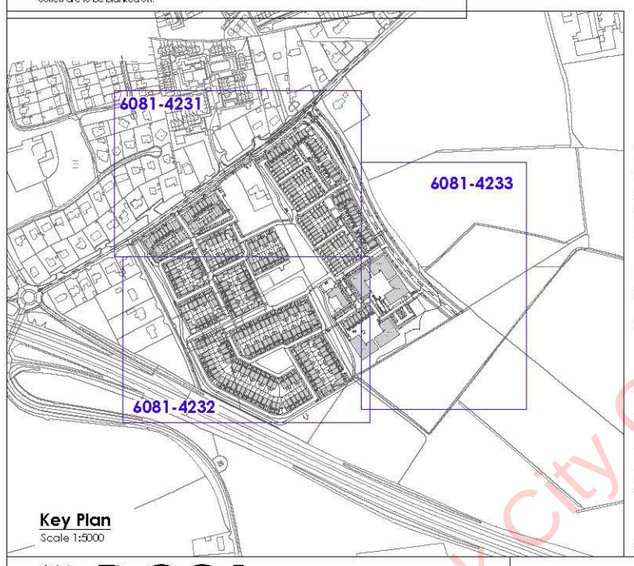
0 5 10 15 20 25 m

SCALE 1:500

Legend:		
Watermain Details:	Document No. IW-CDS-5020-01	
Denotes Connection Pipe (25mm O.D. PE Pipe)	Water Service Connection Responsibility :	STD-W-01
Denotes Connection Pipe (32mm O.D. PE Pipe)	Customer Connection & Boundary Box :	STD-W-03
	Marker Posts & Plates :	STD-W-27
Denotes 110/125mm O.D. HDPE Watermain	General Pipe Connections :	STD-W-04
Denotes 110/125mm O.D. HDPE Watermain loop	General Pipe Connections :	STD-W-05
	General Pipe Connections :	STD-W-07
Denotes 150mm O.D. HDPE Watermain	Trench Backfill and Bedding :	STD-W-13
	Watermain Thrust & Support Blocks :	STD-W-28
Denotes Sluice Valve	Sluice Valve :	STD-W-15
	Marker Posts & Plates :	STD-W-27
Denotes Washout Hydrant	Washout Hydrant :	STD-W-30A
Denotes Non-Return Valve	On Line Hydrant :	STD-W-18
Denotes Fire Hydrant	Off Line Hydrant :	STD-W-19
	Marker Posts & Plates :	STD-W-27
Denotes Air Valve	Air Valve :	STD-W-22
Denotes Water Meter	Meter Chamber :	STD-W24/24A
	Marker Posts & Plates :	STD-W-27
Denotes Existing Public Watermain		

Note: Refer to Irish Water Standard Details Drawings Document No. IW-CDS-5020-01

1. Mains should extend no more than 1.2m beyond the final Service Connection to mitigate dead-end Mains (Code of Practice for Water Infrastructure - Section 3.5)
2. Service connection pipes should be a minimum of 25mm ouside diameter, 20mm inside diameter, and should be provided with appropriately sized fittings. (Code of Practice for Water Infrastructure - Section 3.8)
3. Separation distances must be in compliance with Standard details & Code of Practice for Water Infrastructure
4. All meters in the manifold shall be tagged to indicate which property is supplied and any unused outlets are to be blanked off.



Key Plan

Scale 1:5000

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D	K.M.	L.O.T.	L.O.T.	21.07.25	Issued for LRD Planning Application

CLIENT: Murnane & O'Shea Ltd.

PROJECT: Residential Development at Greenfield, Ballincollig

DRAWING TITLE: Proposed Watermain Layout Plan (2 of 3)

SHEET: A1/ A3

SCALE: 1:500/ 1:1000

PROJECT NO. 6081 _ DRAWING NO. 4232 _ STATUS/REVISION D

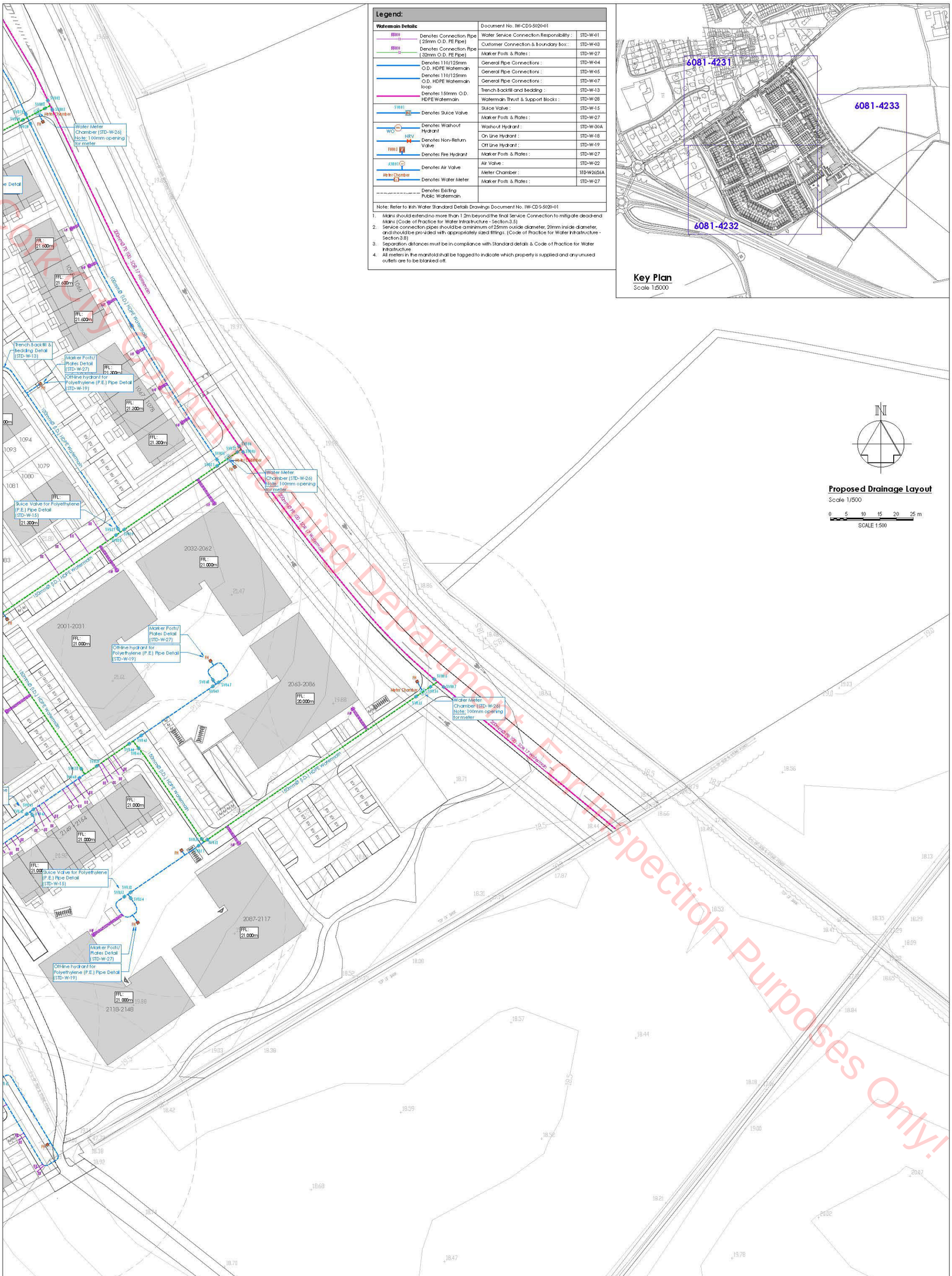
Legend:

Watermain Details:		Document No. IW-CDS-5020-01	
	Denotes Connection Pipe (25mm O.D. PE Pipe)	Water Service Connection Responsibility :	STD-W-01
	Denotes Connection Pipe (32mm O.D. PE Pipe)	Customer Connection & Boundary Box :	STD-W-03
		Marker Posts & Plates :	STD-W-27
	Denotes 110/125mm O.D. HDPE Watermain	General Pipe Connections :	STD-W-04
	Denotes 110/125mm O.D. HDPE Watermain loop	General Pipe Connections :	STD-W-05
	Denotes 150mm O.D. HDPE Watermain	General Pipe Connections :	STD-W-07
		Trench Backfill and Bedding :	STD-W-13
		Watermain Thrust & Support Blocks :	STD-W-28
SVW01	Denotes Sluice Valve	Sluice Valve :	STD-W-15
		Marker Posts & Plates :	STD-W-27
WO	Denotes Washout Hydrant	Washout Hydrant :	STD-W-30A
NRV	Denotes Non-Return Valve	On Line Hydrant :	STD-W-18
FHW2	Denotes Fire Hydrant	Off Line Hydrant :	STD-W-19
		Marker Posts & Plates :	STD-W-27
AVW01	Denotes Air Valve	Air Valve :	STD-W-22
Meter Chamber	Denotes Water Meter	Meter Chamber :	STD-W26/26A
		Marker Posts & Plates :	STD-W-27
	Denotes Existing Public Watermain		

Note: Refer to Irish Water Standard Details Drawings Document No. IW-CDS-5020-01

1. Mains should extend no more than 1.2m beyond the final Service Connection to mitigate dead-end Mains (Code of Practice for Water Infrastructure - Section 3.5)
2. Service connection pipes should be a minimum of 25mm ouside diameter, 20mm inside diameter, and should be provided with appropriately sized fittings. (Code of Practice for Water Infrastructure - Section 3.8)
3. Separation distances must be in compliance with Standard details & Code of Practice for Water Infrastructure
4. All meters in the manifold shall be tagged to indicate which property is supplied and any unused outlets are to be blanked off.

Key Plan
Scale 1:5000



Proposed Drainage Layout
Scale 1/500

0 5 10 15 20 25 m
SCALE 1:500

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D	K.M.	L.O.T.	L.O.T.	21.07.'25	Issued for LRD Planning Application	
REV.	DRAWN	CHKD	APPRVD	DATE	DETAILS	

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CLIENT: Murnane & O'Shea Ltd.
PROJECT: Residential Dev. at Greenfield, Ballincollig
DRAWING TITLE: Proposed Watermain Layout Plan (3 of 3)
SHEET: A1/ A3
SCALE: 1:500/1:1000
PROJECT NO.: 6081
DRAWING NO.: 4233
STATUS/REV: D

APPENDIX 5-3 Public Lighting Strategy – Molloys Engineering

Cork City Council Planning Department. For Inspection Purposes Only!

DATE: 5 July 2025
DESIGNER: James Molloy
PROJECT No: PL2507
PROJECT NAME: Greenfield Ballincollig

Grid 1: Class P3

Grid 2, 4, 6, 8, 10, 12: Class P2

Grid 3, 5, 7, 9, 11: Class C3

Grid 13: Lighting Design to BS5489:2020 Table 4 Maintained Lighting Levels for Outdoor Carpark.
Parking areas of medium traffic e.g. parking areas of sports complexes. Eav> 10 Lux, Emin> 2.5 Lux

Outdoor Lighting Report

c:\users\jamesmolloy\onedrive - molloy consulting engineers\03 designs\pl25\pl2507 mos greenfield ballincollig\04 lighting reality\pl2507 outdoor ligh

Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Grid 1	5986.31	1478.84	371.13	387.72	1.50	1.55
2	Grid 2	5761.79	1794.95	105.74	15.12	1.49	1.37
3	Grid 3	5848.01	1856.23	32.21	14.95	1.46	1.50
4	Grid 4	5874.37	1875.29	232.10	27.49	1.50	1.45
5	Grid 5	6072.52	1996.53	56.08	55.19	1.48	1.49
6	Grid 6	6122.83	1926.59	48.57	86.06	1.47	1.48
7	Grid 7	6145.33	1895.11	42.30	38.70	1.46	1.49
8	Grid 8	6192.27	1829.32	35.67	80.82	1.49	1.50
9	Grid 9	6210.66	1803.09	35.76	32.04	1.49	1.46
10	Grid 10	6247.64	1751.81	35.43	63.11	1.48	1.47
11	Grid 11	6267.20	1724.13	35.41	34.00	1.48	1.48
12	Grid 12	6307.24	1667.78	48.47	69.09	1.47	1.47
13	Grid 13	6153.14	1623.42	141.48	121.78	1.49	1.49

Luminaires

Luminaire A Data

Supplier	Philips
Type	BGP292 DW10
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	9.00
File Name	LumiStreet Gen2 Mini_BGP292_DW10_9000_40LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	415.9, 39.5, 0.0
No. in Project	8

Luminaire B Data

Supplier	Philips
Type	BGP292 DW10
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	8.00
File Name	LumiStreet Gen2 Mini_BGP292_DW10_8000_40LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	415.9, 39.5, 0.0
No. in Project	9

Luminaire C Data

Supplier	Philips
Type	BGP292 DX10
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	12.00
File Name	LumiStreet Gen2 Mini_BGP292_DX10_12000_40LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	513.2, 85.3, 0.0
No. in Project	22

Luminaire D Data

Supplier	Philips
Type	BGP292 DW10
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	10.00
File Name	LumiStreet Gen2 Mini_BGP292_DW10_10000_40LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	415.9, 39.5, 0.0
No. in Project	6

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Luminaires

Luminaire F Data

Supplier	Philips
Type	BGP291 DW10
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	3.80
File Name	LumiStreet Gen2 Micro_BGP291_DW10_3800_20LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.76
Imax70,80,90(cd/klm)	415.9, 39.5, 0.0
No. in Project	83

Luminaire G Data

Supplier	Philips
Type	BGP291 DX10
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	4.60
File Name	LumiStreet Gen2 Micro_BGP291_DX10_4600_20LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.76
Imax70,80,90(cd/klm)	513.2, 85.3, 0.0
No. in Project	39

Luminaire H Data

Supplier	Philips
Type	BGP291 DW10
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	2.00
File Name	LumiStreet Gen2 Micro_BGP291_DW10_2000_10LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.76
Imax70,80,90(cd/klm)	415.9, 39.5, 0.0
No. in Project	71

DATE: 5 July 2025 DESIGNER: James Molloy
PROJECT No: PL2507 PROJECT NAME: Greenfield Ballincollig

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	5758.84	1822.88	10.00	295.00	0.00	0.00	2.00			
2	A	5785.80	1840.30	10.00	299.00	0.00	0.00	2.00			
3	A	5815.67	1872.47	10.00	302.00	0.00	0.00	2.00			
4	A	5850.57	1890.36	10.00	300.00	0.00	0.00	2.00			
5	C	5898.60	1887.98	8.00	121.00	0.00	0.00	0.30			
6	B	5922.96	1905.25	10.00	124.00	0.00	0.00	0.30			
7	A	5944.57	1947.82	10.00	297.00	0.00	0.00	1.00			
8	A	5965.37	1961.97	10.00	295.00	0.00	0.00	1.00			
9	A	5984.61	1977.93	10.00	300.00	0.00	0.00	1.00			
10	A	6006.16	1993.10	10.00	310.00	0.00	0.00	1.00			
11	B	6035.43	1986.71	8.00	127.00	0.00	0.00	0.30			
12	B	5789.30	1814.73	8.00	127.00	0.00	0.00	0.30			
13	B	5825.20	1838.11	8.00	122.00	0.00	0.00	0.30			
15	B	5846.33	1852.77	8.00	127.00	0.00	0.00	0.30			
16	B	5874.01	1872.00	8.00	127.00	0.00	0.00	0.30			
17	B	5944.64	1924.65	8.00	127.00	0.00	0.00	0.30			
18	B	5966.83	1940.55	8.00	127.00	0.00	0.00	0.30			
19	B	6003.41	1962.39	8.00	127.00	0.00	0.00	0.30			
20	C	6143.86	1898.61	8.00	27.00	0.00	0.00	0.30			
21	C	6086.91	2039.72	8.00	213.00	0.00	0.00	0.30			
22	C	6071.39	2010.11	8.00	47.00	0.00	0.00	0.30			
23	C	6105.32	2019.97	8.00	219.00	0.00	0.00	0.30			
24	C	6097.01	2053.10	8.00	139.00	0.00	0.00	0.30			
25	D	6172.55	1894.87	8.00	202.00	0.00	0.00	0.30			
26	C	6087.97	1992.63	8.00	42.00	0.00	0.00	0.30			
27	C	6058.49	2005.88	8.00	122.00	0.00	0.00	0.30			
28	C	6125.85	1992.44	8.00	214.00	0.00	0.00	0.30			
29	C	6145.26	1955.66	8.00	207.00	0.00	0.00	0.30			
30	C	6110.82	1959.85	8.00	30.00	0.00	0.00	0.30			
31	C	6158.56	1926.26	8.00	208.00	0.00	0.00	0.30			
32	C	6130.99	1924.91	8.00	25.00	0.00	0.00	0.30			
33	D	6160.71	1863.74	8.00	24.00	0.00	0.00	0.30			
34	D	6194.44	1854.18	8.00	213.00	0.00	0.00	0.30			
35	C	6185.86	1821.99	8.00	19.00	0.00	0.00	0.30			
36	C	6213.08	1825.63	8.00	215.00	0.00	0.00	0.30			
37	C	6203.06	1797.43	8.00	51.00	0.00	0.00	0.30			

9750148225

Cork City Council Planning Department. For Inspection Purposes Only!

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
38	D	6230.89	1800.87	8.00	216.00	0.00	0.00	0.30			
39	D	6222.92	1771.37	8.00	39.00	0.00	0.00	0.30			
40	D	6251.31	1775.38	8.00	221.00	0.00	0.00	0.30			
41	C	6244.16	1746.72	8.00	50.00	0.00	0.00	0.30			
42	C	6273.97	1752.87	8.00	226.00	0.00	0.00	0.30			
43	C	6268.05	1725.87	8.00	55.00	0.00	0.00	0.30			
44	C	6298.91	1732.38	8.00	229.00	0.00	0.00	0.30			
45	C	6297.65	1701.44	8.00	48.00	0.00	0.00	0.30			
46	C	6329.94	1706.72	8.00	226.00	0.00	0.00	0.30			
49	F	5860.07	1857.25	6.00	35.00	0.00	0.00	0.30			
50	F	5870.35	1842.29	6.00	37.00	0.00	0.00	0.30			
51	F	5882.20	1803.88	6.00	110.00	0.00	0.00	0.30			
52	G	5855.15	1790.88	6.00	112.00	0.00	0.00	0.30			
53	F	5874.79	1724.27	6.00	119.00	0.00	0.00	0.30			
54	H	5854.31	1810.23	6.00	300.00	0.00	0.00	0.30			
55	H	5869.67	1820.80	6.00	303.00	0.00	0.00	0.30			
56	H	5806.77	1810.03	6.00	220.00	0.00	0.00	0.30			
57	H	5817.44	1780.29	6.00	31.00	0.00	0.00	0.30			
58	F	5828.37	1796.04	6.00	218.00	0.00	0.00	0.30			
59	H	5832.56	1757.80	6.00	36.00	0.00	0.00	0.30			
60	G	5844.69	1735.86	6.00	31.00	0.00	0.00	0.30			
61	H	5856.73	1710.84	6.00	27.00	0.00	0.00	0.30			
62	H	5865.43	1691.69	6.00	9.00	0.00	0.00	0.30			
63	G	5867.12	1668.29	6.00	9.00	0.00	0.00	0.30			
64	F	5843.42	1770.27	6.00	204.00	0.00	0.00	0.30			
65	F	5903.87	1738.44	6.00	120.00	0.00	0.00	0.30			
66	F	5924.99	1749.31	6.00	211.00	0.00	0.00	0.30			
67	F	5909.84	1766.17	6.00	30.00	0.00	0.00	0.30			
68	F	5904.14	1799.61	6.00	206.00	0.00	0.00	0.30			
69	F	5930.24	1777.97	6.00	294.00	0.00	0.00	0.30			
70	F	5958.82	1791.94	6.00	294.00	0.00	0.00	0.30			
71	F	5974.87	1774.22	6.00	27.00	0.00	0.00	0.30			
72	F	5973.78	1813.90	6.00	207.00	0.00	0.00	0.30			
73	F	5956.36	1828.91	6.00	29.00	0.00	0.00	0.30			
74	F	5947.98	1863.37	6.00	24.00	0.00	0.00	0.30			
75	F	5937.15	1901.60	6.00	215.00	0.00	0.00	0.30			

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DATE: 5 July 2025 DESIGNER: James Molloy
PROJECT No: PL2507 PROJECT NAME: Greenfield Ballincollig

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
76	H	5916.93	1872.23	6.00	127.00	0.00	0.00	0.30			
77	H	5892.66	1855.80	6.00	118.00	0.00	0.00	0.30			
78	H	5934.05	1875.15	6.00	33.00	0.00	0.00	0.30			
79	F	5920.64	1834.09	6.00	119.00	0.00	0.00	0.30			
80	F	5946.50	1846.55	6.00	113.00	0.00	0.00	0.30			
81	H	5925.79	1858.58	6.00	307.00	0.00	0.00	0.30			
82	F	5989.03	1828.38	6.00	113.00	0.00	0.00	0.30			
83	F	6018.62	1842.85	6.00	119.00	0.00	0.00	0.30			
84	F	6043.43	1847.23	6.00	98.00	0.00	0.00	0.30			
85	F	6058.52	1860.06	6.00	124.00	0.00	0.00	0.30			
86	F	6047.57	1884.26	6.00	211.00	0.00	0.00	0.30			
87	F	6036.41	1900.46	6.00	218.00	0.00	0.00	0.30			
88	F	6020.16	1924.54	6.00	212.00	0.00	0.00	0.30			
89	F	6012.26	1948.28	6.00	212.00	0.00	0.00	0.30			
90	H	5992.10	1941.36	6.00	41.00	0.00	0.00	0.30			
91	H	6004.48	1923.31	6.00	32.00	0.00	0.00	0.30			
92	H	6018.07	1903.49	6.00	30.00	0.00	0.00	0.30			
93	H	6028.03	1881.39	6.00	31.00	0.00	0.00	0.30			
94	H	6040.05	1864.36	6.00	35.00	0.00	0.00	0.30			
95	F	5938.92	1720.79	6.00	208.00	0.00	0.00	0.30			
96	F	5946.09	1706.11	6.00	204.00	0.00	0.00	0.30			
97	F	5912.83	1682.83	6.00	296.00	0.00	0.00	0.30			
98	G	5888.04	1659.66	6.00	115.00	0.00	0.00	0.30			
99	G	5891.50	1642.22	6.00	205.00	0.00	0.00	0.30			
100	H	5898.11	1840.27	6.00	301.00	0.00	0.00	0.30			
101	G	5901.96	1620.74	6.00	211.00	0.00	0.00	0.30			
102	G	5917.54	1592.28	6.00	213.00	0.00	0.00	0.30			
103	G	5938.48	1578.39	6.00	246.00	0.00	0.00	0.30			
104	G	5966.43	1564.79	6.00	242.00	0.00	0.00	0.30			
105	F	5938.23	1684.10	6.00	117.00	0.00	0.00	0.30			
106	G	5994.41	1551.01	6.00	248.00	0.00	0.00	0.30			
107	G	6011.98	1542.37	6.00	256.00	0.00	0.00	0.30			
108	G	6033.03	1539.54	6.00	270.00	0.00	0.00	0.30			
109	H	6027.93	1521.73	6.00	87.00	0.00	0.00	0.30			
110	G	6054.59	1549.90	6.00	298.00	0.00	0.00	0.30			
111	G	6080.05	1565.29	6.00	301.00	0.00	0.00	0.30			

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Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
112	F	6085.82	1577.12	6.00	209.00	0.00	0.00	0.30			
113	F	6069.10	1604.97	6.00	215.00	0.00	0.00	0.30			
114	F	6052.26	1633.04	6.00	217.00	0.00	0.00	0.30			
115	F	6039.30	1603.30	6.00	113.00	0.00	0.00	0.30			
116	F	6014.20	1602.01	6.00	62.00	0.00	0.00	0.30			
117	F	5984.86	1616.48	6.00	55.00	0.00	0.00	0.30			
118	F	5992.09	1635.09	6.00	295.00	0.00	0.00	0.30			
119	F	6021.47	1649.54	6.00	290.00	0.00	0.00	0.30			
120	F	6050.53	1648.74	6.00	118.00	0.00	0.00	0.30			
121	F	6067.59	1666.98	6.00	296.00	0.00	0.00	0.30			
122	G	6082.14	1673.99	6.00	299.00	0.00	0.00	0.30			
123	F	6094.13	1686.92	6.00	27.00	0.00	0.00	0.30			
124	F	6106.81	1654.03	6.00	27.00	0.00	0.00	0.30			
125	F	6123.68	1625.95	6.00	34.00	0.00	0.00	0.30			
126	F	6136.42	1604.74	6.00	30.00	0.00	0.00	0.30			
127	F	5969.10	1634.15	6.00	250.00	0.00	0.00	0.30			
128	G	5951.83	1643.27	6.00	26.00	0.00	0.00	0.30			
129	G	5952.21	1668.29	6.00	206.00	0.00	0.00	0.30			
130	F	5964.14	1681.27	6.00	113.00	0.00	0.00	0.30			
131	F	5992.18	1694.77	6.00	117.00	0.00	0.00	0.30			
132	F	6020.34	1708.01	6.00	113.00	0.00	0.00	0.30			
133	F	5996.04	1730.52	6.00	25.00	0.00	0.00	0.30			
134	H	5996.68	1715.20	6.00	296.00	0.00	0.00	0.30			
135	H	5980.85	1707.52	6.00	294.00	0.00	0.00	0.30			
136	H	5959.32	1697.05	6.00	289.00	0.00	0.00	0.30			
137	F	5985.43	1752.43	6.00	27.00	0.00	0.00	0.30			
138	F	6014.97	1778.83	6.00	304.00	0.00	0.00	0.30			
139	F	6037.09	1789.51	6.00	299.00	0.00	0.00	0.30			
140	F	6037.55	1714.66	6.00	116.00	0.00	0.00	0.30			
141	F	6053.22	1722.14	6.00	119.00	0.00	0.00	0.30			
142	F	6080.97	1740.65	6.00	124.00	0.00	0.00	0.30			
143	F	6075.50	1725.56	6.00	28.00	0.00	0.00	0.30			
144	F	6085.19	1705.35	6.00	22.00	0.00	0.00	0.30			
145	F	6105.41	1756.14	6.00	119.00	0.00	0.00	0.30			
146	F	6111.23	1775.60	6.00	217.00	0.00	0.00	0.30			
147	F	6123.80	1754.86	6.00	127.00	0.00	0.00	0.30			

DATE: 5 July 2025 DESIGNER: James Molloy
PROJECT No: PL2507 PROJECT NAME: Greenfield Ballincollig

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
148	G	6143.35	1764.08	6.00	125.00	0.00	0.00	0.30			
149	G	6161.28	1776.30	6.00	127.00	0.00	0.00	0.30			
150	G	6180.00	1789.61	6.00	122.00	0.00	0.00	0.30			
151	G	6154.04	1804.28	6.00	35.00	0.00	0.00	0.30			
152	G	6141.66	1822.19	6.00	34.00	0.00	0.00	0.30			
153	G	6140.07	1847.69	6.00	218.00	0.00	0.00	0.30			
154	F	6117.20	1834.73	6.00	302.00	0.00	0.00	0.30			
155	F	6104.02	1816.68	6.00	122.00	0.00	0.00	0.30			
156	F	6093.67	1801.17	6.00	215.00	0.00	0.00	0.30			
157	F	6078.17	1823.76	6.00	214.00	0.00	0.00	0.30			
158	F	6064.35	1843.98	6.00	219.00	0.00	0.00	0.30			
159	F	6043.22	1921.32	6.00	125.00	0.00	0.00	0.30			
160	F	6065.16	1936.35	6.00	126.00	0.00	0.00	0.30			
161	F	6061.66	1953.10	6.00	38.00	0.00	0.00	0.30			
162	H	6050.48	1972.80	6.00	308.00	0.00	0.00	0.30			
163	H	6031.14	1958.84	6.00	299.00	0.00	0.00	0.30			
164	H	6066.47	1983.38	6.00	311.00	0.00	0.00	0.30			
165	H	6078.01	1969.57	6.00	213.00	0.00	0.00	0.30			
166	H	6088.85	1953.93	6.00	214.00	0.00	0.00	0.30			
167	F	6082.45	1923.70	6.00	34.00	0.00	0.00	0.30			
168	H	6096.87	1947.29	6.00	128.00	0.00	0.00	0.30			
169	F	6101.60	1926.06	6.00	215.00	0.00	0.00	0.30			
170	F	6118.74	1913.66	6.00	291.00	0.00	0.00	0.30			
171	F	6110.52	1893.88	6.00	113.00	0.00	0.00	0.30			
172	F	6097.52	1901.59	6.00	33.00	0.00	0.00	0.30			
173	F	6097.87	1885.02	6.00	119.00	0.00	0.00	0.30			
174	F	6077.11	1870.81	6.00	125.00	0.00	0.00	0.30			
175	G	6247.73	1725.88	6.00	127.00	0.00	0.00	0.30			
176	G	6222.91	1708.93	6.00	122.00	0.00	0.00	0.30			
177	F	6198.96	1693.67	6.00	120.00	0.00	0.00	0.30			
178	F	6187.45	1711.98	6.00	217.00	0.00	0.00	0.30			
179	F	6201.79	1719.41	6.00	209.00	0.00	0.00	0.30			
180	F	6168.61	1727.21	6.00	314.00	0.00	0.00	0.30			
181	G	6215.84	1686.24	6.00	35.00	0.00	0.00	0.30			
182	G	6238.22	1686.75	6.00	128.00	0.00	0.00	0.30			
183	G	6245.76	1707.05	6.00	216.00	0.00	0.00	0.30			

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Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
184	F	6130.29	1673.60	6.00	43.00	0.00	0.00	0.30			
185	F	5895.53	1821.92	6.00	119.00	0.00	0.00	0.30			
186	G	6117.14	1698.57	6.00	299.00	0.00	0.00	0.30			
187	G	6144.86	1717.81	6.00	304.00	0.00	0.00	0.30			
188	G	6153.27	1737.73	6.00	213.00	0.00	0.00	0.30			
189	G	6127.77	1741.69	6.00	39.00	0.00	0.00	0.30			
190	G	6145.45	1753.82	6.00	217.00	0.00	0.00	0.30			
191	G	6138.24	1726.91	6.00	37.00	0.00	0.00	0.30			
192	G	6222.88	1708.92	6.00	304.00	0.00	0.00	0.30			
193	G	6132.08	1708.71	6.00	303.00	0.00	0.00	0.30			
194	H	6111.98	1567.79	6.00	115.00	0.00	0.00	0.30			
195	H	6100.21	1725.24	6.00	9.00	0.00	0.00	0.30			
196	H	6098.51	1744.10	6.00	28.00	0.00	0.00	0.30			
197	H	6105.99	1707.21	6.00	19.00	0.00	0.00	0.30			
198	H	6137.36	1656.97	6.00	208.00	0.00	0.00	0.30			
199	H	6146.08	1637.78	6.00	200.00	0.00	0.00	0.30			
200	H	6163.48	1612.67	6.00	122.00	0.00	0.00	0.30			
201	H	6110.43	1677.76	6.00	111.00	0.00	0.00	0.30			
202	G	6261.52	1702.08	6.00	121.00	0.00	0.00	0.30			
203	G	6245.85	1707.13	6.00	37.00	0.00	0.00	0.30			
204	G	6247.77	1725.90	6.00	305.00	0.00	0.00	0.30			
205	H	6150.66	1668.53	6.00	127.00	0.00	0.00	0.30			
206	H	6136.26	1582.18	6.00	118.00	0.00	0.00	0.30			
207	H	6182.83	1623.23	6.00	141.00	0.00	0.00	0.30			
208	H	6158.73	1681.19	6.00	299.00	0.00	0.00	0.30			
209	H	6174.03	1691.37	6.00	302.00	0.00	0.00	0.30			
207	H	6230.99	1669.81	6.00	139.00	0.00	0.00	0.30			
211	H	6172.97	1661.75	6.00	124.00	0.00	0.00	0.30			
209	H	6252.19	1686.03	6.00	139.00	0.00	0.00	0.30			
213	H	6188.32	1672.88	6.00	122.00	0.00	0.00	0.30			
214	H	6194.03	1761.15	6.00	223.00	0.00	0.00	0.30			
216	H	6176.45	1751.24	6.00	38.00	0.00	0.00	0.30			
214	H	6277.01	1709.67	6.00	113.00	0.00	0.00	0.30			
218	H	6203.94	1745.86	6.00	215.00	0.00	0.00	0.30			
216	H	6151.27	1615.23	6.00	181.00	0.00	0.00	0.30			
220	H	6188.20	1736.02	6.00	39.00	0.00	0.00	0.30			

9750148225

DATE: 5 July 2025 DESIGNER: James Molloy
PROJECT No: PL2507 PROJECT NAME: Greenfield Ballincollig

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
221	H	6174.01	1769.72	6.00	32.00	0.00	0.00	0.30			
222	H	6213.23	1759.26	6.00	118.00	0.00	0.00	0.30			
223	H	6185.05	1653.34	6.00	37.00	0.00	0.00	0.30			
224	H	6126.51	1869.14	6.00	208.00	0.00	0.00	0.30			
225	H	6120.06	1853.03	6.00	32.00	0.00	0.00	0.30			
226	H	6106.50	1872.40	6.00	32.00	0.00	0.00	0.30			
231	H	6133.49	1882.67	6.00	296.00	0.00	0.00	0.30			
226	H	6024.93	1826.46	6.00	29.00	0.00	0.00	0.30			
227	H	6035.99	1808.46	6.00	29.00	0.00	0.00	0.30			
228	F	6000.61	1771.86	6.00	292.00	0.00	0.00	0.30			
229	H	5832.95	1815.42	6.00	122.00	0.00	0.00	0.30			
230	H	5857.15	1831.85	6.00	124.00	0.00	0.00	0.30			
230	H	6057.74	1799.46	6.00	280.00	0.00	0.00	0.30			
231	H	6053.61	1829.80	6.00	18.00	0.00	0.00	0.30			
232	H	6070.60	1806.74	6.00	43.00	0.00	0.00	0.30			
233	H	6074.00	1782.72	6.00	354.00	0.00	0.00	0.30			
234	H	6090.02	1768.40	6.00	283.00	0.00	0.00	0.30			
235	H	6073.83	1755.40	6.00	331.00	0.00	0.00	0.30			
236	H	6050.97	1736.42	6.00	303.00	0.00	0.00	0.30			
237	H	6025.05	1724.18	6.00	281.00	0.00	0.00	0.30			
238	H	6198.88	1639.40	6.00	118.00	0.00	0.00	0.30			
239	H	6220.19	1648.38	6.00	115.00	0.00	0.00	0.30			

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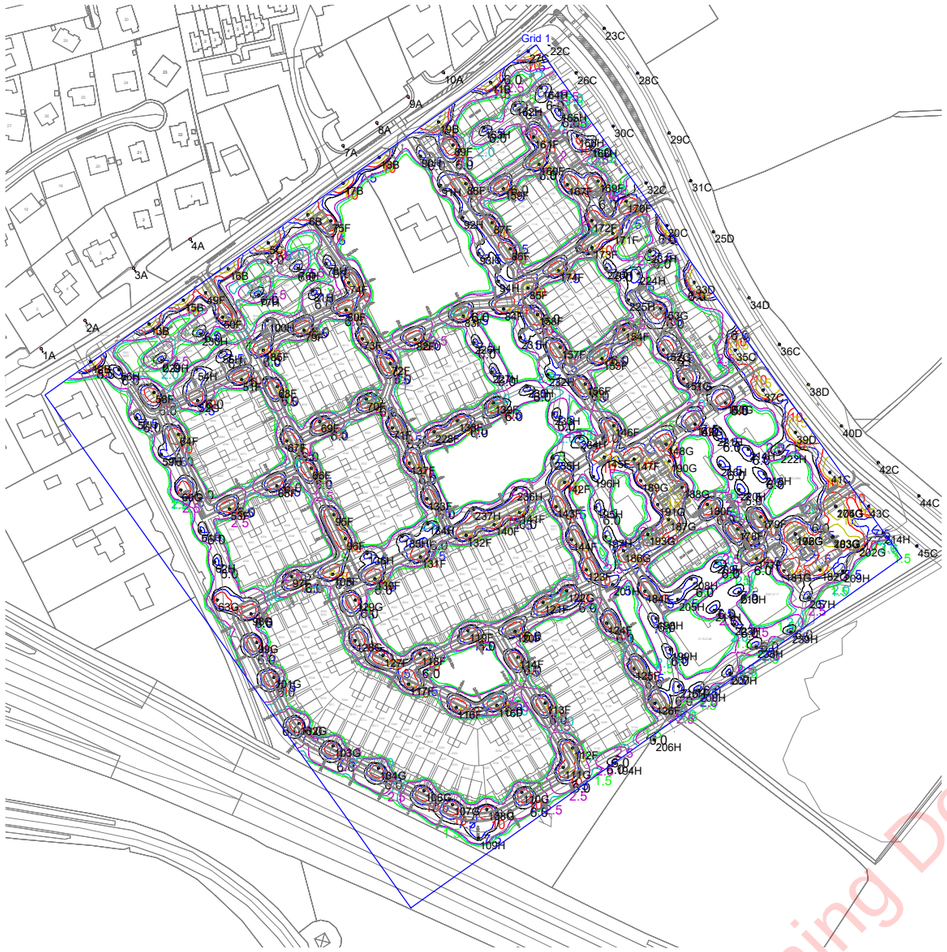
PROJECT No: PL2507 PROJECT NAME: Greenfield Ballincollig

Horizontal Illuminance (lux)

Grid 1



Results

Eav	7.72
Emin	1.51
Emax	25.02
Emin/Emax	0.06
Emin/Eav	0.20

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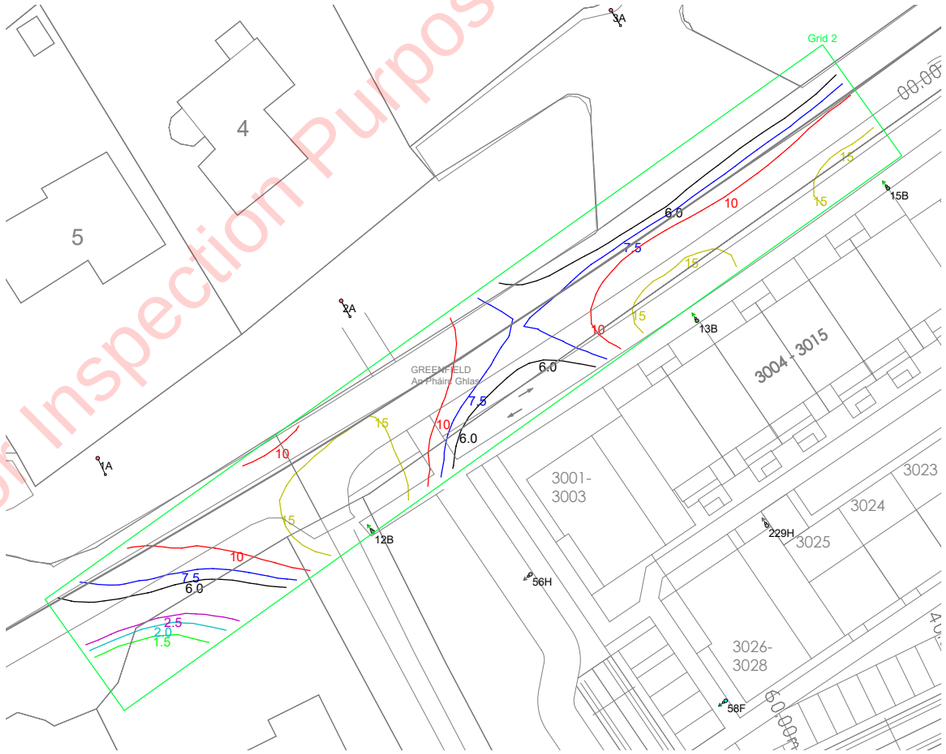
Horizontal Illuminance (lux)

Grid 2



Results

Eav	10.73
Emin	4.33
Emax	19.07
Emin/Emax	0.23
Emin/Eav	0.40

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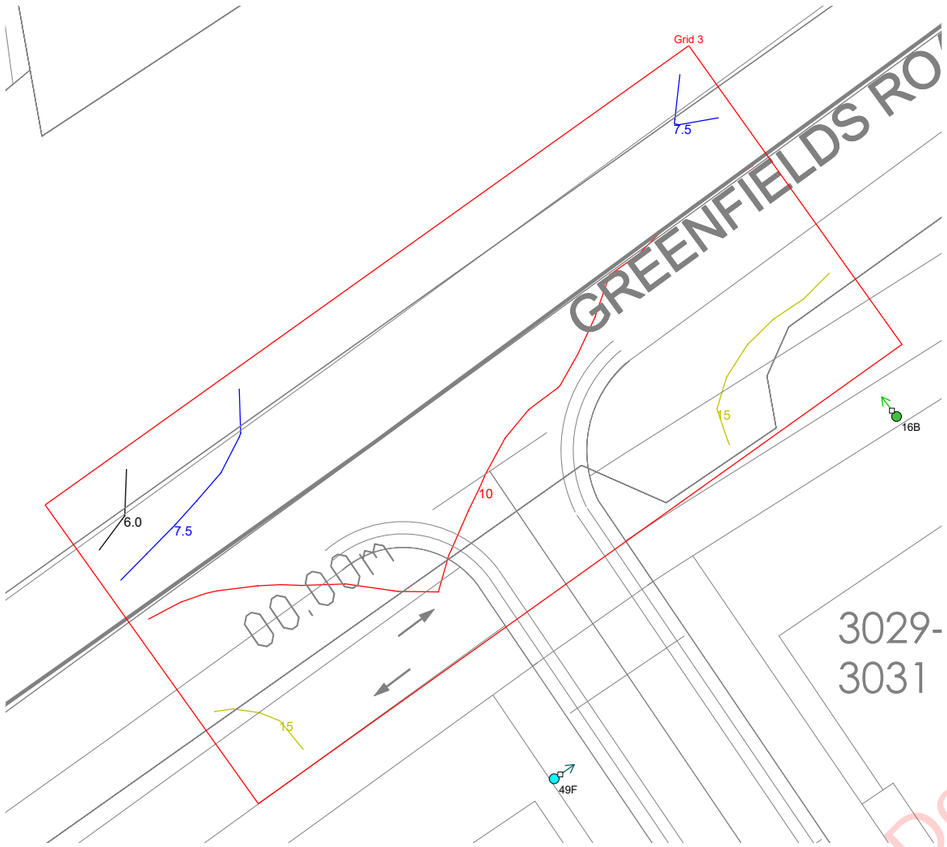
Horizontal Illuminance (lux)

Grid 3



Results

Eav	10.14
Emin	5.57
Emax	15.45
Emin/Emax	0.36
Emin/Eav	0.55

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PROJECT No: PL2507 PROJECT NAME: Greenfield Ballincollig

Horizontal Illuminance (lux)

Grid 4

Results

Eav	11.90
Emin	2.97
Emax	23.75
Emin/Emax	0.13
Emin/Eav	0.25

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PROJECT No: PL2507 PROJECT NAME: Greenfield Ballincollig

Horizontal Illuminance (lux)

Grid 5

Results

Eav	15.16
Emin	6.35
Emax	25.70
Emin/Emax	0.25
Emin/Eav	0.42

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PROJECT No: PL2507 PROJECT NAME: Greenfield Ballincollig

Horizontal Illuminance (lux)

Grid 6

Results

Eav	12.10
Emin	3.34
Emax	24.04
Emin/Emax	0.14
Emin/Eav	0.28

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Horizontal Illuminance (lux)

Grid 7

Results

Eav	16.46
Emin	6.53
Emax	24.75
Emin/Emax	0.26
Emin/Eav	0.40

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PROJECT No: PL2507 PROJECT NAME: Greenfield Ballincollig

Horizontal Illuminance (lux)

Grid 8

Results

Eav	11.20
Emin	2.23
Emax	25.89
Emin/Emax	0.09
Emin/Eav	0.20

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PROJECT No: PL2507 PROJECT NAME: Greenfield Ballincollig

Horizontal Illuminance (lux)

Grid 9

Results

Eav	17.55
Emin	7.10
Emax	23.93
Emin/Emax	0.30
Emin/Eav	0.40

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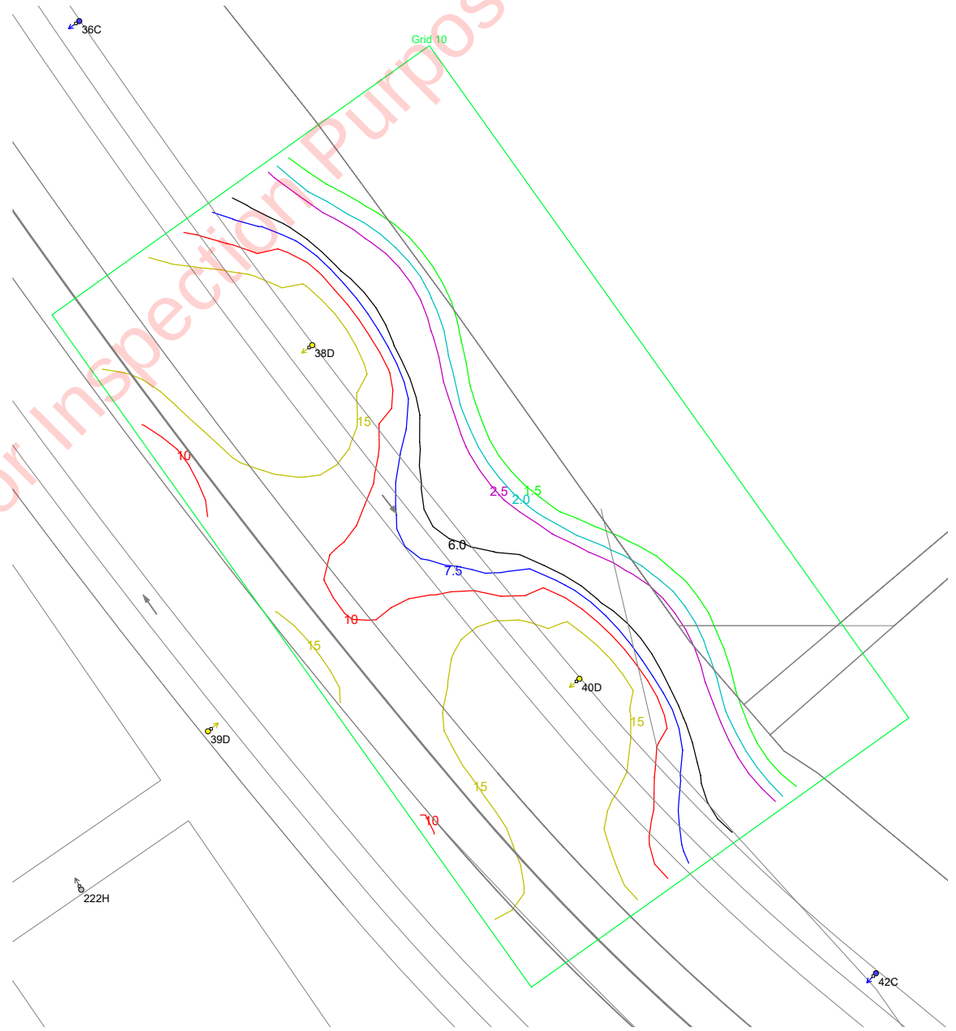
PROJECT No: PL2507 PROJECT NAME: Greenfield Ballincollig

Horizontal Illuminance (lux)

Grid 10



Results

Eav	14.90
Emin	6.91
Emax	25.03
Emin/Emax	0.28
Emin/Eav	0.46

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Horizontal Illuminance (lux)

Grid 11

Results

Eav	17.23
Emin	7.00
Emax	25.91
Emin/Emax	0.27
Emin/Eav	0.41

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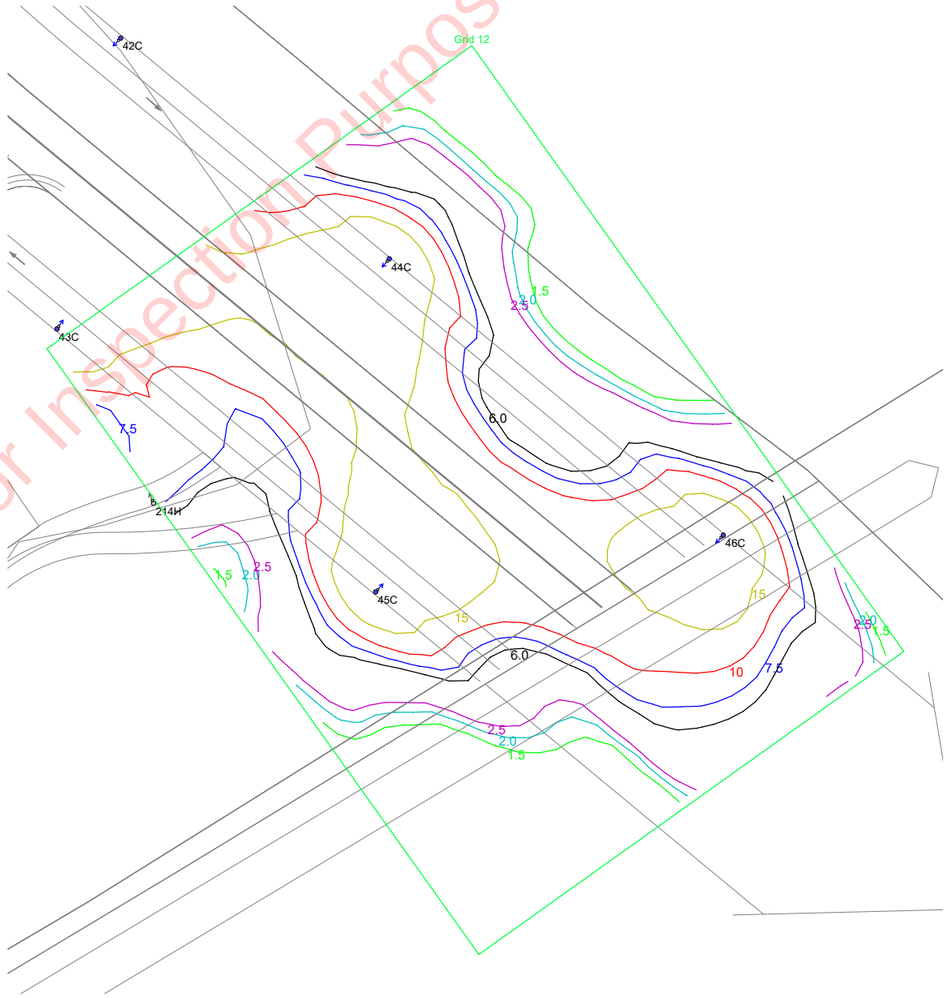
PROJECT No: PL2507 PROJECT NAME: Greenfield Ballincollig

Horizontal Illuminance (lux)

Grid 12



Results

Eav	14.37
Emin	3.95
Emax	25.54
Emin/Emax	0.15
Emin/Eav	0.27

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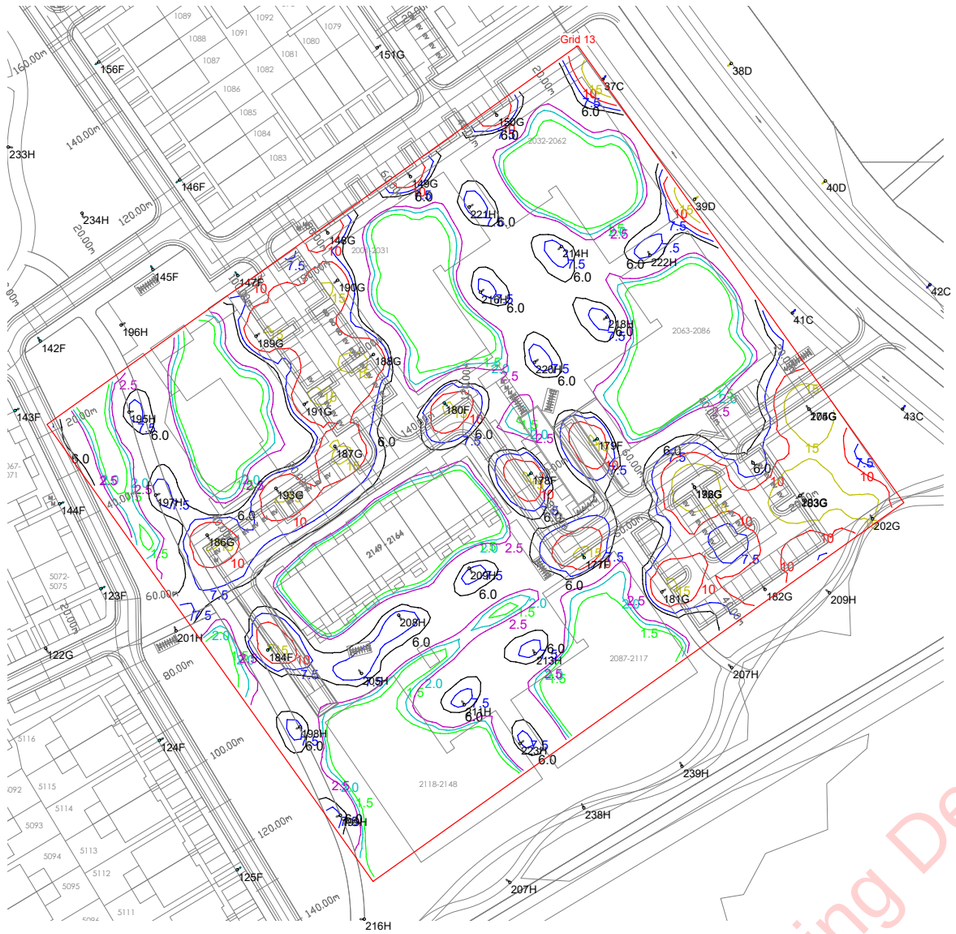
DATE: 5 July 2025 **DESIGNER: James Molloy**

PROJECT No: PL2507 **PROJECT NAME: Greenfield Ballincollig**

Horizontal Illuminance (lux)

Grid 13



Results

Eav	10.29
Emin	3.59
Emax	28.25
Emin/Emax	0.13
Emin/Eav	0.35

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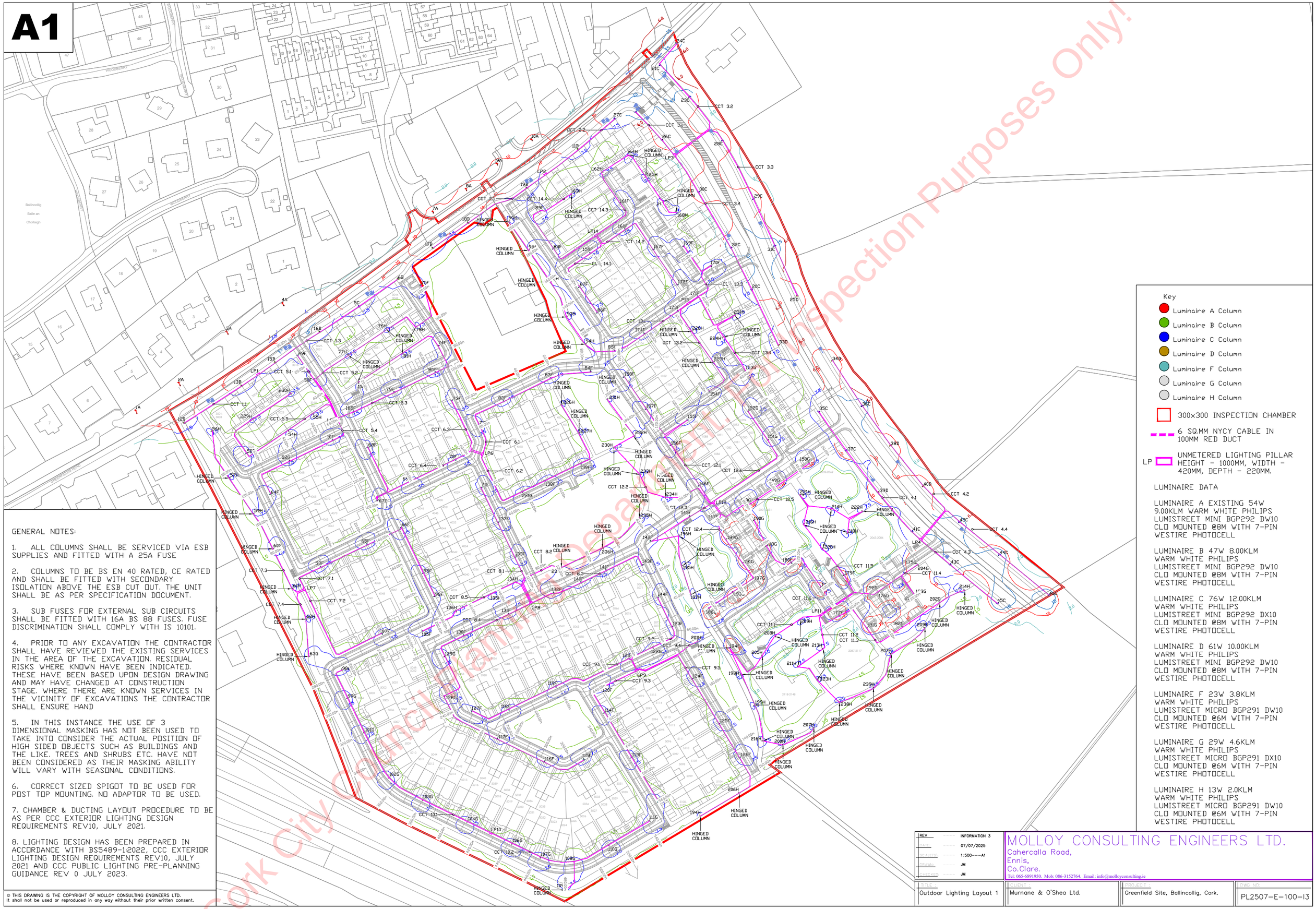

GENERAL NOTES:

1. ALL COLUMNS SHALL BE SERVICED VIA ESB SUPPLIES AND FITTED WITH A 25A FUSE

2. COLUMNS TO BE BS EN 40 RATED, CE RATED AND SHALL BE FITTED WITH SECONDARY ISOLATION ABOVE THE ESB CUT OUT. THE UNIT SHALL BE AS PER SPECIFICATION DOCUMENT.

3. SUB FUSES FOR EXTERNAL SUB CIRCUITS SHALL BE FITTED WITH 16A BS 88 FUSES. FUSE DISCRIMINATION SHALL COMPLY WITH IS 10101.

4. PRIOR TO ANY EXCAVATION THE CONTRACTOR SHALL HAVE REVIEWED THE EXISTING SERVICES IN THE AREA OF THE EXCAVATION. RESIDUAL RISKS WHERE KNOWN HAVE BEEN INDICATED. THESE HAVE BEEN BASED UPON DESIGN DRAWING AND MAY HAVE CHANGED AT CONSTRUCTION STAGE. WHERE THERE ARE KNOWN SERVICES IN THE VICINITY OF EXCAVATIONS THE CONTRACTOR SHALL ENSURE HAND

5. IN THIS INSTANCE THE USE OF 3 DIMENSIONAL MASKING HAS NOT BEEN USED TO TAKE INTO CONSIDER THE ACTUAL POSITION OF HIGH SIDED OBJECTS SUCH AS BUILDINGS AND THE LIKE. TREES AND SHRUBS ETC. HAVE NOT BEEN CONSIDERED AS THEIR MASKING ABILITY WILL VARY WITH SEASONAL CONDITIONS.

6. CORRECT SIZED SPIGOT TO BE USED FOR POST TOP MOUNTING. NO ADAPTOR TO BE USED.

7. CHAMBER & DUCTING LAYOUT PROCEDURE TO BE AS PER CCC EXTERIOR LIGHTING DESIGN REQUIREMENTS REV10, JULY 2021.

8. LIGHTING DESIGN HAS BEEN PREPARED IN ACCORDANCE WITH BS5489-1:2022, CCC EXTERIOR LIGHTING DESIGN REQUIREMENTS REV10, JULY 2021 AND CCC PUBLIC LIGHTING PRE-PLANNING GUIDANCE REV 0 JULY 2023.

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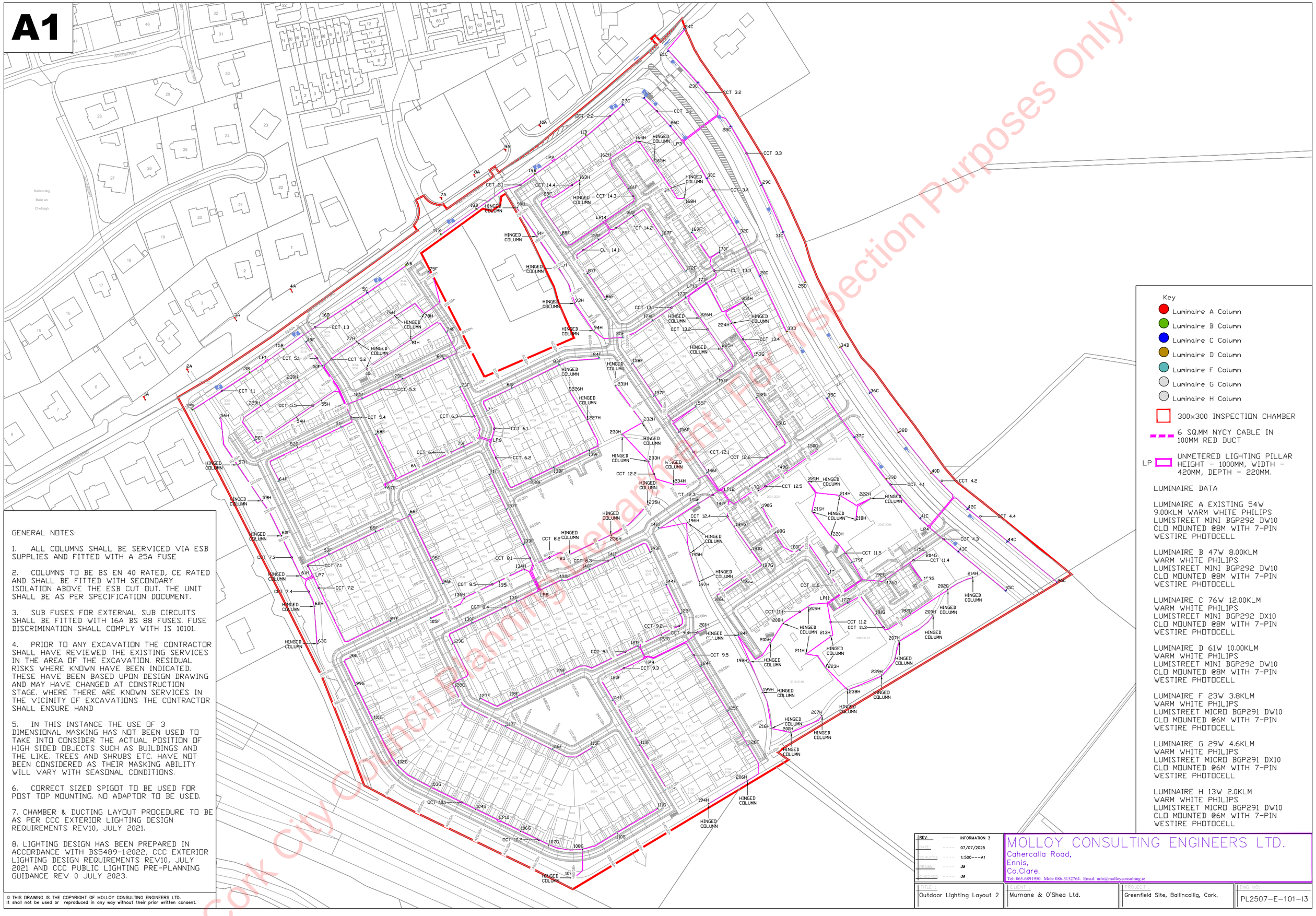
Tel: 065-6891950. Mob: 086-3152764. Email: info@molloyconsulting.ie

TITLE	CLIENT	PROJECT	DWG NO:
Outdoor Lighting Layout 1	Murnane & O'Shea Ltd.	Greenfield Site, Ballincollig, Cork.	PL2507-E-100-13

A1



GENERAL NOTES:

1. ALL COLUMNS SHALL BE SERVICED VIA ESB SUPPLIES AND FITTED WITH A 25A FUSE

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Key

- Luminaire A Column
- Luminaire B Column
- Luminaire C Column
- Luminaire D Column
- Luminaire F Column
- Luminaire G Column
- Luminaire H Column
- 300x300 INSPECTION CHAMBER
- 6 SQ.MM NYCY CABLE IN 100MM RED DUCT
- LP UNMETERED LIGHTING PILLAR HEIGHT - 1000MM, WIDTH - 420MM, DEPTH - 220MM.

LUMINAIRE DATA

LUMINAIRE A EXISTING 54W 9.00KLM WARM WHITE PHILIPS LUMISTREET MINI BGP292 DW10 CLO MOUNTED @8M WITH 7-PIN WESTIRE PHOTOCELL

LUMINAIRE B 47W 8.00KLM WARM WHITE PHILIPS LUMISTREET MINI BGP292 DW10 CLO MOUNTED @8M WITH 7-PIN WESTIRE PHOTOCELL

LUMINAIRE C 76W 12.00KLM WARM WHITE PHILIPS LUMISTREET MINI BGP292 DX10 CLO MOUNTED @8M WITH 7-PIN WESTIRE PHOTOCELL

LUMINAIRE D 61W 10.00KLM WARM WHITE PHILIPS LUMISTREET MINI BGP292 DW10 CLO MOUNTED @8M WITH 7-PIN WESTIRE PHOTOCELL

LUMINAIRE F 23W 3.8KLM WARM WHITE PHILIPS LUMISTREET MICRO BGP291 DW10 CLO MOUNTED @6M WITH 7-PIN WESTIRE PHOTOCELL

LUMINAIRE G 29W 4.6KLM WARM WHITE PHILIPS LUMISTREET MICRO BGP291 DX10 CLO MOUNTED @6M WITH 7-PIN WESTIRE PHOTOCELL

LUMINAIRE H 13W 2.0KLM WARM WHITE PHILIPS LUMISTREET MICRO BGP291 DW10 CLO MOUNTED @6M WITH 7-PIN WESTIRE PHOTOCELL

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Tel: 065-6891950. Mob: 086-3152764. Email: info@molloyconsulting.ie

TITLE:	CLIENT:	PROJECT:	DWG NO:
Outdoor Lighting Layout 2	Murnane & O'Shea Ltd.	Greenfield Site, Ballincollig, Cork.	PL2507-E-101-13

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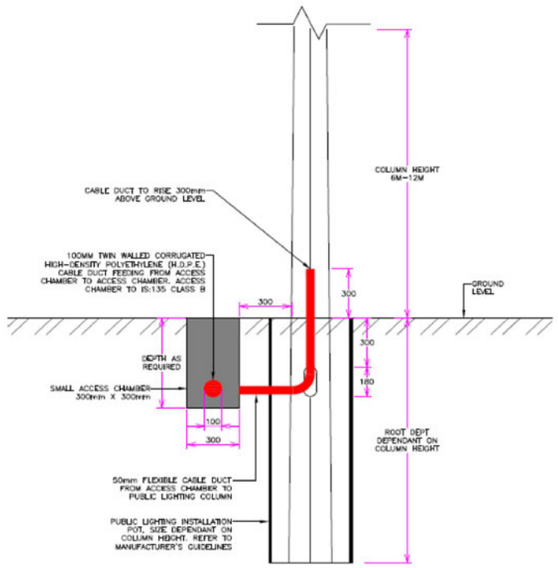
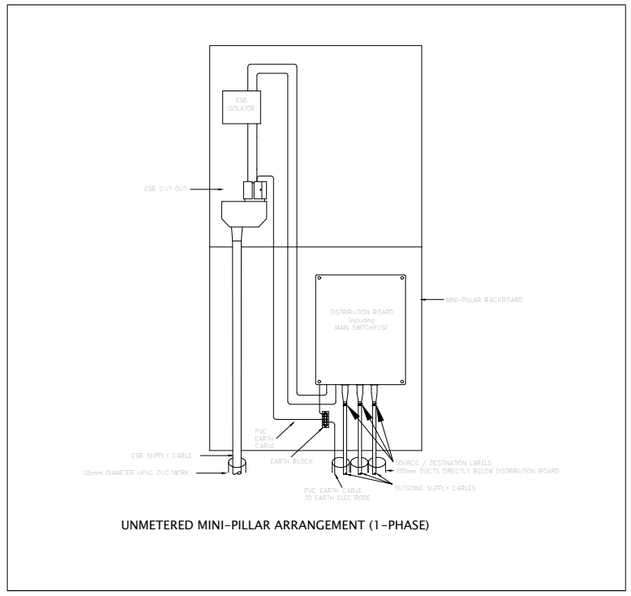
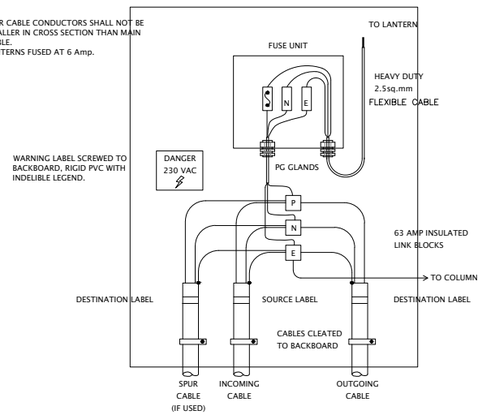
A1





UNMETERED MINI–PILLAR ARRANGEMENT (1–PHASE)

NOTE:
1. SPUR CABLE CONDUCTORS SHALL NOT BE SMALLER IN CROSS SECTION THAN MAIN CABLE.
2. LANTERNS FUSED AT 6 Amp.



LIGHTING COLUMN BASE LAYOUT – Central Switching
Single Phase Distribution

Cable Circuits			
Circuit	Size (mm2)	Cable Length (m)	Connection Sequence
1.1	6 sq.mm	59	13B, 12B.
1.2	6 sq.mm	113	15B, 16B, 5C, 6B.
2.1	6 sq.mm	90	19B, 18B, 17B.
2.2	6 sq.mm	59	11B, 27C.
3.1	6 sq.mm	36	26C, 22C.
3.2	6 sq.mm	139	23C, 21C, 24C.
3.3	6 sq.mm	156	28C, 29C, 31C, 25D.
3.4	6 sq.mm	75	30C, 32C, 20C, 33D.
4.1	6 sq.mm	110	41C, 39D, 37C, 35C.
4.2	6 sq.mm	148	40D, 38D, 36C, 34D.
4.3	6 sq.mm	72	43C, 45C.
4.4	6 sq.mm	161	42C, 44C, 46C.
5.1	6 sq.mm	50	50F, 49F.
5.2	6 sq.mm	145	77H, 76H, 78H, 75F.
5.3	6 sq.mm	165	185F, 79F, 80F, 74F, 81H, 100H.
5.4	6 sq.mm	87	51F, 52G, 64F.
5.5	6 sq.mm	140	55H, 54H, 58F, 229H, 230H.
6.1	6 sq.mm	112	72F, 82F, 83F, 84F.
6.2	6 sq.mm	141	228F, 138F, 139F, 227H, 226H.
6.3	6 sq.mm	43	73F.
6.4	6 sq.mm	122	70F, 69F, 567F, 68F.
7.1	6 sq.mm	138	53F, 65F, 66F, 95F, 96F.
7.2	6 sq.mm	78	97F.
8.1	6 sq.mm	127	133F, 138F, 71F.
8.2	6 sq.mm	53	237H, 236H, 235H.
8.3	6 sq.mm	92	132F, 140F, 141F, 143F.
8.4	6 sq.mm	90	131F, 130F, 129G, 128G, 117F, 116F, 115F.
8.5	6 sq.mm	53	134H, 135H. 136H, 105F.
9.1	6 sq.mm	125	121F, 119F, 118F, 127F.
9.2	6 sq.mm	84	122G, 123F, 144F.
9.3	6 sq.mm	125	120F, 114F, 113F, 112F.
9.4	6 sq.mm	45	201H.
9.5	6 sq.mm	168	124F, 125F, 126F, 206H, 194H.
10.1	6 sq.mm	162	104G, 103G, 102G, 101G, 99G, 98G.
10.2	6 sq.mm	142	106G, 107G, 108G(109H), 110G, 111G.
11.1	6 sq.mm	191	109H, 108H, 105H, 184F, 198H, 199H, 216H, 200H, 207H.
11.2	6 sq.mm	168	213H, 211H, 223H, 238H, 239H, 207H, 209H.
11.3	6 sq.mm	162	177F, 181G, 182G, 202G, 214H.
11.4	6 sq.mm	104	176G/192G, 203G/183G, 175G/204G.
11.5	6 sq.mm	174	179F, 220H, 216H, 221H, 214H, 222H, 218H.
11.6	6 sq.mm	100	178F, 180F, 188G, 190G.
12.1	6 sq.mm	140	146F, 156F, 155F, 157F, 158F.
12.2	6 sq.mm	135	234H, 233H, 230H, 232H, 231H.
12.3	6 sq.mm	111	145F, 142F, 196H, 195H, 197H.
12.4	6 sq.mm	102	147F, 189G, 191G, 187G, 193G, 186G.
12.5	6 sq.mm	81	148G, 149G, 150G.
12.6	6 sq.mm	86	151G, 152G.
13.1	6 sq.mm	182	173F, 174F, 85F, 94H, 93H, 92H, 91H, 90H.
13.2	6 sq.mm	76	226H, 225H, 154F.
13.3	6 sq.mm	62	171F, 170F, 169F.
13.4	6 sq.mm	88	231H, 224H, 153G.
14.1	6 sq.mm	68	159F, 87F, 86F.
14.2	6 sq.mm	81	160F, 167F, 172F.
14.3	6 sq.mm	138	161F, 162H, 164H, 165H, 166H, 168H
14.4	6 sq.mm	94	88F, 89F, 163H.

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Ennis,
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Tel: 065-6891950. Mob: 086-3152764. Email: info@molloyconsulting.ie

TITLE: Circuit Schematics
CLIENT: Murnane & O'Shea Ltd.
PROJECT: Greenfield Site, Ballincollig, Cork.
DWG NO: PL2507–E–102–I3

APPENDIX 5-4 Operational Waste Management Plan – AWN Consulting

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REPORT

Trinity Consultants

awnconsulting

Operational Waste Management Plan

Project Title: OWMP for a Large Residential Development at Greenfield, Ballincollig, Cork.

CLIENT	DOCUMENT REFERENCE	DATE
HW Planning	257501.0273	22/07/2025

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

DOCUMENT CONTROL SHEET

Document Control Sheet	
Our Reference	257501.0273
Original Issue Date	21/07/2025
Client:	HW Planning

Revision	Revision Date	Description

Details	Written by	Approved by
Signature	Isabel Gogarty Meade	
Name	Isabel Gogarty Meade	Chonaill Bradley
Title	Environmental Consultant	Associate
Date	22/07/2025	22/07/2025

Disclaimer
This report considers the specific instructions and requirements of our client. It is not intended for third-party use or reliance, and no responsibility is accepted for any third party. The provisions in this report apply solely to this project and should not be assumed applicable to other developments without review and modification.

ENVIRONMENT I.S. EN ISO 14001:2015 NSAI Certified | HEALTH & SAFETY I.S. ISO 45001:2018 NSAI Certified | QUALITY I.S. EN ISO 9001:2015 NSAI Certified

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1. INTRODUCTION

AWN Consulting, a Trinity Consultants Team, has prepared this Operational Waste Management Plan (OWMP) on behalf of HW Planning for the proposed Large Residential Development at Greenfield, Ballincollig, County Cork.

This OWMP has been prepared to ensure that the management of waste during the operational phase of the proposed development is undertaken in accordance with the current legal and industry standards including, the *Waste Management Act 1996* as amended and associated Regulations [1], *Environmental Protection Agency Act 1992* as amended [2], *Litter Pollution Act 1997* as amended [3], *the National Waste Management Plan for a Circular Economy 2024 - 2030 (NWMPCE)* (2024) [4] and the *Cork City Council (CCC) 'Cork City Council (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws' 2018* [5]. In particular, this OWMP aims to provide a robust strategy for the storage, handling, collection and transport of the wastes generated at Site.

This OWMP aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. The OWMP also seeks to provide guidance on the appropriate collection and transport of waste to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil or water resources). The plan estimates the type and quantity of waste to be generated from the proposed development during the operational phase and provides a strategy for managing the different waste streams.

At present, there are no specific national guidelines in Ireland for the preparation of OWMPs. Therefore, in preparing this document, consideration has been given to the requirements of national and regional waste policy, legislation and other guidelines.

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2. OVERVIEW OF WASTE MANAGEMENT IN IRELAND

2.1 National level

The Irish Government issued a policy statement in September 1998 entitled *'Changing Our Ways'*[6], which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. A heavy emphasis was placed on reducing reliance on landfill and finding alternative methods for managing waste. Amongst other things, *Changing Our Ways* stated a target of at least 35% recycling of municipal (i.e. household, commercial and non-process industrial) waste.

A further policy document, *'Preventing and Recycling Waste – Delivering Change'* was published in 2002 [7]. This document proposed a number of programmes to increase recycling of waste and allow diversion from landfill. The need for waste minimisation at source was considered a priority.

This view was also supported by a review of sustainable development policy in Ireland and achievements to date, which was conducted in 2002, entitled *'Making Irelands Development Sustainable – Review, Assessment and Future Action'*[8]. This document also stressed the need to decouple economic growth and waste generation, again through waste minimisation and reuse of discarded material.

In order to establish the progress of the Government policy document *Changing Our Ways*, a review document was published in April 2004 entitled *'Taking Stock and Moving Forward'*[9]. Covering the period 1998 – 2003, the aim of this document was to assess progress to date with regard to waste management in Ireland, to consider developments since the policy framework and the local authority waste management plans were put in place, and to identify measures that could be undertaken to further support progress towards the objectives outlined in *Changing Our Ways*.

In particular, *Taking Stock and Moving Forward* noted a significant increase in the amount of waste being brought to local authority landfills. The report noted that one of the significant challenges in the coming years was the extension of the dry recyclable collection services.

In September 2020, the Irish Government published a new policy document outlining a new action plan for Ireland to cover the period of 2020-2025. This plan *'A Waste Action Plan for a Circular Economy'*[10] (WAPCE), was prepared in response to the *'European Green Deal'* which sets a roadmap for a transition to a new economy, where climate and environmental challenges are turned into opportunities, replacing the previous national waste management plan *"A Resource Opportunity"* (2012).

The WAPCE sets the direction for waste planning and management in Ireland up to 2025. This reorientates policy from a focus on managing waste to a much greater focus on creating circular patterns of production and consumption. Other policy statements of a number of public bodies already acknowledge the circular economy as a national policy priority.

The policy document contains over 200 measures across various waste areas including circular economy, municipal waste, consumer protection and citizen engagement, plastics and packaging, construction and demolition, textiles, green public procurement and waste enforcement.

One of the first actions to be taken was the development of the *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less'* (2021) [11] to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021. It is anticipated that the Strategy will be updated in full every 18 months to 2 years. There has not yet been an update released regarding a new interation.

The *Circular Economy and Miscellaneous Provisions Act 2022* [12] was signed into law in July 2022. The Act underpins Ireland's shift from a *"take-make-waste"* linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions, tackling the delays which can be encountered by industry, and supporting the availability of recycled secondary raw materials in the Irish market, and tackles illegal fly-tipping and littering.

The *Department of Housing, Local Government and Heritage authored Sustainable Residential Development and Compact Settlements - Guidelines for Planning Authorities (2024)* [13], suggests the below thresholds at which the need for the supplemental information such as the OWMP should be considered.

- 30 or more residential units

Since 1998, the Environmental Protection Agency (EPA) has produced periodic '*National Waste (Database) Reports*' which as of 2023 have been renamed *Circular Economy and Waste Statistics Highlight Reports* [14] detailing, among other things, estimates for household and commercial (municipal) waste generation in Ireland and the level of recycling, recovery and disposal of these materials. The *2024 National Circular Economy and Waste Statistics* web resource, which is the most recent study published, along with the national waste statistics web resource (2024) reported the following key statistics for 2022:

- Generated – Ireland produced 3,190,000 tonnes of municipal waste in 2022. This is a slight increase since 2021. Of this, 55% came from households and 45% came from commercial and public service sources.
- Managed –In 2022, a total of 1.76 million tonnes of Household waste collected and treated by the waste industry.
- Unmanaged – An estimated 36,970 tonnes of household waste was unmanaged waste i.e., not disposed of in the correct manner in 2022.
- Recovered – A rounded 1.3 million tonnes of Ireland's municipal waste went for incineration with energy recovery in 2022. This tonnage is 43% of municipal waste managed and a marginal increase on the 42% achieved in 2021.
- Recycled –Some 1.3 million tonnes of municipal waste generated in Ireland was recycled in 2022, resulting in a recycling rate of 41%. This indicates that we face significant challenges to meet the upcoming EU recycling targets for 2025 to 2035
- Of the municipal waste recycled in 2022, over 825,000 tonnes went for material recycling (approximately the same as 2021) and over 480,000 tonnes were treated by composting/anaerobic digestion (approximately the same as 2021 but up 37% in 2020). The large increase of composted/anaerobically digested biowaste from 2020 is mainly due to a change in our way of estimating home composting.
- Disposed – Ireland's landfill rate for municipal waste managed was 15% in 2022. This is a 1% decrease from 2021's rate of 16%.
- Reuse – 54,800 tonnes of second-hand products we estimated by the EPA to have been reused in Ireland in 2021. The average annual Reuse rate per person in Ireland is 10.6 kg per person.

2.2 Regional Level

The proposed development is located in the Local Authority administrative area of Cork City Council (CCC).

The *Southern Region (SR) Waste Management Plan 2015 – 2021*, which previously governed waste management policy in the CCC area, has been superseded as of March 2024 by the NWMPCE 2024 – 2030, the new national waste management plan for Ireland.

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The NWMPCE does not dissolve the three regional waste areas. The NWCPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector. This Plan seeks to influence sustainable consumption and prevent the generation of waste, improve the capture of materials to optimise circularity and enable compliance with policy and legislation.
The national plan sets out the following strategic targets for waste management in the country that are relevant to the proposed development:

National Targets

- 1A. (Residual Municipal Waste) 6% Reduction in Residual Municipal Waste per person by 2030
- 2A. (Contamination of Materials) 90% of Material in Compliance in the Dry Recycling Bin
- 2B. (Material Compliance Residual) 10% per annum increase in Material Compliance in the residual bin. (90% by the end of 2030)
- 3A. (Reuse of Materials) 20kg Per person / year – Reuse of materials like cloths or furniture to prevent waste.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Munster Region, charges are approximately €140-160 per tonne of waste, which includes a €85 per tonne landfill levy introduced under the Waste Management (Landfill Levy) (Amendment) Regulations 2015 (as amended)[15]. *The Circular Economy (Waste Recovery Levy) Regulations 2024* [16] will also have a levy of €10 per tonne to waste accepted for recovery.

The *Cork City Development Plan 2022 – 2028* [17] is guided by the National Planning Framework along with several other national and regional plans, including the current regional waste management plan and the Waste Action Plan for a Circular Economy. Waste management has been addressed under *Chapter 9 Environmental Infrastructure* and *Chapter 11 Placemaking and Managing Development*. Waste policies and objectives with a particular relevance to this development are as follows:

Objectives:

- **Objective 9.12 - Waste Management:**
  a) To support the sustainable management of waste in line with the objectives of the Southern Region Waste Management Plan 2015-2021 and the National Waste Management Plan for a Circular Economy (NWMPCE) when published, which will replace the existing Regional Waste Management Plans.
  b) To facilitate the transition to a circular economy facilitating the value recovery and recirculation of resources in order to generate minimal waste.

- **Objective 11.3 Housing Quality and Standards:**
  a) Waste: Housing should be designed with adequate and easily accessible storage space that supports the separate collection of dry recyclables, food waste and residual waste.

With reference to operational waste strategy, Section 11.270 of Chapter 11 requests:

'Adequate bin storage provision shall be made for the storage, segregation, and recycling of waste in residential developments. In the case of communal refuse storage provision, the collection point for refuse should be accessible both to the external collector and to the resident and be secured against illegal dumping by non-residents. These shall be well screened from public view and adequately ventilated'.

2.3 Legislative Requirements

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

- *Waste Management Act 1996 as amended;*
- *Environmental Protection Agency Act 1992 as amended;*
- *Litter Pollution Act 1997 as amended;*
- *Planning and Development Act 2000 as amended* [18]*;*
- *Circular Economy and Miscellaneous Provisions Act 2022.*

These Acts and subordinate Regulations transpose the relevant European Union Policy and Directives into Irish law.

One of the guiding principles of European waste legislation, which has in turn been incorporated into the Waste Management Act 1996 as amended and subsequent Irish legislation, is the principle of "Duty of Care". This implies that the waste producer is responsible for waste from the time it is generated through until its legal disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final disposal area, waste contractors will be employed to physically transport waste to the final waste disposal site.

It is, therefore, imperative that the residents and any proposed facilities management company undertake on-site management of waste in accordance with all legal requirements and that the facilities management company employ suitably permitted / licenced contractors to undertake off-site management of their waste in accordance with all legal requirements. This includes the requirement that a waste contactor handle, transport and reuse / recover / recycle / dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007*, as amended, or a Waste Licence granted by the EPA. The COR / permit / licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and / or disposed of at the specified site.

2.3.1 Cork City Council Waste Bye-Laws

The CCC "Cork City Council Bye-Laws for the Segregation Storage and Presentation of Household and Commercial Waste" (2019)" came into use on the 1st of May 2019. The Bye-Laws set a number of enforceable requirements on waste holders with regard to storage, separation and presentation of waste within the CCC functional area. Key requirements under these Bye-Laws of relevance to the development include the following:

- Outside of Cork City Centre: Kerbside waste presented for collection shall not be presented for collection earlier than 6.00 pm on the day immediately preceding the designated waste collection day;
- Outside of Cork City Centre: All containers used for the presentation of kerbside waste and any uncollected waste shall be removed from any roadway, footway, footpath or any other public place no later than 7:00pm on the day following the designated waste collection day;
- Documentation, including receipts, are to be obtained and retained for a period of no less than one year to provide proof that waste has been disposed of in accordance with the bye-laws; and

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- Waste containers shall be stored within the curtilage of the premise where the waste in produced and they shall not be stored on a road, footway, footpath or any other public place unless expressly authorised, in writing, by Cork City Council.

The full text of the Waste Bye-Laws is available from the CCC website.

2.4 Regional Waste Management Service Providers and Facilities

Various contractors offer waste collection services for the residential sector in the CCC region. Details of waste collection permits (granted, pending and withdrawn) for the region are available from the NWCPO.

There is only one active landfill in the Southern Region, at Powerstown in Co. Carlow, which is also now a civic amenity centre. There are two other landfills in the region with capacity for landfilling waste but neither are carrying out landfilling activity. Both sites, however, operate as recycling facilities.

There are a number of other licensed and permitted facilities in operation in the region including waste transfer stations, hazardous waste facilities and integrated waste management facilities. There is a proposed thermal treatment facility in Ringaskiddy, Co. Cork which was approved by An Bord Pleanála in 2018. However, a legal challenge in the high court has however slowed this application up and the applicant is now back engaged with dialogue with ABP. The High Court quashed the decision of the Board in case PA0045. The case was remitted under a new number (318802) for a fresh determination.

The development has a number of bring back centres located in the surrounding area. Quishes Supervalu Ballincollig Bring back centre is located 1.6 km northeast of the proposed development and can be used by residents to dispose of household waste streams including clear, green and brown glass.

The CCC Civic Amenity Centre, Kinsale Road, Cork, located 11.5 km east of the development site, can be used by residents of the proposed development for other household waste streams. This centre can accept general waste, plastic, glass, paper, metals, Tetra Pak, batteries, electrical items, light bulbs, paints, varnish and waste mineral oil.

A copy of all CORs and waste permits issued by the Local Authorities are available from the NWCPO website and all Waste Licenses issued are available from the EPA.

3. DESCRIPTION OF THE DEVELOPMENT

3.1 Location, Size and Scale of the Development

The proposed development consists of the demolition of an existing dwelling house and farmyard with associated agricultural buildings and the construction of a mixed-use residential development of 544 no. residential units consisting of 232 no. dwelling houses, 312 no. apartment/duplex units, a two storey creche facility, commercial/retail unit and all ancillary site development works. The proposed 232 no. dwelling houses will include 100 no. 4 bedroom detached/semi-detached dwelling houses, 124 no. 3 bedroom semi-detached/townhouse dwelling houses and 8 no. 2 bedroom townhouse units. The proposed 312 no. apartment/duplex units will include 61 no. 3 bedroom units, 171 no. 2 bedroom units and 80 no. 1 bedroom units, to be provided in 28 no. apartment/duplex buildings ranging in height from 3-4 storeys. One of the proposed apartment buildings (Block 3) will provide the ground floor commercial/retail unit.

Vehicular access to the proposed development will be via two entrances from Greenfields Road (L2216) with separate pedestrian/cycle connections also provided from Greenfields Road. Ancillary site works include the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex buildings, creche and commercial/retail unit, landscaping and servicing proposals including the upgrade of public footpaths/active travel infrastructure and water service infrastructure, 2 no. pedestrian crossings on Greenfields Road and the installation of a noise attenuation screen along the site's southern boundary.

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Figure 3.1 Proposed Site Layout & Redline Boundary

3.2 Typical Waste Categories

The typical non-hazardous and hazardous wastes that will be generated at the proposed development will include the following:

- Dry Mixed Recyclables (DMR) - includes waste paper (including newspapers, magazines, brochures, catalogues, leaflets), cardboard and plastic packaging, metal cans, plastic bottles, aluminium cans, tins and Tetra Pak cartons;
- Organic waste – food waste and green waste generated from internal plants / flowers, landscaping and gardens;
- Glass; and
- Mixed Non-Recyclable (MNR)/General Waste.

In addition to the typical waste materials that will be generated at the development on a daily basis, there will be some additional waste types generated less frequently / in smaller quantities which will need to be managed separately including:

- Drink Cans and Bottles (Deposit Return Scheme)
- Green / garden waste may be generated from external landscaping;
- Batteries (both hazardous and non-hazardous);
- Waste electrical and electronic equipment (WEEE) (both hazardous and non-hazardous);
- Printer cartridges / toners;
- Chemicals (paints, adhesives, resins, detergents, etc.);
- Light bulbs;
- Textiles;
- Waste cooking oil (if any generated by the residents or the commercial tenants);
- Furniture (and, from time to time, other bulky wastes); and
- Abandoned bicycles.

Wastes should be segregated into the above waste types to ensure compliance with waste legislation and guidance while maximising the re-use, recycling and recovery of waste with diversion from landfill wherever possible.

3.3 List of Waste Codes

In 1994, the *European Waste Catalogue* [19] and *Hazardous Waste List* [20] were published by the European Commission. In 2002, the EPA published a document titled the *European Waste Catalogue and Hazardous Waste List* [21], which was a condensed version of the original two documents and their subsequent amendments. This document has recently been replaced by the EPA '*Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* [22] 2018. This waste classification system applies across the EU and is the basis for all national and international waste reporting, such as those associated with waste collection permits, COR's, permits and licences and EPA National Waste Database.

Under the classification system, different types of wastes are fully defined by a code. The List of Waste (LoW) code for typical waste materials expected to be generated during the operation of the proposed development are provided in Table 3.1 below.

Table 3.1 Typical Waste Types Generated and LoW Codes

Waste Material	LoW Code
Paper and Cardboard	20 01 01
Plastics	20 01 39
Metals	20 01 40
Mixed Non-Recyclable Waste	20 03 01
Glass	20 01 02
Biodegradable Kitchen Waste	20 01 08
Oils and Fats	20 01 25
Textiles	20 01 11
Batteries and Accumulators*	20 01 33* - 34
Printer Toner/Cartridges*	20 01 27* - 28
Green Waste	20 02 01
WEEE*	20 01 35*-36
Chemicals (solvents, pesticides, paints & adhesives, detergents, etc.) *	20 01 13*/19*/27*/28/29*30
Fluorescent tubes and other mercury containing waste*	20 01 21*

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Bulky Wastes	20 03 07

** Individual waste type may contain hazardous materials*

4. ESTIMATED WASTE ARISING

A waste generation model (WGM) developed by AWN has been used to predict waste types, weights and volumes expected to arise from operations within the proposed development. The WGM incorporates building area and use and combines these with other data, including Irish and US EPA waste generation rates.

The estimated quantum / volume of waste that will be generated from the residential units has been determined based on the predicted occupancy of the units and the floor area has been used to determine the estimated waste generated from the creche unit and the retail unit.

The estimated waste generation for the proposed development for the main waste types is presented in Tables 4.1 - 4.4.

Table 4. 1 Estimated Waste Generation for the Residential Units of the Proposed Development

Waste Type	Waste Volume (m^3 / week)		
	1-Bed House Unit (Individual WSA)	2-Bed House Unit (Individual WSA)	3-Bed House Unit (Individual WSA)
Organic Waste	0.01	0.02	0.02
DMR	0.08	0.11	0.13
Glass	0.00	0.00	0.00
MNR	0.05	0.07	0.08
Total	**0.14**	**0.20**	**0.23**

Table 4. 2 Estimated Waste Generation for the Residential Units of the Proposed Development

Waste Type	Waste Volume (m^3 / week)		
	4-Bed House Unit (Individual WSA)	Apartment Blocks (Shared WSA)	K Block Units (Shared WSAs)
Organic Waste	0.02	2.41	0.02
DMR	0.18	17.06	0.16
Glass	0.00	0.37	<0.01
MNR	0.09	8.97	0.09
Total	**0.29**	**28.80**	**0.28**

Table 4. 3 Estimated Waste Generation for the Residential Units of the Proposed Development

Waste Type	Waste Volume (m^3 / week)		
	F Block Units (Shared WSAs)	G Block Units (Shared WSAs)	J Block Units (Shared WSAs)
Organic Waste	0.07	0.10	0.07
DMR	0.46	0.69	0.51
Glass	0.01	0.02	0.01
MNR	0.27	0.40	0.29
Total	**0.80**	**1.21**	**0.89**

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Table 4. 4 Estimated Waste Generation for the Commercial Units of the Proposed Development

Waste Type	Waste Volume (m^3 / week)	
	Creche Unit (Individual WSA)	Retail Unit (Individual WSA)
Organic Waste	0.08	0.71
DMR	3.09	1.55
Glass	0.01	0.06
MNR	1.69	1.86
Total	**4.87**	**4.18**

BS5906:2005 Waste Management in Buildings – Code of Practice [23] has been considered in the calculations of waste estimates. AWN's modelling methodology is based on recently published data and data from numerous other similar developments in Ireland and is based on AWN's experience, it provides a more representative estimate of the likely waste arisings from the proposed development.

5. WASTE STORAGE AND COLLECTION

This section provides information on how waste generated within the site will be stored and collected. This has been prepared with due consideration of the proposed site layout as well as best practice standards, local and national waste management requirements, including those of CCC. In particular, consideration has been given to the following documents:

- BS 5906:2005 Waste Management in Buildings – Code of Practice,
- The NWMPCE (2024);
- *The Cork City Council Development Plan 2022-2028* ;
- CCC, *Cork City Council (Segregation, Storage and Presentation of Household & Commercial Waste) Bye-Laws' (2019); and*
- *DoHLGH, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2023)* [24].

Waste Storage Areas

Location of the Waste Storage Areas (WSAs) can be viewed on the drawings submitted with the planning application under separate cover and in the appendices of this report.

Locations

- There is one (1 no.) shared WSA for the apartment blocks which is located externally at ground floor level.
- There is one (1 no.) shared WSA for the K block units which is located externally at ground floor level.
- There is one (1 no.) shared WSA for the F block units which is located externally at ground floor level.
- There is one (1 no.) shared WSA for the J block units which is located externally at ground floor level.
- There are two (2 no.) shared WSAs for the G block units which are located externally at ground floor level.
- There is a separate WSA designated for the creche unit which is located externally at ground floor level.
- The retail unit has a designated WSA located externally at ground floor level; and
- The Deposit Return Scheme (DRS) vending machines will be located internally at ground floor level within the lobby of the retail unit.

The house units will have individual areas to store their waste and will be the duty of the residents within the houses to bring the bins out for each collection.

Facilities management will supply all residents with shared WSAs and tenants of the proposed development with a document that shall clearly state the methods of source waste segregation, storage, reuse and recycling initiatives that shall apply within the development.

Using the estimated waste generation volumes in Tables 4.1 to 4.4, above, the waste receptacle requirements for MNR, DMR, organic waste and glass have been established for the WSAs. It is envisaged that all waste will be collected on a weekly basis.

Waste Storage Requirements

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Estimated waste storage requirements for the operational phase of the proposed development are detailed in Table 5.1, below.

Table 5.1 Waste Storage Requirements for the Proposed Development

Area/Use	Bins Required			
	MNR[1]	DMR[2]	Glass	Organic
Apartment Blocks (Shared WSA)	8 no. 1100 L & 1 no. 240 L	15 no. 1100 L & 2 no. 240 L	2 no. 240 L	10 no. 240 L
K Block Units (Shared WSA)	1 no. 240 L	1 no. 240 L	1 no. 120 L	1 no. 120 L
F Block Units (Shared WSA)	2 no. 240 L	2 no. 240 L	1 no. 120 L	1 no. 120 L
J Block Units (Shared WSA)	2 no. 240 L	3 no. 240 L	1 no. 120 L	2 no. 120 L
G Block Units (Shared WSA)	2 no. 240 L	3 no. 240 L	1 no. 120 L	1 no. 120 L
Individual Houses (Individual WSA)	1 no. 240 L	1 no. 240 L	Bottle Bank	1 no. 120 L
Creche Unit WSA	2 no. 1100 L	2 no. 1100 L & 4 no. 240 L	1 no. 120 L	1 no. 120 L
Retail Unit WSA	2 no. 1100 L	1 no. 1100 L & 2 no. 240 L	1 no. 240 L	3 no. 240 L

Note: 1 = Mixed Non-Recyclables
2 = Dry Mixed Recyclables

The waste receptacle requirements have been established from distribution of the total weekly waste generation estimate into the holding capacity of each receptacle type.

Waste storage receptacles as per Table 5.1 above (or similar appropriate approved containers) will be provided by the facilities management team in the shared WSAs. Residents in the house units, tenants in the creche unit and the retail unit will need to provide their own waste receptacles.

The types of bins used will vary in size, design and colour dependent on the appointed waste contractor. However, examples of typical receptacles to be provided in the WSA are shown in Figure 5.1. All waste receptacles used will comply with the SIST EN 840-1:2020 and SIST EN 840-2:2020 as the standards for performance requirements of mobile waste containers, where appropriate.

Figure 5-1. Typical waste receptacles of varying size (240L and 1100L)

Receptacles for organic, DMR, glass and MNR will be provided in the WSAs prior to first occupation of the development i.e. prior to the first residential unit or commercial unit being occupied.

This Plan will be supplemented, as required, by the property management company with any new information on waste segregation, storage, reuse and recycling initiatives that are subsequently introduced.

5.1 Waste Storage – Residential Units

Residents will be required to segregate their waste into the following main waste categories within their own units:

- Organic waste;
- DMR;
- Glass; and
- MNR.

Provision will be made in all residential units to accommodate 3 no. bin types to facilitate waste segregation at source. An example of a potential 3 bin storage system is provided in Figure 5.2 below.

Figure 5.2 Example three bin storage system to be provided within the unit design

Graphical signage will be erected by facilities management, above or on the bins to show exactly which wastes can be put in each. Bins/containers will also be colour coded to avoid cross contamination of the different waste streams.

Access to the shared WSAs will be restricted to authorised residents, facilities management and waste contractors by means of a key or electronic fob access.

Other waste materials such as textiles, batteries, printer toner/cartridges, cooking oil and WEEE may be generated infrequently by the residents. Residents will be required to identify suitable temporary storage areas for these waste items within their own units and dispose of them appropriately. Further details on additional waste types can be found in Section 5.4.

5.2 Waste Storage – Commercial Units

The retail tenants and the creche tenants will be required to segregate their waste into the following main waste categories within their own units:

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- Organic waste;
- DMR;
- Glass; and
- MNR.

The commercial tenants will be required to take their segregated waste materials to their designated WSA and deposit their segregated waste into the appropriate bins. The location of the WSA is illustrated in the drawings submitted with the planning application under separate cover.

The Deposit Return Scheme vending machines will be provided in the retail store internally and the storage of additional waste receptacles for the reverse vending machines will be stored in the external service yard immediately adjacent to the retail unit.

Suppliers for the commercial tenants should be requested by the tenants to make deliveries in reusable containers, minimize packaging or remove any packaging after delivery, where possible, to reduce waste generated by the proposed development.

If any kitchens are allocated in commercial unit areas, this will contribute a significant portion of the volume of waste generated on a daily basis, and as such it is important that adequate provision is made for the storage and transfer of waste from these areas to the WSA.

If kitchens are required it is anticipated that waste will be generated in kitchens throughout the day, primarily at the following locations:

- Food Storage Areas (i.e. cold stores, dry store, freezer stores and stores for decanting of deliveries);
- Meat Preparation Area;
- Vegetable Preparation Area;
- Cooking Area;
- Dish-wash and Glass-wash Area; and
- Bar Area

Small bins will be placed adjacent to each of these areas for temporary storage of waste generated during the day. Waste will then be transferred from each of these areas to the designated retail or creche WSA.

All bins / containers in the commercial tenants' areas as well as in the WSAs will be clearly labelled and colour coded to avoid cross contamination of the different waste streams. Signage will be posted above or on the bins to show exactly which wastes can be put in each.

Access to the retail and creche WSAs will be restricted to authorised tenants, facilities management and waste contractors by means of a key or electronic fob access.

Other waste materials such as textiles, batteries, printer toner/cartridges, cooking oil and WEEE may be generated infrequently by the tenants. Tenants will be required to identify suitable temporary storage areas for these waste items within their own units and dispose of them appropriately. Further details on additional waste types can be found in Section 5.4.

5.3 Waste Collection

There are numerous private contractors that provide waste collection services in the Cork City area. All waste contractors servicing the proposed development must hold a valid waste collection permit for the specific waste types collected. All waste collected must be transported to registered / permitted / licensed facilities only.

All bins from the proposed development shared WSAs and commercial WSAs will be collected directly from the WSAs there will be no need for a temporary staging/collection area. It will be the responsibility of the facilities management or the waste contractor, depending on the agreement, to bring bins from the shared WSAs to the collection truck for emptying. The facilities manager or the waste contractor will ensure that empty bins are promptly returned to the WSAs after emptying.

Residents in the house units with their own individual WSAs will be responsible for relocating their bins to and from the roadside on designated collection days.

Suitable access and egress has been provided to enable the bins to be moved easily from the WSAs to the waste collection vehicle on the appropriate days. Waste will be collected at agreed days and times by the nominated waste contractors.

All waste receptacles will be clearly identified as required by waste legislation and the requirements of the CCC *Waste Bye-Laws*. Waste will be presented for collection in a manner that will not endanger health, create a risk to traffic, harm the environment or create a nuisance through odours or litter.

It is recommended that bin collection times are staggered to reduce the number of bins required to be emptied at once and the time the waste vehicle is on-site. This will be determined during the process of appointment of a waste contractor.

A road sweep analysis can be found in Appendix B of this report.

The collection of the waste will be such that it will not obstruct traffic or pedestrians (allowing a footway path of at least 1.8m, the space needed for two wheelchairs to pass each other) as is recommended in the *Design Manual for Urban Roads and Streets* (2019) [25].

5.4 Additional Waste Materials

In addition to the typical waste materials that are generated on a daily basis, there will be some additional waste types generated from time to time that will need to be managed separately. A non-exhaustive list is presented below.

<u>Deposit Return Scheme</u>
Most drinks containers can be recycled via the deposit return scheme, such as bottles, cans and tins made from plastic, aluminium or steel can be returned once they are between 150ml and 3 litres in size and have the Re-turn logo on them.

DRS items will be brought to the DRS units located internally in the retail unit, where they will be loaded into the machine by the consumers. When a machine is full, facilities management will replace the full 1100L bins and wheel it to the retail unit service yard WSA where they will be stored while awaiting collection.

It is envisaged that a weekly collection of DRS materials will occur from the WSA service yard immediately beside the retail unit.

At the shops you can either return the containers:

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- Using a Reverse Vending Machine (RVM)
- Manually in the shop

If a shop does not have a RVM but they sell containers with the Re-turn logo, the shop may allow you to manually return containers in store, unless they have a take back exemption.

Locations of RVM machines can be found via the Re-turn website (www.re-turn.ie)

Green Waste
Green waste may be generated from external landscaping and internal plants / flowers. Green waste generated from landscaping of external areas will be removed by external landscape contractors. Green waste generated from gardens internal plants / flowers can be placed in the organic waste bins.

Batteries
A take-back service for waste batteries and accumulators (e.g. rechargeable batteries) is in place in order to comply with the S.I. No. 283/2014 - *European Union (Batteries and Accumulators) Regulations 2014*, as amended. In accordance with these regulations, consumers are able to bring their waste batteries to their local civic amenity centre or can return them free of charge to retailers which supply the equivalent type of battery, regardless of whether or not the batteries were purchased at the retail outlet and regardless of whether or not the person depositing the waste battery purchases any product or products from the retail outlet.

The commercial tenants cannot use the civic amenity centre. They must segregate their waste batteries and either avail of the take-back service provided by retailers or arrange for recycling / recovery of their waste batteries by a suitably permited / licenced contractor. Facilties management may arrange collection, depending on the agreement.

Waste Electrical and Electronic Equipment (WEEE)
The WEEE Directive (Directive 2002/96/EC) and associated Waste Management (WEEE) Regulations have been enacted to ensure a high level of recycling of electronic and electrical equipment. In accordance with the regulations, consumers can bring their waste electrical and electronic equipment to their local recycling centre. In addition, consumers can bring back WEEE within 15 days to retailers when they purchase new equipment on a like for like basis. Retailers are also obliged to collect WEEE within 15 days of delivery of a new item, provided the item is disconnected from all mains, does not pose a health and safety risk and is readily available for collection.

As noted above, the commercial tenants cannot use the civic amenity centre. They must segregate their WEEE and either avail of the take-back / collection service provided by retailers or arrange for recycling / recovery of their WEEE by a suitably permited / licenced contractor. Facilties management may arrange collection, depending on the agreement.

Printer Cartridge / Toners
It is recommended that a printer cartridge / toner bin is provided in the commercial units, where appropriate. The commercial tenants will be required to store this waste within their unit and arrange for return to retailers or collection by an authorised waste contractor, as required.

Waste printer cartridge / toners generated by residents can usually be returned to the supplier free of charge or can be brought to a civic amenity centre.

Chemicals
Chemicals (such as solvents, paints, adhesives, resins, detergents, etc) are largely generated from building maintenance works. Such works are usually completed by external contractors who are responsible for the off-site removal and appropriate recovery / recycling / disposal of any waste materials generated.

Any waste cleaning products or waste packaging from cleaning products generated in the commercial units that is classed as hazardous (if they arise) will be appropriately stored within the tenants' own space. Facilties management may arrange collection, depending on the agreement.

Any waste cleaning products or waste packaging from cleaning products that are classed as hazardous (if they arise) generated by the residents will be brought to a civic amenity centre.

Light Bulbs
Waste light bulbs (fluorescent, incandescent and LED) may be generated by lighting at the commercial units. It is anticipated that commercial tenants will be responsible for the off-site removal and appropriate recovery / disposal of these wastes. Facilties management may arrange collection, depending on the agreement.

Light bulbs generated by residents should be taken to the nearest civic amenity centre for appropriate storage and recovery / disposal.

Textiles
Where possible, waste textiles should be recycled or donated to a charity organisation for reuse. The commercial tenants and residents will be responsible for disposing of waste textiles appropriately.

Waste Cooking Oil
If the commercial tenants use cooking oil, waste cooking oil will need to be stored within the unit on a bunded area or spill pallet and regular collections by a dedicated waste contractor will need to be organized as required. Under sink grease traps will be installed in any cooking space.

If the residents generate waste cooking oil, this can be brought to a civic amenity centre.

Furniture & Other Bulky Waste Items
Furniture and other bulky waste items (such as carpet, etc.) may occasionally be generated by the commercial tenants. The collection of bulky waste will be arranged, as required by the tenant. If residents wish to dispose of furniture, this can be brought a civic amenity centre.

Abandoned Bicycles
Bicycle parking areas are planned for the development. As happens in other developments, residents sometimes abandon faulty or unused bicycles, and it can be difficult to determine their ownership. Abandoned bicycles will be donated to charity if they arise or facilities management will arrange collection by a licensed waste contractor.

5.5 Waste Storage Area Design

The shared and commercial WSAs will be designed and fitted-out to meet the requirements of relevant design Standards, including:

- Be fitted with a non-slip floor surface;
- Provide ventilation to reduce the potential for generation of odours with a recommended 6-10 air changes per hour for a mechanical system for internal WSAs;
- Provide suitable lighting – a minimum Lux rating of 400 is recommended;
- Be easily accessible for people with limited mobility;
- Be restricted to access by nominated personnel only;
- Be supplied with hot or cold water for disinfection and washing of bins;
- Be fitted with suitable power supply for power washers;
- Have a sloped floor to a central foul drain for bins washing run-off;

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- Have appropriate signage placed above and on bins indicating correct use;
- Have access for potential control of vermin, if required; and
- Be fitted with CCTV for monitoring.

The facilities manager, commercial tenants and residents will be required to maintain the bins and storage areas in good condition as required by the CCC Waste Bye-Laws.

5.6 Facility Management Responsibilities

It shall be the responsibility of the facilities manager to ensure that all waste generated is managed to ensure correct storage prior to collection by an appropriately permitted waste management company.

The facilities manager will provide the following items to all residents with shared WSAs, commercial tenants and any facilities management team appointed*:*

- Provision of a Waste Management Plan document, prepared by the facilities manager to all residents, commercial tenants and facilities management staff which shall clearly state the methods of source waste segregation, storage, reuse and recycling initiatives that shall apply to the management of the development;
- Provision and maintenance of appropriate graphical signage to inform residents and commercial tenants of their obligation to reduce waste, segregate waste and in the correct bin;
- Preparation of an annual waste management report for all residents and commercial tenants to view;
- Designation of access routes to common waste storage areas to ensure safe access from the unit by mobility impaired persons;
- Provision of an appropriately qualified and experienced staff member, who will be responsible for all aspects of waste management at the development;
- Frequent inspection of waste storage areas and signing of a check list, which shall be displayed within the area; and
- Maintenance of a register, detailing the quantities and breakdown of wastes collected from the development and provision of supporting documentation by the waste collector to allow tracking of waste recycling rates.

5.7 Pest Management

A pest control operator will be appointed as required to manage pests onsite during the operational phase of this development. All waste generated within the development will be stored in closed waste receptacles both within the unit and within the WSAs. Any waste receptacles will be carefully managed to prevent leaks, odours and pest problems.

The WSAs will have access for potential control of vermin, if required, be supplied with hot or cold water, drainage point and will be regularly inspected by facilities management to deter pests.

6. SUMMARY AND CONCLUSION

In summary, this OWMP presents a waste strategy that addresses all legal requirements, waste policies and best practice guidelines and demonstrates that the required storage areas have been incorporated into the design of the proposed development.

Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the proposed development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus contributing to the targets set out in *the NWMPCE*.

Adherence to this plan will also ensure that waste management at the development is carried out in accordance with the requirements of the *CCC Waste Bye-Laws.*

The waste strategy presented in this document will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated areas for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy.

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18. Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended.
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APPENDIX A. WASTE STORAGE AREA LOCATIONS

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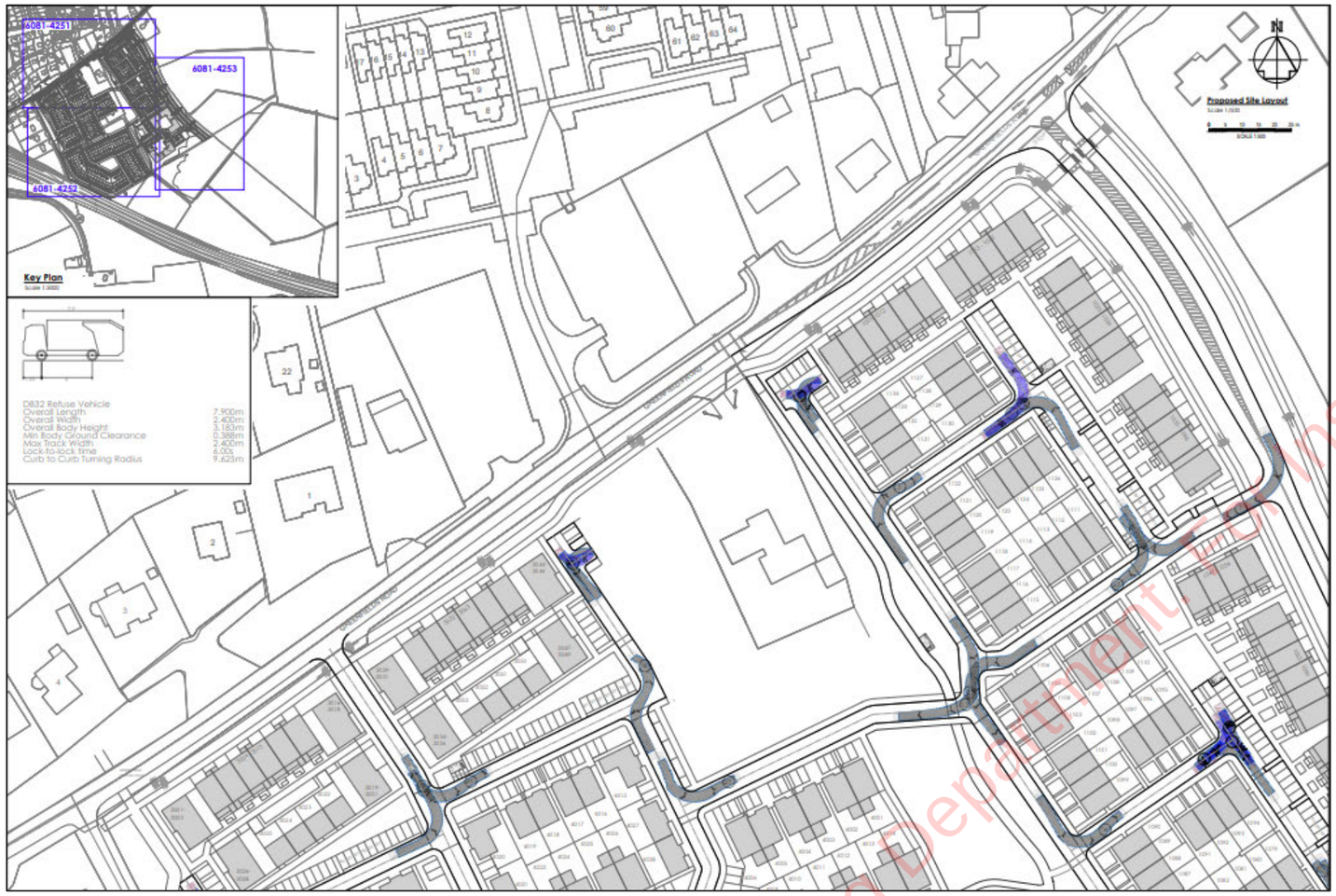
APPENDIX B. ROAD SWEEP ANALYSIS



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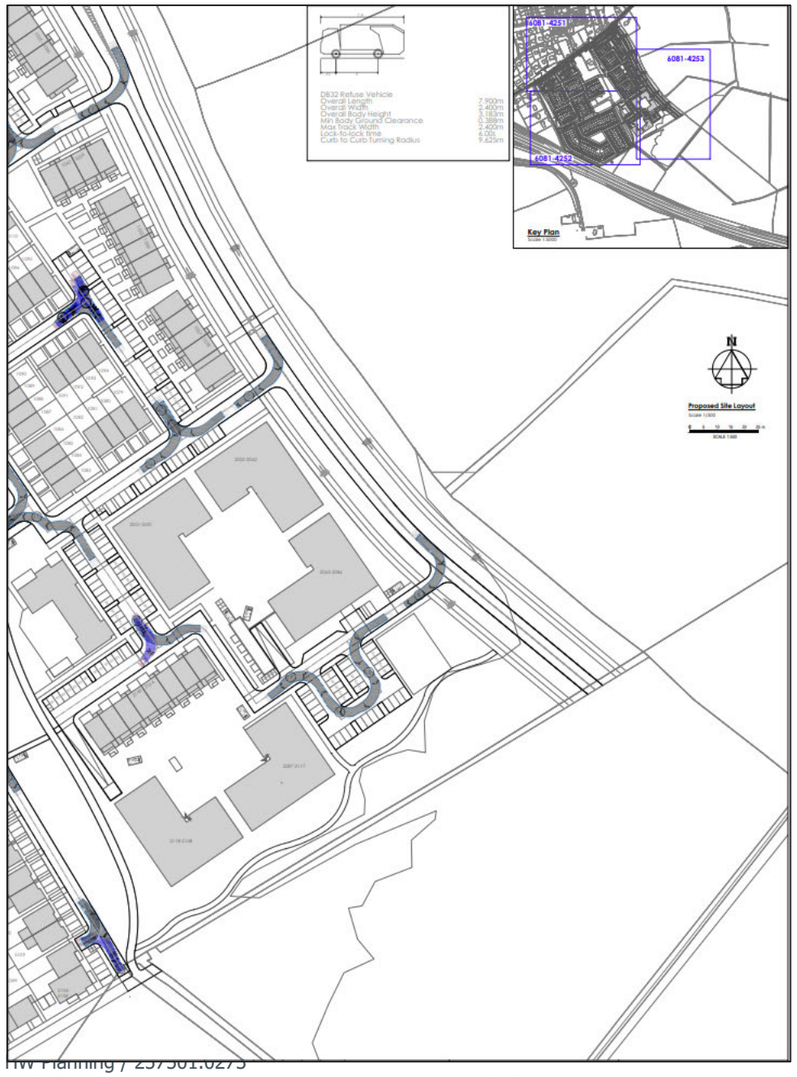

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CHAPTER SIX

LAND & SOILS

APPENDIX 6-1 Ground Investigation Reports

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APPENDIX 6-1 Ground Investigation Reports

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TRIAL PIT LOG

Project:	Crowley Site	Trial Pit No.	GF-TP-01
Location:	Greenfield Ballincollig Cork	Logged by:	Dan Keohane
Date:	24 September 2024	Keohane Geological & Environmental Consultancy	
Co-ords:	557800 / 569788		

Depth	Description	Samples	Comments
0.0 m	Firm brown organic silty CLAY. Dry. Topsoil.		0.0 to 0.15m.
0.5 m	Firm to stiff brown gravely SILT. Dry. Gravel is smooth & angular limestone and smooth rounded to subrounded green + red sandstone.		0.15 to 0.5m.
1.0 m	Loose brown silty gravely FINE SAND with occasional cobble. Dry. Gravel is mostly fine to coarse smooth rounded to subrounded limestone.		0.5 to 1.1m.
1.5 m	Dense brown - grey silty sandy FINE GRAVEL with occasional cobble. Dry.	Bulk @ 1.3m.	1.1 to 1.6m.
2.0 m	Limestone cobbles in matrix of sandy fine gravel. Dry. - Presumed top of fractured limestone bedrock. Total Depth = 1.8m.		1.6 to 1.8m. No groundwater ingress. Bedrock is **Little Island Formation** - fractured & susceptible to karstification
2.5 m			
3.0m			
3.5 m			
4.0m			
4.5m			
5.0m			
5.5 m			

Description of Trial Pit Location:
Excavated with a Wacker Neuson EX50 6-tonne track-mounted excavator with 0.9m-wide bucket.
Located at northwestern corner of landholding currently used for grazing.
Trial pit backfilled immediately after logging.

TRIAL PIT GF-TP-01 - PHOTOGRAPHS

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TRIAL PIT LOG

Project:	Crowley Site	Trial Pit No.	GF-TP-02
Location:	Greenfield Ballincollig Cork	Logged by:	Dan Keohane
Date:	24 September 2024	Keohane Geological & Environmental Consultancy	
Co-ords:	558045 / 569757		

Depth	Description	Samples	Comments
0.0 m	Firm brown slightly gravely silty organic CLAY. Dry. Topsoil.		0.0 to 0.2m.
0.5 m	Firm yellowish brown silty FINE SAND with occasional gravel. Dry. Gravel is angular rough limestone and smooth rounded red sandstaone.		0.2 to 0.7m.
1.0 m	Moderately dense brown silty sandy GRAVEL with occasional cobble. Dry. Cobble is white and grey angular smooth limestone. Gravel is smooth angular limestone and smooth rounded red sandstone. Limestone gravel + cobbles becoming more prominent with depth.	Bulk @ 1.5m.	0.7 to 1.6m.
1.5 m	Moderately dense brown-grey silty sandy GRAVEL. Dry. Gravel is angular rough limestone.		1.6 to 1.8m
2.0 m	Limestone cobbles in matrix of sandy fine gravel. Dry. - Presumed top of fractured limestone bedrock.		1.8 to 2.1m. No groundwater ingress. Bedrock is **Little Island Formation** - fractured & susceptible to karstification
2.5 m	Total Depth = 2.1m.		
3.0m			
3.5 m			
4.0m			
4.5m			
5.0m			
5.5 m			

Description of Trial Pit Location:
Excavated with a Wacker Neuson EX50 6-tonne track-mounted excavator with 0.9m-wide bucket.
Located at southeast corner of northwestern field currently used for grazing.
Trial pit backfilled immediately after logging.

TRIAL PIT GF-TP-02 - PHOTOGRAPHS

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Proposed Residential Development at Greenfield, Ballincollig, Cork

Geophysical Survey Report

Report Number: P23196_Gp_Rp_Rev.03

Project ID: P23196

This geophysical survey report is provided for informational purposes only and is not intended to be used for any other purpose. The information contained in this report is based on data gathered from geophysical surveying techniques and is subject to limitations and uncertainties inherent in such methods. Therefore, no warranties or representations are made as to the accuracy, completeness, or reliability of the information presented in this report.

The results of the survey are based on the specific conditions and assumptions made during the survey process and may not be applicable to other locations or conditions. It is the responsibility of the reader to determine the suitability of the information presented in this report for their intended use.

Furthermore, this report is not intended to provide advice or recommendations regarding the suitability of any site for construction or any other purpose. The reader should consult with qualified professionals and conduct their own investigations and assessments before making any decisions based on the information presented in this report.

The author(s) of this report are not liable for any loss, damage, or expense resulting from the use of the information presented in this report.

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REPORT CONTROL SHEET

Project Client	Murnane & O'Shea Ltd					
Hydro Survey Client	Priority Geotechnical Ltd.					
Project Name	Proposed Residential Development at Greenfield, Ballincollig, Cork					
Document Type	Technical Report					
Project Number	P23196					
This Report Comprises of	**TOC**	**Text**	**No. of Volume**	**No. of Appendices**	**Drawings**	**Electronic data**
	1	15	1	1	3	*.dwg, *.pdf

Revision	Status	Author(s)	Approved by	Issue Date
Rev 01	Draft	DH	HP	13/11/2023
Rev 02	Updated with client comments	DH	HP	12/02/2024
Rev 03	Updated with site investigations	CN	HP	01/07/2025

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Acronyms

- bgl – below ground level
- ERT – Electrical Resistivity Tomography
- RES-Resistivity meter
- ERS – Electrical Resistivity Soundings
- GPR – Ground Penetrating Radar
- ITM – Irish Transverse Mercator
- MASW – Multi-Channel Analysis of Surface Waves
- OD Malin – metres above Ordnance Datum Malin (OSGM15)
- SRP – Seismic Refraction Profiling
- Vp – P-wave velocity

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A) Executive Summary

Hydro Survey was instructed by Priority Geotechnical Ltd. on behalf of Murnane & O'Shea Ltd to undertake a geophysical investigation at Proposed Residential Development at Greenfield, Ballincollig, Cork.

The survey consisted of seismic refraction profiling (SRP) and electrical resistivity tomography (ERT) in accordance with BS5930[1] and BS7022[2] and the Geological Society Engineering Group Working Party Report on Engineering Geophysics. The survey locations are shown in Figure B-1 below.

The survey was carried out between 13th October to 3rd November 2023.

The survey consisted of 5 ERT profiles with a 5m electrode spacing and a total 2260m ERT survey length, also 35 SRP profiles with a 2/3m geophone spacing and a total length of 2200m SRP survey. The geophysical survey objectives were as follows:

- Provide information on the type and thickness of the overburden.
- Assess the depth to bedrock.
- Identify the type of bedrock.
- Identify any potential faults/fissure/karst zones within the bedrock.

The survey profile positions, modelled profiles and geophysical interpretations are shown in APPENDIX A: Drawing No. P23196_Gp_D01 to D03. These drawings are plotted at paper size ISO A1 and are also supplied in AutoCAD format.

A sandy gravelly CLAY layer has been interpreted as the overburden layer through all the ERT profiles which overlays a stiff sandy GRAVEL layer. This layer overlays a weathered LIMESTONE which overlays a more resistant and slightly weathered LIMESTONE. Some faulted and karstified zones have been highlighted in R1, R2, R3, R4 and R5 profiles.

A sharp lateral/vertical physical property change through inverted ERT/SRP sections has been highlighted as a faulted/karstified zone. The absence of fault/karst within the survey dataset is not evidence of their absence, as features may exist beyond the range and resolution of the employed methods.

[1] *The BS5930 standard recommends that geophysical surveys should be carried out in conjunction with other site investigation techniques, such as drilling and sampling, to provide a comprehensive understanding of the ground conditions. It also emphasizes the importance of selecting appropriate geophysical methods and equipment for the specific site conditions and objectives, and of using experienced and qualified personnel to carry out and interpret the surveys.*

[2] *BS0722 is a British Standard that provides guidance on the use of geophysical methods for detecting and mapping buried utilities and other underground features. In relation to geophysics, BS0722 recognizes that geophysical surveys can provide valuable information about the location and nature of buried objects, such as pipes, cables, and archaeological features, which can help to reduce the risk of damage during construction works.*

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B) Introduction

Hydro Survey was instructed by Priority Geotechnical Ltd. on behalf of Murnane & O'Shea Ltd to undertake a geophysical investigation at Proposed Residential Development at Greenfield, Ballincollig, Cork.

The survey consisted of seismic refraction profiling (SRP) and electrical resistivity tomography (ERT) in accordance with BS5930 and BS7022 and the Geological Society Engineering Group Working Party Report on Engineering Geophysics. The survey locations are shown in Figure B-1 below.

The survey was carried out between 13th October to 3rd November 2023.

Figure B-1: Location map showing ERT and SRP surveyed geophysical profiles in red and blue, respectively.

B.1) Survey Objectives

The survey objectives were to provide information on the following:

- Provide information on the type and thickness of the overburden.
- Assess the depth to bedrock.

- Identify the type of bedrock.
- Identify any potential faults/fissure/karst zones within the bedrock.

B.2) Site Topography

The site was a grassy field with elevations ranging from 17.95m OD to 27.5m OD.

B.3) Coordinate System and Datum

All coordinates are given in Irish Transverse Mercator (EPSG: 2157). All elevations are given in metres Ordnance Datum Malin Head (EPSG: 7959), OSGM15 revision.

B.4) Intrusive Works

This report has been drafted considering all site investigation logs made available by Priority Geotechnical LTD.

B.5) Site Geology

According to the GSI 100k Geology Map (see Figure B-2) the southern part of the survey area is underlain by the "Waulsortian LIMESTONE" shown in light blue, described as "Massive unbedded LIMESTONE". The northern part of the survey area is underlain by Little Island Formation, described as Massive and crinoidal fine limestone. Some faults are crossing the study area which caused some karstified zones in the bedrock. These geohazards have been detected and highlighted through the inverted ERT/SRP profiles and shown in the CAD file.

Project ID: P23196

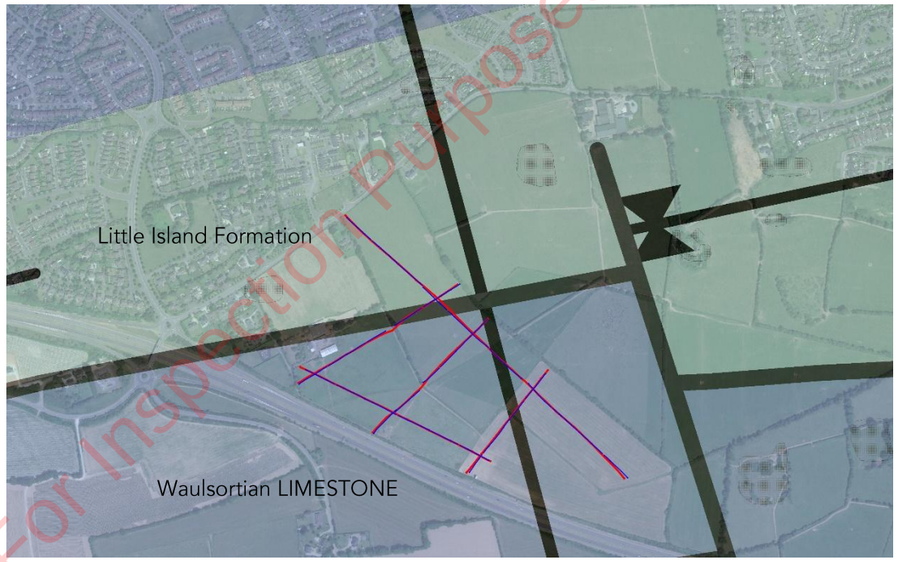

Figure B-2: GSI 100k Bedrock Geology Map of the site.

According to the GSI Quaternary Soils Map (see Figure B-3) the survey area is underlain by "Till derived from Devonian Sandstones", shown in green. Bedrock outcrops are shown in brown.

Figure B-3: Quaternary Sediments Map of the site.

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All above mapping is available for free viewing on the Geological Survey of Ireland website at *https://www.gsi.ie/en-ie/Pages/default.aspx.* Both Figure B-2 and Figure B-3 contain Irish Public Sector Data (Geological Survey) licensed under a Creative Commons Attribution 4.0 International (CC BY 4.0) licence.

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C) Methodology

The geophysical techniques used were as follows:

C.1) 2D Electrical Resistivity Tomography (ERT)

This technique involved measuring electrical resistivity at the ground surface to image subsurface structures. A total of 5 profiles were collected along pre-determined lines (R1 to R5), with an electrode spacing of 5m with a total ERT length of 2260m.

An 84-channel ABEM LS2 resistivity meter was used. Multicore resistivity cables with 20 channels and stainless-steel electrodes were employed. Contact resistivities were checked and improved if necessary. The Wenner Alpha Array protocol was used.

C.2) Seismic Refraction Profiling (SRP)

Seismic waves were measured to determine subsurface layer Vp velocities. A total of 35 SRP profiles were recorded, following the same orientation as the ERT lines. A geophone spacing of 2/3m was used throughout with a total SRP length of 2200m. A 24-channel Geometrics Geode seismic system was used.

C.3) Data Processing and Interpretation:

Data processing and interpretation were carried out using specific software for each technique:

- ERT data was processed using Res2DInv software, with up to 5 iterations of inversion per profile. RMS errors for the inversions are provided in Table C-1.
- SRP data was processed using Plotrefa software. Velocity modelling, travel time plots, and layer thickness calculations were performed. RMS errors for the inversions are listed in Table C-2.
- RMS Errors is a root mean square error that measures the average difference between the statistical models predicted value and the actual values. For ERT inversion, the RMS error lower than 10% and for SRP inversion the RMS error lower than 3% are acceptable. Any inverted sections with RMS error higher than mentioned ranges need to be rejected.

Table C-1: RMS Errors for ERT inversion through RES2Dinv software (<10% low divergence inversion)

ERT Profile	RMS Error Inversion (%)	Iteration Number
R1	8.1%	4
R2	5.4%	4
R3	9.3%	4
R4	6.3%	5
R5	6.4%	4

Table C-2: RMS Errors for seismic refraction inversion through Plotrefa software (<3% low divergence inversion)

Seismic Profile	RMS Error Inversion (ms)	RMS Error Raytracing (%)
S1	0.2	0.7
S2	0.4	0.9
S3	0.3	0.8
S4	0.4	1.1
S5	0.4	1.3
S6	0.3	1.2
S7	0.2	0.7
S8	0.3	1.2
S9	0.3	1.1
S10	0.8	2.7
S11	0.3	1.2
S12	0.6	1.7
S13	0.5	1.3
S14	0.2	0.5
S15	0.3	1.0
S16	0.7	2.9
S17	0.4	1.2
S18	0.3	1.1
S19	0.5	2.2
S20	0.4	1.4
S21	0.3	1.1
S22	0.7	2.1
S23	0.5	1.1
S24	0.6	1.3
S25	0.6	1.8

S26	0.5	1.3
S27	0.3	0.8
S28	0.7	2.2
S29	0.5	2.1
S30	0.8	3.1
S31	0.5	1.9
S32	0.5	1.7
S33	0.7	2.3
S34	0.3	1.2
S35	0.5	1.5

C.4) Geospatial Relocation:

Horizontal control and elevation were determined using an RTK-enabled GNSS receiver.

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D) Results and Geophysical Interpretation

The survey profile positions, modelled profiles and geophysical interpretations are shown in APPENDIX A: Drawing No. P23196_Gp_D01 to D03. These drawings are plotted at paper size ISO A1 and are also supplied in AutoCAD format.

D.1) Seismic Refraction:

The seismic refraction method was employed to determine the depth and velocity of subsurface layers. By analysing the travel times of seismic waves, the boundaries between different geological units were identified. This information helped in delineating the subsurface layering and identifying bedrock formations. Velocity-depth profiles were generated to visualise the variations in subsurface velocities and infer the lithological composition of the layers.

D.2) Electrical Resistivity Tomography (ERT):

ERT was utilised to assess the electrical resistivity distribution in the subsurface. By measuring the resistivity of different materials, the ERT technique provided information about the lithological variations, water content, and presence of geological structures such as faults or fractures. ERT profiles and imaging allowed for the interpretation of subsurface layering and the identification of potential groundwater resources or areas of interest.

D.3) Integration of Results:

The integration of seismic refraction (SRP) and ERT results allowed for a comprehensive understanding of the subsurface conditions. Correlations between seismic velocities and resistivity values provided valuable information on the lithological composition and layer thicknesses of the surveyed area. The combined interpretation helped in identifying potential geological hazards, delineating aquifers, or other subsurface resources.

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The SRP refracted boundaries were used to establish top of rock and overburden / rock material physical property (P-wave velocity) across all profiles. The general geophysical interpretation is outlined in Table D-1.

Resistivity (Ohm-m)	Vp velocity (m/s)	Interpretation
>70	<750	Sandy Gravelly CLAY
>150	<2500	Sandy GRAVEL
>250	>2600	Weathered LIMESTONE
>1500	>3500	LIMESTONE

Table D-1: Interpretation based on electrical resistivity and P-wave velocity.

D.4) Geophysical Interpretation Summary

A sandy gravelly CLAY layer has been interpreted as the overburden layer through all the ERT profiles which overlays a stiff sandy GRAVEL layer. This layer overlays a weathered LIMESTONE which overlays a more resistant and a slightly weathered LIMESTONE. Some faulted and karstified zones have been highlighted in R1, R2, R3, R4 and R5 profiles.

A sharp lateral/vertical physical property change through inverted ERT/SRP sections has been highlighted as a faulted/karstified zone. The absence of fault/karst within the survey dataset is not evidence of their absence, as features may exist beyond the range and resolution of the employed methods.

D.4.i) R1, S1, S2, S3, S17, S18, S19, S20, S21, S22, S23, S24, S25

Inverted SRP sections through profiles R1 were interpreted across three layers. Based on the inverted ERT section which images deeper layers than SRP profiles, a 4th layer has been interpreted as a slightly weathered LIMESTONE. The overburden was interpreted as sandy gravelly CLAY with an ERT value >70 (ohm-m), Vp<750m/s and a maximum c.13m thickness (south-eastern part of R1) which overlays a stiff sandy GRAVEL layer with an ERT value >150 (ohm-m), Vp<2500m/s and a maximum 20m thickness (north-west of R1). This layer overlays a weathered LIMESTONE with a Vp>2600m/s and maximum c.40m thickness (in the center of the profile). This layer overlays a more resistant LIMESTONE layer with a Res>1500 (ohm-m). Three faulted zones between 140m and 200m, 245m and 310m, 390m and 520m positions have been detected. These crossing faults resulted in the probable karstified zones in the weathered LIMESTONE layer.

D.4.ii) R2, S4, S5, S6, S7, S8, S9

Inverted SRP sections through profiles R2 were interpreted across three layers. Inverted ERT section through profile R2 images deeper layers than SRP profiles due to greater depth with relation to longer profile length. In this circumstance it is possible to interpret a 4th layer as a slightly weathered LIMESTONE. The overburden was interpreted as sandy gravelly CLAY with a ERT values >70 (ohm-m), Vp <750m/s and a maximum c.5.5m thickness which overlays a stiff sandy GRAVEL layer with an ERT value >150 (ohm-m), Vp<2500m/s and a maximum 14m thickness (south-west part of R2). This layer overlays a weathered LIMESTONE with a Vp>2600m/s and maximum c.26m thickness. This layer overlays a more resistant LIMESTONE layer with ERT values >1500 (ohm-m). Two probable karstified zones and a probable faulted zone were highlighted between 40m and 85m, and between 130m and 180m positions.

D.4.iii) R3, S10, S11, S12, S13, S14, S15, S16

Inverted SRP sections through profiles R3 were interpreted across three layers. The overburden was interpreted as sandy gravelly CLAY with ERT values >70 (ohm-m), Vp<750m/s and a maximum c.5m thickness which overlays a stiff sandy GRAVEL layer with an ERT value >150 (ohm-m), Vp<2500m/s and a maximum 13m thickness. This layer overlays a weathered LIMESTONE with a Vp>2600m/s and maximum c.23m thickness. Based on the inverted ERT section it is possible to interpret the 4th layer as a slightly weathered LIMESTONE layer with an ERT value >1500 (ohm-m). A fault and its relevant karstified zone has been highlighted between 190m and 250m position. Also, a probable karstified zone has been detected between 310m and 340m position.

D.4.iv) R4, S26, S27, S28, S29

Inverted SRP sections through profiles R4 were interpreted across three layers. The overburden was interpreted as sandy gravelly CLAY with ERT values >70 (ohm-m), Vp<750m/s and a maximum c.23m thickness which overlays a weathered LIMESTONE with a Vp >2600m/s and maximum c.30m thickness. Based on the inverted ERT section, the 3rd bedrock layer has been interpreted as a slightly weathered LIMESTONE layer with a Res>1500 (ohm-m). Two probable fault zones have been highlighted between 60m and 85m and between 95m to 185m position. Also, two karstified zones have been highlighted between 125m and 155m, and between 185m and 215m positions through profile R4.

D.4.v) R5, S30, S31, S32, S33, S34, S35

Inverted SRP sections through profiles R5 were interpreted across three layers. The overburden was interpreted as sandy gravelly CLAY with a Res>70 (ohm-m), Vp<750m/s and a maximum c.4m thickness which overlays a stiff sandy GRAVEL layer with a Res>150 (ohm-m), Vp<2500m/s and a maximum 22m thickness (at the fault location). This layer overlays a weathered LIMESTONE with a Vp>2600m/s and maximum c.36m thickness. Based on the inverted ERT section it is possible to interpret the 4th layer as a slightly weathered LIMESTONE layer with a Res>1500 (ohm-m). Two probable faulted zones and their associated karstified zones have been highlighted between 160m and 220m, and between 245m and 320m positions through profile R5.

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APPENDIX A: DRAWINGS

Drawing Number	Description	Scale
P23196_Gp_D01	Location Map of Geophysical Profiles R1, R2, R3, R4 & R5	1:1250 @ A1
P23196_Gp_D02	Geophysical Results and Interpreted Cross-Sections – R1 & R5	1:1000 @ A1
P23196_Gp_D03	Geophysical Results and Interpreted Cross-Sections – R2, R3 & R4	1:1000 @ A1

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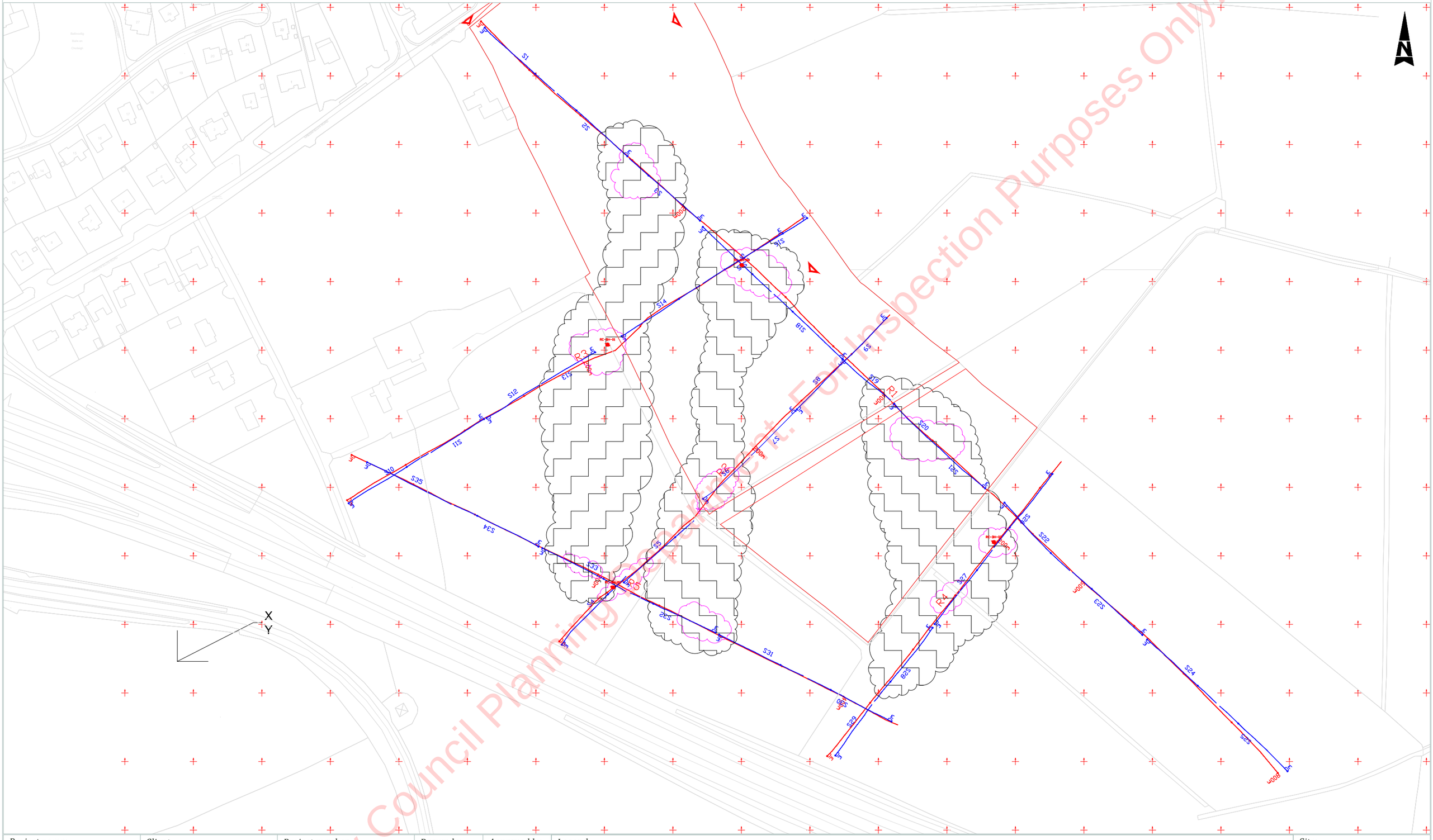
FIGURE 1: LOCATION MAP SHOWING GEOPHYSICAL PROFILE LOCATIONS R1, R2, R3, R4 & R5
SCALE 1:1250



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Project name:
PROPOSED RESIDENTIAL DEVELOPMENT AT GREENFIELD, BALLINCOLLIG, CORK

Sheet Title:
LOCATION MAP OF GEOPHYSICAL PROFILES R1, R2, R3, R4 & R5

Client:
Murnane & O'Shea Ltd

Hydro Survey client:
PRIORITY GEOTECHNICAL LTD.

Survey by:
HYDRO SURVEY
UNIT 12 OWENACURRA BUSINESS PARK,
MIDLETON, CO. CORK, P25 C563
T: +353 21 483 1184
E: info@hydrosurvey.com

Project number:
P23196

Drawing number:
P23196_Gp_D01

Revision:
Rev.03

Drawn by:
DH

Approved by:
HP

CRS:
ITM (EPSG 2157)

Datum:
OD Malin (EPSG 7959)

Scale:
As stated A1

Issue date:
01/07/2025

Legend:

Location Map
- Seismic profile
- ERT profile
- MASW profile
- RC01 Rotary core
- BH01 Cable percussion borehole
- TP01 Trial pit
- Possible area of karst
- Possible area of faulting

Geophysical pseudosection
Seismic refraction boundaries with P-wave velocities (m/s)
- ground surface
- 300 layer 1 / layer 2 boundary
- 1000 layer 2 / layer 3 boundary
- 3000 ground surface

ERT boundaries and resistivity colour scale (Ωm)
0 45 70 95 135 190 270 380 540 760 1080 1520 2145 3030 4275 6000 6500

Geophysical interpretation
- R6 Intersection of another named profile
- BH22 Approx location of named site investigation work
- Change in overburden boundary
- Rock surface boundary
- Change in rock boundary

Overburden types
- Sand
- Gravel
- Clay
- Silt
- Sandy CLAY
- Sandy gravelly CLAY
- Sandy GRAVEL
- GRAVEL

Rock types
- Slightly Weathered LIMESTONE
- Weathered LIMESTONE
- Possible area of faulting
- Possible area of karst

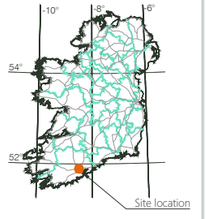
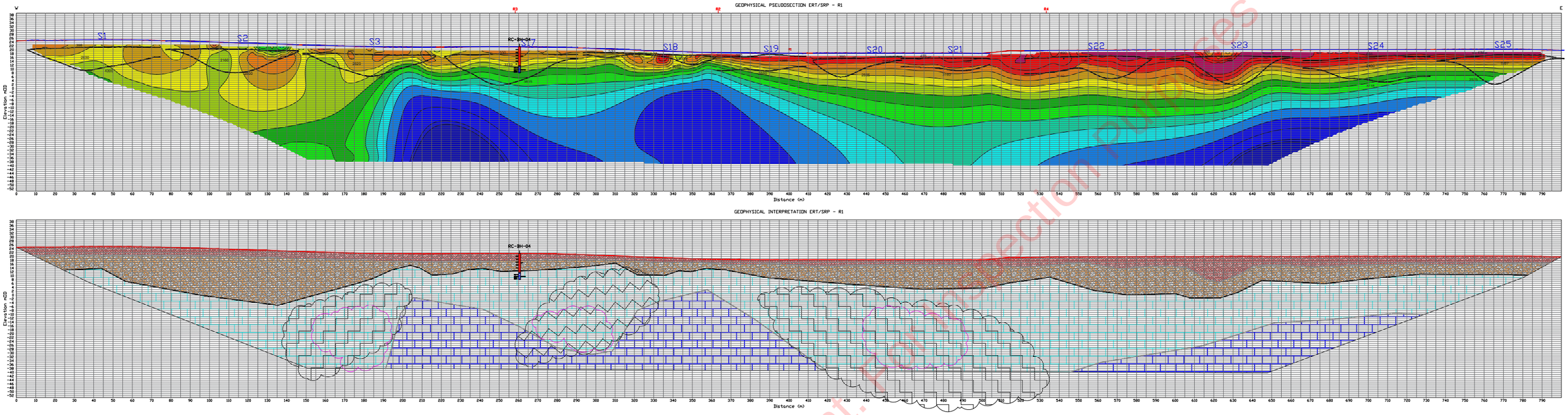
Site:


FIGURE 1: GEOPHYSICAL PSEUDOSECTION AND GEOPHYSICAL INTERPRETATION OF PROFILES R1 & R5
SCALE 1:1000



Cork City Council Planning Section purposes Only!

Project name:
PROPOSED RESIDENTIAL DEVELOPMENT AT GREENFIELD, BALLINCOLLIG, CORK

Sheet Title:
GEOPHYSICAL PSEUDOSECTION AND GEOPHYSICAL INTERPRETATION OF PROFILES R1 & R5

Client:
Murnane & O'Shea Ltd

Hydro Survey client:
PRIORITY GEOTECHNICAL LTD.

Survey by:
HYDRO SURVEY
UNIT 12 OWENACURRA BUSINESS PARK, MIDLETON, CO. CORK, P25 C563
T: +353 21 483 1184

Project number:
P23196

Drawing number:
P23196_Gp_D02

Revision:
Rev.03

Drawn by:
DH

Approved by:
HP

CRS:
ITM (EPSG 2157)

Datum:
OD Malin (EPSG 7959)

Scale:
As stated A1

Issue date:
01/07/2025

Legend:

Location Map
- Seismic profile
- ERT profile
- MASW profile
- RC01 Rotary core
- BH01 Cable percussion borehole
- TP01 Trial pit
- Possible area of karst
- Possible area of faulting

Geophysical pseudosection

Seismic refraction boundaries with P-wave velocities (m/s)
- 300 ground surface
- 1000 layer 1 / layer 2 boundary
- 3000 layer 2 / layer 3 boundary
- ground surface

ERT boundaries and resistivity colour scale (Ωm)
0 45 70 95 135 190 270 380 540 760 1080 1520 2145 3060 4375 6900 6900

Geophysical interpretation
- R6 Intersection of another named profile
- BH22 Approx location of named site investigation work
- Change in overburden boundary
- Rock surface boundary
- Change in rock boundary

Overburden types
- Sand
- Gravel
- Clay
- Silt
- Sandy CLAY
- Sandy gravelly CLAY
- Sandy GRAVEL
- GRAVEL

Rock types
- Slightly Weathered LIMESTONE
- Weathered LIMESTONE
- Possible area of faulting
- Possible area of karst

Site:

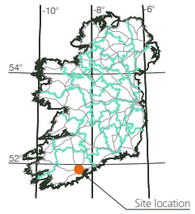
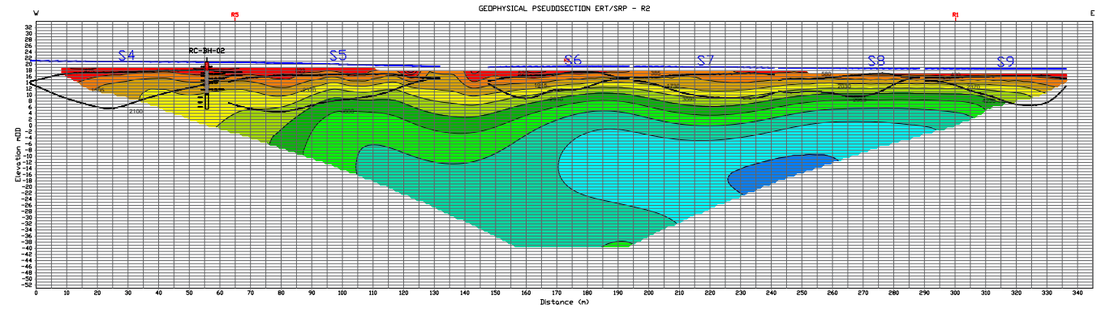
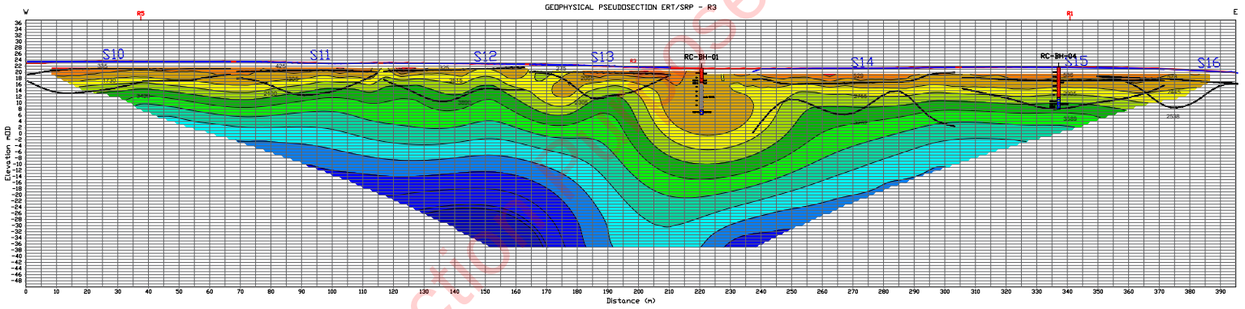
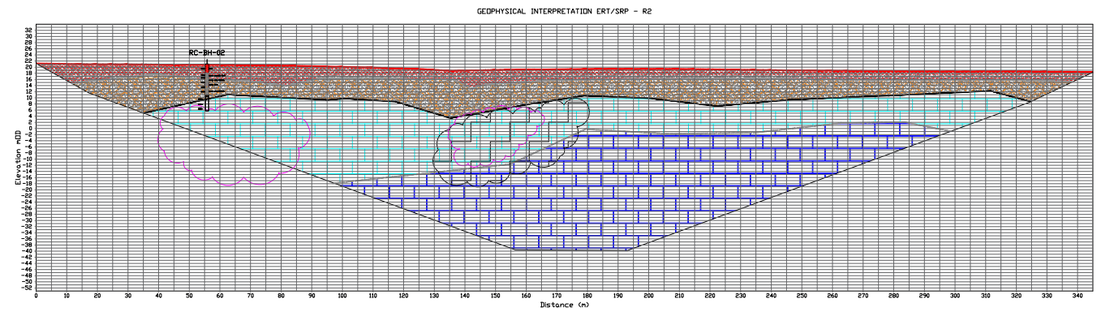
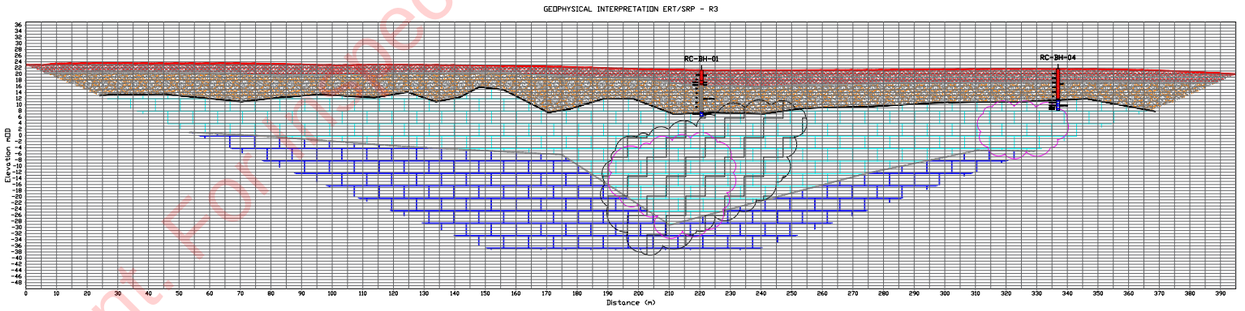


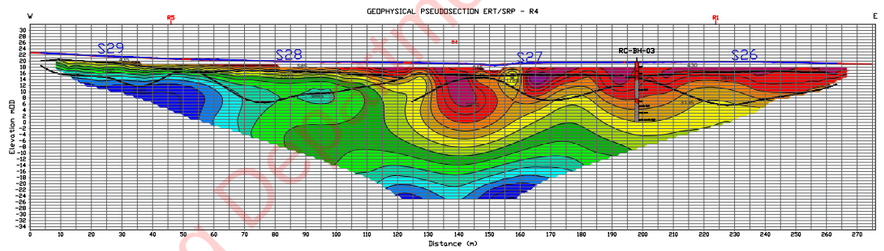
FIGURE 1: GEOPHYSICAL PSEUDOSECTION AND GEOPHYSICAL INTERPRETATION OF PROFILES R2, R3 & R4
SCALE 1:1000

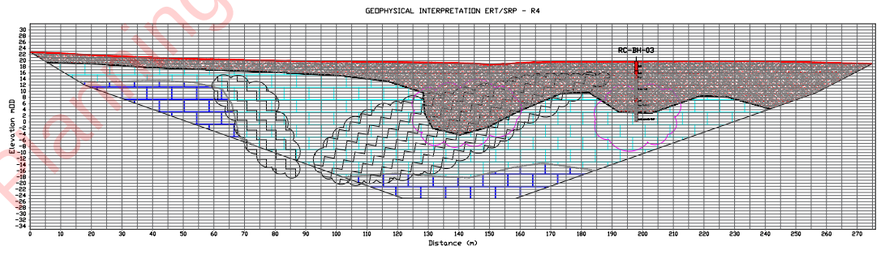












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Project name: PROPOSED RESIDENTIAL DEVELOPMENT AT GREENFIELD, BALLINCOLLIG, CORK	*Client:* Murnane & O'Shea Ltd	*Project number:* P23196	*Drawn by:* DH	*Approved by:* HP	
Sheet Title: GEOPHYSICAL PSEUDOSECTION AND GEOPHYSICAL INTERPRETATION OF PROFILES R2, R3 & R4	*Hydro Survey client:* PRIORITY GEOTECHNICAL LTD.	*Drawing number:* P23196_Gp_D03	*CRS:* ITM (EPSG 2157)		
	Survey by: HYDRO SURVEY UNIT 12 OWENACURRA BUSINESS PARK, MIDLETON, CO. CORK, P25 C563 T: +353 21 483 1184 E: info@hydrosurvey.com	*Revision:* Rev.03	*Datum:* OD Malin (EPSG 7959)		
			Scale: As stated A1	*Issue date:* 01/07/2025	

Legend:

Location Map
- Seismic profile
- ERT profile
- MASW profile
- RC01 Rotary core
- BH01 Cable percussion borehole
- TP01 Trial pit
- Possible area of karst
- Possible area of faulting

Geophysical pseudosection

Seismic refraction boundaries with P-wave velocities (m/s)
- ground surface
- 300 layer 1 / layer 2 boundary
- 1000 layer 2 / layer 3 boundary
- 3000 ground surface

ERT boundaries and resistivity colour scale (Ωm)
0 45 70 95 135 190 270 380 540 760 1080 1520 2150 3040 4275 6000 8500

Geophysical interpretation
- R6 Intersection of another named profile
- BH22 Approx location of named site investigation work
- Change in overburden boundary
- Rock surface boundary
- Change in rock boundary

Overburden types: Sand, Gravel, Clay, Silt, Sandy CLAY, Sandy gravelly CLAY, Sandy GRAVEL, GRAVEL

Rock types: Slightly Weathered LIMESTONE, Weathered LIMESTONE

Possible area of faulting
Possible area of karst

Site:

REFERENCES

BANERJEE, B. and GUPTA, S. (1975). HIDDEN LAYER PROBLEM IN SEISMIC REFRACTION WORK*. *Geophysical Prospecting*, 23(4), pp.642-652.

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KEY TO SYMBOLS ON EXPLORATORY HOLE RECORDS

GENERAL

m	Meter
mm	Millimetres
BGL	Below existing ground level
mOD	Level to OD Malin
TP	Trial Pit
ST	Slit Trench
CP	Cable Percussion Borehole
RC	Rotary Cored Borehole
IP	Inspection Pit
FP	Foundation Pit
DP	Dynamic Probe
Geobore S	Geobore S Borehole

SAMPLES

B	Bulk disturbed sample
D	Small disturbed sample
U	Undisturbed sample
WS	Dynamic sample/ window sample
ENV	Environmental sample
SPLTLS	Split spoon sample
CBR	California Bearing Ratio mould sample

RECOVERY AND ROCK QUALITY

TCR %	Total Core Recovery (% of Core Run)
SCR %	Solid Core Recovery (length of core having at least one full diameter as % of core run) RQD
RQD %	Rock Quality Designation (length of solid core greater than 100mm as % of core run)
FI	Fracture Index (Measured over length of core run)
NI	Non intact
AVG	Average distance between fractures
MAX	Maximum distance between fractures
MIN	Minimum distance between fractures

GROUNDWATER

Strike ▽

Level after standing ▼

IN-SITU TESTING

N	Standard Penetration Test - Blows required to drive 300mm after seating drive
C	Standard Penetration Test - 60Cone
S	Standard Penetration Test – Split Spoon

Soil and rock descriptions are based on the guidance in BS5930:2015, The Code of Practice for Site Investigation

pgl priority geotechnical

Cork City Council Planning Department. For Inspection Purposes Only.

Priority Geotechnical Ltd.
Tel: 021 4631600
www.prioritygeotechnical.ie

Drilled By	AK & SC	**Location**	**RC-BH-01**		
Logged By	DS		Sheet 1 of 2		
Project Name	Greenfield Ballincollig - Site Investigation	**Project No.**	P25078	**Co-ords**	558074E - 569691N
Hole Type	RC				
Location	Ballincollig, Cork			**Level**	21.51 m OD
Scale	1:50				
Client	Murnane & O'Shea Ltd.			**Date**	16/04/2025 - 17/04/2025

Backfill	Water Strike (m bgl)	Sampling and In-Situ Testing: Depth (m bgl)	Type	Results	Coring %: TCR	SCR	RQD	FI/ Run	Spacing (mm)	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
		1.50	SPT(C)	N=30 (3,5/4.6,11,9)									Open hole boring. Driller described: Stiff, CLAY with boulder content.
		3.00	SPT(C)	53 (7,16/53 for 225mm)									
		3.40 - 4.50			44	0	0			3.40	18.11		Core run attempted. Poor recovery. Recovered as: CLAY with boulder content. Boulders are light grey, Limestone lithology.
		4.50 - 5.10			0	0	0			4.50	17.01		Core run attempted. No recovery. Driller described: CLAY with boulder content.
		6.00	SPT(C)	25 (25 for 75mm/25 for 75mm)						5.10	16.41		Open hole boring. Driller described: Possible weathered Limestone. Recovered as: Medium dense, sandy GRAVEL. Possible boring through vertical fracture filled with Sand & Gravel.
		7.50	SPT(C)	25 (25 for 75mm/25 for 75mm)									
		9.00	SPT(C)	25 (25 for 75mm/25 for 75mm)									
					TCR	SCR	RQD						

Shift Data

Date & Time	Depth (m bgl)	Water (m bgl)	Remarks
16/04/2025 08:00	0.00		Start of shift.
16/04/2025 18:00	13.50	2.50	End of shift.
17/04/2025 08:00	13.50	2.00	Start of shift.
17/04/2025 18:00	15.00	2.00	End of borehole.

Chiselling Details

Top (m bgl)	Base (m bgl)	Duration (hh:mm)	Tool

Plant	Soilmec PSM
Method	Compressed air mist

Hole Details		Casing Details	
Depth (m)	**Diameter (mm)**	**Depth (m)**	**Diameter (mm)**
13.50	131	13.50	131
15.00	76		

Remarks

Rotary borehole terminated at 15.00m bgl. Reached required depth. 50mm standpipe installed. Response zone from 9.00m to 15.00m bgl.

Groundwater Details

Strike (m bgl)	Rose (m bgl)	After (Mins)	Remarks
			See shift data.

Priority Geotechnical Ltd. **Tel: 021 4631600** **www.prioritygeotechnical.ie**		**Drilled By** AK & SC **Logged By** DS	**Location** **RC-BH-01** Sheet 2 of 2
Project Name Greenfield Ballincollig - Site Investigation	**Project No.** P25078	**Co-ords** 558074E - 569691N	**Hole Type** RC
Location Ballincollig, Cork		**Level** 21.51 m OD	**Scale** 1:50
Client Murnane & O'Shea Ltd.		**Date** 16/04/2025 - 17/04/2025	

Backfill	Water Strike (m bgl)	Sampling and In-Situ Testing: Depth (m bgl)	Type	Results	Coring %: TCR	SCR	RQD	Fl/ Run	Spacing (mm)	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
													Open hole boring. Driller described: Possible weathered Limestone. Recovered as: Medium dense, sandy GRAVEL. Possible boring through vertical fracture filled with Sand & Gravel.
		10.50	SPT(C)	25 (25 for 75mm/25 for 75mm)									
		12.00	SPT(C)	25 (25 for 75mm/25 for 75mm)									
		13.50 - 15.00			47	47	36	5	0mm min 290mm max 130mm avg	13.50	8.01		Lithology: Very strong, light grey, LIMESTONE. Weathering: Slightly weathered. Slight oxidation discolouration on fracture surfaces and 3.80m bgl. Fractures: 1 set observed dipping at 90-100 degrees with planar, smooth fracture surfaces and wide spacing.
										15.00	6.51		End of Borehole at 15.000m
					TCR	SCR	RQD						

Shift Data

Date & Time	Depth (m bgl)	Water (m bgl)	Remarks
16/04/2025 08:00	0.00		Start of shift.
16/04/2025 18:00	13.50	2.50	End of shift.
17/04/2025 08:00	13.50	2.00	Start of shift.
17/04/2025 18:00	15.00	2.00	End of borehole.

Chiselling Details

Top (m bgl)	Base (m bgl)	Duration (hh:mm)	Tool

Plant	Soilmec PSM
Method	Compressed air mist

Hole Details		Casing Details	
Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)
13.50	131	13.50	131
15.00	76		

Remarks

Rotary borehole terminated at 15.00m bgl. Reached required depth. 50mm standpipe installed. Response zone from 9.00m to 15.00m bgl.

Groundwater Details

Strike (m bgl)	Rose (m bgl)	After (Mins)	Remarks
			See shift data.

Cork City Council Planning Department. For Inspection Purposes Only!

Photographic Record

Number:	**RC-BH-01**	**Project** Greenfield Ballincollig **Project No** P25078	

Priority Geotechnical Ltd.
Tel: 021 4631600
www.prioritygeotechnical.ie

Drilled By	Location
AK & SC	RC-BH-02
Logged By	Sheet 1 of 2
DS	

Project Name	Greenfield Ballincollig - Site Investigation	**Project No.** P25078	**Co-ords**	558078E - 569514N	**Hole Type** RC
Location	Ballincollig, Cork		**Level**	20.97 m OD	**Scale** 1:50
Client	Murnane & O'Shea Ltd.		**Date**	17/04/2025 - 15/05/2025	

Backfill	Water Strike (m bgl)	Depth (m bgl)	Type	Results	TCR	SCR	RQD	Fl/ Run	Spacing (mm)	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
													Open hole boring. Driller described: Stiff, CLAY with boulder content.
		1.50	SPT(C)	N=16 (4,4/4,4,4,4)									
										3.00	17.97		Open hole boring. Driller described: Stiff, dark brown, slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium and sub-angular.
		3.60	SPT(C)	N=24 (3,4/9,5,5,5)									
		4.50	SPT(C)	N=42 (6,8/10,9,11,12)						4.50	16.47		Open hole boring. Driller described: Dense, light brown, silty sandy GRAVEL. Sand is fine to coarse. Gravel is fine and angular to sub-rounded.
		6.00	SPT(C)	N=19 (3,3/4,5,4,6)						6.00	14.97		Open hole boring. Driller described: Stiff, dark brown, slightly sandy CLAY. Sand is fine to coarse.
		7.50	SPT(C)	N=20 (3,3/3,6,6,5)						7.50	13.47		Open hole boring. Driller described: Medium dense, pale yellow, silty very sandy GRAVEL. Sand is fine to coarse. Gravel is fine and sub-angular to sub-rounded.
		9.00	SPT(C)	N=24 (1,5/5,6,7,6)									
					TCR	SCR	RQD						

1 2 3 4 5 6 7 8 9

Shift Data

Date & Time	Depth (m bgl)	Water (m bgl)	Remarks
17/04/2025 08:00	0.00		Start of shift.
17/04/2025 18:00	6.00	Dry	End of shift.
22/04/2025 08:00	6.00	2.00	Start of shift.
22/04/2025 18:00	15.30	2.00	End of borehole.

Chiselling Details

Top (m bgl)	Base (m bgl)	Duration (hh:mm)	Tool

Plant Soilmec PSM
Method Compressed air mist.

Hole Details		Casing Details	
Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)
10.60	131	10.60	131
15.30	76		

Remarks

Rotary borehole terminated at 15.30m bgl. Reached required depth. 50mm standpipe installed. Response zone from 10.90m to 14.90m bgl.

Groundwater Details

Strike (m bgl)	Rose (m bgl)	After (Mins)	Remarks
			See shift data.

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Drilled By	Location
AK & SC	RC-BH-02
Logged By	Sheet 2 of 2
DS	

Project Name	Greenfield Ballincollig - Site Investigation	**Project No.** P25078	**Co-ords**	558078E - 569514N	**Hole Type** RC
Location	Ballincollig, Cork		**Level**	20.97 m OD	**Scale** 1:50
Client	Murnane & O'Shea Ltd.		**Date**	17/04/2025 - 15/05/2025	

Backfill	Water Strike (m bgl)	Depth (m bgl)	Type	Results	TCR	SCR	RQD	Fl/ Run	Spacing (mm)	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
										10.20	10.77		Open hole boring. Driller described: Medium dense, pale yellow, silty very sandy GRAVEL. Sand is fine to coarse. Gravel is fine and sub-angular to sub-rounded.
		10.60 - 12.30			91					10.60	10.37		Open hole boring. Driller described: Possible Limestone bedrock. White flush return. Core runs attempted. No solid core recovery. Driller reported creamy white flush return. Assumed weathered Limestone bedrock.
		12.30 - 13.90			31								
		13.90 - 15.30			11								15.00m: Colour change to dark creamy yellow.
										15.30	5.67		End of Borehole at 15.300m
					TCR	SCR	RQD						

10 11 12 13 14 15 16 17 18

Shift Data

Date & Time	Depth (m bgl)	Water (m bgl)	Remarks
17/04/2025 08:00	0.00		Start of shift.
17/04/2025 18:00	6.00	Dry	End of shift.
22/04/2025 08:00	6.00	2.00	Start of shift.
22/04/2025 18:00	15.30	2.00	End of borehole.

Chiselling Details

Top (m bgl)	Base (m bgl)	Duration (hh:mm)	Tool

Plant Soilmec PSM
Method Compressed air mist.

Hole Details		Casing Details	
Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)
10.60	131	10.60	131
15.30	76		

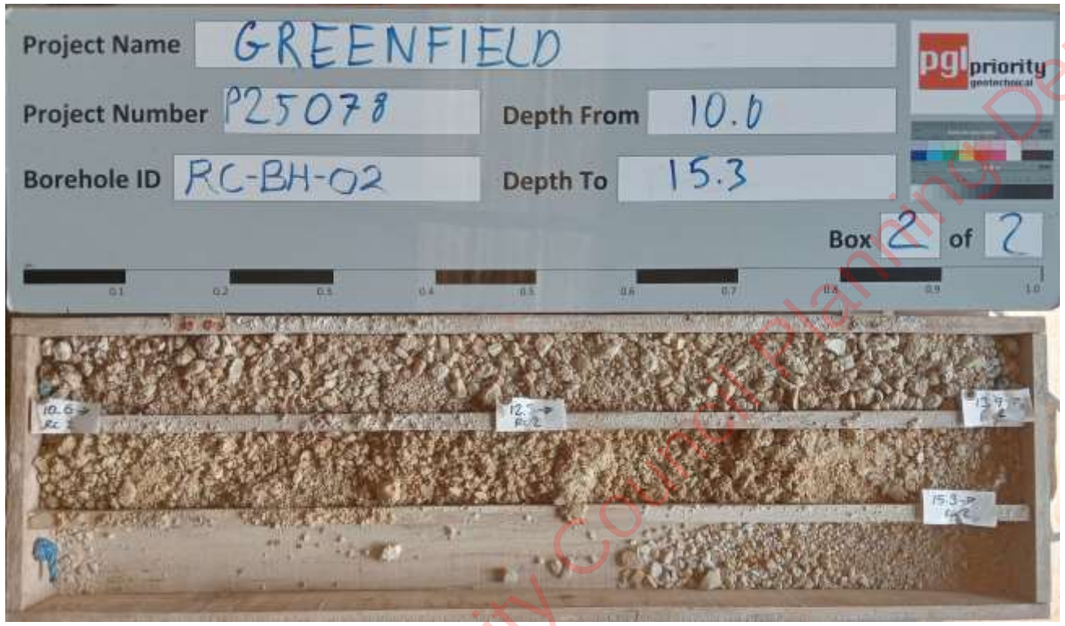
Remarks

Rotary borehole terminated at 15.30m bgl. Reached required depth. 50mm standpipe installed. Response zone from 10.90m to 14.90m bgl.

Groundwater Details

Strike (m bgl)	Rose (m bgl)	After (Mins)	Remarks
			See shift data.

Photographic Record



Number:	**RC-BH-02**	**Project**	Greenfield Ballincollig	
		Project No	P25078	

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Drilled By	AK & SC	**Location**	**RC-BH-03**
Logged By	DS		Sheet 1 of 3

Project Name	Greenfield Ballincollig - Site Investigation	**Project No.** P25078	**Co-ords**	558356E - 569547N	**Hole Type** RC
Location	Ballincollig, Cork		**Level**	19.89 m OD	**Scale** 1:50
Client	Murnane & O'Shea Ltd.		**Date**	23/04/2025 - 24/04/2025	

Backfill	Water Strike (m bgl)	Sampling and In-Situ Testing: Depth (m bgl)	Type	Results	Coring %: TCR	SCR	RQD	Fl/ Run	Spacing (mm)	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
													Open hole boring. Driller described: CLAY.
										3.00	16.89		Open hole boring. Driller described: Gravelly CLAY.
										4.50	15.39		Open hole boring. Driller described: CLAY with boulder content.
										6.00	13.89		Open hole boring. Driller described: Slightly sandy CLAY.
													7.50m: Driller noted 'blowing sands'.
					TCR	SCR	RQD						

Shift Data

Date & Time	Depth (m bgl)	Water (m bgl)	Remarks
23/04/2025 08:00	0.00		Start of shift.
23/04/2025 18:00	19.50	13.00	End of shift.
24/04/2025 08:00	19.50		Start of shift.
24/04/2025 18:00	19.50		End of borehole.

Chiselling Details

Top (m bgl)	Base (m bgl)	Duration (hh:mm)	Tool

Plant	Soilmec PSM
Method	Compressed air mist

Hole Details		Casing Details	
Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)
19.50	131	19.50	131

Remarks

Rotary borehole terminated at 19.50m bgl. Reached required depth. 50mm standpipe installed. Response zone from 15.50m to 19.50m bgl.

Groundwater Details

Strike (m bgl)	Rose (m bgl)	After (Mins)	Remarks
13.20			See shift data.

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Drilled By	Location
AK & SC	RC-BH-03
Logged By	Sheet 2 of 3
DS	

Project Name	Greenfield Ballincollig - Site Investigation	**Project No.** P25078	**Co-ords**	558356E - 569547N	**Hole Type** RC
Location	Ballincollig, Cork		**Level**	19.89 m OD	**Scale** 1:50
Client	Murnane & O'Shea Ltd.		**Date**	23/04/2025 - 24/04/2025	

Backfill	Water Strike (m bgl)	Sampling and In-Situ Testing: Depth (m bgl)	Type	Results	Coring %: TCR	SCR	RQD	Fl/ Run	Spacing (mm)	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
													Open hole boring. Driller described: Slightly sandy CLAY.
										12.00	7.89		Open hole boring. Driller described: Gravelly CLAY.
										13.50	6.39		Open hole boring. Driller described: Light yellowish brown, gravelly CLAY. Gravel is fine to medium and sub-angular.
										15.00	4.89		Open hole boring. Driller described: Light brown, sandy CLAY. Sand is fine to coarse.
										18.00	1.89		Open hole boring. Driller described:

10 11 12 13 14 15 16 17 18

Shift Data				Chiselling Details				Plant	Soilmec PSM
Date & Time	Depth (m bgl)	Water (m bgl)	Remarks	Top (m bgl)	Base (m bgl)	Duration (hh:mm)	Tool	Method	Compressed air mist
23/04/2025 08:00	0.00		Start of shift.					Hole Details: Depth (m) 19.50; Diameter (mm) 131	Casing Details: Depth (m) 19.50; Diameter (mm) 131
23/04/2025 18:00	19.50	13.00	End of shift.						
24/04/2025 08:00	19.50		Start of shift.						
24/04/2025 18:00	19.50		End of borehole.						

Remarks

Rotary borehole terminated at 19.50m bgl. Reached required depth. 50mm standpipe installed. Response zone from 15.50m to 19.50m bgl.

Groundwater Details

Strike (m bgl)	Rose (m bgl)	After (Mins)	Remarks
13.20			See shift data.

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Drilled By	Location
AK & SC	RC-BH-03
Logged By	Sheet 3 of 3
DS	

Project Name	Greenfield Ballincollig - Site Investigation	**Project No.** P25078	**Co-ords**	558356E - 569547N	**Hole Type** RC
Location	Ballincollig, Cork		**Level**	19.89 m OD	**Scale** 1:50
Client	Murnane & O'Shea Ltd.		**Date**	23/04/2025 - 24/04/2025	

Backfill	Water Strike (m bgl)	Sampling and In-Situ Testing: Depth (m bgl)	Type	Results	Coring %: TCR	SCR	RQD	Fl/ Run	Spacing (mm)	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
										19.50	0.39		Open hole boring. Driller described: Weathered rock. Chippings recovered as: Dark grey, sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium and sub-angular to sub-rounded.
													End of Borehole at 19.500m

19 20 21 22 23 24 25 26 27

Shift Data				Chiselling Details				Plant	Soilmec PSM
Date & Time	Depth (m bgl)	Water (m bgl)	Remarks	Top (m bgl)	Base (m bgl)	Duration (hh:mm)	Tool	Method	Compressed air mist
23/04/2025 08:00	0.00		Start of shift.					Hole Details: Depth (m) 19.50; Diameter (mm) 131	Casing Details: Depth (m) 19.50; Diameter (mm) 131
23/04/2025 18:00	19.50	13.00	End of shift.						
24/04/2025 08:00	19.50		Start of shift.						
24/04/2025 18:00	19.50		End of borehole.						

Remarks

Rotary borehole terminated at 19.50m bgl. Reached required depth. 50mm standpipe installed. Response zone from 15.50m to 19.50m bgl.

Groundwater Details

Strike (m bgl)	Rose (m bgl)	After (Mins)	Remarks
13.20			See shift data.

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Photographic Record

Number:	**RC-BH-03**	**Project** / **Project No**	Greenfield Ballincollig / P25078

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Project Name	Greenfield Ballincollig - Site Investigation	**Project No.** P25078	**Co-ords**	558172E - 569749N	
Location	Ballincollig, Cork		**Level**	22.01 m OD	
Client	Murnane & O'Shea Ltd.		**Date**	24/04/2025 - 25/04/2025	

Drilled By	Location
AK & SC	**RC-BH-04**
Logged By	Sheet 1 of 2
DS	**Hole Type** RC
	Scale 1:50

Backfill	Water Strike (m bgl)	Sampling and In-Situ Testing			Coring %			FI/ Run	Spacing (mm)	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
		Depth (m bgl)	Type	Results	TCR	SCR	RQD						
		1.50	SPT(C)	N=24 (3,3/4,6,6,8)									Open hole boring. Driller described: Stiff, CLAY with boulder content.
		3.00	SPT(C)	N=21 (4,5/5,4,5,7)									
		4.50	SPT(C)	N=26 (5,5/5,5,7,9)									
		6.00	SPT(C)	N=27 (8,7/6,6,7,8)									
		7.50	SPT(C)	N=31 (5,6/7,7,7,10)									
		9.00	SPT(C)	61 (6,18/61 for 225mm)									
					TCR	SCR	RQD						

1 2 3 4 5 6 7 8 9

Shift Data

Date & Time	Depth (m bgl)	Water (m bgl)	Remarks
24/04/2025 08:00	0.00		Start of shift.
24/04/2025 18:00	9.00	Dry	End of shift.
25/04/2025 08:00	9.00	2.00	Start of shift.
25/04/2025 18:00	13.50	2.00	End of borehole.

Chiselling Details

Top (m bgl)	Base (m bgl)	Duration (hh:mm)	Tool

Plant	Soilmec PSM
Method	Compressed air mist

Hole Details		Casing Details	
Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)
13.50	131	13.50	131

Remarks

Inspection pit dug prior to drilling. Rotary borehole terminated at 13.50m bgl. Reached required depth. 50mm standpipe installed. Response zone from 10.50m to 13.50m bgl.

Groundwater Details

Strike (m bgl)	Rose (m bgl)	After (Mins)	Remarks
			See shift data.

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Drilled By	Location
AK & SC	**RC-BH-04**
Logged By	
DS	Sheet 2 of 2

Project Name	Greenfield Ballincollig - Site Investigation	**Project No.** P25078	**Co-ords**	558172E - 569749N	**Hole Type** RC
Location	Ballincollig, Cork		**Level**	22.01 m OD	**Scale** 1:50
Client	Murnane & O'Shea Ltd.		**Date**	24/04/2025 - 25/04/2025	

Backfill	Water Strike (m bgl)	Sampling and In-Situ Testing: Depth (m bgl)	Type	Results	Coring %: TCR	SCR	RQD	FI/ Run	Spacing (mm)	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
										9.80	12.21		Open hole boring. Driller described: Stiff, CLAY with boulder content.
													Open hole boring. Driller described: Bedrock. Assumed Limestone Lithology.
		10.40 - 11.60			93	49	49	4	0mm min 490mm max 100mm avg	10.40	11.61		Lithology: Very strong, light grey, fossiliferous LIMESTONE. Weathering: Moderately weathered. Oxidation discolouration present on fracture surfaces at 11.50m bgl. Clay infilling present on fracture surfaces between 10.40mm and 12.30m bgl. Core is brecciated between 12.30m and 13.40m bgl. Fractures: 2 sets observed. Set 1 is dipping 70 degrees with undulating, rough fracture surfaces and wide spacing. Set 2 is dipping 110 degrees with planar, rough fracture surfaces and close spacing.
		11.60 - 12.30			100	29	29	6	0mm min 200mm max 90mm avg				
		12.30 - 12.90			100	0	0		0mm min 100mm max 40mm avg				
		12.90 - 13.40			100	0	0		0mm min 70mm max 30mm avg				*10.40m - 13.50m: Hole collapsing, driller re-cased borehole to 13.50m bgl to allow installation of standpipe.*
										13.50	8.51		End of Borehole at 13.500m
					TCR	SCR	RQD						

10 11 12 13 14 15 16 17 18

Shift Data

Date & Time	Depth (m bgl)	Water (m bgl)	Remarks
24/04/2025 08:00	0.00		Start of shift.
24/04/2025 18:00	9.00	Dry	End of shift.
25/04/2025 08:00	9.00	2.00	Start of shift.
25/04/2025 18:00	13.50	2.00	End of borehole.

Chiselling Details

Top (m bgl)	Base (m bgl)	Duration (hh:mm)	Tool

Plant	Soilmec PSM
Method	Compressed air mist

Hole Details		Casing Details	
Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)
13.50	131	13.50	131

Remarks

Inspection pit dug prior to drilling. Rotary borehole terminated at 13.50m bgl. Reached required depth. 50mm standpipe installed. Response zone from 10.50m to 13.50m bgl.

Groundwater Details

Strike (m bgl)	Rose (m bgl)	After (Mins)	Remarks
			See shift data.

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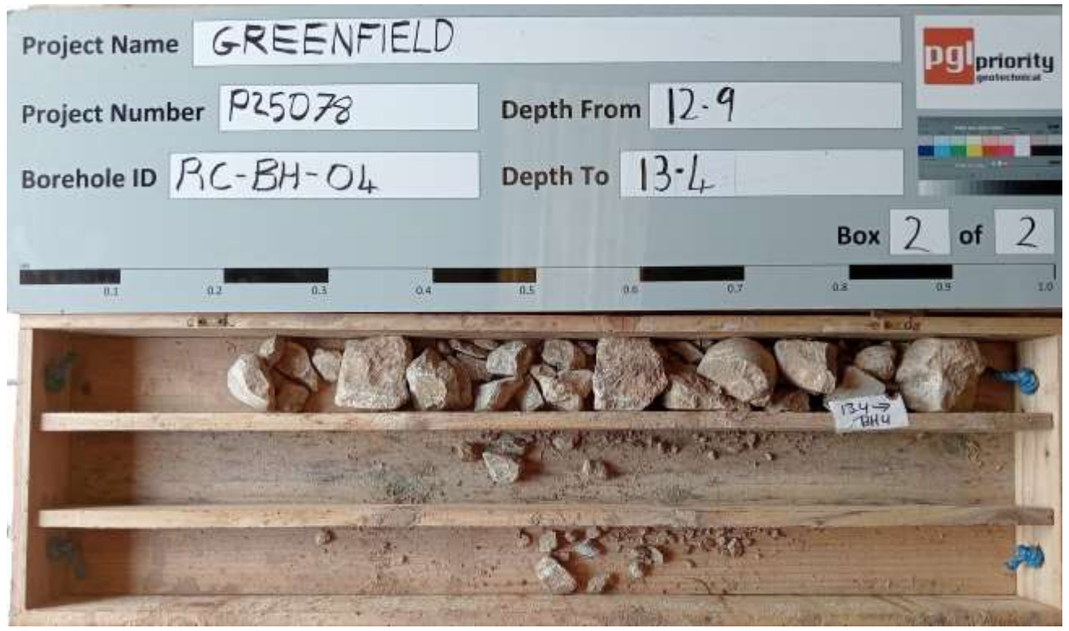
Photographic Record



Number:	**RC-BH-04**	**Project**	Greenfield Ballincollig
		Project No	P25078

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Project Name	Greenfield Ballincollig - Site Investigation	**Project No.** P25078	**Co-ords**	557867E - 569844N	**Hole Type** RC
Location	Ballincollig, Cork		**Level**	29.38 m OD	**Scale** 1:50
Client	Murnane & O'Shea Ltd.		**Date**	28/05/2025 - 29/05/2025	

Backfill	Water Strike (m bgl)	Sampling and In-Situ Testing: Depth (m bgl)	Type	Results	Coring %: TCR	SCR	RQD	Fl/ Run	Spacing (mm)	Depth (m bgl)	Level (mOD)	Legend	Stratum Description
		1.50	SPT(C)	N=17 (1,2/3,2,4,8)									Open hole boring. Driller described: Stiff, CLAY with boulder content.
		2.90 2.90 - 4.40	SPT(C)	25 (25 for 5mm/25 for 1mm)	98	73	73	9	0mm min 210mm max 110mm avg	2.90	26.48		Lithology: Very strong, light grey, LIMESTONE. Weathering: Slightly weathered. Oxidation discolouration present on fracture surfaces at 4.90m and 5.60m bgl. Core is brecciated between 5.60m to 5.80m bgl. Fractures: 3 sets observed. Set 1 is dipping 70-80 degrees with undulating, smooth fracture surfaces and moderate spacing. Set 2 is dipping 10-15 degrees with stepped, rough fracture surfaces and close spacing. Set 3 is dipping 160 degrees with planar, smooth fracture surfaces and wide spacing.
		4.40 - 5.60			100	67	51	10	0mm min 340mm max 130mm avg				
	▼	5.60 - 7.10			100	86	59	11	0mm min 310mm max 160mm avg				
		7.10 - 7.80			100	26	26		0mm min 180mm max 90mm avg	7.80	21.58		End of Borehole at 7.800m
					TCR	SCR	RQD						

Shift Data

Date & Time	Depth (m bgl)	Water (m bgl)	Remarks
28/05/2025 08:00	0.00		Start of shift.
28/05/2025 18:00	7.80	6.20	End of shift.
29/05/2025 08:00	7.80		Start of shift.
29/05/2025 18:00	7.80		End of borehole.

Chiselling Details

Top (m bgl)	Base (m bgl)	Duration (hh:mm)	Tool

Plant	Soilmec PSM
Method	Compressed air mist

Hole Details		Casing Details	
Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)
2.90	131	2.90	131
7.80	76		

Remarks

Rotary borehole terminated at 7.80m bgl. Reached required depth. 50mm standpipe installed. Response zone from 4.80m to 7.80m bgl.

Groundwater Details

Strike (m bgl)	Rose (m bgl)	After (Mins)	Remarks
6.50			See shift data.

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Photographic Record

Number:	RC-BH-05	Project	Greenfield Ballincollig
		Project No	P25078

CHAPTER SEVEN

WATER (HYDROLOGY & HYDROGEOLOGY)

APPENDIX 7-1 Surface Water Sampling Locations
APPENDIX 7-2 Surface Water Result Certificates
APPENDIX 7-3 Site Specific Flood Risk Assessment – Malachy Walsh & Partners
APPENDIX 7-4 Drainage Impact Assessment – DOSA Consulting Engineers
APPENDIX 7-5 Water Framework Directive Assessment - Keohane Geological & Environmental Consultancy

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APPENDIX 7-1 Surface Water Sampling Locations

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Greenfield Development
Surface Water Sampling Locations

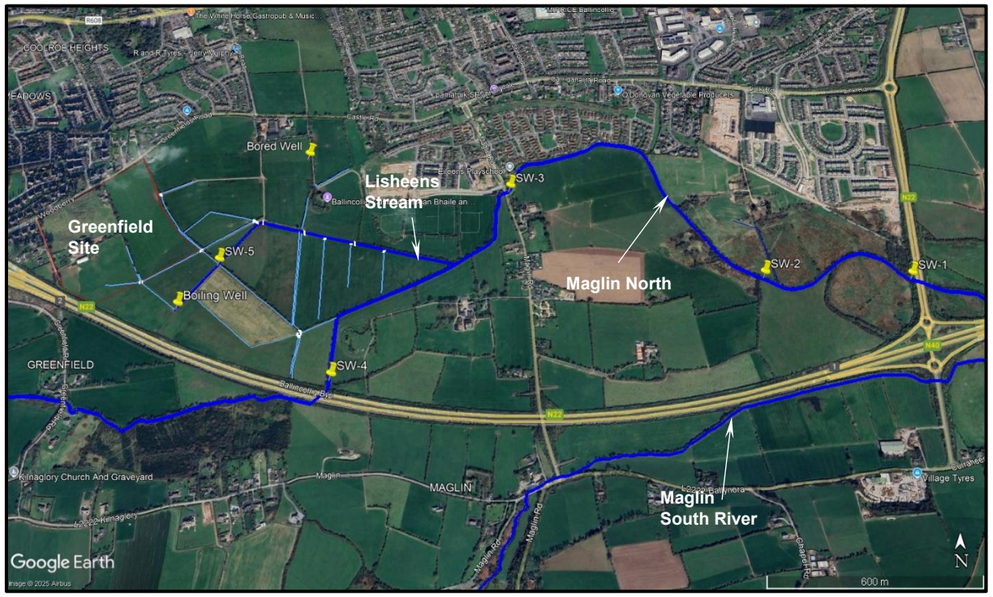

Figure A7.1-1: SW Monitoring Locations

Plate 1: **SW Sampling Location SW1 – Maglin North at N22 Culvert**

Plate 2: **SW Sampling Location SW2 – Maglin North at Former Confluence with Maglin South**

Plate 3: **SW Sampling Location SW3 – Maglin North at Maglin Road Bridge**

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Plate 4: **SW Sampling Location SW4 – Maglin North D/S of By-Pass Culvert**

Plate 5: **SW Sampling Location SW5 – Lisheens Stream**

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APPENDIX 7-2 Surface Water Result Certificates

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University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Environmental Research Institute

Environmental Research Institute,
Lee Road, University College Cork

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Analysis Certificate (Ballincollig)						
	Sampling Date	14/02/2024	14/02/2024	14/02/2024	14/02/2024	14/02/2024
	Arrival Date	15/02/2024	15/02/2024	15/02/2024	15/02/2024	15/02/2024
EPA approved	**Sample**	**SW1**	**SW2**	**SW3**	**SW4**	**SW5**
Yes	**Total Alkalinity (mg $CaCO_3$/l)**	144	145	131	112	275
Yes	**Total Nitrogen (mg N/l)**	4.950	5.120	5.150	5.580	4.560
Yes	**Nitrate (mg N/l)**	3.987	4.155	4.309	4.750	3.899
N/A	**Nitrite (mg N/l)**	0.031	0.029	0.023	0.020	0.008
Yes	**Total Ammonia (mg N/l)**	0.097	0.090	0.078	0.077	0.033
N/A	**Unionised Ammonia (mg N/l)**	0.004	0.003	0.003	0.002	0.001
Yes	**Ortho-P (mg P/l)**	0.055	0.054	0.050	0.054	0.020
Yes	**Total-P (mg P/l)**	0.139	0.127	0.118	0.106	0.042
Yes	**BOD (mg O_2/l)**	1.7	1.3	1.0	1.2	0.3
Yes	**COD (mg O_2/l)**	24.4	21.8	22.2	19.2	15.3
Yes	**Chloride (mg Cl/l)**	20.0	20.2	20.5	21.1	26.5
Yes	**Suspended Solids (mg/l)**	13.3	11.8	11.5	9.8	3.8
Yes	**Conductivity @25°C (µS/cm)**	394	397	377.0	364	656
N/A	**Turbidity (NTU)**	14.83	13.63	13.19	9.93	3.89

Arrial Date: 15-02-24
Report Date: 20-02-24

University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

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Analysis Certificate (M&OS-Ballincollig)						
	Sampling Date	07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
	Arrival Date	07/05/2025	07/05/2025	07/05/2025	07/05/2025	07/05/2025
EPA approved	**Sample**	**SW1**	**SW2**	**SW3**	**SW4**	**SW5**
Yes	**Total Alkalinity (mg $CaCO_3$/l)**	145	135	123	103	235
Yes	**Total Nitrogen (mg N/l)**	5.964	6.479	6.193	6.221	6.539
Yes	**Nitrate (mg N/l)**	5.429	5.674	5.639	5.863	6.110
N/A	**Nitrite (mg N/l)**	0.013	0.012	0.009	0.006	0.008
Yes	**Total Ammonia (mg N/l)**	0.038	0.020	0.027	0.021	0.034
N/A	**Unionised Ammonia (mg N/l)**	<0.001	<0.001	<0.001	<0.001	0.001
Yes	**Ortho-P (mg P/l)**	0.034	0.032	0.033	0.040	0.014
Yes	**Total-P (mg P/l)**	0.055	0.055	0.045	0.049	0.023
Yes	**BOD (mg O_2/l)**	0.8	0.8	0.6	0.8	1.2
Yes	**COD (mg O_2/l)**	9.2	11.8	9.2	7.9	8.8
Yes	**Chloride (mg Cl/l)**	20.7	21.0	21.0	20.2	24.7
Yes	**Suspended Solids (mg/l)**	6.0	8.0	2.5	2.8	12.3
Yes	**Conductivity @25°C (µS/cm)**	415	395	378	342	587
N/A	**Turbidity (NTU)**	6.67	7.99	3.82	2.79	7.82

Arrival Date: 07-05-25
Report Date: 19-05-25

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APPENDIX 7-3 Site Specific Flood Risk Assessment – Malachy Walsh & Partners

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MWP

Flood Risk Assessment

Greenfield Residential Development, Ballincollig, Cork

Murnane O' Shea

June 2025

Cork City Council Planning Department. For Inspection Purposes Only!

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Appendix 1 – Site Layout Plan
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Flood Risk Assessment Report
Greenfield Residential Development
MWP

1. General

1.1 Introduction

Malachy Walsh and Partners (MWP) Consulting Engineers have been commissioned by Murnane O' Shea to carry out a Flood Risk Assessment for a proposed residential development at Greenfield, Ballincollig, Cork.

1.2 Overview of Existing Site

The site is located in Greenfield, Ballincollig, Cork. The total area of the site is 15.4 hectares.

The existing site is largely a greenfield site. The site is bounded by pastures to the southeast and east, the N22 Ballincollig Bypass to the southwest and residential developments to the west and north.

The site slopes from northwest to southeast. Elevations of c.30mOD were surveyed along the northwestern boundary of the site. Elevations of c.18.5mOD were surveyed along the southeastern boundary of the site.

The existing site location is highlighted in Figure 1.1.

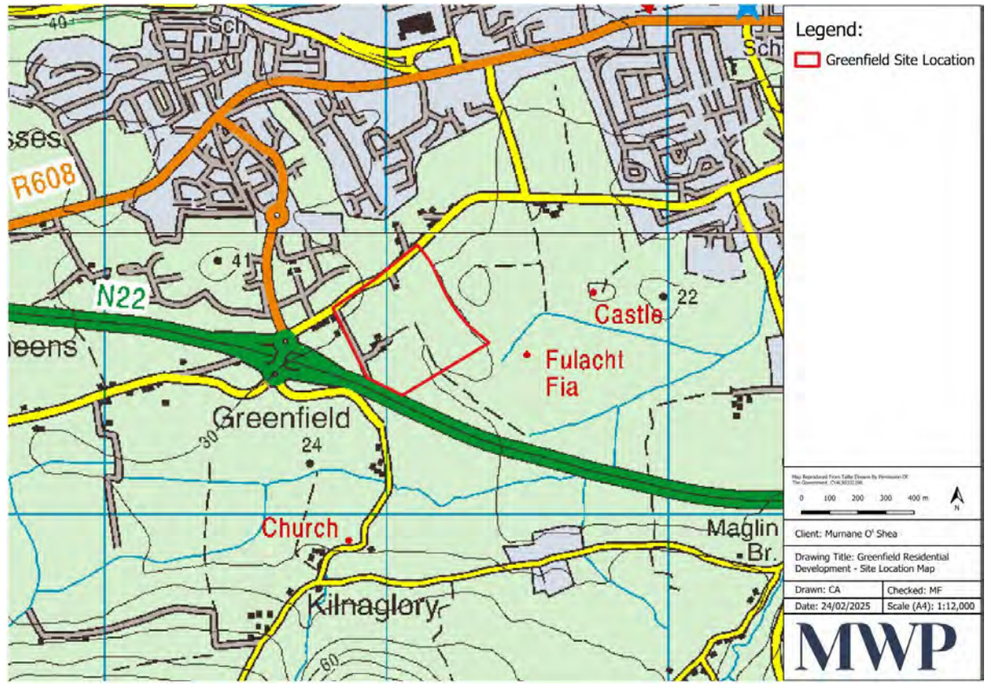

Figure 1.1: Site Location Map

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1.3 Overview of Proposed Development

The proposed development comprises a Large-Scale Residential Development (LRD) at Greenfield (townland), Ballincollig Cork. The proposed development consists of the demolition of an existing dwelling house, farmyard and associated agricultural buildings and the construction of a residential development of 546 no. units (234 no. dwelling houses and 312 no. apartment/duplex units. Vehicular access to the proposed development will be provided via 2 no. entrances from the Greenfield Road with separate pedestrian entrances also provided. Ancillary site works include the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex buildings, a creche facility and public realm upgrades to the Greenfield Road.

The proposed site layout is illustrated in Figure 1.2 below.

Figure 1.2: Proposed Site Layout

1.4 Objectives

The purpose of the report is to establish the flood risk associated with the proposed development and, if appropriate, to recommend mitigation measures to prevent any increase in flood risk within the site or externally in the wider area.

The report has been prepared in the context of *The Planning System and Flood Risk Management – Guidelines for Planning Authorities, November 2009*, published by the Office of Public Works and the Department of Environment, Heritage and Local Government. Flood Risk Assessments are carried out at different scales by different organisations. The hierarchy of assessment types are Regional Flood Risk Assessment(RFRA), Strategic Flood Risk Assessment (SFRA) and Site-specific Flood Risk Assessment (FRA). This report is site-specific.

1.5 Methodology

The Flood Risk Management Guidelines document outlines three stages in the assessment of flood risk as follows:

Stage 1 Flood risk identification – to identify whether there may be any flooding or surface water management issues related to a plan area or proposed development site that may warrant further investigation;

Stage 2 Initial flood risk assessment – to confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information and to determine what surveys and modelling approach is appropriate to match the spatial resolution required and complexity of the flood risk issues. The extent of the risk of flooding should be assessed which may involve preparing indicative flood zone maps. Where existing river or coastal models exist, these should be used broadly to assess the extent of the risk of flooding and potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures; and

Stage 3 Detailed risk assessment – to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures. This will typically involve use of an existing or construction of a hydraulic model or a river or coastal cell across a wide enough area to appreciate the catchment wide impacts and hydrological processes involved.

This report has been prepared generally in accordance with these stages.

1.6 Flood Risk & Zones

In the Planning System and Flood Risk Management Guidelines document, the likelihood of a flood occurring is established through the identification of Flood Zones which indicate a high, moderate or low risk of flooding from fluvial or tidal sources. Table 1.1 below includes the definition of Flood Zones as well as the implications for planning.

The flood zone type is determined based on current water surface levels without allowance for climate change and without the benefit of any flood defences.

It is important to note that the Flood Zones do not take into account other sources of flooding, such as groundwater or pluvial, so an assessment of risk arising from such sources should also be made, where appropriate.

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Flood Zone	Description & Summary of Planning Implications
Zone A High probability of flooding	More than 1% probability (1 in 100) for river flooding and more than 0.5% probability (1 in 200) for coastal flooding. Most types of development would be considered inappropriate in this zone.
Zone B Moderate probability of flooding	0.1% to 1% probability (between 1 in 100 and 1 in 1,000) for river flooding and 0.1% to 0.5% probability (between 1 in 200 and 1 in 1,000) for coastal flooding. Highly vulnerable development, such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses and primary strategic transport and utilities infrastructure, would generally be considered inappropriate in this zone.
Zone C Low probability of flooding	This zone defines areas with a low risk of flooding from rivers and the coast (i.e. less than 0.1% probability or less than 1 in 1,000). Development in this zone is appropriate from a flooding perspective (subject to assessment of flood hazard from sources other than rivers and the coast).

Table 1.1: Definitions of Flood Zones

The Guidelines have outlined three Vulnerability Classifications for developments based on the proposed land use and type of development. These classifications and particular examples of development types which would be included in each classification are summarised as follows;

- **Highly Vulnerable Development:** This would include emergency services, hospitals, schools, residential institutions, dwelling houses, essential infrastructure, water & sewage treatment etc.
- **Less Vulnerable Development:** Retail, leisure, commercial, industrial buildings, local transport infrastructure.
- **Water-compatible development:** Docks, marinas and wharves. Amenity and open space, outdoor sports and recreation and essential facilities such as changing rooms.

The Guidelines include a matrix that determines the appropriateness of different types of development based on their vulnerability classification and the Flood Zones in which they are located. The matrix is reproduced in Table 1.2 below.

Where the matrix indicates that a development is not appropriate it may still be justified based on a procedure described as a Justification Test.

Vulnerability Classification	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable Development (Including essential Infrastructure)	Justification Test	Justification Test	Appropriate
Less Vulnerable Development	Justification Test	Appropriate	Appropriate
Water-compatible Development	Appropriate	Appropriate	Appropriate

Table 1.2: Vulnerability Matrix

2. Flood Risk Identification (Stage 1)

Possible sources of flood risk were identified by;

- Geology & Soil Maps
- EPA Watercourse Maps
- Flood History - Examination of available information on the OPW website (www.floodinfo.ie)
- South Ballincollig Drainage Study - Strategic Flood Risk Assessment
- Lee Catchment Flood Risk and Management Study (CFRAMS)
- National Indicative Fluvial Mapping (NIFM)
- OPW Arterial Drainage Scheme & Drainage Districts
- GSI Winter 2015/2016 Surface Water Flooding
- GSI Predictive & Historic Groundwater Flood Mapping
- Internet Searches
- Site Walkover & Anecdotal Information

2.1 Geology & Soil Mapping

The GSI bedrock geology map is presented in Figure 2.1. Bedrock is the solid rock at or below the land surface. Over much of Ireland, the bedrock is covered by materials such as soil and gravel. The Bedrock map shows what the land surface of Ireland would be made up of if these materials were removed. As the bedrock is commonly covered, bedrock maps are an interpretation of the available data. The bedrock geology at the proposed site location comprises of the *Little Island Formation* and *Waulsortian Limestones*. Little Island Formation (CDLITT) is described as Carboniferous massive calcilutite limestones (mudbank facies) and crinoidal calcilutites. The formation is a uniform succession of crinoidal biomicrite limestones (wackestones) and massive unbedded calcilutite limestones of mudbank facies. The top of the formation is highly crinoidal and passes up to poorly bedded wackestones. The formation is estimated to be up to 500m thick. Waulsortian Limestones (CDWAUL) is described as Carboniferous massive, unbedded limes mudstones. Sometimes informally called "reef" limestones, although inaccurate. Dominantly pale grey, crudely bedded or massive limestone. Known to be moderately to intensely karstified. Typically, 300m - 500m thick.

The Quaternary sediments map is presented in Figure 2.2. The map shows the sediments mapped within 1 metre of the surface which were laid down during the Quaternary, bedrock at or close to the surface, water bodies or made ground. The Quaternary sediments underlaying the site is primarily "*TDSs – Till derived from Devonian Sandstones"*. There is also an instance of bedrock outcrop or subcrop mapped in the northwest corner of the site.

The National Soils Map is presented in Figure 2.3. The site is primarily composed of *"AminDW - Deep well drained mineral (Mainly acidic)"* sourced from Devonian Sandstone till.

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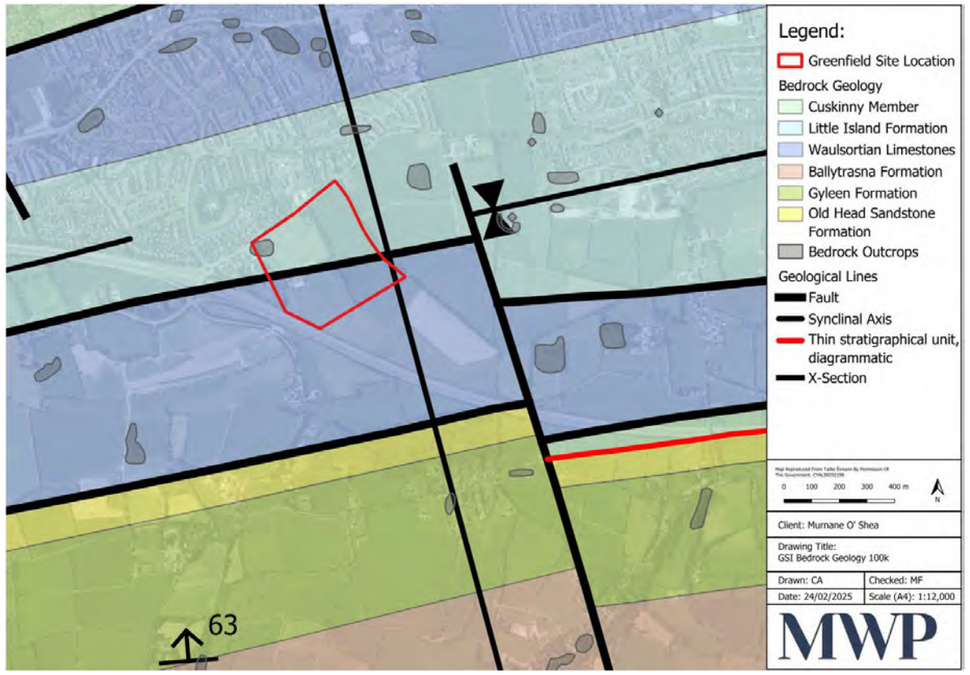

Figure 2.1: GSI Bedrock Geology 100k Map

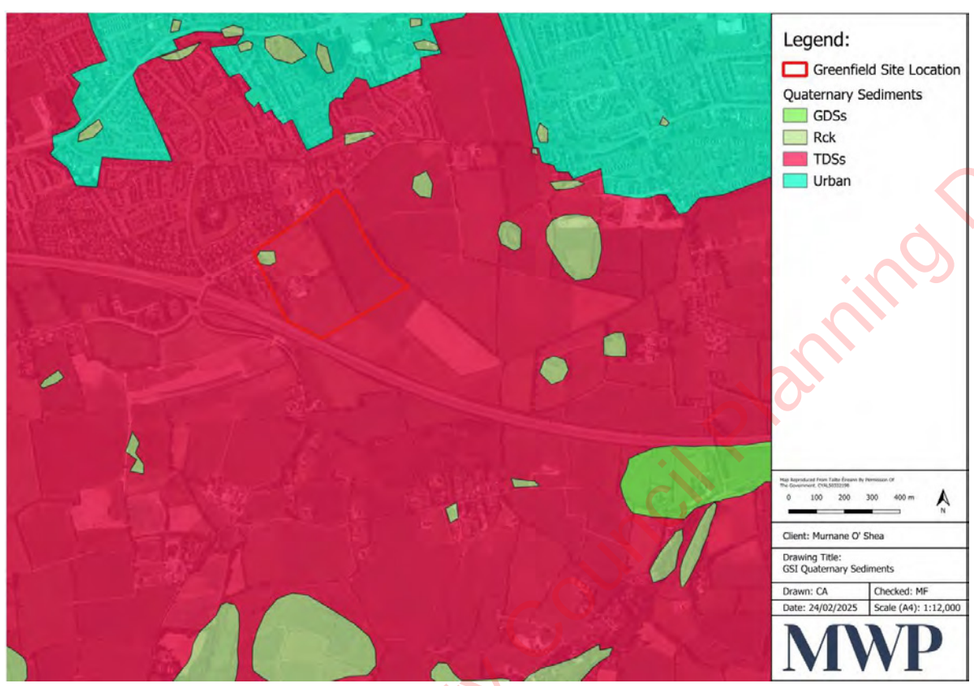

Figure 2.2: GSI Quaternary Sediments

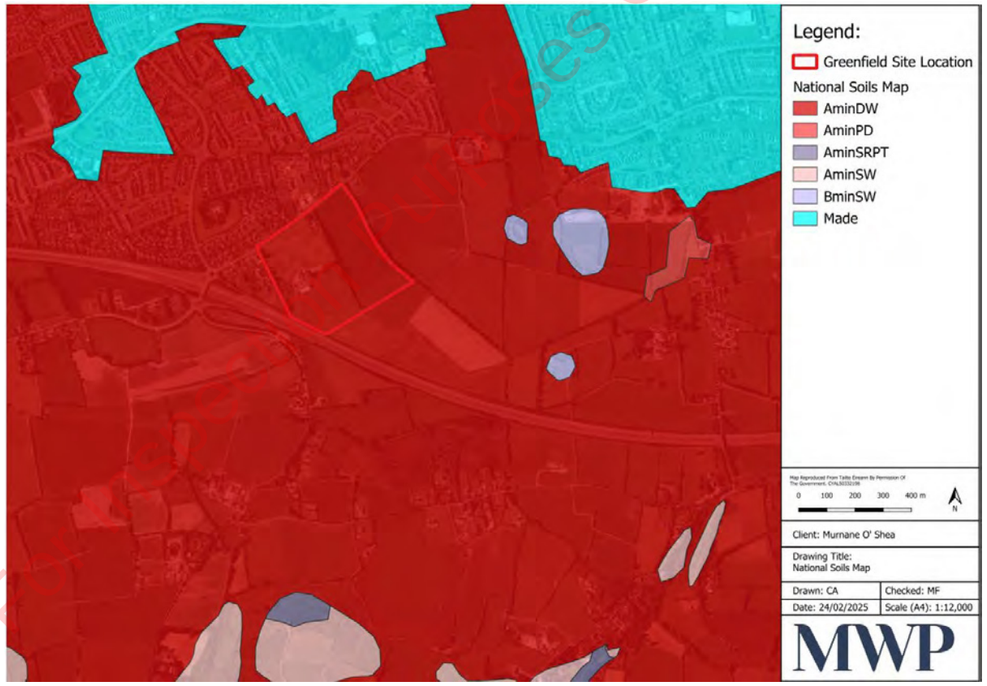

Figure 2.3: National Soils Map

2.2 EPA Watercourse Mapping

The EPA River Network database was reviewed to identify any watercourses located within or in close proximity of the proposed development site. Two watercourses were identified in close proximity of the site, the Maglin North River flowing from west to east through the Maglin area and Lisheens Stream flowing firstly from south to north before flowing east towards the Maglin North River. At its closest point, Lisheens Stream passes within 75m of the proposed development site. The Maglin North River at its closest point is approximately 500m from the proposed development site. The watercourses identified above are labelled in Figure 2.4.

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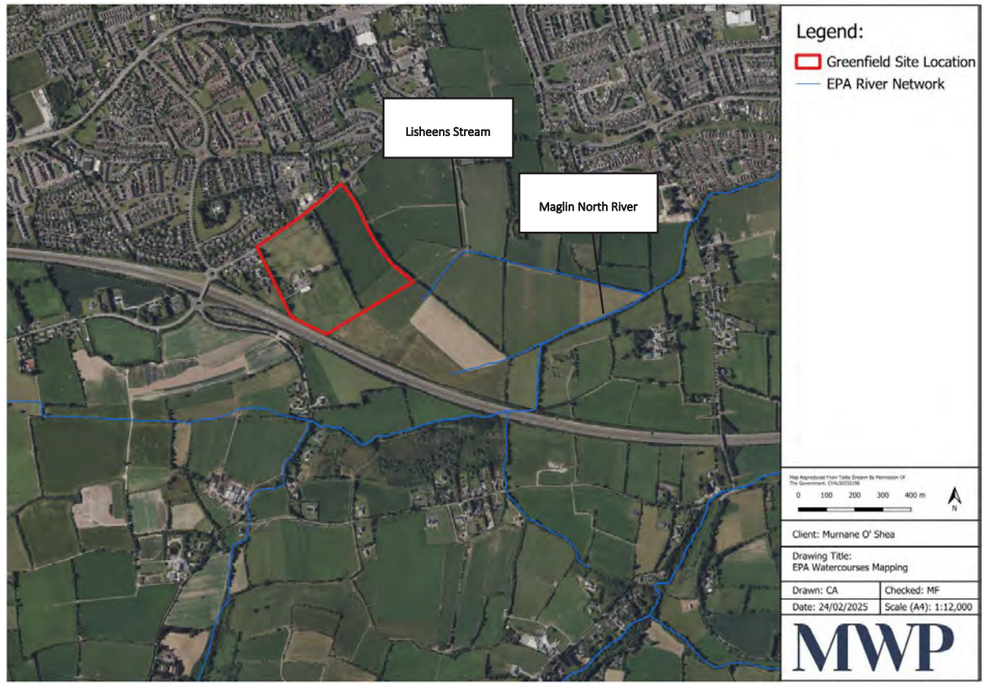


Figure 2.4: EPA Watercourse Mapping

2.3 Flood History – OPW Local Area Summary Report

The Past Flood Event Local Area Summary Report which was obtained from the Office of Public Works (OPW) floodinfo.ie website summarises all recorded past flood events within 2.5km of the site. There are 12 flood events which have been reported below which are largely located within 2.5km of the proposed development site. There is no recorded history of flooding within the proposed development site.

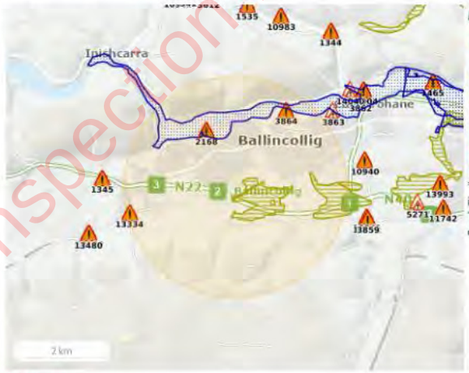
Past Flood Event Local Area Summary Report

OPW

Report Produced: **25/2/2025 11:19**

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.



12 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Army Barracks Ballincollig Co. Cork undated (ID-3864)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
2.	Lee Inniscarra to Cork City Aug 1986 (ID-492)	04/08/1986	Area
	Additional Information: Reports (8) Press Archive (3)		
3.	Lee Oct 1975 (ID-2168)	21/10/1975	Approximate Point
	Additional Information: Reports (2) Press Archive (1)		
4.	Lee Dec 1978 (ID-2170)	01/12/1978	Approximate Point
	Additional Information: Reports (3) Press Archive (2)		
5.	Lee Oct Nov 1980 (ID-2172)	31/10/1980	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
6.	Lee Inniscarra Bridge November 2000 (ID-1469)	28/11/2000	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
7.	Lee Sept 1957 (ID-122)	21/09/1957	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
8.	Lee Feb 1966 (ID-123)	03/02/1966	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
9.	Lee Dec 1964 (ID-136)	11/12/1964	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
10.	Ballincollig Regional Park, Co. Cork Recurring (ID-3865)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
11.	Lee Inniscarra Bridge Nov 1997 (ID-1464)	18/11/1997	Approximate Point
	Additional Information: Reports (3) Press Archive (0)		
12.	Lee Feb 1997 (ID-124)	16/02/1997	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		

Figure 2.5: OPW Local Area Summary Report

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2.4 South Ballincollig Drainage Study - Strategic Flood Risk Assessment

Malachy Walsh and Partners (MWP) Consulting Engineers were commissioned by Cork City Council (CCC) to carry out a Strategic Flood Risk Assessment (SFRA) in relation to the development of lands in Maglin, Ballincollig, Cork. This was completed in October 2021. A detailed hydrological analysis was carried out to estimate the flood flows throughout the study area and the surrounding areas. The results of this analysis were used as input parameters to the hydraulic modelling.

Detailed hydraulic analysis was also carried out which included modelling of approximately 3.2km of the Maglin North River, 2.1km of Maglin South River, circa 1km of the Curraheen River as well as Lisheens Stream[1] running through the western portion of the lands. In order to ensure the model was performing to an acceptable level of accuracy, the model was calibrated using surveyed and estimated flood levels from the February 2021 event.

The results of this hydraulic analysis were used to identify the Flood Zones for the study area. Cork City Council reviewed the flood zones identified during the SFRA preparation and applied the sequential approach when making decisions on land zoning in the South Ballincollig Plan Area. The baseline hydraulic model was adjusted for the post-development situation which includes for the proposed new spine road which will cross the river and floodplain at a number of locations. It was assumed for the purpose of this SFRA that no other alterations will be made to the river or floodplains. An indicative road alignment and footprint was agreed with Cork City Council to enable the SFRA to be completed. A number of mitigation measures were recommended from a SFRA perspective to ensure that the flood risk to developments within the South Ballincollig Plan Area is acceptable and to prevent an adverse impact upstream or downstream of the site.

The baseline predicted flood extents from the SFRA are presented in Figure 2.6.

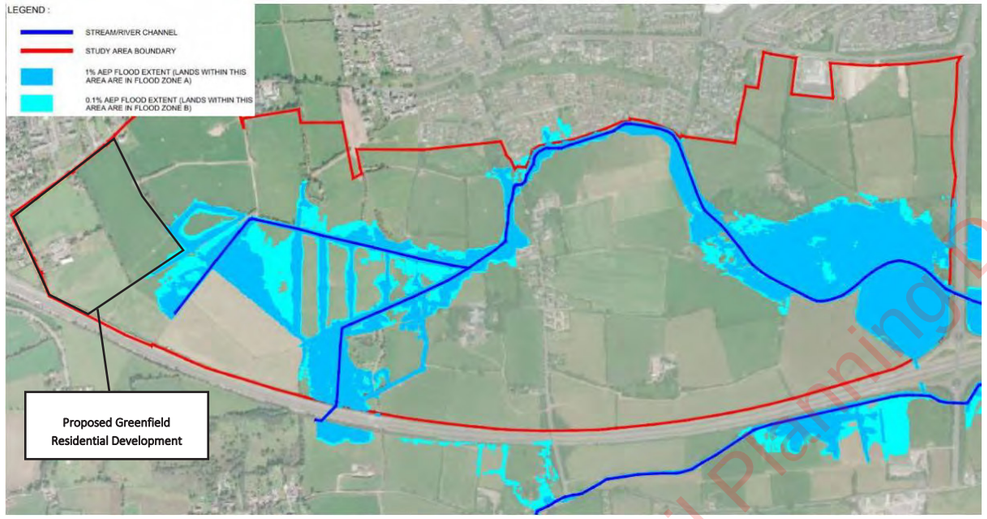

Figure 2.6: 1% AEP & 0.1% AEP Baseline SFRA Flood Extents

[1] Lisheens Stream is referred to as the Artificial Drain in South Ballincollig Drainage Study (Will be referred to as Lisheens Stream hereafter).

2.5 Lee Catchment Flood Risk and Management Study (CFRAMS)

The Lee CFRAMS involved detailed hydraulic modelling of rivers and their tributaries along with coastal flooding. Flood extents have been generated for the Lisheens Stream and Maglin North River which flow through the Maglin area. An extract of the flood extent map for the present-day scenario is shown in Figure 2.7.

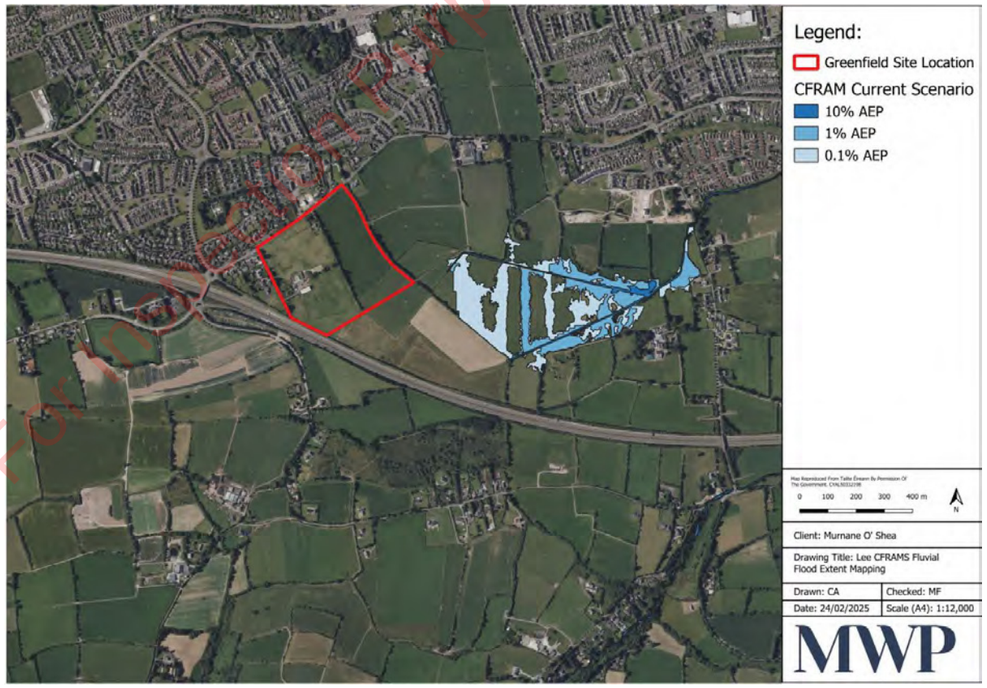

Figure 2.7: CFRAMS Fluvial Flood Mapping

2.6 National Indicative Fluvial Mapping (NIFM)

The National Indicative Fluvial Flood Maps have been produced for catchments greater than 5km² in areas for which flood maps were not produced under the National Catchment Flood Risk Assessment and Management Programme (CFRAM). An extract from the National Indicative Fluvial Flood Maps for the current scenario is shown in Figure 2.8. These maps are not the best achievable representation of projected flood extents, such as those that could be generated through detailed hydraulic modelling and are only indicative of the predicted flood extent of any given probability at any particular location.

The flood maps may be used in the Stage 1 Flood Risk Assessment (Flood Risk Identification) to identify areas where further assessment would be required if development is being considered within or adjacent to the flood extents shown on the maps.

The maps refer to flood event probabilities in terms of a percentage Annual Exceedance Probability, or 'AEP'. This represents the probability of an event of this severity occurring in any given year. They are also commonly referred to in terms of a return period (e.g. the 100-year flood). The flood extents for the 1% AEP (100-year flood) and 0.1% AEP (1000-year flood) Present Day Scenario (Current Scenario) flood events are illustrated below in Figure

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2.8. The NIFM mapping indicates that there is a risk of flooding south of the proposed development site associated with the Maglin South River.

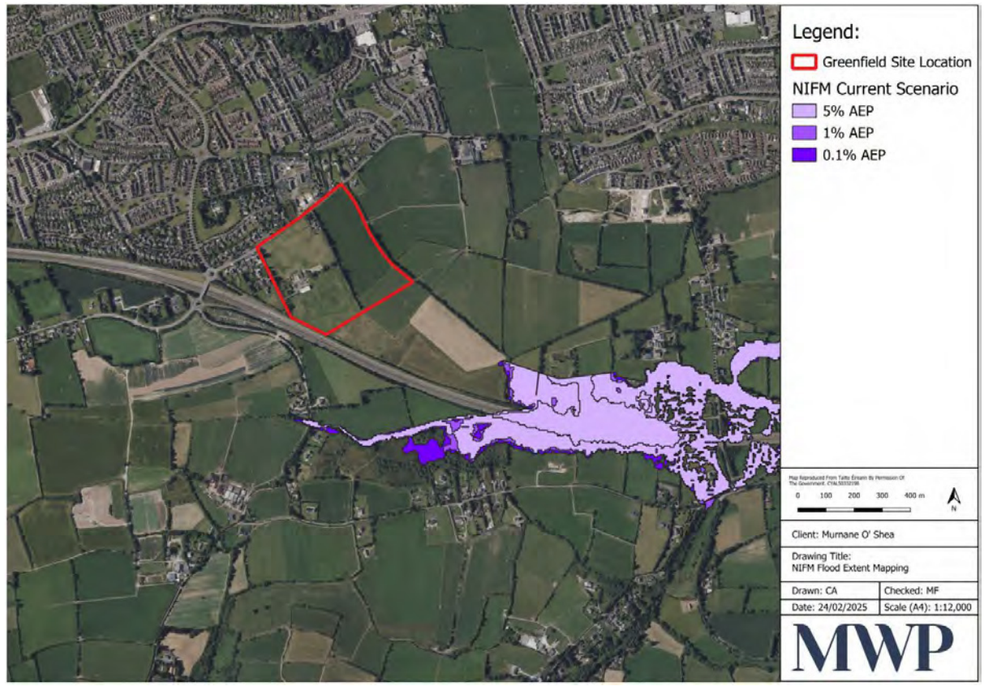

Figure 2.8: National Indicative Fluvial Mapping

2.7 OPW Arterial Drainage Scheme & Drainage Districts

Arterial Drainage Schemes were carried out under the Arterial Drainage Act, 1945 to improve land for agriculture and to mitigate flooding. Rivers, lakes, weirs and bridges were modified to enhance conveyance, embankments were built to control the movement of flood water and various other work was carried out under Part II of the Arterial Drainage Act, 1945. The purpose of the schemes was to improve land for agriculture, to ensure that the 3 – year flood was retained in bank. This was achieved by lowering water levels during the growing season to reduce waterlogging on the land beside watercourses known as callows. Flood protection in the benefiting lands was increased as a result of the Arterial Drainage Schemes.

The watercourses forming part of the arterial drainage scheme are indicated in Figure 2.9. The Benefited land layer identifies land that was drained as part of the scheme and is also indicated in Figure 2.9.

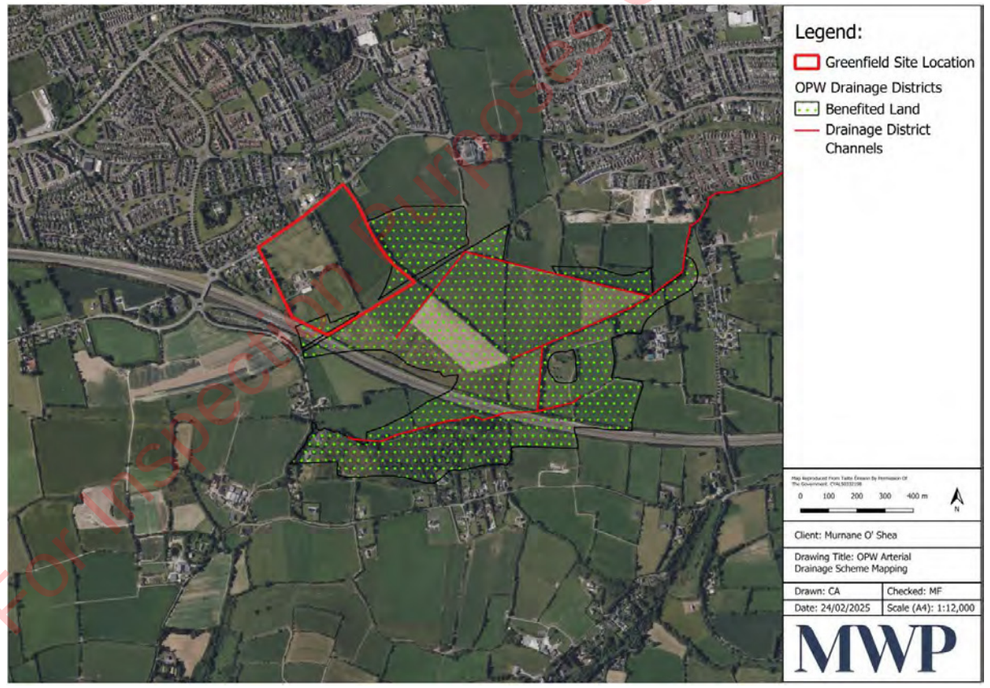

Figure 2.9: OPW Arterial Drainage Scheme Features

2.8 GSI Winter 2015/2016 Surface Water Flooding

The Winter 2015/2016 Surface Water Flooding map shows fluvial (rivers) and pluvial (rain) floods, excluding urban areas, during the winter 2015/2016 flood event. There is no flooding indicated within the proposed development site during this flood event.

2.9 GSI Predictive Groundwater Flood Mapping

The GSI Groundwater Probability Mapping shows the probabilistic flood extent of groundwater flooding in limestone regions. There is no flooding indicated within the proposed development boundary.

2.10 Internet Searches

An internet search was conducted on 25/02/2025 to gather information about whether the site was affected by flooding previously. There were no reports of flooding within the proposed development boundary.

2.11 Summary of Stage 1 FRA

The Stage 1 FRA has identified a flood risk at this site which is confined to the southeastern corner of the site. A Stage 2 FRA will be carried out to provide a more comprehensive assessment of the flood risk.

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3. Initial Flood Risk Assessment (Stage 2)

The purpose of Initial Flood Risk Assessment is primarily to ensure that the relevant flood risk sources are identified so that they can be addressed appropriately in the Detailed Flood Risk Assessment, where relevant.

3.1 Flooding Sources

The potential sources of flooding and their relevance to the flood risk to the site are outlined in the following sub-sections.

3.1.1 Fluvial Flooding

Fluvial flooding occurs when the capacity of a river channel is exceeded and water flows onto the adjacent land or floodplain. The main watercourse in the proximity of the site is Lisheens Stream which flows from south to north in close proximity to the southeastern corner of the site.

As previously indicated, the South Ballincollig Drainage Study SFRA has included detailed modelling of Lisheens Stream, Maglin North River, Curraheen River and Maglin South River in this area. The flood maps from the SFRA demonstrate that a small area located in the southeastern corner of the site is at risk of flooding for the 1% AEP and 0.1% AEP fluvial flood events.

As part of the proposed development, there is a proposed distributor road that will encroach into Flood Zones A & B. The proposed distributor road could potentially change the floodplain flow mechanisms associated with fluvial flooding from Lisheens Stream. Therefore, an updated hydraulic model will be required. In conjunction with this update, the hydraulic model utilised for the SFRA will be adopted for this FRA. The updated hydraulic model will include topographic survey data for the proposed development and immediate surrounds. The impacts of incorporating this topographic survey data is discussed in more detail in the Hydraulic Analysis Report included in Appendix 2.

It will be necessary to complete a Stage 3 -Detailed Flood Risk Assessment for this site. The Stage 3 assessment will determine the required finished Floor Level (FFL) of proposed buildings and will deliver updated flood extent maps, water surface elevations(mOD) and assess the impacts of the development on flood risk elsewhere.

3.1.2 Pluvial Flooding

Overland flow or pluvial flooding occurs when rainfall intensity exceeds the infiltration capacity of the ground. The excess water flows overland to the nearest watercourse or piped drainage system. Intense rainfall events can result in ponding in low areas or upstream of physical obstructions. Overland flow is most likely to occur following periods of sustained and intense rainfall when the ground surface becomes saturated.

Flood risk from pluvial sources exists in all areas. The existing site is predominantly a greenfield site. Increase in hardstanding area will increase the risk of pluvial flooding. There is no history of pluvial or surface water flooding on the site. As discussed previously, the general topography of the site falls from northwest to southeast. There is no low points within the site which overland flows could pond.

The design of adequate storm water drainage systems will minimise pluvial flood risk to an acceptable level. The design of this drainage system should be confirmed at detailed design stage.

Pluvial flooding does not require further consideration in this report.

3.1.3 Tidal Flooding

Estuarial or tidal flooding is caused by higher-than-normal sea levels which occur primarily due to extreme high tides, storm surges, wave action or due to high river flows combining with high tides. This risk is not relevant to this site due to its location inland and its elevation. The tidal influence of the River Lee reaches inland as far as Ballymullen which is located approximately 5km east of the proposed development site. Therefore, this does not require further consideration in this report.

3.1.4 Groundwater Flooding

Groundwater flooding occurs when the water table rises to the level of the ground surface due to rainfall and flows out over the surface. Groundwater flooding occurs relatively slowly and generally poses a low hazard to people. There is also no known history of such an occurrence in the vicinity of the site and for these reasons this source of flooding will not be considered further in this report.

3.2 Summary of Identified Flood Risk (Stage 2)

The Stage 2 FRA indicates that there is a potential fluvial flood risk in the southeastern corner of the proposed development site and a Stage 3 Flood Risk Assessment is required.

3.3 Requirements for Detailed Flood Risk Assessment (Stage 3)

A Stage 3 detailed flood risk assessment will be carried out in Section 4 of this report in order to provide a quantitative appraisal of potential flood risk to the site and to examine the potential impact of the development on flood risk elsewhere. This will require the construction of a hydraulic model of the Maglin North River and Lisheens Stream and the completion of a hydrological assessment of the catchment. Any relevant mitigation measures will be reviewed, and residual risks will be assessed.

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4. Detailed Flood Risk Assessment (Stage 3)

4.1 Introduction

The purpose of this Stage 3 FRA is to assess flood risk issues in sufficient detail to provide a quantitative appraisal of potential flood risk to the site, of the potential impact of the development on flood risk elsewhere and to establish what mitigation measures, if any, may be required. The Stage 3 FRA will therefore require carrying out a detailed review of the Maglin North River and Lisheens Stream catchment hydrology to establish appropriate flood flows for various scenarios. A hydraulic model of the river reach will then be created to determine key flood risk parameters such as flood levels and flood extents.

4.2 Hydrology & Flow Estimation

4.2.1 Overview

A detailed hydrological analysis was carried out to estimate the flood flows throughout the site and the surrounding Maglin area for the South Ballincollig Drainage Study SFRA. The hydrology and flow estimation methods adopted for the South Ballincollig Drainage Study SFRA was reviewed and deemed suitable for reuse for the purpose of this hydraulic analysis to ensure consistency with the SFRA. A summary of the hydrological analysis performed for the South Ballincollig Drainage Study SFRA is provided below. The South Ballincollig Drainage Study SFRA can be consulted for a detailed overview of the hydrological analysis.

4.2.2 Catchment & River Reach Description

The Maglin North River flows through the Maglin area where it joins the Curraheen River approximately 2.8km east of the Greenfield site. Due to the construction of the N22 road system, local changes have been made to the Maglin South River alignment and catchment area of both the Maglin North River and the Maglin South River. In particular, the confluence of these two watercourses has shifted further downstream. A hydraulic connection, following the original channel of the Maglin South River, still exists between the two rivers. This takes the form of a twin culvert system under the N22 road which allows flows to pass between the tributaries via the floodplain a short distance upstream of Hydrological Estimation Point (HEP) MN02. For this reason it is necessary to include Maglin South River in the hydrological analysis and hydraulic modelling.

The Maglin South River discharges into the Maglin North River which then discharges to the Curraheen River approximately 2.8km east of the Greenfield site. In order to ensure that the downstream boundary conditions are suitably accounted for in the hydraulic analysis, the model has been extended a distance downstream of the confluence with the Maglin North River Therefore, it is necessary to include the Curraheen River in the hydrological analysis.

Maglin North River has a catchment area of approximately 5.6km^2 and 9.8km^2 at MN06 and MN02 respectively. The upstream catchment is characterised by relatively steep reaches, whilst the gradient reduces significantly on the northern downstream portion of the catchment.

The soil classification for the catchment is Soil Class 2 according to the Flood Studies Report 1975 (FSR) soil maps. This is consistent with MWP's local knowledge of the area and the EPA soil mapping.

The catchment of Maglin North River is also influenced by urban development in Ballincollig and the N22 road, primarily via inflows within or adjacent to the Maglin area. Estimation of the urban area contributing to the catchments was influenced by the available storm and foul network drawings which are available for Ballincollig.

On the lower reaches, parts of the Maglin North River and Curraheen River catchments are located within a drainage district. These lands were drained by the Commissioners of Public Works under various acts between 1842 and the 1930's. The purpose of the schemes were to improve land for agriculture by lowering water levels. Typical works included channel and lake widening / deepening, embankment construction, weir removal and bridge replacement / modification. For Section 50 applications the OPW typically requires that design flows in drained catchments be increased by a factor of 1.6 to account for increased rate of runoff, and therefore peak flows, from the artificially drained areas. It is entirely possible that Local Authorities have not maintained the drainage districts in the recent past therefore any such increased flows may not be realised. In any case, this has been accounted for in the FSU methodology with the ARTDRAIN2 PCD.

The Standard Average Annual Rainfall (SAAR) for the Maglin North River catchment is approximately 1080mm according to the FSU database. It is slightly higher at circa 1100mm for the Curraheen catchment.

The sub-catchment delineation of the key catchments included in this study is shown on Figure 4.1 below.

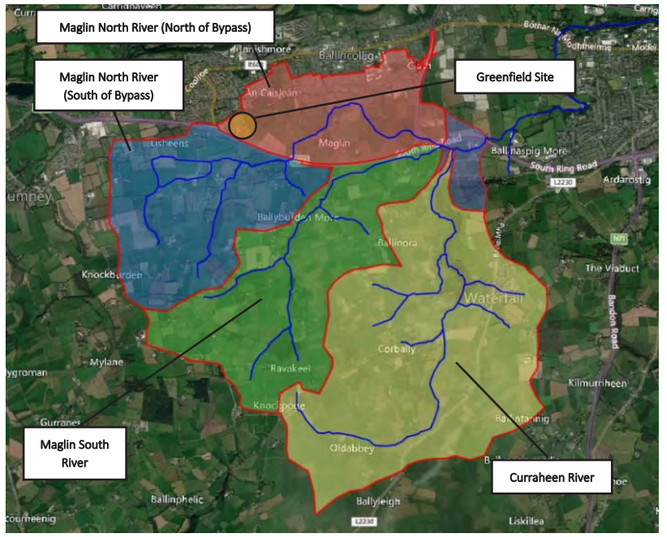

Figure 4.1: Sub Catchment Delineation

4.2.3 Hydrological Estimation Points

In order to gain a suitable understanding of the flood sources and mechanisms and to build a representative hydraulic model of the system, it is necessary to estimate the relevant flows at suitable locations along the reach. Hydrological Estimation Points (HEP) were selected at relevant locations along the length of the rivers, typically at the location of significant changes to the catchment area or flow regime. The location of all HEP's selected for this study are summarised on Table 4.1 and Figure 4.2 below.

Flows at MN02 are not presented in the following sections because the initial flood estimation indicated that the difference in peak flow between upstream and downstream HEP is not significant.

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HEP	River	Description
CU01	Curraheen	Near downstream end of model
CU02	Curraheen	N40 crossing
CU03	Curraheen	N40 crossing
MA01	Maglin North River	Downstream of Confluence
MS01	Maglin	Upstream of Confluence
MN01	Maglin North River	Upstream of Confluence
MN02	Maglin North River	Upstream of N22 Culvert
MN03	Maglin North River	Open Channel, downstream of urban inflows
MN04	Maglin North River	Downstream of Lisheens Stream confluence
MN05	Maglin North River	Upstream of Lisheens Stream confluence
MN06	Maglin North River	Downstream of N22 Culvert
AD01	Lisheens Stream	Open Channel
AD02	Lisheens Stream	Upstream end of model

Table 4.1: Hydrological Estimation Points

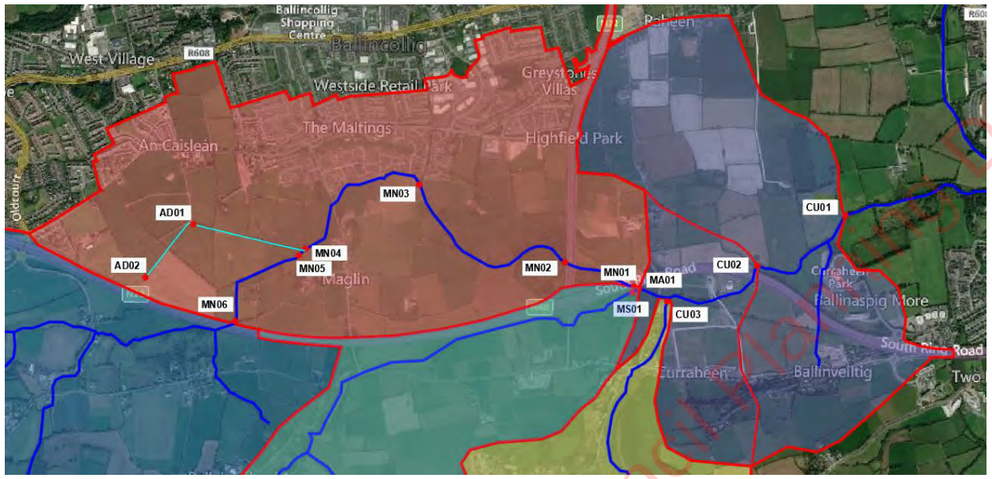

Figure 4.2: Hydrological Estimation Points

4.2.4 Flow Estimation Summary

The Flood Studies Update (FSU) programme was undertaken by the OPW in order to provide improved extreme rainfall and flood estimation methods for Ireland. It is the most recent major study of its kind to be carried out in Ireland and is broadly recognised as the best practice method for estimating peak flood flows.

One of the key outputs from the FSU was the 7 variable regression equation for estimating the Index Flood (i.e. QMED) based on Physical Catchment Descriptors (PCD's). The Index Flood is the flow that can statistically be expected to be equalled or exceeded once in a 2 year period. Ideally the application of this equation would be limited to catchments greater than 25km^2, although it has been shown to perform reasonably well for smaller catchments, albeit with a seemingly higher Factorial Standard Error (FSE) of 1.879 rather than 1.37 (Gebre et al., 2012). An alternative regression equation which was developed as part of FSU WP 4.2 for small and urbanised catchments was shown to perform slightly better than the 7 variable equation with a FSE of 1.674. However, it was concluded that the dataset on which the small catchment equation was based is very small and the FSU 7 variable equation is still the preferred method for catchments greater than 5km^2.

It is for these reasons, and others outlined below, that the flows estimated using the FSU 7 variable regression equation have been compared to the flows calculated using the following methods;

1. FSU WP4.2 Small Catchment Equation, modified by Gebre et. al. 2012;
2. Flood Studies Report (FSR) 1975 Rainfall Runoff (RR) Method;
3. Institute of Hydrology (IH) 124 3-variable Equation;
4. Poots & Cochrane, 1979

Since it is the flows associated with the northern tributary of the Maglin South River that are of most interest to this study, design flows were initially estimated at MN01 and MN06 using the methods outlined above. The selected method was then applied to the other HEP's in the study area.

The peak flows estimated at MN01 using the techniques outlined above are summarised on Table 4.2 below for various AEP's. The peak flows estimated at MN06 are similarly presented on Table 4.3. The IH124 is a clear outlier and is not considered further. It is encouraging that the estimated flows up to around 1% are broadly similar, with a maximum difference of around 10%. The difference increases to around 15% for the 0.1% AEP event. Poots & Cochrane method mainly differs for rarer events due to the difference in the adopted growth curves. When this method is eliminated, the maximum difference between the three remaining methods is less than 10% for all events.

The analysis carried out indicates that the FSU 7-variable equation with pivotal site adjustment is suitable for estimating Q_{MED} at all HEP's. The flows for various AEP's will be derived using the growth curves derived from the FSU pooling group.

The peak flows in Lisheens Stream (AD01 and AD02) are assumed to correspond to the difference between the peak flows of MN04 and MN05. This approach is considered reasonable based on a comparison with the flow estimated for Lisheens Stream using the IH124 method.

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MN01 - Peak Flow Summary						
Return Period, T	AEP (%)	FSU 7-Variable	FSU Small Catchment Eqn.	FSR RR	IH124	Poots & Cochrane
2	0.50	3.86	3.54	3.36	2.54	3.60
5	0.20	4.86	4.46		3.21	4.55
10	0.10	5.56	5.09		3.66	5.19
20	0.05	6.25	5.73		4.14	5.87
30	0.033	6.71	6.16		4.42	6.27
50	0.02	7.25	6.65		4.73	6.71
100	0.01	8.10	7.43	8.27	5.24	7.43
200	0.005	8.99	8.24		5.72	8.11
1000	0.001	11.42	10.47		6.95	9.85

Table 4.2: MN01 - Summary of Peak Flows

MN06 - Peak Flow Summary						
Return Period, T	AEP (%)	FSU 7-Variable	FSU Small Catchment Eqn.	FSR RR	IH124	Poots & Cochrane
2	0.50	2.34	2.43	2.16	1.33	2.33
5	0.20	2.95	3.06		1.67	2.94
10	0.10	3.37	3.50		1.91	3.36
20	0.05	3.79	3.94		2.16	3.80
30	0.033	4.07	4.23		2.31	4.06
50	0.02	4.40	4.57		2.47	4.34
100	0.01	4.91	5.11	5.36	2.73	4.81
200	0.005	5.45	5.66		2.99	5.25
1000	0.001	6.92	7.20		3.63	6.38

Table 4.3: MN06 - Summary of Peak Flows

4.3 Baseline Hydraulic Modelling

4.3.1 General

As previously discussed, additional topographic surveying was made available to MWP in November 2023. The details of this additional topographical survey information are summarised in the Hydraulic Analysis Report included in Appendix 2. This has resulted in a review and update of the South Ballincollig Drainage Study SFRA baseline hydraulic model. The result of this update is outlined in the Hydraulic Analysis Report included in Appendix 2. This update has resulted in minor changes to flood levels and extents in the Greenfield Residential Development area.

4.3.2 Hydraulic Model Overview

The hydraulic analysis was carried out using the Hydraulic Engineering Centre River Analysis System software which was developed by the US Army Corps of Engineers.

The initial model was developed as a combined 1D-2D hydraulic model using HEC-RAS Version 5.0.7. The model was updated following the release of HEC-RAS Version 6.1 in June 2021 and it was determined through various sensitivity checking that the results from a full 2D model were similar to the initial model and moreover the 2D model was found to provide better stability and robustness with less uncertainty associated with the efficiency of flow transfer between the 1D and 2D domains. The model has subsequently been updated using HEC RAS 6.4.1 for the purpose of this study.

The final model includes approximately a 3.2km reach of the Maglin North River, 2.1km of Maglin South River and circa 1km of the Curraheen River as well as the Lisheens Stream running southeast of the Greenfield site.

The river channel was created using the 1-dimensional (1D) cross sections obtained from the OPW Lee CFRAMS survey data with a small number of supplementary cross sections surveyed by HD surveys for this SFRA. These 1D cross sections were used to create a digital terrain model DTM of the river channel to enable in-bank flows to be modelled using the hydrographic survey data since LIDAR data would not be suitable. The river channel remains unchanged for the hydraulic analysis completed as part of this study.

The remainder of the 2D model was developed using a DTM from LIDAR data. This has a total area of approximately 360 hectares and includes the lands within the Maglin area, to the south of the N25 road as well as an extensive area downstream of the Maglin North River confluence with the Curraheen River. The DTM based on the 1D cross sections was then enforced onto the LIDAR DTM to provide a single terrain model for the entire area. As previously discussed, the 2D area in the Maglin area has been updated where applicable using the additional topographical survey information obtained in 2023. The result of this update is discussed in the Hydraulic Analysis Report in Appendix 2.

The model also includes 18no. existing bridge/culvert structures. The hydraulic model extents and schematic is included in Figure 4.3 below.

An unsteady flow analysis was performed using flow hydrographs which were derived during the hydrological analysis outlined previously and in the South Ballincollig Drainage Study SFRA. The downstream boundary condition was set to match the water surface gradient at the downstream end of the reach.

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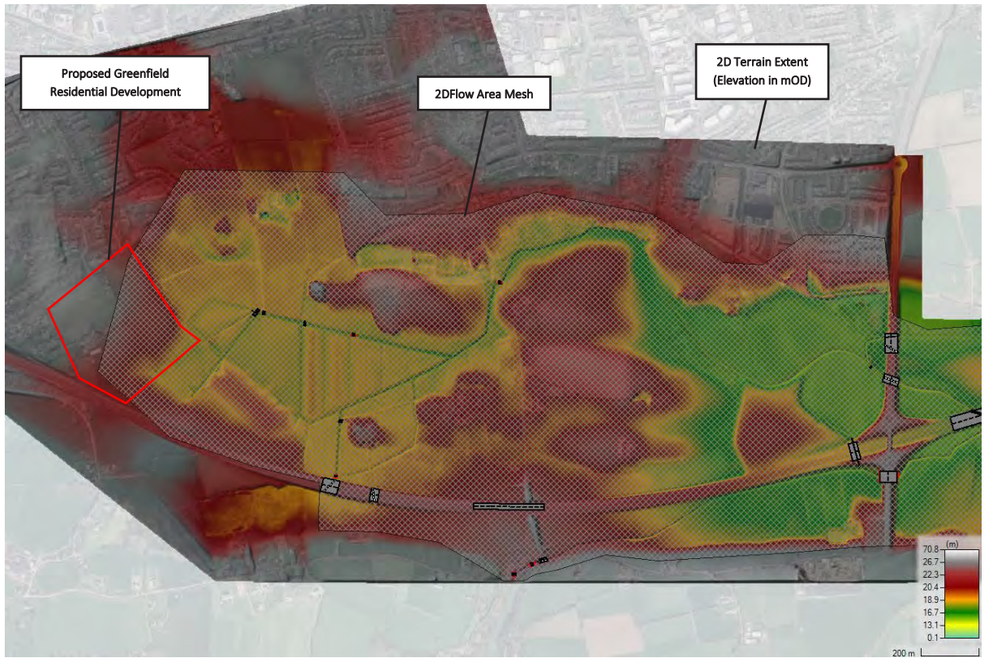

Figure 4.3: Hydraulic Model Schematic

4.4 Flood Zone Mapping & Baseline Flood Levels

The Planning System and Flood Risk Management Guidelines for Planning Authorities (2009) defines three flood zone types 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 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and
- *Flood Zone C* – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

The hydraulic model was used to establish the baseline (existing situation at time of writing i.e. no development, no distributor road) flood levels at the site for the 1% AEP and 0.1% AEP events and these were used to produce a flood zone map for the site. The Flood Zone map, which indicates the extent of Flood Zones A and B, is shown on Figure 4.4 and Figure 4.5 below. The baseline flood levels are presented in Table 4.4. It is demonstrated that the flood extents for the baseline SFRA hydraulic model and the updated baseline hydraulic model are relatively similar. For the purpose of this study, the updated baseline model results will be adopted as the updated terrain surface used in the baseline hydraulic model is based on more accurate topographic survey data.

Figure 4.4: Baseline Flood Extents - SFRA v Updated Baseline - 1% AEP

Figure 4.5: Baseline Flood Extents - SFRA v Updated Baseline – 0.1% AEP

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Scenario	SFRA Baseline Flood Level (mOD)	Updated Baseline Flood Level (mOD)
1% AEP Current	18.47	18.48
0.1% AEP Current	18.66	18.63
1% AEP MRFS	18.57	18.55

Table 4.4: Baseline Flood Levels (mOD)

4.5 Vulnerability of Proposed Development

The Guidelines have outlined three Vulnerability Classifications for developments based on the proposed land use and type of development. These classifications and particular examples of development types which would be included in each classification are summarised as follows;

- **Highly Vulnerable Development:** This would include emergency services, hospitals, schools, residential institutions, dwelling houses, essential infrastructure, water & sewage treatment etc.
- **Less Vulnerable Development:** Retail, leisure, commercial, industrial buildings, local transport infrastructure.
- **Water-compatible development:** Docks, marinas and wharves. Amenity and open space, outdoor sports and recreation and essential facilities such as changing rooms.

The Guidelines include a matrix that determines the appropriateness of different types of development based on their vulnerability classification and the Flood Zones in which they are located. The matrix is reproduced in Table 4.5 below.

Where the matrix indicates that a development is not appropriate it may still be justified based on a procedure described as a Justification Test.

Vulnerability Classification	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable Development (Including essential Infrastructure)	Justification Test	Justification Test	Appropriate
Less Vulnerable Development	Justification Test	Appropriate	Appropriate
Water-compatible Development	Appropriate	Appropriate	Appropriate

Table 4.5: Vulnerability Matrix

The following is noted:

1. The proposed residential development is considered to be a Highly Vulnerable Development in accordance with the PSFRM Guidelines. The majority of the site is within Flood Zone C and these areas are therefore appropriate for development without completing a Justification Test.
2. The small portion of the site located within Flood Zone A/B would not be suitable for the development of residential units but could be incorporated into development as a less vulnerable land use. In this instance an amenity area/open space is proposed which is consistent with Water Compatible Development.
3. On the basis that the proposed housing scheme will be located within Flood Zone C and the portion of the site located in Flood Zone A/B would be used for amenity space or landscaping it is concluded that a Justification Test is not necessary for the development.
4. The proposed Ballincollig Distributor Road will be developed to the site boundary as indicated in the site layout drawing. Local transport infrastructure is considered as less vulnerable infrastructure. As a small portion of this proposed distributor road is located within Flood Zone A, a Justification Test is required.

4.6 Post Development Hydraulic Modelling

As part of the proposed development, a new distributor road is proposed. The proposed development will include constructing the proposed distributor road to the site boundary as indicated in the site layout drawings. It is necessary to model the impacts of the post development scenario to ensure the proposed development will not increase flood risk to lands upstream or downstream of the site or to those occupying the proposed development.

The adjustments made to the hydraulic model to represent the post development situation are summarized as follows. The model schematic is shown on Figure 4.6.

1. The proposed distributor road adjacent to the proposed residential development was added to the baseline terrain file used for hydraulic model computations. The modelled road was raised to prevent flooding for the purpose of this hydraulic analysis.

The hydraulic model was run for the post development situation (with no mitigation measures applied) which confirmed that the proposed development will not adversely impact flood risk elsewhere. The flood extents for this situation compared to the baseline situation are presented in Figure 4.8 to Figure 4.10. The following is noted;

- The design flood levels for the post-development situation coincide with the baseline scenario (See Table 4.6 below)
- The proposed minimum finished floor level of all buildings (20.00mOD) is well above the predicted design flood level (18.55mOD for the 1% AEP MRFS) therefore the risk to occupants of the residential units is low.
- There is no impact on flood extents downstream of the site with minimal impacts on flood extents adjacent to the site as indicated in Figure 4.8 to Figure 4.10.
- The peak flow passing forward downstream is consistent with the baseline scenario, as demonstrated by the hydrograph presented on Figure 4.7.

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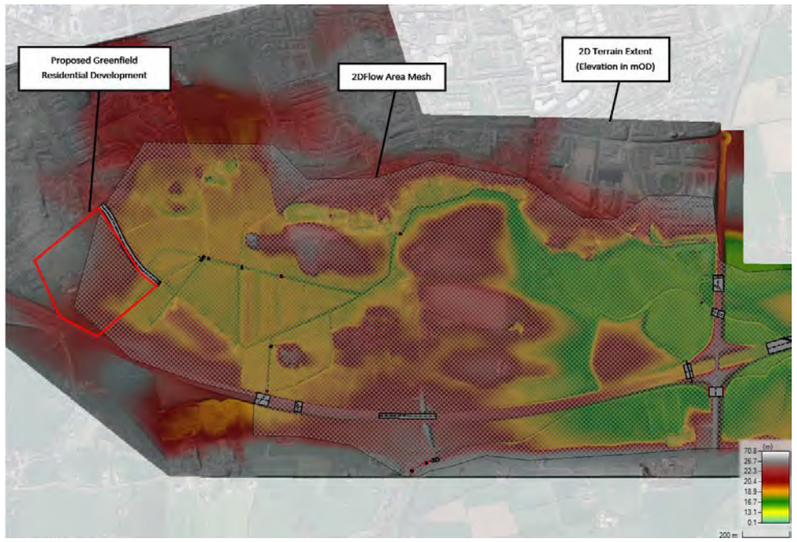

Figure 4.6: Post Development Hydraulic Model Schematic

Scenario	Baseline Flood Level (mOD)	Post Development Baseline Flood Level (mOD)
1% AEP Current	18.48	18.48
0.1% AEP Current	18.63	18.63
1% AEP MRFS (20% Climate Change Allowance)	18.55	18.55

Table 4.6: Post Development Flood Levels (mOD) – No Mitigation Applied

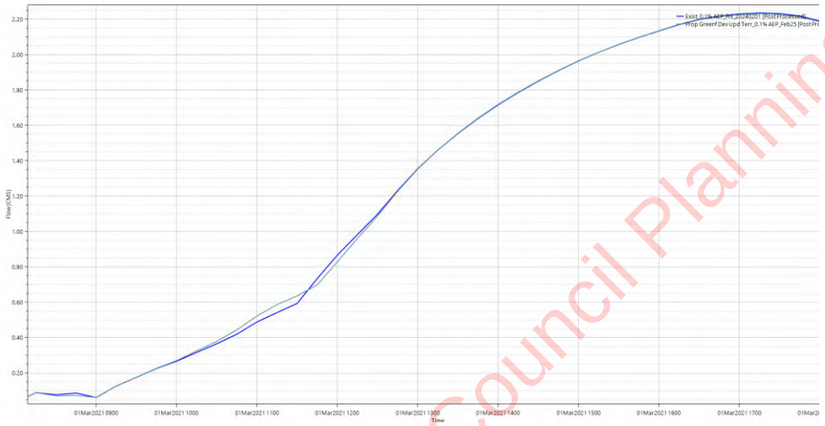

Figure 4.7: Downstream Peak Flow Hydrograph - 0.1% AEP Current

Figure 4.8: Baseline Flood Extents (Blue) v Post Development Flood Extents (Orange) (No Mitigation) - 1% AEP Current

Figure 4.9: Baseline Flood Extents (Blue) v Post Development Flood Extents (Orange) (No Mitigation) - 1% AEP MRFS

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Figure 4.10: Baseline Flood Extents (Blue) v Post Development Flood Extents (Orange) (No Mitigation) – 0.1% AEP Current

4.7 Mitigation Measures

Despite the proposed development having no impact on flood risk elsewhere, it is proposed to provide a number of mitigation measures. The adjustments made to the hydraulic model to represent the post development mitigation measures are summarized as follows. The revised model schematic is shown on Figure 4.11.

1. In order to ensure the previously discussed overland flow paths are maintained from the upstream side of the road embankment to the downstream side, 3no. 300mm diameter pipe culverts was added to the distributor road to ensure continuity of the existing floodplain flow. These culverts are located within the floodplain and not the existing drain. The distributor road will not cross the existing drain at the SE corner of the site. The invert levels of the 300mm diameter pipes on the upstream side of the road embankment is typically 18.2mOD. The invert level of the 300mm diameter pipe on the downstream side of the road embankment is typically 18.47mOD. These invert levels were selected to match the existing ground levels in this area. The invert levels should be confirmed at detailed design stage.
2. Due to the minor loss of floodplain storage as a result of the proposed distributor road, it is proposed that compensation storage can be provided in the open space area located at the southeastern corner of the proposed development site. This has been modelled as a 350mm reduction in existing ground levels for the purpose of this hydraulic analysis. The extent and size of this compensation storage is indicative and should be confirmed at detailed design stage.

The results of the post development modelling with these mitigation measures are summarised in the following sub-sections.

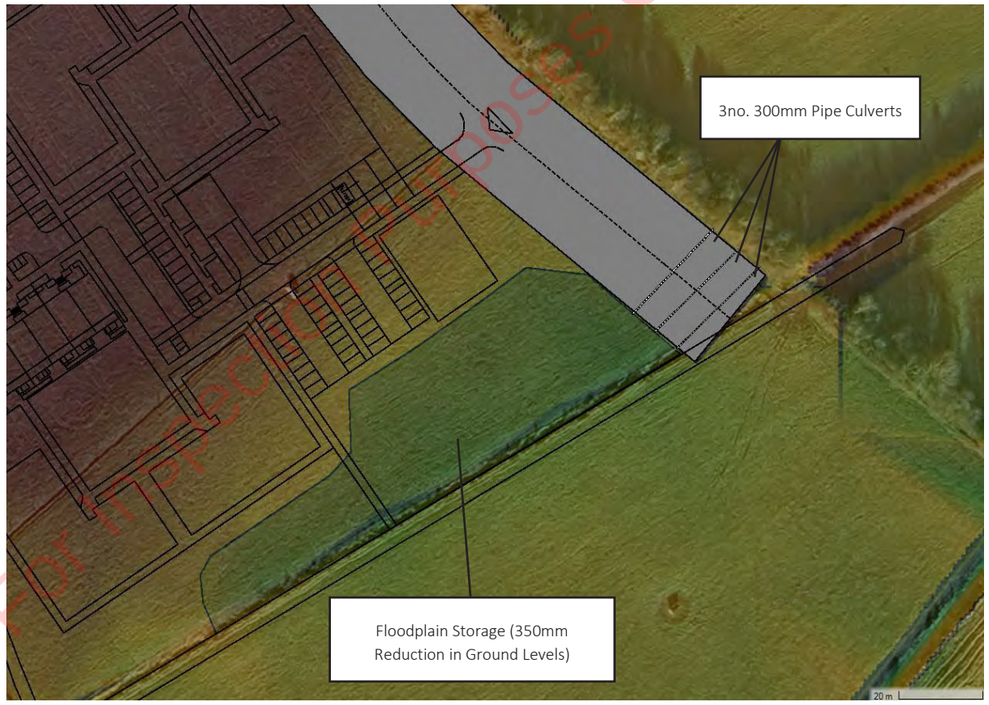

Figure 4.11: Proposed Mitigation Measures

4.8 Assessment of Risk to Occupants

The proposed finished floor level of all buildings is well above the predicted flood level therefore the risk to occupants of the residential units is low. The proposed distributor road is elevated above the flood level therefore safe access and egress is available to the site during flood events.

The amenity open space is located in an area susceptible to flooding however the proposed use is consistent with water compatible development. Flood depths in this area are relatively shallow and flow velocities are low therefore the flood hazard and risk to people would be low. Furthermore, in the event of a flood, users of the amenity area can easily retreat to higher ground. Notwithstanding this, it is recommended that users of the site are made aware of the potential for flooding in this area and that warning signs and life-saving equipment are provided at accessible locations. The exact details of these should be established by an operational risk assessment of the site.

4.9 Impact of Development on Flooding Elsewhere

Generally, potential impacts outside the site can occur due to increased storm water runoff rates from roofs and paved surfaces or due to loss of water storage where part of a flood plain is filled to accommodate development.

The mitigation measures outlined in this report have been formulated to ensure that the proposed development will not adversely impact flood risk elsewhere. In particular, the following is noted:

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1. As demonstrated by the comparative flood extent map provided on Figure 4.12 to Figure 4.14 below, there is no increase in flood level upstream or downstream of the proposed distributor road due to the minor encroachment of the road into Flood Zone A and B. Therefore, the proposed development will not increase flood risk upstream or downstream of the site.
2. As indicated on the flood extent map on Figure 4.12 to Figure 4.14, the construction of the road embankment and 300mm diameter pipe culverts would maintain the existing flow path from upstream of the road to downstream. Figure 4.7 shows the flow hydrographs for the pre and post development situations downstream of the site in the 0.1% AEP event. This demonstrates that there is no change to the post- development hydrograph shape or peak flow passing downstream. Consequently, it is concluded that the proposed development will not increase flood risk downstream of the site.
3. In order to ensure that peak flows discharging from the developed site do not exceed pre-development runoff rates, appropriate SuDS systems should be implemented.
4. There is an increase in flood extents within the proposed open area of the development site due to the proposed floodplain compensation storage. This ensures there is no increase in flood risk to 3rd party landowners outside of the development site boundary.

Scenario	Baseline Flood Level (mOD)	Post Development Baseline Flood Level (mOD)
1% AEP Current	18.48	18.42
0.1% AEP Current	18.63	18.63
1% AEP MRFS (20% Climate Change Allowance)	18.55	18.55

Table 4.7: Post Development Flood Levels (mOD) – Mitigation Applied

Figure 4.12: Baseline Flood Extents (Blue) v Post Development Flood Extents (Orange) - 1% AEP Current

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Figure 4.13: Baseline Flood Extents (Blue) v Post Development Flood Extents (Orange)- 1% AEP MRFS

Figure 4.14: Baseline Flood Extents (Blue) v Post Development Flood Extents (Orange)– 0.1% AEP Current

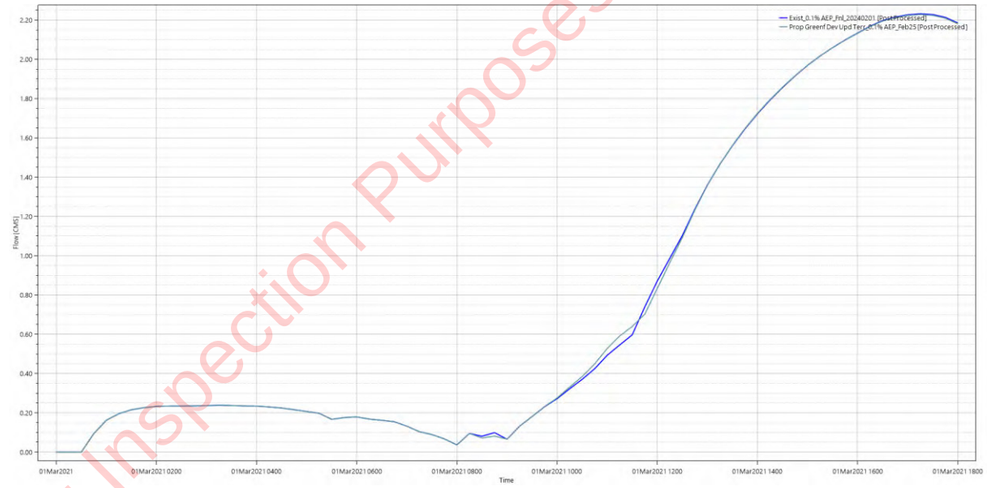

Figure 4.15: Downstream Peak Flow Hydrograph - 0.1% AEP Current

4.10 Residual Risks

The following residual risks have been identified;

1. Climate change effects larger than currently estimated
2. Flood Flows Larger than estimated
3. Blockage of proposed 3no. 300mm diameter pipe culverts

4.10.1 Climate Change Effects & Larger Flood Flows

During the sensitivity analysis an assessment was carried out to determine the impact a 1% AEP flood event for the HEFS (i.e. 30% increase in flows to allow for climate change). The predicted flood level for the 1% AEP HEFS flood event is 18.60mOD. There is still 1.4m freeboard to the proposed minimum F.F.L.

Based on this the site is deemed not to be at risk during the 1%AEP HEFS.

4.10.2 Blockage of Proposed Pipe Culverts

During the sensitivity analysis an assessment was carried out to determine the impact a 100% blockage of the proposed 3no. 300mm diameter pipe culverts. The scenario was run using the 1% AEP MRFS flood event. There is an approximate 1mm – 2mm increase in flood levels as a result of this blockage. Based on this the site is deemed not to be at risk due to the residual risk of a pipe culvert blockage.

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4.11 Justification Test

The PSFRM Guidelines outlines two types of Justification Test, namely Plan-making Justification Tests and Development Management Justification Tests. The latter is appropriate at the planning application stage for developments in moderate or high risk flood areas.

The PSFRM Guidelines state that when applying the Justification Test to developments which may be vulnerable to flooding a number of criteria should be satisfied. These are listed and commented on below.

Criterion 1: "The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines".

The Cork City Development Plan 2022-2028 was adopted on 27th June 2022 and requires proposals for development in Ballincollig to comply with objectives 10.56 – 10.62 of the Cork City Development Plan 2022 - 2028 and with the provisions of the Planning System and Flood Risk Management Guidelines. This Flood Risk Assessment has been carried out in accordance with these Objectives and Guidelines. The following objectives have been extracted from the Cork City Development Plan 2022-2028.

Objective 10.57 South Ballincollig (Maglin) Expansion Area: To support the compact growth and development of South Ballincollig Expansion Area as a strategic City consolidation and expansion area, as identified in the Core Strategy. All development shall be designed, planned and delivered in a co-ordinated and phased manner, using a layout and mix of uses that form part of an emerging neighbourhood integrated with the wider area.

Objective 10.60 Ballincollig Framework Plan for the Link Road/Leo Murphy Road Area: During the lifetime of this Plan Cork City Council in collaboration with relevant stakeholders including the National Transport Authority, Transport Infrastructure Ireland and landowners will prepare a Framework plan for the Link Road / Leo Murphy Road Area through a multidisciplinary master planning approach for the comprehensive and coordinated redevelopment of these lands.

The site has been zoned ZO 02 – New Residential Neighbourhoods under the Cork City Development Plan 2022 – 2028. The objective of this zoning is *"to provide for new residential development in tandem with the provision of the necessary social and physical infrastructure"*.

Ballincollig experienced significant economic growth in recent times. Future housing and population growth in Ballincollig will be concentrated in the Maglin Area to the south of the town and other zoned lands to the west and on infill and brownfield lands within the existing built-up area of the town. The construction of a spine road through the Maglin Area is essential to facilitate the sustainable development of these lands and thereby provide for the targeted expansion of the town. The objectives

This demonstrates that the proposed development of the distributor road is in compliance with the relevant zoning objectives for the site.

Criterion 1 of the justification test is therefore considered to be satisfied.

Criterion 2: Table 4.8 outlines the justification for Criterion 2 of the Justification Test.

Justification Test Criterion 2	
Justification Criteria	**Justification**
The proposal has been subject to an appropriate flood risk assessment that demonstrates:	These criteria are addressed in the previous sub-sections and have been fulfilled by carrying out appropriate risk assessments,

Justification Test Criterion 2	
Justification Criteria	**Justification**
i. The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk ii. The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible iii. The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access iv. The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.	the implementation of mitigation measures and by adequately assessing all associated risks as summarised below: i. As outlined in Section 4.6, there is no increase in flood levels due to the proposed development and the proposed development will not increase flood risk elsewhere. ii. As outlined in the site-specific FRA, the provision of mitigation measures such as ensuring F.F.L have appropriate freeboard above flood levels, the provision of a suitably designed storm drainage system to control surface runoff, the provision of 3no. 300mm pipe culverts under the proposed distributor road and the provision of floodplain compensation storage, will minimise flood risk to people, property the economy and the environment as far as reasonably possible. iii. As outlined in Section 4.10, there are uncertainties with regard to climate change impacts on peak flows. The best approach is to be flexible with regard to management of flood risk. The proposed minimum F.F.L of the residential development units is 20.00mOD. This provides 1.4m freeboard above the 1% AEP HEFS flood event. The HEFS is deemed an appropriate uplift in flood levels due to climate change for residual risk assessment. The development proposed therefore includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access. iv. As outlined throughout the FRA, the development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

Table 4.8: Justification Test Criterion 2

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5. Summary & Conclusions

A summary of the main findings of this FRA is as follows;

1. This report has been prepared in the context of The Planning System and Flood Risk Management – Guidelines for Planning Authorities, November 2009 (PSFRM), published by the Office of Public Works and the Department of Environment, Heritage and Local Government.
2. The proposed development includes for the construction of a residential development of 546 no. units (234 no. dwelling houses and 312 no. apartment/duplex units, vehicular from the Greenfield Road and all associated ancillary site works.
3. The Stage 1 and 2 flood risk assessments indicated that there is potential for fluvial flooding at this site. The potential source of flooding was identified as the Lisheens Stream located southeast of the site.
4. A Stage 3 Detailed Flood Risk Assessment (FRA) was carried out to assess flood risk issues in sufficient detail to provide a quantitative appraisal of potential flood risk to the site.
5. A hydraulic model was created to predict the flood zones and flood levels at the site. This demonstrated that the majority of the site is located in Flood Zone C and therefore has a low probability of flooding. More localised areas of the site in the southeast corner are located in Flood Zone A/B and therefore has a high/moderate probability of flooding.
6. On the basis that the residential units will be located within Flood Zone C and the portion of the site located in Flood Zone A/B would be used for amenity space or landscaping, development of the site is considered appropriate without a Justification Test in the context of the PSFRM Guidelines.
7. A Justification Test is required for the proposed distributor road as it encroaches slightly into Flood Zone A and B. A Justification Test was carried out which demonstrates that the proposed development of the distributor road is compliant with PSFRM Guidelines and the Objectives of Cork City Development Plan 2022 - 2028.
8. To ensure that there is no unacceptable flood risk, the following mitigation measures are recommended:
    a. The finished floor level (FFL) of all buildings should be set above the 1% AEP flood level for the MRFS plus 500mm freeboard. This recommendation is in line with the requirements of Criterion 3 of the Greater Dublin Strategic Drainage Study (GDSDS), 2005. On this basis, the minimum FFL would be 19.05mOD. The proposed minimum F.F.L of the residential units is 20.00mOD.
    b. The land within the site which is located in Flood Zone A/B should be used only for amenity open space, landscaping or the like.
    c. 3no. 300mm circular pipe culverts should be added beneath the proposed road to provide continuity of flow along the existing floodplain.
    d. It is proposed to provide floodplain compensation storage in the proposed open area of the proposed development site.
9. It was concluded that, once the above mitigation measures are implemented, the proposed development would not have an adverse impact on flooding elsewhere.
10. It was demonstrated that the risk to occupants of the site would be low. Since the amenity area will be located within an area susceptible to flooding, it is recommended that users of the site are made aware of the potential for flooding in the area and that warning signs and life-saving equipment are provided at accessible locations. The exact details of these should be established by an operational risk assessment of the site.
11. Residual risks associated with the development were also assessed and are considered to be acceptable.

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Appendix 1

Site Layout Plan

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DO NOT SCALE. WORK TO FIGURED DIMENSIONS ONLY.
ALL EXISTING DIMENSIONS TO BE CHECKED ON SITE.
DRAWN ON AUTOCAD R2004 AT DEADY GAHAN ARCHITECTS LTD
LAYERS ON THIS DRAWING COMPLY WITH BS 1192: PART 5

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AREAS SCHEDULE	
SITE AREA	15.2 Ha
DEV. AREA	12.1 Ha
NO.UNITS	544
OPEN SPACE	15.3% Usable
DENSITY	45 Unit/Ha

- Character Area 1 - Greenfield View
- Character Area 2 - Castle Park
- Character Area 3 - Beech Green
- Character Area 4 - Sycamore Park
- Character Area 5 - Village Mews

LOCATION OF SITE NOTICE
PROPOSED UNCONTROLLED PEDESTRIAN CROSSING
PROPOSED UNCONTROLLED PEDESTRIAN CROSSING
PROPOSED SUSTAINABLE ACCESS CORRIDOR
PROPOSED 4m WIDE SIGNALISED PEDESTRIAN CROSSING
PEDESTRIAN ENTRANCE
EXISTING ADJOINING PROPERTY
SITE ENTRANCE
PROPOSED LOCATION OF ACTIVE TRAVEL PATHS TO ACCOMMODATE FUTURE ROAD WIDENING
RELOCATED ENTRANCE AND ROADSIDE BOUNDARY OF ADJOINING PROPERTY TO FACILITATE ACTIVE TRAVEL PATHS
LOCATION OF SITE NOTICE
SITE ENTRANCE
PEDESTRIAN ENTRANCE
PROPOSED UNCONTROLLED PEDESTRIAN CROSSING
SITE ENTRANCE
PROPOSED SHOP AT GROUND FLOOR OF BLOCK 3
SITE ENTRANCE
PROPOSED GREENWAY
LOCATION OF SITE NOTICE
LOCATION OF SITE NOTICE
PROPOSED GREENWAY
ACCESS PROVIDED SOUTH TO FUTURE DEVELOPMENT
2.5m HIGH TIMBER NOISE BARRIER

FOR LOCATION OF SITE NOTICES - REFER TO LOCATION MAPS - DWG NO. 20195/P/001 & 20195/P/002

PLEASE REFER TO SRLA LANDSCAPE DRAWINGS FOR DETAILS OF BOUNDARY AND SURFACE TREATMENTS

PLEASE REFER TO ENGINEERS DRAWINGS FOR ROAD DETAILS

Denotes area of land subject to planning application

NORTH

PROPOSED SITE PLAN - MASTERPLAN

SCALE 1:1000 @ A1

date	rev	name	chk	note
18.07.25	P2	GN	EJG	ISSUE FOR PLANNING

DEADY GAHAN ARCHITECTS
EASTGATE VILLAGE, LITTLE ISLAND, CORK
T: 021 4355016 W: WWW.DGARCHITECTS.IE
EMAIL: INFO@DGARCHITECTS.IE

Project
PROPOSED RESIDENTIAL DEVELOPMENT
GREENFIELD,
BALLINCOLLIG, CO. CORK

Drawing title
PROPOSED SITE LAYOUT
MASTERPLAN

Scale	Drawn	Checked	Date
1:1000 @ A1	GN	EJG	23.05.2025

Project No.	Drg. No.	Revision
20195	20195/P/003	P2

☐ Information \ Comments — Tender ☐
☐ Planning — Construction ☐

Cork City Council

MWP

Appendix 2

Baseline Model Update – Hydraulic Analysis Report

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Hydraulic Analysis Report

Maglin Area Baseline Hydraulic Model Update

Murnane O' Shea

January 2025

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Appendices

Appendix A – Topographic Survey

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Hydraulic Analysis Report
Baseline Model Update

1. General

1.1 Introduction

Malachy Walsh and Partners (MWP) has been commissioned by Murnane O'Shea to carry out the hydraulic analysis in relation to a proposed residential development located in Maglin, Ballincollig, Cork.

This report has been commissioned to establish the hydraulic implications of additional topographical survey information of the Maglin area and the further design development of the Ballincollig Distributor Road since the South Ballincollig Drainage Study SFRA was undertaken in 2021.

1.2 Summary of South Ballincollig Drainage Study SFRA

Malachy Walsh and Partners (MWP) Consulting Engineers were commissioned by Cork City Council (CCC) to carry out a Strategic Flood Risk Assessment (SFRA) in relation to the development of lands in Maglin, Ballincollig, Cork. This was completed in October 2021. A detailed hydrological analysis was carried out to estimate the flood flows throughout the study area and the surrounding areas. The results of this analysis were used as input parameters to the hydraulic modelling.

Detailed hydraulic analysis was also carried out which included modelling of approximately 3.2km of the Maglin North River, 2.1km of Maglin South River, circa 1km of the Curraheen River as well as the artificial drainage channel running through the western portion of the lands. In order to ensure the model was performing to an acceptable level of accuracy, the model was calibrated using surveyed and estimated flood levels from the February 2021 event.

The results of this hydraulic analysis were used to identify the Flood Zones for the study area. Cork City Council reviewed the flood zones identified during the SFRA preparation and applied the sequential approach when making decisions on land zoning in the Plan Area.

The baseline hydraulic model was adjusted for the post-development situation which includes for the proposed new spine road which will cross the river and floodplain at a number of locations. It was assumed for the purpose of this SFRA that no other alterations will be made to the river or floodplains. An indicative road alignment and footprint was agreed with Cork City Council to enable the SFRA to be completed. A number of mitigation measures were recommended from a SFRA perspective to ensure that the flood risk to developments within the Plan Area is acceptable and to prevent an adverse impact upstream or downstream of the site.

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2. Data Acquisition & Review

2.1 Additional Topographic Survey Information

2.1.1 Overview

As previously discussed, additional topographic surveying has been completed in the Maglin area and made available to MWP in November 2023. This topographical survey information relates to the floodplain areas in the Maglin area as indicated in Figure 2.1. This has resulted in a review and update of the South Ballincollig Drainage Study SFRA baseline hydraulic model based on the most up to date survey information for the purpose of the hydraulic analysis completed for this proposed development. It should be noted that this additional information only affects the 2D terrain surface utilised in South Ballincollig Drainage Study SFRA hydraulic modelling. The hydrographic survey data used to create the 1D cross sectional model of the river channels remains unchanged.

A summary of the location of the additional topographic survey information is provided below.

- The lands located in the western area of the Ballincollig lands (highlighted in orange in Figure 2.1) have a point spacing ranging from 30m – 60m with elevations ranging from approximately 30mAOD in the west to approximately 18mAOD in the east of this section of the surveyed area.
- The lands located in the north east area of the Ballincollig lands (highlighted in red in Figure 2.1) have a point spacing ranging from 10m – 15m with elevations ranging from approximately 23mAOD in the south west to approximately 15mAOD in the south east of this section of the surveyed area.
- The lands located in the south eats area of the Ballincollig lands (highlighted in purple in Figure 2.1have a point spacing ranging from 30m – 60m with elevations ranging from approximately 23mAOD in the west to approximately 15mAOD in the east of this section of the surveyed area.

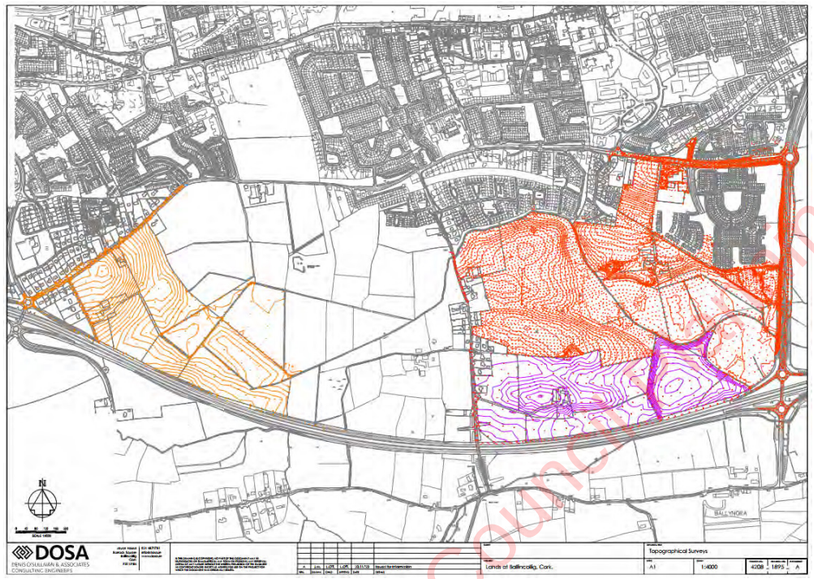

Figure 2.1: Location of Topographic Survey Areas

2.1.2 Comparison of LiDAR & Topographical Survey Information

The majority of the 2D terrain surface utilised for the South Ballincollig Drainage Study SFRA hydraulic analysis was created using 2.0m LIDAR data which was obtained from National Map Services in March 2021.

Presented below are screenshots of profile lines which compare the new topographical survey levels with the LIDAR surface from the South Ballincollig Drainage Study SFRA hydraulic model. This indicates the topographical survey is typically lower than the LIDAR by approximately 100mm-150mm. This is likely to have an impact on flood extents and levels within this area as these areas are located within the floodplain.

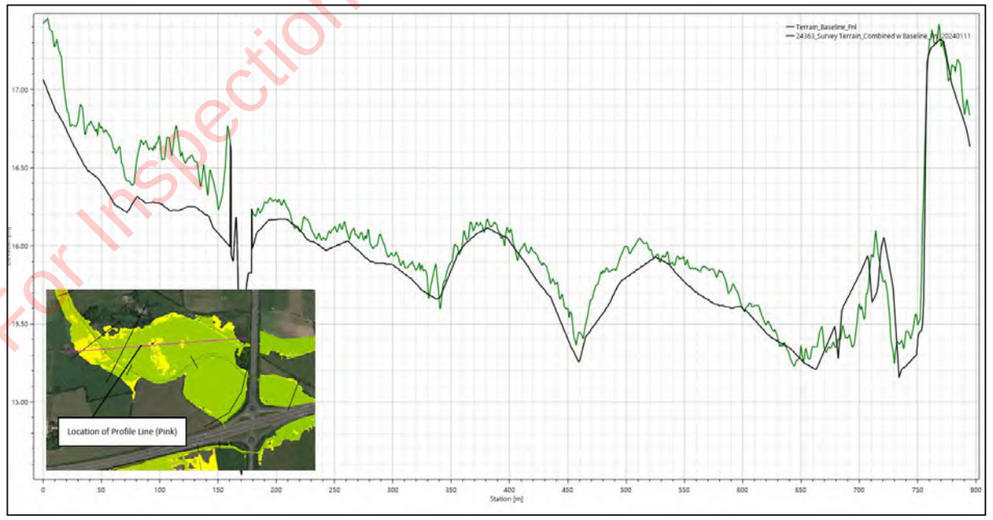

Figure 2.2: Comparison of Elevations - Topographic Survey 2023 (Black) LIDAR (Green)

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3. Hydraulic Modelling

3.1 Overview of Hydraulic Modelling Approach

The hydraulic analysis was carried out using the Hydraulic Engineering Centre River Analysis System software which was developed by the US Army Corps of Engineers.

The initial model was developed as a combined 1D-2D hydraulic model using HEC-RAS Version 5.0.7. The model was updated following the release of HEC-RAS Version 6.1 in June 2021 and it was determined through various sensitivity checking that the results from a full 2D model were similar to the initial model and moreover the 2D model was found to provide better stability and robustness with less uncertainty associated with the efficiency of flow transfer between the 1D and 2D domains. The model has subsequently been updated using HEC RAS 6.4.1 for the purpose of this study.

The final model includes approximately a 3.2km reach of the Maglin North River, 2.1km of Maglin South River and circa 1km of the Curraheen River as well as the artificial drainage channel running through the western portion of the lands.

As discussed in the South Ballincollig Drainage Study SFRA, the river channel was created using the 1-dimensional (1D) cross sections obtained from the OPW Lee CFRAMS survey data with a small number of supplementary cross sections surveyed by HD surveys for this SFRA. These 1D cross sections were used to create a digital terrain model DTM of the river channel to enable in-bank flows to be modelled using the hydrographic survey data since LIDAR data would not be suitable. The river channel remains unchanged for the hydraulic analysis completed as part of this study.

The remainder of the 2D model was developed using a DTM from LIDAR data. This has a total area of approximately 360 hectares and includes the lands within the study area, to the south of the N25 road as well as an extensive area downstream of the Maglin confluence with the Curraheen River. The DTM based on the 1D cross sections was then enforced onto the LIDAR DTM to provide a single terrain model for the entire area. As previously discussed, the 2D area in the Maglin area has been updated where applicable using the additional topographical survey information obtained in 2023. The result of this update is discussed in the following sub sections.

The model also includes 18no. existing bridge/culvert structures. The hydraulic model extents and schematic is included in Figure 3.1 below.

As indicated previously, the Ballincollig Distributor Road layout has also been modified since the completion of the South Ballincollig Drainage Study SFRA and this modification has been captured in the hydraulic analysis completed during this study and the result of this modification will be discussed in the following sub sections.

An unsteady flow analysis was performed using flow hydrographs which were derived during the hydrological analysis outlined previously and in the South Ballincollig Drainage Study SFRA. The downstream boundary condition was set to match the water surface gradient at the downstream end of the reach.

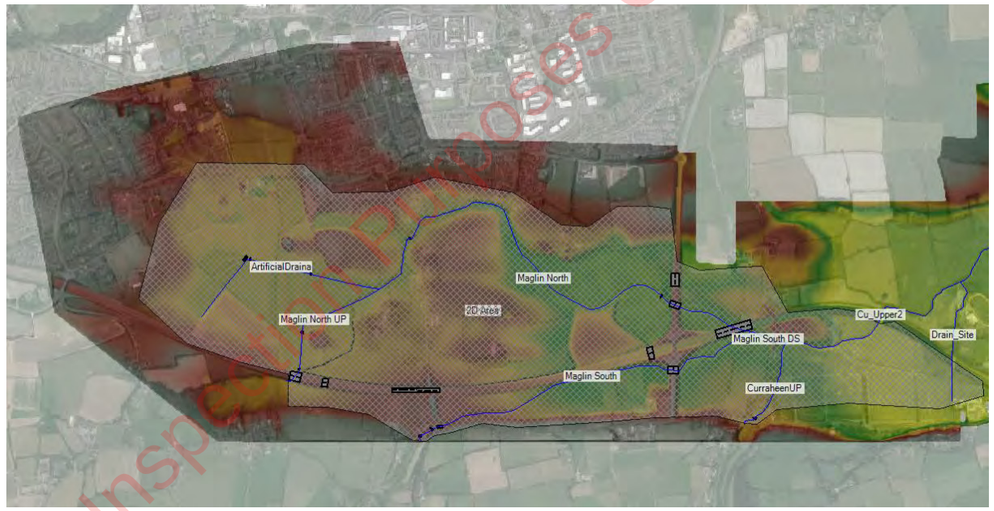

Figure 3.1: Hydraulic Model Schematic

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3.2 Baseline Hydraulic Model Update

3.2.1 Overview

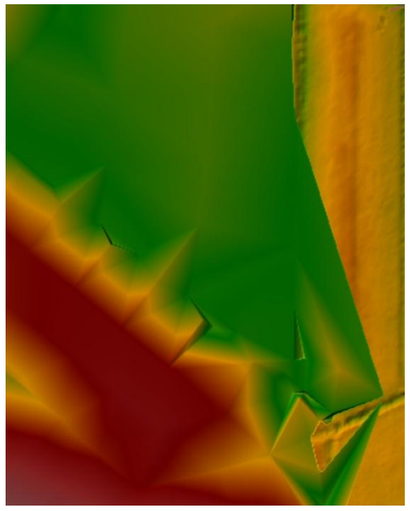
As previously discussed, additional topographic surveying was made available to MWP in November 2023. The details of this additional topographical survey information are summarised in Section 2.1. This has resulted in a review and update of the South Ballincollig Drainage Study SFRA baseline hydraulic model. The result of this update is outlined below.

3.2.2 Baseline Hydraulic Model Update Approach

3.2.2.1 Surface Update – No Modifications to Topographical Survey

Initially the topographical survey was combined with the LIDAR surface that was originally created for the hydraulic model for the South Ballincollig Drainage Study SFRA completed in 2021 without any modifications to the topographic survey. Combining the new topographical survey with the LIDAR surface presented a number of issues which had to be addressed. Some of these issues are described below.

1. Drainage ditches located in the western area of the Ballincollig lands were not surveyed so these drainage channels are not defined when the topographical survey is combined with the LIDAR surface which results floodplain storage and conveyance not being reasonably represented. If no modification is made to the new topographical survey flow will not be conveyed in this channel.



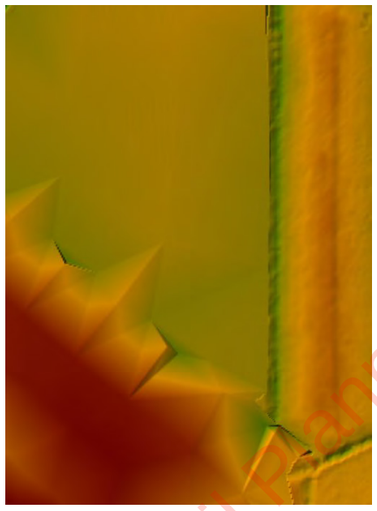
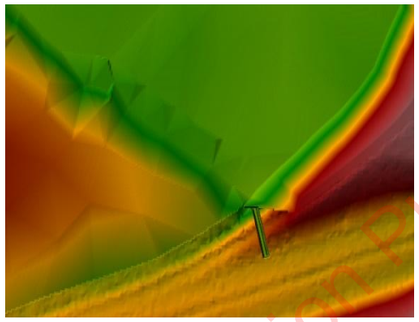


Figure 3.2 (Left): Topographic Survey Surface 2023

Figure 3.3 (Right): LIDAR Surface 2021

2. Drainage channel located immediately north of the N22 is not defined in the new topographical survey. If no modification is made to the new topographical survey flow will not be conveyed in this channel.



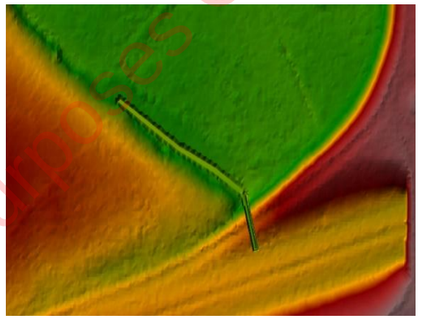
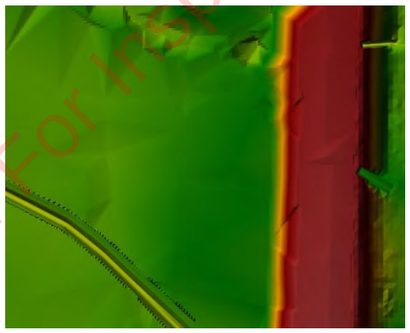


Figure 3.4 (Left): Topographical Survey Surface 2023

Figure 3.5 (Right): LIDAR Surface 2021

3. Drainage channel located immediately west of the N22 is not defined in the new topographical survey. If no modification is made to the new topographical survey flow will not be conveyed in this channel.



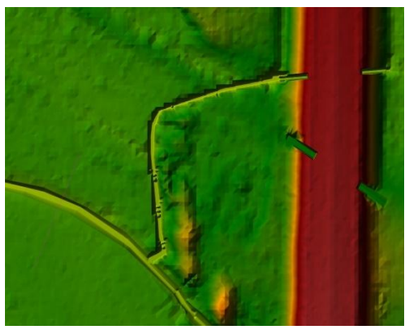


Figure 3.6 (Left): Topographical Survey Surface 2023

Figure 3.7 (Right): LIDAR Surface 2023

The screenshots presented above highlight some of challenges presented if the topographical survey is combined without making allowance for these drainage channels and ditches.

3.3 Surface Update –Modifications to Topographical Survey

In order to address this issue, the topographical survey was modified to remove survey points where channels/ditches are located to prevent these points from overwriting the channels/ditches captured in the LIDAR. A combination of both sources was then trialled, this involved modifying the topographical survey to remove survey points wherever channel drains/ditches were located and allowing the LIDAR surface to take precedence in these areas. An example is illustrated below.

The result of this modification was adopted as the terrain for the updated baseline model. The updated terrain is therefore a combination of the additional topographical survey information and the previously adopted LiDAR information where topographic survey information was removed or absent.

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3.4 Baseline Hydraulic Model Update Results

3.4.1 Overview

The baseline model was then re-run for the 1% AEP and 0.1% AEP Current and MRFS flood events to compare the differences between the South Ballincollig Drainage Study SFRA baseline hydraulic model and the updated baseline hydraulic model which included the additional topographical survey information with some minor modifications as outlined above.

A comparison of flood extents for the 1% AEP & 0.1%AEP Current & MRFS flood events is illustrated below in Figure 3.9 to Figure 3.11. A comparison of the flood levels recorded at Nodes 0-20 are presented in Table 3.3. For ease of comparison the nodes used to compare flood levels in the South Ballincollig Drainage Study SFRA have also been adopted for this study.

These results indicate that the flood extents in the updated baseline hydraulic model increase in the eastern and western areas of the Maglin area. However, as the topographical survey levels are generally lower than the LIDAR levels this has led to a decrease in flood levels generally by approximately 40mm across the Maglin lands.

Overall, the change in flood extents has not been drastic as a result of combining the new topographical survey with the LIDAR survey to update the baseline hydraulic model. The increase in flood extent surrounding Node 8 is largely attributed to the decrease in survey level which has increased the extent of flooding in this area. Similar reasons are attributed to the increase in flood extents surrounding Nodes 16 && 17. The updated baseline hydraulic model will be adopted in order to progress the hydraulic analysis for this report.

Figure 3.8: Flood Level Node Locations

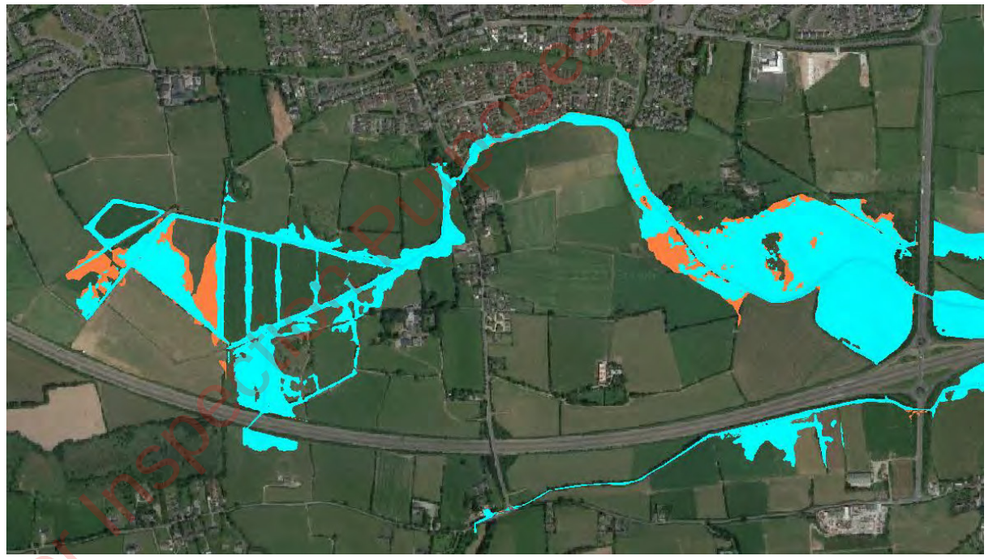

Figure 3.9: Comparison of South Ballincollig Drainage Study SFRA Baseline Hydraulic Model Results (Blue) v Updated Baseline Hydraulic Model Results (Orange) - 1% AEP Current Flood Event

Figure 3.10: Comparison of South Ballincollig Drainage Study SFRA Baseline Hydraulic Model Results (Blue) v Updated Baseline Hydraulic Model Results (Orange) - 0.1% AEP Current Flood Event

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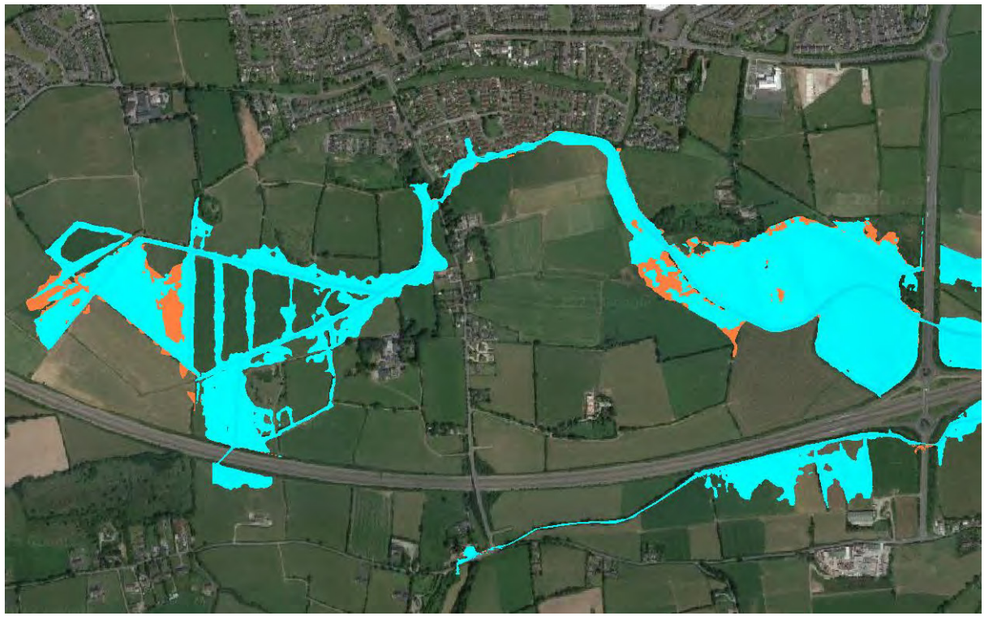

Figure 3.11: Comparison of South Ballincollig Drainage Study SFRA Baseline Hydraulic Model Results (Blue) v Updated Baseline Hydraulic Model Results (Orange) - 1% AEP MRFS Flood Event

Flood Levels at Node Points (South Ballincollig Drainage Study SFRA Baseline Hydraulic Model v Updated Baseline Hydraulic Model)			
Node ID	1% AEP Current (South Ballincollig Drainage Study SFRA) (mOD)	1% AEP Current (Updated Baseline Model Model) (mOD)	Difference (m)
0	19.08	19.08	0
1	18.84	18.84	0
2	18.67	18.67	0
3	18.44	18.42	-0.02
4	18.28	18.25	-0.03
5	18.18	18.14	-0.04
6	18.01	17.99	-0.02
7	17.33	17.30	-0.03
8	16.57	16.53	-0.04
9	16.24	16.11	-0.13
10	16.12	16.04	-0.08
11	15.96	15.93	-0.03
12	18.59	18.54	-0.05
13	18.48	18.45	-0.03
14	18.42	18.39	-0.03
15	18.35	18.32	-0.03
16	18.49	18.40	-0.09
17	-	-	-
18	15.98	15.95	-0.03
19	15.98	15.95	-0.03
20	16.07	16.00	-0.07

Table 3.1: Predicted Flood Levels at Node Points (South Ballincollig Drainage Study SFRA Baseline Hydraulic Model v Updated Baseline Hydraulic Model) – 1% AEP Current

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Flood Levels at Node Points (South Ballincollig Drainage Study SFRA Baseline Hydraulic Model v Updated Baseline Hydraulic Model)			
Node ID	0.1% AEP Current (South Ballincollig Drainage Study SFRA) (mOD)	0.1% AEP Current (Updated Baseline Model Model) (mOD)	Difference (m)
0	19.16	19.16	0
1	18.90	18.90	0
2	18.76	18.76	0
3	18.58	18.56	-0.02
4	18.50	18.46	-0.04
5	18.43	18.38	-0.05
6	18.16	18.14	-0.02
7	17.41	17.40	-0.01
8	16.68	16.59	-0.09
9	16.37	16.30	-0.07
10	16.33	16.28	-0.05
11	16.30	16.25	-0.05
12	18.71	18.66	-0.05
13	18.65	18.62	-0.03
14	18.62	18.59	-0.03
15	18.55	18.52	-0.03
16	18.65	18.62	-0.03
17	18.65	18.62	-0.03
18	16.30	16.26	-0.04
19	16.30	16.26	-0.04
20	16.32	16.27	-0.05

Table 3.2: Predicted Flood Levels at Node Points (South Ballincollig Drainage Study SFRA Baseline Hydraulic Model v Updated Baseline Hydraulic Model) – 0.1% AEP Current

Flood Levels at Node Points (South Ballincollig Drainage Study SFRA Baseline Hydraulic Model v Updated Baseline Hydraulic Model)			
Node ID	1% AEP MRFS (South Ballincollig Drainage Study SFRA) (mOD)	1% AEP MRFS (Updated Baseline Model Model) (mOD)	Difference (m)
0	19.12	19.12	0
1	18.87	18.87	0
2	18.72	18.72	0
3	18.51	18.49	-0.02
4	18.4	18.36	-0.04
5	18.32	18.27	-0.05
6	18.1	18.07	-0.03
7	17.38	17.35	-0.03
8	16.63	16.56	-0.07
9	16.29	16.18	-0.11
10	16.2	16.14	-0.06
11	16.12	16.09	-0.03
12	18.65	18.64	-0.05
13	18.57	18.53	-0.04
14	18.53	18.50	-0.03
15	18.46	18.43	-0.03
16	18.58	18.52	-0.06
17	18.58	18.53	-0.05
18	16.14	16.10	-0.04
19	16.14	16.10	-0.04
20	16.18	16.12	-0.06

Table 3.3: Predicted Flood Levels at Node Points (South Ballincollig Drainage Study SFRA Baseline Hydraulic Model v Updated Baseline Hydraulic Model) – 1% AEP MRFS

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4. Summary & Conclusion of Hydraulic Analysis

1. Malachy Walsh and Partners (MWP) has been commissioned by Murnane O'Shea to carry out the hydraulic analysis in relation to a proposed residential development located in Greenfields, Ballincollig, Cork.
2. This report was commissioned to evaluate the hydraulic impacts of additional topographical data, Ballincollig Distributor Road realignment, associated with the proposed residential development on flood levels.
3. A detailed hydrological analysis was carried out to estimate the flood flows throughout the site and the surrounding Maglin area for the South Ballincollig Drainage Study SFRA. The hydrology and flow estimation methods adopted for the South Ballincollig Drainage Study SFRA was reviewed and deemed suitable for reuse for the purpose of this hydraulic analysis to ensure consistency with the SFRA.
4. Additional topographic surveying has been completed in the Maglin area and made available to MWP in November 2023 by Murnane O'Shea. This combined with the modification of the Ballincollig Distributor Road layout since the completion of the South Ballincollig Drainage Study SFRA has led to an update in the baseline hydraulic model which was adopted for the SFRA which was used for this study.
5. The hydraulic analysis results indicate that the flood extents in the updated baseline hydraulic model increase slightly in the eastern and western areas of the Maglin area when compared to the SFRA flood extents. However, as the topographical survey levels are generally lower than the LIDAR levels used in the SFRA this has led to a decrease in flood levels generally by approximately 40mm across the Maglin lands. The updated baseline hydraulic model was deemed suitable for use in this study.

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APPENDIX 7-4 Drainage Impact Assessment – DOSA Consulting Engineers

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DOSA

DENIS O'SULLIVAN & ASSOCIATES

CONSULTING ENGINEERS

RESIDENTIAL DEVELOPMENT AT GREENFIELD, BALLINCOLLIG, CORK

DRAINAGE IMPACT ASSESSMENT

DATE 07/07/2025

REVISION 1

JOB NO. 6081

Joyce House, Barrack Square, Ballincollig, Co. Cork

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DOCUMENT CONTROL

PROJECT NAME: Residential Development At Greenfield, Ballincollig, Cork

PROJECT NUMBER: 6081

REVISION	DATE	FILE NAME: Residential Development At Greenfield, Ballincollig, Cork			
1	07.07.2025	DESCRIPTION: Drainage Impact Assessment			
			PREPARED	CHECKED	APPROVED
		INITIAL	SO'G	LO'T	LO'T
		DATE	07.07.2025	07.07.2025	07.07.2025
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1 Introduction

DOSA Consulting Engineers were engaged as Engineers for the proposed development at Greenfield, Ballincollig, Cork. The purpose of this Drainage Impact Assessment report is to provide details of the Storm Water elements associated with the proposed development.

1.1 Site Location

The subject site (currently greenfield) is located within the Ballincollig town boundary. The site is a greenfield site characterised by its gently sloping topography. The site is directly bound on the north by the existing Woodberry/Greenfields Road and to the south by the Ballincollig Bypass (N22). The western lands are currently in agricultural use but are also zoned in the Current City Development Plan. A snapshot of the application boundary is outlined in Figure 1.1 below.

Figure 1.1 – Context Map (Source: Google Maps)

1.2 Scope of Assessment

This report deals with the following aspects associated with this development:

- Existing Site
- Site Investigations
- Soil Type Classification
- Storm Water Drainage Design
- Sustainable urban Drainage Systems (SuDS)
- Flood Risk Assessment and Exceedance Flows
- SuDS Maintenance

1.3 Site Topography

The topography of the site gently slopes from the north and west to a low point on the south-eastern boundary which is approximately +18.42m AOD. The elevation height along the perimeter from the north, west and southern side varies from +30.0m to +19.0m AOD. A full Topographical feature and level survey has been completed. Figure 1.3 shows a snip of the topographical survey.

Figure 1.3 – Site Topography

1.4 Existing Hydrological Environment

The site is within hydrometric area19 (Lee, Cork Harbour and Youghal Bay). Hydrometric area No19 includes the surface catchment drained by the River Lee and all streams entering tidal water in Cork Harbour and Youghal Bay and between Knockaverry and Templebreedy. The site is in the sub catchment of Glasheen(Corkcity)_SC_010 (EPA Segment Code 19_17). The surface water catchment divide is shown on Figure 1.4.

The main hydrological features of the area are the "Lisheens 19" and "Maglin North" networks. Both of these watercourse's flow in a westerly direction. The Maglin North watercourse is joined by the Maglin South River approximately 2km downstream from the subject site before discharging to the Curragheen River, which is approximately a further 2km downstream. The Curragheen River then flows in a north-easterly direction and joins the River Lee before ultimately discharges to Cork harbour. Figure 1.5 below illustrates the main hydrological features associated with the site.

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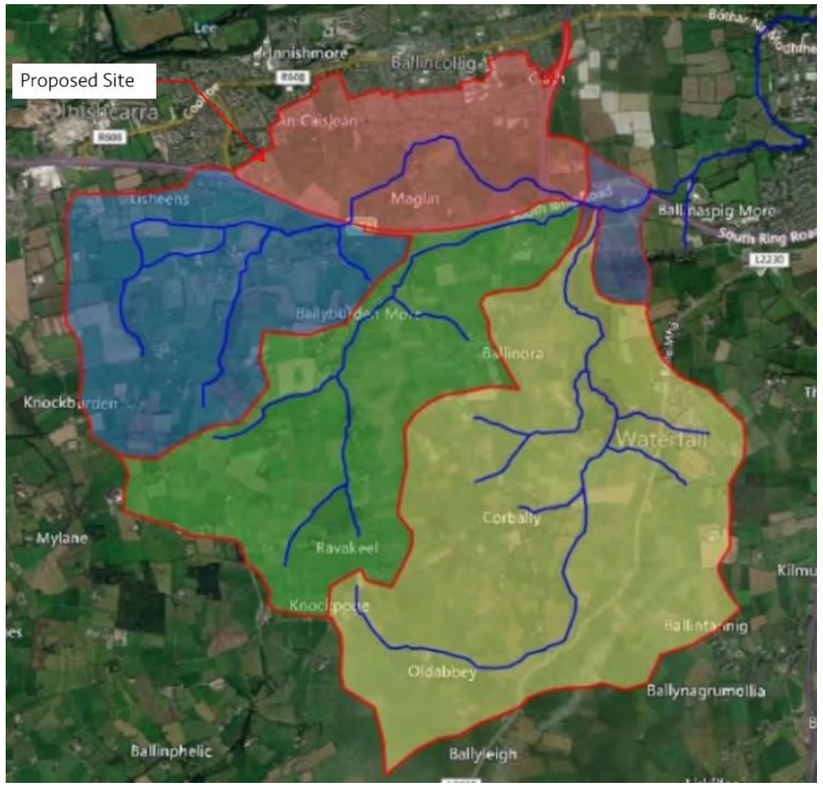

Figure 1.4 – Catchments (Source: MWP FRA)

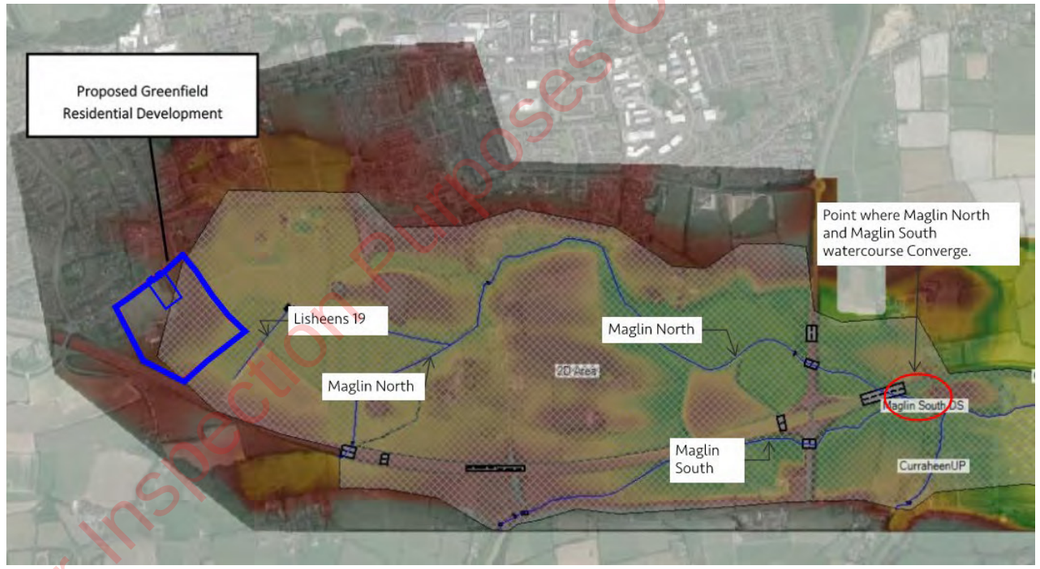

Figure 1.5 – Convergence of Watercourses (Source:MWP South Ballincollig Drainage Study)

1.5 Proposed Development

A Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork. The proposed development consists of the demolition of an existing dwelling house and farmyard with associated agricultural buildings and the construction of a mixed-use residential development of 544 no. residential units consisting of 232 no. dwelling houses, 312 no. apartment/duplex units, a two storey creche facility, commercial/retail unit and all ancillary site development works. The proposed 232 no. dwelling houses will include 100 no. 4 bedroom detached/semi-detached dwelling houses, 124 no. 3 bedroom semi-detached/townhouse dwelling houses and 8 no. 2 bedroom townhouse units. The proposed 312 no. apartment/duplex units will include 61 no. 3 bedroom units, 171 no. 2 bedroom units and 80 no. 1 bedroom units, to be provided in 28 no. apartment/duplex buildings ranging in height from 3-4 storeys. One of the proposed apartment buildings (Block 3) will provide the ground floor commercial/retail unit.

Vehicular access to the proposed development will be via two entrances from Greenfields Road (L2216) with separate pedestrian/cycle connections also provided from Greenfields Road. Ancillary site works include the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex buildings, creche and commercial/retail unit, landscaping and servicing proposals including the upgrade of public footpaths/active travel infrastructure and water service infrastructure, 2 no. pedestrian crossings on Greenfields Road and the installation of a noise attenuation screen along the site's southern boundary.

The proposed development is highlighted in Figure 1.6.

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Figure 1.6 – Proposed Development

1.6 Principle Design Considerations

During the design of the storm water drainage for the proposed site, including SuDS, the following key documents / standards were taken into consideration.

- Sustainable Drainage Strategy – South Ballincollig Drainage Study (December 2021)
- Cork City Council Development Plan specifically

  Section 9.8 of Chapter 9 – Environmental Infrastructure of the Cork City Development Plan "The traditional method of disposing of surface water runoff from impermeable surfaces such as roofs, roads and carparks is collection and redirection to drainage systems. This can result in localised flooding, higher waste treatment costs and the transfer of contaminants (such as oil from carparks) directly to water courses, resulting in pollution and affecting a river's ability to recharge naturally. Sustainable Urban Drainage Systems (SUDS) offer a more integrated approach to rainwater management. It involves a method of replicating the natural characteristics of rainfall runoff from any site, ensuring water is infiltrated or conveyed more slowly to the drainage system and ultimately to water courses via permeable paving, swales, green roofs, rain water harvesting, detention basins, ponds and wetlands. Chapter 5 Climate and Environment includes more detail in terms of the types of SUDS that can be used to achieve these goals. Where appropriate and possible, Cork City Council will encourage the use of SUDS and will prepare guidance on how SUDS can be applied to developments over the period of the plan."
- CIRIA report C753 The SuDS Manual-v6
- Greater Dublin Strategic Drainage Study (GDSDS)
- Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas Water Sensitive Urban Design - Best Practice Interim Guidance Document, (CDP Objective 9.4) - The Department of Housing, Local Government and Heritage.

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2 Surface Water Design Overview

The completed development site is a mix of soft landscaping and hard paving or roofing. The existing topography produces one catchment area. Groundwater flow direction is interpreted to be from the north/west to the south eastern boundary.

Discharge from the site will be at the southern boundary to the existing Lisheens 19 watercourse.

The proposed storm water drainage system has been designed to cater for all surface water runoff from all hard surfaces within the proposed development including roadways, roofs, parking areas and green areas etc. The development has been split into a number of catchment areas.

The proposed surface water drainage network will collect surface water runoff from the site via a piped network prior to discharging off site via the attenuation tanks, flow control devices and separator arrangement. Final discharge rates will be at Qbar greenfield run-off rates.

Prior to entering the system, the stormwater generated will be treated through a number of nature-based solutions in line with adopted SuDS measures.

The storm sewer network was designed using Innovyze Micro Drainage modelling software. Outputs from the storm sewer design can be found in the Appendices of the Infrastructure Report.

Refer to DOSA Stormwater Drawing Series for details of the proposed surface water network.

All flow velocities within the network fall within the limits of 0.75 and 3m/sec as set out in "Recommendations for Site Development Works" as published by the Department of Environment. The storm water network and infiltration basin are designed to accommodate the 100-year return period plus an additional 20% to account for the effects of climate change.

2.1 Proposed Sustainable Urban Drainage (SuDS) Strategy

For the proposed development, a "SuDS triangle" was utilised to ensure all three functions are provided for within the SuDS strategy.

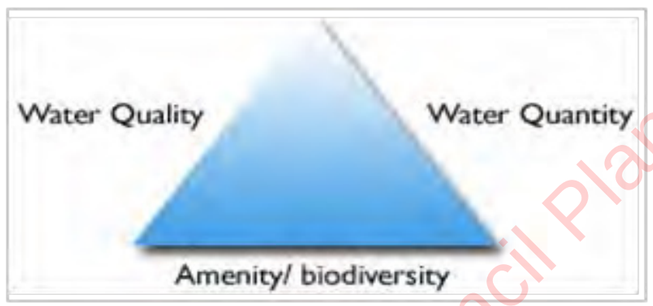

Figure 2.1– SuDS Triangle

By considering the three functions of the triangle, a SuDS system will allow for water quality treatment through natural processes by.

- Encouraging infiltration (where appropriate) and attenuating peak flows.
- Improving water quality by providing treatment to storm water prior to discharge.

- Providing habitat and function where possible for those using the area (including wildlife).

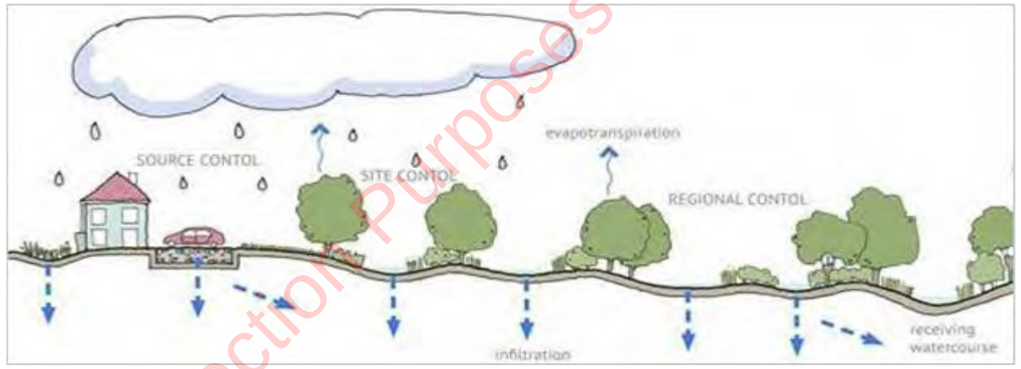

Figure 2.2– SuDS Treatment Train

The principles of a SuDS treatment train were used during the design of the surface water drainage system. The treatment train as illustrated in the image below provides an understanding of prevention and source control to reduced water run-off from a site and improve water quality.

Criterion 1: River Water Quality Protection

Satisfied by providing stormwater attenuation tanks and treatment of surface water run-off by SuDS features such full retention fuel/oil separators at surface water discharge points.

Criterion 2: River Regime Protection

Satisfied by attenuating surface water run-off in association with flow control devices prior to discharge off site at Greenfield runoff rate. Site critical duration storm used to assess attenuation volume.

Criterion 3: Level of Service (Flooding) for the Site

Satisfied by reviewing available flood hazard information relating to the site's proximity to tidal and fluvial flood plains (up to 1 in 100-year flood event).

Criterion 4: River Flood Protection

Satisfied by attenuating surface water discharge to greenfield runoff rates, addressing flood risk associated with the 1 in 100-year storm and avoiding development in flood plains.

Following a comprehensive review of the design of the storm water drainage system we considered all options under the SuDS guidance policies referred to in the Greater Dublin Drainage Strategy. A preliminary feasibility of the applicable SuDS Techniques was conducted. The preliminary analysis indicated that the following techniques were suitable attenuation tanks, infiltration basins, tree pits, filter drains, Blue/Green roofs, rain water harvesting.

Each proposal was examined and evaluated on its merits / suitability under site specific constraints for use in the proposed development site. Our design approach summary is as follows:

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2.2 Design Response to Section 247/LRD Meeting Commentary/Queries

2.2.1 247 Meetings

Queries raised via meetings and minutes of notes from 247 meetings have been incorporated into the design. This has been noted in the LRD Opinion

"The overall storm water drainage strategy is acceptable and incorporates our feedback and comments from previous S247 meetings."

2.2.2 LRD Meeting

Drainage Section – Cork City Council Comments

The overall storm water drainage strategy is acceptable and incorporates our feedback and comments from previous S247 meetings.

In relation to the proposed attenuation tanks, there are concerns over how the tanks will be accessed for maintenance. Attenuation Tank Nr. 5 is located in a green area between a private area and an area to be Management Company. There appears to be no access for plant and equipment.

Attenuation Tank Nr. 6 is located in an area of public open space and amenity. It is located a significant distance from an access road and would require crossing pedestrian/cycle paths. There are concerns that accessing the tank with plant and equipment could significantly damage the landscaping. Also, the SuDS schematic layout shows numerous trees planted on top of and around the tank which would further impede access.

Please clarify how the tanks will be accessed, identifying access routes and locations for the safe parking and positioning of plant and equipment.

Also no drawings were provided for the attenuation tank. Please provide general arrangement and cross section drawings for each of the proposed attenuation tanks. Please note that internal walls or any internal obstructions to cleaning should be avoided. Access covers with fall arrests are required on opposite sides of the tanks to facilitate cleaning.

Response

Detailed General Arrangement Plans have been included for all attenuation Tanks proposed. Refer to drawings

6081-4280, 6081-4281, 6081-4282, 6081-4283, 6081-4284 & 6081-4285

Tank locations have been reviewed and located in open areas. (minor repositioning to that previously submitted). In relation to Access and maintenance all tanks are accessible. Any sloped areas in and around tanks will be a maximum of 1:4. Off road parking green parking (Reinforced grass parking areas) have been provided for all tanks as indicated on relevant drawings listed above. No landscaping trees will be planted over the reinforced tanks. It will be predominantly grass with potentially small pockets of low level shrubs. These are indicated on the drawings listed above.

Any access paths, landscaping areas etc that require traversing will be such designed so that there is no damage

In terms Of Operation and Maintenance the use of Reinforced concrete tanks is robust and maintenance free. The typical arrangement is the following train

- A Petrol interceptor which is accessible only via an on-grade heavy duty manhole cover.
- An inlet manhole to the tank will have a sump incorporated to trap silt so as to reduce the need to access the tank.
- The SuDS train is followed by a reinforced concrete attenuation tank. This is accessed via a number of heavy-duty manholes covers and fall arrest gates. (anticipated requirement to enter is extremely low). In the unlikely event of entry being necessary only trained personnel in confirmed spaces will be permitted in any tank and this will be detailed and highlighted in any handover/maintenance files at taking in charge stage. There are no moving parts or plant associated with these tanks.
- The outflow will be controlled by a hydrobrake located in an outlet manhole abutting the tank. This will be a vortex arrangement and separate access to that of the tank itself.

Specifically In relation to the proposed attenuation tank no. 5 and concerns over how the tanks will be accessed for maintenance. and its location in a green area between a private area and an area to be Management Company the inclusion of drawing no. 6081-4284 and the notes highlighted above should alleviate these concerns

In relation Attenuation Tank Nr. 6 (should be tank 3)

- being located in an area of public open space and amenity,
- located a significant distance from an access road,
- requiring crossing pedestrian/cycle paths. , that accessing the tank with plant and equipment
- could significantly damage the landscaping .
- the SuDS schematic layout shows numerous trees planted on top of and around the tank which would further impede access.

Drawing No. 6081-4282 shows the tank being relocated and orientated differently. There will be access to both the north and south from adjacent access roads. Similar to all tank locations there will be no trees or significant SuDS measures that impede the locations and operations of the attenuation tanks.

General arrangement and cross section drawings for each of the proposed attenuation tanks and their interaction with landscaping have been included as part of the package. Internal walls are required for structural purposes but large openings in same will provide access. Addition access covers will provide safe access if required. There will be no obstructions to cleaning and maintenance of these tanks.

2.3 SuDS Appraisal

2.3.1 Introduction

In developing a SuDS strategy particular reference is made to the *"South Ballincollig Drainage Strategy – South Ballincollig Drainage Study"*

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The purpose of this report is to prepare a Sustainable Drainage Strategy (SDS) for the overall development area. This includes:

- Provide a clear, creative, cost-effective and innovative SuDS which would be adopted for the main infrastructure design and by future designers on a site specific basis;
- Identify suitable locations for different types of SuDS;
- Identify key amenity features & potential habitats, such as wetlands or ponds;
- Set out all mitigation measures required for each area of the site, including confirmation of the minimum finished floor levels and ground levels throughout the study area & the maximum discharge rates from the developed sites;
- Identify the route, inverts & outfalls of the proposed main drainage system serving the developed area, including interfaces with existing or future foul trunk mains, rising mains or other utilities;
- Set out firm and clear requirements in relation to the incorporation of SuDS in both the development
- masterplan and the future development of the zoned lands.

Whilst the report is broad ranging and sets out certain recommendations etc it also acknowledges certain constraints associated with the site. Section 4.3 Key Challenges Posed by Subject Lands affect the SuDS strategy.

Section 4.3.3 Unstable Subsurface/ Potential Karstification (Extracted from report)

This site potentially has areas which are prone karstification as the subject area is underlain by carboniferous limestone bedrock. This may lead to instability issues within these areas if water is encouraged to infiltrate these areas. Further site investigation is recommended to assess the risk of unstable/karstified subsurface. A number of issues can arise when implementing a SuDS scheme on a site that may be prone to subsurface soil or rock instability. These issues arise mainly due to the effects of SuDS components that encourage water infiltration. Water infiltration into the ground can cause instability in poorly consolidated soils because the water can wash out the soil or cause it to compact. Also, rocks such as the limestone and sandstones found in this area may slowly dissolve over time. Water from infiltration systems can also cause slope or retaining wall failure, because water pressure may increase in the soil behind the slope or wall. SuDS for sites where there are soils or rocks prone to instability should not use infiltration as a runoff destination, and it may be necessary to line systems to prevent any water infiltrating the ground. This will depend on the risks associated with any potential instability and the likely volume of water discharging to the infiltration device when compared to natural exposure to rainfall on the same area. A small amount of infiltration to provide interception may not be a problem. An appropriate risk assessment may need to be carried out on a case by case basis. The use of SuDS in such areas with rock/soil instability risks will require advice from a geotechnical specialist.

Table 4.1 of Section 4.3.7 highlights the following

Attribute	Description	Influence on SuDS Design
Fluvial Flooding	The SFRA assesses the flood risk within the site. Parts of the site have been identified as being at risk of flooding. The areas at risk follow the path of the Maglin River through the site and are illustrated on the SFRA map.	The siting and design of SuDS should take cognisance of the predicted flood extents and levels.
Karstification	The site has a number of physical constraints in the form of a karst limestone underground cavers system associated with an extensive central area at risk of flooding which form tributaries to Maglin Steam, running west to east.	Areas that experience karstification may limit the feasibility of infiltration solutions. Further ground investigation is required to confirm this constraint.
Topography	Elevation within the site was found to be between 20 – 30m AOD, with an average of 23m AOD. The site has a slight dip from west to east as ground level approaches sea-level within Cork City.	Flat topography influences existing and proposed flow routes and should be considered at design stage of SuDS components.
Groundwater Flooding	Groundwater flooding was not identified as a significant risk in the plan area.	This is based off relatively old data and further monitoring is warranted.
Archaeological Heritage & Architectural Heritage	There are 8 archaeological features recorded on the site as shown on the map. There are 4 Fulacht Fia's, 2 Lime Kilns, a standing stone, and a country house Maglin House which are all protected. Ballincollig cave pNHA 001249 is the only proposed Natural Heritage Area in the site. Most notable of the features is the Ballincollig Castle, which is a protected structure (RPS 467). It is important that any proposed development does not diminish the importance of the castle in the landscape and that some of its original purpose as a look out over the surrounding landscape is maintained.	Ballincollig Castle requires a 100m buffer around the castle. SuDS features should not impact on protected structures/recorded monuments.
Land Use	The site is largely undeveloped agricultural land that has been zoned for residential, educational, public open space and also contains a proposed spine road.	Proposed land use is relatively low risk to water quality requirements with the exception of the proposed spine road.
Groundwater Levels, Soil Permeability & Infiltration Potential	Groundwater levels are not confirmed however it is anticipated that certain areas of the site could experience high groundwater. GSI mapping indicates soils would have medium to high permeability.	Solutions relying on infiltration may be unsuitable where high GW levels occur. Where high GW is not present, soil permeability should be sufficient to accommodate infiltration. Further investigation required.

Table 4.1: Site Constraints

Extensive Site investigations summarised in the accompanying report confirm the presence of Karst and as a result has informed the SuDS selection and Proposed Management Train for this development.

In endeavouring to design a system having regard to the recommendations in Section 6.1.3 Drainage Proposal for Residential Developments

- That all runoff within the curtilage of the property boundary pass through at least one suitable SuDS component prior to discharging to downstream SuDS components.
- Storage up to the 1 in 100 year event including climate change allowance shall be provided within the curtilage of the property boundary, with maximum discharge rates/volumes in accordance with Section 3.
- Runoff from public areas (such as roads, parking areas, hard and soft landscaped areas, and footpaths) shall pass through at least one SuDS component prior to discharging to the final downstream detention/retention SuDS components.
- Runoff from roofs can be managed using water butts, rainwater harvesting, rain gardens, infiltration trenches, permeable paving, and soakaways.
- Runoff from hardstanding areas can be managed using permeable paving, filter strips, swales, and bioretention systems.

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- The final SuDS components located within the development shall comprise basins/ponds/wetlands, prior to discharge to the Maglin River or local surface water sewer.

The conclusion is that the site investigations restrict the ability to implement a number of these recommendations.

In developing a SuDS Management Train reference has been made to Section 5.6 of the Drainage Study

A summary of possible SuDS components is included on Table 5-2 below. **Since there is currently limited site specific information with respect to groundwater levels and infiltration potential, and also because the site layouts have not yet been established, very few components have been eliminated. This provides developers flexibility to develop suitable systems in accordance with the sustainability and discharge hierarchies provided above.** Further technical detail on how these components can be designed for various ground conditions can be examined in "Part D: Technical Detail of the CIRIA SuDS Manual C753". SuDS components that have been disregarded include attenuation tanks and oversized pipes. These components should only be used as a last resort and it is envisaged that more sustainable measures will be feasible for developments in this plan area.

SuDS Component	Control Type	Design Criteria						If Infiltration Suitable	If Infiltration Unsuitable	Comments
		Peak Runoff	Frequent Runoff Volumes	Extreme Runoff Volumes	Water Quality	Amenity	Bio-diversity			
RWH	Source		✓	✓		✓		✓	✓	Suitable for residential and education zones.
Green/Blue Roofs	Source		✓		✓	✓	✓	✓	✓	
Infiltration Systems	Source/Site	✓	✓	✓	✓	✓	✓	✓		Only suitable if groundwater level and subsurface conditions allow.
Trees	Source/Site	✓	✓		✓	✓	✓	✓	✓	Suitable for wide variety of land use types and site conditions.
Filter Strips	Source/Site		✓		✓			✓	✓*	May be used with a liner if infiltration not suitable.
Filter Drains	Source/Site	✓			✓			✓		Not suitable in unstable ground conditions or high groundwater levels.
Swales	Source/Site	✓	✓	✓	✓	✓	✓	✓	✓*	May be used with impermeable lining in areas where infiltration unsuitable.
Pervious Pavements	Source/Site	✓	✓	✓	✓			✓	✓*	May be used with impermeable lining in areas where infiltration unsuitable.
Bioretention Systems	Site	✓	✓	✓	✓	✓	✓	✓	✓*	Can be designed for areas where infiltration not suitable.
Detention Basins	Site/Regional	✓	✓		✓	✓	✓	✓	✓*	Ensure storage capacity not reduced by high groundwater levels.
Ponds & Wetlands	Regional	✓			✓	✓	✓	✓	✓*	Can be used with liner if infiltration undesirable.

Table 5.2: SuDS Potential for the Plan Area

✓* = Alteration to design may be required.

Whilst acknowledging the above the execution of site specific investigations has provided more specific and detailed information to formulate the SuDS management Train

As a result the following methodologies are being implemented as part of the SuDS treatment train approach:

2.3.2 Rainwater Harvesting

In relation to rainwater harvesting an option is to provide a water butt with each individual dwelling. This could be located to the rear of each unit. This water butt will only have the ability to catch the rear sloping side of the dwelling and the reuse would be for watering plants. The intention would be that the homeowner retrospectively provides these.

2.3.3 Infiltration Basins

The proposal as submitted in the LRD application was to incorporate infiltration basins in green spaces to compliment the SuDS strategy.

Infiltration basins are vegetated depressions designed to store runoff on the surface and infiltrate it gradually into the ground. They are normally dry except in periods of heavy rainfall. The infiltration basins proposed to be located in various green areas and designed so that there would be no water storage at any time. They will act as infiltration only.

For clarity these act as simply infiltration basins for the associated area highlighted only and will not act as a collection/infiltration solution for adjacent areas. As a result, there willbe no water depth in these as the infiltration rates exceeded the runoff. It is proposed to retain and integrate infiltration basins in open areas. They will have a max side slope of 1:4 and fully useable by the public at all times.. They have been carefully coordinated with eth Landscape design The substrata incorporates additional permeable material and the basins are highlighted on the SuDS drawing series 6081-4241 to 6081-4245.

2.3.4 Filter drain

Trenches filled with permeable material and a perforated collection pipe at the invert with an optional permeable 'sandy' topsoil at surface. These will treat, convey, and attenuate runoff at source, and can infiltrate to the ground where the subgrade is suitable. These systems will allow some form of storage for small rainfall events and can result in water evaporation and adsorption in small quantities, therefore there will be less run-off from these areas in small rainfall events thus mimicking the natural response for this catchment. The LRD Application proposed to locate these along the proposed pedestrian/cycle pathways and will allow groundwater to recharge to its natural state. All proposed filter drains are indicated on drawings series 6081-4241 to 6081-4245.

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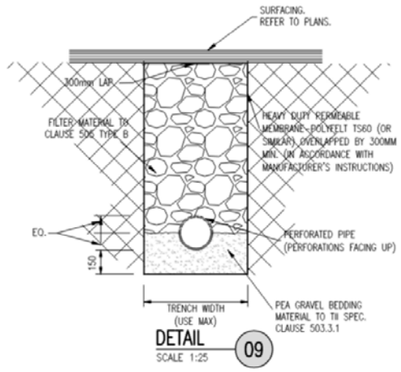

Figure 2.3– Typical Filter Drain Detail

The runoff and infiltration from the filter drains in the public areas have not been incorporated in any reduction of areas from an attenuation storage calculation perspective. Theoretically the installation of these filter drains in public areas contribute to a possible volumetric reduction in required attenuation. This potential reduction has not been factored into the attenuation calculations.

2.3.5 Tree Pits

Trees can be planted within a range of infiltration SuDS components to improve their performance, as root growth and decomposition increase soil infiltration capacity. Alternatively, they can be used as standalone within soil-filled tree pits, tree planters or structural soils, collecting and storing runoff and providing treatment via filtration and phytoremediation. Tree pits and planters will be designed to collect and attenuate runoff by providing additional storage within the underlying structure. The soils around trees can also be used to filter out pollutants from runoff directly. Tree pits are proposed to be in green space areas to treat and control runoff, while at the same time providing amenity value to adjacent pedestrian, and residential zones. It is also proposed, where possible to fit tree pits along the estate road to drain and treat surface water runoff from the road network. This will allow for treatment of first flush and low flows while high flows will discharge into the surface water network during extreme rainfall events. Rainwater gullies will still be provided downstream of any tree pit to drain runoff during an extreme rainfall event.

Trees Pits are proposed as indicated on drawings series 6081-4241 to 6081-4245.

Calculations in relation to the infiltration rates of same are included in Appendix B. The proposed detail is as per Fig 2.4 below.

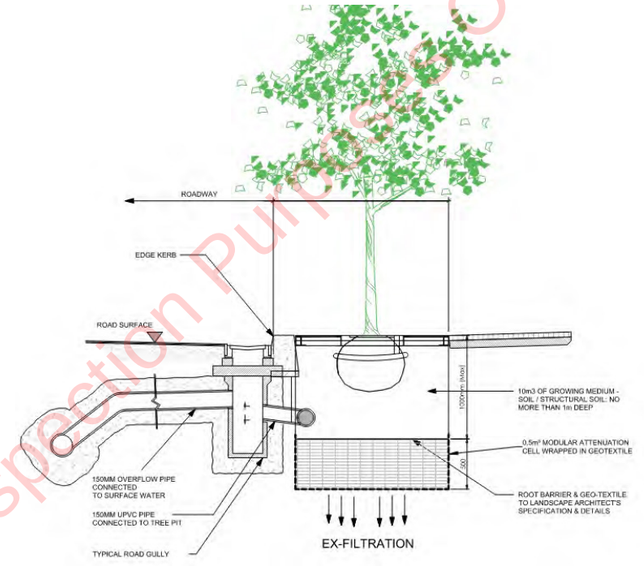

Figure 2.4– Tree Pit Detail

2.3.6 Attenuation Tanks

Whilst acknowledging that attenuation tanks are a last resort site investigations have concluded that they are the most suitable solution due to the presence of the Karst substrata.

The proposed attenuation system attenuates surface water to restrict the outflow to the equivalent of the existing agricultural runoff. This ensures the development will not give rise to any impact downstream of the site. It is the council's preference not to use proprietary modular systems, so it is proposed to use reinforced concrete underground tanks. These systems will be impermeable and no infiltration of the runoff to the ground is proposed. These systems will be used under the large open spaces within the development. Elements such as blue/green roofs, filter drains, tree pits, infiltration basins whilst having a reducing effect of the attenuation volumes required have been ignored from the stormwater network and attenuation design. The use of same are added benefits to the overall system. Attenuation tank location and details are indicated on drawings series 6081-4241 to 6081-4245. Refer to Infrastructure Report for each tank capacity.

In summary

	No. of Tanks Required	Attenuation Volume required
LRD Application	6 No. Attenuation Tanks	5,588.75 m^3

2.3.7 Flow Control Device

It is proposed to provide a hydro brake, or similar approved, at the outfall of the surface water catchment to restrict the outflow of water from the subject site. The hydro-brakes will be fitted with a pull cord bypass and a penstock valve installed on the inlet to the manhole for maintenance purposes. The restricted outlets will be designed to the following

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		Restricted Outlet
Catchment 1	Tank No. 1	14.200 l/s
Catchment 2	Tank No. 2	3.400 l/s
Catchment 3	Tank No. 3	10.400 l/s
Catchment 4	Tank No. 4	2.500 l/s
Catchment 5	Tank No. 5	3.500 l/s
Catchment 6	Tank No. 6	15.600 l/s

2.3.8 Petrol Interceptor

It is proposed to provide a petrol interceptor upstream of the attenuation tanks to ensure that any remaining hydro-carbons or pollutants within the runoff from trafficked areas are treated prior to outfall to the existing watercourse. It is proposed to provide a Conder Bypass Separator Types or similar approved.

In conclusion the water quality from this catchment should be of a high quality due to the above-mentioned measures, which are applied in a treatment train to treat the water before discharge at a restricted rate to the local network.

The above measures ensure a suitable management train is provided.

		Petrol Interceptor Specification
Catchment 1	Tank No. 1	CNSB40s & CNSB6s
Catchment 2	Tank No. 2	CNSB15s
Catchment 3	Tank No. 3	CNSB30s
Catchment 4	Tank No. 4	CNSB10s
Catchment 5	Tank No. 5	CNSB15s
Catchment 6	Tank No. 6	CNSB80s

2.3.9 Rain Gardens/Bioretention Tree Pit

Rain Gardens/Bioretention Tree pits are small, planted areas with stormwater controls that collect and treat stormwater runoff. Shallow landscaped basins make use of soils and vegetation to remove pollutants. This treated runoff shall be collected in these basins and form part of a wider SuDS approach for the areas adjacent the Main Distributor Road within the development.

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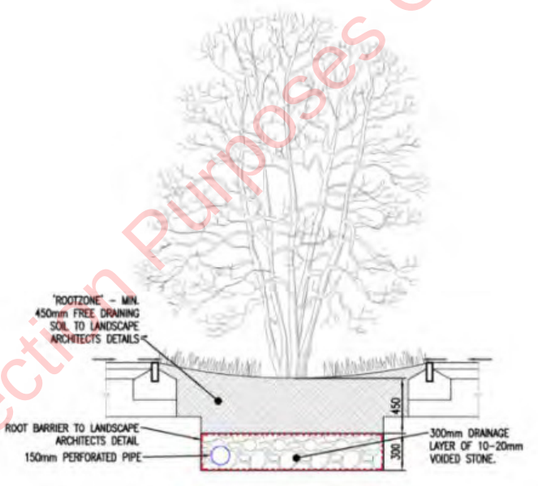

Figure 2.5– Typical Raingarden/Bioretention Tree Pit Arrangement

The proposed raingardens are included on the SuDS drawings series 6081-4241 to 6081-4245. It is proposed to include them along the main access road and along green areas within the development. Theoretically the installation of these Raingarden/Bioretention tree pits in public areas (approximately 7,010.33 m2) contribute to a possible volumetric reduction in required attenuation in the overall development , however they have been omitted from providing any reduction in these attenuated volume requirements.

Surface water runoff treated will infiltrate to the substrata. Design calculations in relation to the required depth of infiltration are included in Appendix B.

2.3.10 Green /Blue Sedum Roofs

Green/Blue and Sedum roofs involve covering a roof of a building with vegetation laid over a drainage & storage layer and a waterproofing membrane. They are designed to intercept and store rainwater and therefore, reduce surface water runoff. They are suited to the flat type of roof being proposed for the proposed apartment buildings. Sedum roofs have ecological and aesthetic benefits and remove pollutants from rainwater.

It is proposed to provide blue/ green roofs to the apartment buildings in the development. Attenuation specific to these areas will be provided on the roof. Volumetric calculations in relation to the apartment buildings is included in Appendix B. The provision of same has facilitated the reduction in the volumetric requirements of the overall attenuation required.

Apartment	Roof Area	Attenuation Volume required	Storage Depth Required	Attenuation Volume provided
Block 01	910m^2	47.32 m^3	52mm	47.32 m^3
Block 02	910m^2	47.32 m^3	52mm	47.32 m^3
Block 03	910m^2	47.32 m^3	52mm	47.32 m^3

Block 04	910m²	47.32 m³	52mm	47.32 m³
Block 05	910m²	47.32 m³	52mm	47.32 m³
Total	4550m²	236.6m³		236.6 m³

The net result of providing blue roofs is that there is a reduction in required runoff to be attenuated. However this has been ignored in the calculation of attenuation. Also of note is that these SuDS elements will be located in areas that will be contained in Management Companies and will not be required to be taken in charge by Cork City Council.

2.3.11 Existing Ditches, Trees and Hedgerows Within Site

Within Site where possible, existing ditches, trees and hedgerows are to be maintained. Incorporating these existing drainage features into the proposed overall SuDS strategy would assist in the conveyance and treatment of the generated surface water runoff. The retention of existing trees and hedgerows will also assist in the reduction of surface water runoff by evapotranspiration.

2.3.12 SuDS Components Affected by Site Specific Investigations

The results of the site-specific site investigations resulted in the following components being omitted from design consideration due predominantly to the presence of Karst

- Infiltration Systems
- Permeable Paving
- Ponds & Wetlands
- Swales

2.4 Management Train

The management train commences with source control through the provision of rain-water butts (potentially) in the rear gardens. This will also reduce the water consumption required of each housing unit. This employment of these source controls along with the usage of localised tree pits and infiltration/ filter drains will aid to reduce the peak runoff rate, placing less stress on the facilities downstream.

The second stage of the management train, site control, is provided by the introduction of the hydrocarbon interceptors in open areas which provide a degree of treatment before discharging to the attenuation system.

The attenuation tanks offer a third stage of treatment, regional control, by slowing the storm water discharge down and removing additional silts which may remain in the storm water.

2.5 Surface Water System

The existing watercourse 'Lisheens 19' on the southern boundary of the site has been chosen as the suitable surface water discharge point for the proposed development.

To reduce the effects of the surface runoff on potential flooding, a Stormwater Management Plan will be applied to surface water discharges into adjacent watercourses. The Stormwater Management Plan can be applied to control the rate of runoff from new development. The

maximum permitted surface water outflow from the new development is to be restricted to that of the existing Greenfield site by the usage of attenuation storage.

Control of runoff by attenuation methods requires a hydraulic control to restrict the magnitude of flows passing downstream, together with an upstream storage capacity to contain the volume of runoff held back by the hydraulic control. The flows are proposed to be attenuated in the surface water system by adopting a flood storage attenuation tank along with restricted outlets as the control devise. The storage volume required has been designed using the computer aided design package Windes 10.4.

The attenuation strategy for the site is for the detention of flows in interlinked attenuation tanks.

2.6 Surface Water Drainage Network

The surface water drainage network for the proposed development was modelled using the Micro drainage software application. The surface water pipe lengths, slopes, contributing impermeable areas, upstream invert levels, upstream cover levels and pipe diameters were entered into the model using the drawings supplied.

2.7 Design Criteria:

The proposed surface water drains have been designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS), the Department of the Environment's Recommendations for Site Development Works for Housing Areas, the Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Waste Water Disposal" and BS EN 752: 2008 Drain and Sewer Systems Outside Buildings.

- Return period for pipe work design 2 years
- Return period for attenuation design 100 years
- Soil Type 0.3
- Allowable Outflow 49.6 l/second
- Time of entry 5 minutes
- M5 – 60 18.80 mm
- Ratio "r" 0.250
- Pipe Friction (Ks) 0.6 mm
- Minimum Velocity (based on pipe flowing full) 1.0 m/s
- Rainfall Runoff from Roads and Footpaths 100%
- Rainfall Runoff from Roofs 80%
- Rainfall Runoff from Driveways 80%
- Rainfall Runoff from Green Areas 20%
- Rainfall Depth Factored for Climate Change (as per GDSDS) 20%

(in accordance with GDSDS Volume 2, Chapter 6, Table 6.2 – see below)

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Climate Change Category	Characteristics
River flows	20% increase in flows for all return periods up to 100 years
Sea level	400+mm rise (see Climate Change policy document for sea levels as a function of return period)
Rainfall	10% increase in depth (factor all intensities by 1.1)
	Modify time series rainfall in accordance with the GDSDS climate change policy document

Table 6.2 Climate Change Factors to be Applied to Drainage Design

2.8 Storm Water Outfall

Storm water from the proposed development shall discharge into the existing watercourse 'Lisheens 19' located to the southern boundary of the site via a hydro brake manhole, which will limit the amount of water discharging to the network. The amount of water discharged from the hydro brake manhole will be determined by using the allowable Greenfield Runoff rate for the developable area of the site. It is to be noted that all on site storm water storage facilities have been sized to cater for all storm water generated within the site boundary of the development. The discharge will be onto an area of stone riprap setback approximately 10m from the watercourse. This will dissipate energy and avoid bank erosion / scouring in the streambed

2.9 SuDS Calculations

Calculations of the various SuDS elements proposed are contained in Appendix B of this report. This report should also be read in conjunction with the Infrastructure Report submitted as part of the application. Attenuation Tank Sizes and Petrol Interceptor Sizing/Specifications have been included as part of the Stormwater Network Design in this report. The nature-based SuDS principles proposed will have a positive impact from a sustainable impact.

A contingency has been built in by providing SuDS measures and not including their volumetric benefits in the attenuation calculations, namely

- Filter drains along public paths
- Raingarden/Bioretention Tree Pits along access road and greens area's within the development
- Tree-pit infiltration and storage
- Infiltration basins in public green areas/open spaces

3 Site Investigations

The purpose of the site investigation was to investigate subsurface conditions utilising a variety of investigative methods. The scope of the site investigation works undertaken for this project included the following:

- Visit project site to observe existing conditions.
- Excavate. Trial Pits to confirm Geophysical Results.
- Carry out infiltration test of existing ground conditions
- Report with recommendations

3.1 Subsurface Exploration

A geophysical survey was conducted to explore the subsurface conditions on site. The survey consisted of seismic refraction profiling (SRP) and electrical resistivity tomography (ERT) in accordance with BS5930 and BS7022 and the Geological Society Engineering Group Working Party Report on Geophysics.

The survey consisted of 5 ERT profiles with a 5m electrode spacing and a total of 2260m ERT survey length, also 35 SRP profiles with a 2/3m geophone spacing and a total length of 2200m SRP survey. The geophysical objectives were as follows

- Provide information of the type and thickness of overburden
- Assess the depth to bedrock
- Identify the type of bedrock
- Identify any potential faults/fissure/karst zone within the bedrock.

3.2 Trial Pits

The trial pits were excavated using a 21T tracked excavator. The trial pits were conducted to assess and classify the insitu ground material and to confirm the geophysical investigations. The location of the trial pits was checked using a CAT scan to minimise the potential for encountering services during the excavation. The trial pits were, logged and photographed by any prior to backfilling. Notes were made of any services, inclusions, pit stability, groundwater encountered, and the characteristics of the strata encountered and are presented on the trial pit logs. Refer to Site Investigation report for trial logs.

3.3 Ground Conditions

3.3.1 General

The ground conditions encountered during the investigation are summarised in the accompanying Site Investigations Report (separate document).

3.3.2 Groundwater

Five boreholes were drilled and ground monitoring wells installed in April 2025. Snippet of ground water levels in Figure 3.2 below. For further information on ground water levels refer to Chapter 7 of the EIAR.

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Well ID	Depth to GW (m)			GW Elev. (mOD)		
	30-Apr-25	07 May '25	21 May '25	30-Apr-25	07 May '25	May '25
RC-BH1	2.19	2.25	2.53	19.57	19.51	19.23
RC-BH2	1.62	1.72	1.9	19.49	19.39	19.21
RC-BH3	1.88	1.96	2.02	18.06	17.98	17.92
RC-BH4	3.33	3.46	3.73	19.1	18.97	18.7
RC-BH5	5.92	5.98	6.7	23.46	23.4	22.68
Water Level at start of Lisheens Stream	---	---	---	17.93	---	---

Figure 3.2 – Well data

3.3.3 Soil Infiltration Rate

DOSA Consulting Engineers carried out a soakaway trial to access the soil infiltration rate of the subsoil.

A mechanical excavator was used to excavate 2 No. soakage trial pits to a depth of 2.0m. Each of the pits were 2.0m long and 1.0m wide. As the invert level of the proposed stormwater was assumed to be 0.8 m, the pits were filled to a depth below this of 1200mm and allowed to drain to near empty. The water level from filling was recorded at intervals sufficiently close to clearly define water level versus time. The soil infiltration rate was calculated from the time taken for the water level to fall from 75% to 25% of the effective depth of the pits. Photographs of the test holes on site are included in Appendix C.

$$\text{Soil Infiltration Rate} \quad f = \frac{Vp75\text{-}25}{Ap50 \times tp75\text{-}25}$$

Where Vp75-25 = the effective storage volume of water in the trial pit between 75% and 25% effective depth.

Ap50 = the internal surface area of the trial pit and up to 50% effective depth.

Tp75-25 = the time for the water level to fall from 75% to 25% effective depth.

The soil infiltration calculations are in Appendix C.

4 Existing Site Hydrology

A review of Historical Ordinance Survey Ireland information (www.osi.ie) was conducted to determine if the OSI 6- inch Maps indicated historic water courses / surface water features within the site. The maps indicate no existing watercourses inside the site, refer to figure 4.0 below.

The main hydrological features of the area are the "Lisheens 19" and "Grange Hill" networks. Both of these watercourse's flow in a westerly direction. The Grange Hill watercourse is joined by the Maglin River approximately 2km downstream from the subject site before discharging to the Curragheen River, which is approximately a further 2km downstream. The Curragheen River then flows in a north-easterly direction and joins the River Lee before ultimately discharges to Cork harbour. The main watercourses are illustrated below in figure 4.1.

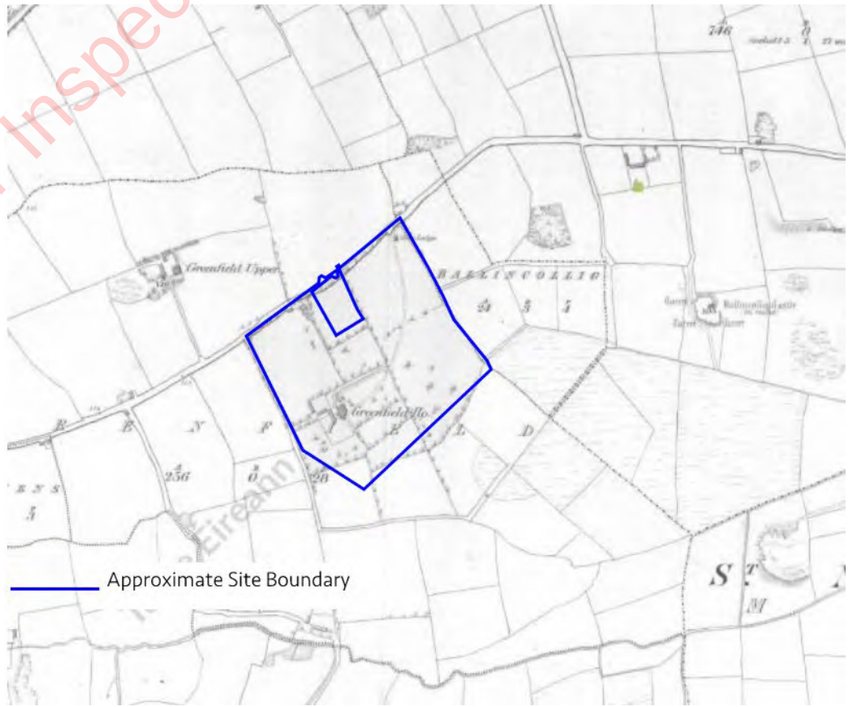

Figure 4.0: Historic 6" Mapping

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Figure 4.1: Hydrological Features of the Area

5 Maintenance Regime for SuDS Devices

The SuDS features proposed above for the site will require the following maintenance: It should be noted that as part of the as-builts and taking in charge process, documentation in relation to Operation and maintenance etc will be provided. The proposed SuDS strategy has been developed to try and strike a balance between efficient and robust operation and the minimising of frequent and on-going maintenance requirements. The maintenance of all SuDS features shall remain the responsibility of the developer until such time as any proposed taking in charge has been completed.

5.1.1 Underground attenuation systems

Inspection of the system should be conducted monthly for the first 3 months and then annually to ensure the system is working correctly. Debris should be removed monthly from the catchment surface where it may cause risk to the performance of the underground attenuation system. As required sediment from pre-treatment (catch pit) manholes prior to the attenuation system should be removed to ensure on going performance of the system. The inside of the tank should be surveyed every 5 years or as required if performance is reduced with any sediment build up removed if necessary.

The locations of all six tanks have readily accessible areas adjacent. Off road parking for maintenance vehicles and crew can be provided for all three as indicated on relevant drawings listed above.
In terms Of Operation and Maintenance the use of Reinforced concrete tanks is robust and maintenance free. The typical arrangement is the following train

- A Petrol interceptor which is accessible only via an on-grade heavy duty manhole cover.
- An inlet manhole to the tank will have a sump incorporated to trap silt so as to reduce the need to access the tank.
- The SuDS train is followed by a reinforced concrete attenuation tank. This is accessed via a number of heavy-duty manholes covers and fall arrest gates (anticipated requirement to enter is extremely low). In the unlikely event of entry being necessary only trained personnel in confined spaces will be permitted in any tank and this will be detailed and highlighted in any handover/maintenance files at taking in charge stage. There are no moving parts or plant associated with these tanks.
- The outflow will be controlled by a hydro brake located in an outlet manhole abutting the tank. This will be a vortex arrangement and separate access to that of the tank itself.

5.1.2 Tree Pits

Maintenance of trees will be greatest in the first few years, which will include regular inspection of tree condition including inlets and outlets, removal of invasive vegetation and possibly irrigation during long dry periods. As any handover process (taking in charge) is medium to long term it is anticipated that the Tree Pit regime will be well established and operational with little maintenance required.

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5.1.3 Filter Drains

Inspection of the system should be conducted monthly on the inlet / outlet pipework and any control systems for blockages. Inspection of pre-treatment systems including should be conducted every 6 months for catch pits manholes prior to the filter drain with removal of silt or other build-ups. Removal of silt build-up may be required more frequent. Annual cleaning of roof runoff gutters etc should be part of the maintenance of the drainage system to ensure debris is removed prior to entering the network. Perforated pipework should be cleared of blockage if required.

5.1.4 Hydro brake Manhole:

Normally little maintenance is required as there are no moving parts within a hydro brake, however, after installation, hydro brakes should be inspected to ensure the hydro brake orifice is not blocked monthly for three months and thereafter at six monthly intervals and hosed down if required. Remove rubbish or debris from hydro brake if present. Hydro-Brake Flow Controls are fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur. The hydro brake will be located in a manhole separate to the tanks. As a result, any access will be similar to entering a standard manhole.

5.1.5 Petrol Interceptor:

Systems should be visually inspected for every rainfall event for 30 days after installation and the amount of sediment measured to give the operator an idea of the expected rate of deposition. Systems should then be inspected every 6 months to verify the appropriate level of maintenance. Floating debris and solids should be removed, and the sump cleaned with a conventional sump vacuum cleaner. Filter media should be replaced, and sediments, oils and grease should be removed where required.

5.1.6 Blue Roof Maintenance:

Maintenance of a blue roof is critical to the viability to its function. It is recommended that:

1) Following any significant storm event, the outlets should be visually inspected to ensure no blockage has occurred.
2) Following any significant traffic or remedial works that take place on or around the roof, each of the outlets should be visually inspected to ensure all drainage holes are clear and free draining.
3) Quarterly each outlet, should be inspected and cleared of any build up or debris. All leaf litter mainly autumnal visit should be removed from the roof surface. Debris must be removed from the roof and not simply flushed down rainwater pipes.
4) Cut back tree limbs that overhang the roof to give at least a 1 metre clearance, this will significantly reduce any risk of any blockage to outlets

Blue Roofs are only proposed in private curtilage. As a result, it is maintenance will be the responsibility of a management company and not that of the council. Safe working procedures in relation to the maintenance of these roofs post construction will be detailed in Risk Assessments and associated method statements and included in any as-built package and hand over documentation at taking in charge stage.

5.1.7 Green Roof Maintenance

With the right conditions, green roofs are self-regulating but a minimum of two inspections per year should be conducted.

A typical maintenance programme includes:

1) Roof Evaluation - a comprehensive review of your green roof to determine what remedial work, if any, needs to be done.
2) Removal of Unwanted Items - Over time a green roof can become congested with leaves, debris, and other unwanted vegetation, which can be removed as part of the service.
3) Inspection - of roof outlets and removal of any encroaching vegetation to enable water to flow freely through rainwater pipes.
4) Application of fertiliser - To help restore your green roof to its best, an organic slow-release granular fertiliser if required will encourage growth.

Green Roofs are only proposed in private curtilage. As a result, it is maintenance will be the responsibility of a management company and not that of the council. Safe working procedures in relation to the maintenance of these roofs post construction will be detailed in Risk Assessments and associated method statements and included in any as-built package and hand over documentation at taking in charge stage.

6 Design Compliance Summary

The Drainage Impact Assessment and SuDS Treatment Train Design has been developed in accordance with the reference documents described earlier. Primarily it has been developed to take account of the recommendations in the *"South Ballincollig Drainage Study"*. Whilst it deviates from some of the recommendations (due to site specific investigations) made we believe that the overall strategy achieves the objectives set out. We believe that any deviations proposed are in compliance with the acknowledgment in Section 5.6

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Appendix A –Schematic SuDS Train

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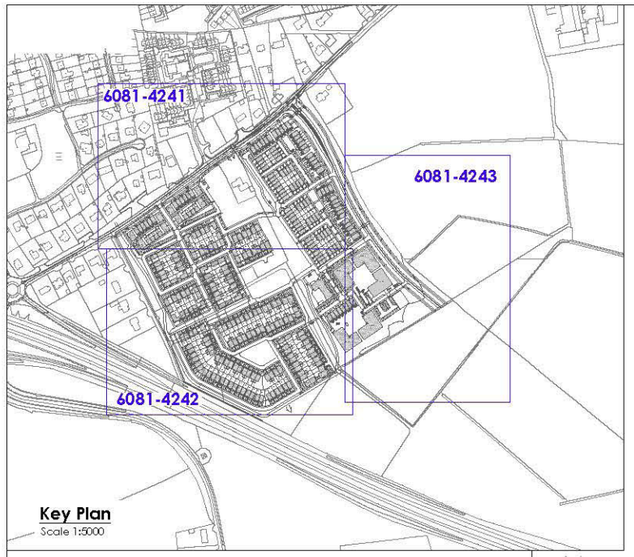

Key Plan
Scale 1:5000

Legend:

- Tree Pit (Bioretention Zone) (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Tree Pit (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Filter Drain (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Blue/ Green Roofs (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Raingarden/ Bioretention tree pit (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Stormwater Attenuation areas
- Infiltration Basin (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Attenuation Tank

GREENFIELDS ROAD

N

Proposed SUDS Layout
Scale 1/500
0 5 10 15 20 25 m
SCALE 1:500

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C	K.M.	L.O.T.	L.O.T.	21.07.25	Issued for LRD Planning Application

CLIENT: Murnane & O'Shea Ltd.

PROJECT: Residential Development at Greenfield, Ballincollig

DRAWING TITLE: Schematic SUDS Layout (1 of 3)

SHEET: A1/ A3

SCALE: 1:500/ 1:1000

PROJECT NO. 6081 _ DRAWING NO. 4241 _ STATUS/ISSUE C

Legend:

- Tree Pit (Bioretention Zone) (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Tree Pit (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Filter Drain (Refer to Detail on dwg 6081-4244 & 6081-4245)
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- Infiltration Basin (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Attenuation Tank

Proposed SUDS Layout

Scale 1/500

0 5 10 15 20 25 m

SCALE 1:500

N

6081-4241

6081-4243

6081-4242

Key Plan

Scale 1:5000

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PROJECT: Residential Development at Greenfield, Ballincollig

DRAWING TITLE: Schematic SUDS Layout (2 of 3)

SHEET: A1/ A3

SCALE: 1:500/ 1:1000

PROJECT NO. 6081 _ DRAWING NO. 4242 _ STATUS/ISSUE C

Legend:

- Tree Pit (Bioretention Zone) (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Tree Pit (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Filter Drain (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Blue/ Green Roofs (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Raingarden/ Bioretention tree pit (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Stormwater Attenuation areas
- Infiltration Basin (Refer to Detail on dwg 6081-4244 & 6081-4245)
- Attenuation Tank

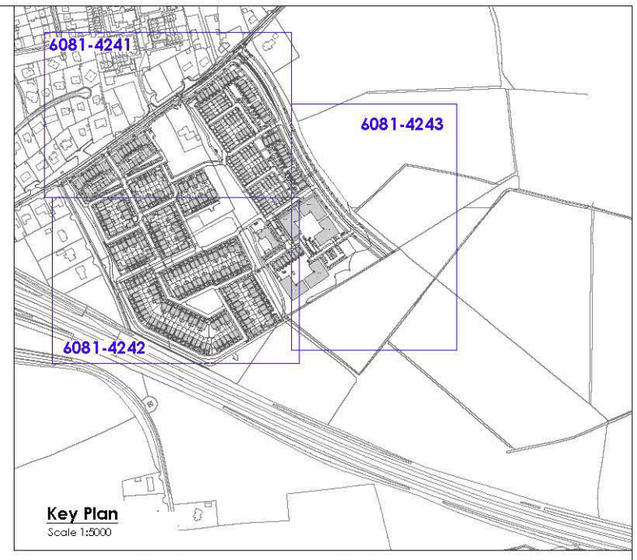
N

Proposed SUDS Layout

Scale 1/500

0 5 10 15 20 25 m

SCALE 1:500



Key Plan

Scale 1:5000

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PROJECT: Residential Dev. at Greenfield, Ballincollig

DRAWING TITLE: Schematic SUDS Layout (3 of 3)

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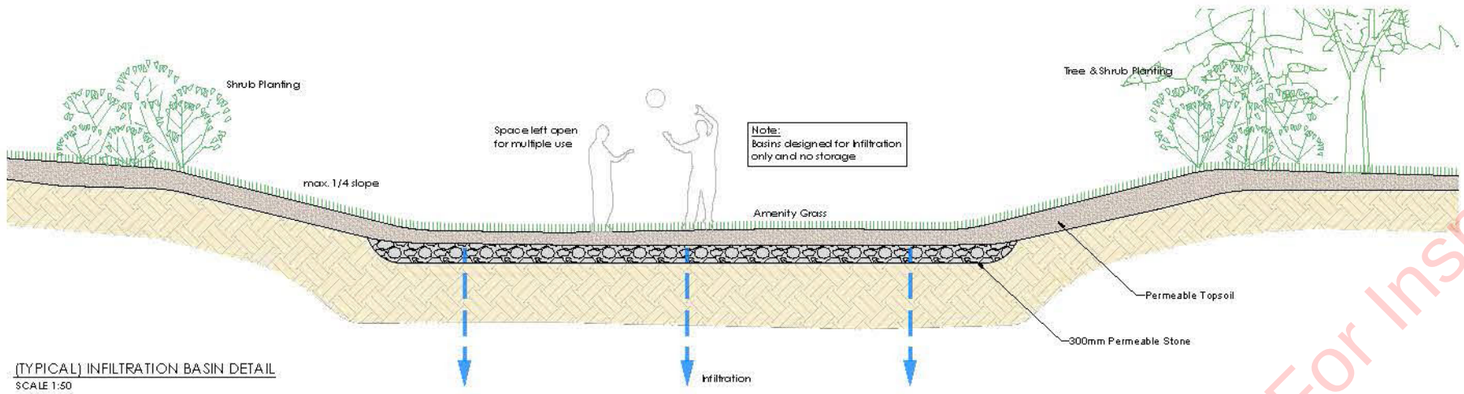
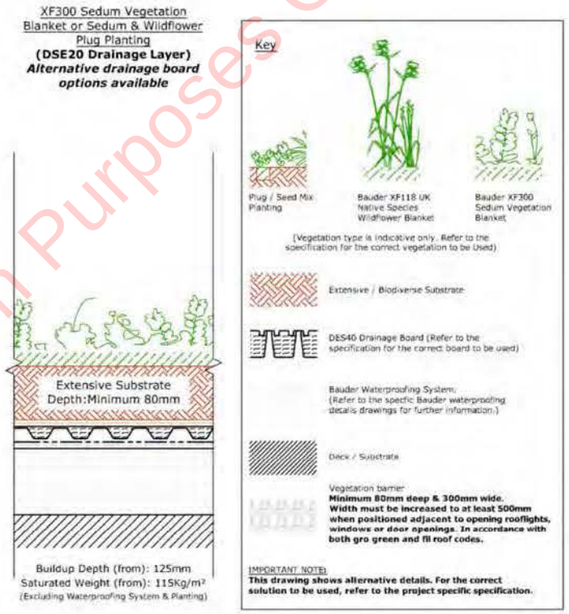
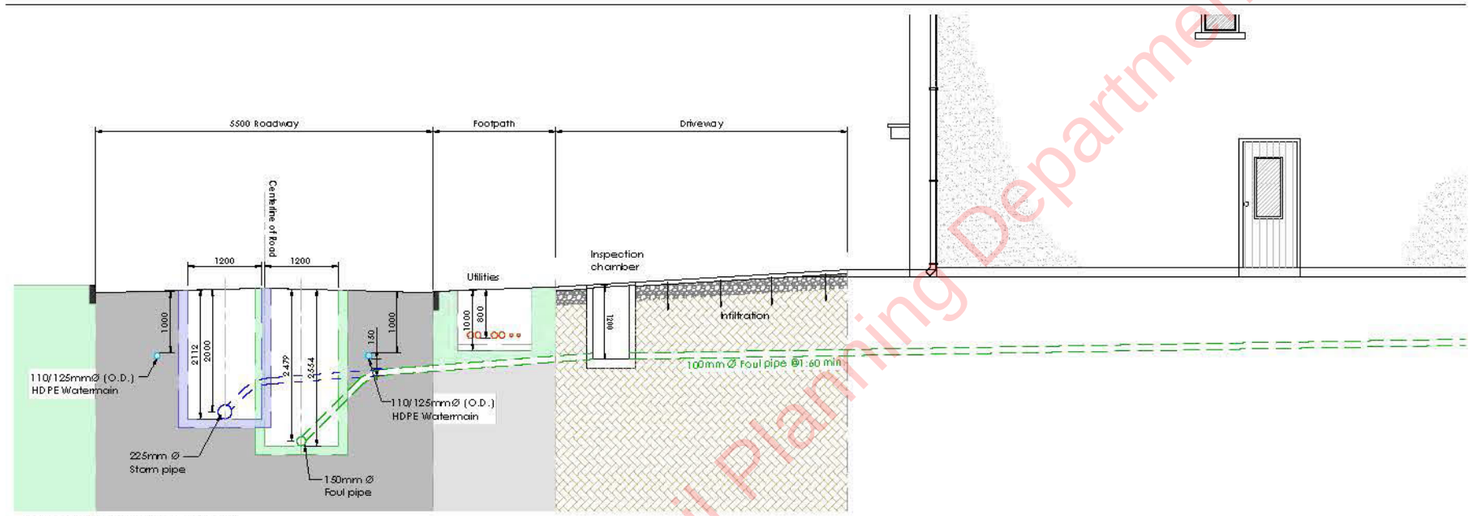


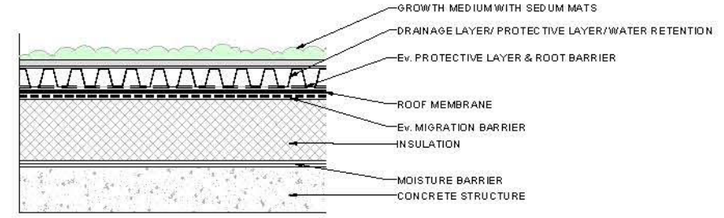
(TYPICAL) INFILTRATION BASIN DETAIL
SCALE 1:50



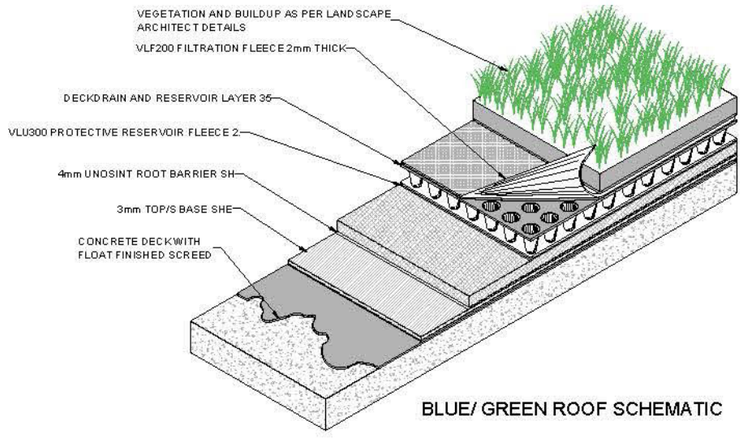
TYPICAL SECTIONS THROUGH GREEN ROOF
(DETAILS SOURCED FROM BAUDER LIMITED)
N.T.S.



(TYPICAL) DWELLING SECTION
SCALE 1:50



(TYPICAL) SECTION THRU BLUE/ GREEN ROOF
SCALE 1:20



BLUE/ GREEN ROOF SCHEMATIC

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PROJECT: Residential Development at Greenfield, Ballincollig

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SIZE: A1/ A3

SCALE: As shown

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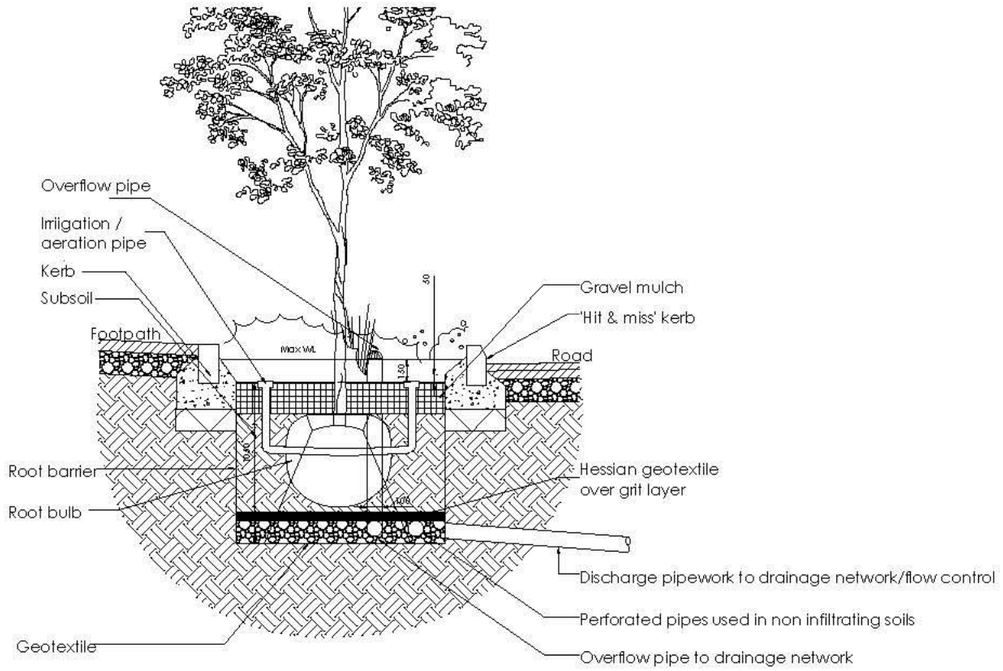
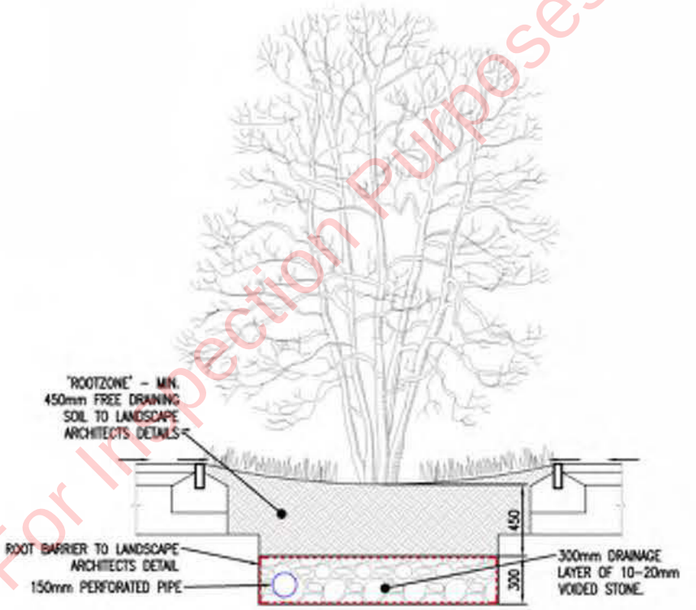


(Typical) Tree Pit Section - Bioretention Raingarden
SCALE : NTS

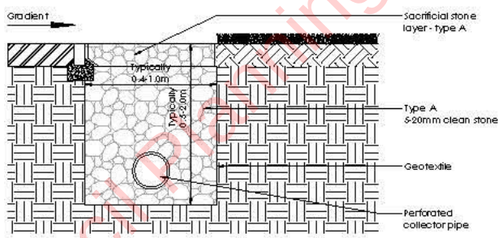
Indicated on Plan .....



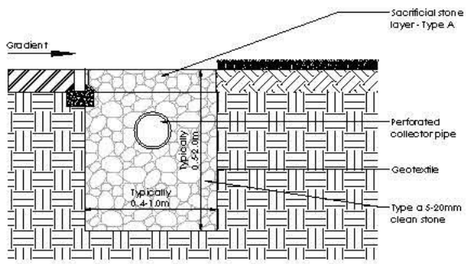
TYPICAL SECTION THROUGH RAIN GARDEN/BIORETATION TREE PIT

(Typical) Tree Pit Section
SCALE : NTS

Indicated on Plan .....



Filter Drain with Collector Pipe
SCALE : 1/20



Filter Drain with High Level overflow Pipe
SCALE : 1/20

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DRAWING TITLE: Schematic SUDS Details

SHEET: A1/ A3

SCALE: As shown

PROJECT NO. 6081 _ DRAWING NO. 4245 _ STATUS/ISSUE B

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Appendix B –SuDS Calculations

Tekla Tedds	Project				Job no.	
DOSA Joyce House Barrack Square Ballincollig, Cork	Residential Development, Greenfield, Ballincollig, Cork				6081	
	Calcs for				Start page no./Revision	
	Blue/Green Roof				1	
	Calcs by	Calcs date	Checked by	Checked date	Approved by	Approved date
	S.O'Grady	26/06/2025	L.O'Toole	26/06/2025	L.O'Toole	26/06/2025

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ATTENUATION DESIGN

In accordance with CIRIA publication C753 - The SUDS Manual

Tedds calculation version 1.0.04

Allowable discharge method

Site characteristics

Location	Other
Hydrological region	3
Soil type (Wallingford Procedure W.R.A.P map)	4
Standard percentage runoff	SPR = **0.47**
Average annual rainfall	SAAR = **1025** mm
5 year return period rainfall of 60 minute duration	M5_60min = **18.8** mm
Ratio 60-minute to 2 day rainfalls of 5 year return	r = **0.30**
Rainfall intensity increase due to global warming	$p_{climate}$ = **20**%

Catchment details

Subcatchment	Name	Area (ha)	PIMP (%)	Impermeable. area (ha)
1;	Blue Roofs;	0.46;	100.0	0.46;
	Total	0.46;	100.0	0.46;

Greenfield runoff rates

Catchment area	AREA = **50.00** hectare
Greenfield runoff rate (50 hectare site)	$\bar{Q}_{rural}$ = 0.00108m^3/s × (AREA/1km^2)$^{0.89}$ × (SAAR/1mm)$^{1.17}$ × SPR$^{2.17}$ = **377.1** l / s
Greenfield runoff rate	$\bar{Q}$ = $\bar{Q}_{rural}$ / AREA × A = **3.4** l / s
Greenfield runoff rate per unit area	$\bar{Q}_A$ = $\bar{Q}$ / A = **7.5** l / s / hectare

Estimated site discharges

FSR growth rate (2 year)	FSR_{2yr} = **0.93**
Discharge (2 year)	Q_{2yr} = $\bar{Q}$ × FSR_{2yr} = **3.2** l/s
FSR growth rate (30 year)	FSR_{30yr} = **1.75**
Discharge (30 year)	Q_{30yr} = $\bar{Q}$ × FSR_{30yr} = **6.0** l/s
FSR growth rate (100 year)	FSR_{100yr} = **2.08**
Discharge (100 year)	Q_{100yr} = $\bar{Q}$ × FSR_{100yr} = **7.1** l/s

Table equations

Total surface water	$V_w = A_{imp} \times M$
Permitted dischrage	$Q_{allow} = Q_{2yr} \times D$
Storage volume required	$V_{req} = V_w - Q_{allow}$

Attenuation storage

Duration (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	30 year rainfall (mm)	Total surf water (m^3)	Permit dischrge (2 years) (m^3)	Storage vol. reqd (m^3)
5	0.34;	7.7;	1.47;	11.3;	51.19;	0.96;	50.23
10	0.49;	11.1;	1.49;	16.5;	74.98;	1.92;	73.06
15	0.59;	13.3;	1.49;	19.9;	90.37;	2.87;	87.50
30	0.77;	17.4;	1.48;	25.8;	117.28;	5.75;	111.54

Duration (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	30 year rainfall (mm)	Total surf water (m^3)	Permit dischrge (2 years) (m^3)	Storage vol. reqd (m^3)
60	1.00;	22.6;	1.47;	33.1;	150.53;	11.49;	139.04
120	1.25;	28.2;	1.45;	40.9;	185.96;	22.98;	162.98
240	1.57;	35.4;	1.43;	50.5;	229.98;	45.96;	184.02
360	1.78;	40.2;	1.41;	56.7;	258.12;	68.94;	189.18
600	2.12;	47.8;	1.38;	66.1;	300.75;	114.90;	185.84
1440	2.84;	64.1;	1.35;	86.4;	393.24;	275.77;	117.48

Attenuation storage required

Vol. increase due to head-discharge relationship p_{hydro} = **1.25**

Maximum attenuation storage required $V_{req\_max} = V_{max} \times p_{hydro}$ = **236.5** m^3

Interception storage

Interception rainfall depth d_{int} = **5** mm

Volume of interception storage required $V_{int\_req} = 0.8 \times A_{imp} \times d_{int}$ = **18.20** m^3

SOAKAWAY DESIGN

In accordance with BRE Digest 365 - Soakaway design

Tedds calculation version 2.0.05

Design rainfall intensity

Location of catchment area	Other
Impermeable area drained to the system	A = **10.0** m^2
Return period	Period = **100** yr
Ratio 60 min to 2 day rainfall of 5 yr return period	r = **0.300**
5-year return period rainfall of 60 minutes duration	M5_60min = **18.8** mm
Increase of rainfall intensity due to global warming	$p_{climate}$ = **20** %

Soakaway / infiltration trench details

Soakaway type	Rectangular
Minimum depth of pit (below incoming invert)	d = **400** mm
Width of pit	w = **650** mm
Length of pit	l = **5000** mm
Percentage free volume	V_{free} = **30** %

Soil infiltration rate (BRE digest 365)

Length of trial pit	l_{trial} = **2000** mm
Width of trial pit	b_{trial} = **1000** mm
Depth of trial pit (below invert)	d_{trial} = **1200** mm
Free volume (if fill used)	V_{trial} = **100** %
75% depth of pit	$d_{75} = (d_{trial} \times 0.75)$ = **900.00** mm
50% depth of pit	$d_{50} = (d_{trial} \times 0.50)$ = **600.00** mm
25% depth of pit	$d_{25} = (d_{trial} \times 0.25)$ = **300.00** mm
Test 1 - time to fall from 75% depth to 25% depth	T1 = **443** min
Test 2 - time to fall from 75% depth to 25% depth	T2 = **443** min
Test 3 - time to fall from 75% depth to 25% depth	T3 = **443** min
Longest time to fall from 75% depth to 25% depth	t_{lg} = max(T1, T2, T3) = **443** min
Storage volume from 75% to 25% depth	$V_{p75\_25} = (l_{trial} \times b_{trial} \times (d_{75} - d_{25})) \times V_{trial}$ = **1.20** m^3
Internal surface area to 50% depth	$a_{p50} = ((l_{trial} \times b_{trial}) + (l_{trial} + b_{trial}) \times 2 \times d_{50})$ = **5.60** m^2
Surface area of soakaway to 50% storage depth	$A_{s50} = 2 \times (l_{trial} + b_{trial}) \times d_{trial} / 2$ = **3.600** m^2
Soil infiltration rate	$f = V_{p75\_25} / (a_{p50} \times t_{lg})$ = **8.06×10^{-6}** m/s
Wetted area of pit 50% full	$a_{s50} = l \times d + w \times d$ = **2260000** mm^2

Table equations

Inflow (cl.3.3.1)	$I = M100 \times A$
Outflow (cl.3.3.2)	$O = a_{s50} \times f \times D$
Storage (cl.3.3.3)	$S = I - O$

Note: The following Z2 table values are user defined.

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Inflow (m^3)	Outflow (m^3)	Storage required (m^3)
5	0.34;	7.7;	1.92;	14.7;	0.15;	0.01;	0.14
10	0.49;	11.1;	1.97;	21.8;	0.22;	0.01;	0.21

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Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Inflow (m^3)	Outflow (m^3)	Storage required (m^3)
15	0.59;	13.3;	1.98;	26.3;	0.26;	0.02;	0.25
30	0.77;	17.4;	1.96;	34.0;	0.34;	0.03;	0.31
60	1.00;	22.6;	1.91;	43.1;	0.43;	0.07;	0.37
120	1.25;	28.2;	1.86;	52.6;	0.53;	0.13;	0.39
240	1.57;	35.4;	1.81;	64.0;	0.64;	0.26;	0.38
360	1.78;	40.2;	1.77;	71.0;	0.71;	0.39;	0.32
600	2.12;	47.8;	1.73;	82.8;	0.83;	0.66;	0.17
1440	2.84;	64.1;	1.66;	106.6;	1.07;	1.57;	0.00

Required storage volume S_{req} = **0.39** m^3

Soakaway storage volume $S_{act} = l \times d \times w \times V_{free}$ = **0.39** m^3

PASS - Soakaway storage volume

Time for emptying soakaway to half volume $t_{s50} = S_{req} \times 0.5 / (a_{s50} \times f)$ = 2hr 58min 23s

PASS - Soakaway discharge time less than or equal to 24 hours

SOAKAWAY DESIGN

In accordance with BRE Digest 365 - Soakaway design

Tedds calculation version 2.0.05

Design rainfall intensity

Location of catchment area	Other
Impermeable area drained to the system	A = **4.0** m^2
Return period	Period = **100** yr
Ratio 60 min to 2 day rainfall of 5 yr return period	r = **0.300**
5-year return period rainfall of 60 minutes duration	M5_60min = **18.8** mm
Increase of rainfall intensity due to global warming	$p_{climate}$ = **20** %

Soakaway / infiltration trench details

Soakaway type	Rectangular
Minimum depth of pit (below incoming invert)	d = **300** mm
Width of pit	w = **1500** mm
Length of pit	l = **1500** mm
Percentage free volume	V_{free} = **30** %

Soil infiltration rate (BRE digest 365)

Length of trial pit	l_{trial} = **2000** mm
Width of trial pit	b_{trial} = **1000** mm
Depth of trial pit (below invert)	d_{trial} = **1200** mm
Free volume (if fill used)	V_{trial} = **100** %
75% depth of pit	$d_{75} = (d_{trial} \times 0.75)$ = **900.00** mm
50% depth of pit	$d_{50} = (d_{trial} \times 0.50)$ = **600.00** mm
25% depth of pit	$d_{25} = (d_{trial} \times 0.25)$ = **300.00** mm
Test 1 - time to fall from 75% depth to 25% depth	T1 = **443** min
Test 2 - time to fall from 75% depth to 25% depth	T2 = **443** min
Test 3 - time to fall from 75% depth to 25% depth	T3 = **443** min
Longest time to fall from 75% depth to 25% depth	t_{lg} = max(T1, T2, T3) = **443** min
Storage volume from 75% to 25% depth	$V_{p75\_25} = (l_{trial} \times b_{trial} \times (d_{75} - d_{25})) \times V_{trial}$ = **1.20** m^3
Internal surface area to 50% depth	$a_{p50} = ((l_{trial} \times b_{trial}) + (l_{trial} + b_{trial}) \times 2 \times d_{50})$ = **5.60** m^2
Surface area of soakaway to 50% storage depth	$A_{s50} = 2 \times (l_{trial} + b_{trial}) \times d_{trial} / 2$ = **3.600** m^2
Soil infiltration rate	$f = V_{p75\_25} / (a_{p50} \times t_{lg})$ = **8.06×10^{-6}** m/s
Wetted area of pit 50% full	$a_{s50} = l \times d + w \times d$ = **900000** mm^2

Table equations

Inflow (cl.3.3.1)	$I = M100 \times A$
Outflow (cl.3.3.2)	$O = a_{s50} \times f \times D$
Storage (cl.3.3.3)	S = I - O

Note: The following Z2 table values are user defined.

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Inflow (m^3)	Outflow (m^3)	Storage required (m^3)
5	0.34;	7.7;	1.92;	14.7;	0.06;	0.00;	0.06
10	0.49;	11.1;	1.97;	21.8;	0.09;	0.00;	0.08

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Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Inflow (m^3)	Outflow (m^3)	Storage required (m^3)
15	0.59;	13.3;	1.98;	26.3;	0.11;	0.01;	0.10
30	0.77;	17.4;	1.96;	34.0;	0.14;	0.01;	0.12
60	1.00;	22.6;	1.91;	43.1;	0.17;	0.03;	0.15
120	1.25;	28.2;	1.86;	52.6;	0.21;	0.05;	0.16
240	1.57;	35.4;	1.81;	64.0;	0.26;	0.10;	0.15
360	1.78;	40.2;	1.77;	71.0;	0.28;	0.16;	0.13
600	2.12;	47.8;	1.73;	82.8;	0.33;	0.26;	0.07
1440	2.84;	64.1;	1.66;	106.6;	0.43;	0.63;	0.00

Required storage volume S_{req} = **0.16** m^3

Soakaway storage volume $S_{act} = l \times d \times w \times V_{free}$ = **0.20** m^3

PASS - Soakaway storage volume

Time for emptying soakaway to half volume $t_{s50} = S_{req} \times 0.5 / (a_{s50} \times f)$ = 3hr 3min 46s

PASS - Soakaway discharge time less than or equal to 24 hours

SOAKAWAY DESIGN

In accordance with BRE Digest 365 - Soakaway design

Tedds calculation version 2.0.05

Design rainfall intensity

Location of catchment area	Other
Impermeable area drained to the system	A = **5.0** m^2
Return period	Period = **100** yr
Ratio 60 min to 2 day rainfall of 5 yr return period	r = **0.250**
5-year return period rainfall of 60 minutes duration	M5_60min = **18.8** mm
Increase of rainfall intensity due to global warming	$p_{climate}$ = **20** %

Soakaway / infiltration trench details

Soakaway type	Rectangular
Minimum depth of pit (below incoming invert)	d = **300** mm
Width of pit	w = **1500** mm
Length of pit	l = **2000** mm
Percentage free volume	V_{free} = **30** %

Soil infiltration rate (BRE digest 365)

Length of trial pit	l_{trial} = **2000** mm
Width of trial pit	b_{trial} = **1000** mm
Depth of trial pit (below invert)	d_{trial} = **1200** mm
Free volume (if fill used)	V_{trial} = **100** %
75% depth of pit	$d_{75} = (d_{trial} \times 0.75)$ = **900.00** mm
50% depth of pit	$d_{50} = (d_{trial} \times 0.50)$ = **600.00** mm
25% depth of pit	$d_{25} = (d_{trial} \times 0.25)$ = **300.00** mm
Test 1 - time to fall from 75% depth to 25% depth	T1 = **443** min
Test 2 - time to fall from 75% depth to 25% depth	T2 = **443** min
Test 3 - time to fall from 75% depth to 25% depth	T3 = **443** min
Longest time to fall from 75% depth to 25% depth	t_{lg} = max(T1, T2, T3) = **443** min
Storage volume from 75% to 25% depth	$V_{p75\_25} = (l_{trial} \times b_{trial} \times (d_{75} - d_{25})) \times V_{trial}$ = **1.20** m^3
Internal surface area to 50% depth	$a_{p50} = ((l_{trial} \times b_{trial}) + (l_{trial} + b_{trial}) \times 2 \times d_{50})$ = **5.60** m^2
Surface area of soakaway to 50% storage depth	$A_{s50} = 2 \times (l_{trial} + b_{trial}) \times d_{trial} / 2$ = **3.600** m^2
Soil infiltration rate	$f = V_{p75\_25} / (a_{p50} \times t_{lg})$ = **8.06×10^{-6}** m/s
Wetted area of pit 50% full	$a_{s50} = l \times d + w \times d$ = **1050000** mm^2

Table equations

Inflow (cl.3.3.1)	$I = M100 \times A$
Outflow (cl.3.3.2)	$O = a_{s50} \times f \times D$
Storage (cl.3.3.3)	S = I - O

Note: The following Z2 table values are user defined.

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Inflow (m^3)	Outflow (m^3)	Storage required (m^3)
5	0.32;	7.1;	1.91;	13.6;	0.07;	0.00;	0.07
10	0.47;	10.5;	1.97;	20.8;	0.10;	0.01;	0.10

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Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Inflow (m^3)	Outflow (m^3)	Storage required (m^3)
15	0.57;	12.8;	1.98;	25.3;	0.13;	0.01;	0.12
30	0.75;	17.0;	1.96;	33.3;	0.17;	0.02;	0.15
60	1.00;	22.6;	1.91;	43.1;	0.22;	0.03;	0.18
120	1.29;	29.1;	1.86;	54.0;	0.27;	0.06;	0.21
240	1.69;	38.1;	1.79;	67.9;	0.34;	0.12;	0.22
360	1.96;	44.2;	1.75;	77.3;	0.39;	0.18;	0.20
600	2.35;	52.9;	1.71;	90.4;	0.45;	0.30;	0.15
1440	3.27;	73.7;	1.63;	119.8;	0.60;	0.73;	0.00

Required storage volume S_{req} = **0.22** m^3

Soakaway storage volume $S_{act} = l \times d \times w \times V_{free}$ = **0.27** m^3

PASS - Soakaway storage volume

Time for emptying soakaway to half volume $t_{s50} = S_{req} \times 0.5 / (a_{s50} \times f)$ = 3hr 36min 35s

PASS - Soakaway discharge time less than or equal to 24 hours

SOAKAWAY DESIGN

In accordance with BRE Digest 365 - Soakaway design

Tedds calculation version 2.0.05

Design rainfall intensity

Location of catchment area	Other
Impermeable area drained to the system	A = **10.0** m^2
Return period	Period = **100** yr
Ratio 60 min to 2 day rainfall of 5 yr return period	r = **0.300**
5-year return period rainfall of 60 minutes duration	M5_60min = **18.8** mm
Increase of rainfall intensity due to global warming	$p_{climate}$ = **20** %

Soakaway / infiltration trench details

Soakaway type	Rectangular
Minimum depth of pit (below incoming invert)	d = **1000** mm
Width of pit	w = **1200** mm
Length of pit	l = **1200** mm
Percentage free volume	V_{free} = **30** %

Soil infiltration rate (BRE digest 365)

Length of trial pit	l_{trial} = **2000** mm
Width of trial pit	b_{trial} = **1000** mm
Depth of trial pit (below invert)	d_{trial} = **1200** mm
Free volume (if fill used)	V_{trial} = **100** %
75% depth of pit	$d_{75} = (d_{trial} \times 0.75)$ = **900.00** mm
50% depth of pit	$d_{50} = (d_{trial} \times 0.50)$ = **600.00** mm
25% depth of pit	$d_{25} = (d_{trial} \times 0.25)$ = **300.00** mm
Test 1 - time to fall from 75% depth to 25% depth	T1 = **443** min
Test 2 - time to fall from 75% depth to 25% depth	T2 = **443** min
Test 3 - time to fall from 75% depth to 25% depth	T3 = **443** min
Longest time to fall from 75% depth to 25% depth	t_{lg} = max(T1, T2, T3) = **443** min
Storage volume from 75% to 25% depth	$V_{p75\_25} = (l_{trial} \times b_{trial} \times (d_{75} - d_{25})) \times V_{trial}$ = **1.20** m^3
Internal surface area to 50% depth	$a_{p50} = ((l_{trial} \times b_{trial}) + (l_{trial} + b_{trial}) \times 2 \times d_{50})$ = **5.60** m^2
Surface area of soakaway to 50% storage depth	$A_{s50} = 2 \times (l_{trial} + b_{trial}) \times d_{trial} / 2$ = **3.600** m^2
Soil infiltration rate	$f = V_{p75\_25} / (a_{p50} \times t_{lg})$ = **8.06×10^{-6}** m/s
Wetted area of pit 50% full	$a_{s50} = l \times d + w \times d$ = **2400000** mm^2

Table equations

Inflow (cl.3.3.1)	$I = M100 \times A$
Outflow (cl.3.3.2)	$O = a_{s50} \times f \times D$
Storage (cl.3.3.3)	S = I - O

Note: The following Z2 table values are user defined.

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Inflow (m^3)	Outflow (m^3)	Storage required (m^3)
5	0.34;	7.7;	1.92;	14.7;	0.15;	0.01;	0.14
10	0.49;	11.1;	1.97;	21.8;	0.22;	0.01;	0.21

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Tekla Tedds	Project				Job no.	
DOSA Joyce House Barrack Square Ballincollig, Cork	Residential Development, Greenfield, Ballincollig, Cork				6081	
	Calcs for				Start page no./Revision	
	SuDS Measures - Tree Pit				2	
	Calcs by	Calcs date	Checked by	Checked date	Approved by	Approved date
	S.O'Grady	26/06/2025	L.O'Toole	26/06/2025	L.O'Toole	26/06/2025

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Inflow (m^3)	Outflow (m^3)	Storage required (m^3)
15	0.59;	13.3;	1.98;	26.3;	0.26;	0.02;	0.25
30	0.77;	17.4;	1.96;	34.0;	0.34;	0.03;	0.31
60	1.00;	22.6;	1.91;	43.1;	0.43;	0.07;	0.36
120	1.25;	28.2;	1.86;	52.6;	0.53;	0.14;	0.39
240	1.57;	35.4;	1.81;	64.0;	0.64;	0.28;	0.36
360	1.78;	40.2;	1.77;	71.0;	0.71;	0.42;	0.29
600	2.12;	47.8;	1.73;	82.8;	0.83;	0.70;	0.13
1440	2.84;	64.1;	1.66;	106.6;	1.07;	1.67;	0.00

Required storage volume S_{req} = **0.39** m^3

Soakaway storage volume $S_{act} = l \times d \times w \times V_{free}$ = **0.43** m^3

PASS - Soakaway storage volume

Time for emptying soakaway to half volume $t_{s50} = S_{req} \times 0.5 / (a_{s50} \times f)$ = 2hr 47min 59s

PASS - Soakaway discharge time less than or equal to 24 hours

Appendix C –Soil Infiltration Rate

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Infiltration Test

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Calculating Soil Infiltration Rate

The average of the 2 no. test holes across the site has been taken to calculate the Soil Infiltration Rate. It was proposed that the invert of the discharge drain will be approximately 0.8m below ground surface. When trimmed and clean the trial pit was 2.0m deep, 2.0m long and 1.00m wide. As the depth of the soakpit was 2000mm, this gave an effective storage depth of 1200mm.

Volume outflowing between 75% and 25% effective depth:

$$Vp75\text{-}25 = 2.0 \times 1.00m\ (0.80 - 0.20) = 1.2m^3$$

The mean surface area through which the outflow occurs, taken to be the pit sides of 50% effective depth and including the base of the pit.

$$Ap75\text{-}25 = (2.0 \times 0.6 \times 2) + (1.00 \times 0.6 \times 2) + (2.0 \times 1.00) = 5.6m^2$$

The time for the outflow between 75% and 25% effective depth:

$$tp75\text{-}25\ (maximum) = 443 \text{ minutes}$$

Soil Infiltration Rate, $f = \frac{1.2}{5.6 \times 443.0 \times 60} = 8.06 \times 10\text{-}6$ m/second

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APPENDIX 7-5 Water Framework Directive Assessment - Keohane Geological & Environmental Consultancy

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Greenfield Large-scale Residential Development
Ballincollig
Cork

Water Framework Directive Assessment Report

Prepared for:
Murnane & O'Shea Limited
Link Road
Ballincollig
Cork

Prepared by:
Keohane Geological & Environmental Consultancy
Ivy House
Clash
Carrigrohane
Cork

July 2025

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1. Introduction

1.1 Background

Murnane & O'Shea Ltd (MOS) intends to apply to Cork City Council for a large-scale residential development (LRD) on zoned lands in Greenfield townland located at the western side of Ballincollig. A description of the proposed development is provided in Section 3.0 below. In summary, the proposed development consists of the demolition of an existing dwelling house, farmyard and associated agricultural buildings and the construction of 544 no. residential units (232 no. dwelling houses and 312 no. apartment/duplex units). Vehicular access to the proposed development will be provided via 2 no. entrances from the Greenfield Road with separate pedestrian entrances also provided. Ancillary site works include the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex buildings, a creche facility and public realm upgrades to the Greenfield Road. Associated works include connection to the existing Uisce Eireann potable water network and foul sewer network (which is treated at Ballincollig wastewater treatment plant). The site location is shown in Figure 1. The proposed development is shown on Figure 2.

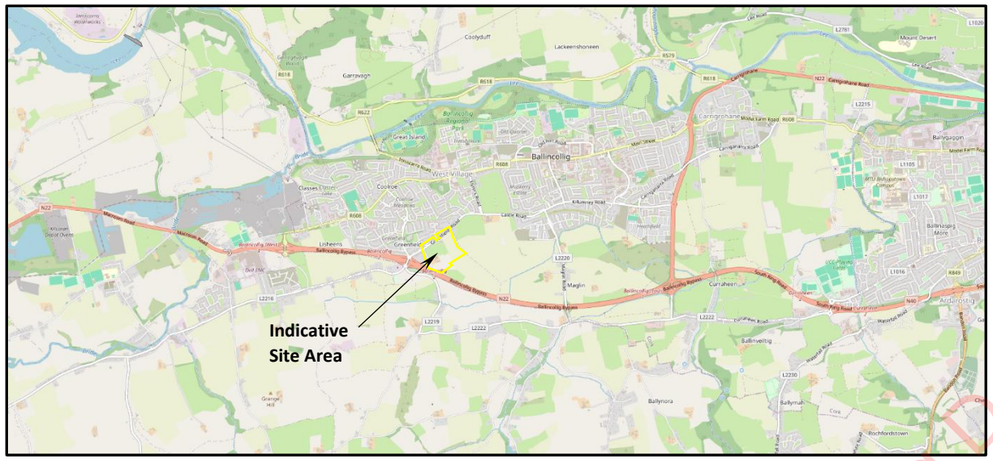

Figure 1: Site Location Map

1.2 Scope and Purpose

The purpose of this report is to assess the development's compliance with the Water Framework Directive (WFD). The EU Water Framework Directive (2000/60/EC), as amended by Directives 2008/105/EC, 2013/39/EU and 2014/101/EU, was signed into law in October 2000. It requires EU member States to achieve water quality of at least *Good Status* in rivers, lakes, groundwater, estuaries and coastal waters by 2027 at the latest. The Directive was transposed into Irish law by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003).

Figure 2: Proposed Site Layout

As noted, the Directive requires that all member states protect and improve water quality in all waters, with the aim of achieving good status by 2027. Any new development must ensure that it doesn't compromise this core requirement of the Directive.

The WFD is implemented through the River Basin Management Plans (RBMP) in 6-year cycles. WFD Cycle 1 covered the period 2010 – 2015; WFD Cycle 2 covered the period 2016 – 2021; and WFD Cycle 3 covers the period 2022 – 2027. Ireland's 31 local authorities coordinate water quality management across a 5-region structure. The Greenfield site is in the South West region.

The River Basin Management Plan objectives include:

- Ensure full compliance with relevant EU legislation.
- Prevent deterioration.
- Meet the objectives for designated protected areas.
- Protect high-status waters.
- Implement targeted actions and pilot schemes in focused sub-catchments aimed at:
  - targeting water bodies close to meeting their objective.
  - addressing more complex issues that will build knowledge for subsequent cycles.

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2.0 WFD Waterbodies & Designated Sites

2.1 Surface Water Bodies

The site is within hydrometric area 19 (Lee, Cork Harbour and Youghal Bay). Hydrometric area No 19 includes the surface catchment drained by the River Lee and all streams entering tidal water in Cork Harbour and Youghal Bay and between Knockaverry and Templebreedy, extending to an area of 2,153km^2. The Greenfield site is in the:

- Lee, Cork Harbour and Youghal Bay WFD catchment/Hydrometric Area 19 – refer to Figure 3.
- Glasheen (Cork City)_SC_010 WFD sub-catchment – refer to Figure 4.
- Curraheen (Cork City)_010 WFD River sub-basin – refer to Figure 5.

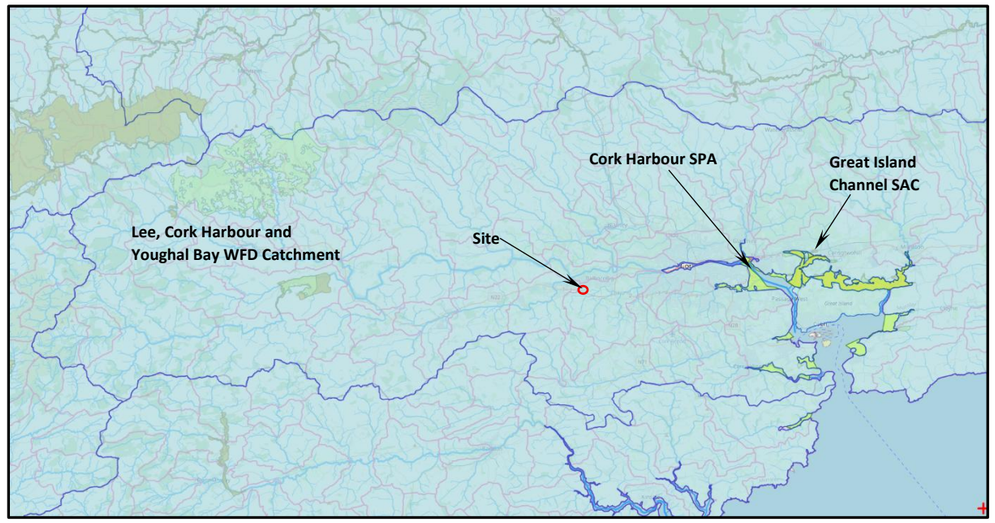

Figure 3: WFD Catchment Area - Lee, Cork Harbour and Youghal Bay

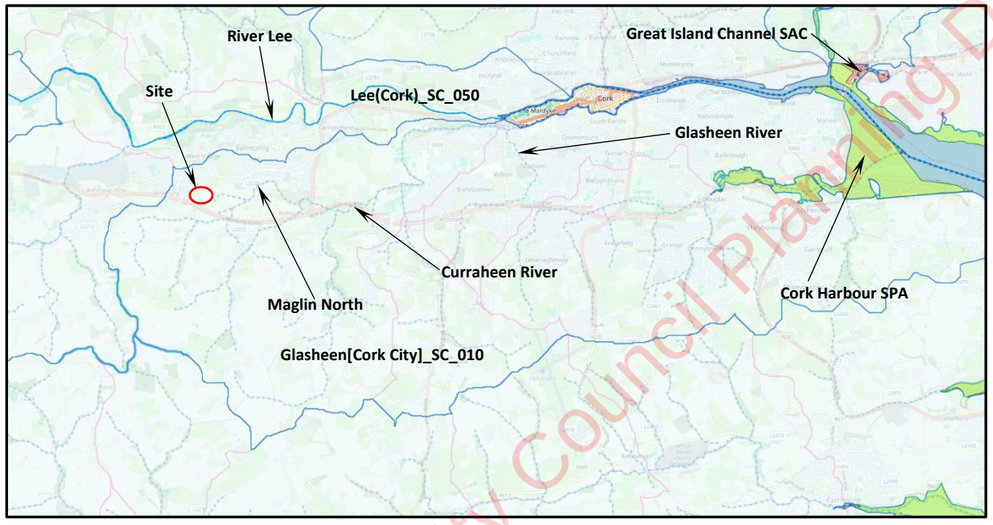

Figure 4: WFD Sub-Catchment Areas – Glasheen (Cork City) + Lee (Cork)

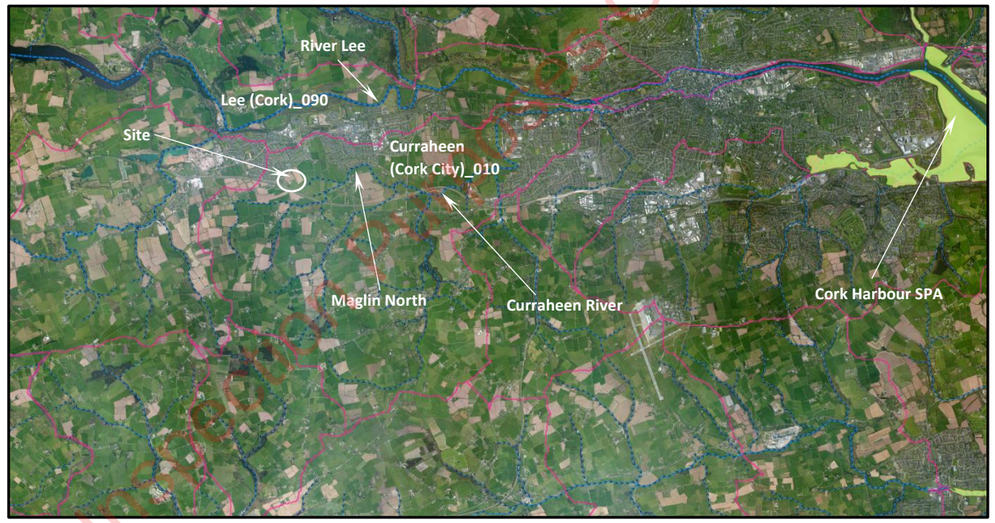

Figure 5: WFD Sub-Basin Area - Curraheen (Cork City)_010 + Lee(Cork)_090

The Maglin North[1] is a second order stream that rises in the townland of Grange, to the southwest of the site. The Lisheens Stream[2] (a first order stream) is fed by several field drains, many ephemeral, draining the project site and adjacent fields. The Lisheens Stream was included in the OPW's arterial drainage scheme carried out under the Arterial Drainage Act (1945) to improve land for agriculture and to mitigate flooding. These works included dredging, bridge modification and embankment construction.

The Lisheens Stream is slow moving and for much of its length is choked with aquatic vegetation. It joins the Maglin North River just east of Ballincollig Castle. The Maglin North River joins the Curraheen River just east of Clash Road and just south of the Ballincollig By-pass. The Curraheen River flows east towards Bishopstown, turns north and then east again, joining with the Glasheen River near Victoria Lodge on the Wilton Road. The Glasheen River joins the south channel of the River Lee near Victoria Cross. The local drainage is shown on Figure 6.

The connection works to the Uisce Eireann networks are located within the same WFD sub-basin as the Greenfield site. The Ballincollig WWTP is located in, and discharges treated water to, the Lee(Cork)_050 WFD river waterbody sub-catchment and Lee(Cork)_090 WFD river waterbody sub-basin.

[1] The EPA name for the Maglin North River is the Grange Hill Stream. The stream is named Maglin North River in the Ballincollig Drainage Study and this nomenclature is used for the Greenfield LRD project.
[2] The EPA name 'Lisheens Stream' is used for the Greenfield LRD project. This watercourse is referred to as 'Artificial Drain' in the Ballincollig Drainage Study. Lisheens Stream is used for the Greenfield LRD project to distinguish this watercourse from the other artificial drains in the area.

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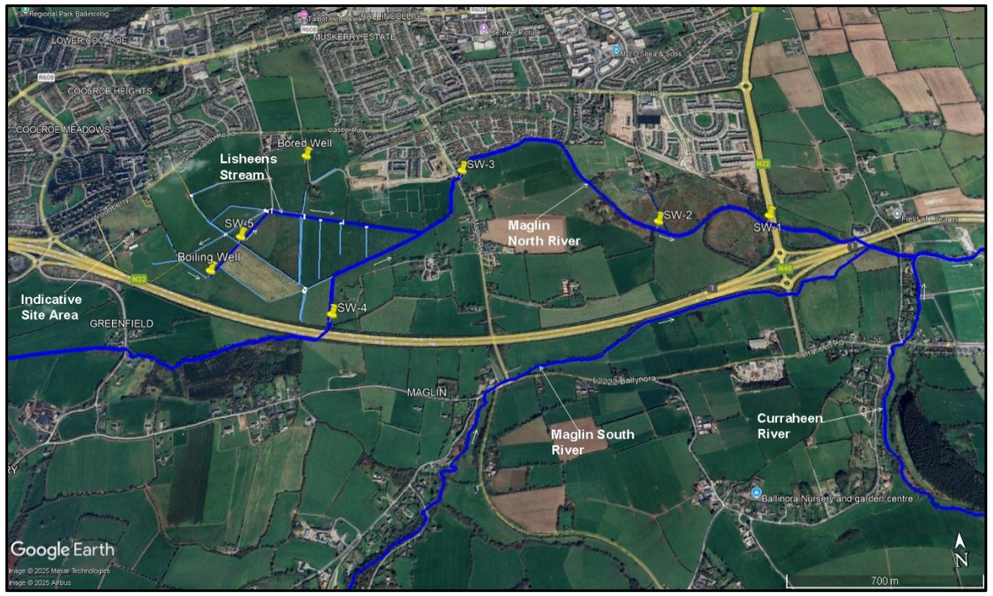

Figure 6: Local Drainage Network

2.1.1 Surface Water Quality

The EPA monitors water quality in the rivers and streams across the country – refer to https://gis.epa.ie/EPAMaps/ for most recent data. However, there are no water quality (Q-value) monitoring points on the Maglin North River or rivers further downstream of the site. The river waterbody WFD status 2016 – 2021 for the Maglin North River, Curraheen River and all streams draining this WFD River sub-basin is Moderate – refer to Figure 7. This is based on 'expert judgement' (i.e., in the absence of water quality data).

Figure 7: River Waterbody WFD Status 2016-2021

All waterbodies in the Curraheen WFD River sub-basin are assigned 'At Risk' due to elevated phosphate concentrations – Figure 8. According to the WFD Cycle 3 (for the Glasheen sub-catchment, including Curraheen sub-basin), further investigation is required to determine what is impacting nutrient conditions. Monitoring of surface water quality in the Lisheens Stream near the Greenfield site as part of the EIA process did not indicate nutrient enrichment. The Curraheen Sub-basin is noted to be under anthropogenic pressures (pressure subcategory is not defined).

The Lee (Cork)_090 is assigned good WFD river waterbody status for 2016-2021. This is an improvement over the 2013-2018 WFD river waterbody status of moderate. It is assigned 'Not At Risk'.

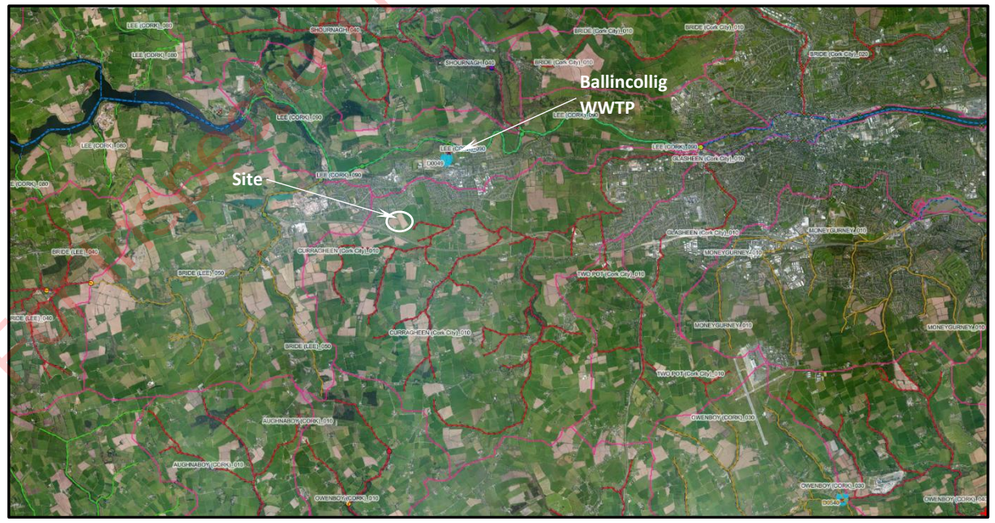

Figure 8: WFD River Waterbodies Risk

2.2 Groundwater Bodies

The site is underlain by the Little Island Formation and Waulsortian Limestone Formation, both consisting predominately of limestones. The GSI has classified these formations as Regionally Important Aquifer - Karstified (diffuse) (Rkd). Regionally important karstified (Rkd) aquifers generally are capable for providing sufficient water for public, commercial and industrial purposes. Transmissivity values of up to 1,100m^2/day are recorded. Borehole productivity class is generally III - IV, where class I is the best and V being the worst. Class III - IV have specific capacities of between 10 and 100m^3/day/m.

These formations form part of the Ballincollig WFD groundwater body, which extends from Crookstown in the west to Lough Mahon in the east. The ground waterbody WFD status 2016 - 2021 is Good. It is categorised as 'Not at Risk'. The Lee Vally Gravels are located to the north of the Ballincollig WFD ground waterbody, extending primarily along the Bride Valley and Lee Valley (downstream of the abbey at Inniscarra). It also includes the Curraheen River valley downstream of the Munster Agricultural Society showgrounds. The Lee Vally Gravels WFD ground waterbody is categorised as 'At Risk'.

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Figure 9: **WFD Ground Waterbodies Risk**

2.3 Designated Sites

The designated sites downstream of the Greenfield site are:

- Great Island Channel SAC & pNHA – site code 001058.
- Cork Harbour SPA - site code 004030.
- Douglas River Estuary pNHA - site code 001046.
- Dunkettle Shore pNHA - site code 001082.
- Rockfarm Quarry, Little Island pNHA - site code 001074.
- Monkstown Creek pNHA – site code 001979.
- Lough Beg (Cork) pNHA – site code 001066.
- Whitegate Bay pNHA – site code 001084.
- Ballincollig Caves pNHA – site code 001249.

In addition to these, the Lee Valley pNHA (site code 000094) is downstream of the discharge from the Ballincollig WWTP.

Designated sites are shown on Figure 10.

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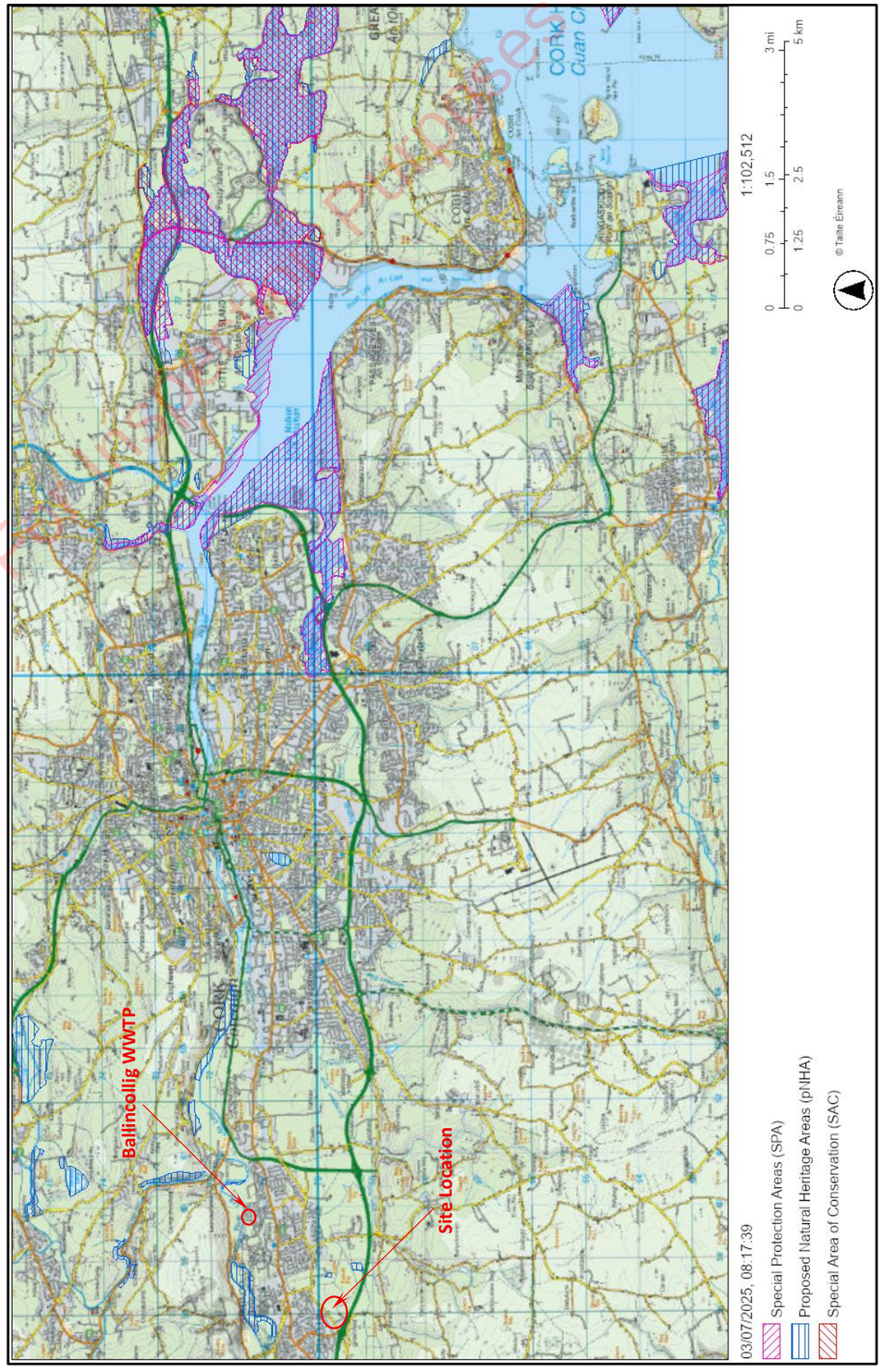

Figure 10: **Designated Sites**

3.0 Proposed Development

The proposed development comprises a 10-Year Planning Permission for a Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork.

The proposed development consists of the demolition of an existing dwelling house and farmyard with associated agricultural buildings and the construction of a mixed-use residential development of 544 no. residential units consisting of 232 no. dwelling houses, 312 no. apartment/duplex units, a two storey creche facility, commercial/retail unit and all ancillary site development works. The proposed 232 no. dwelling houses will include 100 no. 4 bedroom detached/semi-detached dwelling houses, 124 no. 3 bedroom semi-detached/townhouse dwelling houses and 8 no. 2 bedroom townhouse units. The proposed 312 no. apartment/duplex units will include 61 no. 3 bedroom units, 171 no. 2 bedroom units and 80 no. 1 bedroom units, to be provided in 28 no. apartment/duplex buildings ranging in height from 3-4 storeys. One of the proposed apartment buildings (Block 3) will provide the ground floor commercial/retail unit.

Vehicular access to the proposed development will be via two entrances from Greenfield Road (L2216) with separate pedestrian/cycle connections also provided from Greenfield Road. Ancillary site works include the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex buildings, creche and commercial/retail unit, landscaping and servicing proposals including the upgrade of public footpaths/active travel infrastructure and water service infrastructure, 2 no. pedestrian crossings on Greenfield Road and the installation of a noise attenuation screen along the site's southern boundary. The proposed site layout is shown in Figure 2.

Associated works include connection to the existing Uisce Eireann potable water network and foul sewer network (which is treated at Ballincollig wastewater treatment plant).

3.1 Characteristics of Proposed Development

The aspects of the proposed development that have the potential to affect the surface water and / or the groundwater environment are discussed in the subsections below.

3.1.1 Land Use Change

The Greenfield site consists of several fields and is currently in agricultural use – horse and cattle grazing. There are good quality hedgerows on the western and eastern boundaries and two internally within the site. Many of the field boundaries, as depicted in the historic 6-inch mapping, have been removed, some replaced by wooden post & rail fencing. The northern and southwestern boundaries have masonry walls, built in the early 2000's as part of the Ballincollig Bypass construction works.

There are internal field boundary drains, but these are dry except during prolonged heavy rainfall. An open drain flows in a southwestern direction on the south-eastern boundary of the site. Halfway along this boundary it turns to the southeast for approximately 150m before joining the headwater of Lisheens Stream at the 'Boiling Well'. There are a network of interconnected field boundary drains at the site and adjoining agricultural fields which connect to the Lisheens Stream at three locations. The Lisheens Stream joins the Maglin North River to the east of Ballincollig Castle (approximately 825m from the southeast corner of the Greenfield site. The drainage from N22 (Ballincollig Bypass) and Greenfield Road in the vicinity of the site discharges to the Maglin North River approximately 650m to the southeast of the site. There is no direct connection between the N22 drainage infrastructure and the drainage from the site (existing or proposed).

The fields are described in the Biodiversity Chapter of the EIAR as improved agricultural grassland with ryegrasses the dominant grass species. Other species include White Clover, Yorkshire Fog, Buttercup, Dandelion, Black Medick and Plantains, Ribwort plantain, Dock, Creeping buttercup, Pineapple weed and Daisy. The eastern field appears to be in receipt of more fertilizer/manure. Grassland is more diverse on the margins, but overall diversity within this habitat is low. The western field which is grazed by horses is slightly more diverse. The northwest field is tightly grazed. Vegetation is taller on the southwest field. However, overall, this habitat is generally species poor. Other habitats on site include hedgerows, treelines, stonewalls, drainage ditches and artificial surfaces.

Of the 15.2ha site, 12.1ha will be developed. The remaining 3.1ha will be used for open space and landscaping – 15.3% of the site usable open space.

3.1.2 Flood Risk

Malachy Walsh & Partners (MWP) carried out a site-specific flood risk assessment (FRA) for the Greenfield development. This FRA was taken to stage 3 as potential flooding was identified in the Ballincollig Drainage Study[3]. This study indicated that the 0.1% AEP (Annual Exceedance Probability) high end future scenario flooding will extend into the southeastern periphery of the site. The proposed distributor road encroaches into this potential flood extends. As the road extends into the flood extents area, modelling was carried out to assess the potential impacts on flooding extents and magnitude. This is discussed further in Section 4.1 and mitigation of flood risk is discussed in Section 5.1.

3.1.3 Discharges to Surface Water

Discharge to surface water will be via SuDS features, including rainwater harvesting, infiltration basins, filter drains, tree pits, raingarden / bioretention tree pits, green roofs and attenuation tanks fitted with flow control devices. Hydrocarbon interceptors will also be installed upstream of each attenuation tank. Treated surface water from the development will be discharged at one location – the open drain at the southeastern boundary of the site where it turns in a southeasterly direction. This will flow to the Lisheens Stream.

3.1.4 Discharges to Groundwater

There will be no direct discharges to groundwater. As the site is underlain by limestone formations which are susceptible to karstification, infiltrating SuDS features, which would concentrate flows to the subsurface, are avoided. Of the 15.2ha of site area, 3.1ha will consist of open space and landscaping. Incident rainfall in these areas will continue to percolate into subsoil and recharge the aquifer.

3.1.5 Foul Water Discharge

The development will be serviced by mains sewer which will be treated at Ballincollig WWTP. This WWTP (EPA license number D0049-01) has tertiary treatment with nitrogen and phosphorous removal. Discharge of treated water is to the River Lee. The increased volumes of wastewater associated with the development (252 m^3/day for all four phases) will increase the loading to the receiving water and increase pressure on its assimilative capacity.

[3] Malachy Walsh and Partners, October 2021. Strategic Flood Risk Assessment South Ballincollig Drainage Study.

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The Ballincollig WWTP has a capacity of 33,000 PE. According to the latest Annual Environment Report for this facility, the quality of the treated water discharged to the River Lee is compliant for all test parameters. Uisce Eireann has confirmed its capacity to treat sewage from the Greenfield site. Connection to the sewer network will be subject to the following upgrades:

- To complete the proposed foul sewer connection, there is a requirement for a pumping station with 24-hour storage. The discharge connection would be to the 450mm diameter sewer line located on Maglin Road.
- An alternative foul sewer connection could be made to the network to the north of the site, but this would require downstream upgrades near the R608 road.

3.1.6 Potable Water Supply

The development will be serviced by mains water. The drinking water supply for the proposed development is sourced from the Inniscarra Reservoir – a man-made reservoir on the River Lee. The development will therefore place an increased demand on this surface water supply. When completed, residents of the development will use approximately 231m^3/day.

Uisce Éireann confirmed that there is capacity for the potable water connection for the proposed development, subject to the following upgrades:

- In order to complete the proposed water supply connection for the development, approximately 250m of watermain upgrades are required between Station Road and Maglin Road.
- A 200mm diameter spine main, located through the Greenfield site, will be required to service future development.

3.1.7 Contamination

Polluting materials stored, use and / or generated on site include hydrocarbons, concrete and silt. These present a risk of polluting the surface water and groundwater environment primarily during the construction phase.

4.0 Potential Impact on Water Bodies

The potential impacts to the water environment are discussed below for the construction and operational phases of the Greenfield residential development. Decommissioning impacts are not considered relevant for this development.

4.1 Construction Phase

The housing development will be built in four phases over an approximate 7-year period. There is potential for direct and indirect impacts on surface water quality during construction activity from several sources. These are:

- Increased sediment loading in the surface water runoff from the site and entering the Lisheens Stream via the existing field boundary drains. Most of the earthworks for the housing development will take place greater than 70m from the Lisheens Stream – the sustainable access corridor will be the closest works to the stream. However, there will be earthworks within 10m of the field boundary drains discharging to the Lisheens Stream. Once the earthworks and landscaping are completed, the risk of sediment loading of watercourses is significantly reduced.
- Potential spillage of oil and diesel used on site for plant and equipment. During construction there would be typically 8 to 10 machines on site (excavators, dump trucks, teleporters, generators etc.). These would be refuelled every 2 to 3 days. This is either done using refuelling bowsers owned by the plant hire contractors or at the site compound where fuel will be stored. The machines also use hydraulic oils and motor oils. There is potential for leaks and spillages of diesel or oils during refuelling, breakdowns (e.g., breaking of a hydraulic hose) etc.
- Release of cement to watercourses during concrete pours for apartment and housing foundations. Some of these will be near the field boundary drains discharging to the Lisheens Stream, so concrete spillages could potentially reach the stream.
- In addition, the chutes of concrete trucks are typically rinsed down on site. There will be approximately 3,600 concrete loads brought to site over the construction period. If not carried out properly, concrete washdown water could reach watercourses, affecting its pH.

The potential impacts on groundwater quality are of a similar nature to the surface water environment as discussed above. This includes potential impacts on groundwater quality from hydrocarbon spills or leaks from construction machinery.

Based on the ground investigations conducted, dewatering of excavations (pumping of groundwater) on the housing development is not predicted.

Groundwater (aquifer) vulnerability will be increased with the removal of topsoil and overburden. While this will not change the current aquifer vulnerability rating (extreme to moderate), the depth of protection provided by the topsoil / overburden will be reduced in areas of cut. It is reversible with the construction of foundations and roads which will provide a barrier to downward migration of any pollutants.

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During the construction phase foul effluent will be generated at the welfare facilities. The number of workers on site during the construction phase will vary depending on site activities. During peak activity, there would be approximately 100 workers on site. This would generate up to approximately 3m^3 of foul sewage per day. Depending on how this is managed, it could present a risk to the underlying aquifer (or receiving surface water body).

4.2 Operational Phase

There is less potential for direct and indirect impacts on surface water quality during the operational phase of the residential development. The site would be fully landscaped, there would be no earthworks, no concrete pours and comparably little hydrocarbons used or stored. The potential sources of surface water contamination during the operational phase are:

- The parking of cars and the storage of home-heating fuel within the development may result in the leakage of small amounts of oil resulting in contamination of surface water. Any leaks or spillage is likely to be small in scale.
- The underlying bedrock formations are susceptible to karstification, which could result in subsidence. Inappropriate management of runoff from the site could affect underlying karst bedrock.
- The development will be serviced by mains sewer which will be treated at Ballincollig WWTP. This WWTP has tertiary treatment with nitrogen and phosphorous removal. Discharge of treated water is to the River Lee. The increased volumes of wastewater associated with the development (approximately 252 m^3/day for all four phases) will increase the loading to the receiving water and increase pressure on its assimilative capacity.

The proposed development will progressively increase the hardstanding areas as roads, and housing units are constructed. The runoff characteristics of the developed site will be different to the greenfield site conditions, with increases in runoff volumes and rates. The changes in runoff are primarily associated with the operational phase. These potential direct and indirect impacts on hydrology are:

- The development site extends to approximately 15.2ha. Of this, approximately 12.1ha will be finished with hard paving or roofing, with the remaining 3.1ha landscaped and green space. The runoff from the entire developed site will discharge to the Lisheens Stream.
- The proposed sustainable access corridor will extend into the flood extents as mapped in the Ballincollig drainage study. It will displace a small volume of flood storage capacity. During flooding events over the operational phase of the development, the flood waters that would have occupied that space will be displaced to other locations, potentially increasing flood levels and / or extents.
- In addition to the surface water quality and hydrology effects, the development will place additional pressure on the water supply resources in Cork. As noted, the development will be serviced by mains water. On-site groundwater wells are not proposed. The drinking water supply for the proposed development is sourced from the Inniscarra Reservoir – a man-made reservoir on the River Lee. The development will therefore place an increased demand on this surface water supply. When completed, residents of the development will use approximately 231m^3/day. According to the EPA web-mapping the Inniscarra Reservoir is not identified as being under river abstraction pressure and Uisce Eireann has confirmed capacity in the existing potable water infrastructure to service the site.

The potential impacts on groundwater quality are of a similar nature to the surface water environment as discussed above. This includes potential impacts on groundwater quality from hydrocarbon spills or leaks from parked cars and home heating oil (if used).

Interception of incident rainfall will reduce the volume of water entering the groundwater environment. This could result in lower groundwater recharge and subsequently lowering of groundwater levels. There would also be a reduction in stream baseflow from the aquifer, but this would be offset by direct discharge of stormwater to the open drain.

As noted, the development will be serviced by mains sewer with no direct discharge for foul effluent to groundwater or surface water. However, leakage from the sewer pipework at the development could impact on groundwater quality.

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5.0 Mitigation

The avoidance and mitigation to be implemented to protect the water environment are discussed below for the construction and operational phases of the Greenfield residential development. As noted, decommissioning is not considered relevant for this development.

5.1 Construction Phase

The mitigation measures to be implemented for the construction phase are set out below:

- Design considerations in the site layout to avoid and reduce impacts to surface water and groundwater include:
  - The housing units are setback from the Lisheens Stream, providing a buffer of greater than 70m.
  - The main field boundary drains on the site have been incorporated into the development layout.
- Following mobilisation to site, surface water management infrastructure will be the first works carried out. Additional controls will be installed as needed as construction progresses through the site, and/or as identified during site inspections of surface water management infrastructure.
- The attenuation tanks required for phase 1 of the development will be installed early in the construction sequencing to control runoff rates as the site gets developed. The attenuation infrastructure will be progressively expanded through the site ahead of housing construction. This will ensure that there is always adequate capacity in the system to deal with design flows.
- During the construction phase, best practices will be employed to minimise the release of sediment laden storm water runoff, including;
  - Areas stripped of vegetation will be kept to a minimum; enough to keep pace with house construction. On-going landscaping and restoration of completed units will be carried out. This will reduce areas of soil exposed to erosion.
  - Stripped and excavated soils will be managed as described in Section 6.5.1. Soil stockpiles will be setback a minimum of 50m from any watercourse. Silt fencing will be erected downgradient to stockpiles to filter runoff water.
  - Construction phase settlement ponds will be constructed to hold runoff water from earthworks areas. These will be located and moved as the development progresses through the site.
  - Check dams and / or straw bales will be installed along the field boundary drains to slow flows and remove silt. Check dams will be constructed using clean stone and geotextile spanning across the drainage channel.
  - The public road serving the site will be kept clean of mud and debris. A street sweeper will attend site regularly to clean the road when there are truck movements in and out of the site.
  - Earthworks will be suspended during extreme weather conditions. An extreme rainfall event will be classified as an event that corresponds to the Met Éireann Orange – Weather Alert for rainfall. The Site Manager will monitor the weather forecast to make preparations ahead of adverse weather conditions.

Met Eireann Orange Weather Alert for Rainfall
50 mm – 80 mm in 24 hrs
40 mm – 60 mm in 12 hrs or less
30 mm – 50 mm in 6 hrs or less

  - If required, dewatering of the excavations will be to temporary silt traps. Flow from the silt traps, placed upgradient of the silt fencing protecting watercourses, will be diffuse.
  - The release of cement to watercourses will be prohibited. Concrete pours will occur in contained areas using shuttering. Rinsing down of concrete trucks will be done at a dedicated location on site – adjacent to the construction site compound, or at a suitable alternative location, a minimum distance of 75m from any watercourse. Signage will be erected at each concrete pour location directing drivers to the rinse down area. This rinse down area will be removed at the end of the construction phase.
  - Hydrocarbons (oils, diesel and chemicals) will be stored and managed in an appropriate manner to ensure no negative effects.

The infrastructure to be used to manage and treat surface water, and to control erosion at the construction site are:

- To reduce the volume of water to be treated during construction and to reduce the erosion potential of exposed soils, clean surface water runoff will be diverted around earthworks areas. This will be done with the use of diversion channels. Diversion channels are shallow interceptor drains to divert overland flows.
- Silt fences will be erected on the downslope side of any earthworks areas to intercept any overland flows that could potentially be carrying silt / fines. These are constructed with geotextile embedded in the topsoil and supported with wooden pegs.
- Check dams will be installed at appropriate locations along the field boundary drains. These will be constructed using geotextile supported by two wooden pegs, sandwiched by clean washed filter gravel. Alternatively, straw bales will be used.

5.2 Operational Phase

Mitigation measures to be employed during the operation phase are:

- The runoff from the site will be controlled and managed using a suite of SuDS and engineering controls designed for a 1:100-year storm event plus a 20% allowance for climate change. These will include These will include rainwater harvesting, infiltration basins, filter drains, tree pits, raingarden / bioretention tree pits, green roofs and attenuation tanks fitted with flow control devices. Hydrocarbon interceptors will also be installed upstream of each attenuation tank. The overall management will limit discharge from the site to greenfield rates (i.e., 49.6 l/sec).
- With the potential for oil spills and leaks from cars parked in the development, hydrocarbon interceptors and grit traps are included in the drainage design to protect the water quality in the Lisheens Stream. The hydrocarbon interceptors will be cleaned and maintained by the management company.
- The SuDS infrastructure proposed has regard to the underlying karst limestone bedrock. Infiltration to the subsurface has been avoided. Engineering solutions are proposed to manage stormwater runoff – 6 No. tanks are proposed. Discharge from the site will be to the existing field boundary drain located centrally along the southern boundary of the site. The discharge to be onto an area of stone riprap to dissipate energy and avoid bank erosion / scouring in the stream bed.
- The foul sewer for the facility will connect into the Uisce Eireann sewer network, which discharges to the Ballincollig WWTP – EPA license number D0049-01. This is a tertiary treatment plant with a capacity of 33,000 PE. According to the latest Annual Environment

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Report for this facility, the quality of the treated water discharged to the River Lee is compliant for all test parameters. Uisce Eireann has confirmed capacity in the Ballincollig WWTP to treat sewage from the Greenfield.

- A Site-Specific Flood Risk Assessment (SSFRA) was undertaken for the proposed development. The SSFRA had regard to findings of the Ballincollig drainage study, which identified flooding extending into the southeast corner of the site for a 1:100-year rainstorm event. The conclusion of the SSFRA is that, with the recommended mitigation, the development will not result in increased flood risk at or downstream of the site.
- Groundwater (aquifer) vulnerability will be temporary increased as the site is stripped and reprofiled for development. The progressive construction of paved roads, foundations and landscaping will provide protection to the aquifer.
- To conserve water usage (and consequently reduce the volume of foul sewerage generated), each house will be fitted with a water meter, aerated shower heads, aerated strainers in taps, duel flush cisterns etc.

6.0 Predicted Residual Impacts

With the implementation of the avoidance and mitigation measures as detailed above, the predicted residual impacts of the proposed development on the water environment are:

- The impacts on surface water quality are predicted to have not significant, localised temporary negative effects during the construction phase and imperceptible, localised brief negative effects during the operational phase. No significant indirect impact is predicted on the aquatic habitats and fauna downstream of the site.
- The impacts on hydrology / runoff characteristics of the site are predicted to have imperceptible, local, permanent negative effects during the operational phase.
- The impacts on groundwater / aquifers are predicted to have imperceptible, localised, permanent negative effects.
- The impacts on water infrastructure (drinking water treatment and WWTP) are predicted to have likely imperceptible, regional, permanent negative effects.

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7.0 WFD Compliance

WFD status for the river waterbodies, ground waterbodies and designated sites hydraulically linked to the Greenfield LRD project are defined in Section 2. Avoidance and mitigation measures, detailed in Sections 4 and 5 above, demonstrate that the proposed development will have no significant impacts on the water quality of the underlying ground waterbody or surface waterbodies at and downstream of the site. It can therefore be concluded that compliance of the WFD will be achieved. As detailed in Section 6 above (and in Chapter 7 of the EIAR), the significance of the residual effects on the water environment is determined to be 'Imperceptible'. There will be no change in the WFD status of any hydraulically connected waterbodies resulting from the Greenfield LRD:

- There will be no effects on downstream protected areas. It is consistent with the EIA Directive (2014/52/EU), the Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC).
- It will not cause a deterioration in the status of any surface and ground waterbodies assessed.
- The good status of the Lee(Cork)_090 WFD river waterbody will not be jeopardised.
- The good status of the Ballincollig WFD ground waterbody will not be jeopardised.
- The potential for the Curraheen (Cork City)_10 WFD river waterbody (or other waterbodies further downstream) achieving good status will not be jeopardised.
- There will be no conflict with the objectives set in the River Basin Management Plan.

It can therefore be concluded that the proposed development is compliant with the requirements of the Water Framework Directive (2000/60/EC).

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CHAPTER EIGHT

BIODIVERSITY

APPENDIX 8-1 Classification scheme outlined in the Guidelines for Assessment of Ecological Impacts of National Road Schemes - National Roads Authority, 2009
APPENDIX 8-2 Botanical survey Results
APPENDIX 8-3 Aquatic surveys - Dixon Brosnan Ecology
APPENDIX 8-4 Screening/Natura Impact Statement – Dixon Brosnan Ecology

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APPENDIX 8-1 Classification scheme outlined in the Guidelines for Assessment of Ecological Impacts of National Road Schemes - National Roads Authority, 2009

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Appendix 8.1. NRA 2009 Guidelines

Examples of valuation at different geographical scales

Ecological valuation: Examples

International Importance:
• 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation and Proposed Special Protection Area (pSPA).
• Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
• Features essential to maintaining the coherence of the Natura 2000 Network.[1]
• Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
• Resident or regularly occurring populations (assessed to be important at the national level) [2] of the following:
  ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
  ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
• Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
• World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
• Biosphere Reserve (UNESCO Man & The Biosphere Programme).
• Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
• Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
• Biogenetic Reserve under the Council of Europe.
• European Diploma Site under the Council of Europe.
• Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).[3]

National Importance:
• Site designated or proposed as a Natural Heritage Area (NHA).
• Statutory Nature Reserve.
• Refuge for Fauna and Flora protected under the Wildlife Acts.
• National Park.
• Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
• Resident or regularly occurring populations (assessed to be important at the national level)[4] of the following:
  ○ Species protected under the Wildlife Acts; and/or
  ○ Species listed on the relevant Red Data list.
• Site containing 'viable areas'[5] of the habitat types listed in Annex I of the Habitats Directive.

County Importance:
• Area of Special Amenity.[6]
• Area subject to a Tree Preservation Order.
• Area of High Amenity, or equivalent, designated under the County Development Plan.
• Resident or regularly occurring populations (assessed to be important at the County level)[7] of the following:
  ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  ○ Species protected under the Wildlife Acts; and/or
  ○ Species listed on the relevant Red Data list.
• Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
• County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, [8] if this has been prepared.
• Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
• Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):
• Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
• Resident or regularly occurring populations (assessed to be important at the Local level)[9]of the following:
  ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  ○ Species protected under the Wildlife Acts; and/or
  ○ Species listed on the relevant Red Data list.
• Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
• Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value): • Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; • Sites or features containing non-native species that are of some importance in maintaining habitat links.

1 See Articles 3 and 10 of the Habitats Directive.

2 It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

3 Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*).

4It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

5 A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).

6 It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.

7 It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

8 BAP: Biodiversity Action Plan

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9 It is suggested that, in general, 1%of the local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle

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APPENDIX 8-2 Botanical survey Results

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Appendix 8.2. Floral species recorded during botanical survey

Northwestern boundary Hedgerow/Stonewalls and other stonework	
Common Name	**Latin Name**
Ash	*Fraxinus excelsior*
Bindweed	*Convolvulus arvensis*
Blackthorn	*Prunus spinosa*
Bramble	*Rubus fruticosus*
Cleavers	*Galium aparine*
Cock's foot	*Dactylis glomerata*
Common fumitory	*Fumaria officinalis*
Common mouse here	*Cerastium fontanum*
Cow parsley	*Anthriscus sylvestris*
Dandelion	*Taraxacum vulgaria*
Elm	*Ulmus sp.*
False oat grass	*Arrhenatherum elatius*
Figwort	*Scrophularia nodosa*
Hard shield fern	*Polystichum Aculeatum,*
Hawthorn	*Crataegus monogyna*
Herb Robert	*Geranium robertianum*
Ivy	*Hedera helix*
Pendulous sedge	*Carex pendula*
Pig nut	*Conopodium majus*
Prickly South thistle.	*Sonchus asper*
Privet	*Ligustrum vulgare*
Red fescue	*Festuca rubra*
Remote sedge	*Carex remota*
Ribwort plantain	*Plantago lanceolata*
Shepherd's purse	*Capsella bursa-pastoris*
Virginia creeper	*Parthenocissus quinquefolia*
Wild Rose	*Rosa canina*
Willow	*Salix sp.*
Winter heliotrope	*Petasites fragrans*
Wood avens	*Geum urbanum*

Western hedgerow	
Common Name	**Latin Name**
Alder	*Alnus glutinosa*
Alexanders	*Smyrnium olusatrum*
Ash	*Fraxinus excelsior*
Beech	*Fagus sylvatica*
Blackthorn	*Prunus spinosa*
Bracken	*Pteridium aquilinum*
Bramble	*Rubus fruticosus*
Broad buckler fern	*Dryopteris dilatata*
Broadleaf dock	*Rumex obtusifolius*
Bush vetch	*Vicia sepium*
Cleavers	*Galium aparine*
Cow parsley	*Anthriscus sylvestris*
Creeping buttercup	*Ranunculus repens*
Dog violet	*Viola riviniana*
Elder	*Sambucus nigra*
Elm	*Ulmus sp.*
Germander speedwell	*Veronica chamaedrys*
Gorse	*Ulex europaeus*
Grey willow	*Salix cinerea*
Ground ivy	*Glechoma hederacea*
Guelder rose	*Ulex europaeus*
Hard shield fern	*Polystichum Aculeatum,*
Hart's-tongue fern,	*Asplenium scolopendrium*
Hawthorn	*Crataegus monogyna*
Hazel	*Corylus avellana*
Herb Robert	*Geranium robertianum*
Hogweed	*Heracleum sphondylium*
Holly	*Ilex aquifolium*
Ivy	*Hedera helix*
Lords and ladies	*Arum maculatum*
Male fern	*Dryopteris filix-mas*
Meadow vetchling	*Lathyrus pratensis*
Monteray cypruss	*Cupressus macrocarpa*
Nettle	*Urtica dioica L*
Privet	*Ligustrum vulgare*
Ragged robin	*Lychnis flos-cuculi*
Red fescue	*Festuca rubra*
Remote sedge	*Carex remota*
Soft Rush	*Juncus effusus*
Spindle	*Euonymus europaeus*
Sycamore	*Acer pseudoplatanus*
Wild Rose	*Rosa canina*
Willowherb	*Epilobium angustifolium*
Winter heliotrope	*Petasites fragrans*
Wood avens	*Geum urbanum*
Wood dock	*Rumex sanguineus*
Wood rush	*Luzula* sp,
Woodrush	*Luzula sylvatica*
Yellow flag	*Iris pseudacorus*

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Improved agricultural grassland	
Common Name	**Latin Name**
Annual meadow grass	*Poa annua*
Broadleaf dock	*Rumex obtusifolius*
Black Medick	*Medicago lupulina*
Cock's foot	*Dactylis glomerata*
Common bent	*Agrostis capillaris*
Common mouse ear	*Cerastium fontanum*
Creeping bent	*Agrostis stolonifera*
Creeping buttercup	*Ranunculus repens*
Curled dock	*Rumex crispus*
Daisy	*Bellis perennis*
Dandelion	*Taraxacum vulgaria*
Eyebright	*Euphrasia officinalis*
Field thistle	*Cirsium discolor*
Herb Robert	*Geranium robertianum*
Hogweed	*Heracleum sphondylium*
Nettle	*Urtica dioica L*
Perennial ryegrass	*Lolium perenne*
Ragged robin	*Lychnis flos-cuculi*
Red clover	*Trifolium pratense*
Red fescue	*Festuca rubra*
Rough meadowgrass	*Poa trivialis*
Shepherd's purse	*Capsella bursa-pastoris*
Smooth meadow grass	*Poa pratensis*
Soft hair grass	*Deschampsia cespitosa,*
Spear thistle	*Cirsium vulgare*
Speedwell	*Veronica persica*
Stitchwort	*Stellaria holostea*
Sweet vernal grass	*Anthoxanthum odoratum*
White clover	*Trifolium repens*
Yorkshire fog	*Holcus lanatus*

Drainage ditch	
Common Name	**Latin Name**
Compact rush	*Juncus conglomeratus*
Field sorrel	*Rumex acetosella*
Figwort	*Scrophularia nodosa*
Floating sweet grass	*Glyceria fluitans*
Fool's watercress	*Helosciadium nodiflorum*
Horsetail	*Equisetum arvense*
Marsh bed straw	*Galium palustre*
Meadowsweet	*Filipendula ulmaria*
Purple loosestrife	*Lythrum salicaria*
Ragged robin	*Lychnis flos-cuculi*
Reed canary grass	*Phalaris arundinacea*
Remote sedge	*Carex remota*
Soft Rush	*Juncus effusus*
Watercress	*Nasturtium officinale*

Willowherb	*Epilobium angustifolium*

Treelines	
Common Name	**Latin Name**
Alexanders	*Smyrnium olusatrum*
Apple	*Malus sp.*
Ash	*Fraxinus excelsior*
Beech	*Fagus sylvatica*
Black spleenwort	*Asplenium adiantum-nigrum*
Blackthorn	*Prunus spinosa*
Bracken	*Pteridium aquilinum*
Bramble	*Rubus fruticosus*
Broadleaf dock	*Rumex obtusifolius*
Bush vetch	*Vicia sepium*
Cherry laurel	*Prunus laurocerasus*
Cleavers	*Galium aparine*
Cock's foot	*Dactylis glomerata*
Cow parsley	*Anthriscus sylvestris*
Creeping buttercup	*Ranunculus repens*
Curled dock	*Rumex crispus*
Dog rose	*Rosa canina*
Dog violet	*Viola riviniana*
Elder	*Sambucus nigra*
Elm	*Ulmus sp.*
Eucalyptus	*Eucalyptus gunnii.*
Foxglove	*Digitalis purpurea*
Germander speedwell	*Veronica chamaedrys*
Hard shield fern	*Polystichum Aculeatum,*
Hart's-tongue fern,	*Asplenium scolopendrium*
Hawthorn	*Crataegus monogyna*
Hedge woundwort	*Stachys sylvatica*
Honeysuckle	*Lonicera periclymenum*
Ivy	*Hedera helix*
Larch	*Larix decidua*
Lesser celandine	*Ficaria verna*
Lord and ladies	*Arum maculatum*
Maidenhair spleenwort	*Asplenium trichomanes*
Male fern	*Dryopteris affinis*
Meadow vetchling	*Lathyrus pratensis*
Nettle	*Urtica dioica L*
Nipplewort	*Lapsana communis*
Pennyworth	*Umbilicus rupestris*
Perennial ryegrass	*Lolium perenne*
Prickly South thistle.	*Sonchus asper*
Primrose	*(Primula vulgaris*
Privet	*Ligustrum vulgare*
Red dead nettle	*Lamium purpureum*
Remote sedge	*Carex remota*
Ribwort plantain	*Plantago lanceolata*
Scaly male fern	*Dryopteris affinis*
Scot's pine	*Pinus sylvestris*

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Sitka spruce	*Picea sitchensis*
Spirit thistle	*Cirsium vulgare*
Sycamore	*Acer pseudoplatanus*
Wild Rose	*Rosa canina*
Winter heliotrope	*Petasites fragrans*
Wood avens	*Geum urbanum*
Wood dock	*Rumex sanguineus*
Woodrush	*Luzula sylvatica*

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APPENDIX 8-3 Aquatic surveys - – Dixon Brosnan Ecology

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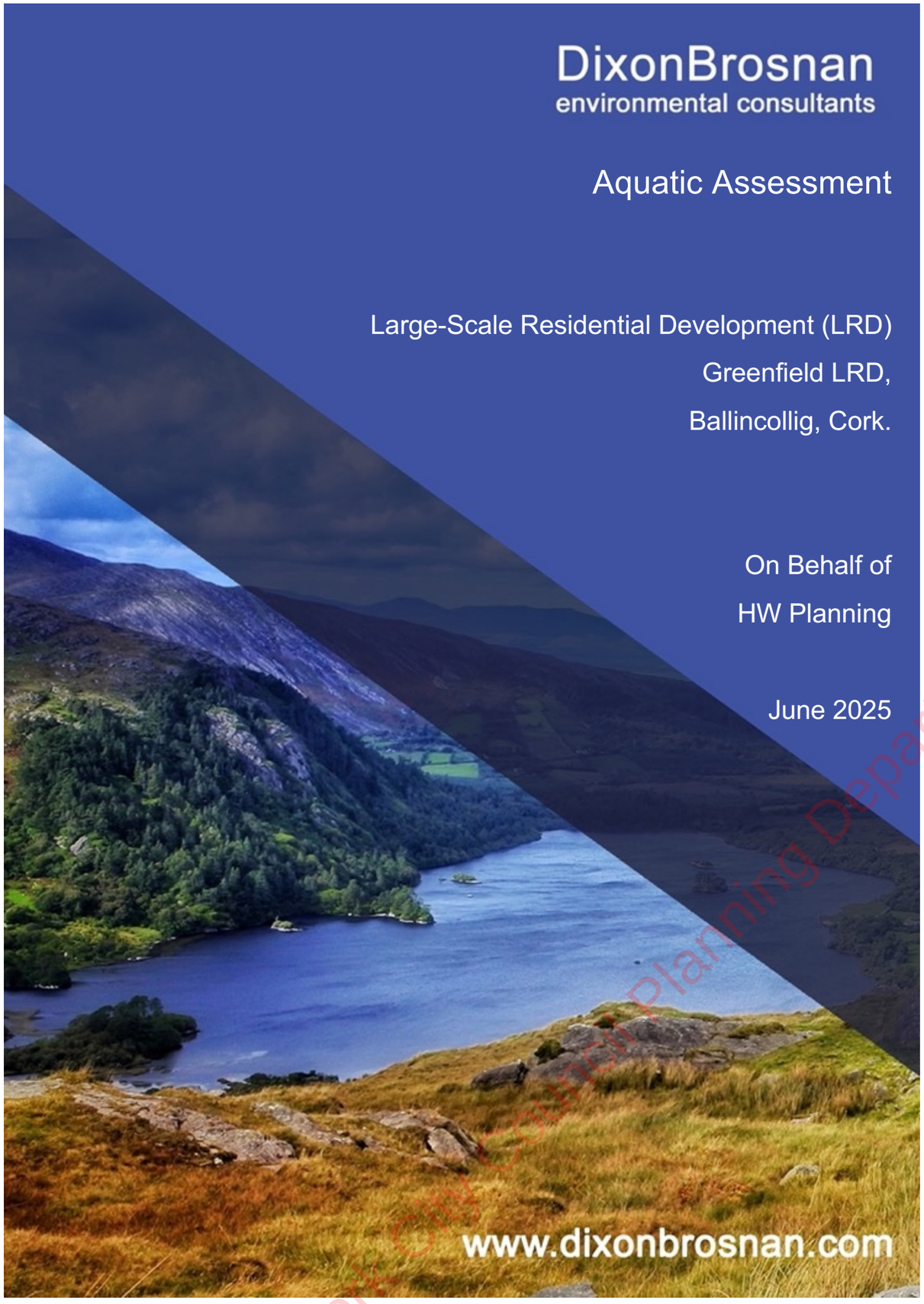

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DixonBrosnan

environmental consultants

Project	Aquatic Assessment for Greenfield Large-Scale Residential Development (LRD) Ballincollig, Cork.	
Client	HW Planning	
Project Ref.	25068	
Report No.	25068.01	
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Date	**Revision**	**Prepared By**
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1. Introduction

1.1 Background

DixonBrosnan Environmental Consultants were commissioned to assess the potential impacts of a proposed Greenfield Large-Scale Residential Development (LRD) at Ballincollig, Cork, and all associated site works on terrestrial and aquatic flora and fauna.

This report describes and evaluates the aquatic habitats within the Lisheens Stream, which is located to the south-east of the proposed development site.

1.2 Aim of Report

The survey, which consisted of biological analyses at eight sampling stations was carried out to assess the current water quality of the streams at these stations. The results are compared to those obtained during previous surveys.

This report has been written in accordance with the Chartered Institute of Ecological and Environmental Management (CIEEM) *Guidelines for Ecological Report Writing* (CIEEM 2017).

1.3 Authors of Report

This report was prepared by Carl Dixon MSc. (Ecological Monitoring). Carl Dixon MSc (Ecology) is a senior ecologist who has over 25 years' experience in ecological and water quality assessments with particular expertise in freshwater ecology. He also has experience in mammal surveys, invasive species surveys and ecological supervision of large-scale projects. Projects in recent years include the Waste to Energy Facility Ringaskiddy, Shannon LNG Project, supervision of the Fermoy Flood Relief Scheme, Skibbereen Flood Relief Scheme, Upgrade of Mallow WWTP Scheme, Douglas Flood Relief Scheme, Great Island Gas Pipeline etc. He has carried out ecological surveys and prepared AA/NIS reports for a range of projects.

2. Location

The proposed development site is located within the Ballincollig town boundary. The site is dominated by grazed agricultural lands which is characterised by a gently sloping topography. The Greenfields Road provides access to the site, running along the site's northern-west edge. The site is flanked by grassland lands to the east, with one-off residential developments separated by a local access road to the western edge. The N22 National Primary Road runs along the site southern boundary.

The Lisheens Stream, a tributary of the Grange Hill and Curraheen Streams, is located at the southeast corner of the proposed development site. It is proposed to discharge treated and attenuated stormwater runoff to the Lisheens Stream at the southeastern boundary. The Lisheens Stream meets the Curraheen Stream approximately 2.6km downstream of the proposed development site (via the Grange Hill Stream). The Curraheen Stream meets the Glasheen River c.5.9km downstream of this and the River Glasheen flows into the Lee Estuary 3.7km downstream of this point. The Lisheen Stream, Grange Hill and Curraheen Streams are known as CURRAGHEEN (Cork City) _010 by the EPA (See **Figure 1**).

Figure 1. Waterbodies in the vicinity of the proposed development site

The Grange Hill Stream is located downstream of the proposed development. Here the stream has a dense mud substrate with high shade levels and large amounts of decaying instream vegetation. Although the Grange Hill Stream does support Brown Trout further downstream (i.e. the Curraheen River) this section of the watercourse is of very limited value for salmonids.

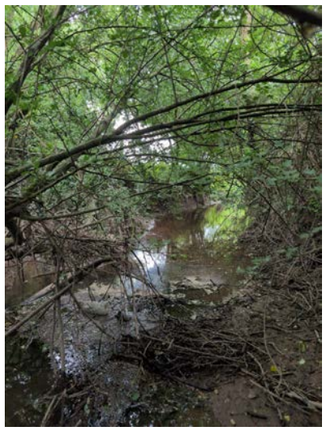

Plate 1. Lisheens Stream immediately upstream of confluence with Grange Hill Stream. Heavy shade and minimal flows noted.

Plate 2. Minimal flows with duckweed and invasive water fern downstream of the survey area.

3. Survey Methodology

The field survey was undertaken on 26th of May 2024 and 24th of June 2025. Kick sampling was carried out on the 24th of June 2025. It is noted that the Lisheen Stream is generally considered as unsuitable for biological monitoring using EPA methodology as it is a depositing watercourse i.e. deep fine sediment, minimal flows with an absence of riffle habitat, dense macrophyte growth which clogs the channel. Therefore, the Q values provided below are likely to be due to morphological conditions rather than being indicative of nutrient levels.

Biological sampling was carried out at each station using the kick-sampling technique as per Environmental Protection Authority (EPA) methodology (Feeley *et al.,* 2020). This biotic index is used by the EPA and allows river quality to be compared under standardized guidelines. This method divides macro-invertebrates into five groups, depending on their sensitivity to pollution as presented in **Table 1**.

The kick-sampling technique involved using a 'D' shaped hand net (mesh size 0.5 mm; 350 mm diameter). Sweeps through the sediment and deep sediment was carried out. The substrate immediately upstream of the net was kicked for two minutes to dislodge invertebrates. Stone washings were not carried out as there was no suitable substrate within the survey area. Samples are transferred to plastic containers and preserved using 70% alcohol. Samples are subsequently sieved and sorted using a white sorting tray. Identification was undertaken in the laboratory using a high-powered binocular microscope and using standard identification keys.

An assessment was also made of the fisheries value of the watercourse and macrophytes were recorded.

Table 1. Macroinvertebrate Sensitivity Classes

Group	Sensitivity
A	Sensitive
B	Less Sensitive

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Group	Sensitivity
C	Tolerant
D	Very tolerant
E	Most tolerant

Having determined the relative proportions of the various organisms in a sample, water quality can be inferred by a comparison of this data with that which might be expected from unpolluted habitats of the type under investigation. The Q-value determined using the fauna collected at each station therefore provides an indication of the quality of the water at that station. The relationship between Q values and water quality is set out in **Table 2**. The relationship between the Q-rating system and the Water Framework Directive classification as defined by the Surface Waters) Regulations 2009 (S.I. 272 of 2009) is shown in **Table 3**.

Table 2. Q-value and water quality

Q-value	Water quality	Status
5	Good	Satisfactory
4	Fair	Satisfactory
3	Doubtful	Unsatisfactory
2	Poor	Unsatisfactory
1	Bad	Unsatisfactory

Table 3. Correlation between the WFD classification and Q values

Ecological status WFD	Q Values
High	Q5, Q4-5
Good	Q4
Moderate	Q3-4
Poor	Q3, Q2-3
Bad	Q2, Q1

4. Characteristics of Sampling Stations

Two sampling sites were chosen along the Lisheens Stream. The locations of these sites are shown in **Figure 2**.

Figure 2. Location of aquatic survey along the Lisheens Stream

4.1 Site 1

Site 1 is the most upstream site of the two sampling locations and is surrounded by pasture grazed by horses. There is a small section of open drain at this location which is probably occasionally used by horses. This high up the catchment flows are very low and the substrate is characterised by deep silt. The Lisheens Stream is densely clogged with macrophytes growth along the dees with species such as duckweed and fools watercress noted. The watercourse has been straightened with no meanders or riffle habitat. Shade is c.25%. Algae growth is high.

Plate 1. Site 1 kick sampling location

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4.2 Site 2

Site 2 (S2) is located at the western boundary of the landholding. At this location the channel is densely clogged with macrophytes including Fool's watercress. Small sections of open water are dominated by invasive *Azolla* sp. Slows are extremely sluggish with a substrate of deep, fine mud. The surrounding land is dominated by pasture grazed by horses and shade levels were approximately 25%.

Plate 2. Site 2 kick-sampling site

5. Survey Results

Survey results including Q values are shown in **Table 4.**

Table 4. Macroinvertebrates Indentification and Q Values

Station	Site 1	Site 2
EPHEMEROPTERA		
Baetidae		
Caenidae		
Ephemeridae		
Ephemerellidae		
Heptageniidae		
PLECOPTERA		
Leuctridae		
Perlodidae		
Chloroperlidae		
Nemouridae		
Taeniopterygidae		
TRICHOPTERA		
Rhyacophilidae		
Hydropsychidae		
Sericostomatidae		
Lepidostomatidae		
Polycentropidae		
Limnephilidae		
Leptoceridae		
Goeridae		
Beraeidae		
CRUSTACEA		
Gammarus sp.		
Asellus sp.	F	C
COLEOPTERA		
Elminthidae		
Gyrinidae		
Helodidae		
Coleoptera unidentified	P	P
HIRUDINEA		
Glossiphonidae		
HYDRACARINA		
Hydracarina		
HEMIPTERA		
Aphelocheirus sp.		
DIPTERA		
Simuliidae		

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Station	Site 1	Site 2
Chironomidae	F	F
Chironomous sp.	P	P
Tipulidae		
MOLLUSCA		
Ancylidae		
Planorbidae		
Lymnaea		
Oligochaeta	P	P
Gordius sp		
Acari		
Q VALUE	Indeterminate	Indeterminate

P = Present, F=Frequent, C=Common, N = Numerous, D = Dominant, subscript No. = number of animals present.

6. Results Summary

6.1 Biological Monitoring

The EPA methodology specifically notes the following:

Macroinvertebrate criteria do not apply to rivers with mud, bedrock or sand substrate, very sluggish or torrential flow, head-water or high altitude streams and those affected by significant ground water input, excessive caldification, drainage, canalisation, culverting, marked shading etc

It is noted that the Lisheens Stream is generally considered as unsuitable for biological monitoring using EPA methodology as it is a depositing watercourse with deep fine sediment, minimal flows with an absence of riffle habitat and with dense macrophyte growth which clogs the channel.

It is noted that a survey was previously carried out by DixonBrosnan on the Lisheens Stream downstream of the proposed development site. This noted that…….

The species recorded such as Asellus aquatica (water louse) and Chironomidae (fly larvae) are generally recorded where there is low oxygen levels and decaying vegetation.. Morphologically the watercourse is characterised by a straightened channel and an absence of riffle habitat with dense mud. There is a high density of aquatic macrophytes within the channel. Whilst some increase in nutrient levels associated with run-off from intensive pasture in proximity to the site - which will the exacerbated by sluggish flows and minimal dilution -

may occur, the nutrient status of the watercourse could not be assessed via an analysis of macroinvertebrate populations. Overall, therefore this watercourse is not considered suitable for assessment via the EPA Q value methodology and Q values could not be assigned.

No fish were recorded during the site Greenfield surveys although it is noted that Stickleback were recoded on this watercourse further downstream during a previous survey. Due to the dense macrophyte growth, in particular at S2, it is possible that this species is present and were not recorded during the survey.

Overall, this stream is considered of relatively low value due to its modified nature and sluggish flows. It functions primarily as a land drain and supports a limited diversity of macroinvertebrates who are tolerant of sluggish flows and a mud substrate. Although the presence of Stickleback cannot be altogether precluded, it is not of significant value for fish. The dense growth of macrophytes is probably indicative of a degree of nutrient enrichment and the ecology of the stream is further affected by the presence of the invasive species *Azolla* sp. which forms a dense carpet on sections of open water. This watercourse is not considered of significant ecological value and the use of a kick sampling methodology to classify water quality is not considered appropriate for a water feature of this size, with dense macrophyte growth, a mud substrate and with such limited flows. Therefore, Q values were not assigned.

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APPENDIX 8-4 Sreening/Natura Impact Statement – Dixon Brosnan Ecology

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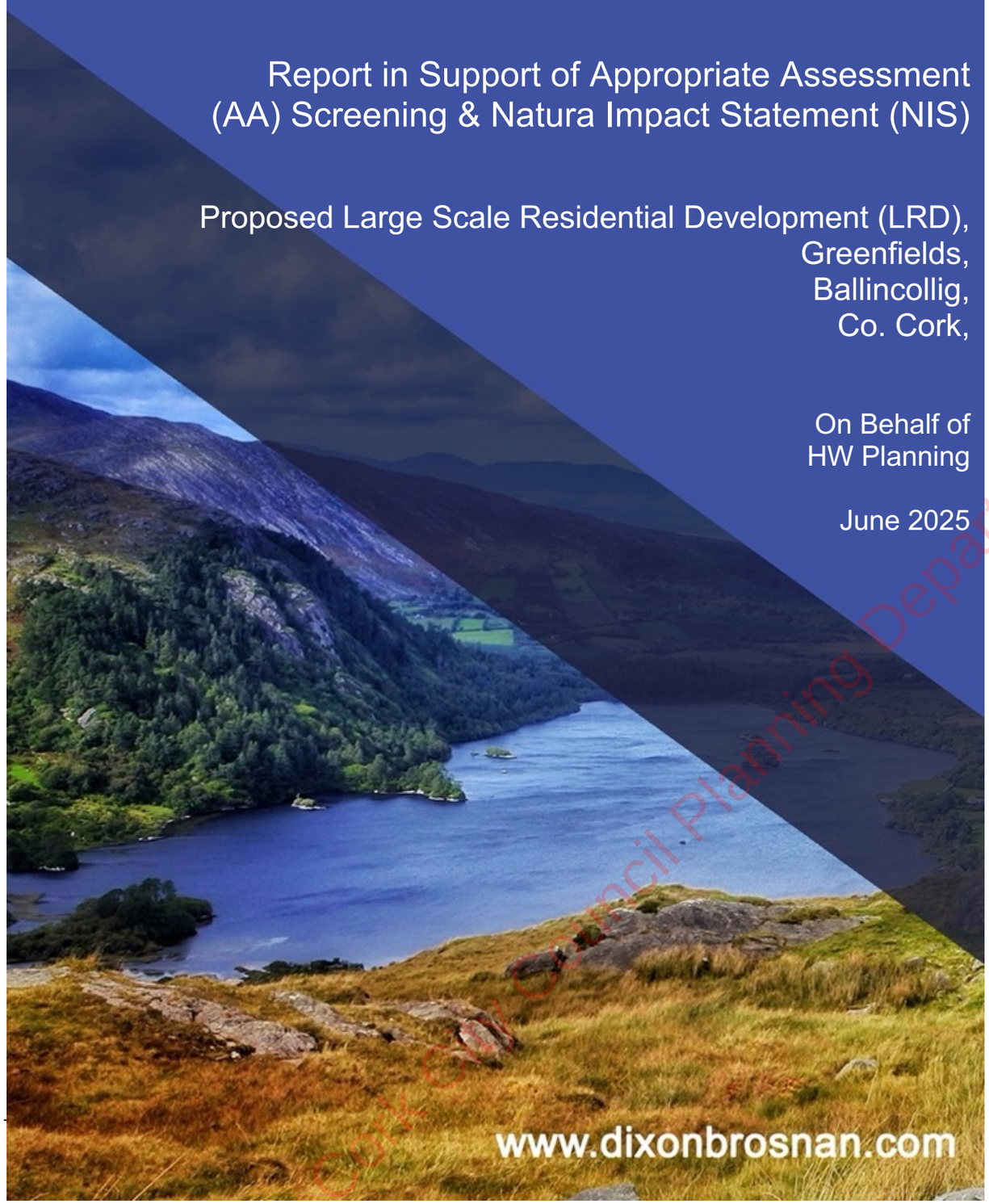
DixonBrosnan
environmental consultants

Report in Support of Appropriate Assessment (AA) Screening & Natura Impact Statement (NIS)

Proposed Large Scale Residential Development (LRD), Greenfields, Ballincollig, Co. Cork,

On Behalf of
HW Planning

June 2025



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DixonBrosnan

environmental consultants

Project	Report in Support of Appropriate Assessment (AA) Screening & Natura Impact Statement (NIS) for Proposed Large Scale Residential Development, Greenfields, Ballincollig, Co. Cork	
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1. Introduction

1.1 Background

The information in this report has been compiled by DixonBrosnan Environmental Consultants, on behalf of the applicant. It provides information on and assesses the potential for the Proposed Large Scale Residential Development (LRD) at Greenfields, Ballincollig, Co. Cork, to impact on any Natura 2000 sites within its zone of influence. The information in this report forms part of and should be read in conjunction with the planning application documentation for the proposed development.

The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network of sites of highest biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises Special Areas of Conservation (SACs, including candidate SACs) and Special Protection Areas (SPAs). SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites and from these the conservation objectives of the site are derived. The Birds and Habitats Directives set out various procedures and obligations in relation to nature conservation management in Member States in general, and of the Natura 2000 sites and their habitats and species in particular. A key protection mechanism is the requirement to consider the possible nature conservation implications of any plan or project on the Natura 2000 site network before any decision is made to allow that plan or project to proceed. Not only is every new plan or project captured by this requirement but each plan or project, when being considered for approval at any stage, must take into consideration the possible effects it may have in combination with other plans and projects when going through the process known as Appropriate Assessment (AA).

The obligation to undertake Appropriate Assessment (AA) derives from Article 6(3) and 6(4) of the Habitats Directive, and both involve a number of steps and tests that need to be applied in sequential order. Article 6(3) is concerned with the strict protection of sites, while Article 6(4) is the procedure for allowing derogation from this strict protection in certain restricted circumstances. As set out in Section 177U of the Planning and Development Act 2000 as amended, a screening for appropriate assessment of an application for consent for the proposed development must be carried out by the competent authority to assess, in view of best scientific knowledge, if the proposed development, individually or in combination with another plan or project is likely to have a significant effect on any European site. Each step in the assessment process precedes and provides a basis for other steps. The results at each step must be documented and recorded carefully so there is full traceability and transparency of the decisions made.

1.2 Aim of the report

The purpose of this report is to inform the AA process as required under the Habitats Directive (92/43/EEC) in instances where a plan or project may give rise to significant impacts on a Natura 2000 site. This report aims to inform the Appropriate Assessment process in determining whether the development, both alone and in combination with other plans or projects, are likely to have a significant impact on the Natura 2000 sites in the study area, in the context of their conservation objectives and specifically on the habitats and species for which the sites have been designated.

This report has been prepared with regard to the following guidance documents, where relevant.

- *Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC (European Commission (EC), 2018);*
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodical Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission (EC), 2021);*
- *Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC (European Commission, (EC) 2007);*
- *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (Department of Environment, Heritage and Local Government, 2010 revision);*
- *Appropriate Assessment under Article 6 of the Habitats Directive; Guidance for Planning Authorities. Circular NPW 1/10 and PSSP 2/10 (Department of Environment, Heritage and Local Government, 2010);*
- *Guidelines for Good Practice Appropriate Assessment of Plans under Article 6(3) Habitats Directive (International Workshop on Assessment of Plans under the Habitats Directive, 2011);*
- *Commission notice Guidance document on wind energy developments and EU nature legislation, (EC 2020);*
- *Communication from the Commission on the precautionary principle. European Commission (2000)*
- *Assessment of plans & projects in relation to N2K sites – Methodological Guidance (EC 2021) and*
- *Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (EC 2021).*

1.3 Authors of the Report

This report was prepared by Carl Dixon MSc (Ecological Monitoring) and Dr. Sorcha Sheehy PhD (Ecology/ornithology).

Carl Dixon MSc (Ecology) is a senior ecologist who has over 25 years' experience in ecological and water quality assessments. Carl Dixon holds an Honours Degree (BSc) in Ecology and a Masters (MSc) in Ecological Monitoring from UCC. He is a senior ecologist with over 25 years' experience in ecological assessment. Prior to setting up DixonBrosnan Environmental Consultants in 2000, Carl set up and ran Core Environmental Services which included Rural

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Environmental Protection Scheme (REPS) planning for landowners and ecological assessments. Carl has particular experience in freshwater ecology including electrofishing fish stock assessments and water quality assessments. He also has considerable experience in habitat mapping and mammal ecology including survey work and reporting in relation to badgers and bats. Other competencies include surveys for invasive species and bird surveys. Carl has extensive experience with regards to EIAR and NIS mitigation and impact assessment. He has particular experience in large-scale industrial developments with extensive experience in complex assessments as part of multi-disciplinary teams. Such projects include gas pipelines, incinerators, electrical cable routes, oil refineries and quarries.

Dr. Sorcha Sheehy PhD (ecology/ornithology) is an experienced ecological consultant specialising in bird behaviour. Sorcha received a BSc in Applied Ecology from UCC and subsequently went on to receive a PhD in behavioural ornithology at UCC. During her PhD research, Sorcha studied bird-aircraft collision with a particular focus on bird behaviour. Sorcha has worked for over 15 years in a professional ecology role and specialises in the coordination of ecology projects and assessments. She has coordinated and contributed to Habitats Directive Assessments (AA screenings and NIS) and Environmental Impact Assessment Reports (EIAR) for a range of small and large-scale projects with particular expertise in assessing impacts on birds. Notable projects include Arklow Bank Wind Park, Shannon Technology and Energy Park and Waste to Energy Facility Ringaskiddy.

2. Regulatory Context and Appropriate Assessment Procedure

2.1 Regulatory Context

The Habitats Directive (Council Directive 92/43/EEC on the *Conservation of Natural Habitats and of Wild Fauna and Flora*) aims to maintain or restore the favourable conservation status of habitats and species of community interest across Europe. The requirements of these directives are transposed into Irish law through the European Communities (Birds and Natural Habitats Regulations 2012-2022).

Under the Directive a network of sites of nature conservation importance have been identified by each Member State as containing specified habitats or species requiring to be maintained or returned to favourable conservation status. In Ireland the network consists of SACs and SPAs, and also candidate sites, which form the Natura 2000 network.

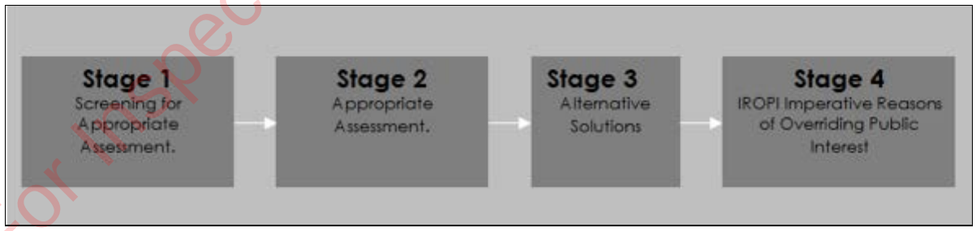
Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the *Conservation of Natural Habitats and of Wild Fauna and Flora* (as amended) (hereafter 'the Habitats Directive') requires that, any plan or project not directly connected with or necessary to the management of a designated site, but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. A competent authority (e.g. the EPA or Local Authority) can only agree to a plan or project after having determined that it will not adversely affect the integrity of the site concerned.

The possibility of a significant effect on a designated or "European" site has generated the need for an appropriate assessment to be carried out by the competent authority for the purposes of Article 6(3). A Stage Two Appropriate Assessment is required if it cannot be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.

The first (Screening) Stage for appropriate assessment operates merely to determine whether a (Stage Two) Appropriate Assessment must be undertaken on the implications of the plan or project for the conservation objectives of relevant European sites.

2.2 Appropriate Assessment Procedure

The assessment requirements of Article 6(3) establish a stage-by-stage approach. This assessment follows the stages outlined in the 2001 European Commission publications "Assessment of plans and projects significantly affecting Natura 2000 sites: methodological guidance on the provisions of Articles 6(3) and 6(4) of the Habitats Directive 92/43/EEC" (2001) and Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC Office for Official Publications of the European Communities, Luxembourg (EC, 2015);



The stages are as follows:

Stage One: Screening — the process which identifies any appreciable impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant;

Stage Two: Appropriate assessment — the consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts;

Stage Three: Assessment of alternative solutions: The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site. It is confirmed that no reliance is placed by the developer on Stage Three in the context of this application for development consent;

Stage Four: Assessment where no alternative solutions exist and where adverse impacts remain — an assessment of compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed (it is important to note that this guidance does not deal with the assessment of imperative reasons of overriding public interest). Again, for the avoidance of doubt, it is confirmed that no reliance is placed by the developer on Stage Four in the context of this application for development consent.

It is the responsibility of the competent authority to make a decision on whether or not the proposed development should be approved, taking into consideration any potential impact upon any Natura 2000 site within its zone of influence.

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3. Receiving Environment

3.1 Existing site

The proposed development site is located at the southwest Ballincollig town (**Figure 1**). The site is directly bound on the north by the existing Woodberry Road and to the south by the Ballincollig Bypass (N22). The western lands are currently in agricultural use but are also zoned in the Current City Development Plan.

The site is a greenfield site, characterised by its gently sloping topography. The topography of the site gently slopes from the north and west to a low point on the south-eastern boundary which is approximately +18.42m AOD. The elevation height along the perimeter from the north, west and southern side varies from +30.0m to +19.0m AOD.

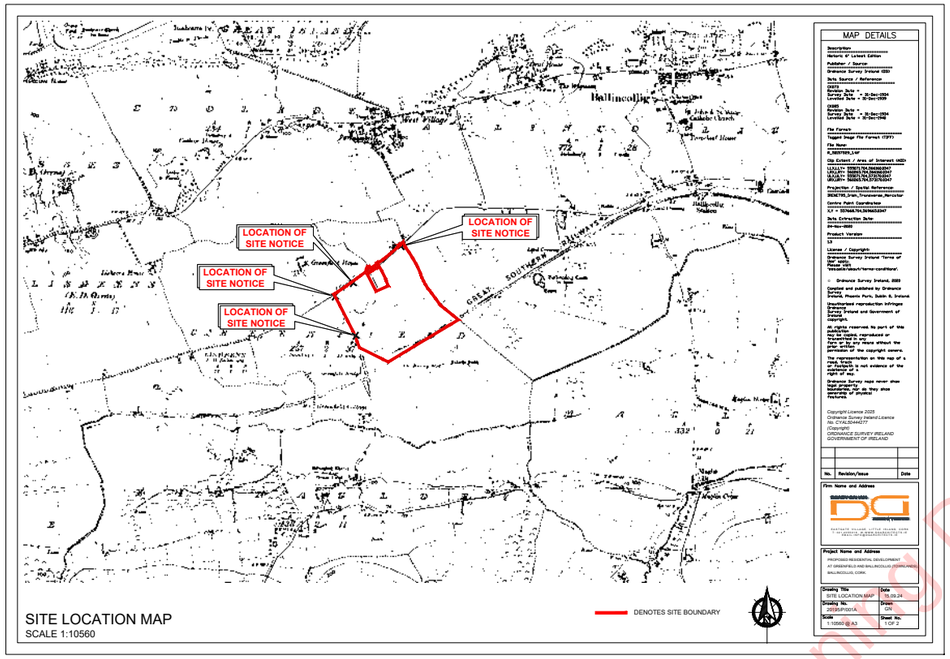

Figure 1. Proposed development site location | DG Architects

Figure 2. Proposed Site Layout | Source DG Architects

3.2 Proposed Development

The proposed development consists of the demolition of an existing dwelling house and farmyard with associated agricultural buildings and the construction of a mixed-use residential development of 544 no. residential units consisting of 232 no. dwelling houses, 312 no. apartment/duplex units, a two storey creche facility, commercial/retail unit and all ancillary site development works. The proposed 232 no. dwelling houses will include 100 no. 4 bedroom detached/semi-detached dwelling houses, 124 no. 3 bedroom semi-detached/townhouse dwelling houses and 8 no. 2 bedroom townhouse units. The proposed 312 no. apartment/duplex units will include 61 no. 3 bedroom units, 171 no. 2 bedroom units and 80 no. 1 bedroom units, to be provided in 28 no. apartment/duplex buildings ranging in height from 3-4 storeys. One of the proposed apartment buildings (Block 3) will provide the ground floor commercial/retail unit. Vehicular access to the proposed development will be via a new access road and junction from Greenfields Road (L2216), with a secondary vehicular entrance also from Greenfields Road, with the proposed development also providing for separate pedestrian/cycle connections to Greenfields Road.

An overview of the proposed development is shown in **Figure 2**. Site drawings are included in **Appendix 2.**

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3.3 Surface Water Drainage

The existing watercourse 'Lisheens 19' (Lisheens Stream) on the southern boundary of the site has been chosen as the suitable surface water discharge point for the proposed development. To reduce the effects of the surface runoff on potential flooding, a Stormwater Management Plan will be applied to surface water discharges into adjacent watercourses. The Stormwater Management Plan can be applied to control the rate of runoff from new development. The maximum permitted surface water outflow from the new development is to be restricted to that of the existing Greenfield site by the usage of attenuation storage.

Control of runoff by attenuation methods requires a hydraulic control to restrict the magnitude of flows passing downstream, together with an upstream storage capacity to contain the volume of runoff held back by the hydraulic control. The flows are proposed to be attenuated in the surface water system by adopting a flood storage attenuation tank along with restricted outlets as the control devise.

The proposed surface water drains have been designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS), the Department of the Environment's Recommendations for Site Development Works for Housing Areas, the Department of the Environment's Building Regulations "*Technical Guidance Document Part H Drainage and Waste Water Disposal"* and BS EN 752: 2008 Drain and Sewer Systems Outside Buildings.

The stormwater management plan adopted for the development involves using interlinked attenuation tanks located in the green areas of the site.

All surface water runoff arising from the paved development will be drained away from the site. The attenuation tanks will be designed for a 100-year storm event. The maximum discharge from the tanks will be limited to calculated permissible runoff (QBAR) for the catchment area.

It should be noted that climate change has been accounted for in the design. As per volume 5 of the GDSDS a factor of 20% has been incorporated into the design. The allowable runoff utilising IH 124 of49.600 l/second for the entire catchment area for the site of 15.457 hectares. The allowable runoff equates to 3.431 l/second/hectare.

A petrol interceptor is a trap used to filter out hydrocarbon pollutants from rainwater runoff. It is used in construction to prevent fuel contamination of streams carrying away the runoff.

The proposed petrol interceptor from Conder Environmental also includes a silt storage capacity in addition to the oil storage capacity that allow silt to be collected in the interceptor prior to discharge to the proposed attenuation tanks. This silt build-up can then be removed from the tanks. The interceptors will be specified at detailed design stage.

Attenuation Tank Sizes and Petrol Interceptor Sizing/Specifications have been included as part of the Stormwater Network Design in this report. The nature-based SuDS principles proposed will have a positive impact from a sustainable impact. A contingency has been built in by providing SuDS measures and not including their volumetric benefits in the attenuation calculations, namely

- Filter drains along public paths
- Raingarden/Bioretention
- Tree Pits along access road and greens area's within the development
- Tree-pit infiltration and storage
- Infiltration basins in public green areas/open spaces

Surface water drawings are included in **Appendix 2** of this report.

3.4 Foul Drainage

A Pre-Connection Enquiry was submitted to Irish Water The Irish Water Reference Number for this enquiry is CDS21003483. The response to this Enquiry was issued by Irish Water on 22nd June 2021. This confirmed that, subject to a valid connection agreement being put in place, the proposed connection to the Irish Water network could be facilitated.

The most recent Confirmation of Feasibility document is included in **Appendix 3**. DOSA Consulting Engineers have been engaging with Irish Water and an updated Confirmation of Feasibility was requested on 18th September 2024. This hasn't been re-issued to date but is forthcoming. The report will be updated to incorporate this revised COF prior to lodging the final application. We also note that the final application will be accompanied by a Design Acceptance Statement from Irish Water.

The foul sewer has been designed using the System 1 and Simulation Modules of the Micro-drainage package. The foul network design addresses present day design issues and can view velocities at Full Bore, Proportional Depth and 1/3 flow.

A model of the proposed foul drainage network was built using the micro-drainage software applications. The model was analysed and amended until the results met with the design criteria specified.

The network has been designed to achieve self-cleansing velocities at 1/3 flow whilst maintaining minimum gradients.

548 No. Dwellings

Section 3.6 of The Irish Water Code of Practice Wastewater Infrastructure states that for the gravity sewers shall be designed to carry a minimum wastewater volume of 6 times the dry weather flow (6DWF) which is to be taken as 446 litres per dwelling

Loading = (548) (446) / (24) (60) (60) = 2.829 litres/second

6DWF =16.973 litres/second

1 shop

Maximum of 8 no. staff.

From the EPA Code of Practice for Small Communities, Business, Leisure Centres and Hotels

Loading = 30 L/Person/day

Loading = (8) (30) / (24) (60) (60) = 0.0027 litres/second

6DWF =0.017 litres/second

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Crèche

128 No Staff & 24 No. Children

From the EPA Code of Practice for Small Communities, Business, Leisure Centres and Hotels

Loading = 60 L/Person/day

Loading = (152) (60) / (24) (60) (60) = 0.106 litres/second

6DWF =0.63 litres/second

The overall quantity of wastewater for the proposed development is estimated at 254 m³ per day.

This is based on the unit schedule submitted by the architect. The foul waste within the development will be collected via an internal gravity network and will discharge to the public foul sewer via a gravity connection.

All works will be in accordance with Irish Water Code of Practice for Wastewater Supply & the Wastewater Infrastructure Standard Details Document Number: IW-CDS-5030-01.

The foul water network model was built and analysed using the Micro-drainage Software application and was assessed to ensure velocities maintained a self-cleansing velocity. The system will consist of an internal gravity network discharging to the existing Irish Water asset via a new pumping station and rising main.

Foul water drawings are included in **Appendix 2** of this report.

4. Stage 1 - Screening for Appropriate Assessment

4.1 Introduction

This section contains the information required for the competent authority to undertake screening for AA for the proposed development.

The aims of this section are to:

- Determine whether the proposed development is directly connected with, or necessary to, the conservation management of any Natura 2000 sites;
- Provide information on, and assess the potential for the proposed development to significantly effect on Natura 2000 Sites (also known as European sites); and
- Determine whether the proposed development, alone or in combination with other projects, is likely to have significant effects on Natura 2000 sites in view of their conservation objectives.

The proposed development is not directly connected with, or necessary to the conservation management of any Natura 2000 sites.

4.2 Zone of influence

The Zone of Influence (ZoI) comprises the area within which the proposed development may potentially affect the conservation objectives (or qualifying interests) of a Natura 2000 site. There is no recommended zone of influence, and guidance from the National Parks and Wildlife Service (NPWS) recommends that the distance should be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects (cumulative).

In ecological and environmental impact assessment, for an effect to occur there must be a risk enabled by having a source (e.g. construction works at a proposed development site), a 'receptor' (e.g. SAC or other ecologically sensitive feature), and a pathway between the source and the receptor (e.g. a watercourse which connects the proposed development site to the SAC, *ex situ* foraging habitat for SCI birds). A 'receptor' is defined as the Special Conservation Interest (SCI) of SPAs or Qualifying Interest (QI) of SACs for which conservation objectives have been set for the European sites being screened.

Consideration is therefore given to the source-pathway-receptor linkage and associated risks between the proposed development and Natura 2000 sites. For a significant effect to occur there needs to be an identified risk whereby a source (e.g. contaminant or pollutant arising from construction activities) affects a particular receptor (i.e. Natura 2000 site) through a particular pathway (e.g. a watercourse which connects the proposed development with the Natura 2000 site).

The identification of risk does not automatically mean that an effect will occur, nor that it will be significant. The identification of these risks means that there is a possibility of environmental or ecological damage occurring. The level and significance of the effect depends upon the nature of the consequence, likelihood of the risk and characteristics of the receptor.

The precautionary principle is applied for the purposes of screening to ensure that consideration and pre-emptive action is undertaken where there is a lack of scientific evidence. It is noted that mitigation measures are not taken into account in the AA screening assessment process.

4.3 Field Study

Extensive field surveys were carried out at the proposed development site between December 2023 and June 2025. Dates and details of surveys are described in **Section 4.5** of this report.

These surveys included an assessment of the potential for all Qualifying Interests (QIs)/ Special Conservation Interests (SCIs) of European sites and third schedule invasive species to occur within the proposed site.

4.4 Source-Pathway-Receptor Model

The likely effects of the development on any European site have been assessed using a source-pathway-receptor model, where:

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- A ‘source’ is defined as the individual element of the proposed works that has the potential to impact on a European site, its qualifying features and its conservation objectives.
- A ‘pathway’ is defined as the means or route by which a source can affect the ecological receptor.
- A ‘receptor’ is defined as the SCI of SPAs or QI of SACs for which conservation objectives have been set for the European sites being screened.

A source-pathway-receptor model is a standard tool used in environmental assessment. In order for an effect to be likely, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism results in no likelihood for the effect to occur. The source-pathway-receptor model was used to identify a list of European sites, and their QIs/SCIs, with potential links to European sites. These are termed as ‘relevant’ European sites/QIs/SCIs throughout this report.

4.5 Likely Significant Effect

The threshold for a Likely Significant Effect (LSE) is treated in the screening exercise as being above a de minimis level. The opinion of the Advocate General in CJEU case C-258/11 outlines:

“the requirement that the effect in question be ‘significant’ exists in order to lay down a de minimis threshold. Plans or projects that have no appreciable effect on a European site are thereby excluded.

If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill.”

In this report, therefore, ‘relevant’ European sites are those within the potential ZoI of activities associated with the construction and operation of the development, where LSE pathways to European sites were identified through the source-pathway-receptor model.

4.6 Screening Process

The Screening for Appropriate Assessment will incorporate the following steps:

Definition of the likely zone of impact for the proposed works;

- Identification of the European sites that are situated (in their entirety or partially or downstream) within the likely zone of impact of the proposed works;
- Identification of the most up-to-date QIs and SCIs for each European site within the likely zone of impact;
- Identification of the environmental conditions that maintain the QIs/SCIs at the desired target of Favourable Conservation Status;
- Identification of the threats/impacts – actual or potential that could negatively impact the environmental conditions of the QIs/SCIs within the European sites;

- Highlighting the activities of the proposed works that could give rise to significant negative impacts; and
- Identification of other plans or projects, for which in-combination impacts would likely have significant effects.

4.7 Desktop Review

A desktop review facilitates the identification of the baseline ecological conditions and key ecological issues relating to Natura 2000 sites and facilitates an evaluation assessment of potential in-combination impacts. Sources of information used for this report include reports prepared for the Ballincollig area and information from statutory and non-statutory bodies. The following sources of information and relevant documentation were utilised:

- National Parks & Wildlife Service (NPWS) - www.npws.ie
- Environmental Protection Agency (EPA) – www.epa.ie
- National Biodiversity Data Centre (NBDC) – www.biodiversityireland.ie
- EPA Catchments Data https://www.catchments.ie
- Birdwatch Ireland - http://www.birdwatchireland.ie/
- Invasive Species Ireland - http://www.invasivespeciesireland.com/
- *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011)
- *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (National Roads Authority, 2009)
- *Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)* European Union, 2017
- Cork City Heritage and Biodiversity Plan (2021-2026) and
- Cork City Development Plan 2022-2028 (Cork City Council 2022).

4.8 Natura 2000 Sites

4.8.1 Natura 2000 Sites within Zone of Influence

Special Areas of Conservation (SACs) and candidate SACs (cSACs) are protected under the Habitats Directive 92/43/EEC and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Special Protection Areas (SPAs) are protected under the Birds Directive 2009/147/EC and European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Collectively, these sites are referred to as Natura 2000 or European sites.

In accordance with the European Commission Methodological Guidance (EC 2018), a list of Natura 2000 sites that can be potentially affected by the proposed project has been compiled. All SAC, cSAC and SPAs sites which could potentially be impacted by the proposed Special

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Areas of Conservation (SACs) and candidate SACs (cSACs) are protected under the Habitats Directive 92/43/EEC and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Special Protection Areas (SPAs) are protected under the Birds Directive 2009/147/EC and European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Collectively, these sites are referred to as Natura 2000 or European sites. The proposed development does not overlap with any European site. European sites within the likely zone of impact of the proposed development site are listed in **Table 1** and illustrated in **Figure 3**.

The proposed development site does not overlap with any European sites. The Cork Harbour SPA is located c.11.5km east of the proposed development site. The Lisheens Stream, a tributary of the Grange Hill and Curraheen Stream, is located at the south-east corner of the proposed development site. During operation, the proposed surface water drainage network will discharge to this stream. The Lisheens Stream meets the Curraheen stream approximately 2.8km downstream of the proposed development site (via the Grange Hill Stream). The Curraheen Stream meets the Glasheen River c.5.9km downstream of this and the River Glasheen flows into the Lee Estuary 3.7km downstream of this point. The Cork Harbour SPA is located 4.5km downstream of this point. Therefore, although unlikely, surface water run-off/discharges during the construction or operational phases could potentially flow into the Cork Harbour SPA via the Lisheens Stream (16.9km downstream).

Wastewater from the site will ultimately discharge into River Lee via the Ballincollig Wastewater treatment plant (WWTP) approximately 14.6km upstream of Cork Harbour SPA. Although unlikely given the distance upstream, this could potentially impact on water quality within the Cork Harbour SPA.

Although unlikely given the distance involved, surface water run-off during the construction or discharges during the operational phases as well as wastewater discharges from the proposed development could potentially impact on Cork Harbour SPA via the Lisheens Stream and River Lee. Habitats within or near the proposed development area could also potentially provide *ex-situ* foraging grounds for SCI species outside the Cork Harbour SPA.

Therefore, a source-pathway-receptor link has been identified between the source (proposed development) and the receptor (Cork Harbour SPA) via a potential pathway (surface water runoff, the spread of invasive species and disturbance to/ loss of *ex-situ* habitats during construction and surface water and wastewater discharges during operation). Further information on the Cork Harbour SPA is provided below and a full site synopsis included **Appendix 1**.

Given the distances involved and the lack of hydrological connection, no potential pathway for impact has been identified between the proposed development and any <u>other</u> European site.

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Table 1. Natura 2000 sites within the zone of influence of the proposed development site

European sites name and code	Distance from site boundary (at closest point) and potential source-pathway-receptor link	Qualifying interests (QI)/ Special Conservation Interests (SCI)
Special Protection Area (SPA)		
Cork Harbour SPA (site code 004030)	11.5km east (16.9km downstream). The Lisheens Stream, a tributary of the Grange Hill and Curraheen Stream, is located at the south-eastern corner of the proposed development site. During operation, the proposed surface water drainage network will discharge to this stream. The Lisheens Stream meets the stream c.2.8km downstream of the proposed development site (via the Grange Hill Stream). The Stream meets the Glasheen River c.5.9km downstream of this and the River Glasheen flows into the Lee Estuary 3.7km downstream of this point. The Cork Harbour SPA is located 4.5km downstream of this point. Therefore, although unlikely, surface water run-off/discharges during the construction or operational phases could potentially flow into the Cork Harbour SPA via the Lisheens Stream (16.9km downstream). Wastewater from the site will ultimately discharge into River Lee via the Ballincollig Wastewater treatment plant (WWTP) approximately 14.6km upstream of Cork Harbour SPA. This could potentially impact on water quality within the Cork Harbour SPA. Although unlikely given the distance involved, surface water run-off/discharges during the construction or operational phases as well as wastewater discharges from the proposed development could potentially impact on Cork Harbour SPA via the Lisheens River and River Lee. Habitats within or near the proposed development area could also potentially provide ex-situ foraging grounds for SCI species outside the Cork Harbour SPA.	**Birds** A193 Common Tern (*Sterna hirundo*) A028 Grey Heron (*Ardea cinerea*) A130 Oystercatcher (*Haematopus ostralegus*) A140 Golden Plover (*Pluvialis apricaria*) A157 Bar-tailed Godwit (*Limosa lapponica*) A056 Shoveler (*Anas clypeata*) A156 Black-tailed Godwit (*Limosa limosa*) A052 Teal (*Anas crecca)* A183 Lesser Black-backed Gull (*Larus fuscus)* A054 Pintail (*Anas acuta*) A149 Dunlin (*Calidris alpina*) A017 Cormorant (*Phalacrocorax carbo*) A162 Redshank (*Tringa totanus*) A004 Little Grebe (*Tachybaptus ruficollis*) A050 Wigeon (*Anas penelope*) A160 Curlew (*Numenius arquata*) A005 Great Crested Grebe (*Podiceps cristatus*) A069 Red-breasted Merganser (*Mergus serrator*) A048 Shelduck (*Tadorna tadorna*) A142 Lapwing (*Vanellus vanellus*) A179 Black-headed Gull (*Chroicocephalus ridibundus*) A182 Common Gull (*Larus canus*) A141 Grey Plover (*Pluvialis squatarola*) **Habitats** Wetlands

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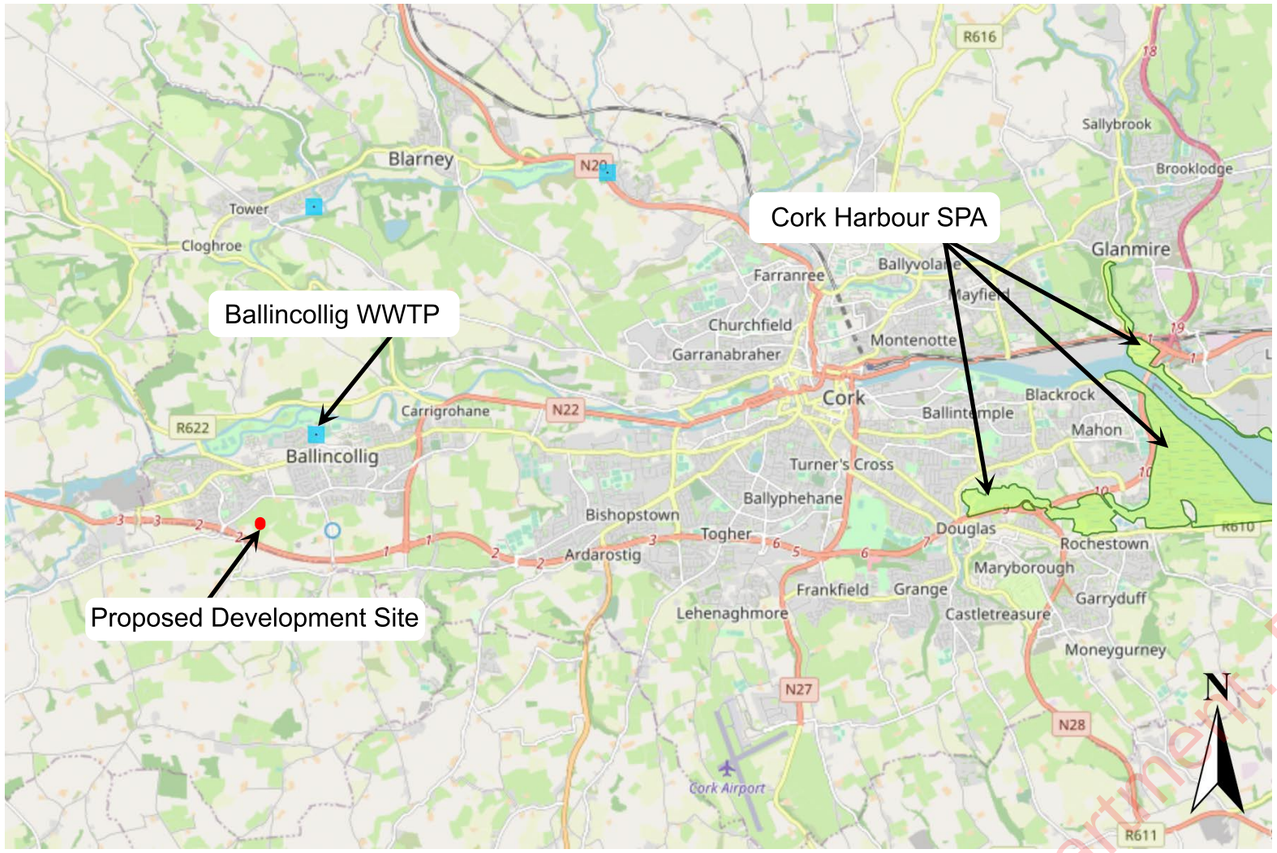

Figure 3. European sites within likely zone of impact of proposed development site | Source EPA Envision mapping | Not to scale

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4.8.2 Cork Harbour SPA (site code 004030) Site Synopses

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poulnabibe inlets.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Mallard, Pintail, Shoveler, Redbreasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank, Blackheaded Gull, Common Gull, Lesser Black-backed Gull and Common Tern. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Cork Harbour has a nationally important breeding colony of Common Tern (102 pairs in 1995). The birds have nested in Cork Harbour since about 1970, and since 1983 on various artificial structures, notably derelict steel barges and the roof of a Martello Tower.

A full site synopsis for the Cork Harbour SPA is included as **Appendix 1** of this report.

4.8.3 European sites – Features of interests and conservation objectives.

The EU Habitats Directive contains a list of habitats (Annex I) and species (Annex II) for which SACs must be established by Member States. Similarly, the EU Birds Directive contains lists of important bird species (Annex I) and other migratory bird species for which SPAs must be established. Those that are known to occur at a site are referred to as 'qualifying interests' and are listed in the Natura 2000 forms which are lodged with the EU Commission by each Member State. A 'qualifying interest (QI)' (or 'special conservation interest (SCI)' in the case of SPAs) is one of the factors (such as the species or habitat that is present) for which the site merits designation. The National Parks and Wildlife Service (NPWS) are responsible for the designation of SACs and SPAs in Ireland.

The conservation objectives for Cork Harbour SPA site are detailed in: NPWS (2014) *Conservation Objectives: Cork Harbour SPA 004030. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and SACs and SPAs are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network. European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status sites designated as SACs and SPAs. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those

habitats and species at a national level. Favourable conservation status of a habitat is achieved when its natural range, and area it covers within that range, is stable or increasing, and the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and the conservation status of its typical species is favourable. The species and habitats listed as SCIs for the Cork Harbour SPA and specific conservation objectives are included in **Table 2**.

Table 2. Special Conservation Interests (SCIs) for Cork Harbour SPA

Species code	Species		Conservation objective
A056	Shoveler	*Anas clypeata*	Maintain
A149	Dunlin	*Calidris alpina*	Maintain
A140	Golden Plover	*Pluvialis apricaria*	Maintain
A050	Wigeon	*Anas penelope*	Maintain
A028	Grey Heron	*Ardea cinerea*	Maintain
A069	Red- breasted merganser	*Mergus serrator*	Maintain
A142	*Lapwing*	*Vanellus vanellus*	Maintain
A130	*Oystercatcher*	*Haematopus ostralegus*	Maintain
A141	Grey plover	*Pluvialis squatarola*	Maintain
A052	Teal	*Anas crecca*	Maintain
A054	Pintail	*Anas acuta*	Maintain
A157	Bar-tailed Godwit	*Limosa lapponica*	Maintain
A162	Redshank	*Tringa totanus*	Maintain
A183	Lesser Black-backed gull	*Larus fuscus*	Maintain
A179	Black-headed Gull	*Chroicocephalus ridibundus*	Maintain
A004	Little Grebe	*Tachybaptus ruficollis*	Maintain
A160	Curlew	*Numenius arquata*	Maintain
A182	Common Gull	*Larus canus*	Maintain
A048	Shelduck	*Tadorna tadorna*	Maintain
A017	Cormorant	*Phalacrocorax carbo*	Maintain
A193	Common Tern	*Sterna hirundo*	Maintain
A005	Great crested grebe	*Podiceps cristatus*	Maintain
A156	Black-tailed Godwit	*Limosa limosa*	Maintain
A999	Wetlands and waterbirds		Maintain

Restore = Restore favourable conservation condition, Maintain = Maintain favourable conservation condition

To acknowledge the importance of Ireland's wetlands to wintering waterbirds, "Wetland and Waterbirds" may be included as a Special Conservation Interest for some SPAs that have been designated for wintering waterbirds and that contain a wetland site of significant importance to one or more of the species of Special Conservation Interest. Thus, a further objective is to maintain or restore the favourable conservation condition of the wetland habitat within the Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

4.9 Baseline Data

The ecological baseline for the proposed development site was based on a desktop review and direct surveys of the relevant works area and areas proximate to same. This focused on habitats and species that are listed as Qualifying Interests (QI) (in the case of SACs) and Special Conservation Interests (SCI) (in the case of SPAs) in the designations for the

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European sites. Surveys for habitats, mammals, birds and invasive species were undertaken within the study area.

4.9.1 Habitats

Habitat surveys, were carried out the 14th of May, 23rd of May and 24th of May 2025. Habitats were mapped according to the classification scheme outlined in the Heritage Council publication *A Guide to Habitats in Ireland* (Fossitt, 2000) and following the guidelines contained in *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011). Habitats were cross referenced with Habitats Directive Annex I habitats. During these surveys, the site was also surveyed for invasive species and rare floral species (Wyse *et al.,* 2016; Stace 2019). It is noted that a considerable number of site visits were carried during the overall assessment process including winter bird surveys, bat surveys and breeding birds. Observations in relation to habitats made during these site visits are included in the habitat descriptions where relevant.

A current overview of habitats recorded within the site is shown in **Figure 4 and Figure 5**. The habitats recorded on site are described in **Table 3.** Photographs of the site are also included below.

Table 3. Habitats recorded within the proposed development site boundary

Habitats	Comments
Buildings And Artificial Surfaces BL3	This habitat includes the main house, stables building, two barns, the artificially surfaced areas and paths surrounding these buildings, as well as the tracks and paths connecting them. The house is an inhabited one-storey brick building with a tiled roof. The house was constructed in the first half of the 20th century and is shown the OS 6-inch map of 1939. It is a three-bay bungalow with a hipped roof. The Stable building contains stables for 7-8 horses and is currently in use. It is constructed of brick and stone with a metal roof. There are barns to the north and south of the stable block. Both are built with bricks and corrugated iron. Some individual trees are planted within this area. Species include Sycamore *Acer pseudoplatanus*, Ash *Fraxinus excelsior*, and Beech *Fagus sylvatica*. Plate 1. Existing dwelling onsite

Habitats	Comments
	  Plate 2. Stables
Scattered trees and parkland WD5/Flower beds and borders BC4	Between the house and western access track there is an overgrown garden/ paddock and orchard with a number of Apple *Malus* sp. trees. This areas includes planted domestic shrubs and flower beds as well as a number of mature apple trees. A weeping Willow *Salix* sp. is present in the garden. A garden/orchard area is visible on the 1st edition maps (1829-1834). This is associated within the gardens of the original house onsite. Some of the original, mature Apple trees may remain onsite. Plate 3. Paddock/garden and Orchard area adjoining farm Plate 4. Paddock/garden and Orchard area adjoining farm
Hedgerows WL1 H1	A mature, native hedgerow runs along the eastern boundary of the proposed development site. This is a high value hedgerow dominated by Hawthorn Crataegus *monogyna.* A group of mature Sycamore is also present within this hedgerow.

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Habitats	Comments
	Other species include, Dog Rose *Rosa canina*, Spindle *Euonymus europaeus* and Bramble. The ground layer is dominated by Nettles *Urtica dioica*. At the southern section of this hedgerow, a dry drain runs along the base and species such as Alder *Alnus* sp. and Willow become more dominant. Understorey species in this wetter habitat include Willowherb *Epilobium angustifolium* and Yellow flag *Iris pseudacorus.* This hedgerow is of local importance (higher value) providing habitat and feeding suitable for bats and birds, and by providing linkages to the wider landscape. Plate 5. Eastern hedgerow with mature native trees Plate 6. Mature hedgerow along eastern boundary
Hedgerow WL1 H2	Running along the northern boundary of the paddock/garden area there is an overgrown Hawthorn hedge with Bindweed Convolvulus arvensis, Nettle Urtica dioica, Bramble *Rubus fruticosus*, Teasel *Dipsacus fullonum*, Cleavers *Galium aparine* and immature Beech *Fagus sylvatica.*

Habitats	Comments
	  Plate 7. Hedgerow adjoining paddock/garden area
Hedgerows WL1/Stonewalls and other stonework BL1	A patchy hedgerow runs along the northern boundary of the site adjoining the Woodbury road/Greenfields Road. This has some old stone wall at the base. Plate 8. Wall running along Woodbury road/Greenfields Road Plate 9. View from rear of wall/hedgerow running along Woodbury road/Greenfields Road

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Habitats	Comments
	 Plate 10. Hedgerow has overgrown wall in some areas
Treeline WL2 T1	Treeline along access track to farm buildings. Treeline dominated by immature Beech *Fagus sylvatica* including Purple beech *Fagus sylvatica f. purpurea*. Dense Bramble at the base with some wooden fencing and block concrete wall (which do not support any specialist flora). Other species noted include Curled dock *Rumex crispus*, Wood avens *Geum urbanum*, Creeping buttercup *Ranunculus repens*, Teasal *Dipsacus fullonum* Ribwort plantain *Plantago lanceolata* Plate 11. Treeline adjoining farm access track Plate 12. Treeline adjoining farm access track

Habitats	Comments
	 Plate 13. Treeline adjoining farm access track
Treeline WL2 T2	This boundary at the southwest edge of the site is defined by wooden fencing and an stone wall. There is woodland planted as part of the roadworks between the wooden fence and the N22 road. Hawthorn, Hazel, Bramble are quite densely planted consisting primarily of immature tree. Wild Rose *Rosa canina* immature Ash *Fraxinus excelsior*, Ivy *Hedera helix*, Beech, Cleavers and Elder *Sambucus nigra* are also present. Plate 14. Treeline at southwestern boundary Plate 15. Treeline at southwestern boundary
Treeline WL2 T3	This treeline runs along the western boundary of the site. This treeline has developed along an earth bank and is dominated by non-native species. The southern side of this treeline is visible on the 1st edition maps (1829-1834) .This is of lower ecological value than other treeline within the site but still provides valuable habitat for local fauna.

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Habitats	Comments
	Parts of this treeline are patchy, in particular where it runs along the access track for the farm/stables. Small sections of stone wall are evident at the base. The understory is suppressed by the dense growth of non-native conifers in parts. The northern sections have mature trees including mature Ash and Sycamore and very large mature Beech. Species recorded include Sycamore, Ash, Beech, Larch *Larix decidua*, Scot's pine *Pinus sylvestris L.*, Hawthorn, Sitka *spruce Picea sitchensis,* Monterey cypress *Cupressus macrocarpa* and Eucalyptus *aze* Understorey species include Male fern *Dryopteris filix-mas*, Bracken *Pteridium aquilinum*, Bramble, Alexanders *Smyrnium olusatru*, Ivy, Nipplewort *Lapsana communis*, Elder, Hard shield fern *Polystichum aculeatum*, immature Beech, Remote sedge *Carex remota*, Dog violet *Viola riviniana*, Privet *Ligustrum* sp., Wild rose, Wood rush *Luzula* sp, Cow parsley *Anthriscus sylvestris*, Meadow vetchling *Lathyrus pratensis*, Germander speedwell *Veronica chamaedrys*, Wood avens, Harte's tongue fern *Asplenium scolopendrium*, Bush vetch *Vicia sepium* and Winter heliotrope *Petasites fragrans*. Plate 16. Western treeline Plate 17. Western treeline at access gate to farm

Habitats	Comments
	  Plate 18. Western treeline
Treeline WL2 T4	This short, mature internal treeline runs along the track to the fields at the east of the farm/stables. This treeline is visible on the 1st edition maps (1829-1834) and part of the original treeline remains. The treeline has formed on a raised earth bank with mature Ash, Sycamore, immature Elm, Privet as well as Wild Rose, Buttercup, Primrose *Primula vulgaris,* Cleavers, Foxglove *Digitalis purpurea*, Alexanders, Creeping buttercup. A small section of Cherry Laurel *Prunus laurocerasus* adjoins this treeline. Plate 19. Treeline along access track to farm/stables Plate 20. Treeline along access track to farm/stables
Treeline WL2 T5	This is an internal treeline has developed on a raised earth bank. The high number of wood species suggest this is an older treeline and this treeline is visible on the 1st edition maps (1829-1834). This treeline becomes more patchy moving south.

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Habitats	Comments
	Species include Beech, Sycamore, Ash, Aspen *Populus tremuloides,* Hawthorn, Willow, Wild Rose, Elder, Hazel *Corylus avellana*, Blackthorn, Spindle as well as an understory of immature Elder, Ivy, Ground ivy, Dog violet, Sow thistle, Privet, Winter heliotrope, Male fern, Cleavers, Lords and ladies, Figwort. The ground flora here has low diversity due to the dominance on non-native species. The treeline is heavily grazed by Rabbits at the base. Plate 21. Mature treeline at centre of the site Plate 22. Mature treeline at centre of the site Plate 23. Poorer quality treeline moving south
Improved Agricultural Grassland GA1	This is the dominant habitat type within the proposed development site. Rye-grasses *Lolium* spp is the dominant grass species. Other species include White Clover *Trifolium repens*, Yorkshire Fog *Trofilium repens,* Buttercup *Ranunculus repens,* Dandelion

Habitats	Comments
	Taraxacum spp, Black Medick *Medicago lupulina* and Plantains *Plantago* spp., Ribwort plantain, Dock, Creeping buttercup, Pineapple weed, Daisy. The eastern field appears to be in receipt of more fertilizer/manure. Grassland is more diverse on the margins, but overall diversity within this habitat is low. The western field which is grazed by horses is slightly more diverse. The northwest field are tightly grazed. Vegetation is taller on the southwest field. However overall, this habitat is generally species-poor. Plate 24. Improved agricultural grassland at east of site Plate 25. Improved agricultural grassland at east of site Plate 26. Grassland grazed by horses at north-west of site

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Habitats	Comments
	 Plate 27. Grassland grazed by horses at southwest of site Plate 28. Paddock grazed area
Drainage Ditch FW4	A drainage ditch crossing east to west south of the proposed development site boundary. The southeast corner where it overlaps with the proposed development site boundary is mapped by the EPA envision mapping portal as Lisheens 19 (River Waterbody code IE_SW_19C120740) i.e. Lisheens Stream. This meets the Grange Hill Stream c.920m downstream of the proposed development site. Flows were negligible or absent during the site surveys. Species noted include Purple Loosestrife, Meadowsweet, and Water Parsnip *Pastinaca sativa*.The drains ultimately discharge to the Grange Hill Stream which in turn discharges to the River. This watercourse in turn discharges into the Lee River. Further details on this drainage ditch are included in Appendix 8.3. Biological monitoring Plate 29. Drainage ditch at south of site

Habitats	Comments
	 Plate 30 Drainage ditch at south of site

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Figure 4. Habitats recorded within proposed development site boundary

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Figure 5. Treelines and hedgerows within proposed development site boundary

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4.9.2 Birds

Breeding birds

The breeding bird survey was carried out on dates included in **Table 4** and based on the BTO Common Bird Census (CBC) methodology (Bibby *et al.,* 2000 and Gilbert , 1998) which aims to capture a snapshot of breeding bird activity within the study area.

The study area focused on terrestrial habitats within the Proposed Development site. The aim of the breeding bird surveys was to identify any valuable bird habitats within the Site boundary and to identify birds present within the Proposed Development site and surrounding landscape. This survey area encompassed terrestrial habitats along the survey route including hedgerows, treelines and agricultural fields.

During breeding bird surveys the site was walked so that all habitats within 50m of potential nesting features were surveyed. The ornithological surveyor slowly walked through the Site, stopping at regular intervals to scan with binoculars and to listen for bird calls or song. Birds were identified by sight and song, and observations were plotted on a map. Survey visits were made in the early morning to coincide with the peak period of bird activity and all species seen or heard in the study area and immediate environs were recorded including those in flight. Visits were made during favourable weather conditions.

All species encountered during the survey were mapped and coded using standard BTO species codes and activity recorded using the BTO status codes for breeding evidence. In an effort to minimise potential disturbance, no attempts were made to locate nests as such behaviours are generally sufficient to determine probable or confirmed breeding.

The National Biodiversity Centre online data base lists 97 species of bird recorded within grid square W56. Of these 97 species, four of which are listed under Annex I of the Birds Directive, namely, namely, Kingfisher *Alcedo atthis*, Peregrine Falcon *Falco perigrinus*, Little Egret *Egretta garzetta* and Whooper Swan *Cygnus cygnus*. There is no suitable breeding habitat for these Annex I species within the proposed development site boundary.

Breeding bird surveys were carried (31st of May 2024, 31st of May 2025 and 14th of June 2025), based on the Common Bird Census (CBC) methodology (Balmer *et al* 2013 and Gilbert *et al*., 1998). CBS is an annual survey carried out exclusively during the breeding season. Bird counts are undertaken during two visits. The first visit is in the early part of the breeding season (April to mid-May) and the second at least four weeks later (from mid-May to the end of June). This reflects the abundance of residents and early migrants which tend to be more easily detected during the first visit, and later migrants which are more abundant during the second visit. The study area focused on terrestrial habitats within the proposed development site. The aim of the breeding bird surveys was to identify any valuable bird habitats within the Site boundary and to identify birds present within the proposed development site and surrounding landscape. This survey area encompassed terrestrial habitats along the survey route including hedgerows/treelines woodland and agricultural fields. The site was walked so that all habitats within 50m of potential nesting features were surveyed. The surveyor slowly walked through the site, stopping at regular intervals to scan with binoculars and to listen for bird calls or song. Birds were identified by sight and song, and observations were plotted on a map. Survey visits were made in the early morning to coincide with the peak period of bird activity and all species seen or heard in the study area and immediate environs were recorded including those in flight. Visits were made during favourable weather conditions.

All species encountered during the survey were mapped and coded using standard BTO species codes and activity recorded using the BTO codes for breeding evidence. In an effort to minimise potential disturbance, no attempts were made to locate nests as such behaviours are generally sufficient to determine probable or confirmed breeding.

The results of the breeding bird survey are shown in **Table 4.**

Table 4. Bird Species recorded during breeding bird surveys

Species		Breeding Status	Highest evidence of breeding	Estimated number of territories	Conservation Status: Annex I of Birds Directive or Red/Amber List*
Blackbird	*Turdus merula*	Probable	Pair observed	3	
Blue tit	*Cyanistes caeruleus*	Possible	Singing male	1	
Buzzard	*Buteo buteo*	Non-breeding	Flying over		
Chaffinch	*Fringilla coelebs*	Possible	Singing male	2	
Chiffchaff	*Phylloscopus collybita*	Possible	Singing male	1	
Collared dove	*Streptopelia decaocto*	Probable	Pair observed	1	
Dunnock	*Prunella modularis*	Possible	Singing male	2	
Feral pigeon	*Columba livia domestica*	Possible	Species observed in breeding season	1	
Goldfinch	*Carduelis carduelis*	Confirmed	Recently fledged young	2	
Great tit	*Parus major*	Possible	Singing male	1	
Hooded crow	*Corvus cornix*	Non-breeding	Flying over		
House martin	*Delichon urbicum*	Non-breeding	Flying over		Amber List
House sparrow	*Passer domesticus*	Possible	Singing male	1	Amber List
Jackdaw	*Corvus monedula*	Probable	Pair observed	1	
Lesser black-backed gull	*Larus fuscus*	Non-breeding	Flying over		Amber list
Long-tailed tit	*Aegithalos caudatus*	Non-breeding	Flying over		
Linnet	*Linaria cannabina*	Possible	Singing male	2	Amber List
Magpie	*Pica pica*	Possible	Singing male	1	
Meadow pipit	*Anthus pratensis*	Possible	Species observed in breeding season	1	Red list

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Species		Breeding Status	Highest evidence of breeding	Estimated number of territories	Conservation Status: Annex I of Birds Directive or Red/Amber List*
Reed bunting	*Emberiza schoeniclus*	Possible	Singing male	1	
Robin	*Erithacus rubecula*	Confirmed (nesting in farm building)	Recently fledged young	2	
Rook	*Corvus frugilegus*	Non-breeding	Flying over	NA	
Skylark	*Alauda arvensis*	Possible	Singing male	1	Amber List
Sedge warbler	*Acrocephalus schoenobaenus*	Confirmed	Recently fledged young	1	
Song thrush	*Turdus philomelos*	Possible	Singing male	1	
Starling	*Sturnus vulgaris*	Possible	Species observed in breeding season	2	Amber List
Stonechat	*Saxicola rubicola*	Possible	Singing male	1	
Swallow	*Hirundo rustica*	Confirmed (nesting in farm building and dwelling (garage))	Recently fledged young	1	Amber list
Woodpigeon	*Columba palumbus*	Possible	Singing male		
Wren	*Troglodytes troglodytes*	Confirmed	Recently fledged young	3	

No Annex I bird species were recorded during the site survey. A total of 30 species were recorded during the breeding bird surveys. The majority of birds recorded as considered common, woodland edge species which will nest in the mature treelines and hedgerow onsite. The proposed development site is dominated by agricultural grassland with good quality, mature treelines/hedgerow. Native hedgerow provide valuable feeding/nesting resources for birds i.e. Hawthorn, Elder, Blackthorn, Willow.

Eight species of conservation concern (Amber list) were recorded during the breeding birds surveys i.e. House martin *Delichon urbicum,* House sparrow *Passer domesticus,* Lesser black-backed gull *Larus fuscus,* Linnet *Linaria cannabina,* Skylark *Alauda arvensis,* Starling *Sturnus vulgaris,* Swallow *Hirundo rustica* and Meadow pipit *Anthus pratensis.* Several of these species i.e. Lesser Black-backed Gull *Larus fuscus*, House martin *Delichon urbicum* and Starling were recorded overflying the site and not breeding. It is noted that Swallow and Robin were recorded breeding within the stable buildings. Feral pigeon and Jackdaw were recorded roosting in the farm buildings, but no nests were recorded.

Skylark and Meadow pipit were recorded during the breeding bird surveys. However, they are unlikely to breed within the proposed development site as the grassland is too short and heavily grazed to support ground nesting. It is likely that these species are nesting in longer,

less intensively manged grassland to the south of the site. Linnet are likely to be breeding within the mature hedgerows at the site.

While grassland habitats within the proposed developments site can potentially provide terrestrial foraging habitat for wading birds, there is nothing to differentiate this area from other grasslands in the vicinity. It noted that a flock of Lesser black-backed gull were recorded foraging in a recently ploughed field to the south of the proposed development site. Gulls, in particular Lesser black-backed Gulls, will forage opportunistically on recently ploughed fields.

Wintering birds

Winter bird surveys were carried out on the 13th of December 2023, 29th January 2024, 12th February 2024, 22nd January 2024, 7th February 2025 and 27th February 2025. These surveys focused on grassland habitats within the proposed development site as well as grassland habitats on the boundary of the site which could provide potential foraging or roosting habitats for wintering waterbirds and waders.

The survey methodology was based on that used by the British Trust for Ornithology (BTO), Wetland Bird Survey (WeBS) and also that for the Irish Wetland Bird Survey (I-WeBS), as outlined in Gilbert *et al.* (1998). The winter bird survey was undertaken using 8.5×45 binoculars and a Hawke Endurance Ed Spotting Scope 15-45×60 spotting scope using a combination of transects and vantage point counts.

The primary purpose of the study was to assess usage of pasture land within the proposed development site by birds listed as SCI species for the Cork Harbour SPA.

The lands within the proposed development site are used for grazing horses and is laid out in a series of individual fields and paddocks. Grazing pressure varies during the year and electric fencing is used to strip graze the site on an rotating basis.

The more southerly fields on the site, which is located on flatter found, have more dense tussocky grass which is not favoured by wading birds and/or SCI species. The northern fields at the site are more intensely grazed and are dominated by improved agricultural grassland could potentially be used by species such as Curlew, Golden Plover, gulls etc. However, there is nothing the differentiate this grassland from other similar grassland habitat in the immediate vicinity and wider landscape.

Birds recorded during winter bird surveys are listed in **Table 5**. Most species recorded during the winter bird surveys were common, Green List (Gilbert *et al.* 2021), passerine species such as Wren, Robin, Blackbird, Stonechat etc. These species were recorded within the grassland and hedgerow/treelines within the proposed development site. No red list species were recorded during the winter surveys. Gulls were occasionally recorded overflying the site. However, no wading birds or waterfowl were recorded within the proposed development site.

Table 5. Birds recorded during winter bird survey

Species	SCI Species Cork Harbour SPA	Birds Directive Annex	BOCCI	Notes

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			I	Red List	Amber List	
Hooded Crow	*Corvus cornix*					
Robin	*Erithacus rubecula*					
Blackbird	*Turdus merula*					
Blue Tit	*Cyanistes caeruleus*					
Black-headed Gull	*Chroicocephalus ridibundus*	X			X	Overflying
Rook	*Corvus frugilegus*					
Jackdaw	*Corvus monedula*					
Lesser black-backed gull	*Larus marinus*				X	Overflying

No SCI species were recorded during the winter surveys. There is no habitat within the red line boundary which would be considered of particularly high value for wintering birds.

4.9.3 Invasive Species

Non-native plants are defined as those plants which have been introduced outside of their native range by humans and their activities, either purposefully or accidentally. Invasive non-native species are so-called as they typically display one or more of the following characteristics or features: (1) prolific reproduction through seed dispersal and/or re-growth from plant fragments; (2) rapid growth patterns; and, (3) resistance to standard weed control methods.

Where a non-native species displays invasive qualities and is not managed it can potentially: (1) out compete native vegetation, affecting plant community structure and habitat for wildlife; (2) cause damage to infrastructure including road carriageways, footpaths, walls and foundations; and, (3) have an adverse effect on landscape quality. The site of the proposed development lies within Ordnance Survey National Grid 10km square W56 (hectad). The National Parks and Wildlife Service (NPWS) rare plant database does not note the presence of any protected plant species within grid square W56.

The National Biodiversity Data Centre (NBDC) online database provides data on the distribution of mammals, birds, and invertebrates within Irish 10km grid squares. The NBDC lists a number of high impact invasive species which have been recorded within grid square W56 (**Table 6**).

Table 6. NBDC list of high impact invasive species recorded in W56

Species group	Species name
flowering plant	Japanese Knotweed (*Fallopia japonica*)
insect - beetle (Coleoptera)	Harlequin Ladybird (*Harmonia axyridis*)
terrestrial mammal	American Mink (*Mustela vison*)
terrestrial mammal	Chinese Muntjac (*Muntiacus reevesi*)
terrestrial mammal	Musk Rat (*Ondatra zibethicus*)
terrestrial mammal	Sika Deer (*Cervus nippon*)

NBDC 25/05/25

The Birds and Natural Habitats Regulations 2011 (SI 477 of 2011), Section 49(2) prohibits the introduction and dispersal of species listed in the Third Schedule, which includes Japanese Knotweed and Himalayan Balsam, as follows: “any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow [….] shall be guilty of an offence.”

No third schedule species were recorded within the proposed development site. Two other invasive non-native species Cherry Laurel *Prunus laurocerasus* and Winter Heliotrope *Arctostaphylos luciana* were recorded within the proposed development site. Cherry Laurel is classified as a high impact species by the NBDC. Winter Heliotrope is classified as a low-risk invasive species by the NBDC. These species are not listed in SI 477 of 2011 and therefore there is no statutory obligation to remove them. Both have been included in the NRA *Guidelines on the Management of Noxious Weeds and Non-native Species on National Roads* (NRA, 2010) as they have been shown to have an adverse impact on landscape quality, native biodiversity or infrastructure; and are likely to be encountered during road schemes.

It is noted that invasive water fern (*Azolla* sp.) was recorded within the Lisheens Stream downstream of the proposed development site. This was not recorded within the drainage ditch to the south of the proposed development site. This was recorded during an aquatic survey of this stream carried out on the 24th of May 2025. This species is a Third Schedule listed species under Regulations 49 & 50 in the European Communities (Birds and Natural Habitats) Regulations 2011.

4.10 Water Quality

4.10.1 River Basin Management Plan for Ireland 2022-2027 (3rd Cycle)

The Water Framework Directive (WFD) sets out the environmental objectives which are required to be met through the process of river basin planning and implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The challenges that must be overcome in order to achieve those objectives are very significant. Therefore, a key purpose of the River Basin Management Plan (RBMP) is to set out priorities and ensure that implementation is guided by these priorities.

The EPA has published an updated draft Catchment Assessment for each of our 46 catchments. These assessments provide an overview of the situation in the catchment, draw comparison between Cycle 2 and Cycle 3, and will help support the draft River Basin Management Plan 2022-2027 public consultation process. The third cycle RBMP, which was published in July 2022, aims to build on the progress made during the second cycle. Key measures during the first cycle included the licensing of urban waste-water discharges (with an associated investment in urban waste-water treatment) and the implementation of the Nitrates Action Programme (Good Agricultural Practice Regulations). The former measure has resulted in significant progress in terms both of compliance levels and of the impact of urban

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wastewater on water quality. The latter provides a considerable environmental baseline which all Irish farmers must achieve and has resulted in improving trends in the level of nitrates and phosphates in rivers and groundwater. It is acknowledged, however, that sufficient progress has not been made in developing and implementing supporting measures during the first and second cycles.

Overall, RBMP assesses the quality of water in Ireland and presents detailed scientific characterisation of our water bodies. The characterisation process also takes into account wider water quality considerations, such as the special water-quality requirements of protected areas. The characterisation process identifies those water bodies that are *At Risk* of not meeting the objectives of the WFD, and the process also identifies the significant pressures causing this risk. Based on an assessment of risk and pressures, a programme of measures has been developed to address the identified pressures and work towards achieving the required objectives for water quality and protected areas. Data relating to the watercourses in the vicinity of the proposed development site are provided in **Table 7** and the location of these shown in **Figure 6.**

Table 7. WFD Status

Catchment: Lee, Cork Harbour and Youghal Bay (Code 19)				
This catchment includes the area drained by the River Lee and all streams entering tidal water in Cork Harbour and Youghal Bay and between Knockaverry and Templebreedy Battery, Co. Cork, draining a total area of 2,153km². The largest urban centre in the catchment is Cork City. The other main urban centres in this catchment are Ballincollig, Macroom, Carrigaline, Crosshaven, Blarney, Glanmire, Midleton, Carrigtohill, Cobh, Passage West and Belvelly. The total population of the catchment is approximately 328,854 with a population density of 153 people per km². Several small coastal rivers drain the area to the southeast of Cork Harbour and the area at the eastern extreme of the catchment is drained by the Womanagh River which flows into the sea on the western side of Youghal Bay. The Lee-Cork Harbour catchment comprises 18 sub-catchments with 92 river water bodies, three lakes, 13 transitional, six coastal water bodies and 16 groundwater bodies. There are five heavily modified and no artificial water bodies in the catchment. The proposed development site is located within the Glasheen[Corkcity]_SC_010 sub catchment. All four water bodies in this sub catchment are unassigned but AT RISK due to elevated phosphate concentrations. Further investigation is required to determine what is impacting nutrient conditions.				
Waterbodies relevant to the proposed project				
Waterbody	**WFD Risk**	**WFD Status (2016-2021)**	**Significant Pressure**	**Pressure Category**
CURRAGHEEN (Cork City)_010	At risk	moderate	Yes	Anthropogenic pressures
GLASHEEN (Cork City)_010	At risk	Poor	Yes	Anthropogenic pressures
Lee Cork Estuary_Upper	At risk	Moderate	Yes	Urban runoff, urban wastewater
Lee Cork Estuary_Lower	At risk	Moderate	Yes	Urban runoff, urban wastewater
Lough Mahon	At risk	Moderate	Yes	Urban runoff, urban wastewater

Source: EPA envision mapping and www.catchments.ie

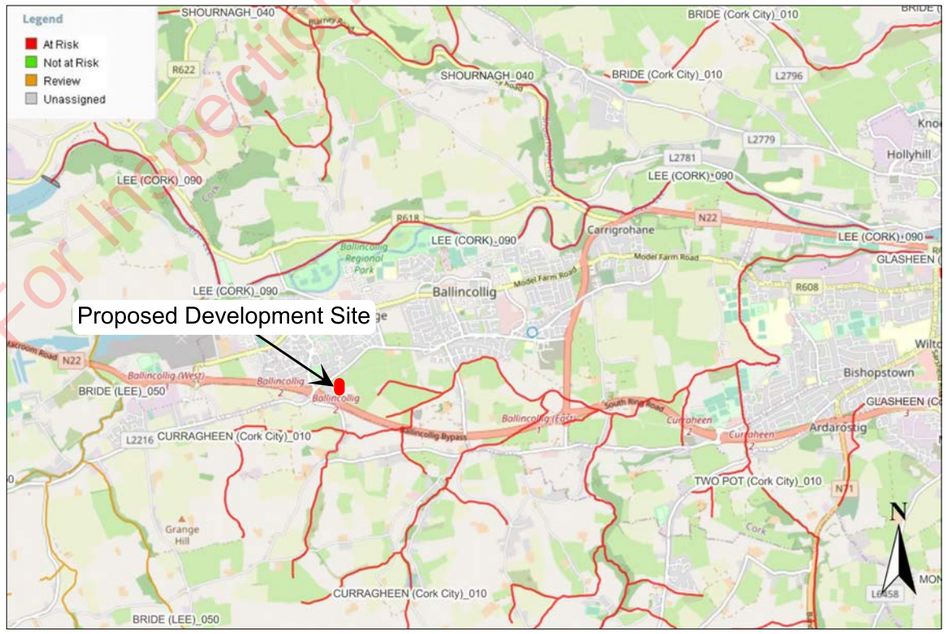

Figure 6. WFD waterbodies in the vicinity of the proposed development WFD Status Green=Good, Yellow=Moderate; Orange=Poor | Source: EPA Envision mapping https://gis.epa.ie/EPAMaps/) | not to scale

4.10.2 Urban Wastewater Treatment Directive

The Wastewater Discharge (Authorisation) Regulations 2007 (S.I. 684 of 2007) gives effect to the requirements of the Urban Wastewater Treatment Directive (Directive 91/271/EEC) and the Water Framework Directive (2000/60/EC) in Ireland. The Urban Wastewater Treatment Directive (UWWTD) lays down the requirements for the collection, treatment and discharge of urban wastewater and specifies the quality standards which must be met — based on agglomeration size — before treated wastewater is released into the environment.

The priority objective for this river basin planning cycle is to secure compliance with the Urban Wastewater Treatment Directive and to contribute to the improvement and protection of waters in keeping with the water-quality objectives established by this Plan. Achieving this objective entails addressing waste-water discharges and overflows where protected areas (i.e.,

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designated bathing waters, shellfish waters and Freshwater Pearl-Mussel sites) or high-status waters are at risk from urban waste-water pressures.

As part of the proposed development wastewater discharging from the proposed development will be conveyed to the Ballincollig WWTP (D0049-01) for treatment prior to discharging into the River Lee.

4.11 Potential effects of proposed development on European sites

Potential effects relate to habitat loss, changes to water quality (during construction and operation), the spread of invasive species and disturbance effects during the proposed works. Based on the *Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC* (European Commission (EC), 2018 and CIEEM guidelines '*Guidelines for Ecological Impact Assessment'* (CIEEM, 2019) impacts are listed as significant using a combination of professional judgement and criteria or standards where available, if impacts have the potential to have a significant impact on the ecological integrity on the habitats and species for which the site is designated.

The potential effects associated with the proposed works are discussed in the following sections with respect to their likelihood to have significant impacts on European sites.

As part of the assessment direct, indirect and in-combination impacts on all relevant QIs/SCIs were considered. Direct impacts refer to habitat loss or fragmentation arising from land-take requirements for development. Indirect and secondary impacts do not have a straight-line route between cause and effect, and it is potentially more challenging to ensure that all the possible indirect impacts of the project/plan - in combination with other plans and projects have been established.

Potential effects could arise from the following:

- Potential effects from loss of habitat
- Potential effects from noise and disturbance
- Potential effects on from surface water runoff/discharges
- Potential effects from wastewater discharges
- Potential effects from spread of invasive species
- In-combination effects.

4.10.1 Loss of habitat

The works area is located 11.5km from Cork Harbour SPA at its closest point. An ecological appraisal of the site indicates that it supports common habitats which are not of high value in the context of European designations. The habitats recorded within the works area do not correspond to habitats listed on Annex I of the Habitats Directive.

The proposed development site is located within managed grassland on the edge of an urban landscape. There are no wetland which could provide valuable foraging or roosting habitat for wading birds within or in immediate proximity to the proposed site boundary. The grassland habitats within the site could potentially provide roosting or foraging habitat for wading birds and waterfowl. However, there is nothing to differentiate this grassland habitat from similar areas of habitat in the wider landscape. Winter bird surveys in 2023/2024 and 2025 found no SCI birds within or in the vicinity of the proposed development site.

In a study around Cork Harbour (NIS for the M28 Cork to Ringaskiddy Project (RPS 2017)) a detailed study was carried out on grasslands in the vicinity of Cork Harbour to determine the value of these habitats for roosting and foraging SCI birds. This study found that while SCI birds occasionally used fields, they found that these grassland areas are not routinely used as a feeding habitat for the SCI species associated with Cork Harbour SPA. In addition, this study concluded that there is, effectively, an unlimited supply of potentially suitable grassland habitat in the vicinity of Cork Harbour, although there may be variations in habitat quality.

In the absence of any specific European or Irish guidance in relation to establishing ecological connectivity to SPAs NatureScot (SNH, 2016) was consulted. This document provides guidance in relation to the identification of ecological connectivity between development sites and SPAs. The guidance takes into consideration the distances species may travel beyond the boundary of relevant SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects. It goes on to state that "*in most cases the core range should be used when determining whether there is connectivity between the proposal and the qualifying Interests*". Where SPAs are at greater distance from the site than the core foraging distances for their listed Special Conservation Interest (SCI) species, there is no likely ecological connectivity to the development and so the SPAs are outside the likely Zone of Impact.

Core ranges are not available for all SCI species of Cork Harbour SPA. However the following may be indicative or core range for other wading birds. According to NatureScot guidance (SNH, 2016), the core foraging distances of Dunlin is 500m (max 3km), Curlew 1km (max 2km) and Golden Plover 2km (max 11km). Given there are no wetland features of significance of the site, ducks and diving SCI species will not forage at the site e.g. Cormorant, Little Grebe, Great Crested Grebe, Common Tern. Based on the above, the proposed development site is essentially outside the core range for SCI birds of Cork Harbour SPA.

There is nothing to differentiate the grassland habitats within the proposed development site from other similar habitats in the vicinity and at this distance from the SPA boundary they could not represent critical foraging or roosting habitat for the SCI birds of Cork Harbour SPA. No signs of SCI birds were recorded here, or in the fields surrounding the proposed development site during the site survey. Given the availability of large areas of similar habitat in the immediate vicinity and wider area, there will be no impact on SCI from loss of foraging or roosting habitat. Considering its distance from the SPA, the core ranges of SCI birds and the absence of wetland habitats in the vicinity, this site does not provide critical roosting or foraging habitat for SCI birds. The proposed development will not result in any significant loss of ex situ foraging or roosting habitat for SCI birds for the Cork Harbour SPA.

Considering the above no likely significant effects on European sites from loss of habitat due to the proposed development have been identified.

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4.10.2 Noise and disturbance

Potentially increased noise and disturbance associated with the site works could cause disturbance/displacement of fauna. If of sufficient severity, there could be impacts on reproductive success. Disturbance can cause sensitive species, such as birds, to deviate from their normal, preferred behaviour, resulting in stress, increased energy expenditure and, in some cases, species mortality.

The potential effects and impacts of disturbance have been widely recognised in wildlife conservation legislation, as has the need to develop conservation measures for birds whilst taking human activities into account. Article 4.4 of the Bird's Directive (79/409/EEC) requires member states to "*take appropriate steps to avoid… any disturbances affecting the birds, in so far as these would be significant having regard to the objectives of this Article*". This specifically relates to conservation measures concerning Annex I species.

The wintering birds listed as qualifying interests for the Cork Harbour SPA are strongly associated with estuarine shoreline areas or wetlands - habitat types absent from the proposed development area.

It is noted that the proposed development area is located 11.5km from the SPA boundary and is located adjacent to existing urban road networks and residential developments. As noted in **Section 8.1**, this area does not provide critical habitat for SCI birds. Given the absence of valuable habitats within and in the vicinity of the site, any increases in disturbance at the site during construction and operation will not impact on SCI birds.

No valuable habitat for SCI species was recorded within or adjacent to the proposed development area. The construction phase of the project will increase noise and disturbance. However, given the lack of valuable habitat for SCI species on or near the proposed development area no impact on birds listed as qualifying interests for the Cork Harbour SPA is predicted to occur.

4.10.3 Surface water runoff

Potential impacts on aquatic habitats which can arise from surface water emissions associated with the construction phase of the proposed development include increased silt levels in surface water run-off, inadvertent spillages of hydrocarbons from fuel and hydraulic fluid and spillage of cementous materials. Hazardous waste, such as asbestos, could also potentially impact on local water quality if not stored/managed correctly during construction/demolition works.

The proposed development site is located c.16.9km upstream of Cork Harbour SPA. Although unlikely given the distance downstream, silt-laden stormwater run-off during site preparation, site clearance, dewatering of excavations and construction of site access roads as well as spillages of fuel and oil and concrete / cement run-off could potentially impact on water quality within the Lisheens Stream and the Cork Harbour SPA downstream of the proposed development site. During operation surface water from the site will discharges to the Lisheens Stream. In the absence of mitigation, hydrocarbons from the parking areas could be carried in the stormwater and increased volumes of stormwater as a result of increased areas of impermeable surfaces could also occur during operation.

Therefore, the conservation objectives of Cork Harbour SPA may be impacted by surface water runoff during construction and operation and likely significant effects from surface water emissions cannot be excluded in the absence of mitigation.

4.10.4 Wastewater discharges during operation

The proposed housing development could potentially result in an increase in nutrients discharging to Cork Harbour via the River Lee discharge for the Ballincollig Wastewater Treatment Plant (WWTP). Although unlikely given the distance downstream (14.6km), increased nutrients can potentially impact on estuarine habitats by changing baseline ecological conditions and increasing algal growth, which in turn could impact on feeding success for birds listed as qualifying interests for the Cork Harbour SPA.

Wastewater from the proposed development will be conveyed for treatment to Ballincollig WWTP. The Ballincollig agglomeration is served by a wastewater treatment plant with a Plant Capacity Population Equivalent (P.E.) of 33,000. The agglomeration consists of one primary discharge point which discharges to the River Lee, located approximately 14.6km upstream of the Cork Harbour SPA.

The WWTP obtained a discharge licence (Reg: D0049-01) from the EPA and has assigned emission limit values (ELV's) for a range of parameters to ensure a high degree of protection to the River Lee, the Lee Estuary and surrounding waters.

Treated effluent from the proposed development will discharge from the Ballincollig WWTP via the main treated effluent line. The discharge licence assigns ELV's for total phosphorous (Total P), chemical oxygen demand (COD), total suspended solids (TSS), biological oxygen demand (BOD), Ammonia, pH and orthophosphate. The ELVs are set based on the full design capacity (P.E. 33,000) and are aimed at providing a high degree of protection to the receiving water body and to ensure the receiving waterbody is capable of accommodating the proposed discharge without causing or exacerbating a breach in the relevant standards.

It is noted that the proposed occupancy of the housing development is approximately Total PE for the development can be taken as 1,504.8 PE (based on 2.7 persons per dwelling and 36 PE for creche). In 2023 the agglomeration PE for Ballincollig WWTP was 23,836 (AER 2023). The proposed development would increase the current WWTP P.E. from 23,836 to 25,340.80, which is well within the 33,000 P.E. design capacity. Thus, given the limited scale of the proposed development and the ability of the WWTP to cater for the additional loading, no impact is expected.

The AER notes that the final effluent from the Primary Discharge Point was compliant with the Emission Limit Values in 2023. The following was noted:

- *The WWTP discharge was compliant with the ELV's set in the wastewater discharge licence.*
- *The discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status.*

A Pre-Connection Enquiry was submitted to Irish Water which confirmed that, subject to a valid connection agreement being put in place, the proposed connection to the Irish Water network could be facilitated (See **Appendix 3**).

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The addition of the effluent discharge from the proposed LRD to the Ballincollig WWTP is well within its design capacity and will not comprise the operational capability of the WWTP to treat effluent to comply with emission limit values. Therefore, the impacts from the proposed development will be negligible given the current operating conditions at the WWTP. Minor increases in nutrient levels potentially discharged by the WWTP will not have a significant impact water quality within the River Lee and/or the Cork Harbour SPA. Therefore, no likely significant effects on water quality within European sites from wastewater discharges have been identified.

4.10.5 Spread of Invasive Species

No high-risk invasive species were recorded within the proposed development area. The other invasive species recorded within the proposed development site i.e. Cherry Laurel and Winter heliotrope, do not have the potential to impact estuarine habitats over 17km downstream.

It is noted that the 3rd schedule invasive species *Azolla* sp. was recorded in the Lisheens Stream downstream of the proposed development site. This species was not recorded within the proposed development site boundary. It is noted that biosecurity protocols will be followed on any works to the adjoining drainage ditch to ensure this invasive species is not spread further outside the proposed development site. However, there is no potential for this freshwater species to impact estuarine habitats within Cork Harbour SPA .

Therefore, there no likely significant effects on Cork Harbour SPA via impacts from the spread of invasive species have been identified.

4.10.7 In-combination Impacts

In-combination impacts refer to a series of individual impacts that may, in combination, produce a significant effect. The underlying intention of this in combination provision is to take account of in-combination impacts from existing or proposed plans and projects and these will often only occur over time.

Article 6(3) of the Habitats Directive requires that:

Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.

It is therefore required that the potential impacts of the proposed development are considered in-combination with any other relevant plans or projects. An assessment of plans and projects with the potential for in-combination effects in association with the proposed development was undertaken. A search of planning applications in the vicinity of the proposed development was undertaken in May 2025 to examine projects with potential for in-combination effects (Source: Cork County Council, An Bord Pleanála, EPA). Other projects or developments which could potentially cause in-combination impacts are listed in **Table 8**.

Table 8. Other projects or developments which could lead to potential in-combination impacts

Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the European Network	
River Basin Management Plan 2022-2027	The project should comply with the environmental objectives of the Irish RBMP which are to be achieved generally by 2027. • Ensure full compliance with relevant EU legislation • Prevent deterioration • Meeting the objectives for designated protected areas • Protect high status waters Implement targeted actions and pilot schemes in focus sub-catchments aimed at: targeting water bodies close to meeting their objective and addressing more complex issues which will build knowledge for the third cycle.	The implementation and compliance with key environmental policies, issues and objectives of this management plan will result in positive in-combination effects to European sites. The implementation of this plan will have a positive impact for the biodiversity. It will not contribute to in-combination impacts with the proposed development.
Inland Fisheries Ireland Corporate Plan 2021-2025	To ensure that Ireland's fish populations are managed and protected to ensure their conservation status remains favourable. That they provide a basis for a sustainable world class recreational angling product, and those pristine aquatic habitats are also enjoyed for other recreational uses. To develop and improve fish habitats and ensure that the conditions required for fish populations to thrive are sustained and protected. To grow the number of anglers and ensure the needs of IFI's other key stakeholders are being met in a sustainable conservation focused manner. EU (Quality of Salmonid Waters) Regulations 1988. All works during development and operation of the project must aim to conserve fish and other species of fauna and flora habitat; biodiversity of inland fisheries and ecosystems and protect spawning Salmon and trout.	The implementation and compliance with key environmental issues and objectives of this corporate plan will result in positive on-combination effects to European sites. The implementation of this corporate plan will have a positive impact for biodiversity of inland fisheries and ecosystems. It will not contribute to in-combination or cumulative impacts with the proposed development.
Irish Water Capital Investment Plan 2020-2024	Proposals to upgrade and secure water services and water treatment services countrywide.	Likely net positive impact due to water conservation and more effective treatment of water. It will not contribute to in-combination impacts with the proposed development.

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Plans and Projects European Network	Key Policies/Issues/Objectives Directly Related to the Conservation of the	
Water Services Strategic Plan (WSSP, 2015)	Irish Water has prepared a Water Services Strategic Plan (WSSP, 2015), under Section 33 of the Water Service No. 2 Act of 2013 to address the delivery of strategic objectives which will contribute towards improved water quality and biodiversity requirements through reducing: Habitat loss and disturbance from new / upgraded infrastructure; Species disturbance; Changes to water quality or quantity; and Nutrient enrichment /eutrophication.	The WSSP forms the highest tier of asset management plans (Tier 1) which Irish Water prepare and it sets the overarching framework for subsequent detailed implementation plans (Tier 2) and water services projects (Tier 3). The WSSP sets out the challenges we face as a country in relation to the provision of water services and identifies strategic national priorities. It includes Irish Water's short, medium and long-term objectives and identifies strategies to achieve these objectives. As such, the plan provides the context for subsequent detailed implementation plans (Tier 2) which will document the approach to be used for key water service areas such as water resource management, wastewater compliance and sludge management. The WSSP also sets out the strategic objectives against which the Irish Water Capital Investment Programme is developed. The current version of the CAP outlines the proposals for capital expenditure in terms of upgrades and new builds within the Irish Water owned assets. The overarching strategy was subject to AA and highlighted the need for additional plan/project environmental assessments to be carried out at the tier 2 and tier 3 level. Therefore, significant in-combination effects can be ruled out.
WWTP discharges	Carrigtwohill and Environs WWTP, Midleton WWTP, Whitegate-Aghada WWTP, Midleton WWTP, Ringaskiddy Village WWTP's, Cobh & North Cobh WWTP's, Passage-Monkstown WWTP.	Discharges from municipal WWTPs are required to meet water quality standards. Irish Water Capital Investment Plan 202-2024 proposes to upgrade water treatment services countrywide. Therefore, significant in-combination effects can be ruled out.

Plans and Projects European Network	Key Policies/Issues/Objectives Directly Related to the Conservation of the	
Other developments in the vicinity	Cork Luas . Emerging preferred routes In the event that the construction phase of the proposed development was to overlap with these schemes, potential cumulative impacts could arise. Coleman Homes 24/43308 Maglin Creche permitted 07/10/2024 23/42446 Large scale residential development (LRD) of 162 units, landscaping and all ancillary site works. Maglin Road, Ballincollig Development permitted and under construction MOS Homes Limited 22/41611 Construction of 98 dwellings at Heathfield, Ballincollig Development permitted and under construction	As noted above, no likely significant effects from noise or disturbance have been identified with the project and therefore, no potential in-combination effects have been identified for noise and disturbance. Future developments will only be granted permission where discharges from same meet with relevant water quality standards. In the absence of mitigation, the potential for significant in-combination effects on Cork Harbour SPA with other projects from emissions to water during construction and operation cannot be ruled out. No other significant in-combination impacts have been identified. There are no projects which could have a potential significant in-combination effect along with the proposed development.

As noted in **Section 4.7.4**, the proposed development will connect Ballincollig WWTP which currently has capacity for this discharge. Therefore, no likely significant in-combination impacts due to foul effluent discharges from the proposed development have been identified.

As Cork Harbour SPA is adjacent to a major urban centre and a major industrial centre, water quality is variable, with the estuary of the River Lee and parts of the Inner Harbour being somewhat eutrophic. However, the polluted conditions may not be having significant impacts on the bird populations. The Natura 2000 Standard Data Form for Cork Harbour SPA notes that there are no serious imminent threats to the wintering birds even though the intertidal areas receive polluted water. Oil pollution from shipping in Cork Harbour is a general threat. Aquaculture occurs though it is not known if this has significant impacts on the birds. Recreational activities are high in some areas, including jet skiing which causes disturbance to roosting birds. Extensive areas of estuarine habitat have been reclaimed since about the 1950s for industrial, port-related and road projects, and further reclamation remains a threat.

In the absence of mitigation, the potential for significant in-combination effects on Cork Harbour SPA with certain projects identified in **Table 8** from emissions to water during construction and operation cannot be ruled out.

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4.11 Stage One Appropriate Assessment Conclusions

4.11.1 Screening of Relevant Natura 2000 Sites and Qualifying Interests/Special Conservation Interests

Potential significant effects on Cork Harbour SPA cannot be ruled out. Screening conclusions with regards to the qualifying species and habitats for relevant Natura 2000 sites are provided in **Table 9**. No significant effects on the conservation objectives of other Natura 2000 sites will occur. Sites/QIs/SCIs that are screened in for further assessment are highlighted in bold.

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Table 9. Screening of relevant Natura 2000 sites

Natura 2000 Site	Qualifying Interest	Potential Impacts	Screened In/Out
Cork Harbour SPA (Site code 004030)	▪ **A056 Shoveler *Anas clypeata*** ▪ **A149 Dunlin *Calidris alpina*** ▪ **A140 Golden Plover *Pluvialis apricaria*** ▪ **A050 Wigeon *Anas penelope*** ▪ **A028 Grey Heron *Ardea cinerea*** ▪ **A069 Red- breasted merganser *Mergus serrator*** ▪ **A142 Lapwing *Vanellus vanellus*** ▪ **A130 Oystercatcher *Haematopus ostralegus*** ▪ **A141 Grey plover *Pluvialis squatarola*** ▪ **A052 Teal *Anas crecca*** ▪ **A05 Pintail *Anas acuta*** ▪ **A157 Bar-tailed Godwit *Limosa lapponica*** ▪ **A162 Redshank *Tringa totanus*** ▪ **A183 Lesser Black-backed gull *Larus fuscus*** ▪ **A179 Black-headed Gull *Chroicocephalus ridibundus*** ▪ **A004 Little Grebe *Tachybaptus ruficollis*** ▪ **A160 Curlew *Numenius arquata*** ▪ **A182 Common Gull *Larus canus*** ▪ **A048 Shelduck *Tadorna tadorna*** ▪ **A017 Cormorant *Phalacrocorax carbo*** ▪ **A193 Common Tern *Sterna hirundo*** ▪ **A005 Great crested grebe *Podiceps cristatus*** ▪ **A156 Black-tailed Godwit *Limosa limosa*** ▪ **A999 Wetlands and waterbirds**	Given the potential impacts from surface water runoff during construction/operation and the hydrological connection of the proposed development site to the SPA, significant effects cannot be ruled out due to impacts on water quality during the construction and operational phase. The proposed development site does not provide habitat that is relied upon by SCI Birds. Given the distance from valuable roosting and foraging habitats within the SPA, the absence of valuable foraging/roosting habitats within the proposed development site, and the existing noise/disturbance environment, significant adverse effects on Cork Harbour SPA from noise and disturbance on *ex-situ* habitats can be excluded. In the absence of mitigation, the potential for significant adverse in-combination effects on Cork Harbour SPA from emissions to water during construction and operation cannot be ruled out. No other significant in-combination impacts have been identified. No significant impacts from loss of habitat, foul water discharges, emissions to air or the spread of invasive species have been identified.	Screened in (surface water)

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4.11.2 Screening conclusion

The aims of this screening section of this report were as follows:

- Determine whether the proposed development, alone or in combination with other projects, is likely to have significant effects on Natura 2000 sites in view of their conservation objectives.
- Provide information on and assess the potential for the proposed development to significantly impact on Natura 2000 Sites (also known as European sites).
- Determine whether the proposed development is directly connected with, or necessary to the conservation management of any Natura 2000 sites.

It has been objectively concluded that:

- The proposed development is not directly connected with, or necessary to the conservation management of any Natura 2000 sites.
- On the basis of objective information, the possibility of significant effects from the proposed development on European sites cannot be excluded. There is potential for the proposed development to significantly impact the Cork Harbour SPA via impacts on water quality during construction and operation (surface water).
- The proposed development, alone or in combination with other projects could potentially impact on the conservation objectives of Cork Harbour SPA.

On the basis of objective information and in view of best scientific knowledge, the possibility of significant effects from the proposed development on the Cork Harbour SPA, cannot be ruled out and therefore an Appropriate Assessment is required.

The NIS (below) has been prepared to inform and assist Cork County Council, to assess, in view of best scientific knowledge, if the proposed development, individually or in combination with another plan or project is likely to have a significant effects on Cork Harbour SPA.

5. Stage 2 – Natura Impact Statement

5.1 Introduction

The main objective of this stage (Stage 2, Natura Impact Statement) in the Appropriate Assessment process is to determine whether the proposed LRD at Greenfield, Ballincollig, Co. Cork (either alone or in combination with other plans, programmes and projects) will result in significant adverse impacts to the integrity of the Natura 2000 sites identified in the previous section i.e., Cork Harbour SPA with respect to the site's structure, function and/or conservation objectives. This stage also outlines the mitigation measures that should be taken in order to avoid any negative impacts associated with the proposed development.

5.2 Status of qualifying interests for the Cork Harbour SPA

Cork Harbour SPA is a large, sheltered bay system that is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl, for which it is amongst the top ten sites in the country. Owing to the sheltered conditions, the intertidal flats are often muddy in character but described principally as 'mixed sediment to sandy mud with polychaetes and oligochaetes'. These muds support a range of macro-invertebrates, notably *Macoma balthica, Scrobicularia plana, Peringia (Hydrobia) ulvae, Nepthys hombergi, Nereis diversicolor* and *Corophium volutator*, all of which provide a food source for many wintering waterbird species. Salt marshes are scattered through the site and these provide high tide roosts for waterbirds (NPWS 2014b).

The specific conservation objectives for the species listed as conservation interests for the Cork Harbour SPA (**Table 10**) are to maintain a favourable conservation condition of the non-breeding/breeding waterbirds and to maintain the favourable conservation condition of the wetland habitat at Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

Table 10. SCI species for which a potential impact has been identified – specific targets

Species/Habitats	Attribute	Measure	Target
Little Grebe Great Crested Grebe Cormorant Grey Heron Shelduck Wigeon Teal Pintail Shoveler Red-breasted Merganser Oystercatcher Golden Plover Grey Plover Lapwing Dunlin Black-tailed Godwit Bar-tailed Godwit Curlew	Population trend	Percentage change	Long term population trend stable or increasing
	Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by each species, other than that occurring from natural patterns of variation

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Species/Habitats	Attribute	Measure	Target
Redshank Black-headed Gull Common Gull Lesser Black-backed Gull			
Common Tern	Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline
	Productivity rate: fledged young per breeding pair	Mean number	No significant decline
	Distribution: breeding colonies	Number; location; area (hectares)	No significant decline
	Prey biomass available	Kilogrammes	No significant decline
	Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase
	Disturbance at the breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding common tern population
Wetlands	Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,587 hectares, other than that occurring from natural patterns of variation

The Conservation Objectives Supporting document for Cork Harbour SPA (NPWS, 2014c) provides a review of the site conservation condition and population trends for Cork Harbour SPA with regard to species' all-Ireland and international trends. All-Ireland trends follow I-WeBS data 1994-2015 (Birdwatch Ireland 2022) while International trends follow Wetlands International (2012). The conservation status of Cork Harbour SPA's SCI birds are included in **Table 11**.

Table 11. Conservation Status of SCI species within Cork Harbour

Special Conservation Interests	BoCCI Category [1]	Site conservation condition[2]	Current All-Ireland Trend[3]	Current International Trend[4]
Shelduck	Amber	Unfavourable	Declining	Increasing
Wigeon	Amber	Unfavourable	Declining	Stable
Teal	Amber	Intermediate (Unfavourable)	Stable	Increasing
Pintail	Amber	Highly unfavourable	Stable	Increasing
Shoveler	Red	Highly unfavourable	Stable	Increasing
Red-breasted Merganser	Amber	Highly unfavourable	Stable	n/c
Little Grebe	Green	Favourable	Increasing	Increasing
Great Crested Grebe	Amber	Unfavourable	Stable	Declining?
Cormorant	Amber	Highly unfavourable	Stable	Increasing
Grey Heron	Green	Intermediate	Stable	Increasing
Oystercatcher	Red	Intermediate (unfavourable)	Stable	Declining
Golden Plover	Red	Favourable	Declining	Declining
Grey Plover	Red	Highly unfavourable	Declining	Declining?
Lapwing	Red	Highly unfavourable	Declining	Stable
Dunlin	Red	Unfavourable	Declining	Stable
Black-tailed Godwit	Red	Favourable	Increasing	Increasing
Bar-tailed Godwit	Red	Favourable	Stable	Increasing
Curlew	Red	Unfavourable	Declining	Declining
Redshank	Red	Unfavourable	Stable	Stable/increasing
Black-headed Gull	Amber	Highly unfavourable	n/c	n/c
Common Gull	Amber	Highly unfavourable	n/c	n/c
Lesser Black-backed Gull	Amber	Highly unfavourable	n/c	n/c

1. Gilbert et al. 2021. 2. NPWS, 2014c, 3. Birdwatch Ireland I-WeBS 1994-2015, 4. Wetlands International (2012)

6. Assessment of Likely Significant Effects

All likely significant effects relate to surface water runoff/discharges during construction and operation. Based on the *Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC* (European Commission (EC), 2018 and CIEEM guidelines '*Guidelines for Ecological Impact Assessment*' (CIEEM, 2019) impacts are listed as significant using a combination of professional judgement and criteria or standards where available, if impacts have the potential to have a significant impact on the ecological integrity on the habitats and species for which the site is designated.

The potential impacts associated with the proposed development are discussed in the following section with respect to their likelihood to have significant impacts on European sites.

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As part of the assessment direct, indirect and in-combination impacts were considered. Direct impacts refer to habitat loss or fragmentation arising from land-take requirements for development. Indirect and secondary impacts do not have a straight-line route between cause and effect, and it is potentially more challenging to ensure that all the possible indirect impacts of the project/plan - in combination with other plans and projects have been established.

Likely significant effects were identified as follows:

- Surface water runoff during construction
- Surface water discharges during operation
- In-combination impacts

6.1 Surface water runoff during construction

Potential impacts on aquatic habitats which can arise from this type of development include increased silt levels in surface water run-off, silt from dewatering of excavations, concrete spillage and hydrocarbon spillage. In the absence of appropriate design and mitigation, high levels of silt in surface water run-off from construction works, could theoretically impact on fish species. If of sufficient severity, adult fish could theoretically be affected by increased silt levels as gills may become damaged by exposure to elevated suspended solids levels. Excessive siltation can cause eggs and fry to be smothered. In particular impacts on spawning lamprey and salmonids can be significant. If of sufficient severity, aquatic invertebrates may be smothered by excessive deposits of silt from suspended solids. In areas of stony substrate, silt deposits may result in a change in the macro-invertebrate species composition, favouring less diverse assemblages and impacting on sensitive species. Aquatic plant communities may also be affected by increased siltation. Submerged plants may be stunted and photosynthesis may be reduced.

Inadvertent spillages of hydrocarbons during construction could introduce toxic chemicals into the aquatic environment via surface water run-off or groundwater contamination and have a direct toxicological impact on habitats and fauna.

The Lisheens Stream, a tributary of the Grange Hill and Currageen Streams, is located to the southeast of the proposed development site. During operation, the proposed surface water drainage network will discharge to this stream. The Lisheens Stream meets the Curraheen stream approximately 2.8km downstream of the proposed development site (via the Grange Hill Stream). The Curraheen Stream meets the Glasheen River c.5.9km downstream of this and the River Glasheen flows into the Lee Estuary 3.7km downstream of this point. The Cork Harbour SPA is located 4.5km downstream of this point. Therefore, although unlikely, surface water run-off during the construction or operational phases could potentially flow into the Cork Harbour SPA via the Lisheen Stream (16.9km downstream).

During the construction phase, the scale of the works will be small and there is no potential for significant hydrocarbon spills. However, given the proximity of the Lisheens Stream a range of mitigation measures have been specified during construction works to prevent impact on water quality and to prevent damage to the banks of the stream and surrounding vegetation. Hydrocarbon and silt control measures are outlined in **Section 7** of this report as well as in the Construction, Environmental, Management Plan (CEMP) which has been included with this application.

Given the surface water mitigation measures will ensure there are no adverse effects on local water quality, there will be no adverse effects on the conservation objectives of the Cork Harbour SPA from construction surface water discharges.

6.2 Surface water discharges during operation

During operation, the proposed surface water management system is designed, as much as is feasible, in accordance with the principles of Sustainable Drainage Systems (SuDS) as embodied in the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS). In order to reduce the effects of the surface runoff on potential flooding, a Stormwater Management Plan will be applied to surface water discharges into adjacent watercourses. The Stormwater Management Plan can be applied to control the rate of runoff from new development. The maximum permitted surface water outflow from the new development is to be restricted to that of the existing Greenfield site by the usage of attenuation storage. Control of runoff by attenuation methods requires a hydraulic control to restrict the magnitude of flows passing downstream, together with an upstream storage capacity to contain the volume of runoff held back by the hydraulic control. The flows are proposed to be attenuated in the surface water system by adopting a flood storage attenuation tank along with restricted outlets as the control devise.

Storm water from the proposed development shall discharge into the Lisheens Stream located to the southern boundary of the site via a hydro brake manhole, which will limit the amount of water discharging to the network. The amount of water discharged from the hydro brake manhole will be determined by using the allowable Greenfield Runoff rate for the developable area of the site. It is to be noted that all on site storm water storage facilities have been sized to cater for all storm water generated within the site boundary of the development. The discharge will be onto an area of stone riprap setback approximately 10m from the watercourse.

This will dissipate energy and avoid bank erosion / scouring in the streambed. Operational phase runoff from the site will be effectively managed to ensure there is no impact on local water quality or any other watercourse downstream of the site.

The operational surface water design measures will ensure there are no significant impact on local water quality and therefore there will be no adverse effect on the conservation objectives of the Cork Harbour SPA from operational surface water discharges.

7. Mitigation Measures

The mitigation measures have been drawn up in line with current best practice and include an avoidance of sensitive habitats at the design stage and mitigation measures will function effectively in preventing significant ecological impacts. The following mitigation measures will be implemented:

A Construction Environmental Management Plan (CEMP) has been prepared (by DOSA Consulting Engineers) for the proposed development and this contains construction mitigation measures, which are also set out in this report.

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7.1 Concrete Pouring Mitigation Measures

The release of cement to water courses will be prohibited. The proposed mitigation measures for the construction phases involving concrete pouring include:

• Concrete pours will occur in contained areas using shuttering. Rinsing down of concrete trucks will be done at a dedicated location on site–adjacent to the construction site or at a suitable alternative location. Signage will be erected at each concrete pour location directing drivers to the rinse down area. This rinse down area will be removed at the end of the construction phase.

7.2 Surface Water Drainage

The storm water system will involve a network of underground pipelines and manholes discharging to the Lisheens Stream at the southern boundary via SuDS measures and an attenuation system, which will be fitted with flow control devices to ensure no increase in peak flows and an oil interceptor and silt trap to remove any traces of oil and silt washed off road surfaces.

The services layout drawings included as part of the planning stage documentation show the

proposed surface water drainage layout for the entire site.

The proposed mitigation measures for both the construction and operational phases include:

• A Site Environment Plan (SEP) identifying fuel storage and refuelling locations will be developed and this plan will also identify the spill kit locations. Spill response kits will be required for each piece of heavy equipment (i.e., Excavators, Loaders, Trucks) which will be at least 21 litre drum size each with spill pads, sorbent, small boom, plastic garbage bag and gloves.

• Silt traps will be installed on surface water drains during the site development works.

• Constructing buildings and roads above the flood level to ensure that back flows through the surface water outfalls will not occur.

• All foul and other wastewater will be discharged to the foul drainage system.

• The storm drainage system with associated hydrocarbon interceptors and silt collection will be cleaned and maintained on an on-going basis throughout its lifetime in a manner and frequency that is in line with guidelines.

• Areas stripped of vegetation will be kept to a minimum; enough to keep pace with house construction. On-going landscaping and restoration of completed units will be carried out. This will reduce areas of soil exposed to erosion.

• During the operational phase the runoff from the site will be controlled and managed using a suite of SuDS and engineering controls. These will include tree pits, infiltration basins, filter drains, blue/green roofs, raingarden / bio retention tree pits and stormwater attenuation tanks fitted with flow control devices.

The following measures will be implemented for the storage and use of hydrocarbons on site:

• Diesel tanks, used to store fuel for the various items of machinery, will be self-contained and double-walled.

• Refuelling will be carried out from these tanks or from delivery vehicles and will not be left unattended.

• Fuels, lubricants and hydraulic fluids for equipment used on the construction site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice - (Enterprise Ireland BPGCS005).

• Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the site and properly disposed of.

• Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.

• The development's road network will be finished with tarmac or asphalt surface which will discharge runoff to a piped drainage system.

• Proven engineering practice will apply during the hydraulic design process.

• Surface water drains will be installed in roads and streets and in pre-determined wayleaves adjacent to building structures.

• Spillage and leaks of oil from cars parked in the development during the operational phase is unavoidable. To reduce the potential impacts, oil interceptors will be incorporated into the site drainage design.

• The area is serviced by mains gas and this utility will be provided to the new development.

The use of home heating oil is therefore eliminated so the risk has been removed.

The proposed development is not anticipated to cause an adverse impact on the surface water regime given the remedial and reductive measures previously outlined. Normal proven construction reinstatement and backfilling procedures will follow pipe laying, jointing, and testing procedures.

7.3 Earthworks

The proposed mitigation measures for both the construction and operational phases include:

• Careful selection of stockpile locations to-avoid, as far as practical, double handling of materials; avoid steep slopes; avoid natural overland flow paths of stormwater runoff; provide shelter from the prevailing wind direction.

• Blading off the vegetative layer (for separate storage). Vegetation will not be incorporated in the stripped topsoil.

• Avoid stripping in inclement wet weather conditions. Wet soils are more difficult to work and handle and it is more likely to damage soil structure in wet conditions.

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• Avoid extending topsoil stripping into the mineral soil layer. Limiting height of stockpiles to avoid anaerobic conditions occurring.

• Profiling of stockpiles to promote rainwater runoff.

• Check dams and / or straw bales will be installed along the alignment of roadside drainage to slow flows and remove silt. These will be constructed using clean stone and geotextile spanning across the drainage channel

• Placement of silt fencing downgradient of stockpiles to catch any fines carried by stormwater runoff.

• Stockpiles will be allowed vegetate naturally, which will reduce erosion by wind and water.

• A street sweeper will attend site regularly to clean the road when there are truck movements in and out of the site.

• Earthworks will be suspended during extreme weather conditions. An extreme rainfall event will be classified as an event that corresponds to the Met Éireann Orange–Weather Alert for Rainfall.

• Hard surface roads will be regularly swept to remove mud and aggregate materials from their surface.

• Public roads outside the site will be regularly inspected for cleanliness, and cleaned as necessary.

• Material handling systems and Site stockpiling of materials will be designed and laid out to minimise exposure to wind; and

• Water misting or sprays will be used on stockpiles as required if particularly dusty activities are necessary during dry or windy periods.

• Potential hydrocarbon spillages during the construction stage are unmitigated and depend largely on the volume released, hydrocarbons reaching the surface water environment would have a local short-term direct slight negative impact on water quality and a short term indirect slight negative impact on habitats downstream. Hydrocarbons attenuate naturally in the environment, so any negative impacts are reversible. During the operational phase there would be comparatively little hydrocarbons apart from parked cars. Interceptors as part of the SuDS train will mitigate this concern.

• Any storage of oils and diesel on site will be in steel or plastic tanks of good integrity and bunded to 110 % of tank capacity. All fuel and hydraulic fluids will be stored in the site COSHH store located in the site compound.

• Refuelling of site plant will be carried out at the site compound where a concrete refuelling pad will be provided adjacent to the fuel storage tank. When refuelling takes place directly from self-bunded mobile refuelling bowsers, spill kits will be readily available (kept in the machine). Refuelling of mobile plant will not take place within 50m of any sensitive receptor. Toolbox talks on refuelling will be given to delivery drivers in addition to plant operatives.

Fuels, lubricants and hydraulic fluids for equipment used on the construction site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice.

• Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the site and properly disposed of. Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.

• Appropriate spill control equipment, such as oil soakage pads, will be kept in the site plant to deal with any accidental spillage. Spare spill kits will be kept at the construction site compound in the container adjacent to the fuel storage

8. In-combination effects

Article 6(3) of the Habitats Directive requires that:

Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.

In-combination impacts refer to a series of individually modest impacts that may in combination produce a significant impact. The underlying intention of this in combination provision is to take account of in-combination impacts from existing or proposed plans and projects and these will often only occur over time.

High negative threats, pressures and activities identified for the Cork Harbour SPA include roads, motorways, port areas, industrial or commercial areas, urbanised areas, human habitation and marine and freshwater aquaculture. Other developments near the proposed development area and their potential in-combination impacts are listed in **Table 8**.

The area surrounding the proposed development area is also heavily populated with a mixture of residential estates, schools, medical facilities, commercial developments and a busy road network. Wastewater is also discharged from other settlements around Ballincollig (e.g., Blarney, Douglas, Ringaskiddy) and local industry. However, in the absence of any significant impact associated with this project no in-combination impacts on water quality have been identified. Similarly, no significant in-combination impacts in relation to noise and disturbance have been identified. No other significant in-combination impacts have been identified. There are no projects which could have a potential significant in-combination effect along with the proposed development.

Following mitigation, no adverse impacts from changes in water quality during construction or operation were identified in the plans or projects described above. In summary, no measurable in-combination impacts are likely to Cork Harbour SPA from other developments.

9. Conclusions

The AA screening concluded, on the basis of objective information and in view of best scientific knowledge, the possibility of significant effects from the proposed project on European sites

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could not be ruled out and therefore an Appropriate Assessment was required. The AA screening concluded that there was potential for the proposed development to significantly impact the Cork Harbour SPA, via water quality impacts during construction and operation.

The NIS has been prepared to inform and assist the competent authority to assess, in view of best scientific knowledge, if the proposed development, individually or in combination with another plan or project is likely to have a significant effect on the European site, Cork Harbour SPA.

This NIS has examined and analysed, in light of the best scientific knowledge, with respect to Cork Harbour SPA within the potential likely zone of impact of the proposed development, the potential effect pathways, how these could impact on qualifying species and habitats and whether the predicted effects would adversely affect the integrity of Cork Harbour SPA.

Mitigation measures are set out in **Section 7** of the NIS and they ensure that any effects on the conservation objectives of Cork Harbour SPA will be avoided during the proposed development such that there will be no risk of adverse effects on the integrity of this European site.

It has been objectively concluded following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted effects from the proposed development and with the implementation of the mitigation measures proposed, that the construction and operation of the proposed development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects. There is no reasonable scientific doubt in relation to this conclusion. The competent authority will make the final determination in this regard.

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Appendices

Appendix 1 – Site synopsis

Cork Harbour Special Protection Area (Site Code 004030)

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay and the Rostellan and Poulnabibe inlets.

Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably Macoma balthica, Scrobicularia plana, Hydrobia ulvae, Nepthys hombergi, Nereis diversicolor and Corophium volutator. Green algae species occur on the flats, especially Ulva lactua and Enteromorpha spp. Cordgrass (Spartina spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Salt marsh species present include Sea Purslane (Halimione portulacoides), Sea Aster (Aster tripolium), Thrift (Armeria maritima), Common Saltmarsh-grass (Puccinellia maritima), Sea Plantain (Plantago maritima), Laxflowered Sea-lavender (Limonium humile) and Sea Arrowgrass (Triglochin maritima). Some shallow bay water is included in the site. Cork Harbour is adjacent to a major urban centre and a major industrial centre. Rostellan Lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Blacktailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl, for which it is amongst the top five sites in the country. The two-year mean of summed annual peaks for the entire harbour complex was 55,401 for the period 1995/96 and 1996/97. Of particular note is that the site supports internationally important populations of Black-tailed Godwit (905) and Redshank (1,782) - all figures given are average winter means for the two winters 1995/96 and 1996/97. At least 18 other species have populations of national importance, as follows: Little Grebe (51), Great Crested Grebe (204), Cormorant (705), Grey Heron (63), Shelduck (2,093), Wigeon (1,852), Teal (922), Pintail (66), Shoveler (57), Red-breasted Merganser (88), Oystercatcher (1,404), Golden Plover (3,653), Grey Plover (84), Lapwing (7,688), Dunlin (10,373), Bartailed Godwit (417), Curlew (1,325) and Greenshank (26). The Shelduck population is the largest in the country (over 10% of national total). The site has regionally or locally important populations of a range of other species including Whooper Swan (10), Pochard (145) and Turnstone (79). Other species using the site include Gadwall (13), Mallard (456), Tufted Duck (113), Goldeneye (31), Coot (53), Mute Swan (38), Ringed Plover (34) and Knot (38). Cork Harbour is a nationally important site for gulls in winter and autumn, especially Black-headed Gull (4,704), Common Gull (3,180) and Lesser Black-backed Gull (1,440).

A range of passage waders occurs regularly in autumn, including such species as Ruff (5-10), Spotted Redshank (1-5) and Green Sandpiper (1-5). Numbers vary between years and usually a few of each of these species over-winter.

The wintering birds in Cork Harbour have been monitored since the 1970s and are counted annually as part of the I-WeBS scheme.

Cork Harbour has a nationally important breeding colony of Common Tern (3-year mean of 69 pairs for the period 1998-2000, with a maximum of 102 pairs in 1995). The birds have nested in Cork Harbour since about 1970, and since 1983 on various artificial structures, notably derelict steel barges and the roof of a Martello Tower. The birds are monitored annually and the chicks are ringed.

Extensive areas of estuarine habitat have been reclaimed since about the 1950s for industrial, port-related and road projects, and further reclamation remains a threat. As Cork Harbour is adjacent to a major urban centre and a major industrial centre, water quality is variable, with the estuary of the River Lee and parts of the Inner Harbour being somewhat eutrophic. However, the polluted conditions may not be having significant impacts on the bird populations. Oil pollution from shipping in Cork Harbour is a general threat. Recreational activities are high in some areas of the harbour, including jet skiing which causes disturbance to roosting birds.

Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its populations of Black-tailed Godwit and Redshank. In addition, there are at least 18 wintering species that have populations of national importance, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Golden Plover, Bar-tailed Godwit, Ruff and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it.

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Appendix 2. Site drawings

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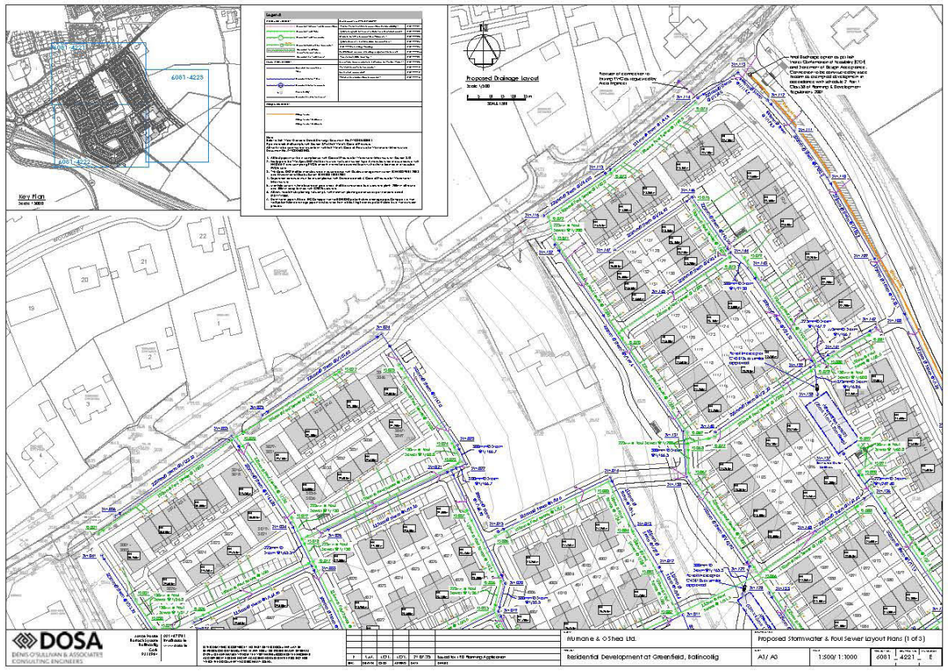

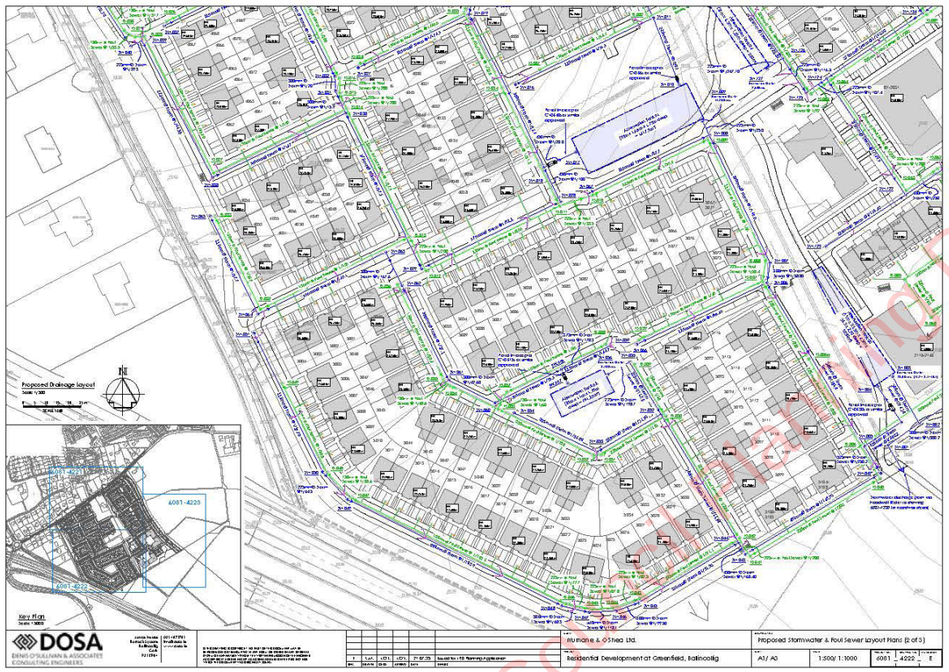

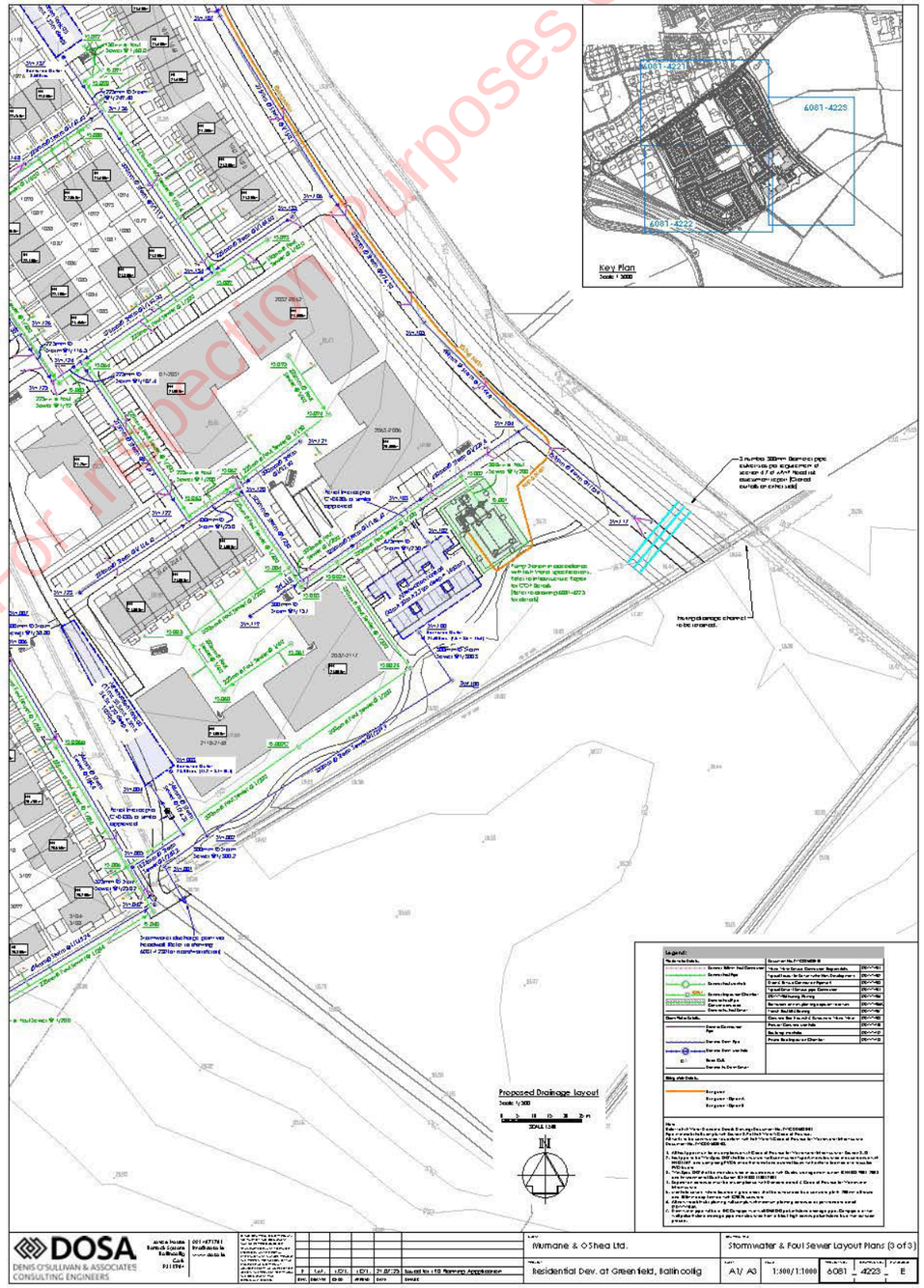

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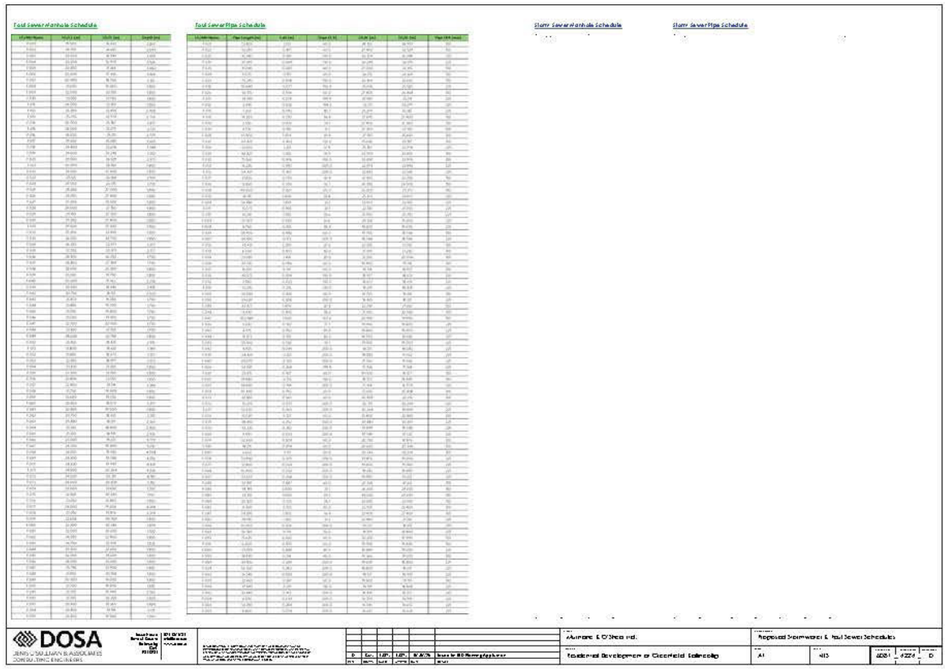
Foul Sewer Manhole Schedule

Foul Sewer Pipe Schedule

Storm Sewer Manhole Schedule

Storm Sewer Pipe Schedule



Pumping Station Plan / Sections

Scale 1:100

Note:
Pumping station to be Vandal proof.

Key Plan

DOSA
DENIS O'SULLIVAN & ASSOCIATES
CONSULTING ENGINEERS

Client: McHale & O'Shea Ltd.

Project: Residential Development at Greenfield, Ballincollig

Title: Proposed Stormwater & Foul Sewer Schedules

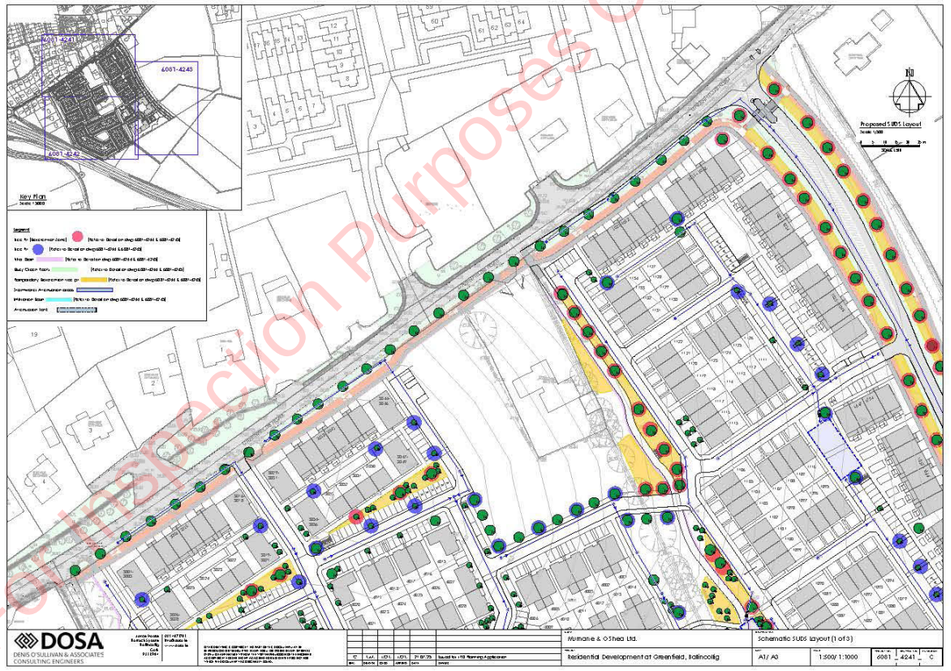
Size: A1

Scale: 4:15

Job No.: 4081

Drawing No.: 4224

Rev: D



DOSA
DENIS O'SULLIVAN & ASSOCIATES
CONSULTING ENGINEERS

Client: McHale & O'Shea Ltd.

Project: Residential Development at Greenfield, Ballincollig

Title: Schematic SUDS Layout (1 of 3)

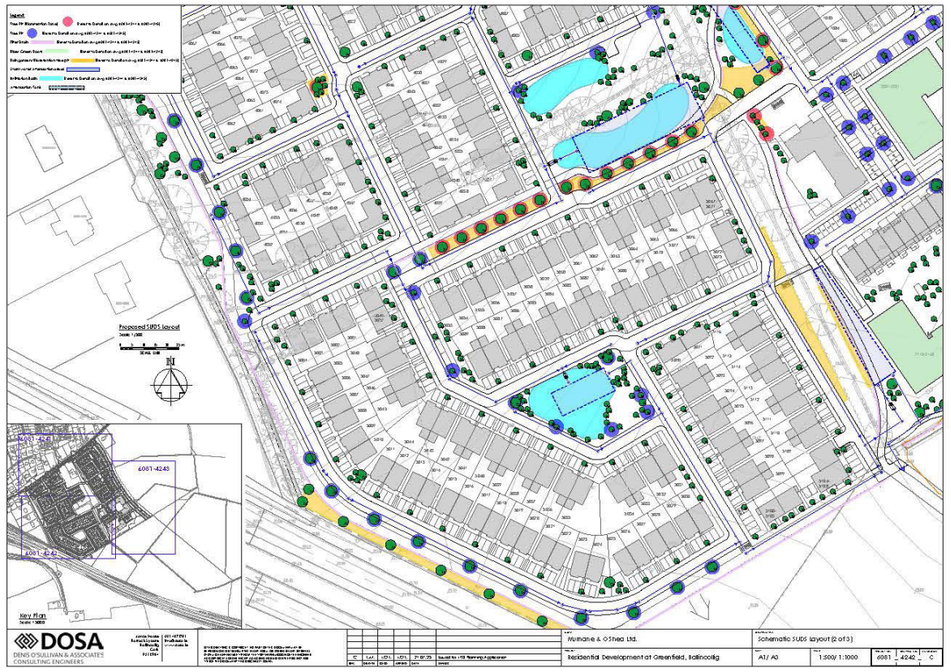
Size: A1/ A3

Scale: 1:500/ 1:1000

Job No.: 4081

Drawing No.: 4241

Rev: C



DOSA
DENIS O'SULLIVAN & ASSOCIATES
CONSULTING ENGINEERS

Client: McHale & O'Shea Ltd.

Project: Residential Development at Greenfield, Ballincollig

Title: Schematic SUDS Layout (2 of 3)

Size: A1/ A3

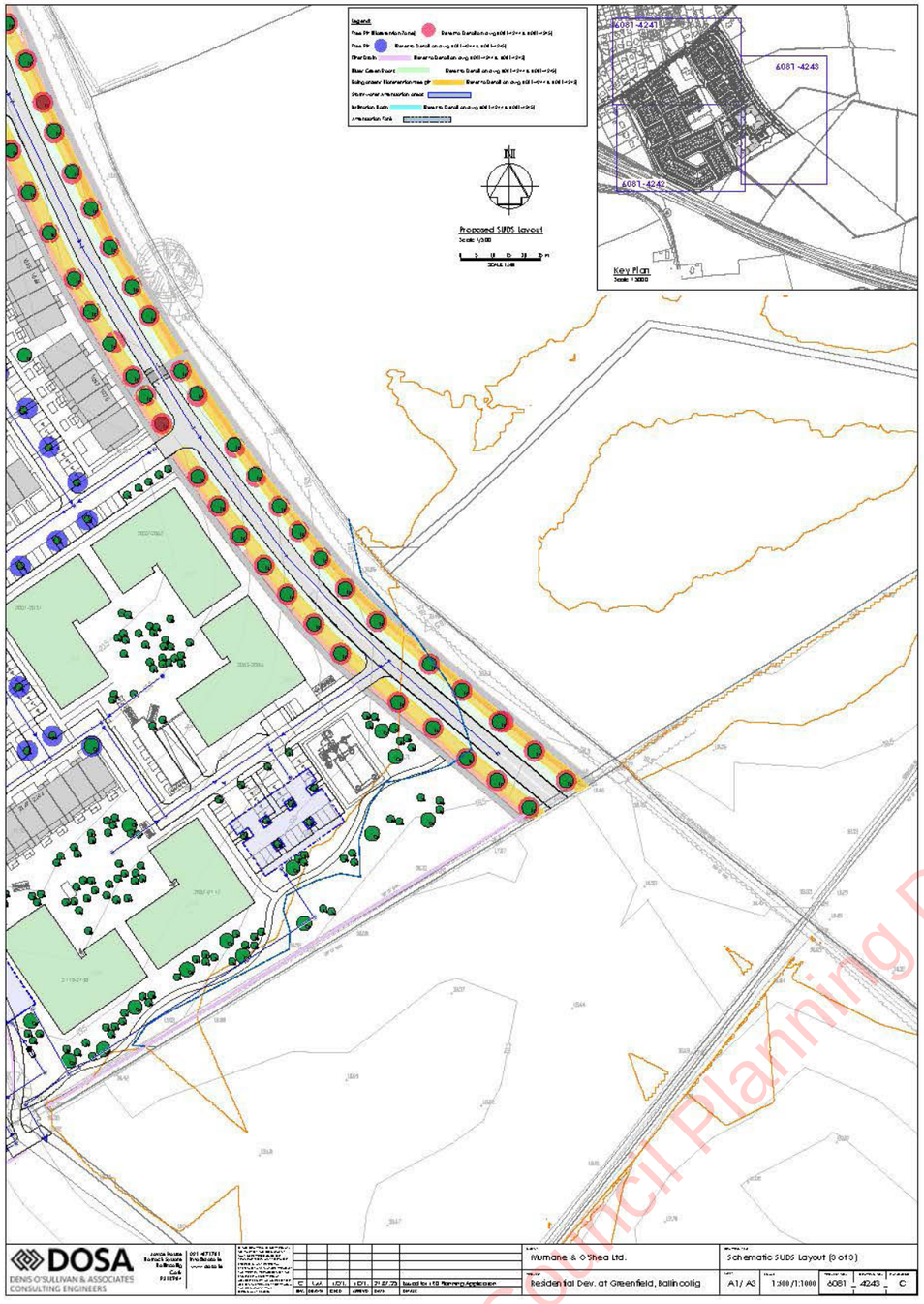
Scale: 1:500/ 1:1000

Job No.: 4081

Drawing No.: 4242

Rev: C

Cork City Council Planning Department. For Publication Purposes Only!



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Appendix 3. Uisce Eireann

Liam O 'Toole
DOSA Enginners
Joyce House
Barrack Square
Ballincollig
Co. Cork
P31 KP84

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

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

www.water.ie

16 June 2021

Re: CDS21003483 pre-connection enquiry - Subject to contract | Contract denied

Connection for Housing Development of 650 unit(s) at Greenfields Road, Ballincollig, Co. Cork

Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Greenfields Road, Ballincollig, Co. Cork (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	OUTCOME OF PRE-CONNECTION ENQUIRY THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.
Water Connection	Feasible – upgrades potentially required
Wastewater Connection	Feasible subject to upgrades
SITE SPECIFIC COMMENTS	
Water Connection	In order to complete the proposed connection at the premises, network re-configuration and/or potential upgrades may be required to the local water network. Irish Water has a hydraulic model of the network which will need to be updated and reviewed to confirm the optimum network configuration for the proposed connection. These details can be assessed at connection application stage.
Wastewater Connection	In order to facilitate this connection it will be necessary to pump to the Tuairin Glas estate to the north. Upgrades will be required to the receiving sewer network downstream. The extent of these upgrades will be determined at connection stage through the ongoing survey and modelling works being undertaken by Irish Water as part of the Ballincollig Drainage Area Plan.

Stiúrthóirí / Directors: Cathal Marley (Chairman), Niall Gleeson, Eamon Gallen, Yvonne Harris, Brendan Murphy, Maria O'Dwyer
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin 1, D01 NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Irish Water is a designated activity company, limited by shares.
Uimhir Chláraithe in Éirinn / Registered in Ireland No.: 530363

Strategic Housing Development:

Irish Water notes that the scale of this development dictates that it is subject to the Strategic Housing Development planning process. Therefore, in advance of submitting your full application to An Bord Pleanala for assessment, you must have reviewed this development with Irish Water and received a Statement of Design Acceptance in relation to the layout of water and wastewater services.

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 that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.

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The map included below outlines the current Irish Water infrastructure adjacent to your site:

Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network 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.

General Notes:

1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**

2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at https://www.water.ie/connections/get-connected/
5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
6) Irish Water Connection Policy/ Charges can be found at https://www.water.ie/connections/information/connection-charges/
7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
9) To access Irish Water Maps email datarequests@water.ie
10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Dario Alvarez from the design team on + 353 2254621 or email dalvarez@water.ie For further information, visit **www.water.ie/connections.**

Yours sincerely,

Yvonne Harris

Yvonne Harris

Head of Customer Operations

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CHAPTER NINE

CULTURAL HERITAGE

APPENDIX 9-1 Geophysics Report – J.M Leigh Surveys
APPENDIX 9-2 Archaeological Testing Report – Lane Purcell Archaeology
APPENDIX 9-3 Walkover Survey Photographs – Lane Purcell Archaeology

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APPENDIX 9-1 Geophysics Report – J.M Leigh Surveys

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GEOPHYSICAL SURVEY

REPORT

Greenfield,

Ballincollig,

County Cork

Date:
10/08/2021

Licence: 21R0175

J. M. Leigh Surveys Ltd.
124 Oaklawn West
Leixlip
County Kildare
www.jmlsurveys.com
01 615 4647

J. M. Leigh Surveys Ltd.
124 Oaklawn West,
Leixlip, Co. Kildare
Tel: 01 615 4647
Mobile: 0879062729
www.jmlsurveys.com

GEOPHYSICAL SURVEY SUMMARY SHEET
GREENFIELD, BALLINCOLLIG, COUNTY CORK

Site Name	Ballincollig	**Ref No.**	21047
Townland	Greenfield	**Licence No.**	21-R-0175
County	Cork	**Licence Holder**	Joanna Leigh
ITM (centre)	E558210, N569574	**Purpose**	Pre-planning
Client	Lane Purcell Archaeology	**Reference No.**	N/A
Ground Conditions	Survey was conducted within seven agricultural fields. Overall ground conditions were poor and much of the ground was very rutted underfoot and comprised long vegetation.		
Survey Type	Detailed gradiometer survey totalling c. 22 hectares.		

Summary of Results

The geophysical survey data is largely dominated by modern magnetic disturbance. Significant parts of all seven fields are dominated by amorphous spreads of modern magnetic material.

The former Great Southern Railway line has been identified in Areas B and C. Part of a former field boundary which is depicted on OS 25inch mapping is evident in Area E.

Several trends and isolated responses have been identified; no clear pattern is evident, and an archaeological interpretation is cautious.

Field Staff	Joanna Leigh & Susan Curran		
Report Date	10/08/2021	**Report Author**	Susan Curran

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Contents

1. Introduction 1

2. Survey ground conditions and further information 1

3. Survey Methodology 2

4. Data Display 3

5. Survey Results & Conclusion 4

6. Technical Information 7

Geophysical Survey Report

Greenfield, Ballincollig, County Cork

1 Introduction

1.1 A geophysical survey has been conducted by J. M. Leigh Surveys Ltd. at a site in the townland of Greenfield, Ballincollig, County Cork. The survey was requested by Lane Purcell Archaeology on behalf of Murnane & O'Shea Group as part of a wider pre-planning investigation.

1.2 The application area is contained within seven agricultural fields (Areas A to G) located along Greenfields Road (L2216) with the M8 motorway immediately to the south. Farm buildings lie to the west with further agricultural fields to the north and east. Figure 1 presents the site and survey location at a scale of 1:5,000.

1.3 There is one recorded monument within the application area. This comprises a 'Fulacht fia' (CO073-061) which is situated in the southern half of the application area. An excavated 'Fulacht fia' (CO073-087) and a 'Pit burial' (CO073-145) lie just outside of the application area to the south. A further excavated 'Fulacht fia' (CO073-131) is located c. 200m to the south-east. A 'Castle – tower house' (CO073-062), 'Bawn' (CO073-062001) and 'Cave' (CO073-062002) are situated c. 350m to the north.

1.4 The main aim of the survey was to identify any responses which may represent previously unknown archaeological remains within the application area. It is the objective of the survey to identify the location, nature, and extent of any responses of potential archaeological interest.

1.5 The detailed gradiometer survey was conducted under licence 21R0175 issued by the Department of Housing, Local Government and Heritage.

2 Survey ground conditions and further information

2.1 The survey area was contained within seven agricultural fields with varying ground conditions.

2.2 Area A is a large rectangular field which comprises short pasture. An internal field division separates a small portion of the southern end (Area A1) which comprised longer grass. Ground conditions were very good.

2.3 Area B is situated to the south-east of Area A1. This triangular area comprised short pasture with extremely rutted ground underfoot. OS 6inch and 25inch mapping show

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the former train line of the Great Southern Railways running along the north-western boundary between Areas B and A1.

2.4 Area C comprised long, overgrown vegetation.

2.5 Area D is situated immediately south of the farm buildings which contributed to substantial localised magnetic disturbance to the north of the area. An internal field division separated it in two down the approximate centre. The northern half of the field comprised long vegetation, while the southern half largely comprised short grass.

2.6 Area E is a small field located immediately west of Area D and comprised overgrown vegetation.

2.7 Area F comprised short pasture which had been recently cut and baled. Several bales were present around the field. The ground was very rutted underfoot.

2.8 Area G is separated from Area F by a substantial ditch containing rubble and other debris. Ground conditions comprised vegetation which had been cut and left on the surface and was extremely rutted underfoot. The north-western part of the field was inaccessible due to overgrown vegetation.

3 Survey Methodology

3.1 A detailed gradiometer survey detects subtle variations in the local magnetic field and measurements are recorded in nano-Tesla (nT). Some archaeological features such as ditches, large pits and fired features have an enhanced magnetic signal and can be detected through recorded survey.

3.2 Data was collected with a Bartington Grad 601-2 instrument. This is a specifically designed gradiometer for use in archaeological prospection. The gradiometer operates with a dual sensor capacity making survey fast and effective.

3.3 The instrument is calibrated in the field to ensure a constant high quality of data. Extremely sensitive, these instruments can detect variations in soil magnetism to 0.01nT, affording diverse application throughout a variety of archaeological, soil morphological and geological conditions.

3.4 All data was collected in 'zigzag' traverses. Grid orientation was positioned to best facilitate site work and ground conditions.

3.5 Data was collected with a sample interval of 0.25m and a traverse interval of 1m, providing 6400 readings per 40m x 40m grid. The survey grid was set out using a GPS VRS unit. Survey tie-in information is available upon request.

3.6 The survey methodology, data presentation and report content adhere to the European Archaeological Council (EAC) (2016) 'Guidelines for the use of Geophysics in Archaeology'.

4 Data display

4.1 An overall summary greyscale image and accompanying interpretation diagram are presented in Figures 2 and 3, at a scale of 1:2,500.

4.2 Figures 4-9 present greyscale images and accompanying interpretation diagrams for the survey Areas A to G, at a scale of 1:1,500.

4.3 Numbers in parenthesis in the text refer to specific responses highlighted in the interpretation diagram (Figures 3, 5,7 & 9).

4.4 Isolated ferrous responses highlighted in the interpretation diagram most likely represent modern ferrous litter and debris and are not of archaeological interest. These are not discussed in the text unless considered relevant.

4.5 The raw gradiometer data is presented in archive format in Appendix A1.01 and A1.02. The raw data is displayed as a greyscale image and xy-trace plot, both at a scale of 1:1,000. The archive plots are used to aid interpretation of the results and are used for reference only. The archive plots are available as PDF images upon request.

4.6 The display formats referred to above and the interpretation categories are discussed in the summary technical information section at the end of this report.

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5 Survey Results & Conclusion

5.1 The data is largely dominated by modern ferrous disturbance. With the exception of Area B, amorphous spreads of magnetic disturbance are evident throughout and may obscure more subtle archaeological responses.

Areas A & A1

5.2 Several long linear trends (1) have been identified throughout Area A. While these may represent former ditched features such as field divisions, no clear pattern is evident, and they may equally represent natural variations in the subsoil. An archaeological interpretation is cautious. Further linear and curvilinear trends within Area A are not considered to be of archaeological potential.

5.3 A positive magnetic response (2) forms a linear pattern in the south-western corner of Area A. This may represent a short ditched feature. However, an archaeological interpretation is tentative given its proximity to the field boundary and the level of magnetic disturbance within this area.

5.4 Further isolated responses (3) are of potential interest, with a magnetic signature similar to pit-type features. However, no clear pattern is evident, and they may equally represent more deeply buried ferrous debris. An archaeological interpretation is cautious.

Area B

5.5 A series of fragmented ferrous responses (4) form a clear linear pattern running approximately north-east / south-west along the western field boundary of Area B. This is consistent with the location of the Great Southern Railway line which is depicted on OS 25inch mapping. The responses appear to continue through to Area C (6).

5.6 Two broad amorphous responses (5) are evident in the southern half of Area B. These are indicative of natural responses reflecting the underlying geology and are not considered to be of archaeological potential.

Area C

5.7 Fragmented ferrous responses (6) form a linear pattern in the north-western corner of the dataset. These appear to be a continuation of the Great Southern Railway Line (4) identified in Area B.

5.8 The remainder of Area C comprises substantial modern ferrous disturbance which may obscure more subtle archaeological remains.

Area D

5.9 Much of the south-eastern half of Area D is dominated by modern ferrous disturbance. This may be associated with the former railway line as its trajectory continued through this area.

5.10 An area of increased magnetic response (7) has been identified in the northern half of Area D. While it is possible that this may represent a spread of archaeological material, an archaeological interpretation is cautious given the level of magnetic disturbance within the dataset. It may equally represent more deeply buried ferrous debris.

5.11 A positive magnetic response (8) may represent a short ditched feature. It lies c. 20m south of (2) identified in Area A. An archaeological interpretation is tentative as this may equally represent more recent activity.

5.12 A clearly defined positive magnetic response (9) forms a linear pattern in the south-western half of Area D. The response is indicative of a ditched feature. It corresponds with the location of a former field boundary which is depicted on OS 6inch and 25inch mapping and most likely represents part of this field boundary.

Area E

5.13 Area E is dominated by modern ferrous responses, particularly from the farm buildings to the north-west and the motorway to the south.

Area F

5.14 A series of poorly defined linear trends are evident close to the northern boundary of the dataset. While it is possible that they represent the remains of ploughed out ditches, an archaeological interpretation is not considered here and they most likely represent natural variations in the subsoil.

5.15 The remainder of Area F is dominated by substantial spreads of modern ferrous responses. The magnetic disturbance here may mask more subtle responses of potential interest.

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Area G

5.16 A series of ferrous responses (11) form a linear pattern running approximately east/west. This is consistent with the location of a former field boundary which is depicted on OS 6inch and 25inch mapping.

5.17 The remainder of Area G is dominated by substantial spreads of modern ferrous responses which may obscure more subtle responses of interest.

5.18 Consultation with a licensed archaeologist and with the Department of Housing, Local Government and Heritage is recommended to establish if any additional archaeological works are required.

6 Technical Information Section

Instrumentation & Methodology

Detailed Gradiometer Survey

Detailed gradiometer survey can either be targeted across a specific area of interest or conducted as a blanket survey across an entire application area, often as a standalone methodology.

Sampling methodologies can vary but a typical survey is conducted with a sample interval of 0.25m and a traverse interval of 1m. This allows detection of potential archaeological responses. Data is often collected in grids measuring 40m x 40m, with the data displayed accordingly. A more detailed survey methodology may be applied where archaeological remains are thought likely. This can sometimes produce results with a more detailed resolution. A survey with a grid size of 20m x 20m and a traverse interval of 0.5m will provide a data set with high resolution.

Bartington GRAD 601-2

The Bartington Grad 601-2 instrument is a specifically designed gradiometer for use in archaeological prospection. The gradiometer operates with a dual sensor capacity making survey very fast and effective. The sensors have a separation of 1m allowing greater sensitivity.

Frequent realignment of the instruments and zero drift correction ensure a constant high quality of data. Extremely sensitive, these instruments can detect variations in soil magnetism to 0.1nT, affording diverse application throughout a variety of archaeological, soil morphological and geological conditions.

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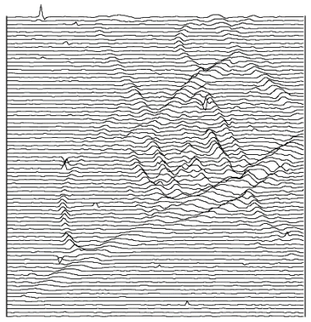
Gradiometer Data Display & Presentation

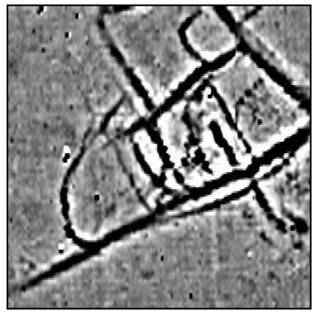
XY Trace

The data are presented as a series of linear traces, enabling a semi-profile display of the respective anomalies along the X and Y-axes. This display option is essential for distinguishing between modern ferrous materials (buried metal debris) and potential archaeological responses. The XY trace plot provides a linear display of the magnitude of the response within a given data set.



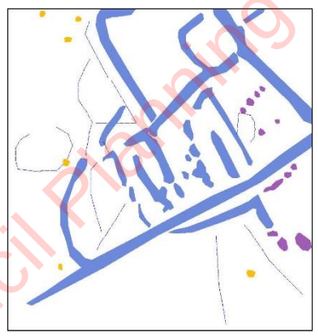
*Greyscale**

As with dot density plots, the greyscale format assigns a cell to each datum according to its location on the grid. The display of each data point is conducted at very fine increments, allowing the full range of values to be displayed within the given data set. This display method also enables the identification of discrete responses that may be at the limits of instrument detection. In the summary diagrams processed, interpolated data is presented. Raw un-interpolated data is presented in the archive drawings along with the xy-trace plots.



Interpretation

An interpretation of the data is made using many of the plots presented in the final report, in addition to examination of the raw and processed data. The project managers' knowledge and experience allow a detailed interpretation of the survey results with respect to archaeological potential.



**XY Trace and raw greyscale plots are presented in archive form for display of the raw survey data. Summary greyscale images of the interpolated data are included for presentation purposes and to assist interpretation. The archive plots are provided as PDF images upon request.*

Glossary of Interpretation Terms

Categories of responses may vary for different data sets. The list below are the most used categories for describing geophysical responses, as presented in the summary interpretation diagrams.

Archaeology

This category refers to responses which are interpreted as of clear archaeological potential and are supported by further archaeological evidence such as aerial photography or excavation. The term is generally associated with significant concentrations of former settlement, such as ditched enclosures, pits, and associated features.

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This term corresponds to anomalies that display typical archaeological patterns where no record of comparative archaeological evidence is available. In some cases, it may prove difficult to distinguish between these and evidence of more recent activity also visible in the data.

Area of Increased Magnetic Response

These responses often lack any distinctive archaeological form, and it is therefore difficult to assign any specific interpretation. The resulting responses are site specific, possibly associated with concentrations of archaeological debris or more recent disturbance to underlying archaeological features.

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This category refers to low-level magnetic responses barely visible above the magnetic background of the soil. Interpretation is tentative, as these anomalies are often at the limits of instrument detection.

Ploughing/Ridge & Furrow

Visible as a series of linear responses, these anomalies equate with recent or archaeological cultivation activity.

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A broad response resulting from localised natural variations in the magnetic background of the subsoil; presenting as broad amorphous responses most likely resulting from geological features.

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These anomalies exhibit a typically strong magnetic response, often referred to as 'iron spikes,' and are the result of modern metal debris located within the topsoil.

Area of Magnetic Disturbance

This term refers to large-scale magnetic interference from existing services or structures. The extent of this interference may in some cases obscure anomalies of potential archaeological interest.

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Bibliography

European Archaeological Council (EAC) (2016) '*Guidelines for the use of Geophysics in Archaeology*' by Armin Schmidt, Paul Linford, Neil Linford, Andrew David, Chris Gaffney, Apostolos Sarris and Jörg Fassbinder.

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Figure 2	Summary greyscale image	A3	1:2,500
Figure 3	Summary interpretation diagram	A3	1:2,500
Figure 4	Areas A, A1 & B Summary greyscale image	A3	1:1,500
Figure 5	Areas A, A1 & B Summary interpretation	A3	1:1,500
Figure 6	Areas C, D & E Summary greyscale image	A3	1:1,500
Figure 7	Areas C, D & E Summary interpretation	A3	1:1,500
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Archive Data Supplied as a PDF Upon Request

A1.01	Raw data greyscale image	A0	1:1,000
A1.02	Raw data XY-Trace plot	A0	1:1,000

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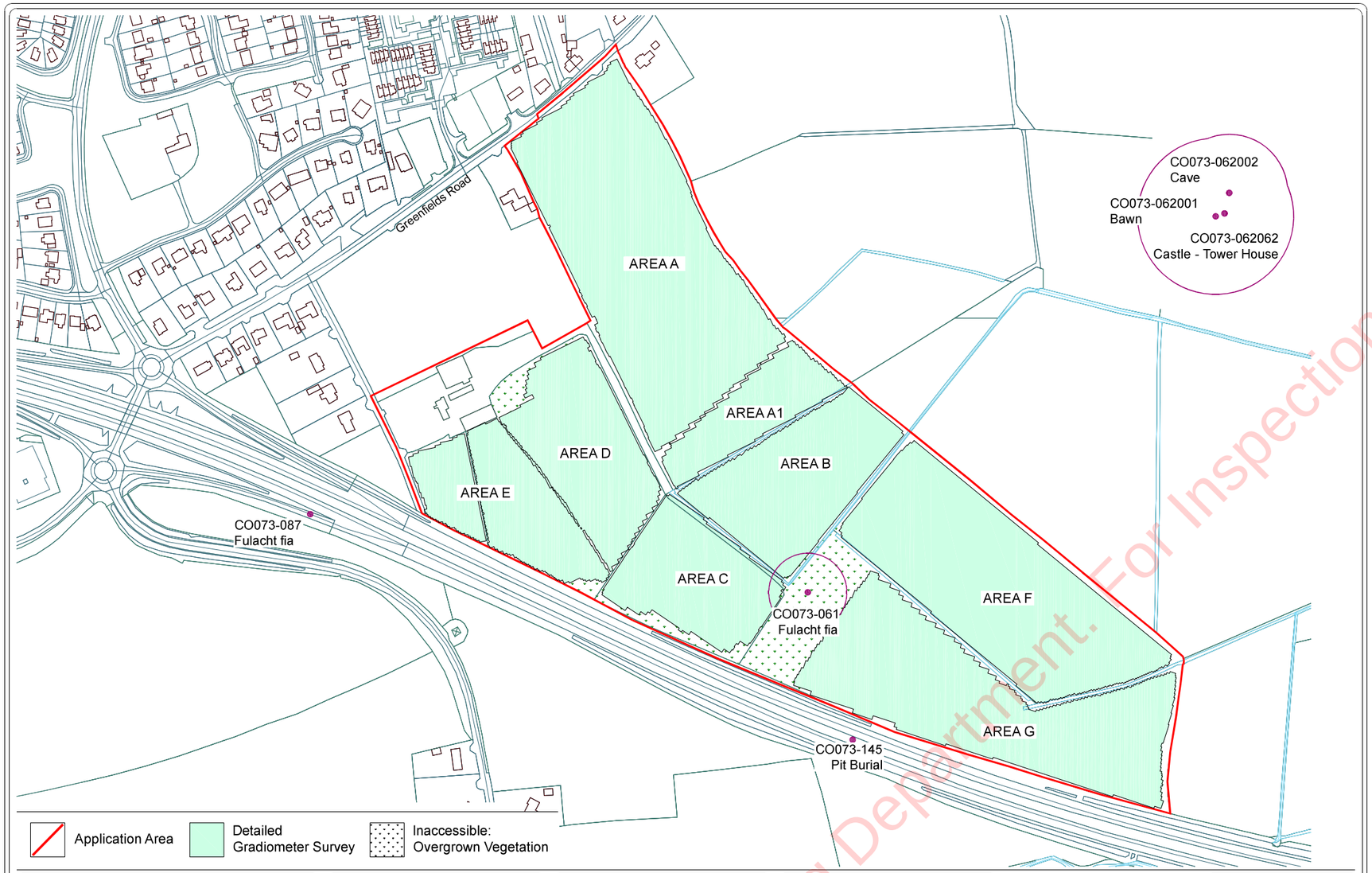


0 metres 200

Client: Lane Purcell Archaeology

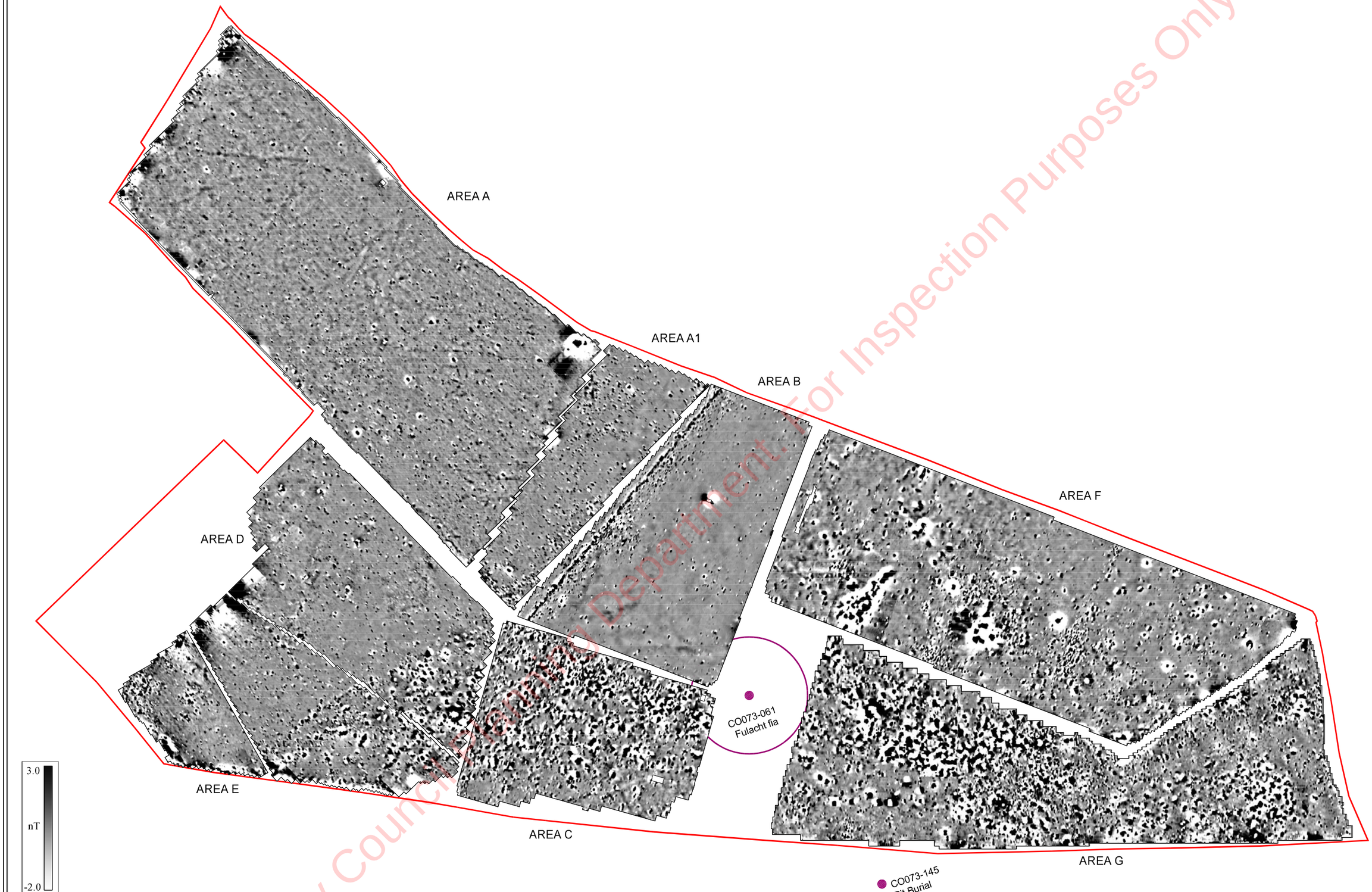
Project: Geophysical Survey
Ballincollig, County Cork

Title: Site & Survey Location

J.M. Leigh Surveys Ltd.
www.jmlsurveys.com

Scale @ A4: 1:5,000
Figure: 1
Licence No.: 21R0175
Issue Date: 10.08.2021

Cork City Council Planning Department. For Inspection Purposes Only!



Cork City Council Planning Department. For Inspection Purposes Only!

0 metres 100

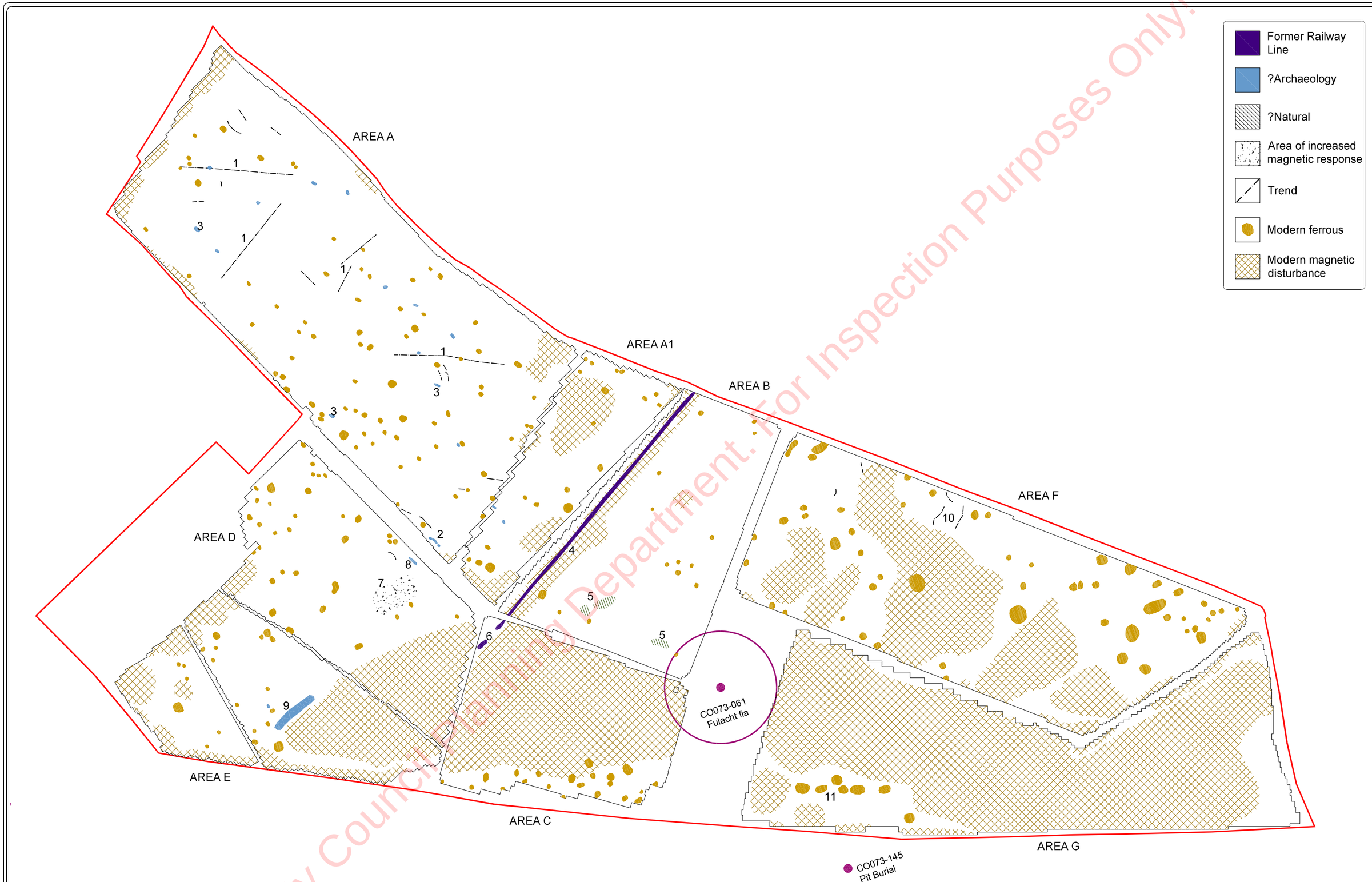
Client: Lane Purcell Archaeology

Project: Geophysical Survey Greenfield, Ballincollig, County Cork

Title: Overall Summary Greyscale Image

J.M. Leigh Surveys Ltd.
www.jmlsurveys.com

Scale @ A3:	1:2,500
Figure:	2
Licence No.:	21R0175
Issue Date:	10.08.2021



Cork City Council Planning Department. For Inspection Purposes Only!

0 metres 100

Client: Lane Purcell Archaeology

Project: Geophysical Survey Greenfield, Ballincollig, County Cork

Title: Overall Summary Interpretation

J.M. Leigh Surveys Ltd.
www.jmlsurveys.com

Scale @ A3:	1:2,500
Figure:	3
Licence No.:	21R0175
Issue Date:	10.08.2021

AREA A

AREA A1

AREA B

AREA C

AREA D

3.0
nT
-2.0

0 metres 60

Client: Lane Purcell Archaeology

Project: Geophysical Survey
Greenfield, Ballincollig,
County Cork

Title: Areas A, A1 & B
Summary Greyscale Image

J.M. Leigh Surveys Ltd.
www.jmlsurveys.com

Scale @ A3:	1:1,500
Figure:	4
Licence No.:	21R0175
Issue Date:	10.08.2021

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Former Railway Line

?Archaeology

?Natural

Area of increased magnetic response

Trend

Modern ferrous

Modern magnetic disturbance

AREA A

AREA A1

AREA B

AREA C

AREA D

1

2

3

4

5

6

7

8

Cork City Council Planning Department. For Information Purposes Only!

0 metres 60

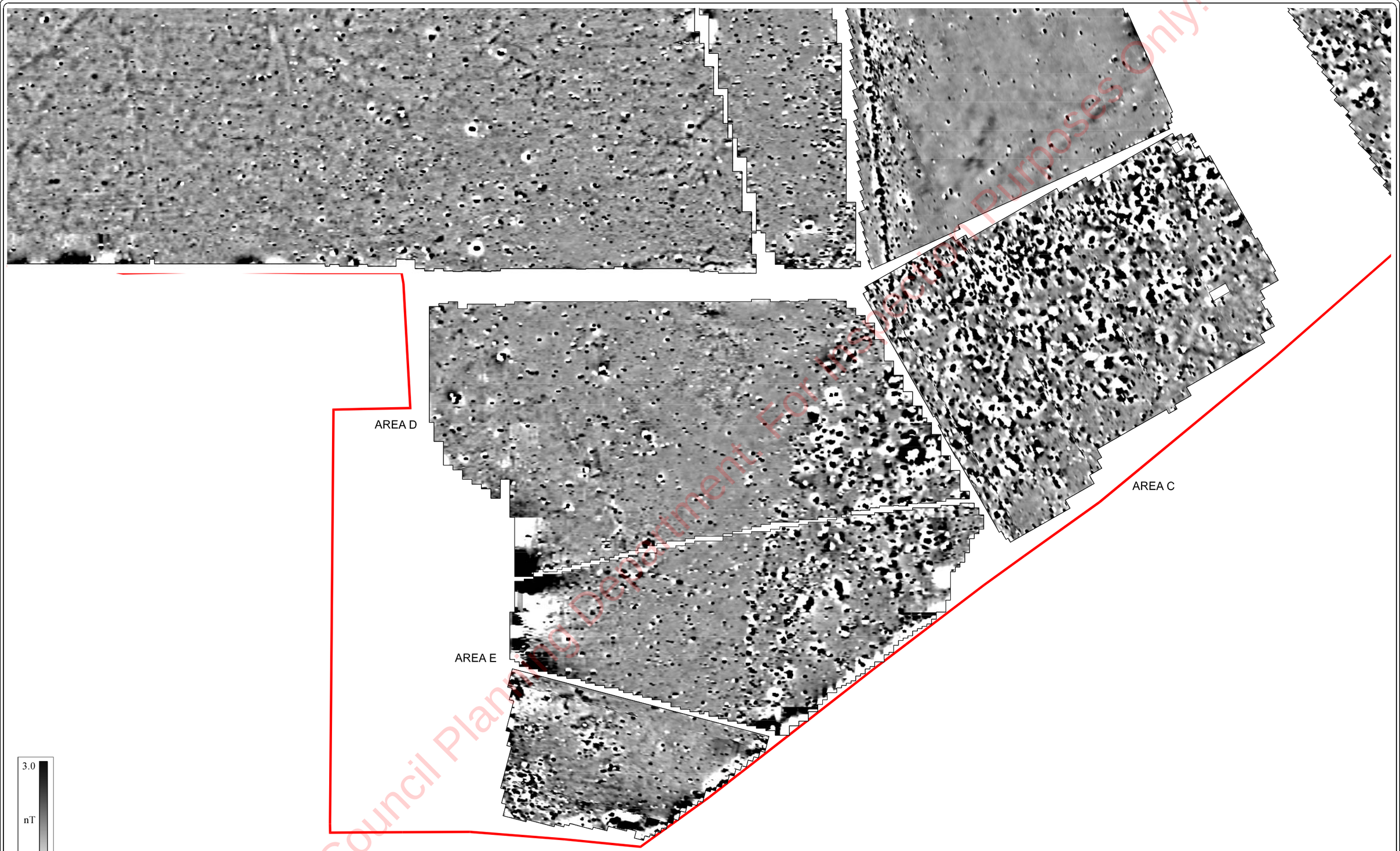
Client: Lane Purcell Archaeology

Project: Geophysical Survey Greenfield, Ballincollig, County Cork

Title: Areas A, A1 & B Summary Interpretation

J.M. Leigh Surveys Ltd.
www.jmlsurveys.com

Scale @ A3:	1:1,500
Figure:	5
Licence No.:	21R0175
Issue Date:	10.08.2021



Cork City Council Planning Department. For Assessment Purposes Only!

0 metres 60

Client: Lane Purcell Archaeology

Project: Geophysical Survey
Greenfield, Ballincollig,
County Cork

Title: Areas C, D & E
Summary Greyscale Image

J.M. Leigh Surveys Ltd.
www.jmlsurveys.com

Scale @ A3:	1:1,500
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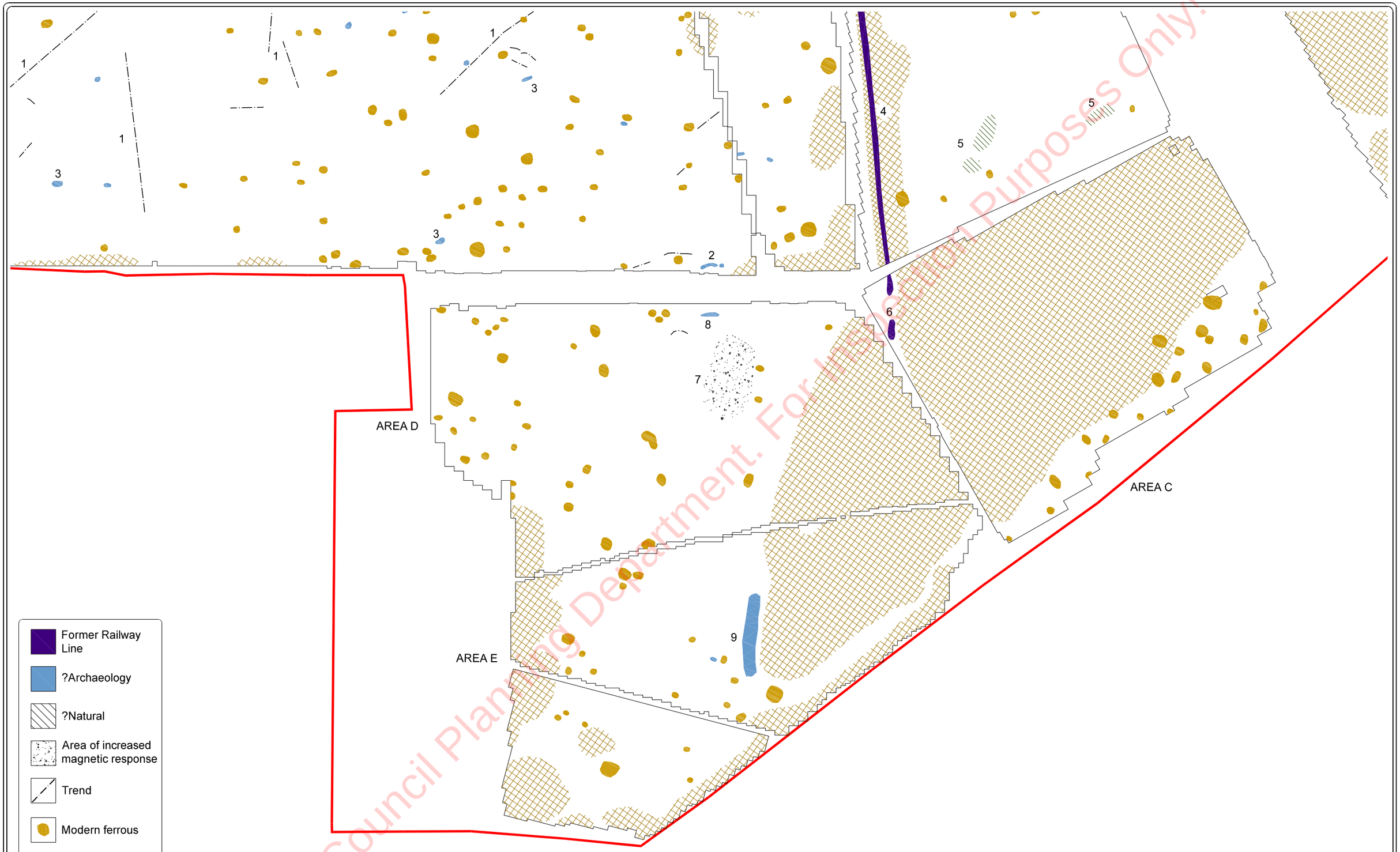
Licence No.:	21R0175
Issue Date:	10.08.2021



Cork City Council Planning Department. For Illustration Purposes Only!

Client: Lane Purcell Archaeology

Project: Geophysical Survey Greenfield, Ballincollig, County Cork

Title: Areas C, D & E Summary Interpretation

J.M. Leigh Surveys Ltd.
www.jmlsurveys.com

Scale @ A3:	1:1,500
Figure:	7
Licence No.:	21R0175
Issue Date:	10.08.2021

AREA F

AREA B

AREA G

3.0
nT
-2.0

0 metres 60

Client: Lane Purcell Archaeology

Project: Geophysical Survey
Greenfield, Ballincollig,
County Cork

Title: Areas F & G
Summary Greyscale Image

J.M. Leigh Surveys Ltd.
www.jmlsurveys.com

Scale @ A3:	1:1,500
Figure:	8
Licence No.:	21R0175
Issue Date:	10.08.2021

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AREA F

AREA B

AREA G

10

11

4

4

5

5

Former Railway Line

?Archaeology

?Natural

Trend

Modern ferrous

Modern magnetic disturbance

0 metres 60

Client: Lane Purcell Archaeology

Project: Geophysical Survey Greenfield, Ballincollig, County Cork

Title: Areas F & G Summary Interpretation

J.M. Leigh Surveys Ltd.
www.jmlsurveys.com

Scale @ A3:	1:1,500
Figure:	9
Licence No.:	21R0175
Issue Date:	10.08.2021

Cork City Council Planning Department. For Inspection Purposes Only!

GEOPHYSICAL SURVEY

REPORT

Greenfield,

Ballincollig,

County Cork

Licence Number: 24R0039

Date:
13/03/2024

J. M. Leigh Surveys Ltd.
124 Oaklawn West
Leixlip
County Kildare
www.jmlsurveys.com
01 615 4647

J. M. Leigh Surveys Ltd.
124 Oaklawn West,
Leixlip, Co. Kildare
Tel: 01 615 4647
Mobile: 0879062729
www.jmlsurveys.com

GEOPHYSICAL SURVEY SUMMARY SHEET
GREENFIELD, BALLINCOLLIG, COUNTY CORK

Site Name	Greenfield, Ballincollig	**JML Ref No.**	24006
Townland	Greenfield	**Licence No.**	24R0039
County	County Cork	**Licence Holder**	Joanna Leigh
ITM (centre)	E557900, N569780	**Purpose**	Pre-planning Investigation
Client	Murnane & O'Shea Ltd.	**Reference No.**	NA

Ground Conditions	The application area is contained within a large open field comprising of short grass. The field was waterlogged at the time of survey.
Survey Type	Detailed gradiometer survey totalling c.3.5 hectares.

Summary of Results

A broad response runs through the field from the road towards the stables. This response is suggestive of a former trackway. Although it is possible that this is of archaeological interest, it is equally likely that this represents a more recent farm access track. Interpretation is cautious.

Numerous curvilinear trends are evident in the data. These are barely discernible in the data and have no clear archaeological pattern. It is speculated that they result from natural variations in the sub-soil.

Numerous isolated responses have also been identified throughout the data. Again, there is no clear archaeological pattern, and these may represent more deeply buried ferrous debris. The archaeological potential of these responses is limited.

Fieldwork Date	26th & 27th February 2024		
Report Date	13/03/2024	**Report Author**	Joanna Leigh

Cork City Council Planning Department. For Inspection Purposes Only!

An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

Consent to use a Detection Device
National Monuments Acts (1930-2004)

Consent Number	24R0039

Application having been duly made to me by	Joanna Leigh
Of	124 Oaklawn West Leixlip Co. Kildare
For a consent to use a specified detection device	Bartington GRAD601 dual Sensor
at the site known as	Co. Cork BALLINCOLLIG
Being part of the townland	BALLINCOLLIG
In or under the portion of land owned by	MARY CROWLEY
Of	Greenfields Ballincollig County Cork
In county of	Co. Cork

The Minister for Housing, Local Government and Heritage, in accordance with the conditions of Section 2 of the National Monuments (Amendment) Act, 1987, as amended, and subject to the conditions overleaf, does hereby issue his consent, to the applicant, to carry out the specified works, during a period of **4** weeks, commencing on the **14/02/2024** and to use a detection device, for the purpose specified.

Duration of licence: **14/02/2204** **to** **13/03/2024**

Signed: [redacted] Date: 14/02/2024

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1. Introduction 1
2. Survey ground conditions and further information 1
3. Survey Methodology 2
4. Data Display 2
5. Survey Results 3
6. Conclusion 4
7. Technical Information 5

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Greenfield, Ballincollig,
County Cork

1 Introduction

1.1 A geophysical survey has been conducted by J. M. Leigh Surveys Ltd. at a site in the townland of Greenfields, Ballincollig, County Cork. This survey forms part of a wider archaeological study by Lane Purcell Archaeology for a pre-planning site investigation.

1.2 The application area is contained within a single large open pasture field, currently used for grazing horses. Woodberry Road is to the immediate north of the application area, with stables to the south and housing to the west. The N22 is to the south of the application area.

1.3 Fields to the immediate east were previously surveyed in 2021 (Licence 21R0175). The location of the previous and current survey is presented in Figure 1 at a scale of 1:5,000.

1.4 There are no recorded monuments within the current application area. A recorded fulacht fia (CO073-145) is located c.370m to the east.

1.5 The summary of the 2021 survey (Licence 21R0175) is presented below.

> *21R0175 Summary*
> *The geophysical survey data is largely dominated by modern magnetic disturbance. Significant parts of all seven fields are dominated by amorphous spreads of modern magnetic material.*
> *The former Great Southern Railway line has been identified in Areas B and C. Part of a former field boundary which is depicted on OS 25inch mapping is evident in Area E.*
> *Several trends and isolated responses have been identified; no clear pattern is evident, and an archaeological interpretation is cautious.*

1.6 The main aim of the survey was to identify any geophysical responses that may represent unknown archaeological features within the application area. A detailed gradiometer survey was conducted under licence 24R0039, issued by the Department of Housing, Local Government and Heritage.

2 Survey Ground Conditions and Further Information

2.1 The application area is contained within a large open pasture field. Stables to the south of the application area produced significant localised magnetic disturbance.

2.2 In front of the stables and within the application area, there was a large manure heap which restricted survey.

2.3 In the north-east of the application area there was a large pile of construction rubble for an adjacent property development. This also prohibited survey in this part of the field.

3 Survey Methodology

3.1 A detailed gradiometer survey detects subtle variations in the local magnetic field and measurements are recorded in nano-Tesla (nT). Some archaeological features such as ditches, large pits and fired features have an enhanced magnetic signal and can be detected through recorded survey.

3.2 Data was collected with a Bartington Grad 601-2 instrument. This is a specifically designed gradiometer for use in archaeological prospection. The gradiometer operates with a dual sensor capacity making survey fast and effective.

3.3 The instrument is calibrated in the field to ensure a constant high quality of data. Extremely sensitive, these instruments can detect variations in soil magnetism to 0.01nT, affording diverse application throughout a variety of archaeological, soil morphological and geological conditions.

3.4 All data was collected in ‘zigzag’ traverses. Grid orientation was positioned to facilitate data collection and remained constant throughout the survey. Data was collected with a sample interval of 0.25m and a traverse interval of 1m. The survey grid was set out using a GPS VRS unit. Survey tie-in information is available upon request.

4 Data Display

4.1 A summary greyscale image is presented in Figure 2, at a scale of 1:1,500. An accompanying interpretation diagram is presented in Figure 3, also at a scale of 1:1,500.

4.2 Numbers in parentheses in the text refer to specific responses highlighted in the interpretation diagram (Figure 3).

4.3 Isolated ferrous responses in the gradiometer data highlighted in the interpretation diagram most likely represent modern ferrous litter and debris and are not of archaeological interest. These are not discussed in the text unless considered relevant.

4.4 The raw gradiometer data is presented in archive format in Appendix A1.01. The raw data is displayed as a greyscale image and xy-trace plot, both at a scale of 1:500.

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The archive plots are used to aid interpretation of the results and are for reference only. These are available as PDF images upon request.

4.5 The display formats referred to above and the interpretation categories are discussed in the summary technical information section at the end of this report.

5 Survey Results (Figure 3)

5.1 The data is dominated by modern ferrous responses. This somewhat obscures the data, although some responses of potential interest have been identified.

5.2 Running north to south through the data is a broad response (1) and linear trend (2). Although it is possible that this represents a broad archaeological trackway, it appears to lead from the road to the stables to the south. It is speculated that this is a more recent farm access trackway running through the field.

5.3 To the south of the probable trackway is a large area of magnetic disturbance (3). This results from the adjacent stable buildings and obscures the data here.

5.4 To the west of the probable trackway there is a short linear positive response (4) and trends (5). Although it is possible that this represents the remains of a rectilinear ditched feature, interpretation is cautious. An archaeological pattern is difficult to discern and the responses (4) and (5) may represent more recent field divisions. It is noted that these are not depicted on current or historic OSI mapping.

5.5 There are further curvilinear trends (6) elsewhere in the data. These are barely discernible in the data and have no clear pattern or form. It is speculated that these are natural in origin, reflecting variations in the sub-soil. No clear archaeological interpretation can be provided.

5.6 In the southeast of the data, there are a series of ferrous responses (7) forming a linear pattern. This results from temporary fencing and is not of archaeological interest.

5.7 Scattered throughout the dataset are numerous isolated responses (8). These have a magnetic signature similar to archaeological pit-type features. However, they have no clear pattern, and it is equally likely that they result from more deeply buried ferrous debris. There is no clear archaeological interpretation for these responses.

5.8 Further magnetic disturbance (9) is modern in origin. No archaeological interpretation within this disturbance can be provided.

6 Conclusion

6.1 A broad response and associated trend appear to run through the field from the road towards the stables to the south. This most likely represents a former trackway. Although it is possible that the trackway is of archaeological interest, it more likely represents a recent farm access track.

6.2 Multiple curvilinear trends are evident in the data. Interpretation is cautious as these are barely discernible in the data and have no clear pattern or form. These may represent natural variations in the sub-soil and no clear archaeological interpretation can be provided.

6.3 Numerous isolated responses are scattered throughout the data. The responses have a magnetic signature similar to pit-type features. However, the data is also littered with modern ferrous responses, and it is possible that the isolated responses represent more deeply buried ferrous debris. Archaeological potential is unclear.

6.4 Consultation with a licensed archaeologist and with the Department of Housing, Local Government and Heritage is recommended to establish if any additional archaeological works are required.

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7 Technical Information Section

Instrumentation & Methodology

Detailed Gradiometer Survey

Detailed gradiometer survey can either be targeted across a specific area of interest or conducted as a blanket survey across an entire application area, often as a standalone methodology.

Sampling methodologies can vary but a typical survey is conducted with a sample interval of 0.25m and a traverse interval of 1m. This allows detection of potential archaeological responses. Data is collected in grids measuring 40m x 40m, with the data displayed accordingly. A more detailed survey methodology may be applied where archaeological remains are thought likely. This can sometimes produce results with a more detailed resolution. A survey with a grid size of 20m x 20m and a traverse interval of 0.5m will provide a data set with high resolution.

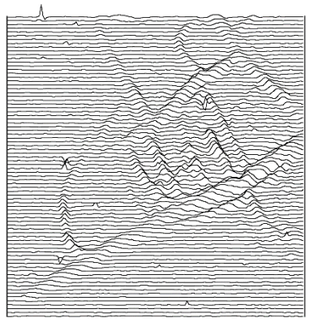
Bartington GRAD 601-2

The Bartington Grad 601-2 instrument is a specifically designed gradiometer for use in archaeological prospection. The gradiometer operates with a dual sensor capacity making survey fast and effective. The sensors have a separation of 1m allowing greater sensitivity.

Frequent realignment of the instruments and zero drift correction ensure a constant high quality of data. Extremely sensitive, these instruments can detect variations in soil magnetism to 0.1nT, affording diverse application throughout a variety of archaeological, soil morphological and geological conditions.

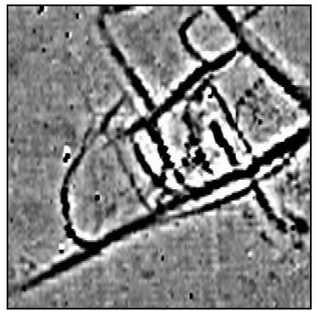
Gradiometer Data Display & Presentation

XY Trace



The data are presented as a series of linear traces, enabling a semi-profile display of the respective anomalies along the X and Y-axes. This display option is essential for distinguishing between modern ferrous materials (buried metal debris) and potential archaeological responses. The XY trace plot provides a linear display of the magnitude of the response within a given data set.

Greyscale*



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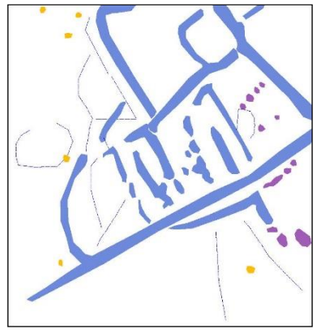

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Area of Increased Magnetic Response

These responses often lack any distinctive archaeological form, and it is therefore difficult to assign any specific interpretation. The resulting responses are site specific, possibly associated with concentrations of archaeological debris or more recent disturbance to underlying archaeological features.

Trend

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Visible as a series of linear responses, these anomalies equate with recent or archaeological cultivation activity.

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List of Figures

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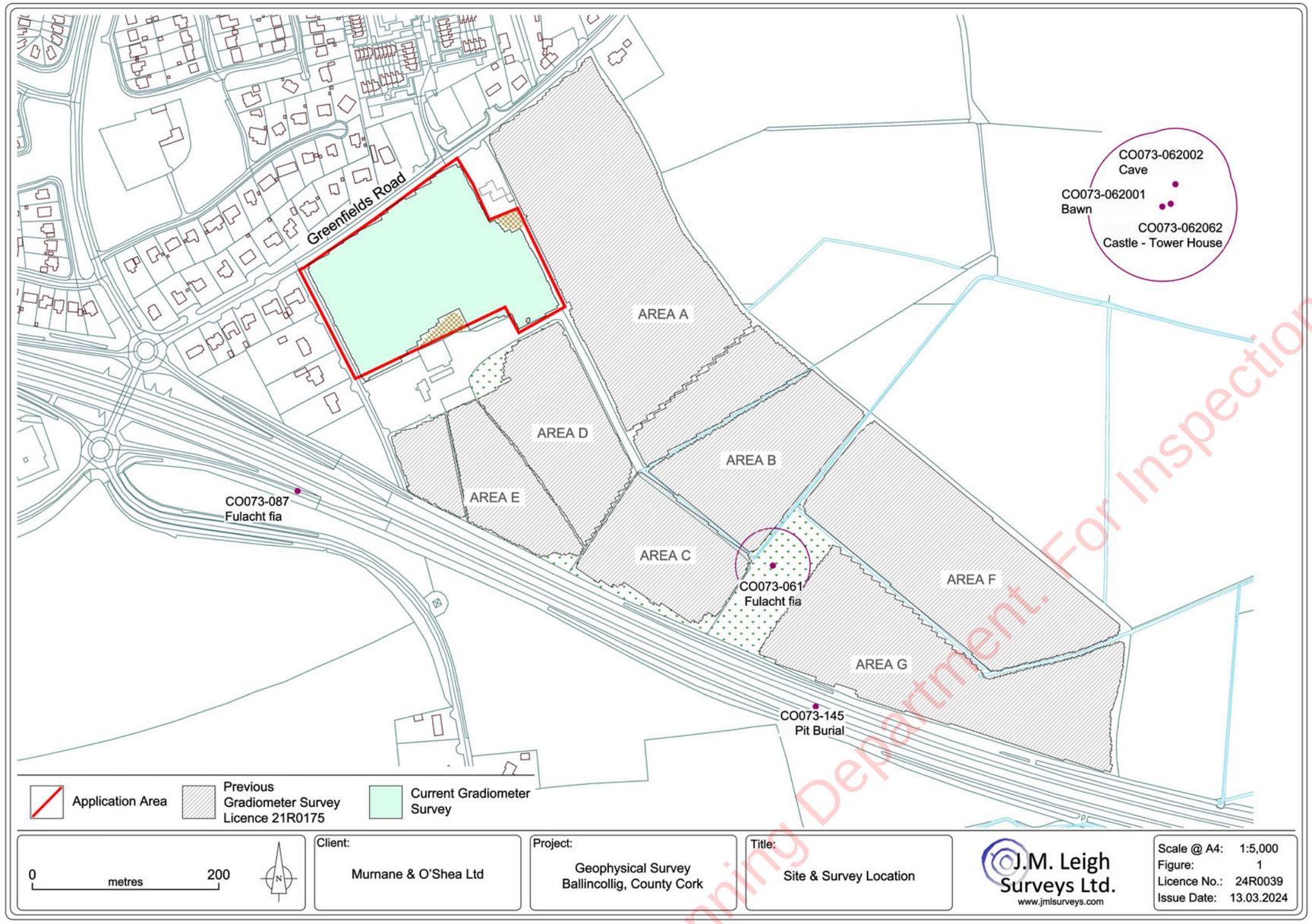
Figure 1	Site & Survey Location Diagram	1:5,000
Figure 2	Summary Greyscale Image	1:1,500
Figure 3	Summary Interpretation Diagram	1:1,500

Archive Data Supplied as a PDF Upon Request

A1.01	Raw data XY-Trace plot & greyscale image	1:500

Cork City Council Planning Department. For Inspection Purposes Only!



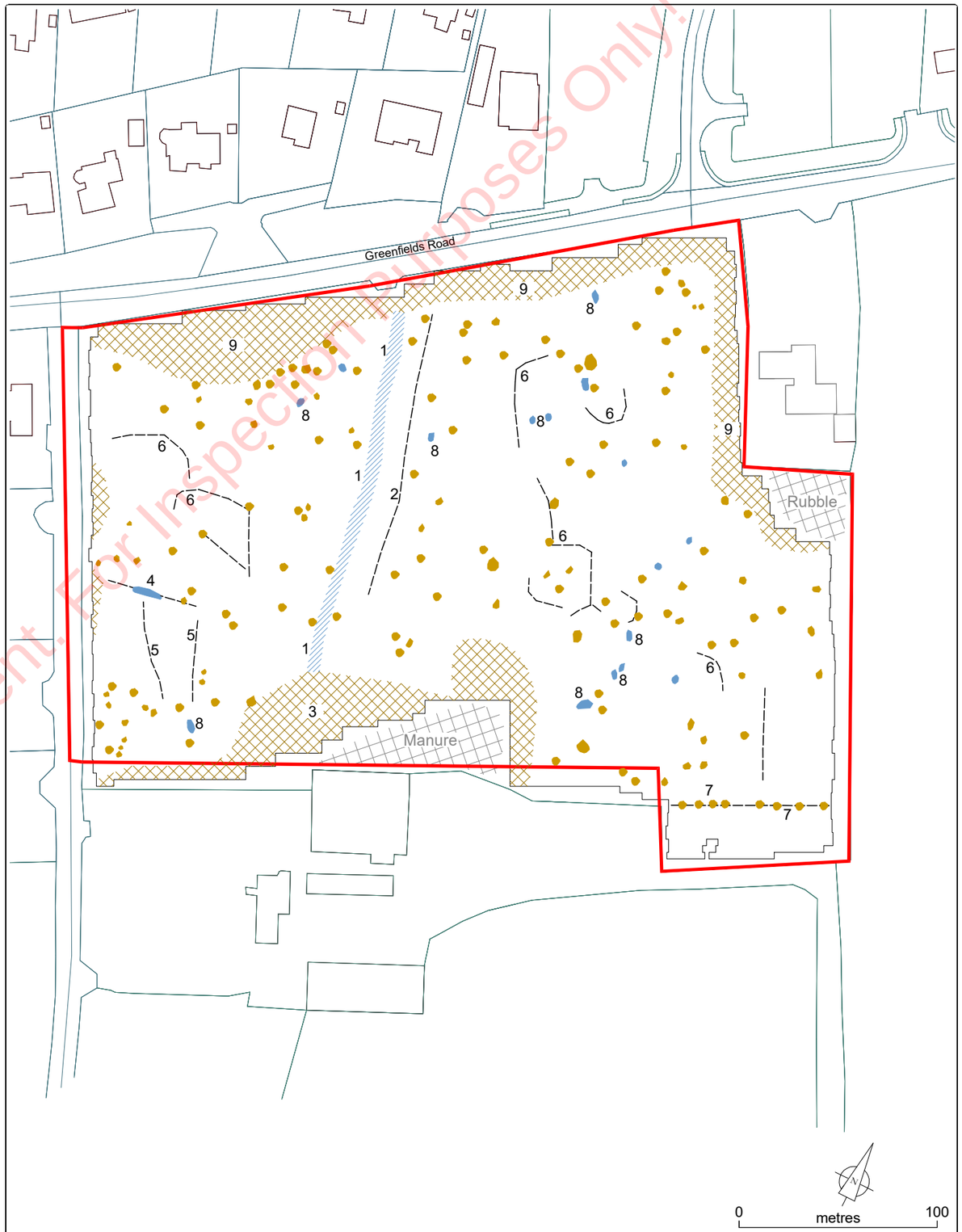
	Client:	Project:	Title:		Scale @ A4: 1:5,000
	Murnane & O'Shea Ltd	Geophysical Survey Ballincollig, County Cork	Site & Survey Location	J.M. Leigh Surveys Ltd. www.jmlsurveys.com	Figure: 1 Licence No.: 24R0039 Issue Date: 13.03.2024

Cork City Council Planning Department. For Inspection Purposes Only!

Application Area

0 metres 100

Client:	Project:	Title:		
Murnane & O'Shea Ltd	Geophysical Survey Ballincollig, County Cork	Summary Greyscale Image	J.M. Leigh Surveys Ltd. www.jmlsurveys.com	Scale @ A4: 1:1,500 Figure: 2 Licence No.: 24R0039 Issue Date: 13.03.2024



Positive response - ?Archaeology

?Archaeology / ?Trackway

Trend

Modern ferrous

Modern magnetic disturbance

Client:	Project:	Title:		
Murnane & O'Shea Ltd	Geophysical Survey Ballincollig, County Cork	Summary Interpretation	J.M. Leigh Surveys Ltd. www.jmlsurveys.com	Scale @ A4: 1:1,500 Figure: 3 Licence No.: 24R0039 Issue Date: 13.03.2024

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APPENDIX 9-2 Archaeological Testing Report – Lane Purcell Archaeology

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Archaeological Testing

Greenfield, Ballincollig, Co Cork

Licence Number 24E0390

Pre planning

Avril Purcell MA MIAI
June 2025

Lane Purcell Archaeology,
64 Fr Mathew Road,
Turner's Cross,
Cork

Job Ref. LPA1227

on behalf of
Murnane & O'Shea Limited,
Link Road Business Centre,
Link Road,
Ballincollig,
Co Cork

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Abstract

The proposed development site is in Greenfield townland approximately 1.5km southwest of Ballincollig town where it is proposed to construct a Large-scale Residential Development.

There are no recorded archaeological sites on the proposed development site.

Two predevelopment geophysical surveys were carried out on the proposed development site and adjoining land in 2021 and in 2024 and no potentially significant archaeological deposits were identified in either survey (Leigh 2021 and Leigh 2024).

Twenty eight test trenches were excavated across the landholding in April 2025 under licence 24E0390. Seven features of archaeological significance were identified in the trenches. A number of these were partially investigated by hand and were relatively small pit type features, deliberately cut and containing charcoal-rich fills. There were no finds.

Preservation by record of these features through archaeological excavation is recommended in advance of development as well as archaeological monitoring of topsoil removal during construction. All recommendations are subject to the approval of the National Monuments Service and the planning authority.

1 Introduction

1.1 The proposed development site is located in Greenfield townland approximately 1.5km southwest of Ballincollig town (ITM 558018 569797) (Figs. 1 and 2). It lies on the southern side of Greenfields Road and extends to the N22 Ballincollig bypass to the southwest.

1.2 There are no recorded archaeological sites on the proposed development site. The closest recorded site is that of a fulacht fia (CO073-087) which lies 110m to the west (Fig. 3).

Figure 1: Ordnance Survey map of development site in red (**www.**archaeology.ie)

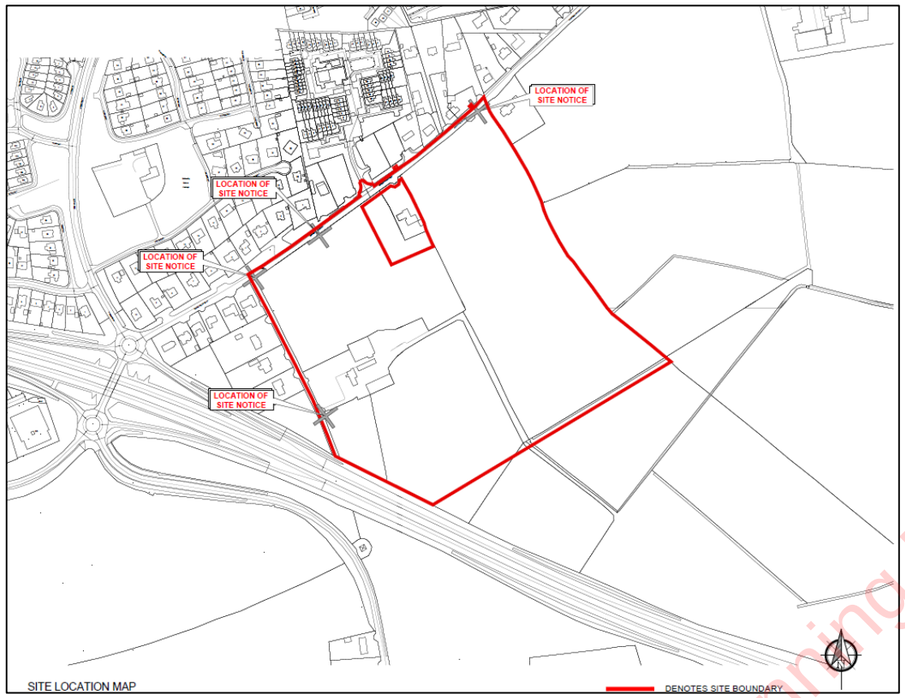

Figure 2: Ordnance Survey site location map (1:2500 reduced) (after Deady Gahan Architects)

1.3 It is proposed to construct a Large-scale Residential Development on the proposed development site (Fig. 4).

1.4 Geophysical survey was carried out on the proposed development site and adjoining land in two phases in 2021 and in 2024 (Leigh 2021 and Leigh 2024) and no potentially significant archaeological deposits were identified in either survey.

1.5 Archaeological testing was carried out in April 2025 following consultation with Cork City Archaeologist. Twenty-eight trenches were excavated, twenty seven of which lay within the proposed development site and one in adjoining land to the south (Trench 28). Seven small probable pits were identified in the test trenches corresponding broadly with a number of small isolated anomalies identified in the geophysical surveys (Anomaly 3 in Leigh 2021 and Anomaly 8 in Leigh 2024).

1.6 The proposed development site is relatively level land in agricultural use and under pasture. It extends across five subdivided fields (Field 1, Area A, Area A1, Area D and Area E) (Fig. 3).

1.7 This report was compiled by Avril Purcell, Lane Purcell Archaeology, 64 Fr Mathew Road, Turner's Cross, Cork on behalf of Murnane & O'Shea, Link Road Business Centre, Link Road, Ballincollig, Cork. It is a component of an EIAR for the proposed development site.

Figure 3: Extract from OS aerial photo 2011 to 2013 MapGenie Digital (www.archaeology.ie)

Figure 4: Development layout (Deady Gahan Architects)

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2 Archaeological and Historic Background

2.1 The proposed development site is in the townland of Greenfield, in the parish of Kilnaglory, and the barony of Muskerry East. There are no recorded archaeological sites on the proposed development site. The closest recorded site is an excavated fulacht fia (CO073-087) which lies 110m to the west. It was excavated in advance of the construction of the N22 in 2001 (Murphy 2001). There is another fulacht fia (CO073-061) located 160m to the south which lies within the larger landholding.

2.2 There are 19 recorded archaeological sites within a 1km radius of the proposed development site, as listed in the Record of Monuments and Places (RMP) for County Cork and the Sites and Monuments Record (SMR) database of the Archaeological Survey of Ireland (ASI) (Table 1 and Fig. 5). These provide evidence for human settlement and activity in the area dating possibly from the Neolithic. The RMP lists all archaeological monuments and places known to be of archaeological importance in the county and affords them statutory protection under the National Monuments Act 1930 to 2004 (1994 amendment). The SMR database is a working database of all known archaeological monuments in the state and is continually updated.

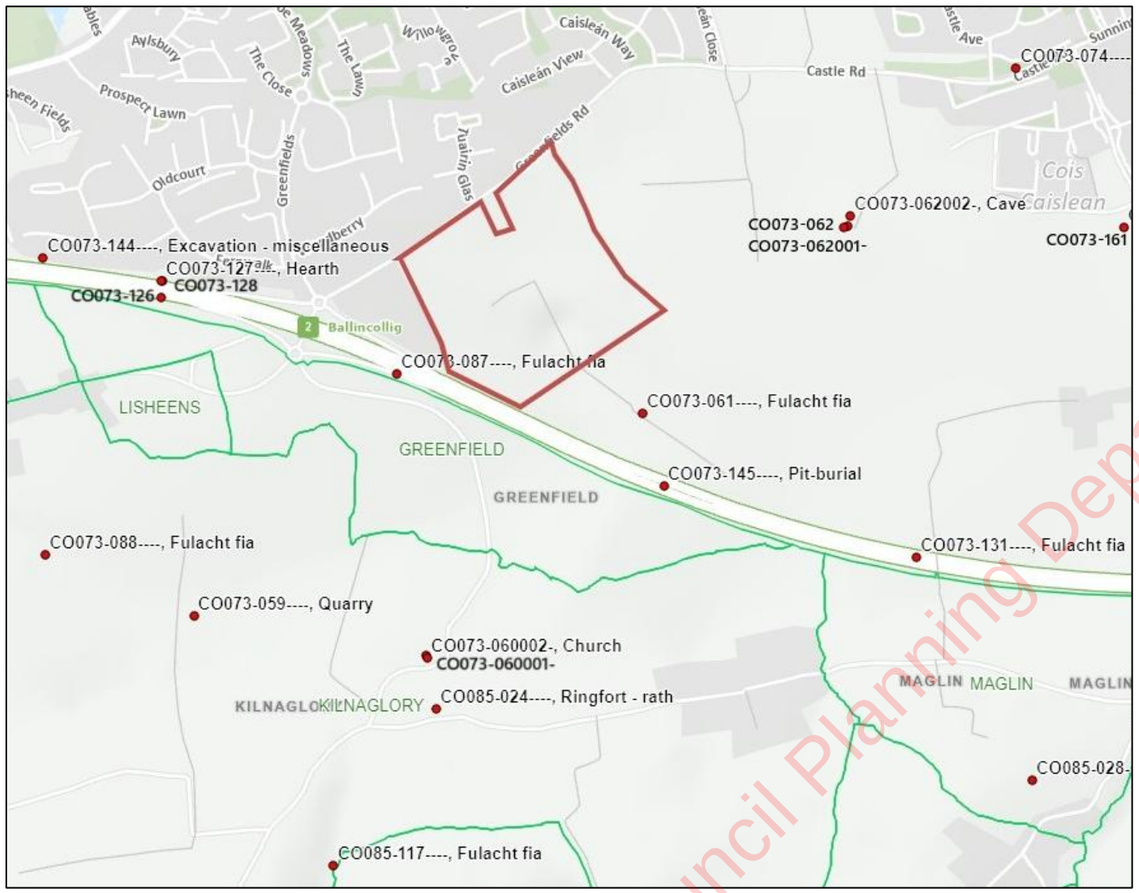

Figure 5: Development site outlined in red showing archaeological monuments within 1km radius of proposed development site (www.archaeology.ie)

SMR/RMP No.	Townland	Site type	Distance from site
CO073-074	Ballincollig	Standing stone	980m to E
CO073-062	Ballincollig	Castle - tower house	405m to E
CO073-062001-	Ballincollig	Bawn	405m to E

CO073-062002-	Ballincollig	Cave	405m to E
CO073-161	Ballincollig	Burnt spread	970m to E
CO073-131	Maglin	Fulacht fia	715m to SE
CO073-145	Greenfield	Pit burial	300m to S
CO073-061	Greenfield	Fulacht fia	160m to S
CO073-060002-	Kilnaglory	Church	550m to S
CO073-060001-	Kilnaglory	Graveyard	550m to S
CO085-024	Kilnaglory	Ringfort	645m to S
CO085-117	Kilnaglory	Fulacht fia	1km to S
CO073-059	Kilnaglory	Quarry	730m to SW
CO073-088	Kilnaglory	Fulacht fia	920m to SW
CO073-087	Greenfield	Fulacht fia	110m to the SW
CO073-126	Greenfield	Enclosure	500m to W
CO073-127	Greenfield	Hearth	495m to W
CO073-128	Greenfield	Hearth	495m to W
CO073-144	Greenfield	Excavation	745m to W

Table 1: SMR/RMP sites within approximately 1km radius of the residential development site

2.3 During archaeological investigations in advance of the construction of the N22 Ballincollig Bypass in Greenfield townland a number of archaeological features were identified dating from the Neolithic to the Iron Age (500 BC to AD 400) (Murphy 2001, Hanley & Hurley 2013). Two hearths (CO073-127 and CO073-128), a pit (CO073-144) and an oval, post-built enclosure (CO073-126) were found to the west of the proposed development site. The hearths were both radiocarbon dated, the latter to the Neolithic/Bronze Age (2920-2560 and 2520-2500 cal BC) and the former to the Iron Age (AD 250-580 cal) (Ronan *et al.* 2009). The pit was a small feature (1m by 0.9 x 0.17m deep) that contained burnt material but there was no evidence it functioned as a hearth (Danagher 2002). The enclosure measured 7.8m by 6.3m and consisted of thirteen circular post holes. No dateable material was found from the enclosure but a flint thumbnail scraper was found nearby and it is assumed it dates to the Bronze Age (Murphy, 2001 and Hanley, 2013).

2.4 There are five fulachtaí fia located within 1km of the proposed development site: one in Maglin (CO073-131), two in Kilnaglory (CO085-117 and CO073-088), two in Greenfield (CO073-087 and CO073-061) and a burnt spread in Ballincollig (CO073-161). Fulachtaí fia typically date to the Bronze Age. Additionally, there is a pit burial in Greenfield (CO073-145), also dating to the Bronze Age and a standing stone in Ballincollig (CO073-074) which may also date to the Bronze Age or later Iron Age. Fulachtaí fia are generally interpreted as ancient cooking sites, but could have been used for any purpose that required large quantities of hot or boiling water. They usually survive as a spread, or mound, of heat-shattered and burnt stone. The burnt stone generally fills and covers one or more troughs or pits cut into the ground. The trough, which was sometimes lined with timber, wattle or stone, would have been excavated below the water table, near a spring or stream and allowed to fill with water. A fire was set adjacent to the trough, to heat stones, and the water was then heated or boiled by immersing the fire-heated stones in it. Experiments have shown that large quantities of water can be boiled in this way in about twenty minutes and joints of meat wrapped in straw can be cooked over several hours. After each use, the burnt and heat-shattered stones would have to be cleaned out of the trough. Over time this material accumulated to form a crescent shaped mound of burnt material around the trough. Although they are generally interpreted as cooking sites, fulachtaí fia were also used for bathing, processing textiles, tanning, brewing, extraction of fats from meat, and soap making, or even a combination of these functions (Ó Drisceoil, 1988; Monk 2007; Quinn & Moore 2007).

A number of the fulachtaí fia sites have been levelled and are not visible above ground including the two in Kilnaglory (CO085-117 and CO073-088) one of which was found during drainage works and the other became apparent during ploughing. One of the examples in Greenfield (CO073-087) was first identified during drainage works and was subsequently excavated in advance of the construction of the N22. The excavation revealed three spreads of burnt material cut by post medieval ditches and modern ploughing. A

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possible trough (measuring 2.26m x 2.2m x 0.75m depth) was identified as well as a possible hearth site (Murphy 2001b).The other Greenfield site (CO073-061) was recorded in the 1930s as being crescent shaped and measuring 40 feet. It is no longer visible and may have been filled during land improvement works associated with the construction of the N22. The Maglin example (CO073-131) was excavated as part of the construction of the N22 and comprised a spread of burnt material (measuring 6.5m x 5.5m x 0.25m deep) associated with two circular pits (Murphy 2001). The burnt spread in Ballincollig (CO073-161) was found during predevelopment archaeological testing (Purcell and O'Leary 2018) and was preserved *in situ* in the new development.

The pit burial in Greenfield (CO073-145), also dating to the Bronze Age, was discovered during the construction of the N22 and radiocarbon dated to the period 1750-1490 BC. The pit contained cremated human bone and sherds of prehistoric pottery (Ronan *et al.* 2009). The standing stone (CO073-074) in Ballincollig is no longer extant, it was removed during the 1980s and a housing estate now stands on the site. It was not shown on the 1842 or 1904 OS 6-inch map but is named Gallan on the 1939 OS 6-inch map (ASI files).

2.5 There is one ringfort within 1km of the proposed development site in Kilnaglory (CO085-024) some distance to the south. It is shown on the 1842 Ordnance Survey map but is not shown on subsequent OS map suggesting it was levelled in antiquity, probably in the second half of the 19th century.

Ringforts date to the historic, early medieval period (5th to the 12th century AD) and are also known by the names rath, lios, cathair or caiseal/cashel. They are defended farmsteads and are the most characteristic monument of this period. Their main phase of construction and occupation dates from the beginning of the 7th century AD to the end of the 9th century. They are generally circular or oval in plan, defined by an earthen bank with an external ditch or fosse. Larger ringforts with double defences (bi-vallate) and triple defences (tri-vallate) are generally interpreted as higher status sites and these can be particularly associated with specialised craft working. The sub-surface remains of circular dwelling houses and associated outbuildings are frequently revealed within ringforts during excavation. Some ringforts have associated souterrains (underground chambers connected by narrow creepways) as defensive features which may have also been used for storage. Others have associated corn-drying kilns and sometimes external structures. The term souterrain derives from the French *sous* meaning under and *terre* meaning earth which would have been called *uam* (*uaimh* in modern Irish) when in contemporary use (Power *et al.* 1992). Generally, it has been speculated that the elite of society occupied ringforts and that the less wealthy lived in undefended settlements scattered across the landscape. In more recent archaeological investigations, particularly on road infrastructure projects in Co. Cork, the number and type of unenclosed medieval settlements identified has been growing, suggesting more diversity in contemporary settlement patterns (Monk, 2019) and challenging the perceived importance of ringforts within the early medieval landscape.

2.6 There are a small number of sites within 1km of the proposed development site that date to the later medieval period including Kilnaglory church (CO073-060002-) and Ballincollig castle and bawn (CO073-062001-). Kilnaglory church probably dates to the 15th /16th century and is one of a large number of churches built across the county at the time and was probably out of use by the 17th century. Ballincollig castle is a tower house situated on a prominent limestone outcrop. It was the principal stronghold of the Barrett clan who purchased the site in 1468 and probably built most of present structure shortly afterwards (Power, *et al* 1997, after O Murchadha 1985, 15-6). Tower houses generally date to the 15th/16th century and were built as residences by both Gaelic and Old English families. Although not castles in the military sense, they maintain many of the defensive features like battlements and narrow slit windows.

Ballincollig tower house occupies a steep-sided limestone outcrop (*c.* 40m E-W; c. 55m N-S) in the Maglin Valley. It consists of a tall rectangular 4-storey tower (4.5m N-S; 5.3m E-W) standing on the eastern side of an area enclosed by a high bawn wall that is intact except for a 20m gap mid-way along the eastern side (Power *et al*, 1997). The area enclosed within the bawn wall contains a visible break in slope down to the south resulting in the bawn wall being at a higher level (H. *c.* 5.5m) to the south than to the north (H. *c.*

3.5m), though the top of the wall is roughly level throughout. The 4-storey rectangular tower is situated in the southeastern corner of the bawn wall. A mural tower stood inside the northeast corner of the bawn and another stood along the south, both of which are missing inside walls. The tower was repaired by the Wyse family in the 19th century and there is a stone plaque on the east wall inscribed 'W 1857' (*ibid.*).

2.7 A number of archaeological investigations, some of which are mentioned above, have been undertaken in the vicinity of the proposed development site. These are included in the excavations database (www.excavations.ie) and summarised as follows:

Excavation Ref.	Location	Details
2001:178	Greenfield, Cork	The site consisted of three spreads of dark brown/black charcoal-stained clay containing substantial quantities of heat-cracked stone. The spreads would have been united originally but have been reduced by post-medieval ditches and more modern ploughing. The maximum depth of the deposit was c. 0.2m. A probable trough was excavated to the west of the fulacht spreads. This consisted of a pit measuring c. 2.16m north–south by c. 2.2m, with a depth of c. 0.75m. The sides were near-vertical and the base was uneven. The pit was filled with fulacht material. An area of pink staining onto the natural may indicate the position of an associated hearth (Murphy 2001a).
2001:179	Greenfield (2), Greenfield, Cork	Test-trenching was undertaken in advance of construction of the N22 Ballincollig Bypass which identified a number of features. 1. An oval, post-built enclosure measuring c. 7.8m north–south by 6.3m. The enclosure consisted of thirteen circular post-holes measuring, on average, c. 0.25m in diameter by c. 0.2m in depth. No finds or datable samples were obtained from the fills of the post-holes and no associated features were identified. A single unstratified flint object, a thumbnail scraper, came from the close vicinity. 2. A number of hearths were identified. Some of these were probably the result of tree-burning during land clearance, whilst others were probably of recent date. Two hearths were of more interest and of similar form. These consisted of two adjacent bowl-shaped pits, one larger than the other. The results of analysis of soil samples for both dating and usage are awaited. 3. Various pits, all of which existed in isolation and provided no dating evidence. Only one, a bowl-shaped pit containing part of the articulated skeleton of a sheep/goat, provided any evidence of purpose; however, the survival of bone probably indicates a recent date for the pit (Murphy 200b).
2001:180	Greenfield, Cork	Test-trenching in advance of construction of the N22 Ballincollig Bypass revealed a series of significant sites. Amongst these was a small area of limestone slabs and tiles. An area around these was stripped and cleaned. Excavation uncovered a series of interconnecting drains feeding into a shallow pond. A number of subsidiary features, a masonry platform, post-hole, hearth, etc., were associated but defied a logical interpretation. The associated finds, including quality glassware and ceramics, would appear to provide a date in the mid-18th century for activity on the site. The features and associated finds must be associated with activity which lay outside the area of the road-take. The nature of the finds would suggest high-status domestic occupation in the close vicinity of the excavated features (Murphy 2001c).
2002:0309	Greenfield 4, Cork	A pit cutting boulder clay was identified during construction of the N22. It was subcircular, measuring 1m north–south by 0.9m, with a maximum depth of 0.17m. Although it contained a charcoal-enriched and heat-shattered stone fill, there was no evidence that this pit may have functioned as a hearth. The primary and predominant fill was a loose, black, charcoal-stained, clayey silt containing c. 45% heat-shattered stones. These stones were mainly sandstone, with the occasional inclusion of quartz, and all had diameters of less than 0.06m.

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		The deposit measured 0.9m east–west, with a maximum depth of just under 0.17m. The secondary fill was revealed at the east of the feature and consisted of a small pocket of redeposited subsoil. This deposit had become slightly mixed with the topsoil, resulting in a brownish-orange colour, and contained occasional heat-shattered stones of up to 0.1m in diameter (Danagher 2002).
2002:0332	Maglin 3, Cork	During work associated with the construction of the N22 archaeological testing was carried out in adjoining land in advance of establishing a permanent soil dump. Four trenches were excavated in a large flat field all of which revealed burnt mound material. Once this material was identified, the trenches were not continued. After these deposits were photographed and recorded, the trenches were backfilled. The maximum measurements of the fulacht fiadh was 19m east–west by 18m. On completion of the testing, a buffer zone was established to protect the site. This was done by excavating four trenches around the site at a distance of 6m from its perimeter (Danaher 2002).
2008:159	Ballincollig, Cork	Ten test-trenches were excavated to subsoil levels on the footprint of a proposed nursing unit to the north of Ballincollig town centre and south of the National Monument Ballincollig Gunpowder Mills (CO073–043). No archaeological features or finds were recorded (Ní Loingsigh, 2008).
2010:108	Ballincollig	Four test trenches were excavated on the site of a proposed medical centre. No features or finds were revealed (Lane 2010).
2017:288	Maglin, Ballincollig, Cork	Fifteen test trenches were mechanically excavated across the site following geophysical survey. No features or finds of archaeological significance were revealed (Purcell 2017).
2017:290	Lisheens, Ovens, Cork	Monitoring was undertaken on ground works associated with a residential development on the site. No features or finds of archaeological significance were revealed (Purcell 2017).
2018:495	Ballincollig (adjoining Maglin Estate)	Two phases of testing were carried out across two adjoining fields following geophysical survey. A total of twenty-three trenches were excavated. A spread of burnt mound material (CO073-161) was revealed measuring 8m north-south by 3.5m. Its eastern extent was not determined as it extended into a field boundary adjoining a stream along the eastern site boundary. It is proposed to preserve the burnt spread in situ within a buffer zone (Purcell 2018).
2019:354	Ballincollig(Adjoining Maglin Estate), Cork	Monitoring was carried out on a residential development which was tested in 2017. A small isolated pit measuring 0.8m by 0.75m by 0.29m deep was found which contained 8 sherds of prehistoric pottery, probably of Beaker type (Helen Roche pers. comm.) Charred apple pips and hazel nut shell fragments were also found. No other features were revealed (Purcell 2019).
2022:709	Ballincollig Maglin Road	Fourteen trenches were mechanically excavated across a circular enclosure and adjoining ground identified in a geophysical survey undertaken in 2017. The enclosure appears to be defined by a pair of slot trenches set on a limestone outcrop. A small number of additional features were identified in adjoining ground including possible pits and deposits. No finds were revealed. Outcropping bedrock and drainage features were also identified in the trenches. (Purcell 2022)
2023:723	Maglin Road, Ballincollig, Cork	Fifteen trenches were excavated across two fields to the east and south of an enclosure identified in 2022. No archaeological features or finds were identified (Purcell 2023).

Table 2: Excavation undertaken in the vicinity of the proposed development site

2.8 The 1842 OS 6-inch map (Fig. 6) shows the area of the proposed development site as comprising Greenfield House and its demesne along with a small extra section of land to the south. The site and demesne

boundaries are defined to the north by what is now the Greenfields Road, to the west by a small local road and to the east by field boundaries which are also the townland boundary. The southern boundary runs a short distance south of the tree-lined demesne boundary, in an arbitrary fashion across four fields. Greenfield House lies south of centre of the proposed development site accessed by an avenue running southwest through the demesne from a gate lodge on Greenfields Road. A number of outbuildings and yards to the rear of the house may have been accessed from the road to the west and a lane running east from these buildings provides direct access to the fields of the demesne. A number of trees are scattered throughout the demesne and the fields are tree-lined. To the southwest of the gate lodge a small unnamed building with a yard to its east (part of the demesne) opens onto Greenfields Road.

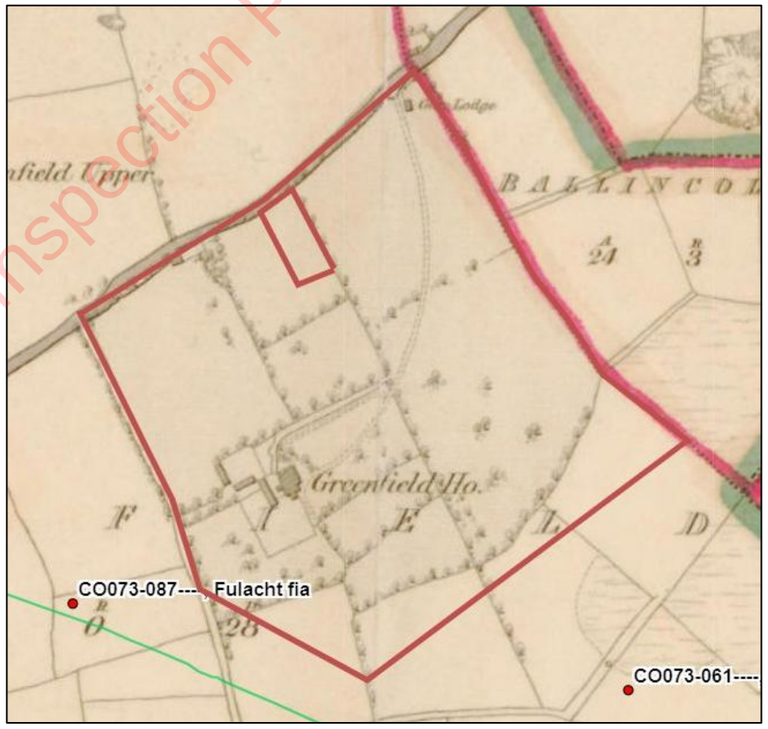

Figure 6: Extract from OS 6-inch map (1842), showing development site in red (www.archaeology.ie)

Substantial changes have been made to the area of the proposed development site by the turn of the 20th century when the 25-inch OS map (1897-1903) (Fig. 7) was compiled. Greenfield House and its demesne have been removed. The field boundaries have been substantially changed and the associated tree cover removed. The line of the Cork & Macroom Direct Railway has been constructed along the southeastern site boundary. The small unnamed building on Greenfields Road is the only surviving feature from the 1842 OS map. Further to the southwest on the south side of Greenfields Road a disused limekiln and small quarry are shown.

The OS 6-inch map of 1939 (Fig. 8) shows the area as largely unchanged other than the removal of the building and lime kiln on Greenfields Road and the addition of a small rectangular building in the area of the outbuildings of Greenfield House. This is a dwelling house that remains extant.

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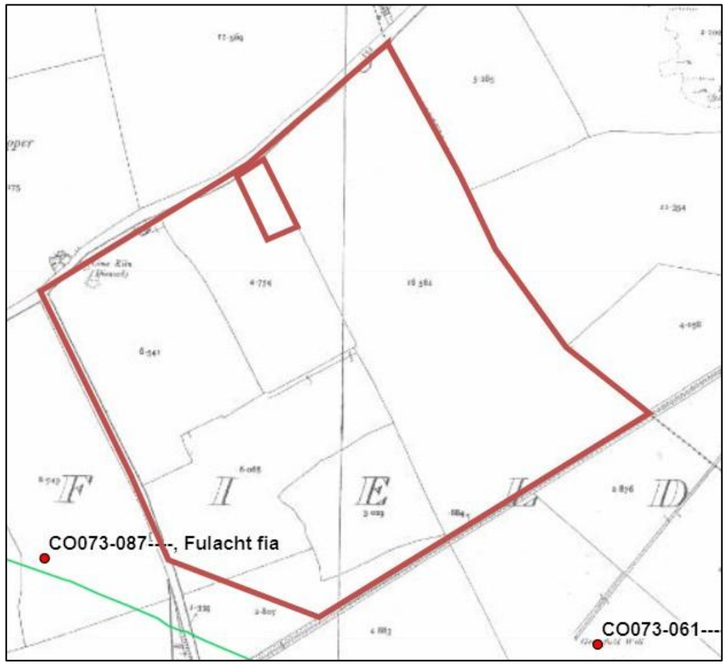

Figure 7: Extract from 25-inch map (1897-1903), showing development site in red (www.archaeology.ie)

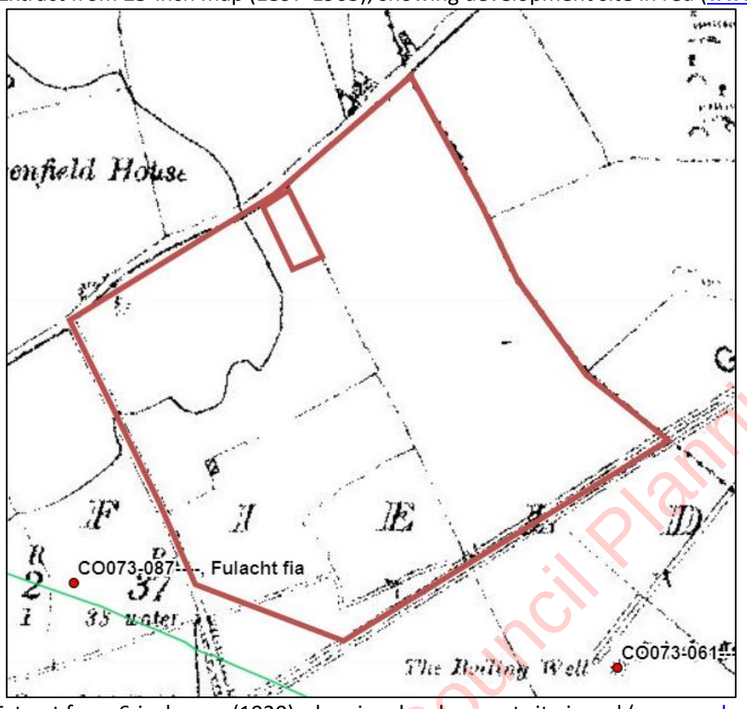

Figure 8: Extract from 6-inch map (1939), showing development site in red (www.archaeology.ie)

2.9 Aerial images from the end of the 20th century (Fig. 9) show the area of the proposed development as farmland. There are no signs of the Cork Macroom (Great Southern Railway) line. The small rectangular building shown on the 1939 OS map in the area of the outbuildings of Greenfield House is shown with modern farm buildings to its north and south. .

In the early 21st century (Fig. 3) the N22 Ballincollig bypass was constructed along the southwestern boundary of the proposed development site causing a consequential alteration in adjoining boundaries.

Figure 9: OSI aerial image (1996 to 2000 MapGenie)

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3 Geophysical Survey

3.1 The proposed development site was subject to geophysical survey in two separate phases; the first 2021 when the northern, eastern, southern and southwestern areas were surveyed under licence 21R0175 (Leigh 2021) and the second in 2024 when the northwestern area (Field 1) was surveyed under licence 24R0039 (Leigh 2024). In both cases, the areas were subject to detailed gradiometer survey with the aim of identifying and locating any responses of potential archaeological interest (*ibid*. and Leigh 2021). The survey in 2021 was carried out on a larger landholding of which the proposed development site forms the northern part, extending across four areas (Areas A, A1, and the larger parts of Areas D and E) (Fig. 10). At that time Field 1 was not available and this was surveyed in 2024 (Fig. 11).

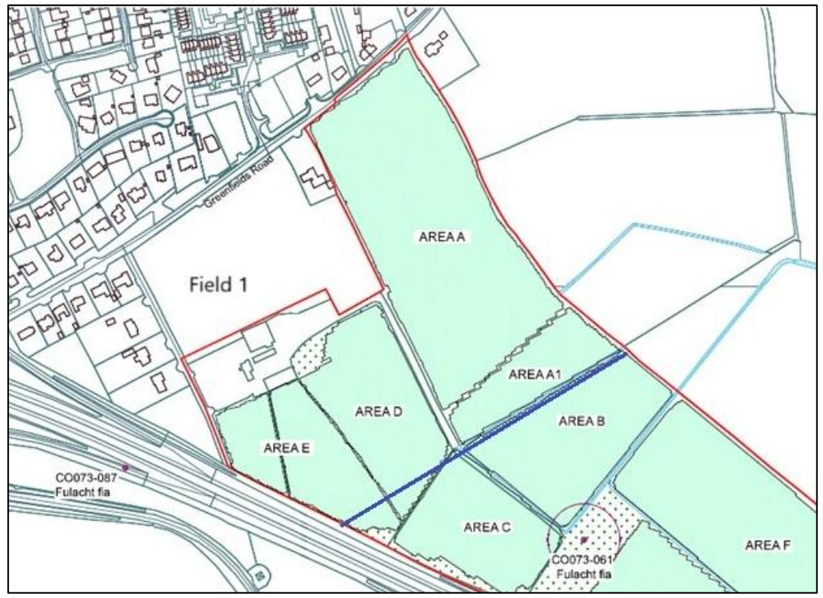

Figure 10: Land included in 2021 geophysical survey. Southeastern boundary shown in blue (Leigh 2021)

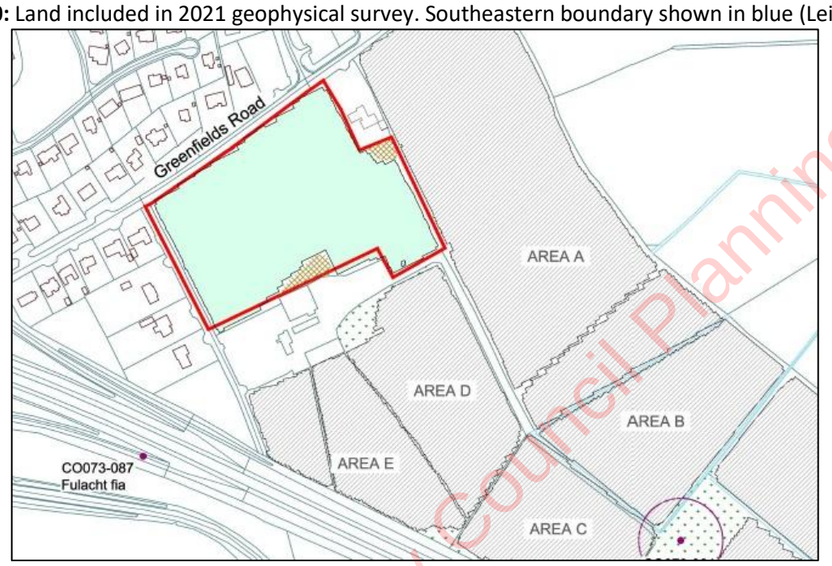

Figure 11: Field 1 included in 2024 geophysical survey (Leigh 2024)

3.2 The 2021 survey (Fig. 12) found that the area was dominated by modern magnetic disturbance, comprising amorphous spreads of modern magnetic material. The results are outlined below):

Areas A & A1

5.2 Several long linear trends (1) have been identified throughout Area A. While these may represent former ditched features such as field divisions, no clear pattern is evident, and they may equally represent natural variations in the subsoil. An archaeological interpretation is cautious. Further linear and curvilinear trends within Area A are not considered to be of archaeological potential.

5.3 A positive magnetic response (2) forms a linear pattern in the south-western corner of Area A. This may represent a short ditched feature. However, an archaeological interpretation is tentative given its proximity to the field boundary and the level of magnetic disturbance within this area.

5.4 Further isolated responses (3) are of potential interest, with a magnetic signature similar to pit-type features. However, no clear pattern is evident, and they may equally represent more deeply buried ferrous debris. An archaeological interpretation is cautious.

Area C

5.7 Fragmented ferrous responses (6) form a linear pattern in the north-western corner of the dataset. These appear to be a continuation of the Great Southern Railway Line (4) identified in Area B.

5.8 The remainder of Area C comprises substantial modern ferrous disturbance which may obscure more subtle archaeological remains.

Area D

5.9 Much of the south-eastern half of Area D is dominated by modern ferrous disturbance. This may be associated with the former railway line as its trajectory continued through this area.

5.10 An area of increased magnetic response (7) has been identified in the northern half of Area D. While it is possible that this may represent a spread of archaeological material, an archaeological interpretation is cautious given the level of magnetic disturbance within the dataset. It may equally represent more deeply buried ferrous debris.

5.11 A positive magnetic response (8) may represent a short ditched feature. It lies c. 20m south of (2) identified in Area A. An archaeological interpretation is tentative as this may equally represent more recent activity.

5.12 A clearly defined positive magnetic response (9) forms a linear pattern in the south-western half of Area D. The response is indicative of a ditched feature. It corresponds with the location of a former field boundary which is depicted on OS 6inch and 25inch mapping and most likely represents part of this field boundary.

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Area E

5.13 Area E is dominated by modern ferrous responses, particularly from the farm buildings to the north-west and the motorway to the south.

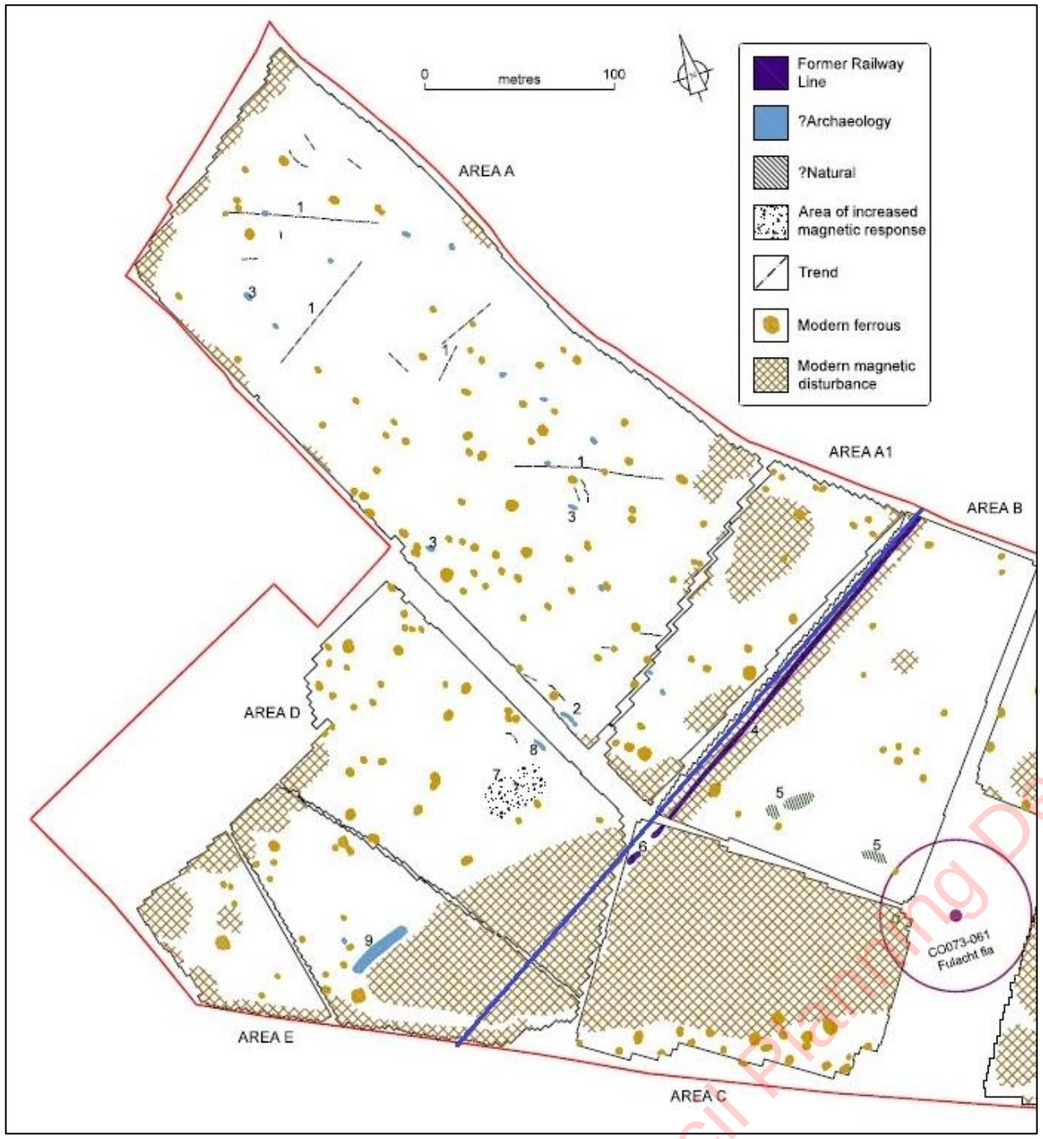

Figure 12: Interpretation of geophysical survey of Area A, A1, D and E (Leigh 2021)

3.3 The results of the 2024 survey of Field 1 (Leigh 2024) (Fig. 13) show a trend running south from Greenfields Road to the stables to the south which probably represents a former trackway. A number of curvilinear trends were noted but these had no clear pattern. The data was scattered with isolated responses which may represent pit type features or deeply buried ferrous material. Modern ferrous responses littered the data. The results are outlined below:

5.1 The data is dominated by modern ferrous responses. This somewhat obscures the data, although some responses of potential interest have been identified.

5.2 Running north to south through the data is a broad response (1) and linear trend (2). Although it is possible that this represents a broad archaeological trackway, it appears to lead from the road to the stables to the south. It is speculated that this is a more recent farm access trackway running through the field.

5.3 To the south of the probable trackway is a large area of magnetic disturbance (3). This results from the adjacent stable buildings and obscures the data here.

5.4 To the west of the probable trackway there is a short linear positive response (4) and trends (5). Although it is possible that this represents the remains of a rectilinear ditched feature, interpretation is cautious. An archaeological pattern is difficult to discern and the responses (4) and (5) may represent more recent field divisions. It is noted that these are not depicted on current or historic OSI mapping.

5.5 There are further curvilinear trends (6) elsewhere in the data. These are barely discernible in the data and have no clear pattern or form. It is speculated that these are natural in origin, reflecting variations in the sub-soil. No clear archaeological interpretation can be provided.

5.6 In the southeast of the data, there are a series of ferrous responses (7) forming a linear pattern. This results from temporary fencing and is not of archaeological interest.

5.7 Scattered throughout the dataset are numerous isolated responses (8). These have a magnetic signature similar to archaeological pit-type features. However, they have no clear pattern, and it is equally likely that they result from more deeply buried ferrous debris. There is no clear archaeological interpretation for these responses.

5.8 Further magnetic disturbance (9) is modern in origin. No archaeological interpretation within this disturbance can be provided.

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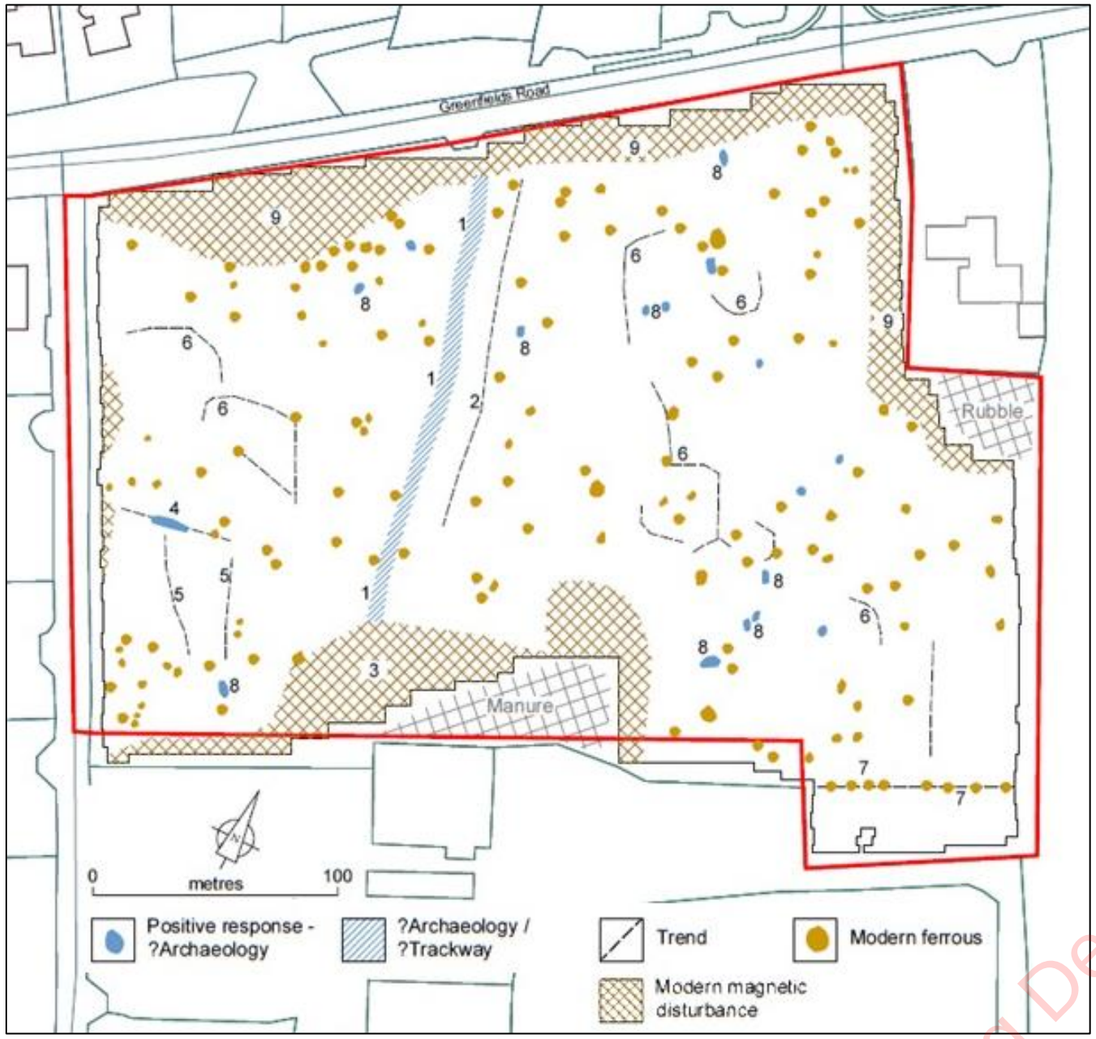

Figure 13: Interpretation of geophysical survey in Field 1 (Leigh 2024)

4 Archaeological Testing

4.1 Archaeological testing was carried out on the proposed development site on the 1st and 3rd of April 2025 in dry sunny weather under licence 24E0390. The trenches were laid out in such a way as to ensure that the anomalies identified in the geophysical survey were investigated and the layout was agreed with Cork City Archaeologist, Ciara Brett. The proposed development site remains largely as depicted on aerial images from the last decades (Fig. 3), subdivided into five fields. Field 1 to the northwest, is separated from the remainder of the land by hedgerows and buildings and Areas A/A1 and D are also separated by a dense hedgerow. Area A and A1 are separated by a post and wire fence and Areas D and E are largely open with the remains of a post and rail fence separating them.

Trenches 1 to 14 were excavated in Field 1, Trenches 15 to 23 were excavated in Areas A and A1 and Trenches 24 to 27 were excavated in Areas D and E (Figs. 14 and 15). One additional trench (Trench 28) was excavated a short distance east of the proposed development site in Area C, to assess if the modern fill in Trenches 26 and 27 extended into that area. All trenches were 2.2m wide. The results of the testing are presented in Table 3 below and Plates 1-35.

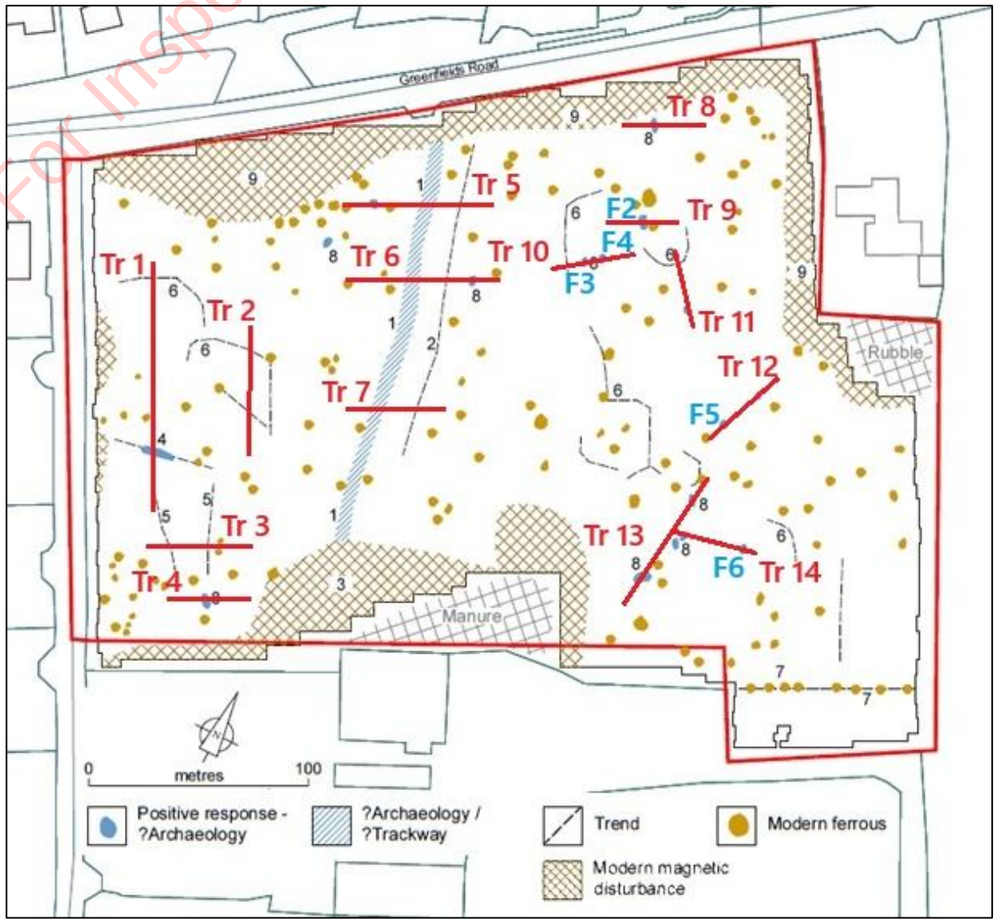

Figure 14: Trenches 1-14 excavated in Field, showing potential archaeological features in blue

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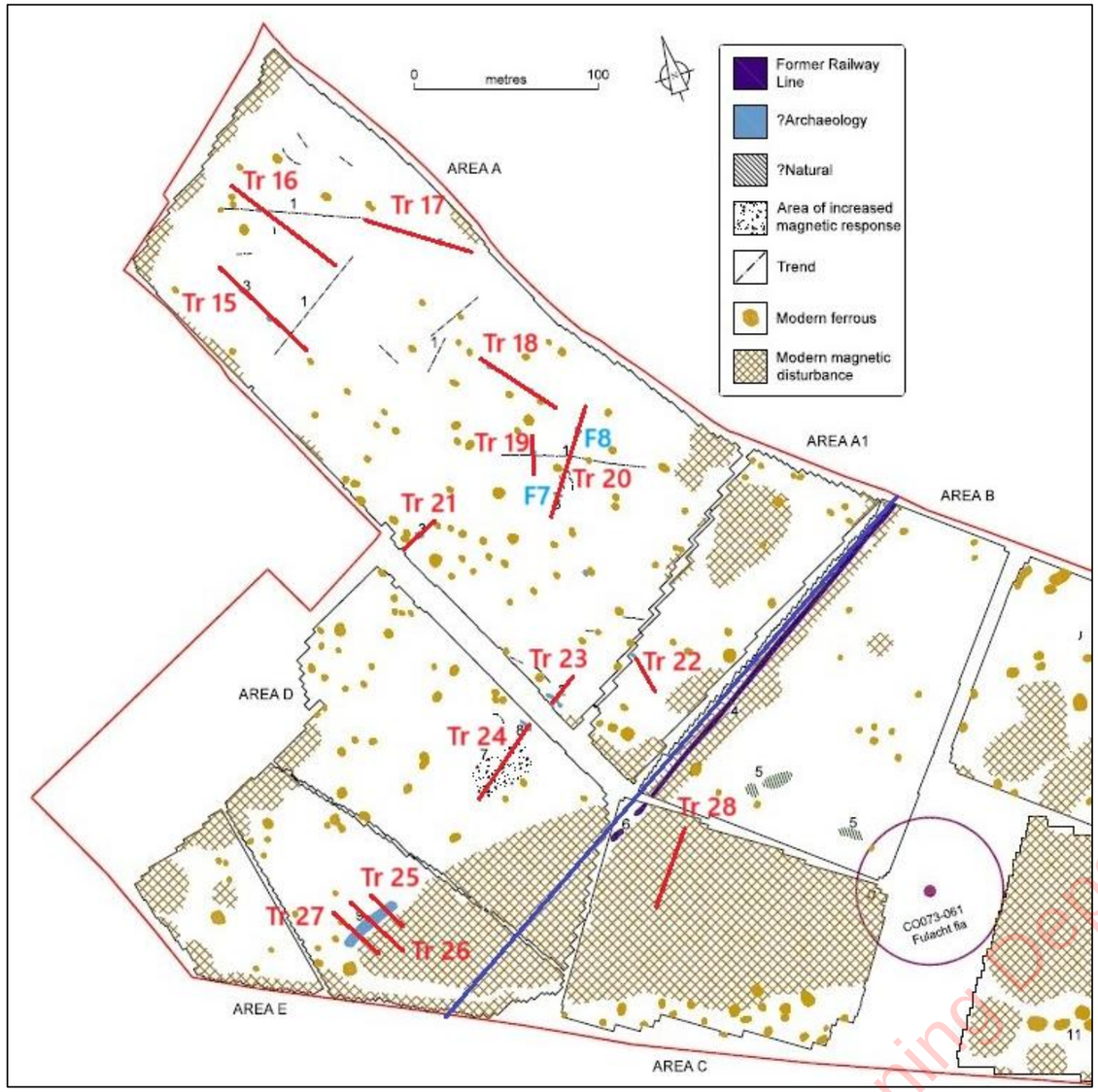

Figure 15: Trenches 15-28 excavated in Areas A, A1, C, D and E, showing potential archaeological features in blue

Trench No.	Description
Field 1	
Trench 1	69m long and oriented NS 0 – 0.17m Topsoil (F1) 0.17 – 0.4m Light orange-brown fine clay loam with very little stone. A patch of metaled surface approximately 1m wide corresponded with Anomaly 4. No features or finds of archaeological significance were identified in the trench.
Trench 2	33m long and oriented NS 0 – 0.18m Topsoil (F1) 0.18 – 0.4m Light orange-brown fine clay loam with very little stone. No features or finds of archaeological significance were identified in the trench.
Trench 3	26.8m long and oriented EW 0 – 0.19m Topsoil (F1) 0.19 – 0.4m Light orange-brown fine clay loam with very little stone. No features or finds of archaeological significance were identified in the trench.
Trench 4	24m long and oriented EW 0 – 0.18m Topsoil (F1) 0.18 – 0.4m Light orange-brown fine clay loam with very little stone. No features or finds of archaeological significance were identified in the trench.
Trench 5	43.4m long and oriented EW 0 – 0.16m Topsoil (F1) 0.16 – 0.38m Light orange-brown fine clay loam with very little stone. The level of the trench was raised at the west end due to the presence of a live water pipe. A band of stone at the west of the trench indicated its likely location. A modern stone trackway and hard standing adjacent to the field entrance corresponded with geophysical Anomaly 1. No features or finds of archaeological significance were identified in the trench.
Trench 6	40.3m long and oriented EW 0 – 0.22m Topsoil (F1) 0.22 – 0.4m Light orange-brown fine clay loam with very little stone. The level of the trench was raised at the west end due to the presence of a live water pipe. A modern stone trackway corresponded with geophysical Anomaly 1. No features or finds of archaeological significance were identified in the trench.
Trench 7	27m long and oriented EW 0 – 0.17m Topsoil (F1) 0.17 – 0.4 Light orange-brown fine clay loam with very little stone. The level of the trench was raised at the west end due to the presence of a live water pipe. A band of stone at the west of the trench indicated its likely location. A modern stone trackway corresponded with geophysical Anomaly 1. No features or finds of archaeological significance were identified in the trench.
Trench 8	20.5?m long and oriented EW 0 – 0.18m Topsoil (F1) 0.18 – 0.45 Light orange-brown fine clay loam with very little stone. A pocket of limestone and cobbles approximately 0.8m diameter, was identified towards the western end of the trench which broadly corresponded with Anomaly 8. No features or finds of archaeological significance were identified in the trench.
Trench 9	20.3m long and oriented EW 0 – 0.19m Topsoil (F1) 0.19 – 0.4 Light orange-brown fine clay loam with very little stone. A circular spread (F2) (0.95m diameter) was present in the centre of the trench, corresponding with the location of Anomaly 8. The trench was extended slightly to the south to expose its full extent. The spread was investigated by hand and contained an upper deposit 0.18m deep of mixed mid-brown and dark brown loose earthy clay with charcoal and frequent inclusions of broken, heat-cracked stone sitting on a lower deposit 0.02m deep (at maximum) of red-orange scorched/ oxidised clay. The excavated side sloped quite steeply to a fairly flat base. The feature appears to represent a roasting pit. No finds were identified.
Trench 10	22.5m long and oriented EW 0 – 0.18m Topsoil (F1) 0.18 – 0.38 Light orange-brown fine clay loam with very little stone. Two probable archaeological features were identified in the trench (F3 and F4). F3 was very similar to F2 in Trench 9. It was circular in plan (0.98m NS by 1.06m EW) defined by scorched oxidised red/orange clay with mixed mid and dark brown loose earthy clay inside. The feature was not further investigated, but it likely to be a roasting pit similar to F2. F4 was 4m east of F3 and extended into the northern trench edge. It was sub-circular in plan (1.06m EW by 0.9m NS) within the trench. A small section 0.15m wide was hand excavated across 0.6m of the feature from the eastern edge. The fill was mixed mid and dark brown soft silty clay with

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	charcoal inclusions. At a depth of 0.13m the fill became more stoney and the investigation ceased. The feature is probably also a roasting pit, although no sign of oxidised clay was apparent. Both features correspond to geophysical Anomaly 8.
Trench 11	21.5m long and oriented NS 0 – 0.17m Topsoil (F1) 0.17 – 0.4 Light orange-brown fine clay loam with very little stone. No features or finds of archaeological significance were identified in the trench.
Trench 12	26m long and oriented NE-SW 0 – 0.2m Topsoil (F1) 0.2 – 0.43 Light orange-brown fine clay loam with very little stone. A possible feature was identified at the SW end of the trench, which was poorly defined in the sunny conditions. The spread (F5) was soft mid-brown charcoal flecked silty clay approximately 0.8m diameter. It was investigated at the eastern edge and appeared to have a regular sloping side which appeared to be flattening into a base at a depth of approximately 0.18m. This corresponded to geophysical Anomaly 8.
Trench 13	41m long and oriented NE-SW 0 – 0.15m Topsoil (F1) 0.15 – 0.4 Light orange-brown fine clay loam with occasional limestone pieces and patches of limestone bedrock protruding. The bedrock broadly corresponds with Anomaly 8.
Trench 14	22m long and oriented EW 0 – 0.16m Topsoil (F1) 0.16 – 0.4 Light orange-brown fine clay loam with very little stone. A possible feature was identified at the eastern end of the trench (F6). This was a spread 1.06m diameter of dark brown very soft clay silt with roughly heat shattered and broken stone. It was investigated by hand and is 0.3m deep with a regular sloping side which appeared to be flattening into a base at approximately 0.3m depth. The feature corresponded with geophysical Anomaly 8.
Area A and A1	
Trench 15	59m long and oriented NNW SSE 0 – 0.17m Topsoil(F1) 0.17 – 0.38m Orange-brown loamy clay. No features or finds of archaeological significance were identified in the trench.
Trench 16	74m long and oriented NNW SSE 0 – 0.12m Topsoil (F1) 0.12 – 0.35m Orange-brown loamy clay with occasional stone and cobble, becoming more loamy at the NW end. No features or finds of archaeological significance were identified in the trench.
Trench 17	55m long and oriented NW SE 0 – 0.13 Topsoil (F1) 0.13 – 0.33m Orange-brown loamy clay with occasional stone and cobble. No features or finds of archaeological significance were identified in the trench.
Trench 18	55m long and oriented NNW SSE 0 – 0.16m Topsoil (F1) 0.16 – 0.37m Orange-brown loamy clay with occasional cobbles and pebbles. No features or finds of archaeological significance were identified in the trench.
Trench 19	19m long and oriented NE SW 0 – 0.17m Topsoil (F1) 0.17 – 0.38m Orange-brown loamy clay with occasional stone 0.38 – 0.4m Light brown-orange loamy clay with occasional stone. No features or finds of archaeological significance were identified in the trench.
Trench 20	61m long and oriented NE SW 0 – 0.13m Topsoil (F1) 0.13 – 0.38m Orange-brown loamy clay with pebbles.

	Several pockets of rooty disturbed material with charcoal and humicy material were present. Two possible archaeological features were identified one at each end of the trench both of which corresponded with geophysical Anomaly 3 (Leigh 2021). At the SW end a subcircular spread (F7) was identified (measuring 0.55m EW x 0.6m NS). It comprised mixed mid-brown slightly stoney clay silt with frequent charcoal. It was partially investigated by hand and was 0.16m deep with a gradually sloping side which appeared to be cut. At the NE end of the trench a similar feature (F8) (measuring 0.65m diameter x 0.2m deep) was identified. It was filled with dark brown charcoal rich silty clay with occasional stone. It was investigated by hand and had steeply sloping sides and quite a flat base and appeared to be bucket shaped in section.
Trench 21	25.3m long and oriented ENE WSW 0 – 0.17m Topsoil (F1) 0.17 – 0.4m Orange-brown loamy clay with occasional stone. Occasional shallow furrows were apparent measuring 0.2m wide and 0.04m deep. No features or finds of archaeological significance were identified in the trench.
Trench 22	26m long and oriented NS 0 – 0.14m Topsoil (F1) 0.14 – 0.35m Orange-brown loamy clay 0.35 – 0.45m Orange-grey loamy clay. No features or finds of archaeological significance were identified in the trench.
Trench 23	22.5m long and oriented ENE WSW 0 – 0.17m Topsoil (F1) 0.17 – 0.35m Orange-brown loamy clay 0.35 – 0.4m Brown-grey-orange loamy clay A drain 0.6m wide extended across the trench. No features or finds of archaeological significance were identified in the trench.
Areas D & E	
Trench 24	60m long and oriented ENE WSW 0 – 0.22m Topsoil (F1) 0.22 – 0.33 Grey-brown humicy clay with very little stone 0.33 – 0.4m Light grey-yellow clay with occasional stone. At least five drains extended across the trench, the largest of which was 0.6m wide and at least 0.4m deep filled with red brown humicy silt with stone. The drains were left *in situ*. No features or finds of archaeological significance were identified in the trench.
Trench 25	22m long and oriented NNW SSE 0 – 0.12m Topsoil (F1) 0.12 – 0.3 Grey-brown humic clay with infrequent small stones 0.33 – 0.44m Yellow-grey clay with some limestone in it. A modern stone filled drain 1.8m wide corresponded with Anomaly 9. The drain was not excavated but plastic and modern material was visible above it. A second smaller drain, 0.5m wide, was present to the south of it. No features or finds of archaeological significance were identified in the trench.
Trench 26	38m long and oriented NNW SSE 0 – 0.13m Topsoil (F1) 0.13 – 0.3 Grey-brown humicy clay with infrequent small stones 0.3 – 0.4m Yellow-grey clay. There was some humic clay and stoney patches in the trench and which was quite disturbed at the north. The modern stone filled drain in Trench 25 was visible here as well corresponded with Anomaly 9. To the SE of the drain there was a stoney mixed pink brown clay approximately 0.2m deep extending to the end of the trench. This appears to be fill brought onto the site to raise ground level in the early 2000s when the N22 Ballincollig bypass was built. No features or finds of archaeological significance were identified in the trench.

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Trench 27	37.8m long and oriented NNW SSE 0 – 0.13m Topsoil (F1) 0.13 – 0.27 Grey-brown humicy clay with infrequent small stones 0.27 – 0.37m Mixed grey and brown clay. 0.37 – 0.4m Grey-yellow clay cut by several shallow stone filled drains (one 0.3m wide and another 0.4m) and the larger drain corresponding with Anomaly 9. As in Trench 26 to the SE of the drain there was a stoney mixed pink brown clay approximately 0.2m deep extending to the south end of the trench. This material appears to be fill brought onto the site to raise ground level in the early 2000s when the N22 Ballincollig bypass was built. No features or finds of archaeological significance were identified in the trench.
Area C	
Trench 28	56m long and oriented NE SW 0 – 0.18m Topsoil (F1) 0.18m – 1m Light orange-brown stoney clay, very firm and hard packed. This appears to be fill brought onto the site in the early 2000s during construction of N22. 1m + Grey marly clay, slightly humic at the surface suggesting an old sod line. Little scraps of wood were noted in the marl. This appears to represent the original pre-fill ground level falling to the south towards the Maglin River valley. No features or finds of archaeological significance were identified in the trench.

Table 3: Details of test trenches excavated

Plates 1 & 2: Trench 1, looking south

Trench 2, looking south

Plates 3 & 4: Trench 3, looking east

Trench 4, looking east

Plates 5 & 6: Trench 5, looking east

Trench 6, looking east

Plates 7 & 8: Trench 7, looking east

Trench 8, looking east

Plates 9 & 10: Trench 9, looking west

F2 in Trench 9 half sectioned

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Plates 11 & 12: Trench 10, looking west

F3 Trench 10, looking W

Plates 13 & 14: Trench 10, F4 in foreground and F3 further west

Trench 11, looking N

Plates 15 & 16: Trench 12, looking e

Trench 12, F5, looking NE

Plates 17 & 18: Trench 13, looking north

Trench 14, looking E

Plates 19 & 20: Trench 14, F6, looking west

Trench 15, looking S

Plates 21 & 22: Trench 16, looking S

Trench 17, looking NW

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Plates 23 & 24: Trench 18, looking NW

Trench 19, looking SW

Plates 25 & 26: Trench 20, looking NE

F7, looking NE

Plates 27 & 28: F8, looking N

Trench 21, looking SW

Plates 29 & 30: Trench 22, looking N

Trench 23, looking SW

Plates 31 & 32: Trench 24, looking west

Trench 25, looking SE

Plates 33 & 34: Trench 26, looking NW

Trench 27, looking NW

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Plate 35: Trench 28, looking SW

4.2 Twenty seven trenches were excavated across the proposed development and one further to its east. Trenches 1-14 were excavated in Field 1 to the northwest of the proposed development site. The ground conditions across the field were quite similar; topsoil ranged in thickness from 0.16m to 0.22m and subsoil was fine clay loam with occasional limestone bedrock protruding to the southeast in Trench 13. Five features of archaeological significance were identified in the trenches (F2 – F6). All were relatively small (approximately 1m in diameter) and appeared to be pits (F5 and F6) or roasting pits (F2-F4). Limited hand excavation suggested these were deliberately cut pits containing charcoal-flecked fills while oxidised clay and burnt stone were found in some of the features. Each of the pits corresponded with Anomaly 8 (identified as positive responses) in the geophysical survey (Leigh 2024). Anomaly 8 comprised numerous isolated responses and these were interpreted as possible archaeological pit-type features or deeply buried ferrous debris (*ibid.*). Anomaly 8 was also investigated in Trenches 4, 5, 6, 8, 11 and 13 where it was found to be of no archaeological significance.

4.3 Trenches 15-23 excavated in Areas A and A1 at the northeast and east were quite similar. Topsoil was between 0.12m 0.17m deep above slightly stoney loamy clay. Two features of archaeological potential were identified in the area, both in Trench 20. Both were investigated by hand and appeared to be deliberately cut pits with charcoal rich fills. The two corresponded with Anomaly 3 identified as isolated responses in the geophysical survey (Leigh 2021). These were interpreted as possible archaeological pit-type features or deeply buried ferrous debris (*ibid.*). Anomaly 3 was also investigated in Trenches 15, 16, 17, 18, 19, 21 and 22 where it was of no archaeological significance.

4.4 Trenches 24-27 were excavated in Areas D and E. These areas were quite heavily disturbed, cut by numerous drains. At the southwestern end, close to the N22 a deposit of stoney clay was present which appeared to be fill brought onto the site to raise ground level in the early 2000s, when the N22 Ballincollig bypass was built. The fill was identified at the southeastern end of Trenches 26 and 27 where it was 0.2m deep. The geophysical survey suggested this was the edge of a large fill deposit which extended to the east. No features or finds of archaeological significance were identified in the area.

4.5 Trench 28 was excavated outside the proposed development site but within the larger landholding which was subject to geophysical survey (*ibid.*). Modern magnetic disturbance had been identified in the area in the survey. Trench 28 confirmed the presence of a substantial deposit of stoney clay fill corresponding with the magnetic disturbance. The fill appears to have been deposited on the original ground surface as traces of slightly humic material were identified at a depth of approximately 1m below the stoney clay and above grey marly clay subsoil. This appears to represent the original pre-fill ground level falling to the south towards the Maglin River valley.

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5 Conclusions

5.1 The proposed development site is located in Greenfield townland approximately 1.5km southwest of Ballincollig town. It lies on the southern side of Greenfields Road and extends to the N22 Ballincollig bypass which borders it to the southwest. A small local road extends along its western edge and it is bordered by agricultural land to the east and southeast. It is proposed to construct a Large-scale Residential Development on the proposed development site.

5.2 There are no recorded archaeological sites on the proposed development site. The closest recorded site is a fulacht fia (CO073-087) 110m to the west which was excavated in advance of the construction of the N22 in 2001 (Murphy 2001). There are 18 other recorded archaeological sites within a 1km radius of the proposed development site which date to as early as the Neolithic. Many of these sites were identified during works associated with the construction of the N22 Ballincollig Bypass to the south, southeast and southwest of the proposed development site.

5.3 Geophysical survey was carried out on the proposed development site and adjoining land in two phases in 2021 and in 2024 (Leigh 2021 and Leigh 2024). No significant archaeological deposits were identified in either survey but a number of isolated responses were identified and were interpreted as possible archaeological pit-type features or deeply buried ferrous debris - Anomaly 3 and Anomaly 8 (Leigh 2021 and Leigh 2024).

5.4 Twenty seven trenches were excavated across the proposed development and one further to its east. Seven features of archaeological significance were identified; five (F2- F6) in Field 1 and two (F7 and F8) in Area A. The five features in Field 1 were relatively small (approximately 1m diameter) and appear to be pits (F5 and F6) or roasting pits (F2-F4). Hand excavation indicated they were deliberately cut pits containing charcoal-flecked fills while there was oxidised clay and burnt stone in some of the features. Each of the pits corresponded with Anomaly 8 - identified as positive responses in the geophysical survey (Leigh 2024). Elsewhere Anomaly 8 was investigated in Trenches 4, 5, 6, 8, 11 and 13 where it was found to be of no archaeological significance.

The two features in Area A were both found in Trench 20. They were investigated by hand and appeared to be deliberately cut pits with charcoal-rich fills. Both corresponded with Anomaly 3 which was identified as isolated responses in the geophysical survey (Leigh 2021). Elsewhere Anomaly 3 was investigated in Trenches 15, 16, 17, 18, 19, 21 and 22 where it was found to be of no archaeological significance.

5.5 There was evidence of extensive disturbance in Areas D and E and further east of the proposed development site in Area C. These areas were cut by numerous drains and to the southwest close to the N22, a deposit of stoney clay appeared to be fill brought onto the site to raise ground level in the early 2000s during construction of the N22 Ballincollig bypass. The fill was identified at the southeastern end of Trenches 26 and 27 where it was 0.2m deep and it was 1m deep in Trench 28 further to the east. No features or finds of archaeological significance were identified in these areas.

5.6 Preservation by record, through archaeological excavation of the seven potential archaeological features is recommended, in advance of development. Preservation by record will require the excavation of the archaeological material; such material will be fully resolved to professional standards of archaeological practice (Policy Guidelines on Archaeological Excavation – Department of Arts, Heritage, Gaeltacht and the Islands). This work will be funded by the developer. Archaeological monitoring of topsoil removal during development is recommended. Archaeological monitoring at the southern end of the proposed development site, where there is evidence of previous ground disturbance, should be undertaken at the discretion of the monitoring archaeologist in consultation with Cork City Archaeologist.

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APPENDIX 9-3 Walkover Survey Photographs – Lane Purcell Archaeology

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Plate 1: Field 1, looking NE

Plate 2: Field 1, looking SE

Plate 3: Front elevation of house, looking east

Plate 4: Rear elevation of house, looking west

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Plate 5: Stables to the NE of the house

Plate 6: Area A, looking north

Plate 7: Area A, looking east with Ballincollig Castle visible in the distance

Plate 8: Area A1, looking northeast

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Plate 9: Area D, looking northwest

Plate 10: Area D, looking southwest

Plate 11: Area E, looking southeast

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CHAPTER TEN

NOISE & VIBRATION

APPENDIX 10-1 Acoustic Design Statement
APPENDIX 10-2 Glossary of acoustic terminology.

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APPENDIX 10-1 Acoustic Design Statement

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Appendix 10.1 Acoustic Design Statement

10. INTRODUCTION – OPERATIONAL PHASE ACOUSTIC DESIGN STATEMENT

The acoustic design statement (ADS) has been presented separately as it refers to the inward impact assessment of the residential properties within the development, rather than the outward impact assessment carried out in Section 10.8 of EIAR Chapter 12 Noise and Vibration**Error! Reference source not found.**. As discussed in Section 10.4.3 of EIAR Chapter 10 Noise and Vibration, an ADS is required for new residential developments as per the current Cork Agglomeration Noise Action Plan (NAP) 2024 – 2028.

This assessment relates to the residential units in the Large Scale Residential Development (LRD) at Greenfield, Ballincollig, Co. Cork.

10.1. STAGE 1 – NOISE RISK ASSESSMENT

10.1.1. Desk-based Study of Published Data

The key sources of available baseline data comprise published noise mapping studies undertaken by TII for road traffic noise which feed into the Cork Agglomeration NAP 2024 – 2028. The modelled noise maps are published on the EPA Geo Portal (EPA Maps) and include existing sources of major rail, road and aircraft noise within the Cork Agglomeration area. This information provides a useful strategic high-level overview of noise levels in the study area. The parameters presented in terms of the noise mapping are the L_{den} and L_{night} noise parameters which are both long-term noise indicators based on annual traffic and transport modes.

The Proposed Development site is within the noise mapping zone for road traffic noise, hence a review of published noise maps has been undertaken to establish the baseline road traffic noise across the development site.

Figure 10.1 and Figure 10.2 present the mapped existing noise levels across the development site for road traffic noise in terms of L_{den} and L_{night} respectively.

Making reference to the published noise maps, the Proposed Development lies within the < 55 to 70 dB L_{den} and <45 to 65 dB L_{night} noise contour zones, with the highest noise levels along the southern boundary of the Proposed Development overlooking the N22.

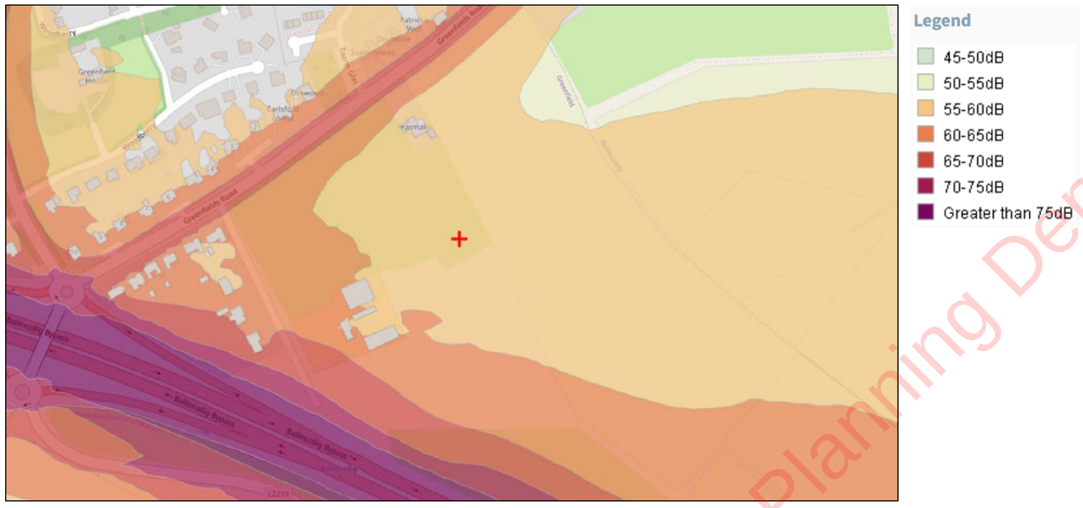

Figure 10.1 Road Traffic Noise L_{den} Noise Contours (Source: EPA)

Figure 10.2 Road Traffic Noise L_{night} Noise Contours (Source: EPA)

10.1.2. Baseline Noise Survey

Environmental noise surveys have previously been outlined in Section 10.6 of EIAR Chapter 10 Noise and Vibration. Daytime attended measurements across the site at 1.5m height range between 50 to 56 dB $L_{Aeq,\ 15\ mins}$. The unattended noise survey was located with a direct line of sight to the N22 to the south and approximately 30m from the road edge. On review of the measured data at 4m height, it is confirmed that the noise levels to the south of the site were as follows:

- Average daytime ambient noise level was 74 dB $L_{Aeq,16hr}$; and,
- Average night time ambient noise level was 68 dB $L_{Aeq,8hr}$.

Additionally, a review of L_{Amax} events has been undertaken for the night period. The measured data indicates that a noise level of 80 dB L_{Amax} is exceeded 20 no. times to the southern boundary of the site and 79 dB L_{Amax} is the most commonly occurring value.

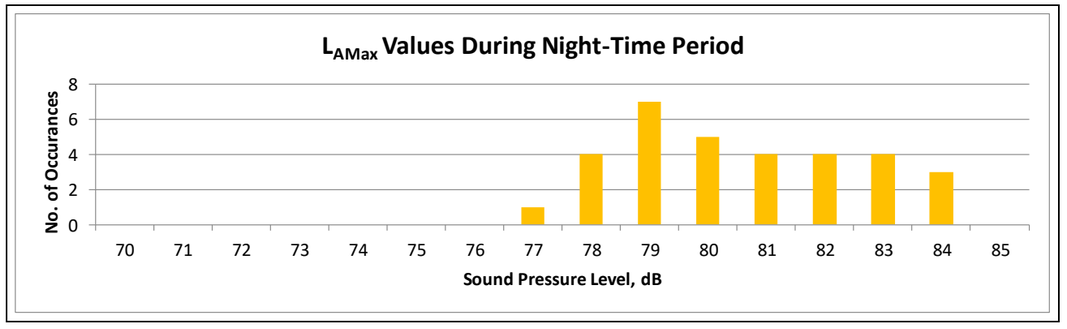

Figure 10.3 Number of dB L_{Amax} Events at Each Noise Level During the Night Period

10.1.3. Methodology

The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the site as a negligible, low, medium or high risk based on the pre-existing noise environment.

Paragraph 2.9 of ProPG states that:

> *"The noise risk assessment may be based on measurements or prediction (or a combination of both) as appropriate and should aim to describe noise levels over a "typical worst case" 24 hour day either now or in the foreseeable future."*

Figure 10.4 presents the basis of the initial noise risk assessment, it provides appropriate risk categories for a range of continuous noise levels either measured and/or predicted on site.

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NOISE RISK ASSESSMENT	POTENTIAL EFFECT WITHOUT NOISE MITIGATION	PRE-PLANNING APPLICATION ADVICE
Indicative Daytime Noise Levels $L_{Aeq,16hr}$ / Indicative Night-time Noise Levels $L_{Aeq,8hr}$ High 70 dB / 60 dB Medium 65 dB / 55 dB 60 dB / 50 dB Low 55 dB / 45 dB 50 dB / 40 dB Negligible	Increasing risk of adverse effect	High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice. As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development. At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.
	No adverse effect	These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.

Figure 1 Notes:

a. Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.

b. Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant".

c. $L_{Aeq,16hr}$ is for daytime 0700 – 2300, $L_{Aeq,8hr}$ is for night-time 2300 – 0700.

d. An indication that there may be more than 10 noise events at night (2300 – 0700) with $L_{Amax,F}$ > 60 dB means the site should not be regarded as negligible risk.

Figure 10.4 ProPG Initial Noise Risk Assessment

It should be noted that a site should not be considered a negligible risk if more than 10 L_{AFmax} events exceed 60 dB during the night period and the site should be considered a high risk if the L_{AFmax} events exceed 80 dB more than 20 times a night.

ProPG states the following with respect to the initial risk assessment:

> *"The risk assessment should not include the impact of any new or additional mitigation measures that may subsequently be included in development proposals for the site and proposed as part of a subsequent planning application. In other words, the risk assessment should include the acoustic effect of any existing site features that will remain (e.g. retained buildings, changes in ground level) and exclude the acoustic effect of any site features that will not remain (e.g. buildings to be demolished, fences and barriers to be removed) if development proceeds."*

In this instance there are buildings to the south of the site to be demolished that have not been considered in the initial noise model. The site topography is not expected to change significantly during construction.

In this instance a 3D computer noise model of the development site has been developed to predict the noise levels across the entire site in order to investigate the initial noise risk. Noise levels measured on site will be used to validate the model.

10.1.4. Noise Model

Noise levels recorded or calculated from the baseline noise survey were used to calibrate the noise model. It is considered that a strong correlation in respect of predicted noise levels has been achieved. Noise levels are calculated over daytime periods, (07:00 to 23:00 hrs) and night-time periods (23:00 to 07:00 hrs).

Table 10.1 details the results of the noise model predictions and compares them to the measured values at the survey location.

Location	Period	Measured (dB L_{Aeq})	Predicted in Model (dB L_{Aeq})
AT02	Day	55-56	56
UN01	Day	74	73
	Night	68	68

Table 10.1 Noise Model Validation

Figures 10.5 and 10.6 present the noise model output across the undeveloped site for noise levels during daytime and night-time periods.

Review of the predicted noise levels across the overall site, concludes the following:

Daytime: Within 60m of the site boundary to the south, the noise levels range between 70 to 75 dB $L_{Aeq,16hr}$ and therefore fall within the high noise risk categories. At distances greater than 60m, which is the majority of the site, the modelled noise levels range are between < 55 to 70 dB $L_{Aeq,16hr,}$ which fall within the low to medium noise risk categories.

Night-time: Within 150m of the site boundary to the south, the noise levels range between 60 to >70 dB $L_{Aeq,8hr}$ and therefore fall within the high noise risk categories. At distances greater than 150m the modelled noise levels range are between < 45 to 60 dB $L_{Aeq,8hr,}$ which fall within the low to medium noise risk categories.

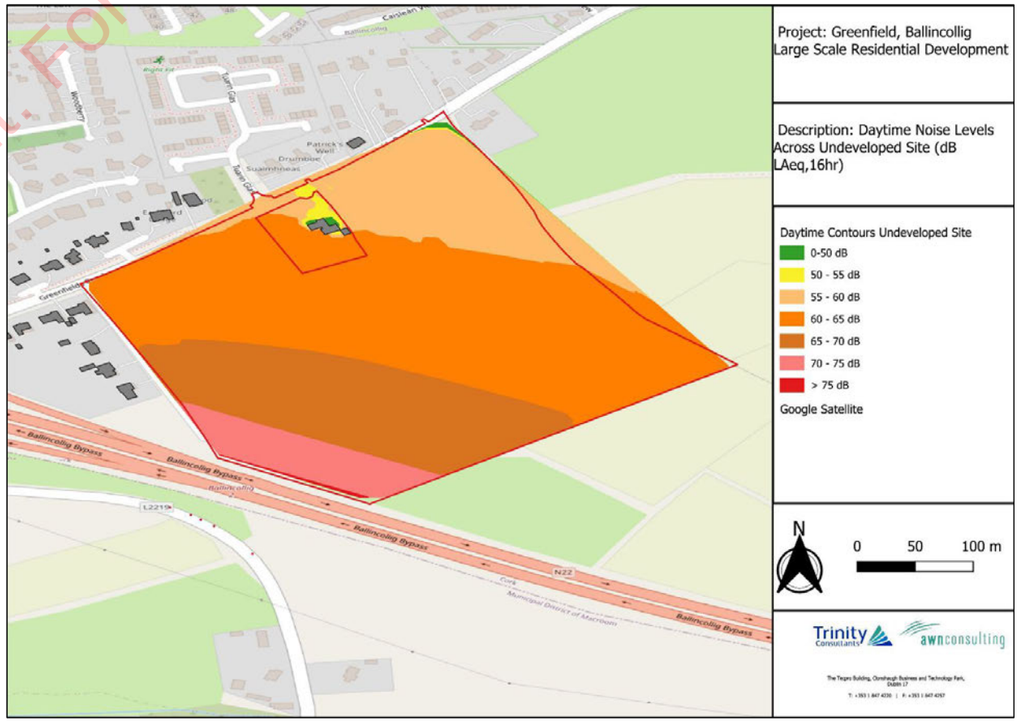

Figure 10.5 Daytime Noise Levels Across Undeveloped Site (dB $L_{Aeq,16hr}$)

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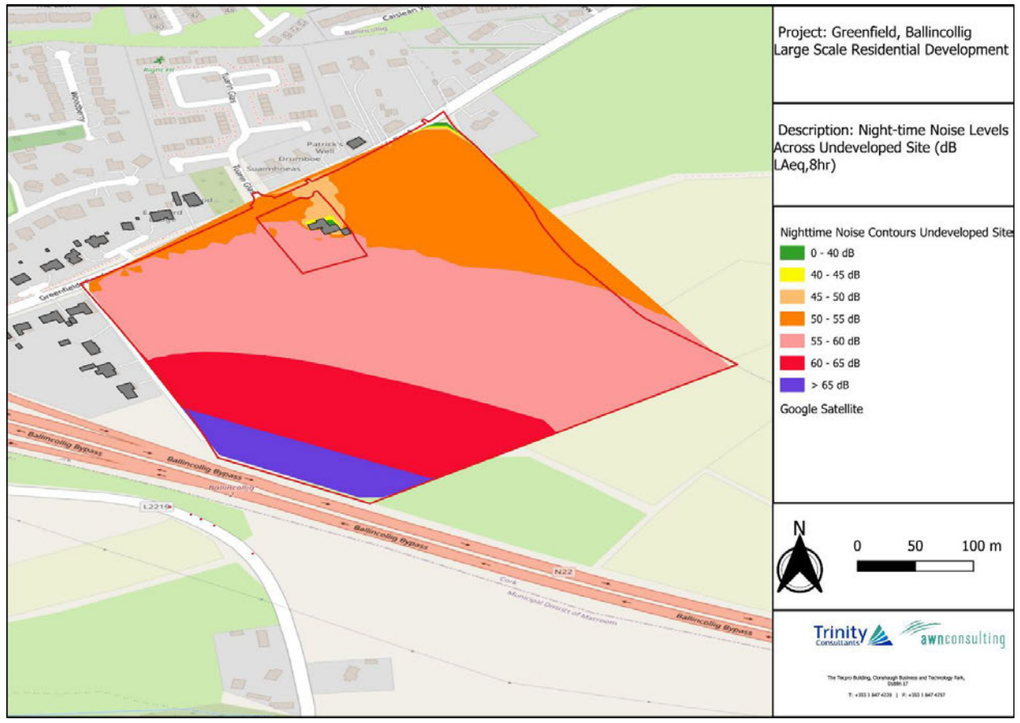

Figure 10.6 Night-time Noise Levels Across Undeveloped Site (dB $L_{Aeq,8hr}$)

10.1.4.2. Noise Risk Assessment Conclusion - Proposed Development

Giving consideration to the measured and predicted noise levels presented in the previous sections the site noise risk assessment has concluded that the level of risk across the site varies from low to medium to high noise risk depending on the proximity to the N22 Ballincollig Bypass to the south of the proposed development.

ProPG states the following with respect to low to high risks:

Low Risk At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.

Medium Risk As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.

High Risk High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice.

Given the above it can be concluded that the development site may be categorised as Low to High Risk, principally due to the noise levels within 150m of the southern boundary, and as such an Acoustic Design Strategy will be required to demonstrate that suitable care and attention has been applied in mitigating and minimising noise impact to such an extent that an adverse noise impact will be avoided in the final development.

It should be noted that ProPG states the following with regard to how the site noise risk assessment is to be used,

> *"2.12 It is important that the assessment of noise risk at a proposed residential development site is not the basis for the eventual recommendation to the decision maker. The recommended approach is intended to give the developer, the noise practitioner, and the decision maker an early indication of the likely initial suitability of the site for new residential development from a noise perspective and the extent of the acoustic issues that would be faced. Thus, a site considered to be high risk will be recognised as presenting more acoustic challenges than a site considered as low risk. A site considered as negligible risk is likely to be acceptable from a noise perspective and need not normally be delayed on noise grounds. A potentially problematical site will be flagged at the earliest possible stage, with an increasing risk indicating the increasing importance of good acoustic design."*

Therefore, following the guidance contained in ProPG does not preclude residential development on sites that are identified as having medium to high noise levels. It merely identifies the fact that a more considered approach will be required to ensure the developments on the higher risk sites are suitably designed to mitigate the noise levels. The primary goal of the approach outlined in ProPG is to ensure that the best possible acoustic outcome is achieved for a particular site.

10.2. Stage 2 – Full Acoustic Assessment

10.2.1. Element 1 – Good Acoustic Design Process

Based on the ProPG guidance, in practice, good acoustic design (GAD) should deliver the optimum acoustic design for a particular site without adversely affecting residential amenity or the quality of life of occupants or compromising other sustainable design objectives. It is important to note that ProPG specifically states that good acoustic design is not equivalent to overdesign or 'gold plating' of a new development but that it seeks to deliver the optimum acoustic environment for a given site.

Section 2.23 of the ProPG outlines the following checklist for Good Acoustic Design:

- Check the feasibility of relocating, or reducing noise levels from relevant sources;
- Consider options for planning the site or building layout;
- Consider the orientation of proposed building(s);
- Select construction types and methods for meeting building performance requirements;
- Assess the viability of alternative solutions; and
- Assess external amenity area noise.

In the context of the Proposed Development each of the considerations listed above have been addressed in the following subsections.

10.2.1.1. Application of GAD Process to Proposed Application

<u>Relocation or Reduction of Noise from Source</u>

The main noise sources are located outside the site boundary and, therefore, it is beyond the scope of this proposed development to introduce any noise mitigation at source.

<u>Planning, Layout and Orientation</u>

Consideration has been given to the location of both the buildings and external amenity areas. In the first instance, a primary consideration was to ensure that residential buildings are located as far as possible from the busy roads. Where this cannot be accommodated along the southern section (e.g. the semi-detached buildings' southern facades facing the N22 Ballincollig Bypass) a review for the need of boundary treatment e.g. noise barriers, and additional façade noise attenuation measures will be incorporated into the design.

The orientation of the site is such that the residential buildings themselves screen the rear private gardens and also many of the common external amenity areas associated with the development.

The higher buildings consisting of apartments and duplex units are set back further from the southern boundary and road traffic noise than the semi-detached buildings. There is a benefit of locating the higher buildings away from the road traffic noise source as some physical mitigation measures such as noise barriers would not be as effective along the southern boundary at receivers located higher than the first floor due to the physical constraints of a barrier height.

<u>Select Construction Types for Meeting Building Regulations</u>

A mixture of masonry, brick and timber insulated constructions will be used in the external walls of the proposed development. These construction types offers high levels of sound insulation performance. However, as is typically the case, the glazed elements and any required ventilation paths to achieve compliance with Part F of the Building Regulations will be the weakest elements in the façade in terms of sound insulation performance.

Consideration will therefore be given to the provision of upgraded glazing and acoustic ventilators, where required. For units where it will not be possible to achieve the desirable internal acoustic environments with windows open, the proposal here will be to provide dwelling units with glazed elements and ventilators that have good acoustic insulation properties so that when the windows are closed the noise levels internally are good. Inhabitants will be able to open the windows if they wish. However, doing so will increase the internal noise level. This approach to mitigation is supported in ProPG where it states the following (emphasis has been added in bold):

> *"2.22: Using fixed unopenable glazing for sound insulation purposes is generally unsatisfactory and should be avoided;* ***occupants generally prefer the ability to have control over the internal environment using openable windows, even if the acoustic conditions would be considered unsatisfactory when open****. Solely relying on sound insulation of the building envelope to achieve acceptable acoustic conditions in new residential development, when other methods could reduce the need for this approach, is not regarded as good acoustic design. Any reliance upon building envelope insulation with closed windows should be justified in supporting documents."*
>
> *"Note 5: Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded."*
>
> *"2.34: Where the LPA accepts that there is a justification that the internal target noise levels can only be practically achieved with windows closed, which may be the case in urban areas and at sites adjacent to transportation noise sources, special care must be taken to design the accommodation so that it provides good standards of acoustics, ventilation and thermal comfort without unduly compromising other aspects of the living environment. In such circumstances, internal noise levels can be assessed with windows closed but with any façade openings used to provide "whole dwelling ventilation" in accordance with Building Regulations Approved Document F (e.g. trickle ventilators) in the open position (see Supplementary Document 2). Furthermore, in this scenario the internal L_{Aeq} target noise levels should not generally be exceeded."*

It is very important to note that it is impractical to achieve the good internal noise levels with windows open across the vast majority of development sites in close proximity to major infrastructure such as roads. Such sites would need to be classified as having a negligible risk in accordance with the ProPG noise risk assessment approach. For this reason, there are no guidance documents either at a local level or an international level that AWN is aware of which would support the approach of achieving the ideal internal noise levels in the open window scenario. It is, therefore, considered entirely justifiable to provide

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building façades with a moderate degree of sound insulation, such that with windows closed but vents opened, a good internal acoustic environment is achieved.

Impact of Noise Control Measures on Fire, Health and Safety

The good acoustic design measures that have been proposed on site do not have any significant impact on other issues.

Assess Viability of Alternative Solutions

Due to the two storey height of the proposed buildings and their proximity to the N22, it is considered that specific boundary treatment along the southern boundary of the site to attenuate traffic noise would be effective in part and will be explored further as part of this Stage 2 assessment.

Assess External Amenity Area Noise

ProPG provides the following advice with regards to external noise levels for amenity areas in the development:

> *"The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$."*

Noise levels across external amenity areas associated with the development are presented in Section 10.2.3 of this Appendix.

Summary

Considering the constraints of the site, in so far as possible and without limiting the extent of the development area, the principles of GAD have been applied to the Proposed Development.

With regards to the external amenity areas across the development,

In terms of viable alternative solutions, considering specific boundary treatment to the southern site boundary along with acoustic treatment of façade elements (proprietary acoustic glazing and ventilation (if required)), will be considered as further options for mitigation.

10.2.2. Element 2 – Internal Noise Guidelines

10.2.2.1. Internal Noise Criteria

Element 2 of the ProPG document sets out recommended internal noise targets derived from BS8233:2014. The recommended indoor ambient noise levels are set out previously in Table 10.7 of Chapter 10 of this EIAR and reproduced below for reference.

Activity	Location	Internal Noise Design Range dB $L_{Aeq,T}$	Derived External Levels dB $L_{Aeq,T}$
Residential Day	Living room	35	50
	Dining room/area	40	55
	Bedroom	35	50
Residential Night	Living room	35	50
	Dining room/area	40	55
	Bedroom	30	45

Table 10.2 Internal Noise Design Range for Residential Buildings (BS 8233:2014)

In addition to these absolute internal noise levels, ProPG provides guidance on flexibility of these internal noise level targets. For instance, in cases where the development is considered necessary or desirable, and noise levels exceed the external noise guidelines, then a relaxation of the internal L_{Aeq} values by up to 5 dB can still provide reasonable internal conditions.

In terms of the ventilation strategy, it is understood that the air supply will be via mechanical ventilation (MVHR) which typically provides a sound insulation performance substantially improved over passive in-frame or wall vents.

In order to assess the requirements for achievement of acceptable internal noise levels, appropriate specifications to the site boundary treatment should be considered along with appropriate acoustic specifications to windows and mechanical vents will be provided to ensure the rooms are adequately ventilated and achieve the good internal noise levels detailed here.

10.2.2.2. Proposed Boundary Treatment

Review of calculated noise levels across the site indicate that mitigation should be included along the southern site boundary to provide screening to two storey houses (Ref: B2.5) overlooking the N22 to the south. The inclusion of a 2.5m high boundary solid screen (either by use of walls, proprietary timber noise barrier, earth berms or a combination of these elements, once a 2.5m height from existing topography to top of barrier is achieved) is recommended to the south of the two storey houses in order to reduce road traffic noise levels at ground to second floor windows. Figure 10.7 illustrates the location of the proposed boundary screening to the south of the site.

If a timber noise barrier is being used – it must achieve a minimum acoustic design requirement – see below.

- All noise barriers shall have a minimum insulation performance of B3 as classified in I.S. EN 1793-2.
- Blockwork or concrete walls will automatically achieve this requirement as standard.

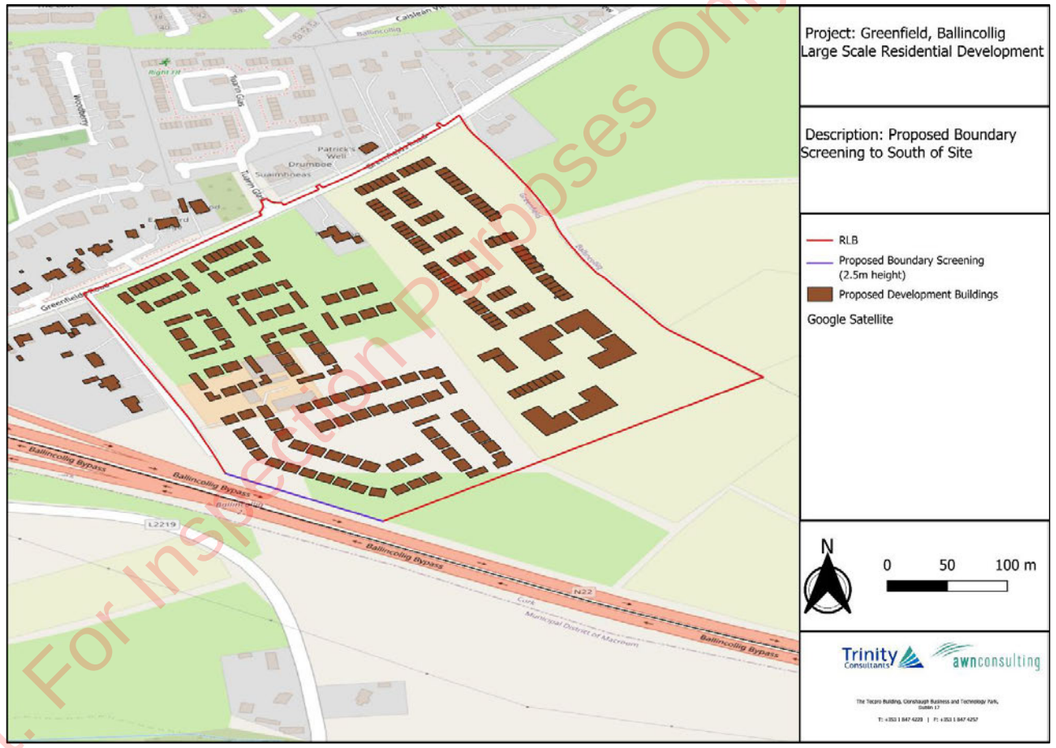

Figure 10.7 Proposed Boundary Treatment to South of the Site

10.2.2.3. Noise Levels Across Proposed Development Based on Modelled Noise Results

As demonstrated in Section 10.1.4 of this Appendix, the current potential impact in relation to noise across the site is categorised as low to high noise risk depending on the proximity of distance from the N22 to the south of the proposed site boundary.

Façade Noise Levels

The proposed site layout including mitigation in the form of 2.5m height boundary treatment to the south of the site boundary have been modelled to determine the calculated noise levels at the facades of the development buildings. These are presented in Figure 10.8 and 10.9 for daytime and night-time, respectively.

Where façade noise levels are less than 55 dB $L_{Aeq,16hr}$ during the day and 50 dB $L_{Aeq,8hr}$ at night it is possible to achieve reasonable internal noise levels while also ventilating the dwellings with open windows. Therefore, for those properties where the façade noise levels are less than 55 dB $L_{Aeq,16hr}$ during the day and 50 dB $L_{Aeq,8hr}$ at night no further mitigation is required i.e. across the majority of the site due to screening from buildings within the development itself.

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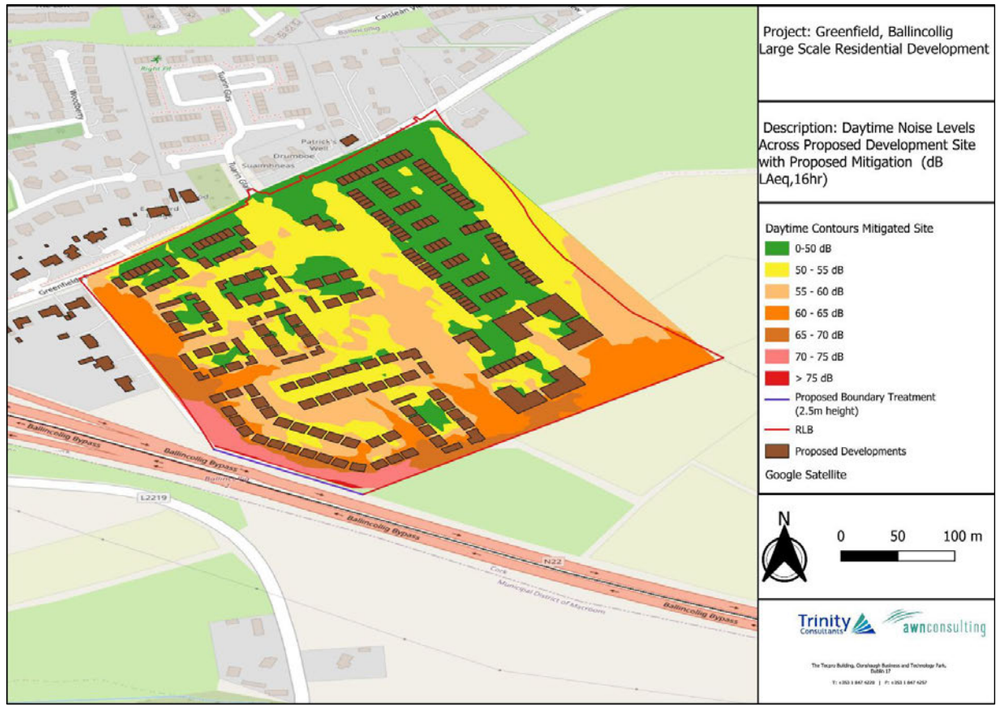

Figure 10.8 Daytime Noise Levels Across Proposed Development Site (4m contour) (dB $L_{Aeq,16hr}$)

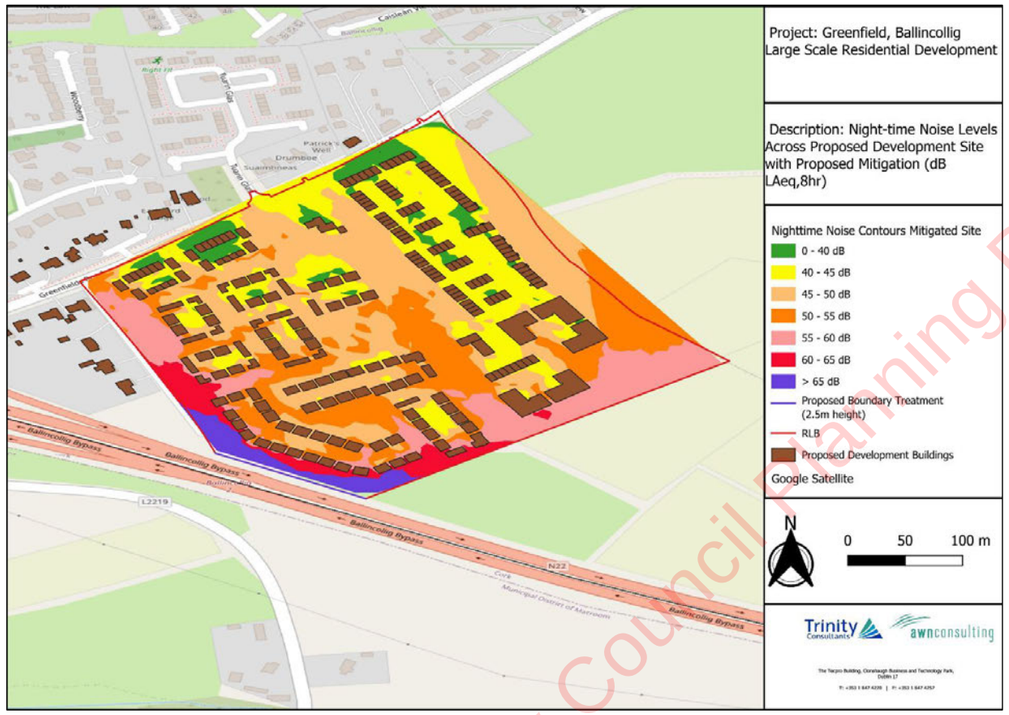

Figure 10.9 Night-time Noise Levels Across Proposed Development Site (4m contour) (dB $L_{Aeq,8hr}$)

Noise levels have been predicted across the development site at the most exposed buildings to the south and southeast within 150m of the N22, to determine the external façade noise level incident on the proposed buildings during day and night-time periods. Noise levels are calculated across all floors of the buildings in question.

Table 10.3 summarises the calculated noise level at the most exposed buildings. For houses and duplex buildings, results are presented for the highest floor level (2nd floor). For apartment buildings, the calculated levels from first to upper floors are included.

Assessment Building	Calculated Noise level, dB,	
	Daytime, $L_{Aeq,16hr}$	Night-time, $L_{Aeq,8hr}$
House Type A1.4	67	61
House Type B1.5	68	63
House Type B2.5	66-71	61-65
House Type B3.4	65	60
Duplex K.5 Block	65-68	60-62
Apartment Block 4	63	58
Apartment Block 5	62-64	57-58

Table 10.3 External Noise Levels

Highest noise levels are calculated at the two storey houses (House Type B2.5) along the south of the development site, representing the southern façade of these houses facing towards the N22 road. Noise levels of between 66 and 71dB $L_{Aeq,16hr}$ daytime and 61 to 65 dB $L_{Aeq,8hr}$ night-time are calculated at these properties.

At the remaining buildings to the southwest and southeast, daytime noise levels are between 62 and 68 dB $L_{Aeq,16hr}$ and night-time noise levels are between 57 to 63 dB $L_{Aeq,8hr}$.

10.2.2.4. Proposed Façade Treatment

The British Standard BS EN 12354-3: 2000: *Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 3: Airborne sound insulation against outdoor sound* provides a calculation methodology for determining the sound insulation performance of the external envelope of a building. The method is based on an elemental analysis of the building envelope and can take into account both the direct and flanking transmission paths.

The Standard allows the acoustic performance of the building to be assessed taking into account the following:

- Construction type of each element (i.e. windows, walls, etc.);
- Area of each element;
- Shape of the façade, and;
- Characteristics of the receiving room.

The principles outlined in BS EN 12354-3 are also referred to in BS8233 and Annex G of BS8233 provides a calculation method to determine the internal noise level within a building using the composite sound insulation performance calculated using the methods outlined in BS EN 12354-3. The methodology outlined in Annex G of BS8233 has been adopted here to determine the required performance of the building facades.

Glazing

As is the case in most buildings, the glazed elements of the building envelope are typically the weakest element from a sound insulation perspective. In this instance it has been calculated that the various facades are to be provided with standard double glazing that, when closed, achieves the recommended internal noise criteria.

Wall Construction

In general, all wall constructions (i.e. block work or concrete) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal. The calculated internal noise levels across the building façade have assumed a minimum sound reduction index of 54 dB R_w for this construction.

Ventilation

A mechanical heat recovery ventilation (MHRV) system is proposed for the development therefore there is no requirement to have windows open to achieve background ventilation requirements. A standard double glazing acoustic specification for windows shall be provided in this instance to ensure the rooms achieve good internal noise levels.

Mechanical ventilation systems typically offer a high performance in terms of preventing sound intrusion from external sources, consequently there is no assessment of the ventilation system required for this noise impact assessment.

Internal Noise Levels

Taking into account the 2.5m boundary treatment to the southern boundary of the site, external façade levels and the specified building envelope, the internal noise levels have been calculated. In all instances the good internal noise criteria are achieved for daytime and night-time periods with standard double glazing across the site.

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10.2.3. Element 3– External Amenity Area Noise Assessment

10.2.3.1. External Noise Levels

Figure 10.10 presents the calculated day time noise levels across the site with the development buildings and barrier treatment in place. The contours are calculated for a height of 1.5m.

External noise levels within the majority of the communal open spaces across the development site are within the recommended range of noise levels from ProPG of between 50 – 55 dB $L_{Aeq,16hr}$ as illustrated in Figure 10.10. The closest private rear gardens of the dwellings located to the south of the site are also below the 55 dB $L_{Aeq,16hr}$. It is considered that the objectives of achieving suitable external noise levels is achieved within the overall site, therefore no further mitigation is required to control external noise levels across amenity areas.

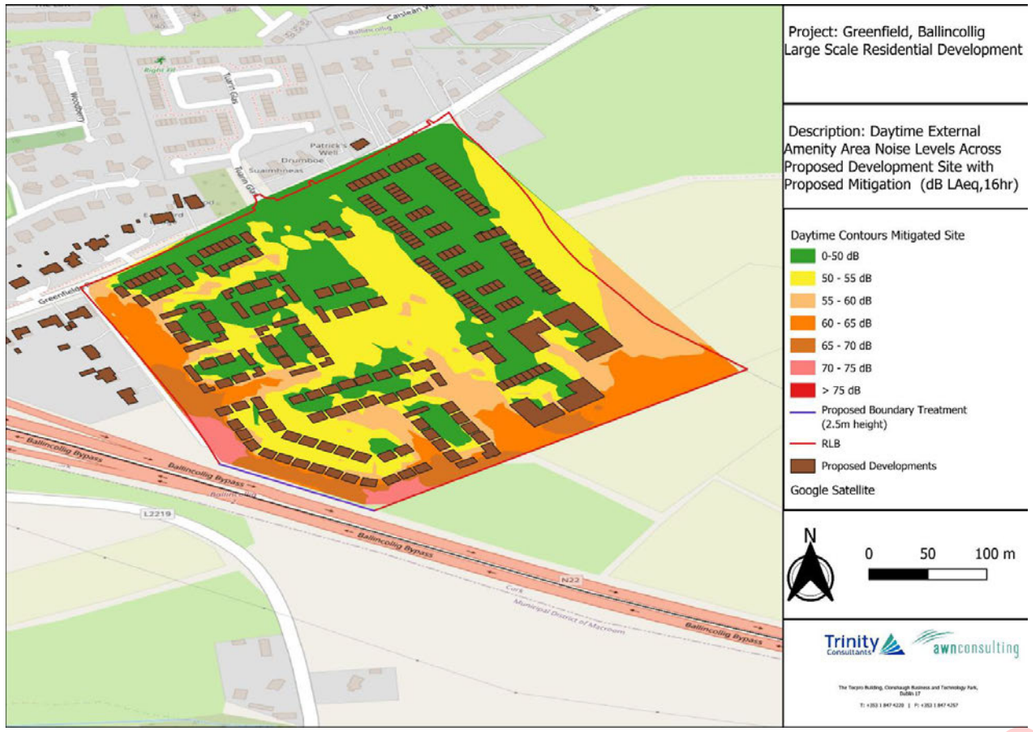

Figure 10.10 External Amenity daytime noise levels across proposed development site (1.5m contour) (dB $L_{Aeq,16hr}$)

10.2.4. Element 4– Assessment of Other Relevant Issues

Element 4 gives consideration to other factors that may prove pertinent to the assessment, these are defined in the document as:

- 4(i) compliance with relevant national and local policy;
- 4(ii) magnitude and extent of compliance with ProPG;
- 4(iii) likely occupants of the development;
- 4(iv) acoustic design v unintended adverse consequences; and
- 4(v) acoustic design v wider planning objectives.

Each is discussed in turn below.

10.2.4.1. Compliance with Relevant National and Local Policy

There are no National policy documents relating to the acoustic design of residential dwellings. Locally the Cork Agglomeration Noise Action Plan 2024 – 2028 specifies that the guidance contained within ProPG should be used in assessing the noise impact on new residential developments.

This Acoustic Design Statement has been prepared in compliance with the requirements of ProPG and therefore complies with the requirements of local policy.

10.2.4.2. Magnitude and Extent of Compliance with ProPG

As discussed within this appendix, the following conclusion has been drawn with regards to the extent of compliance with ProPG:

- All dwellings as part of the development have been designed to achieve the good level of internal noise levels specified within ProPG. The two storey houses (B1.5 and B2.5) units to the immediate southern boundary of the site and duplexes (K.5 Block) to the southeast of the site, overlooking the N22 and that have southern façade facing bedrooms will require closed windows to achieve this level i.e. at the closest facades facing onto the dominant N22 road external to the site.
- External amenity areas have been assessed and calculated and they comply with the recommended criterion set out in ProPG.

Based on the preceding, it is concluded that the proposed development is in compliance with the requirements of ProPG.

10.2.4.3. Likely Occupants of the Development

The criteria adopted as part of this assessment are based on those recommended for permanent dwellings and are, therefore, considered robust and appropriate for the likely occupants.

Acoustic Design v Unintended Adverse Consequences

Unintended adverse consequences did not occur in relation to this proposed development.

Acoustic Design v Wider Planning Objectives

There are no wider planning objectives that affect the acoustic design that are apparent at the time of writing.

10.2.5. Acoustic Design Statement Conclusion

An initial site noise risk assessment has been carried out in respect of the proposed development. The assessment has classified the site as having 'low to high' noise risk. This was determined through on site noise monitoring.

Further discussion is presented in terms of the likely noise impact of both the external and internal areas of the proposed development. It is necessary to provide a suitable 2.5m site boundary treatment to the immediate southern boundary of the proposed site but it is not necessary to provide enhanced acoustic glazing beyond standard double glazing to ensure that, when windows are closed, the internal noise environment is good. The noise level internally with the windows open will be higher than ideal at the southern facing bedrooms at the units to the immediate southern boundary of the site, overlooking the N22. However, inhabitants will have the option to close the window to reduce the noise level internally with mechanical ventilation.

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APPENDIX 10-2 Glossary of acoustic terminology.

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Appendix 10.2 Glossary of Acoustic Terminology

Ambient noise	The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far.
Background noise	The steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T ($L_{AF90,T}$).
dB	Decibel - The scale in which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the RMS pressure of the sound field and the reference pressure of 20 micro-pascals (20 μPa).
dB(A)	An 'A-weighted decibel' - a measure of the overall noise level of sound across the audible frequency range (20 Hz – 20 kHz) with A-frequency weighting (i.e. 'A'-weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
$D_{n,e,w}$	Weighted element-normalized level difference. This is the value of sound insulation performance of a ventilator measured under laboratory conditions. It is a weighted single figure index that is derived from values of sound insulation across a defined frequency spectrum. Technical literature for acoustic ventilators typically presents sound insulation data in terms of the $D_{n,e,w}$ parameter.
Hertz (Hz)	The unit of sound frequency in cycles per second.
$L_{Aeq,T}$	This is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T).The closer the L_{Aeq} value is to either the L_{AF10} or L_{AF90} value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources such as traffic on the background.
L_{AFN}	The A-weighted noise level exceeded for N% of the sampling interval. Measured using the "Fast" time weighting.
L_{AF90}	Refers to those A-weighted noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to estimate a background level. Measured using the "Fast" time weighting.
L_{AF10}	Refers to those A-weighted noise levels in the upper 10 percentile of the sampling interval; it is the level which is exceeded for 10% of the measurement period. It is typically representative of traffic noise levels. Measured using the "Fast" time weighting.
L_{AFmax}	is the instantaneous fast time weighted maximum sound level measured during the sample period.
Octave band	A frequency interval, the upper limit of which is twice that of the lower limit. For example, the 1,000Hz octave band contains acoustical energy between 707Hz and 1,414Hz. The centre frequencies used for the designation of octave bands are defined in ISO and ANSI standards.
Noise Sensitive Location (NSL)	An dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.
R_w	Weighted Sound Reduction Index – This is the value of the sound insulation performance of a partition or element measured under laboratory conditions. It is a weighted single figure index that is derived from values of sound insulation across a defined frequency spectrum. Technical literature typically presents sound insulation data in terms of the R_w parameter.

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CHAPTER TWELVE

CLIMATE

APPENDIX 12-1 Scheme Sustainability & Climate Resilience Statement - DOSA Consulting Engineers

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APPENDIX 12-1 Scheme Sustainability & Climate Resilience Statement - DOSA Consulting Engineers

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DOSA

DENIS O'SULLIVAN & ASSOCIATES

CONSULTING ENGINEERS

RESIDENTIAL DEVELOPMENT AT GREENFIELD, BALLINCOLLIG, CORK

SCHEME SUSTAINABILITY & CLIMATE RESILIENCE STATEMENT

DATE 07/07/2025

REVISION 1

JOB NO. 6081

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DOCUMENT CONTROL

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PROJECT NUMBER: 6254

REVISION	DATE	FILE NAME: Residential Development At Greenfield, Ballincollig, CORK			
1	07.07.2025	DESCRIPTION: Scheme Sustainability & Climate Resilience Statement			
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		INITIAL	CC	LO'T	LO'T
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1 *Introduction*

This report provides information on the various buildings energy status and carbon dioxide emissions, the statutory compliance requirements and energy/CO2 reduction achievements based on the proposed construction specifications.

1.1 Site Location

The subject site (currently greenfield) is located within the Ballincollig town boundary. The site is a greenfield site characterised by its gently sloping topography. The site is directly bound on the north by the existing Greenfields Road and to the south by the Ballincollig Bypass (N22). The western lands are currently in agricultural use but are also zoned in the Current City Development Plan. A snapshot of the application boundary is outlined in Figure 1.1 below.

Figure 1.1 – Context Map (Source: Google Maps)

1.2 Proposed Development Description

A Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork. The proposed development consists of the demolition of an existing dwelling house and farmyard with associated agricultural buildings and the construction of a mixed-use residential development of 544 no. residential units consisting of 232 no. dwelling houses, 312 no. apartment/duplex units, a two storey creche facility, commercial/retail unit and all ancillary site development works. The proposed 232 no. dwelling houses will include 100 no. 4 bedroom detached/semi-detached dwelling houses, 124 no. 3 bedroom semi-detached/townhouse dwelling houses and 8 no. 2 bedroom townhouse units. The proposed 312 no. apartment/duplex units will include 61 no. 3 bedroom units, 171 no. 2 bedroom units and 80 no. 1 bedroom units, to be provided in 28 no. apartment/duplex buildings ranging in height from 3-4 storeys. One of the proposed apartment buildings (Block 3) will provide the ground floor commercial/retail unit.

Vehicular access to the proposed development will be via two entrances from Greenfields Road (L2216) with separate pedestrian/cycle connections also provided from Greenfields Road. Ancillary site works include the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex buildings, creche and commercial/retail unit, landscaping and servicing proposals including the upgrade of public footpaths/active travel infrastructure and water service infrastructure, 2 no. pedestrian crossings on Greenfields Road and the installation of a noise attenuation screen along the site's southern boundary.

The proposed development is highlighted in Figure 1.2.

Figure 1.2 – Proposed Development

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2 *Policy*

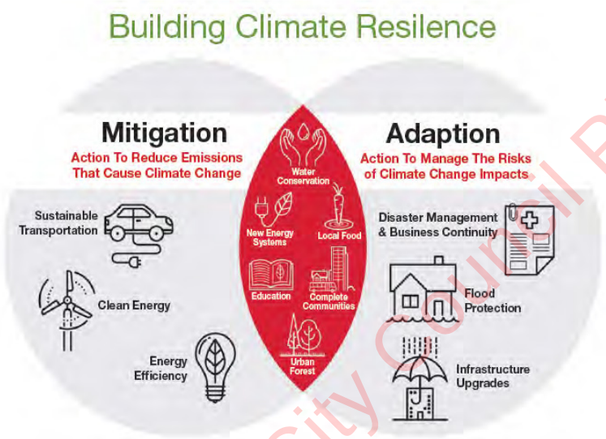
Compliance will be to new Part L 2022. Compliance to the above would deem the development and developments residential units to be "Nearly Zero Energy Buildings" (NZEB) in accordance to the EU Energy performance of Buildings Directive Recast 2013/31/EU. The Cork City Development Plan 2022-2028 refers to the below objectives to implemented as part of their policy:

2.1 Cork City Development Plan 2022-2028 (CDP), 'Climate and Environment'

2.1.1 Climate Resilience

Strategic Objective 4 (SO4) of the Cork City Development Plan 2022-2028 (CDP), 'Climate and Environment' confirms it is a strategic objective of Cork City Council to:

> *"To support transition to a low-carbon, climate-resilient and environmentally sustainable future. To support the circular economy. Cork City Council is committed to the implementation of measures to support the achievement of national policies and targets for climate mitigation, including the Government's policy under Ireland's Transition to a Low Carbon Energy Future 2015-30 and Climate Action Plan 2019, National Mitigation Plan, National Adaptation Framework: Planning for a Climate Resilient Ireland. At the time of preparation of this Plan, the Government agreed to advance the Climate Action and Low Carbon Development (Amendment) Bill 2021 to support Ireland's transition to Net Zero and achieve a climate neutral economy by 2050.*
>
> *Proposals for new development in Cork City will strive to reduce carbon footprints by carbon emission reductions, sustainable energy consumption, sustainable transport, use of renewable energy sources, green construction methods including passive solar design, and flood risk mitigation and adaptation and use of nature-based solutions, through design, layout, implementation and operation.*
>
> *A statement commensurate with the nature and scale of the development proposal will be required to accompany planning applications demonstrating how climate resilience has been considered and implemented at all stages in the development process.*



2.1.2 Energy Conservation and Efficency

CDP Objectives 5.1-5.24 of the CDP outlines the Planning Authority's objectives to achieve SO4[1]. These include.

- Objective 5.10 Energy Conservation and Efficiency

  'To support and help create high levels of energy conservation and energy efficiency in both new and existing buildings.'

- Objective 5.11 Energy Efficiency Considerations

  'New development proposals are expected to maximise energy efficiency through location, siting, orientation, layout, design, stormwater drainage and landscaping. This includes seeking to optimise energy efficiency through thermal insulation, passive ventilation and cooling and passive solar design.'

- Objective 5.24 Green and Blue Infrastructure

  a) *To support the strategic role that Green and Blue Infrastructure plays in facilitating a more climate resilient city.*

  b) *All development proposals will be expected to fully explore and incorporate Green and Blue Infrastructure as an integral component of the scheme.*

  c) *To support communities in the development of local scale Green and Blue Infrastructure projects.*

- Section 12.20 of the CDP, states that.

  'Development proposals in every zone must consider climate resilience from the design to implementation stages. This includes site selection, with a presumption in favour of Brownfield locations, sustainable mobility, reducing energy usage and emissions, use of renewable energy and technologies, climate change adaptation and mitigation measures including flood risk, landscaping including green infrastructure and biodiversity and use of green construction methods. Chapter 11 Placemaking and Managing Development provides further detail and development guidance.'

- SO 5 'Green and Blue Infrastructure, Open Space and Biodiversity' and SO 8 'Environmental Infrastructure' of the CDP also relate to delivery of a sustainable and climate resilient future Cork City aiming to.

  SO 5 - 'Manage and enhance green and blue infrastructure, to protect and promote biodiversity, ecology and habitat connectivity, protect natural areas, enhance landscape character and maritime heritage, and manage access to green and blue spaces that provide recreation, amenity and natural areas.'

  SO 8 - 'Ensure efficient and sustainable use of water services, enhance water quality and resource management. Manage waste generation and treatment and support the principles of the circular economy. Improve air quality and promote pro-active management of noise.

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Enable the sustainable delivery of digital infrastructure, renewable energy and environmental improvements.

2.1.3 Scheme Sustainability

Many of the CDP objectives which relate to climate resilience and the efficient usage of energy, resources and high-quality design, overlap with the principles of the provision of sustainable developments.

- CDP Objective 2.11 'Low Carbon City' aims to.

  Put in place mechanisms to support the delivery of a lower carbon, sustainable city where development avoids, mitigates and adapts to the effects of climate change while protecting and enhancing Cork City's environmental assets.

- Paragraphs 11.271–11.273 of the CDP outlines the requirements of 'Scheme Sustainability Statements' stating that.

  11.271. The built environment will play a key role in addressing climate change mitigation and adaptation and all development proposals will be encouraged to explore and incorporate climate action measures. Large scale development proposals will be expected to demonstrate how this has been taken forward through the evolution of the scheme by submitting a Scheme Sustainability Statement in support of the planning application(s).

  11.272. All planning applications involving developments of 25 or more homes or over 500sqm of commercial floorspace to be accompanied by a Scheme Sustainability Statement demonstrating how the proposal positively responds to the impact of climate change through mitigation and adaption measures. The Scheme Sustainability Statement is required, as a minimum to demonstrate how the following climate change mitigation and adaptation considerations inform the proposal:

  1) How the location, siting, layout, design and drainage proposals maximise climate adaptation opportunities;
  2) How the SUDS strategy integrates the four pillars of SUDS Design – water quantity, water quality, amenity and biodiversity;
  3) The use of green roofs other green infrastructure as a means of contributing towards sustainable urban drainage, improving biodiversity and influencing heat loss/gain from the building;
  4) Energy efficiency through thermal insulation, passive ventilation and cooling, passive solar design and any technologies used to help occupants better manage energy usage;
  5) The use of district, renewable and/or low-carbon energy supply opportunities;
  6) How the proposals at all stages embrace the Circular Economy approach in relation to waste management from construction through to the operation of the building(s);

  7) How noise and air pollution will be managed across all stages of development from construction through to operation of the building(s).

11.273. As part of the Scheme Sustainability Statement, applicants will be required to demonstrate how these considerations were explored and taken forward through the evolution of the development proposal and where they have not been taken forward, reasons are given as to why the measures were not technically feasible or viable. The level of information and commitments within the Statement should be proportionate to the scale and complexity of the development proposal.

2.2 Cork City Climate Action Plan 2024-2029

Ireland's Climate Action Plan 2023 (CAP 2023) aims to achieve the legally binding target of reducing national greenhouse gas emissions by 51% by the year 2030 and reaching net-zero by 2050. While these national targets are ambitious in themselves, the Cork City Climate Action Plan 2024–2029 (CAP) goes even further by seeking to reach net-zero by the year 2030. The CAP recognises that significant interventions are needed across all aspects of life and the economy to achieve the necessary decarbonisation of the city and realise the stated 2030 net-zero target. The 'Transport & Mobility' sector in particular is recognised as one of the areas which will need radical climate adaptation interventions in future years, with 'Road Transport' identified as the second largest emitter of greenhouse gases by sector in Cork City.

Emissions Breakdown by Sector for Cork City

Sector	CO_2-eq (ktonnes)
Household	332
Commercial Services & Industrial	216
Road Transport	290
Public Services	65
Agriculture, Land Use & Fishing	62
Waste	22
Total	**987**

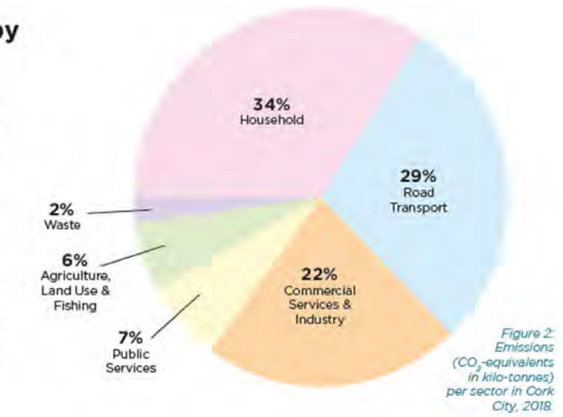

Figure 2: Emissions (CO_2-equivalents in kilo-tonnes) per sector in Cork City, 2018.

Emissions breakdown by Sector for Cork City

The CAP confirms that future growth of the city will need to be led by climate migration, climate proofing and climate adaption principles including sustainable transport, behavioral change and the provision of compact and sustainable settlement patterns. A central component in achieving these goals and reducing emissions will be the continued rollout of active-travel and public transport infrastructure in tandem with the delivery of new housing and communities.

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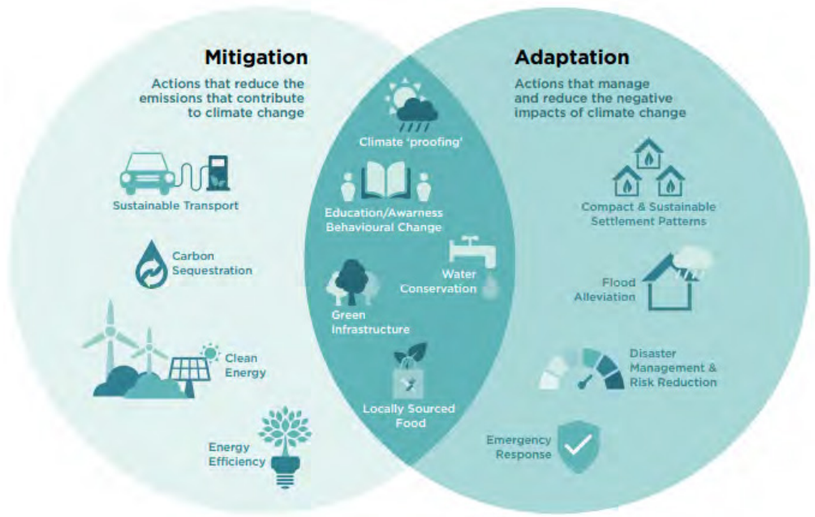
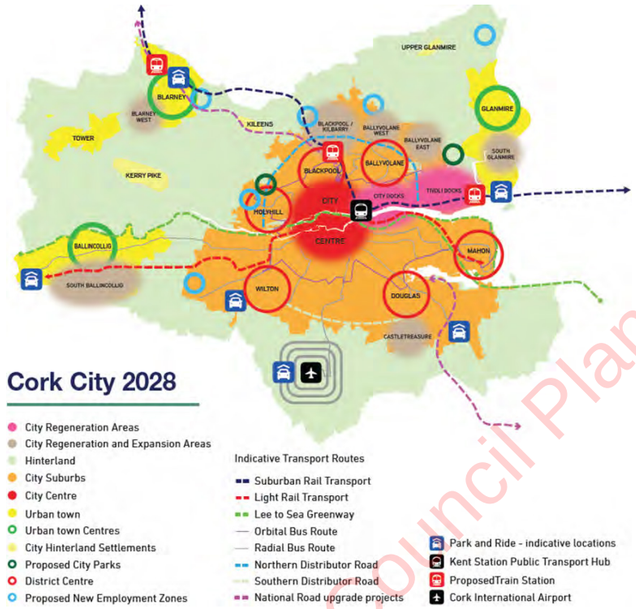


Climate Risk

The subject lands included within the South Ballincollig/Maglin Urban Expansion Regeneration Area (MUEA) as identified in the Core Strategy of the CDP. Section 2.47 of the CDP Core Strategy identifies the CUEA as one of 7 no. strategic consolidation and expansion areas in Cork City which will need to accommodate significant levels of housing and population growth during the lifetime of the CDP.



CDP Core Strategy

The CAP confirms in 'Planning for the Future', that the delivery of a '15-minute city and walkable neighbourhood' is envisaged for the MUEA. The CAP confirms that new communities at the CUEA will benefit from improved active-travel and public infrastructure opportunities, stating on Page 16 that.

> *'The core strategy endorses the concept of compact and liveable growth, incorporating the approaches of a 15-minute city and walkable neighbourhoods. These approaches will be applied in regeneration areas that include Ballincollig. These communities will be better connected by improved sustainable transport routes incorporating both public and active-travel options.'*

The CAP states of its 'Objectives for the Built Environment & Energy' expands further on the future vision for the CUEA confirming on Page 53 that.

> *'The City Development Plan 2022-2028 identifies expansion zones in..... South Ballincollig ..... Design and delivery of our land-use priorities will include compact growth for a 15-minute city, including in the city centre, where the service needs for residents are within easy reach on foot or by sustainable travel. These projects will be exemplars of how to integrate the full range of climate-relevant policy into the built environment.'*

The CAP outlines 129 actions that Cork City Council will follow to best achieve the ambitious climate action targets. These include Actions 3.1, 4.8, 4.11, 4.15 and 5.10 of CAP which aim respectively to.

> *3.1 – 'Deliver the framework plans for the expansion zones ..... South Ballincollig.... identified in the City Development Plan 2022-2028 as exemplary climate positive projects, through integration of approaches recommended in the Cork City GBI Strategy, Trees Strategy, and other good practices for sustainable development.*
>
> *4.8 – 'Support the delivery of enhanced public transport services in Cork City as envisaged under the Bus Connects Cork program of works. Promote climate action co-benefit opportunities and adherence to relevant planning and environmental protection requirements using local authority functions, as appropriate.*
>
> *4.11 – 'Accelerate the implementation of safe routes to school/cycle buses and greenways.'*
>
> *4.15 'Ensure all new developments prioritise walking and cycling integration with the surrounding land uses to minimise travel distances by foot/bike.'*
>
> *5.10 Incorporate sustainable urban development systems (SuDS), such as water-sensitive urban design (WSUD), in every new development in the city, as per Objective 9.4 of the Cork City Development Plan (2022-2028). Support delivery of this action through establishment of a cross-departmental SuDS working group to advise on implementation. Promote the adoption of nature based solutions/protection of biodiversity and avoidance of habitat fragmentation during SuDS projects.*

The implementation of these Actions into the Council's decision making and strategic approach to the future growth of the city will provide Cork City with its best chance of achieving the 2030 'net-zero' target identified in the CAP.

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3 *Sustainability Strategy Approach*

The sustainability vision for the Greenfields development is underpinned by an integrated *Sustainable and Energy Strategy* that embeds environmental responsibility and energy efficiency from the earliest stages of design. By aligning sustainable objectives with project deliverables, the strategy encourages early and ongoing collaboration between the Client and Design Team, ensuring the delivery of a best-in-class development that responds to both regulatory standards and long-term climate goals.

This strategic approach ensures compliance with and surpasses the requirements of *Building Regulations Part L 2022*, supports the objectives of the *Cork City Council Development Plan 2022–2028*, and aligns with the principles set out in the Government's *National Climate Change Policy*. A key objective is the reduction of carbon dioxide (CO_2) emissions, clearly demonstrating the Client's commitment to climate action.

To achieve these outcomes, the strategy incorporates a range of interconnected environmental and economic measures:

- Design Longevity and Passive Performance: The development will feature a flexible, future-proof design aimed at maximising its lifecycle. Passive design strategies, such as optimal façade orientation and enhanced building fabric (with U-values exceeding regulatory standards), will be employed to reduce energy demands. The design will also prioritise airtightness to achieve excellent air permeability performance.
- Daylighting and Visual Comfort: Natural daylight will be maximised in accordance with European, CIBSE, and BRE guidance. High-performance glazing will be used to improve visual comfort and support occupant well-being.
- Façade Optimisation: Advanced computer modelling will be used in collaboration with the project Architect to optimise façade design, enhancing daylight penetration, natural ventilation, and solar benefits specific to the site context.
- Whole-Site Sustainability: Sustainable practices will extend beyond the building envelope to encompass site-wide construction, commissioning, and handover processes, reinforcing environmental performance throughout the development lifecycle.
- Resource Efficiency – Reduce, Reuse, Recycle: Circular economy principles will be integrated across all project phases—design, construction, and operation—to minimise waste and environmental impact.
- Thermal Modelling and Climate Resilience: Dynamic Thermal and Energy Simulations will be conducted to ensure a low-carbon, low-energy design. Residential units will prioritise natural ventilation and undergo compliance assessments for overheating under Part L and long-term climate impacts using CIBSE 2020/2050 weather files.
- Energy Efficient Building Services: Mechanical and electrical systems will be designed to minimise energy use while maintaining high air quality. Measures include:
    - Efficient use of natural light to reduce artificial lighting;

    - Use of high-efficiency LED fittings with dimming, daylight sensing, and occupancy detection;
    - A Lighting Management Plan in common areas to reduce unnecessary energy use;
    - Elimination of fossil-fuel-based systems in favour of heat pumps and other low-carbon heating technologies;
    - Selection of Triple E-registered products to ensure high-performance, energy-efficient installations.
- Renewable Energy Integration: Where technically and economically feasible, renewable energy solutions will be incorporated, such as roof-mounted photovoltaic (PV) arrays and heat pump systems, to offset primary energy use and further reduce emissions.
- Building Energy Rating (BER) Target: All residential units will be designed to achieve an 'A-rated' BER, ensuring high energy efficiency and offering future residents predictable, low operating costs and environmental assurance. *(Refer to Sample BER Certificate below)*

Example BER Cert

- Water Conservation and Management: The development will include a water-efficient design, utilising low-flow sanitary appliances (e.g. dual-flush toilets, spray taps), leak detection linked to the Building Management System (BMS), and measures to reduce potable water consumption.

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- Sustainable Transport Infrastructure: The strategy encourages a modal shift away from private car usage by integrating access to public transport and active travel modes. EV charging infrastructure will be installed in accordance with Policy CAP27 and Part L 2022 to support the transition to electric vehicles.
- Material and System Lifecycle Optimisation: A whole life-cycle approach will inform the selection of building materials and plant. Embodied carbon will be reduced through the avoidance of heavy or high-carbon components, minimisation of mechanical systems where possible, and careful selection of materials with strong environmental credentials. Low-GWP refrigerants with minimal leakage rates will be used to mitigate environmental impacts.

Material Selection lifecycle

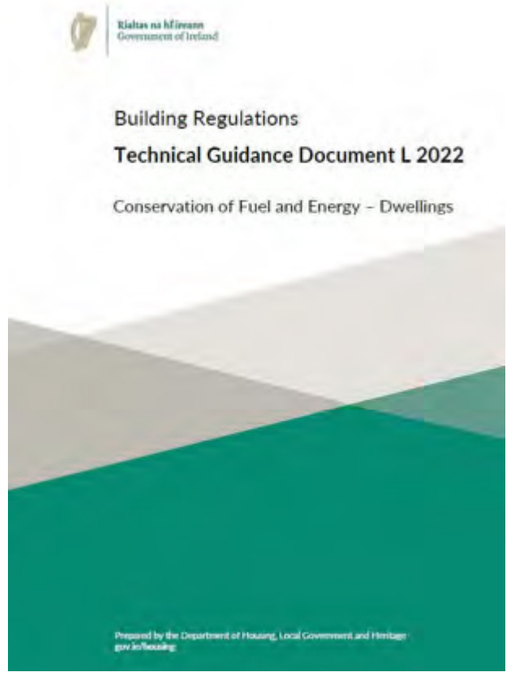
The additional investment required to deliver a sustainable design in line with the Cork City Development Plan 2022 – 2028 will add long term value for the building users. These benefits will require less energy due to the achievement of the Part L 2022 standards, less services and therefore less resources to operate than is required for existing developments. This will make the new apartments and houses more energy and environmentally efficient and will ensure that it is a more sustainable development into the future.

4 Renewable Energy

4.1 Introduction

This report outlines a preliminary design stage assessment for the proposed Greenfields residential development. The development consists of the delivery of new apartments and houses assessed under Part L 2022. A sustainable energy approach to buildings offers an opportunity to create environmentally sound and energy-efficient apartments and houses using an integrated design, planning and construction approach. Sustainable development promotes resource conservation of our limited natural resources, which includes energy efficiency, renewable energy, water conservation, waste minimisation and considers the environmental impact of the operation of an apartment/house building for its entire "life cycle".

The process to maximise the environmental performance of the proposed Greenfields development project is driven by a holistic and fully coordinated approach to achieve sustainable and flexible facilities. The apartments and houses are designed to exceed the provisions of the Building Regulations Part L 2022 (See Figure below) and will offer a sustainable and adaptable design to meet future provisions to these standards.



Building Design Standards Part L 2022

The strategy approach to the design of the facilities is firstly, where feasible, to maximise the passive measures of the apartments and houses (improved insulation, air tightness, solar gains, daylight, etc) and then apply the most efficient active measures (Heat Pumps, LED lighting controls and power density, etc). Only following this, can renewable technologies that are deemed environmentally and economically viable be applied.

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The following key elements will be included in the design parameters:

- Maximise the passive elements of the design (where feasible) in the first instance by:
    - Specifying building fabric insulation u-values better than the Part L 2022 standards applicable to new dwelling buildings.
    - Targeting the air permeability to be < $3m^3/(hr.m^2)$ @ 50Pa.
    - Using dynamic thermal modelling to optimise the façade design using differing glazing u- values, light transmittance and solar gain ('g' values).
    - Ensuring particular detailing of linear thermal bridging.
    - Ensuring the maximum number of spaces are naturally ventilated.
- Maximising the Active elements of the design by:
    - Specifying lighting designs that deliver > 90 lumen/ circuit watt
    - Specifying lighting systems with occupancy and daylight controls for the landlord areas.
    - High-efficiency Heating system using latest low carbon technology e.g. Exhaust Air Heat Pumps
    - Minimise the specific fan power where applicable.
- Utilise renewable technology to target the highest primary energy factor with technologies such as Solar PV, Heat Pumps, etc.

4.2 Renewable Options Considered

Therefore, the following renewable energy sources will be considered for the proposed development during the detailed design stages to assist in reducing the carbon footprint if deemed technically, environmentally, and economically feasible in line with Cork City Council 's (CCC) Development Plan 2022-2028 and climate action plan 2024-2029 CAP24

6254 - Scheme Sustainability & Climate Resilience Statement

Technology	Feasibility			Comments
	Low	Medium	High	
Ground Source Heat Pumps (GSHP) Closed Loop		✓		GSHP technology uses seasonal differences between ground and air temperatures to provide heating in winter and cooling in summer. GSHP provides low- temperature heating and high-temperature cooling suitable for underfloor heating or chilled beams. Site restrictions may be a consideration with vertical borehole being the most practical but also more capital-intensive. Impact on the Primary Energy Factor can be significant with Heat Pumps, but the additional capital and area requirement can be a constraint.
Air Source Heat Pump (ASHP)			✓	ASHP technology uses seasonal differences between external air temperatures and refrigerant temperatures to provide heating in winter and cooling in summer. As most of the energy is taken from the air, they produce less greenhouse gas than a conventional heating system over the heating season. Most efficient when used as a pre-heat mechanism as the COP remains high and therefore has a major impact on the energy efficiency criteria. ASHP can be utlised in conjunction with conventional heating systems such as boilers or standalone, as a centralised system to provide heating and hot water.
Combined Heat & Power (CHP)	✓			Combined heat and power (CHP) refer to the local simultaneous generation of electricity and heat. CHP works best in areas that have a constant "round the clock" heating demand. CHP systems typically run on oil or gas, with biomass also used. Key to a CHP installation is to ensure that the demand load for heating and electricity usage are utilized, i.e. to size the unit correctly on a base load. The objective of this development is to be low carbon user therefore it is not intended to use a CHP plant to run on natural gas.

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Solar Photovoltaic			✓	Solar PV collectors absorb the sun's energy to convert it into electricity. PV Panels can be discrete roof- mounted units or embedded in conventional facades, etc. The ideal location for locating PV systems is facing a southerly direction. Good impact from a Primary Energy perspective.
Solar Thermal		✓		Solar Thermal collectors absorb the sun's energy and provide energy for space heating and hot water generation. The ideal location for locating solar systems is facing a southerly direction. Solar thermal systems are usually designed to meet only a portion of the heating load. The available roof area is better utilised with Solar PV which provides are a greater impact to Primary Energy.
Biomass Heating	✓			Biomass boilers combust wood chips or pellets and are considered to have a very low carbon impact. The technology requires significant plant space and ongoing maintenance. The impact on the Primary Energy factor is not significant.
Small Scale Wind Power	✓			Micro wind turbines can be fitted to roofs but do not supply much energy. Full-scale turbines need open space and are capital-intensive but deliver large energy savings. There is considerable health and safety issues associated with wind turbines, especially in an urban environment. Good impact from a Primary Energy perspective.
District Heating	✓			A centralised district heating system is one where a common energy centre is used to provide heating/cooling to multiple buildings. Such a scheme works best when an input source of heat in the locality can be utilized, such as waste heat from a data centre or waste incinerator facility. Sharing the cost of the capital equipment and increasing diversity of use are the main advantages of this option. However, energy losses below and above ground, inflexibility surrounding billing options for tenants, inflexibility surrounding separate ownership of the building within the one scheme and plant space requirements must be considered. As the scheme is utilizing heat pump technology on an individual apartment basis the building will not be 'District Heating Enabled'.

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5 *Embodied Energy Impacts*

Embodied energy is the concept that the materials and processes involved in construction of a building consume vast amounts of energy and therefore emit carbon, which is also known as "Embodied Carbon". To date, embodied energy/carbon is not currently regulated in Ireland and focus has always been towards "Operational Energy" through the use of compliance with Part L of the Building Regulations.

However, the following points related to Embodied Carbon will be considered for the development:

- Reduce the weight of equipment. Specify products that can be demounted and reused. Specify products with long lifespans.
- Mitigate refrigerant impact through low refrigerant Global Warming Potential (GWP) and leakage rates.
- Plant that should be easily accessible for inspection, maintenance and replacement.
- Design with adaptation in mind.
- Less is more, design out MEP where feasible.
- Source local materials where possible.
- Source materials with an Environmental Product Declaration (EPD) where possible.

6 *Part L Energy Building Procedure*

The performance of buildings to achieve Part L compliance will be checked during the design stage using the most current DEAP methodology. To assess whether a building achieves the Part L performance, it is necessary to first calculate the performance of the building being designed using the DEAP software with the parameters from TGD Part L 2022 for domestic buildings. The Dwelling Energy Assessment Procedure (DEAP) is a software tool and manual which calculates energy consumption and carbon dioxide emissions. It considers space heating, ventilation, water heating, and lighting in a dwelling. The apartments and houses are being designed to incorporate the necessary specification details to achieve compliance with the NZEB Standard.

6.1 NZEB Definition

The definition for Nearly Zero Energy Buildings in the Energy performance in Buildings Directive (EPBD) is "a very high energy performance, as determined in accordance with Annex 1, The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby".

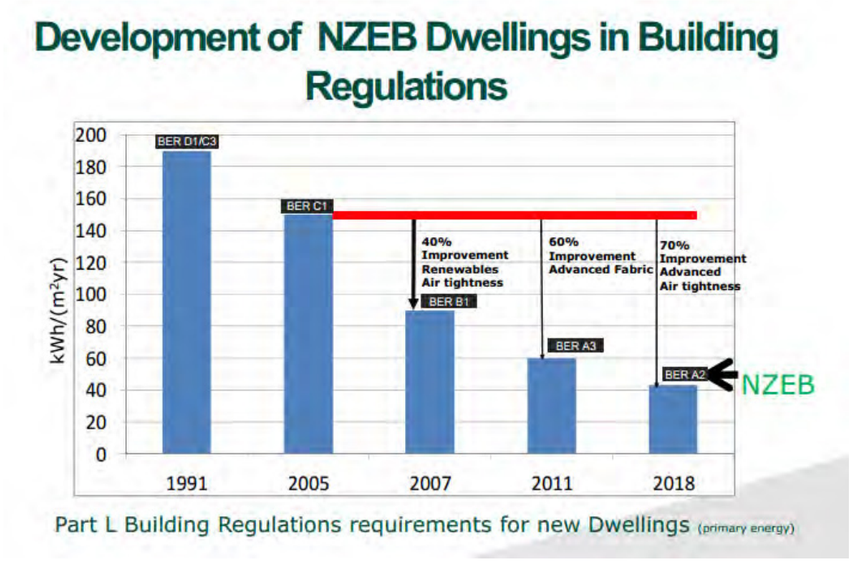
6.2 Requirements for Domestic Buildings

A full review of the public consultation, refer to Department of Housing, Planning and Local Government website has been completed for the building regulations and DEAP methodology.

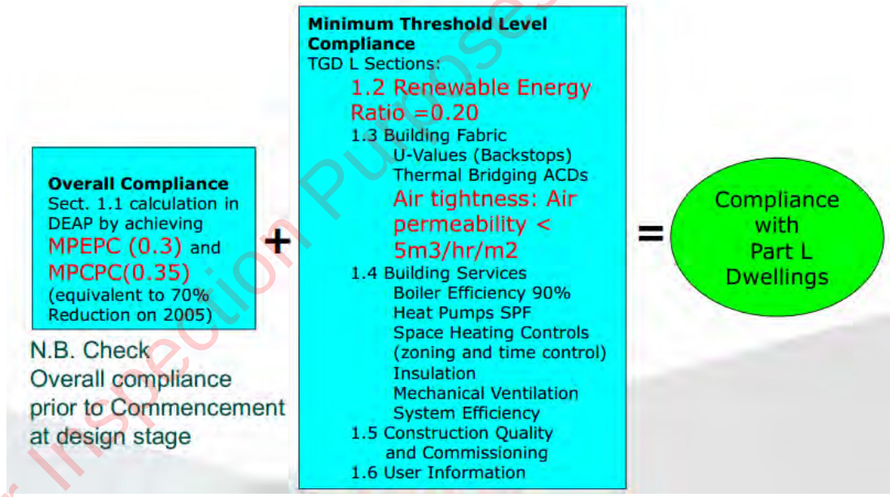
For this report the calculation data is based on residential Part L 2022 and covers the main compliance criteria;

- Primary Energy,
- Carbon dioxide,
- Renewable energy.

To comply to Part L the residential units require to achieve a primary energy reduction of 70% (0.30 MEPC factor), a carbon emission reduction of 65% (0.35 MCPC factor) and a 20% renewable energy contribution on a reference residential unit. This reference residential unit is identical to the actual proposed residential unit but applies pre-fixed Part L stipulated calculation parameters, U-values, insulation levels, boiler efficiency, controls etc.



6.3 Achieving Compliance with TDG L Dwellings 2019



Part L requires a new dwelling to make primary energy and carbon dioxide emission reductions on a reference dwelling by applying improved calculation parameters and technologies. Part L also requires the actual dwelling to provide at least 20% of its primary energy usage by means of renewable energy. The reference dwelling is exactly the same as the actual dwelling but uses fixed pre-set (by the SEAI) basic standard Part L calculation parameters, U-values / insulation levels, energy conversion efficiency, controls etc. to enable the actual dwelling to make substantial reductions. The reference dwelling has no renewable energy element.

6.3.1 DEAP Analysis

The Building Energy Rating has been calculated by Denis O'Sullivan & Associates (DOSA). The current BER is as per that indicated on the energy rating Sheet in the Appendices. All unit types will meet NZEB Compliance.

The analysis has been carried out on the latest SEAI software.

6.3.2 Report Structure

The Building Energy Rating has been calculated by DOSA Consulting Engineers. The current BERs for the various House Types are as per that indicated on the energy rating Sheet. The report is preliminary in nature and provides guidance based on design assumptions (pre design development). In detailed design the specifications will be updated and revised analysis carried out. For the purpose of this report only the house types have been analysed. The Duplex/Apartment Units will have a similar design approach and achieve minimum A3 ratings.

6.3.3 House Specification

- The typical house specification is included in Appendix A to achieve a minimum A3 rating

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- Part L compliance is included in Appendix B

6.3.4 Building Regulations

The Irish Building Regulations will apply in full to the proposed development as listed in the table below:

Building Regulations 1997-2014 (SI 497 of 1997 as amended – refer to www.environ.ie for latest)

Building Regulations 1997-2014 (SI 497 of 1997 as amended – refer to www.environ.ie for latest)
Part A –Structure - 2012
Part B – Fire Safety - Volume 2 – Dwelling Houses - 2017
Part C – Site preparation and resistance to moisture - 2004
Part D – Materials and workmanship - 2013
Part E – Sound - 2014
Part F –Ventilation - 2011
Part G – Hygiene - 2008
Part H – Drainage and wastewater disposal - 2016
Part J – Heat producing appliances - 2014
Part K – Stairways, ladders, ramps and guards -2014
Part L – Conservation of Fuel and Energy – Dwellings - 2017
Part M – Access and Use - 2010

For products or systems that do not fall within the scope of existing standards, or deviate from established norms, third party certification should be used to demonstrate compliance with the Irish Building Regulations.

The Contractor will comply with all relevant & applicable EN Standards & Codes of Practice. Irish Standards and British Standards (or equivalent) are applicable where no equivalent EN standard exists.

All Local Authority Codes of Practice are applicable, along with all statutory regulations appropriate to the provision of Housing will apply.

All Codes of practice, standards, and requirements of the statutory service providers (ESBN, GBN, Irish Water, Cork City Council, Eir, etc.) are applicable in full to the development.

6.3.5 NZEB Summary

The analysis of NZEB Compliance is based under the following 3 headings

- Energy Performance Coefficient - EPC
  (Maximum Permitted Energy Performance Coefficient MPEPC = 0.30)

- Carbon Performance Coefficient - CPC
  (Maximum Permitted Carbon Performance Coefficient MPCPC = 0.35)
- Renewable Energy Ratio - RER (Minimum Requirement 0.20)

Below is a summary of a typical dwellings/ house types (except duplex units) and the percentages whereby it surpasses the minimum requirements of NZEB

Dwelling Ref	Energy Performance Coefficent - EPC (maximum Permitted Energy Performance Coefficent MPEPC = 0.3)	% better than Maximum permitted	Carbon Peformance Coefficent - CPC (Maximum Permitted Carbon Performance Coefficent MPCPC = 0.35)	% better than Maximum permitted	Renewable Energy Ratio - RER (Minimum Requirement = 0.20)	% better than Maximum permitted
A1	0.273	9%	0.147	58.00%	0.53	165%
A2	0.272	9%	0.173	50.57%	0.53	165%
B1	0.268	11%	0.173	50.57%	0.53	165%
B2	0.268	11%	0.173	50.57%	0.53	165%
B3/B4	0.267	11%	0.173	50.57%	0.53	165%
D1	0.257	14%	0.166	52.57%	0.55	175%
D2	0.257	14%	0.166	52.57%	0.55	175%
D3	0.255	15%	0.165	52.86%	0.55	175%
E1	0.217	28%	0.137	60.86%	0.61	205%
E2	0.219	27%	0.144	58.86%	0.57	185%
F1	0.225	25%	0.148	57.71%	0.58	190%
K1	0.22	27%	0.145	58.57%	0.58	190%

7 Conclusions

Compliance to Part L 2022 is achieved by means of a 70% primary energy reduction on the reference dwelling or an EPC (primary energy) of 0.30 or less and 65% carbon dioxide reduction or a CPC (carbon dioxide) of 0.35 or less and an equivalent primary renewable energy contribution of 20% or more. The energy reduction proposals resulted in a much lower primary energy and carbon dioxide performance than required under Part L 2022 and achieved a renewable energy contribution in excess of 50% or half of the primary energy coming from a renewable source. These results were achieved by applying the proposed exposed element parameters in combination with air source heat pumps for space & hot water heating and other reduction measures proposed.

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Appendix A – Preliminary Unit Specification

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All items to have accredited certification

Floor

- 150mm reinforced concrete slab on 150mm Xtratherm XT/HYF, Thermal conductivity 0.022W/mK on radon barrier on blinded hardcore.

Walls

- 310mm cavity wall with 20mm external plaster, 110mm cavity pumped with Korefill cavity, wall insulation system, Thermal conductivity 0.033W/mK, with Xtratherm Insulated plasterboard XT/TL, Thermal conductivity 0.022W/mK on dab skimmed with light weight plaster.
- 310mm Cavity wall, 110mm cavity with brick outer leaf, 60 mmXtratherm XT/CW cavity wall insulation thermal conductivity 0.022W/mK with 72.5mm (60+12.5) Xtratherm insulated plasterboard XT/TL thermal conductivity 0.022W/mK on dabs skimmed with light weight plaster.

Attic

- 400mm (200/200) Thermal conductivity 0.044W/mK, mineral wool insulation.
- Sloping Ceiling 150mm Xtratherm with a Thermal conductivity of 0.022W/mK laid between joists plus 72.5mm (60/12.5) Xtratherm insulated plasterboard with a Thermal conductivity of 0.022W/mK

Windows

- Double glazed windows by Bantry Bespoke Joinery, U-value of 1.2 W/m^{2}K

Doors

- Palladio composite doors supplied by Profile Developments, Glin, Co. Limerick

Primary Heating

- Heat Pump, air to water by Mitsubishi, Model SUZ-SWM 60VA, radiators on both ground and first floors, with time and temperature control. All primary pipe work is insulated.

Secondary Heating

- Hota STi5 stove

Lights

- 100% LED/CFL lights throughout

Ventilation

- Mechanical Extract Ventilation System by Passive House System model PHS MEV/HV

Domestic Hot Water

- 200L cylinder by Mitsubishi model EHST 20D-VM2D

Thermal BridgingAs per "Limiting thermal bridging construction details" TGD L 2011 All key junctions are provided.

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Appendix B – Part L Compliance

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Part L Compliance – House Type A1

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Part L Specification

BER IS NOT PUBLISHED

Property Details

Dwelling Type	Detached house	**Type of BER rating**	New Dwelling - Provisional
Address line 1	A1	**Year of Construction**	2025
Address line 2	GREENFIELDS	**Date of Assessment**	18/06/2025
Address line 3	Ballincollig	**Date of Plans**	
County	Co. Cork	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	10310077707
Purpose of Rating	Sale	**Is MPRN shared with another dwelling?**	N/A
Assessor Name	Stephen O'Donoghue	**Assessor Number**	108540
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m²]	Height [m]	Volume [m³]
Ground Floor	74.00	2.45	181.30
First Floor	74.00	2.90	214.60
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	148.00		395.90

Living Area [m²]	35.50	**Living area percentage [%]**	23.99
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	**Has permeability test been carried out?**	Yes
Open Flues	0	**Structure type**	N/A
Fans & Vents	1	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	No	**Number of sides sheltered**	2
Ventilation method	Whole-house extract ventilation	**Mechanical Ventilation Manufacturer**	N/A
Specific fan power [W/(L/s)]	0.290	**Mechanical Ventilation Model Name**	N/A
Heat exchanger efficiency [%]	N/A	**How many wetrooms (incl. kitchen)?**	N/A

Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m²K]	Area [m²]
Ground Floor - Solid		No	0.16	74
Non-Heat Loss Floor		N/A	0	74

Building Elements - Roof Details

Type	Description	U-Value [W/m²K]	Area [m²]
Pitched Roof - Insulated on Ceiling		0.15	74

Building Elements - Wall Details

Type	Description	U-Value [W/m²K]	Area [m²]
Other	Partial fill with internal insulated slab	0.18	99

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m²K]	Area [m²]
	1	0.79	8.400
	1	0.94	3.450

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Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, argon filled	Yes	1.400	6.100
Double-glazed, argon filled	Yes	1.200	6.400
Double-glazed, argon filled	Yes	1.200	6.900
Double-glazed, argon filled (low-E, en = 0.15, hard coat)	Yes	2.000	0.970
Double-glazed, argon filled	Yes	1.200	0.640

Other Details

Thermal bridging factor [W/m²k]	0.1500	**Thermal mass category of dwelling**	Medium

Heating System - Solar Water Heating

Solar Water Heating Present?	No	**Aperture area of solar collector [m²]**	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	**Collector heat loss coefficient, a1 [W/m²>K]**	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	**Overshading factor**	N/A
Dedicated storage volume [Litres]	N/A	**Combined Cylinder**	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	393.45	**Combi boiler present?**	No
Supplementary electric water heating	N/A	**Water Storage Volume [L]**	170
Hot water storage manufacturer and model name	Mitsubishi EHST 17D-VM2D	**Declared loss factor [kWh/d]**	1.65
Temperature factor unadjusted	0.89	**Temperature Factor Multiplier**	0.89
Primary Circuit loss type	Boiler / heat pump and thermal store within a single casing (cylinder thermostat present)		
Is hot water storage indoors or in group heating system?	Yes	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [°C]	0	**Control Category**	3	**Responsiveness category**	1
Central heating pumps	1	**Oil Boiler Pump**	0	**Oil boiler pump inside dwelling**	No
Gas boiler flue fan	0	**Warm air heating or fan coil radiators present**	No		

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Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	349.05	**Space heating efficiency adjustment factor**	1.0000	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	325.83	**Water heating efficiency adjustment factor**	1.0000	**Main water heating fuel**	Electricity
Secondary heating system efficiency [%]	N/A	**Fraction of heating from secondary heating system**	N/A	**Secondary space heating system fuel**	None
Fraction of main space and water heat from CHP	N/A	**Electrical efficiency of CHP**	N/A	**Heat efficiency of CHP**	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		**Building Regulations**	**2019 TGD L**
BER Result	A2	**Energy Value kWh/m^2/yr**	**37.38**
CO_2 emissions [kg/m^2/yr]	4.78		
EPC	0.273	**EPC Pass/Fail**	**Pass**
CPC	0.174	**CPC Pass/Fail**	**Pass**

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	**U-value [W/m^{2}K]**	**Pass/Fail**	**Conformity with Maximum U-value requirements**	**U-Value [W/m^{2}K]**	**Pass/Fail**
Pitched roof insulated on ceiling	0.15	Pass	**Roofs**	0.15	Pass
Pitched roof insulated on slope	0	Pass	**Walls**	0.18	Pass
Flat Roof	0	Pass	**Floors**	0.16	Pass
Floors with no underfloor heat	0.16	Pass	**External doors / windows / rooflights**	2.00	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	22.20				
Average U value of openings	1.13	Pass			
Permeability test carried out and meets guidelines in TGD L			0.199 | Pass		

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	**PV/Wind**	**0.00**	**0.00**	
+ Delivered energy	**Other**	**0.00**	**0.00**	
+ Delivered energy	**Solar**	**0.00**	**0.00**	
+ Delivered energy	**Biomass**	**0.00**	**0.00**	
+ Delivered energy	**Biodiesel**	**0.00**	**0.00**	
+ Delivered energy	**Bioethanol**	**0.00**	**0.00**	
+ Environmental energy	**HP**	**6212.21**	**6212.21**	
+ Saved energy	**CHP**	**0.00**	**0.00**	
+ District heating	**District Heating**	**0.00**	**0.00**	
+ Delivered energy	**Grid**	**0.00**	**5532.08**	
+ Delivered energy	**Thermal**	**0.00**	**0.00**	
SUBTOTAL		**6212.21**	**11744.29**	**0.53 - Pass**
Energy not used in Regulated Loads	**PV/Wind/CHP**	**0.00**	**0.00**	
TOTAL		**6212.21**	**11744.29**	**0.53**

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Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224

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Part L Compliance – House Type A2

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Part L Specification

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Property Details

Dwelling Type	Semi-detached house	**Type of BER rating**	New Dwelling - Provisional
Address line 1	A2	**Year of Construction**	2025
Address line 2	GREENFIELDS	**Date of Assessment**	18/06/2025
Address line 3	Ballincollig	**Date of Plans**	
County	Co. Cork	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	10310077707
Purpose of Rating	Sale	**Is MPRN shared with another dwelling?**	N/A
Assessor Name	Stephen O'Donoghue	**Assessor Number**	108540
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m^2]	Height [m]	Volume [m^3]
Ground Floor	74.50	2.45	182.53
First Floor	74.50	2.90	216.05
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	149.00		398.58

Living Area [m^2]	37.40	**Living area percentage [%]**	25.10
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	**Has permeability test been carried out?**	Yes
Open Flues	0	**Structure type**	N/A
Fans & Vents	1	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	No	**Number of sides sheltered**	2
Ventilation method	Whole-house extract ventilation	**Mechanical Ventilation Manufacturer**	N/A
Specific fan power [W/(L/s)]	0.290	**Mechanical Ventilation Model Name**	N/A
Heat exchanger efficiency [%]	N/A	**How many wetrooms (incl. kitchen)?**	N/A

Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m^2K]	Area [m^2]
Ground Floor - Solid		No	0.16	74.5
Non-Heat Loss Floor		N/A	0	74.5

Building Elements - Roof Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
Pitched Roof - Insulated on Ceiling		0.15	74.5

Building Elements - Wall Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
Other	Partial fill with internal insulated slab	0.18	97.51

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m^2K]	Area [m^2]
	1	0.79	5.460
	1	0.94	3.450

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Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, argon filled	Yes	1.400	5.200
Double-glazed, argon filled	Yes	1.200	6.800
Double-glazed, argon filled	Yes	1.200	7.700
Double-glazed, argon filled (low-E, en = 0.15, hard coat)	Yes	2.000	0.920
Double-glazed, argon filled	Yes	1.200	0.640

Other Details

Thermal bridging factor [W/m²k]	0.1500	**Thermal mass category of dwelling**	Medium

Heating System - Solar Water Heating

Solar Water Heating Present?	No	**Aperture area of solar collector [m²]**	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	**Collector heat loss coefficient, a1 [W/m²>K]**	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	**Overshading factor**	N/A
Dedicated storage volume [Litres]	N/A	**Combined Cylinder**	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	393.6	**Combi boiler present?**	No
Supplementary electric water heating	N/A	**Water Storage Volume [L]**	170
Hot water storage manufacturer and model name	Mitsubishi EHST 17D-VM2D	**Declared loss factor [kWh/d]**	1.65
Temperature factor unadjusted	0.89	**Temperature Factor Multiplier**	0.89
Primary Circuit loss type	Boiler / heat pump and thermal store within a single casing (cylinder thermostat present)		
Is hot water storage indoors or in group heating system?	Yes	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [ºC]	0	**Control Category**	3	**Responsiveness category**	1
Central heating pumps	1	**Oil Boiler Pump**	0	**Oil boiler pump inside dwelling**	No
Gas boiler flue fan	0	**Warm air heating or fan coil radiators present**	No		

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Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	348.58	**Space heating efficiency adjustment factor**	1.0000	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	325.83	**Water heating efficiency adjustment factor**	1.0000	**Main water heating fuel**	Electricity
Secondary heating system efficiency [%]	N/A	**Fraction of heating from secondary heating system**	N/A	**Secondary space heating system fuel**	None
Fraction of main space and water heat from CHP	N/A	**Electrical efficiency of CHP**	N/A	**Heat efficiency of CHP**	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		**Building Regulations**	**2019 TGD L**
BER Result	A2	**Energy Value kWh/m²/yr**	**36.93**
CO_2 emissions [kg/m²/yr]	4.73		
EPC	0.272	**EPC Pass/Fail**	**Pass**
CPC	0.173	**CPC Pass/Fail**	**Pass**

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	**U-value [W/m²K]**	**Pass/Fail**	**Conformity with Maximum U-value requirements**	**U-Value [W/m²K]**	**Pass/Fail**
Pitched roof insulated on ceiling	0.15	Pass	**Roofs**	0.15	Pass
Pitched roof insulated on slope	0	Pass	**Walls**	0.18	Pass
Flat Roof	0	Pass	**Floors**	0.16	Pass
Floors with no underfloor heat	0.16	Pass	**External doors / windows / rooflights**	2.00	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	20.25				
Average U value of openings	1.15	Pass			
Permeability test carried out and meets guidelines in TGD L			0.199 | Pass		

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	**PV/Wind**	**0.00**	**0.00**	
+ Delivered energy	**Other**	**0.00**	**0.00**	
+ Delivered energy	**Solar**	**0.00**	**0.00**	
+ Delivered energy	**Biomass**	**0.00**	**0.00**	
+ Delivered energy	**Biodiesel**	**0.00**	**0.00**	
+ Delivered energy	**Bioethanol**	**0.00**	**0.00**	
+ Environmental energy	**HP**	**6159.05**	**6159.05**	
+ Saved energy	**CHP**	**0.00**	**0.00**	
+ District heating	**District Heating**	**0.00**	**0.00**	
+ Delivered energy	**Grid**	**0.00**	**5503.01**	
+ Delivered energy	**Thermal**	**0.00**	**0.00**	
SUBTOTAL		**6159.05**	**11662.06**	**0.53 - Pass**
Energy not used in Regulated Loads	**PV/Wind/CHP**	**0.00**	**0.00**	
TOTAL		**6159.05**	**11662.06**	**0.53**

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Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224

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Part L Compliance – House Type B1

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Part L Specification

BER IS NOT PUBLISHED

Property Details

Dwelling Type	Semi-detached house	**Type of BER rating**	New Dwelling - Provisional
Address line 1	B1	**Year of Construction**	2025
Address line 2	GREENFIELDS	**Date of Assessment**	17/06/2025
Address line 3	Ballincollig	**Date of Plans**	
County	Co. Cork	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	10310077707
Purpose of Rating	Sale	**Is MPRN shared with another dwelling?**	N/A
Assessor Name	Stephen O'Donoghue	**Assessor Number**	108540
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m^2]	Height [m]	Volume [m^3]
Ground Floor	60.90	2.45	149.21
First Floor	60.90	2.90	176.61
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	121.80		325.82

Living Area [m^2]	22.30	**Living area percentage [%]**	18.31
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	**Has permeability test been carried out?**	Yes
Open Flues	0	**Structure type**	N/A
Fans & Vents	1	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	No	**Number of sides sheltered**	2
Ventilation method	Whole-house extract ventilation	**Mechanical Ventilation Manufacturer**	N/A
Specific fan power [W/(L/s)]	0.290	**Mechanical Ventilation Model Name**	N/A
Heat exchanger efficiency [%]	N/A	**How many wetrooms (incl. kitchen)?**	N/A

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Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m^2K]	Area [m^2]
Ground Floor - Solid		No	0.16	60.9
Non-Heat Loss Floor		N/A	0	60.9

Building Elements - Roof Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
Pitched Roof - Insulated on Ceiling		0.15	60.9

Building Elements - Wall Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
Other	Partial fill with internal insulated slab	0.18	97.51

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m^2K]	Area [m^2]
	1	0.79	2.100
	1	0.94	2.100

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Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, argon filled	Yes	1.400	3.760
Double-glazed, argon filled	Yes	1.200	4.540
Double-glazed, argon filled	Yes	1.200	5.550
Double-glazed, argon filled (low-E, en = 0.15, hard coat)	Yes	2.000	0.760
Double-glazed, argon filled	Yes	1.200	0.530

Other Details

Thermal bridging factor [W/m²k]	0.1500	**Thermal mass category of dwelling**	Medium

Heating System - Solar Water Heating

Solar Water Heating Present?	No	**Aperture area of solar collector [m²]**	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	**Collector heat loss coefficient, a1 [W/m²>K]**	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	**Overshading factor**	N/A
Dedicated storage volume [Litres]	N/A	**Combined Cylinder**	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	387.97	**Combi boiler present?**	No
Supplementary electric water heating	N/A	**Water Storage Volume [L]**	170
Hot water storage manufacturer and model name	Mitsubishi EHST 17D-VM2D	**Declared loss factor [kWh/d]**	1.65
Temperature factor unadjusted	0.89	**Temperature Factor Multiplier**	0.89
Primary Circuit loss type	Boiler / heat pump and thermal store within a single casing (cylinder thermostat present)		
Is hot water storage indoors or in group heating system?	Yes	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [ºC]	0	**Control Category**	3	**Responsiveness category**	1
Central heating pumps	1	**Oil Boiler Pump**	0	**Oil boiler pump inside dwelling**	No
Gas boiler flue fan	0	**Warm air heating or fan coil radiators present**	No		

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Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	357.51	**Space heating efficiency adjustment factor**	1.0000	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	325.83	**Water heating efficiency adjustment factor**	1.0000	**Main water heating fuel**	Electricity
Secondary heating system efficiency [%]	N/A	**Fraction of heating from secondary heating system**	N/A	**Secondary space heating system fuel**	None
Fraction of main space and water heat from CHP	N/A	**Electrical efficiency of CHP**	N/A	**Heat efficiency of CHP**	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		**Building Regulations**	**2019 TGD L**
BER Result	A2	**Energy Value kWh/m^2/yr**	**38.47**
CO_2 emissions [kg/m^2/yr]	4.92		
EPC	0.268	**EPC Pass/Fail**	**Pass**
CPC	0.173	**CPC Pass/Fail**	**Pass**

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	**U-value [W/m^{2}K]**	**Pass/Fail**	**Conformity with Maximum U-value requirements**	**U-Value [W/m^{2}K]**	**Pass/Fail**
Pitched roof insulated on ceiling	0.15	Pass	**Roofs**	0.15	Pass
Pitched roof insulated on slope	0	Pass	**Walls**	0.18	Pass
Flat Roof	0	Pass	**Floors**	0.16	Pass
Floors with no underfloor heat	0.16	Pass	**External doors / windows / rooflights**	2.00	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	15.88				
Average U value of openings	1.20	Pass			
Permeability test carried out and meets guidelines in TGD L			0.199 | Pass		

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	**PV/Wind**	**0.00**	**0.00**	
+ Delivered energy	**Other**	**0.00**	**0.00**	
+ Delivered energy	**Solar**	**0.00**	**0.00**	
+ Delivered energy	**Biomass**	**0.00**	**0.00**	
+ Delivered energy	**Biodiesel**	**0.00**	**0.00**	
+ Delivered energy	**Bioethanol**	**0.00**	**0.00**	
+ Environmental energy	**HP**	**5227.06**	**5227.06**	
+ Saved energy	**CHP**	**0.00**	**0.00**	
+ District heating	**District Heating**	**0.00**	**0.00**	
+ Delivered energy	**Grid**	**0.00**	**4685.23**	
+ Delivered energy	**Thermal**	**0.00**	**0.00**	
SUBTOTAL		**5227.06**	**9912.29**	**0.53 - Pass**
Energy not used in Regulated Loads	**PV/Wind/CHP**	**0.00**	**0.00**	
TOTAL		**5227.06**	**9912.29**	**0.53**

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Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224

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Part L Compliance – House Type B2

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Part L Specification

BER IS NOT PUBLISHED

Property Details

Dwelling Type	Semi-detached house	**Type of BER rating**	New Dwelling - Provisional
Address line 1	B2	**Year of Construction**	2025
Address line 2	GREENFIELDS	**Date of Assessment**	17/06/2025
Address line 3	Ballincollig	**Date of Plans**	
County	Co. Cork	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	10310077707
Purpose of Rating	Other	**Is MPRN shared with another dwelling?**	N/A
Assessor Name	Stephen O'Donoghue	**Assessor Number**	108540
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m^2]	Height [m]	Volume [m^3]
Ground Floor	57.75	2.45	141.49
First Floor	57.75	2.90	167.48
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	115.50		308.96

Living Area [m^2]	22.20	**Living area percentage [%]**	19.22
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	**Has permeability test been carried out?**	Yes
Open Flues	0	**Structure type**	N/A
Fans & Vents	1	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	No	**Number of sides sheltered**	2
Ventilation method	Whole-house extract ventilation	**Mechanical Ventilation Manufacturer**	N/A
Specific fan power [W/(L/s)]	0.290	**Mechanical Ventilation Model Name**	N/A
Heat exchanger efficiency [%]	N/A	**How many wetrooms (incl. kitchen)?**	N/A

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Part L Report
Date report created: 18/06/2025

Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m^2K]	Area [m^2]
Ground Floor - Solid		No	0.16	57.75
Non-Heat Loss Floor		N/A	0	57.75

Building Elements - Roof Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
Pitched Roof - Insulated on Ceiling		0.15	57.75

Building Elements - Wall Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
Other	Partial fill with internal insulated slab	0.18	97.51

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m^2K]	Area [m^2]
	1	0.79	2.100
	1	0.94	2.100

Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, argon filled	Yes	1.400	3.760
Double-glazed, argon filled	Yes	1.200	4.540
Double-glazed, argon filled	Yes	1.200	5.550
Double-glazed, argon filled (low-E, en = 0.15, hard coat)	Yes	2.000	0.760
Double-glazed, argon filled	Yes	1.200	0.530

Other Details

Thermal bridging factor [W/m²k]	0.1500	**Thermal mass category of dwelling**	Medium

Heating System - Solar Water Heating

Solar Water Heating Present?	No	**Aperture area of solar collector [m²]**	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	**Collector heat loss coefficient, a1 [W/m²>K]**	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	**Overshading factor**	N/A
Dedicated storage volume [Litres]	N/A	**Combined Cylinder**	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	385.64	**Combi boiler present?**	No
Supplementary electric water heating	N/A	**Water Storage Volume [L]**	170
Hot water storage manufacturer and model name	Mitsubishi EHST 17D-VM2D	**Declared loss factor [kWh/d]**	1.65
Temperature factor unadjusted	0.89	**Temperature Factor Multiplier**	0.89
Primary Circuit loss type	Boiler / heat pump and thermal store within a single casing (cylinder thermostat present)		
Is hot water storage indoors or in group heating system?	Yes	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [°C]	0	**Control Category**	3	**Responsiveness category**	1
Central heating pumps	1	**Oil Boiler Pump**	0	**Oil boiler pump inside dwelling**	No
Gas boiler flue fan	0	**Warm air heating or fan coil radiators present**	No		

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Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	357.69	**Space heating efficiency adjustment factor**	1.0000	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	325.83	**Water heating efficiency adjustment factor**	1.0000	**Main water heating fuel**	Electricity
Secondary heating system efficiency [%]	N/A	**Fraction of heating from secondary heating system**	N/A	**Secondary space heating system fuel**	None
Fraction of main space and water heat from CHP	N/A	**Electrical efficiency of CHP**	N/A	**Heat efficiency of CHP**	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		**Building Regulations**	**2019 TGD L**
BER Result	A2	**Energy Value kWh/m^2/yr**	**39.43**
CO_2 emissions [kg/m^2/yr]	5.05		
EPC	0.268	**EPC Pass/Fail**	**Pass**
CPC	0.173	**CPC Pass/Fail**	**Pass**

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	**U-value [W/m^{2}K]**	**Pass/Fail**	**Conformity with Maximum U-value requirements**	**U-Value [W/m^{2}K]**	**Pass/Fail**
Pitched roof insulated on ceiling	0.15	Pass	**Roofs**	0.15	Pass
Pitched roof insulated on slope	0	Pass	**Walls**	0.18	Pass
Flat Roof	0	Pass	**Floors**	0.16	Pass
Floors with no underfloor heat	0.16	Pass	**External doors / windows / rooflights**	2.00	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	16.74				
Average U value of openings	1.20	Pass			
Permeability test carried out and meets guidelines in TGD L			0.199 | Pass		

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	**PV/Wind**	**0.00**	**0.00**	
+ Delivered energy	**Other**	**0.00**	**0.00**	
+ Delivered energy	**Solar**	**0.00**	**0.00**	
+ Delivered energy	**Biomass**	**0.00**	**0.00**	
+ Delivered energy	**Biodiesel**	**0.00**	**0.00**	
+ Delivered energy	**Bioethanol**	**0.00**	**0.00**	
+ Environmental energy	**HP**	**5083.37**	**5083.37**	
+ Saved energy	**CHP**	**0.00**	**0.00**	
+ District heating	**District Heating**	**0.00**	**0.00**	
+ Delivered energy	**Grid**	**0.00**	**4554.54**	
+ Delivered energy	**Thermal**	**0.00**	**0.00**	
SUBTOTAL		**5083.37**	**9637.92**	**0.53 - Pass**
Energy not used in Regulated Loads	**PV/Wind/CHP**	**0.00**	**0.00**	
TOTAL		**5083.37**	**9637.92**	**0.53**

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Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224

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Part L Compliance – House Type B3/B4

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Part L Specification

BER IS NOT PUBLISHED

Property Details

Dwelling Type	Semi-detached house	**Type of BER rating**	New Dwelling - Provisional
Address line 1	B3/B4	**Year of Construction**	2025
Address line 2	GREENFIELDS	**Date of Assessment**	17/06/2025
Address line 3	Ballincollig	**Date of Plans**	
County	Co. Cork	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	10310077768
Purpose of Rating	Sale	**Is MPRN shared with another dwelling?**	Yes
Assessor Name	Stephen O'Donoghue	**Assessor Number**	108540
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m^2]	Height [m]	Volume [m^3]
Ground Floor	54.05	2.45	132.42
First Floor	54.05	2.91	157.29
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	108.10		289.71

Living Area [m^2]	19.40	**Living area percentage [%]**	17.95
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	**Has permeability test been carried out?**	Yes
Open Flues	0	**Structure type**	N/A
Fans & Vents	1	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	No	**Number of sides sheltered**	2
Ventilation method	Whole-house extract ventilation	**Mechanical Ventilation Manufacturer**	N/A
Specific fan power [W/(L/s)]	0.290	**Mechanical Ventilation Model Name**	N/A
Heat exchanger efficiency [%]	N/A	**How many wetrooms (incl. kitchen)?**	N/A

Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m^2K]	Area [m^2]
Ground Floor - Solid		No	0.15	54.05
Non-Heat Loss Floor		N/A	0	54.05

Building Elements - Roof Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
Pitched Roof - Insulated on Ceiling		0.12	54.04

Building Elements - Wall Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
300mm Filled Cavity		0.18	96.06

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m^2K]	Area [m^2]
	1	0.79	2.100
	1	0.94	2.100

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Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, argon filled	Yes	1.400	3.720
Double-glazed, argon filled	Yes	1.200	5.700
Double-glazed, argon filled	Yes	1.200	4.480
Double-glazed, argon filled	Yes	1.200	0.510
Double-glazed, argon filled (low-E, en = 0.15, hard coat)	Yes	2.000	0.700

Other Details

Thermal bridging factor [W/m²k]	0.1500	**Thermal mass category of dwelling**	Medium

Heating System - Solar Water Heating

Solar Water Heating Present?	No	**Aperture area of solar collector [m²]**	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	**Collector heat loss coefficient, a1 [W/m²>K]**	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	**Overshading factor**	N/A
Dedicated storage volume [Litres]	N/A	**Combined Cylinder**	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	381.93	**Combi boiler present?**	No
Supplementary electric water heating	N/A	**Water Storage Volume [L]**	170
Hot water storage manufacturer and model name	Mitsubishi EHST 17D-VM2D	**Declared loss factor [kWh/d]**	1.65
Temperature factor unadjusted	0.89	**Temperature Factor Multiplier**	0.89
Primary Circuit loss type	Boiler / heat pump and thermal store within a single casing (cylinder thermostat present)		
Is hot water storage indoors or in group heating system?	Yes	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [°C]	0	**Control Category**	3	**Responsiveness category**	1
Central heating pumps	1	**Oil Boiler Pump**	0	**Oil boiler pump inside dwelling**	No
Gas boiler flue fan	0	**Warm air heating or fan coil radiators present**	No		

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Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	372.19	**Space heating efficiency adjustment factor**	1.0000	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	287.87	**Water heating efficiency adjustment factor**	1.0000	**Main water heating fuel**	Electricity
Secondary heating system efficiency [%]	N/A	**Fraction of heating from secondary heating system**	N/A	**Secondary space heating system fuel**	None
Fraction of main space and water heat from CHP	N/A	**Electrical efficiency of CHP**	N/A	**Heat efficiency of CHP**	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		**Building Regulations**	**2019 TGD L**
BER Result	A2	**Energy Value kWh/m^2/yr**	**40.40**
CO_2 emissions [kg/m^2/yr]	5.17		
EPC	0.267	**EPC Pass/Fail**	**Pass**
CPC	0.173	**CPC Pass/Fail**	**Pass**

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	**U-value [W/m^{2}K]**	**Pass/Fail**	**Conformity with Maximum U-value requirements**	**U-Value [W/m^{2}K]**	**Pass/Fail**
Pitched roof insulated on ceiling	0.12	Pass	**Roofs**	0.12	Pass
Pitched roof insulated on slope	0	Pass	**Walls**	0.18	Pass
Flat Roof	0	Pass	**Floors**	0.15	Pass
Floors with no underfloor heat	0.15	Pass	**External doors / windows / rooflights**	2.00	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	17.86				
Average U value of openings	1.19	Pass			
Permeability test carried out and meets guidelines in TGD L			0.218 | Pass		

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	**PV/Wind**	**0.00**	**0.00**	
+ Delivered energy	**Other**	**0.00**	**0.00**	
+ Delivered energy	**Solar**	**0.00**	**0.00**	
+ Delivered energy	**Biomass**	**0.00**	**0.00**	
+ Delivered energy	**Biodiesel**	**0.00**	**0.00**	
+ Delivered energy	**Bioethanol**	**0.00**	**0.00**	
+ Environmental energy	**HP**	**4837.63**	**4837.63**	
+ Saved energy	**CHP**	**0.00**	**0.00**	
+ District heating	**District Heating**	**0.00**	**0.00**	
+ Delivered energy	**Grid**	**0.00**	**4367.56**	
+ Delivered energy	**Thermal**	**0.00**	**0.00**	
SUBTOTAL		**4837.63**	**9205.19**	**0.53 - Pass**
Energy not used in Regulated Loads	**PV/Wind/CHP**	**0.00**	**0.00**	
TOTAL		**4837.63**	**9205.19**	**0.53**

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Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224

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Part L Compliance – House Type D1

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Part L Specification

BER IS NOT PUBLISHED

Property Details

Dwelling Type	End of terrace house	**Type of BER rating**	New Dwelling - Provisional
Address line 1	D1	**Year of Construction**	2025
Address line 2	GREENFIELDS	**Date of Assessment**	18/06/2025
Address line 3	BALLINCOLLIG	**Date of Plans**	
County	Co. Cork	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	10310078126
Purpose of Rating	Sale	**Is MPRN shared with another dwelling?**	N/A
Assessor Name	Stephen O'Donoghue	**Assessor Number**	108540
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m^2]	Height [m]	Volume [m^3]
Ground Floor	52.00	2.45	127.40
First Floor	52.00	2.90	150.80
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	104.00		278.20

Living Area [m^2]	19.60	**Living area percentage [%]**	18.85
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	**Has permeability test been carried out?**	Yes
Open Flues	0	**Structure type**	N/A
Fans & Vents	1	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	No	**Number of sides sheltered**	2
Ventilation method	Whole-house extract ventilation	**Mechanical Ventilation Manufacturer**	N/A
Specific fan power [W/(L/s)]	0.800	**Mechanical Ventilation Model Name**	N/A
Heat exchanger efficiency [%]	N/A	**How many wetrooms (incl. kitchen)?**	N/A

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Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m^2K]	Area [m^2]
Ground Floor - Solid		No	0.11	52
Non-Heat Loss Floor		N/A	0	52

Building Elements - Roof Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
Pitched Roof - Insulated on Ceiling		0.15	52

Building Elements - Wall Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
300mm Filled Cavity		0.15	97.85

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m^2K]	Area [m^2]
	1	0.79	2.100
	1	0.94	1.960

Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, argon filled	Yes	1.400	6.300
Double-glazed, argon filled	Yes	1.200	5.770
Double-glazed, argon filled	Yes	1.200	4.660
Double-glazed, argon filled	Yes	1.200	0.600
Double-glazed, argon filled (low-E, en = 0.15, hard coat)	Yes	2.000	0.920

Other Details

Thermal bridging factor [W/m²k]	0.1500	**Thermal mass category of dwelling**	Medium

Heating System - Solar Water Heating

Solar Water Heating Present?	No	**Aperture area of solar collector [m²]**	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	**Collector heat loss coefficient, a1 [W/m²>K]**	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	**Overshading factor**	N/A
Dedicated storage volume [Litres]	N/A	**Combined Cylinder**	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	379.3	**Combi boiler present?**	No
Supplementary electric water heating	N/A	**Water Storage Volume [L]**	200
Hot water storage manufacturer and model name	Mitsubishi EHST 20D-VM2D	**Declared loss factor [kWh/d]**	1.91
Temperature factor unadjusted	0.89	**Temperature Factor Multiplier**	0.89
Primary Circuit loss type	Boiler / heat pump and thermal store within a single casing (cylinder thermostat present)		
Is hot water storage indoors or in group heating system?	Yes	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [ºC]	0	**Control Category**	3	**Responsiveness category**	1
Central heating pumps	1	**Oil Boiler Pump**	0	**Oil boiler pump inside dwelling**	No
Gas boiler flue fan	0	**Warm air heating or fan coil radiators present**	No		

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Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	527.79	**Space heating efficiency adjustment factor**	1.0000	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	281.12	**Water heating efficiency adjustment factor**	1.0000	**Main water heating fuel**	Electricity
Secondary heating system efficiency [%]	N/A	**Fraction of heating from secondary heating system**	N/A	**Secondary space heating system fuel**	None
Fraction of main space and water heat from CHP	N/A	**Electrical efficiency of CHP**	N/A	**Heat efficiency of CHP**	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		**Building Regulations**	**2019 TGD L**
BER Result	A2	**Energy Value kWh/m^2/yr**	**40.01**
CO_2 emissions [kg/m^2/yr]	5.12		
EPC	0.257	**EPC Pass/Fail**	**Pass**
CPC	0.166	**CPC Pass/Fail**	**Pass**

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	**U-value [W/m^{2}K]**	**Pass/Fail**	**Conformity with Maximum U-value requirements**	**U-Value [W/m^{2}K]**	**Pass/Fail**
Pitched roof insulated on ceiling	0.15	Pass	**Roofs**	0.15	Pass
Pitched roof insulated on slope	0	Pass	**Walls**	0.15	Pass
Flat Roof	0	Pass	**Floors**	0.11	Pass
Floors with no underfloor heat	0.11	Pass	**External doors / windows / rooflights**	2.00	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.15	Pass			
Percentage of opening areas [%]	21.45				
Average U value of openings	1.23	Pass			
Permeability test carried out and meets guidelines in TGD L			0.21 | Pass		

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	**PV/Wind**	**0.00**	**0.00**	
+ Delivered energy	**Other**	**0.00**	**0.00**	
+ Delivered energy	**Solar**	**0.00**	**0.00**	
+ Delivered energy	**Biomass**	**0.00**	**0.00**	
+ Delivered energy	**Biodiesel**	**0.00**	**0.00**	
+ Delivered energy	**Bioethanol**	**0.00**	**0.00**	
+ Environmental energy	**HP**	**5129.90**	**5129.90**	
+ Saved energy	**CHP**	**0.00**	**0.00**	
+ District heating	**District Heating**	**0.00**	**0.00**	
+ Delivered energy	**Grid**	**0.00**	**4161.55**	
+ Delivered energy	**Thermal**	**0.00**	**0.00**	
SUBTOTAL		**5129.90**	**9291.45**	**0.55 - Pass**
Energy not used in Regulated Loads	**PV/Wind/CHP**	**0.00**	**0.00**	
TOTAL		**5129.90**	**9291.45**	**0.55**

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Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224

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Part L Compliance – House Type D2

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Part L Specification

BER IS NOT PUBLISHED

Property Details

Dwelling Type	End of terrace house	**Type of BER rating**	New Dwelling - Provisional
Address line 1	D2	**Year of Construction**	2025
Address line 2	GREENFIELDS	**Date of Assessment**	18/06/2025
Address line 3	BALLINCOLLIG	**Date of Plans**	
County	Co. Cork	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	10310078126
Purpose of Rating	Sale	**Is MPRN shared with another dwelling?**	N/A
Assessor Name	Stephen O'Donoghue	**Assessor Number**	108540
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m^2]	Height [m]	Volume [m^3]
Ground Floor	52.00	2.45	127.40
First Floor	52.00	2.90	150.80
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	104.00		278.20

Living Area [m^2]	20.30	**Living area percentage [%]**	19.52
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	**Has permeability test been carried out?**	Yes
Open Flues	0	**Structure type**	N/A
Fans & Vents	1	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	No	**Number of sides sheltered**	2
Ventilation method	Whole-house extract ventilation	**Mechanical Ventilation Manufacturer**	N/A
Specific fan power [W/(L/s)]	0.800	**Mechanical Ventilation Model Name**	N/A
Heat exchanger efficiency [%]	N/A	**How many wetrooms (incl. kitchen)?**	N/A

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Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m^2K]	Area [m^2]
Ground Floor - Solid		No	0.11	52
Non-Heat Loss Floor		N/A	0	52

Building Elements - Roof Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
Pitched Roof - Insulated on Ceiling		0.15	52

Building Elements - Wall Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
300mm Filled Cavity		0.15	97.85

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m^2K]	Area [m^2]
	1	0.79	2.100
	1	0.94	1.960

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Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, argon filled	Yes	1.400	5.200
Double-glazed, argon filled	Yes	1.200	5.770
Double-glazed, argon filled	Yes	1.200	4.660
Double-glazed, argon filled	Yes	1.200	0.600
Double-glazed, argon filled (low-E, en = 0.15, hard coat)	Yes	2.000	0.920

Other Details

Thermal bridging factor [W/m²k]	0.1500	**Thermal mass category of dwelling**	Medium

Heating System - Solar Water Heating

Solar Water Heating Present?	No	**Aperture area of solar collector [m²]**	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	**Collector heat loss coefficient, a1 [W/m²>K]**	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	**Overshading factor**	N/A
Dedicated storage volume [Litres]	N/A	**Combined Cylinder**	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	379.3	**Combi boiler present?**	No
Supplementary electric water heating	N/A	**Water Storage Volume [L]**	200
Hot water storage manufacturer and model name	Mitsubishi EHST 20D-VM2D	**Declared loss factor [kWh/d]**	1.91
Temperature factor unadjusted	0.89	**Temperature Factor Multiplier**	0.89
Primary Circuit loss type	Boiler / heat pump and thermal store within a single casing (cylinder thermostat present)		
Is hot water storage indoors or in group heating system?	Yes	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [ºC]	0	**Control Category**	3	**Responsiveness category**	1
Central heating pumps	1	**Oil Boiler Pump**	0	**Oil boiler pump inside dwelling**	No
Gas boiler flue fan	0	**Warm air heating or fan coil radiators present**	No		

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Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	528.26	**Space heating efficiency adjustment factor**	1.0000	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	281.12	**Water heating efficiency adjustment factor**	1.0000	**Main water heating fuel**	Electricity
Secondary heating system efficiency [%]	N/A	**Fraction of heating from secondary heating system**	N/A	**Secondary space heating system fuel**	None
Fraction of main space and water heat from CHP	N/A	**Electrical efficiency of CHP**	N/A	**Heat efficiency of CHP**	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		**Building Regulations**	**2019 TGD L**
BER Result	A2	**Energy Value kWh/m^2/yr**	**39.96**
CO_2 emissions [kg/m^2/yr]	5.11		
EPC	0.257	**EPC Pass/Fail**	**Pass**
CPC	0.166	**CPC Pass/Fail**	**Pass**

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	**U-value [W/m^{2}K]**	**Pass/Fail**	**Conformity with Maximum U-value requirements**	**U-Value [W/m^{2}K]**	**Pass/Fail**
Pitched roof insulated on ceiling	0.15	Pass	**Roofs**	0.15	Pass
Pitched roof insulated on slope	0	Pass	**Walls**	0.15	Pass
Flat Roof	0	Pass	**Floors**	0.11	Pass
Floors with no underfloor heat	0.11	Pass	**External doors / windows / rooflights**	2.00	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.15	Pass			
Percentage of opening areas [%]	20.39				
Average U value of openings	1.22	Pass			
Permeability test carried out and meets guidelines in TGD L			0.21 | Pass		

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	**PV/Wind**	**0.00**	**0.00**	
+ Delivered energy	**Other**	**0.00**	**0.00**	
+ Delivered energy	**Solar**	**0.00**	**0.00**	
+ Delivered energy	**Biomass**	**0.00**	**0.00**	
+ Delivered energy	**Biodiesel**	**0.00**	**0.00**	
+ Delivered energy	**Bioethanol**	**0.00**	**0.00**	
+ Environmental energy	**HP**	**5106.67**	**5106.67**	
+ Saved energy	**CHP**	**0.00**	**0.00**	
+ District heating	**District Heating**	**0.00**	**0.00**	
+ Delivered energy	**Grid**	**0.00**	**4155.83**	
+ Delivered energy	**Thermal**	**0.00**	**0.00**	
SUBTOTAL		**5106.67**	**9262.50**	**0.55 - Pass**
Energy not used in Regulated Loads	**PV/Wind/CHP**	**0.00**	**0.00**	
TOTAL		**5106.67**	**9262.50**	**0.55**

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Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224

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Part L Compliance – House Type D3

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Part L Specification

BER IS NOT PUBLISHED

Property Details

Dwelling Type	Mid-terrace house	**Type of BER rating**	New Dwelling - Provisional
Address line 1	D3	**Year of Construction**	2025
Address line 2	GREENFIELDS	**Date of Assessment**	17/06/2025
Address line 3	BALLINCOLLIG	**Date of Plans**	
County	Co. Cork	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	10310078138
Purpose of Rating	Sale	**Is MPRN shared with another dwelling?**	N/A
Assessor Name	Stephen O'Donoghue	**Assessor Number**	108540
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m^2]	Height [m]	Volume [m^3]
Ground Floor	52.00	2.45	127.40
First Floor	52.00	2.90	150.80
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	104.00		278.20

Living Area [m^2]	20.30	**Living area percentage [%]**	19.52
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	**Has permeability test been carried out?**	Yes
Open Flues	0	**Structure type**	N/A
Fans & Vents	1	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	No	**Number of sides sheltered**	2
Ventilation method	Whole-house extract ventilation	**Mechanical Ventilation Manufacturer**	N/A
Specific fan power [W/(L/s)]	0.800	**Mechanical Ventilation Model Name**	N/A
Heat exchanger efficiency [%]	N/A	**How many wetrooms (incl. kitchen)?**	N/A

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Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m^2K]	Area [m^2]
Ground Floor - Solid		No	0.1	52
Non-Heat Loss Floor		N/A	0	52

Building Elements - Roof Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
Pitched Roof - Insulated on Ceiling		0.15	52

Building Elements - Wall Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
300mm Filled Cavity		0.15	97.85

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m^2K]	Area [m^2]
	1	0.79	2.100

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Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, argon filled	Yes	1.400	3.670
Double-glazed, argon filled	Yes	1.200	5.770
Double-glazed, argon filled	Yes	1.200	4.660
Double-glazed, argon filled (low-E, en = 0.15, hard coat)	Yes	2.000	0.460

Other Details

Thermal bridging factor [W/m²k]	0.1500	**Thermal mass category of dwelling**	Medium

Heating System - Solar Water Heating

Solar Water Heating Present?	No	**Aperture area of solar collector [m²]**	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	**Collector heat loss coefficient, a1 [W/m²>K]**	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	**Overshading factor**	N/A
Dedicated storage volume [Litres]	N/A	**Combined Cylinder**	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	379.3	**Combi boiler present?**	No
Supplementary electric water heating	N/A	**Water Storage Volume [L]**	200
Hot water storage manufacturer and model name	Mitsubishi EHST 20D-VM2D	**Declared loss factor [kWh/d]**	1.91
Temperature factor unadjusted	0.89	**Temperature Factor Multiplier**	0.89
Primary Circuit loss type	Boiler / heat pump and thermal store within a single casing (cylinder thermostat present)		
Is hot water storage indoors or in group heating system?	Yes	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [ºC]	0	**Control Category**	3	**Responsiveness category**	1
Central heating pumps	1	**Oil Boiler Pump**	0	**Oil boiler pump inside dwelling**	No
Gas boiler flue fan	0	**Warm air heating or fan coil radiators present**	No		

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Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	532.21	**Space heating efficiency adjustment factor**	1.0000	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	281.12	**Water heating efficiency adjustment factor**	1.0000	**Main water heating fuel**	Electricity
Secondary heating system efficiency [%]	N/A	**Fraction of heating from secondary heating system**	N/A	**Secondary space heating system fuel**	None
Fraction of main space and water heat from CHP	N/A	**Electrical efficiency of CHP**	N/A	**Heat efficiency of CHP**	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		**Building Regulations**	**2019 TGD L**
BER Result	A2	**Energy Value kWh/m^2/yr**	**39.31**
CO_2 emissions [kg/m^2/yr]	5.03		
EPC	0.255	**EPC Pass/Fail**	**Pass**
CPC	0.165	**CPC Pass/Fail**	**Pass**

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	**U-value [W/m^{2}K]**	**Pass/Fail**	**Conformity with Maximum U-value requirements**	**U-Value [W/m^{2}K]**	**Pass/Fail**
Pitched roof insulated on ceiling	0.15	Pass	**Roofs**	0.15	Pass
Pitched roof insulated on slope	0	Pass	**Walls**	0.15	Pass
Flat Roof	0	Pass	**Floors**	0.1	Pass
Floors with no underfloor heat	0.10	Pass	**External doors / windows / rooflights**	2.00	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.15	Pass			
Percentage of opening areas [%]	16.02				
Average U value of openings	1.21	Pass			
Permeability test carried out and meets guidelines in TGD L			0.21 | Pass		

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	**PV/Wind**	**0.00**	**0.00**	
+ Delivered energy	**Other**	**0.00**	**0.00**	
+ Delivered energy	**Solar**	**0.00**	**0.00**	
+ Delivered energy	**Biomass**	**0.00**	**0.00**	
+ Delivered energy	**Biodiesel**	**0.00**	**0.00**	
+ Delivered energy	**Bioethanol**	**0.00**	**0.00**	
+ Environmental energy	**HP**	**4928.51**	**4928.51**	
+ Saved energy	**CHP**	**0.00**	**0.00**	
+ District heating	**District Heating**	**0.00**	**0.00**	
+ Delivered energy	**Grid**	**0.00**	**4088.10**	
+ Delivered energy	**Thermal**	**0.00**	**0.00**	
SUBTOTAL		**4928.51**	**9016.60**	**0.55 - Pass**
Energy not used in Regulated Loads	**PV/Wind/CHP**	**0.00**	**0.00**	
TOTAL		**4928.51**	**9016.60**	**0.55**

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Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224

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Part L Compliance – House Type E1

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Part L Specification

BER IS NOT PUBLISHED

Property Details

Dwelling Type	End of terrace house	**Type of BER rating**	New Dwelling - Provisional
Address line 1	E1	**Year of Construction**	2025
Address line 2	GREENFIELDS	**Date of Assessment**	18/06/2025
Address line 3	BALLINCOLLIG	**Date of Plans**	
County	Co. Cork	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	10310077919
Purpose of Rating	Sale	**Is MPRN shared with another dwelling?**	N/A
Assessor Name	Stephen O'Donoghue	**Assessor Number**	108540
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m^2]	Height [m]	Volume [m^3]
Ground Floor	42.20	2.44	102.97
First Floor	42.20	2.90	122.38
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	84.40		225.35

Living Area [m^2]	31.00	**Living area percentage [%]**	36.73
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	**Has permeability test been carried out?**	Yes
Open Flues	0	**Structure type**	N/A
Fans & Vents	1	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	No	**Number of sides sheltered**	2
Ventilation method	Whole-house extract ventilation	**Mechanical Ventilation Manufacturer**	N/A
Specific fan power [W/(L/s)]	0.250	**Mechanical Ventilation Model Name**	N/A
Heat exchanger efficiency [%]	N/A	**How many wetrooms (incl. kitchen)?**	N/A

Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m^2K]	Area [m^2]
Ground Floor - Solid		No	0.12	42.2
Non-Heat Loss Floor		N/A	0	42.2

Building Elements - Roof Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
Pitched Roof - Insulated on Ceiling		0.15	42.2

Building Elements - Wall Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
300mm Filled Cavity		0.15	261.42

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m^2K]	Area [m^2]
	1	0.79	2.100

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Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, argon filled	Yes	1.400	3.920
Double-glazed, argon filled	Yes	1.200	4.720
Double-glazed, argon filled	Yes	1.200	4.300
Double-glazed, argon filled (low-E, en = 0.15, hard coat)	Yes	2.000	0.740

Other Details

Thermal bridging factor [W/m²k]	0.1500	**Thermal mass category of dwelling**	Medium

Heating System - Solar Water Heating

Solar Water Heating Present?	No	**Aperture area of solar collector [m²]**	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	**Collector heat loss coefficient, a1 [W/m²>K]**	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	**Overshading factor**	N/A
Dedicated storage volume [Litres]	N/A	**Combined Cylinder**	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	358.38	**Combi boiler present?**	No
Supplementary electric water heating	N/A	**Water Storage Volume [L]**	200
Hot water storage manufacturer and model name	Mitsubishi EHST 17D-VM2D	**Declared loss factor [kWh/d]**	1.91
Temperature factor unadjusted	0.89	**Temperature Factor Multiplier**	0.89
Primary Circuit loss type	Boiler / heat pump and thermal store within a single casing (cylinder thermostat present)		
Is hot water storage indoors or in group heating system?	Yes	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [ºC]	0	**Control Category**	3	**Responsiveness category**	1
Central heating pumps	1	**Oil Boiler Pump**	0	**Oil boiler pump inside dwelling**	No
Gas boiler flue fan	0	**Warm air heating or fan coil radiators present**	No		

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Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	479.55	**Space heating efficiency adjustment factor**	1.0000	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	331.88	**Water heating efficiency adjustment factor**	1.0000	**Main water heating fuel**	Electricity
Secondary heating system efficiency [%]	N/A	**Fraction of heating from secondary heating system**	N/A	**Secondary space heating system fuel**	None
Fraction of main space and water heat from CHP	N/A	**Electrical efficiency of CHP**	N/A	**Heat efficiency of CHP**	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		**Building Regulations**	**2019 TGD L**
BER Result	A2	**Energy Value kWh/m^2/yr**	**49.81**
CO_2 emissions [kg/m^2/yr]	6.38		
EPC	0.217	**EPC Pass/Fail**	**Pass**
CPC	0.137	**CPC Pass/Fail**	**Pass**

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	**U-value [W/m^{2}K]**	**Pass/Fail**	**Conformity with Maximum U-value requirements**	**U-Value [W/m^{2}K]**	**Pass/Fail**
Pitched roof insulated on ceiling	0.15	Pass	**Roofs**	0.15	Pass
Pitched roof insulated on slope	0	Pass	**Walls**	0.15	Pass
Flat Roof	0	Pass	**Floors**	0.12	Pass
Floors with no underfloor heat	0.12	Pass	**External doors / windows / rooflights**	2.00	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.15	Pass			
Percentage of opening areas [%]	18.70				
Average U value of openings	1.23	Pass			
Permeability test carried out and meets guidelines in TGD L			0.2 | Pass		

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	**PV/Wind**	**0.00**	**0.00**	
+ Delivered energy	**Other**	**0.00**	**0.00**	
+ Delivered energy	**Solar**	**0.00**	**0.00**	
+ Delivered energy	**Biomass**	**0.00**	**0.00**	
+ Delivered energy	**Biodiesel**	**0.00**	**0.00**	
+ Delivered energy	**Bioethanol**	**0.00**	**0.00**	
+ Environmental energy	**HP**	**6612.21**	**6612.21**	
+ Saved energy	**CHP**	**0.00**	**0.00**	
+ District heating	**District Heating**	**0.00**	**0.00**	
+ Delivered energy	**Grid**	**0.00**	**4203.89**	
+ Delivered energy	**Thermal**	**0.00**	**0.00**	
SUBTOTAL		**6612.21**	**10816.10**	**0.61 - Pass**
Energy not used in Regulated Loads	**PV/Wind/CHP**	**0.00**	**0.00**	
TOTAL		**6612.21**	**10816.10**	**0.61**

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Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224

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Part L Compliance – House Type E2

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Part L Specification

BER IS NOT PUBLISHED

Property Details

Dwelling Type	Mid-terrace house	**Type of BER rating**	New Dwelling - Provisional
Address line 1	E2	**Year of Construction**	2025
Address line 2	GREENFIELDS	**Date of Assessment**	18/06/2025
Address line 3	BALLINCOLLIG	**Date of Plans**	
County	Co. Cork	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number		**MPRN No.**	10310077924
Purpose of Rating	Sale	**Is MPRN shared with another dwelling?**	N/A
Assessor Name	Stephen O'Donoghue	**Assessor Number**	108540
Comment		**BER number assigned to shared dwelling**	N/A

Dimension Details

	Area [m^2]	Height [m]	Volume [m^3]
Ground Floor	42.20	2.45	103.39
First Floor	42.20	2.90	122.38
Second Floor	0.00	0.00	0.00
Third and other floors	0.00	0.00	0.00
Room in roof	0.00	0.00	0.00
Total Floor Area	84.40		225.77

Living Area [m^2]	31.00	**Living area percentage [%]**	36.73
No of Storeys	2		

Ventilation Details

	Number		
Chimneys	0	**Has permeability test been carried out?**	Yes
Open Flues	0	**Structure type**	N/A
Fans & Vents	1	**Is there a suspended wooden ground floor?**	No
Number of flueless combustion room heaters	0	**Percentage windows/doors draught stripped [%]**	N/A
Is there a draught lobby on main entrance?	No	**Number of sides sheltered**	2
Ventilation method	Whole-house extract ventilation	**Mechanical Ventilation Manufacturer**	N/A
Specific fan power [W/(L/s)]	0.260	**Mechanical Ventilation Model Name**	N/A
Heat exchanger efficiency [%]	N/A	**How many wetrooms (incl. kitchen)?**	N/A

Building Elements - Floor Details

Type	Description	Underfloor heating	U-Value [W/m^2K]	Area [m^2]
Ground Floor - Solid		No	0.13	42.2
Non-Heat Loss Floor		N/A	0	42.2

Building Elements - Roof Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
Pitched Roof - Insulated on Ceiling		0.15	42.2

Building Elements - Wall Details

Type	Description	U-Value [W/m^2K]	Area [m^2]
Other	Partial fill cavity with insulated slab internally	0.18	37.43

Building Elements - Door Details

Description	Number of Doors	U-Value [W/m^2K]	Area [m^2]
	1	0.79	2.100

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Building Elements - Window Details

Glazing type	User defined u-value	U-Value [W/m²K]	Area [m²]
Double-glazed, argon filled	Yes	1.400	3.920
Double-glazed, argon filled	Yes	1.200	4.220
Double-glazed, argon filled (low-E, en = 0.15, hard coat)	Yes	2.000	0.750
Double-glazed, argon filled	Yes	1.200	4.880

Other Details

Thermal bridging factor [W/m²k]	0.1500	**Thermal mass category of dwelling**	Medium-high

Heating System - Solar Water Heating

Solar Water Heating Present?	No	**Aperture area of solar collector [m²]**	N/A
Type, manufacturer, model	N/A		
Zero loss collector efficiency, n0	N/A	**Collector heat loss coefficient, a1 [W/m²>K]**	N/A
Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)	N/A	**Overshading factor**	N/A
Dedicated storage volume [Litres]	N/A	**Combined Cylinder**	N/A
Solar fraction [%]	0.000		

Heating System - Hot Water System

Distribution Losses	358.38	**Combi boiler present?**	No
Supplementary electric water heating	N/A	**Water Storage Volume [L]**	170
Hot water storage manufacturer and model name	Mitsubishi EHST 17D-VM2D	**Declared loss factor [kWh/d]**	1.65
Temperature factor unadjusted	0.89	**Temperature Factor Multiplier**	0.89
Primary Circuit loss type	Boiler / heat pump and thermal store within a single casing (cylinder thermostat present)		
Is hot water storage indoors or in group heating system?	Yes	**Insulation type**	N/A
Insulation thickness [mm]	N/A		

Heating System - Dist. system losses and gains

Temperature adjustment [ºC]	0	**Control Category**	3	**Responsiveness category**	1
Central heating pumps	1	**Oil Boiler Pump**	0	**Oil boiler pump inside dwelling**	No
Gas boiler flue fan	0	**Warm air heating or fan coil radiators present**	No		

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Heating System - Energy Requirements (Individual)

Main space heating system efficiency [%]	512.08	**Space heating efficiency adjustment factor**	1.0000	**Main space heating fuel**	Electricity
Main water heating system efficiency [%]	331.88	**Water heating efficiency adjustment factor**	1.0000	**Main water heating fuel**	Electricity
Secondary heating system efficiency [%]	N/A	**Fraction of heating from secondary heating system**	N/A	**Secondary space heating system fuel**	None
Fraction of main space and water heat from CHP	N/A	**Electrical efficiency of CHP**	N/A	**Heat efficiency of CHP**	N/A
CHP Fuel type	N/A				

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number		**Building Regulations**	**2019 TGD L**
BER Result	A2	**Energy Value kWh/m^2/yr**	**33.33**
CO_2 emissions [kg/m^2/yr]	4.27		
EPC	0.219	**EPC Pass/Fail**	**Pass**
CPC	0.144	**CPC Pass/Fail**	**Pass**

Part L Conformance - Fabric

Conformity with Maximum avg U-value requirements	**U-value [W/m^{2}K]**	**Pass/Fail**	**Conformity with Maximum U-value requirements**	**U-Value [W/m^{2}K]**	**Pass/Fail**
Pitched roof insulated on ceiling	0.15	Pass	**Roofs**	0.15	Pass
Pitched roof insulated on slope	0	Pass	**Walls**	0.18	Pass
Flat Roof	0	Pass	**Floors**	0.13	Pass
Floors with no underfloor heat	0.13	Pass	**External doors / windows / rooflights**	2.00	Pass
Floors with underfloor heat	0.00	Pass			
Walls	0.18	Pass			
Percentage of opening areas [%]	18.80				
Average U value of openings	1.23	Pass			
Permeability test carried out and meets guidelines in TGD L			0.15 | Pass		

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	**PV/Wind**	**0.00**	**0.00**	
+ Delivered energy	**Other**	**0.00**	**0.00**	
+ Delivered energy	**Solar**	**0.00**	**0.00**	
+ Delivered energy	**Biomass**	**0.00**	**0.00**	
+ Delivered energy	**Biodiesel**	**0.00**	**0.00**	
+ Delivered energy	**Bioethanol**	**0.00**	**0.00**	
+ Environmental energy	**HP**	**3780.79**	**3780.79**	
+ Saved energy	**CHP**	**0.00**	**0.00**	
+ District heating	**District Heating**	**0.00**	**0.00**	
+ Delivered energy	**Grid**	**0.00**	**2813.15**	
+ Delivered energy	**Thermal**	**0.00**	**0.00**	
SUBTOTAL		**3780.79**	**6593.94**	**0.57 - Pass**
Energy not used in Regulated Loads	**PV/Wind/CHP**	**0.00**	**0.00**	
TOTAL		**3780.79**	**6593.94**	**0.57**

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Energy Requirements: Individual Heating Systems

	Fuel Type	Electricity Fuel Factors Date	Primary energy conversion factor	CO_2 emission factor
Main space heating system	Electricity	Current	1.75	0.224
Secondary space heating system	None	Current	0.00	0.000
Main water heating system	Electricity	Current	1.75	0.224
Cooling System	None	Current	0.00	0.000
Pumps, fans	Electricity	Current	1.75	0.224
Energy for lighting	Electricity	Current	1.75	0.224

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CHAPTER THIRTEEN

POPULATION & HUMAN HEALTH

APPENDIX 13-1 School Demand Assessment – HW Planning
APPENDIX 13-2 Childcare Needs Assessment – HW Planning

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APPENDIX 13-1 School Demand Assessment – HW Planning

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hw planning

School Demand Assessment

Proposed Large Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork

Client: Murnane & O'Shea Ltd

July 2025

Connecting people.
Connecting places.

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01 //

Introduction

This School Demand Assessment has been prepared by HW Planning on behalf of Murnane & O'Shea Ltd to accompany a planning application for a proposed Large Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork. This report has been prepared in response to Item 33 of the LRD Opinion 25-03 dated the 28th of May 2025 which requested that.

> *'A Schools Demand Assessment following liaison with the Department of Education clarifying demand levels and numbers of pupils on waiting lists for enrolment years in schools within Ballincollig and the wider catchment.'*

Objective 3.24 of the Cork City Development Plan 2022-2028 (CDP) states that the Council will:

> *'.....Work closely with the Department of Education and Skills and landowners to ensure that new schools are provided to meet the needs of new residential neighbourhoods at: City Docks; Tivoli Docks; Ballincollig Maglin; Ballyvolane; South Glanmire; Blarney (Stoneview); Kilbarry /Blackpool Neighbourhood; and Douglas (Castletreasure).*

The proposed LRD consists of the demolition of an existing dwelling house, farmyard and associated agricultural buildings and the construction of a residential development of 544 no. units (232 no. dwelling houses and 312 no. apartment/duplex units, a creche and 1 no. retail unit.

Unit Type	Total Units	4-Bed	3-Bed	2-Bed	1-Bed
Residential Units	544	100 (18.5%)	185 (34%)	179 (32.5%)	80 (15%)

Table 01 - Proposed Housing Mix

The School Demand Assessment has been prepared to assess whether there will be sufficient capacity locally to cater for future primary and secondary school needs arising from the proposed development. This assessment should be read in conjunction with the accompanying Environmental Impact Assessment Report (EIAR), Planning Statement & Response to LRD Opinion Statement, Statement of Housing Mix and Statement of Consistency prepared by HW Planning which provide a rationale for the proposed density of the proposed development.

As noted in Appendix A of this report, the Department of Education were contacted by HW Planning at scoping stage of the EIAR, and were invited to make any comments/observations that the applicants should have regard to when preparing the EIAR for the project. At the time of writing of this School Demand Assessment, no response was received from the Department of Education.

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02 //

Policy Context

2.1 The Provision of Schools and the Planning System A Code of Practice - 2008

The 2008 Guidelines were jointly published by the Department of Education and Science, and the Department of the Environment, Heritage and Local Government, and sets out national policy in ensuring that sufficient educational facilities of all levels are delivered efficiently and in tandem with population growth. The Guidelines have three key core objectives as follows.

01 Schools provision should be an integral part of the evolution of compact sustainable urban development and the development of sustainable communities;

02 The provision of any new schools (both primary and post-primary) should be driven by and emerge from an integrated approach between the planning functions of planning authorities and the Department of Education and Science; and

03 Local authorities, as planning authorities, will support and assist the Department in ensuring the timely provision of school sites.

The Guidelines identify 6 no. key agreed actions in order to achieve the principles of the Guidelines.

01 Forecasting Future Education Demand.

02 Planning for New Schools through Local Authority Development Plans

03 Location of Schools – Planning Considerations

04 Site Development Standards

05 School Development Proposals and the Development Management Process

06 School Site Identification and Acquisition.

2.2 Cork City Development Plan 2022-2028 (CDP)

CDP Objective 3.24 'School Facilities' confirms that the Planning Authority will.

> *'.....Work closely with the Department of Education and Skills and landowners to ensure that new schools are provided to meet the needs of new residential neighbourhoods at: City Docks; Tivoli Docks; Ballincollig Maglin; Ballyvolane; South Glanmire; Blarney (Stoneview); Kilbarry /Blackpool Neighbourhood; and Douglas (Castletreasure).*

Section 3.70 of the CDP specifically addresses the future provision of schools in Cork City and includes a preliminary assessment prepared by the Department of Education and Skills projections outlining potential areas where additional schools would be required over the period to 2031 (ref Table 02).

DoE Preliminary Assessment of Additional Education Capacity			
School Planning Area	Growth Areas Included	Number of new or expanded Primary Schools (baseline figure)	Number of new or expanded Secondary Schools (baseline figure)
Ballintemple	General	1	0
	Mahon	1	0
	City Docks	4 - 6	1-2
Montenotte	Tivoli Docks	2 - 3	1
Glasheen	General	1-2	0
	Pouladuff / Lehenagmore	1	0
Gurranabraher	Ballyvolane	1- 2	1
	Old Whitechurch Road	1	0
	Kilbarry	1	0
	Farranferris	1	0
Ballincollig	**Maglin**	**2**	**1**
Blarney	Stoneview	1- 2	1
Glanmire	General	0	1
	South Glanmire	1	0
South Suburbs	Douglas	1	1
Total		20 - 26	7 - 8

Table 02 – DoE Preliminary Assessment of Additional Education Capacity – based on CDP Table 3.8

The subject site form part of the wider South Ballincollig (Maglin) Urban Expansion Area (MUEA). The MUEA is a strategic land bank of approximately 220 no. hectares to the south of the town of Ballincollig and north of the N22. The delivery of the MUEA has been a long-held ambition as a strategic expansion area for the town to accommodate population and housing growth in the settlement, in addition to the delivery of new schools, town centre uses, public open spaces and infrastructural upgrades.

Sections 10.222 of the CDP refers to the fact that:

> *"Ballincollig has 4 primary schools and 2 secondary schools. There is also a special needs school, Our Lady of Good Counsel, in Innishmore. Ballincollig as a growing town requires additional educational facilities. The Maglin Urban*

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Expansion Area in the south of the town is considered the optimum location for these schools."

This is reflected in Objective 10.62 - Ballincollig Education

"Cork City Council will work with the Department of Education and landowners to identify new school sites for the town and its wider catchment."

Future schools to be delivered in Ballincollig are identified by the ZO 12 'Education' zoning objectives for Ballincollig, which includes lands at Coolroe, and two separate educational facilities to be delivered in the MUEA.

03 //

School Demand Assessment

This School Demand Assessment has been undertaken to identify the existing school provision in the catchment of the proposed development, to determine the potential school demand arising from the proposal and to consider whether there is capacity within this provision to support the proposed development.

3.1 Demographic Profile of Ballincollig Urban Town

The wider MUEA is one of the designated strategic growth areas which are earmarked to sustainably accommodate the planned expansion of Cork City. Following the 2019 Cork City boundary extension the hitherto county town of Ballincollig became an urban town within Cork City. As such the Central Statistics Office (CSO) no longer reports census data for Ballincollig as a separate settlement with its data being amalgamated into that of Cork City census settlement reporting.

However, the CSO uses a number of smaller administrative units for capturing population statistics at a local level. These include Electoral Division (ED) units and Small Areas (SA), which are a sub-division of the ED units and generally cover 65-90 households. Using a combination of these smaller units the census data for the urban town of Ballincollig can be recreated. From this it can be seen that between the 2016 Census and the 2022 Census the population increased from 18,159 people to 20,578 people, an increase of 2,419 residents or 13.3% growth. While this growth is relatively high in comparison to the overall Cork City population growth of 6.2% in the same period, it is significantly below the ambitious growth forecast for Ballincollig in the CDP of 54.1% growth between 2016 and 2028. In effect the growth of 2,419 residents in this intercensal period was only 49% of that needed by 2022 to be on target to achieve the 2028 target population of 27,987.

Area	2016 Population	2022 Population	2016 -2028 % growth	2028 Population Target	% of Pro-rata Growth Achieved by 2022
Ballincollig Urban Town	18,159	20,578	13.3%	27,987	49%
Cork City	210,853	224,004	6.2%	261,561	52%

Table 03 - Ballincollig Intercensal Growth 2016 – 2022 – based on CDP 2 Year Progress Report Figure 23

While the CDP has identified a potential yield of 3,947 no. housing units in Ballincollig, in the two years to July 2024 only 180 no. units had been delivered. The 2022 Census, also indicated that while the average household size in Ballincollig dropped from 2.88 in 2016 to 2.85, it remains above the national average of 2.74 persons per household and the Cork City average of 2.62.

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3.2 Ballincollig School Planning Area

The Department of Education and Skills in planning for school provision undertake demographic data analysis based on 314 school planning areas nationally. Therefore, this assessment is based not on the Ballincollig Urban Town boundary discussed above but on the wider Ballincollig School Planning Area as indicated in Figure 01.

The Ballincollig school planning area (SPA) straddles the Cork City and County boundary and includes the settlements of Ballincollig and part of Kerry Pike in the City and Killumney/Ovens, Waterfall and Ballynora in the County. Areas of the eastern suburbs of Cork City and hinterland are also included.

The planning area is made up of 112 CSO Census SAs. In total the population in 2022 was 33,498, up from 30,015 people in 2016, a 12% increase, which is in line with the 13.3% increase in the Urban Town of Ballincollig over the same period.

Age	2016	2022	% of Population in 2022	% Change 2016 - 2022
0-4	2,243	2,194	7%	-2%
5 to 12	3,584	3,926	12%	10%
13-18	2,243	2,706	8%	21%
19 - 29	3,916	4,040	12%	3%
30 - 39	5,107	4,825	14%	-6%
40 - 49	4,170	5,357	16%	28%
50 - 59	3,691	3,874	12%	5%
60 - 69	2,809	3,255	10%	16%
70 - 79	1,432	2,255	7%	57%
80+	820	1,066	3%	30%
	30,015	33,498		12%

Table 04 - Ballincollig School Planning Area (SPA) Intercensal Growth 2016 – 2022

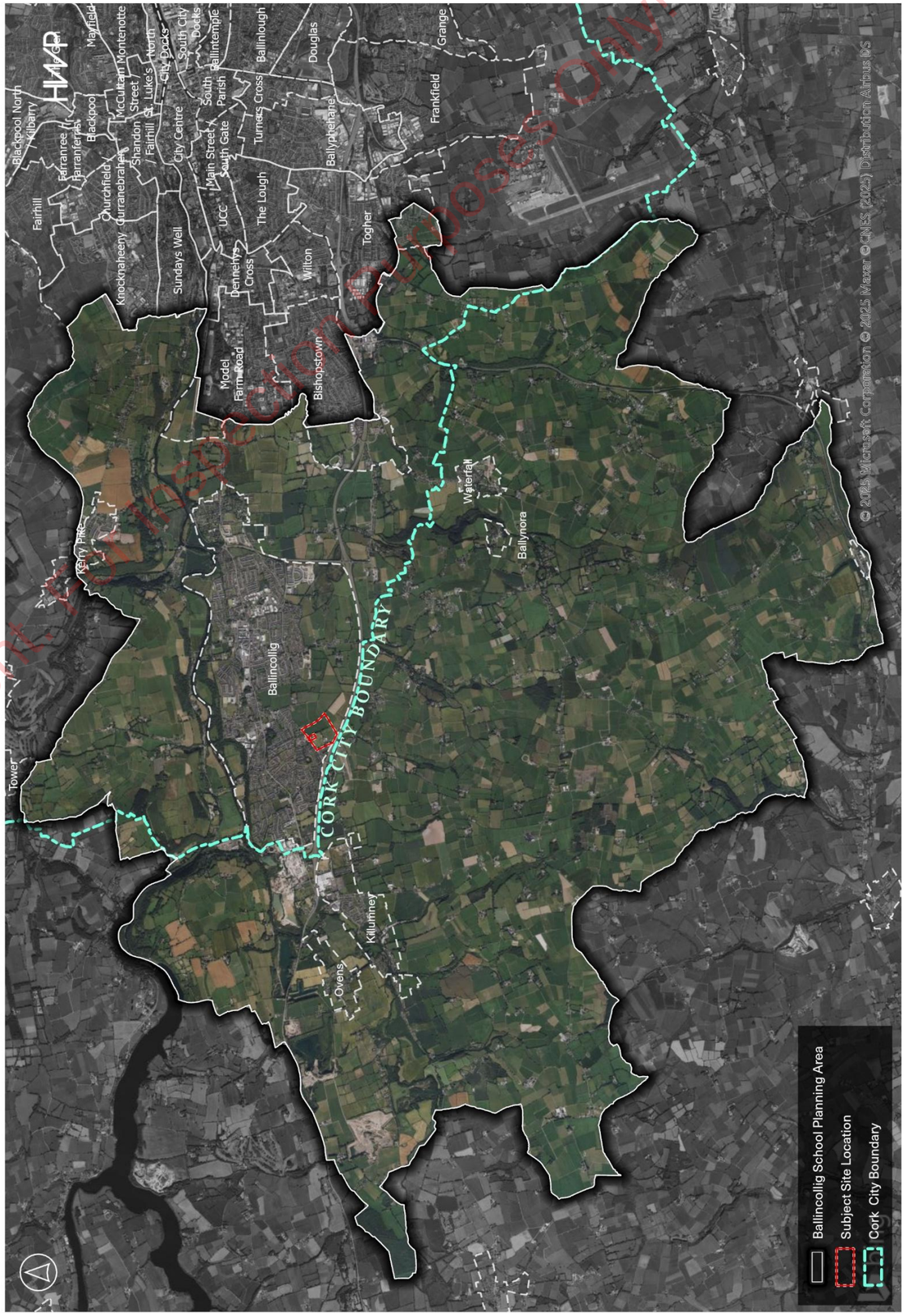

Figure 01 - Ballincollig School Planning Area Context

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Notwithstanding this overall population growth, Table 04 indicates that changes have occurred in the age profile of the population in the Ballincollig School Planning Area (SPA) in the last intercensal period, with the number of pre-school age (0-4 years) residents dropping by 2% from the 2016 figure. This trend in the pre-school population will impact directly on future demand for school places.

In both the 2016 and the 2022 Census the primary school age cohort[1] represented 12% of the total population, however, in 2016 this equated to 3,584 pupils whereas in 2022 this had increased to 3,926 pupils, an increase of 10%. The secondary school age cohort[2] made up 7% of the total 2016 population at a figure of 2,243 children, compared to 8% in 2022 when the figure was 2,706. These figures indicate an increase in the number of older children and a decrease in the number of younger children, resulting in a trend where the average age of children in the area has increased slightly in the intercensal period, in line with the national trend.

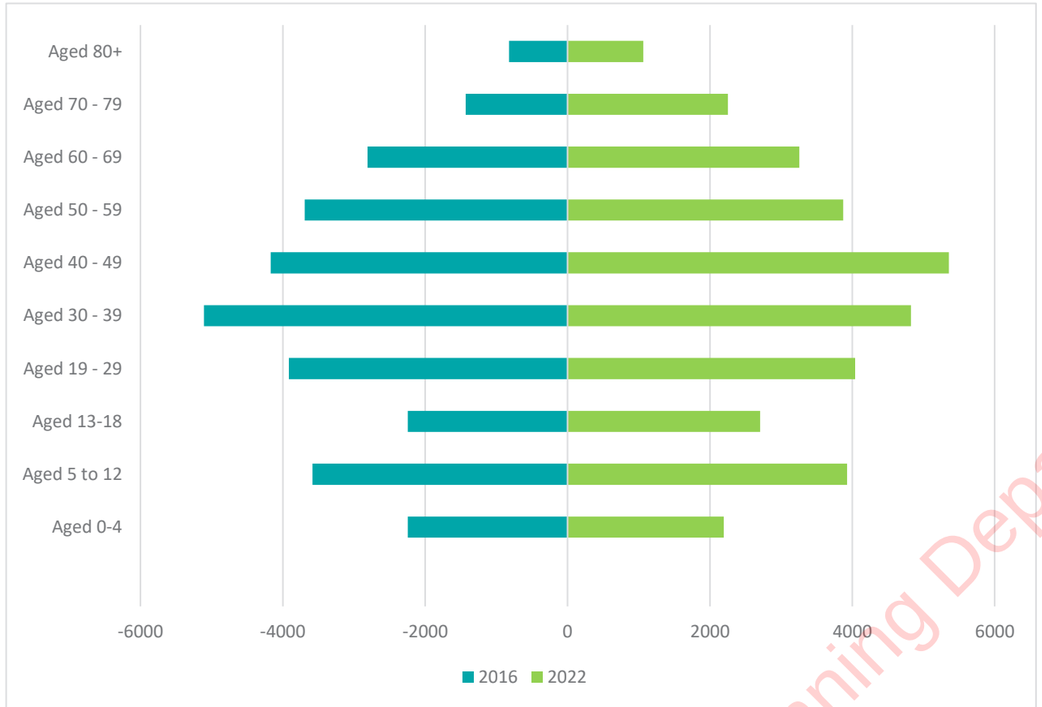

Figure 02: Ballincollig School Planning Area Population Pyramid – Age Profile 2016 - 2022

As Table 05 indicates, while the percentage share of the preschool cohort in the Ballincollig SPA is generally in line with Cork County and State figures, Cork City figures are significantly lower across all-school age categories. This may reflect the fact that the Ballincollig SPA straddles the administrative areas of both Cork City and Cork County Councils, and that the City Council portion was largely within the County Council area prior to 2019.

[1] the census age categories of 5-12 years were used to represent the primary school cohort.
[2] The census age categories of 13 – 18 year olds was used to represent the secondary school cohort

School Cohort	Ballincollig SPA (%)	Cork City (%)	County Cork (%)	State (%)
Pre-school (0-4 year olds)	2,194 (7%)	5%	6%	6%
1y School (5-12 year olds)	3,926 (12%)	9%	12%	11%
2y School (13-18 year olds)	2,709 (8%)	7%	9%	8%

Table 05 - 2022 Census Data for Pre-school, Primary and Secondary School Age Cohorts

3.3 Existing Schools & Educational Outlets in Ballincollig SPA

3.3.1 Primary Schools

Table 06 summarises the capacities of existing ten primary schools within the Ballincollig SPA according to Primary school enrolment figures as published by the Department of Education and Youth[3]. In the 2024/2025 academic year the total enrolment for these schools was 3,882, very slightly increased from the 2023/2024 figure of 3,874.

School	Address	2023/2024 Enrolment	2024/2025 Enrolment
Cloghroe Mixed N S	Cloghroe	515	519
Gogginshill N S	Goggins Hill	237	223
Clogheen Mxd N S	Kerry Pike	183	169
Ovens N S	Knockanemore	436	442
S N Naomh Eoin B	Station Road	411	391
Scoil Naomh Mhuire C	Ballincollig	454	447
S N Baile Nora	Ballynora	300	307
Scoil Barra	Innishmore	438	448
Gael Scoil Ui Riordain	Carraig an Earra	725	731
Gaelscoil An Chaisleáin	Cumann Rugbaí Bhaile an Chollaigh	175	205 *(500)[4]
Total		3,874	3,882 *(4,177)

Table 06. Primary Schools in Ballincollig SPA – 2023/2024/2025 – Preliminary Results

[3] https://www.gov.ie/en/department-of-education/collections/primary-schools-enrolment-figures/#20242025
[4] The development of a School Campus to accommodate Gaelscoil An Chaisleáin is progressing that will make provision for 500 primary students at this new school site

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Figure 03 – Exisitng & Future Schools Context in Ballincollig

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The 2023 projections from the Department of Education and Youth (previously called the Department of Education) estimate that enrolment levels in schools will decrease in the coming years, initially in primary schools and subsequently in post-primary schools. The Department of Education and Youth published the 'Projections of Full-Time Enrolment Primary and Post-primary Level 2023-2042' (2023) which outlines various scenarios of future intake for both primary and post-primary schools. The report estimates that primary school enrolment peaked in 2018 and, subsequent to a minor reversal in 2022 due to Ukrainian pupil enrolments, a continuous decline in new enrolments is expected until 2036.

Figure 1 Actual and projected enrolments in primary schools, 1989-2051

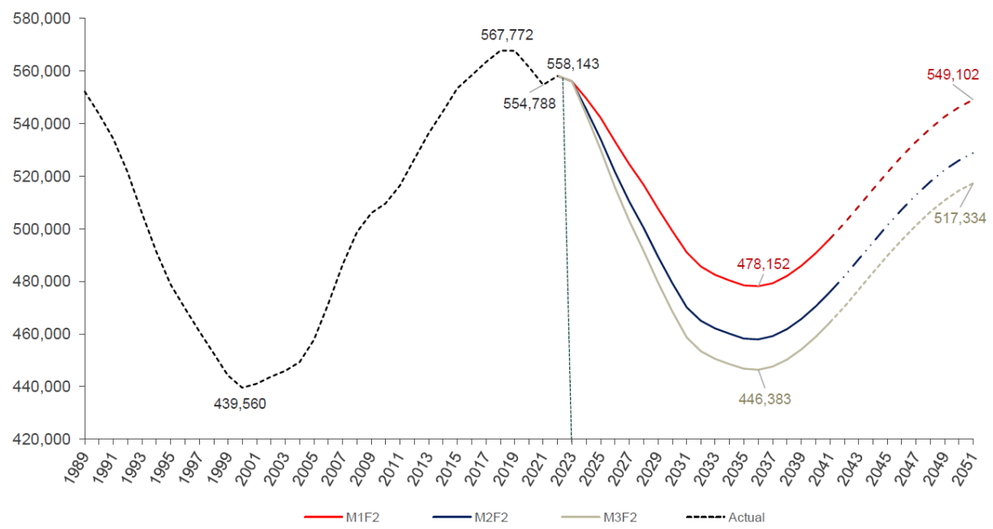

Figure 04 Dept. of Education and Skills Actual and Projected Enrolment at Primary Level 1989 - 2051 (Source: Department of Education and Skills 2023)

The Department's 2023 revised projections notes that:

> *Enrolments in primary schools in Ireland in 2022 stood at 558,143, up by over 3,500 on 2021 (554,788). This increase was due to increased inward migration, including recent enrolments of Ukrainian pupils who arrived since the crisis began. In general, as a reflection of the school age population demographic trends, the enrolments are projected to fall over the coming years under all scenarios, and under the M1F2 scenario to reach a low point of 478,152 by 2036 (Table 4). This is almost 80,000 lower than 2022's figure. Enrolments will rise again thereafter and are projected to reach 502,166 pupils by 2042, a rise of some 24,000 over the seven years 2036 to 2042.*

Ballincollig, however, is an area targeted for strategic growth and therefore does not fully conform to this pattern. However, while the CDP projected in 2022 that it would experience 54.1% growth between 2016 and 2028, in reality between 2016 and 2022 it experienced just 13.3% growth and is unlikely to reach its targets in the remaining years to 2028.

Notwithstanding this slower than anticipated growth rate Ballincollig remains a focus for growth in the west of the city. It should be noted in relation to Gaelscoil An Chaisleáin that while the 205

students are currently accommodated in a temporary building within the grounds of Ballincollig Rugby Club a new schools campus has been identified on a site in Lisheens, Ballincollig. The proposed 15 acre campus will also accommodate the Le Chéile secondary school, which currently has 130 pupils. The provision of these new schools will allow for 500 pupils in Gaelscoil an Chaisleáin and 1,000 pupils in Le Chéile to cater for the envisaged population growth of Ballincollig over the coming years.

3.3.2 Post Primary Schools

Table 07 summarises the capacities of existing secondary schools in Ballincollig SPA according to Post-primary schools enrolment figures. Similar to the trend evident in the primary schools there was an increase in enrolments between the 2023/2024 and the 2024/2025 as published by the Department of Education and Youth[5]. This is in line with the trend evident in the Census 2022 figures of an older average age of children in the settlement.

School	Address	2023/2024 Enrolment	2024/2025 Enrolment
Ballincollig Community School	Ballincollig	961	980
Coláiste Choilm	Ballincollig	1359	1,364
Le Chéile	Ballincollig	117	195 (1,000)* 6
Total		2,437	2,539 (3,344)*

Table 07. Post- Primary Schools in Ballincollig – 2023/2024/2025 – Preliminary Results

Based on the Department of Education's 2023 - 2042 projections, the secondary school enrolment figures are envisaged to peak in 2024/2025. Similar to trends for primary schools, a continuous decline in post primary enrolment is then expected until 2042.

[5] https://www.gov.ie/ga/an-roinn-oideachais/bailiuchain/post-primary-schools-enrolment-figures/
[6] The development of a School Campus to accommodate Le Cheile is progressing that will make provision for 1,000 secondary students at this new school site

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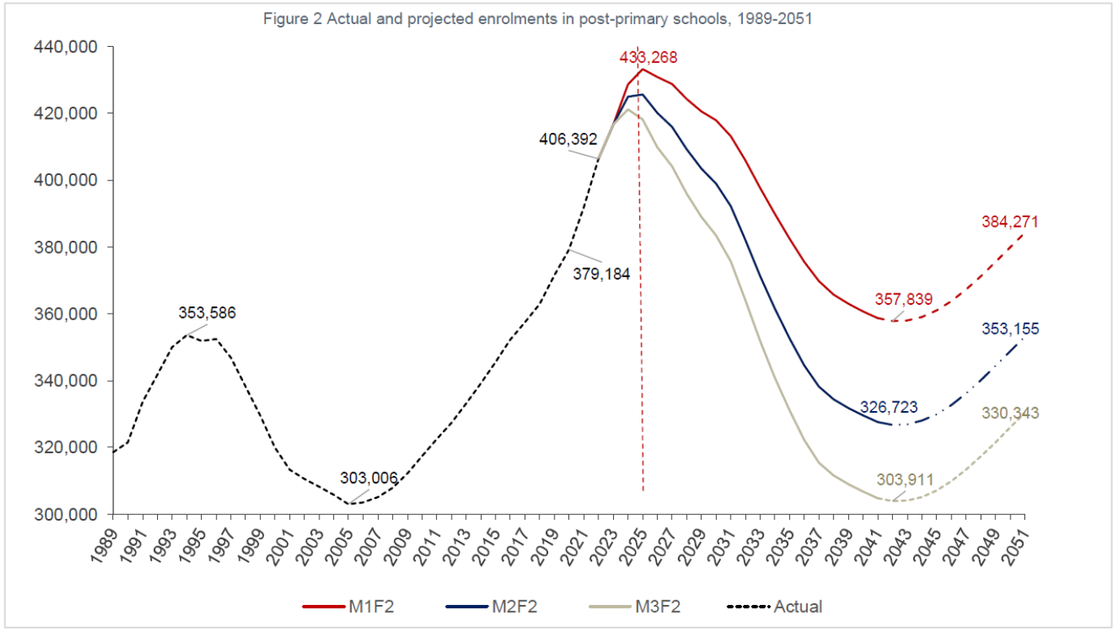

Figure 05 Actual and Projected Enrolment at Second Level 1989 - 2051 (Source: Department of Education and Skills 2023)

3.3.3 Schools Demand Generated by the Proposed Development

Notwithstanding this manifest intercensal changes in the school age population in the settlement, the school demand calculation has been undertaken based on a standardised approach using a proportion of the total indicative population that the proposed residential development is likely to give rise to.

Unit Type	Total Units	4-Bed	3-Bed	2-Bed	1-Bed
Dwellings	544	100 (18.5%)	185 (34%)	179 (32.5%)	80 (15%)

Table 08. Proposed Housing Mix

It is anticipated that of the total 544 proposed units, the 80 no. one-bedroom units could realistically be excluded from generating a school demand. However, if a conservative approach is adopted and all 544 proposed units are considered this could result in an uplift of 1,550 persons based on the 2022 average household size of 2.85 persons in the 2022 Census for Ballincollig. Extrapolating from the percentage of the 2022 population that was of pre-school or school age within the Ballincollig SPA it is estimated that between 92 - 109 children (7%) of the future residents of the scheme will be of pre-school age, between 159 - 186 (12%) will be of primary-school going age and between 106 - 124 (8%) will be secondary school going age. These estimates are conservative and do not factor in the future lag-effect of the significant local and countywide decline in the pre-school population between 2016 and 2022.

	Realistic No.based on Housing Mix	Conservative No. based on all units
No of Units Generating School Place Demand	464	544
Population uplift (based on 2.74 average household size)	1,322	1,550
Potential Pre-school Uplift Generated	93	109
Potential Primary School Uplift Generated	159	186
Potential Secondary School Uplift Generated	106	124

Table 09. Estimates of Pre-School and School Age Residents in the Proposed Scheme

	Primary School	Secondary School
ly/2y School Age Pop in Ballincollig SPA – 2022 Census	3,926	2,709
Potential Demand Generated for 1y/2y School Places	159 - 186	106 - 124
Total Aggregate Future Demand	4,085 – 4,112	2,815 – 2,833
Existing and Planned Capacity	4,177	3,344

Table 10. Capacity Assessment

3.4 Planned Education Developments

In the CDP, in addition to the 15 acre site at Lisheens, Ballincollig where the planned school campus is to be located, there are two further sites zoned for educational use within the MUEA, as identified in Figure 03. However, it is considered that the existing and planned provision is sufficient to cater for the proposed uplift in school demand, given the relatively slow growth rate exhibited to-date in Ballincollig. Furthermore, some outflows from the Ballincollig SPA catchment are to be expected, given the areas proximity to the wide range of schools available in nearby Cork City and its suburban areas. These have not been taken into consideration in the above calculations.

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04 //

Conclusions

From the above assessment it has been demonstrated that the Ballincollig SPA is well serviced by the existing and proposed primary and secondary school provision. A number of both such facilities are within accessible walking distance of the site.

The 2022 Census figures indicate a decline in the pre-school age cohort since the 2016 Census. The population pyramid included as Figure 02 shows an aging population in the settlement in line with the trend in the Country as a whole. This view is evident by the reduction in the pre-school age (0-4 years) from 2,243 children in 2016 to 2,194 children in 2022. Although, as Table 06 indicates, there was a slight increase in primary school enrolments between the 2023/24 and 2024/25 academic years, this reduced pre-school age population will likely result in a decline in future primary school enrolments. The Department of Education and Youth's projection that primary school enrolment peaked in 2018 and, subsequent to a minor reversal in 2022 due to Ukrainian pupil enrolments, a continuous decline in new enrolments is expected until 2036. Given the decline in the pre-school population evident in the 2022 census in Ballincollig, it is reasonable to expect the primary-school figures will fall as projected.

While there was a slight increase evident in the secondary school enrolment figures between the last 2 academic years, the Department of Education predicts that nationally enrolment in secondary level establishments is set to decrease after a peak in 2024/2025, indicating a lag before the pattern currently exhibited nationally in the primary school enrolments is evident in post-primary schools. It should be noted that Ballincollig as a targeted strategic growth area does not reflect the national trends as closely as other locations. However, given the relatively modest growth exhibited to-date in Ballincollig, the divergence is not significant and has been addressed by the planned school campus in Lisheen which will have an overall capacity to accommodate 1,500 students.

In view of the existing and planned capacity and projected future falls in student numbers, the potential school place demand generated by the proposed development of between 159 and 186 no. primary school places and 106 - 124 no. secondary school places, would be unlikely to cause any undue pressure on the existing and planned school capacity.

While consideration has been given to the 1 bedroom units, to some extent the 179 no. 2 no. bedroom units could also to viewed as generating a reduced demand for school places. As a conservative approach has been taken in this assessment, no reductions have been made on this basis. In general, the wide mix of units sized proposed suggests that a significant demographic of this scheme could be comprised of retirees and single person household units. Based on the above, it is concluded that the proposed development would not result in any negative impact on the capacity of primary and secondary school facilities throughout the Ballincollig SPA.

Appendix A

EIAR Scoping Letter sent to the Department of Education - 2nd January 2025.

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The Secretary
Department of Education
Marlborough Street,
Dublin 1,
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Email: info@education.gov.ie

2 January 2025

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Accreditations
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ISO 14001:2015
ISO 45001:2018

Re: EIAR Scoping – Proposed Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork.

Dear Sir/Madam,

We act on behalf of Murnane & O'Shea Limited who are preparing an application for a Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork. The application will be accompanied by an Environmental Impact Assessment Report (EIAR). Site location maps and a proposed site layout prepared by Deady Gahan Architects accompany this letter. The purpose of this letter is to seek any additional comments the Department of Education may have and that we should have regard to when preparing the EIAR for the project.

01 The Site

The subject lands of circa 15.17 hectares in area are situated in the townland of Greenfield, southwest of Ballincollig town centre. The lands are currently in agricultural use and bound to the south by the N22 and to the west by a small cluster of existing residential properties/farmyard and the Greenfield/Killumney Road which serves as the primary access point from the site.

Most of the subject lands are included within an area zoned as 'ZO 2 New Residential Neighbourhoods' in the Cork City Development Plan 2022 (CDP), with a portion of the site to the east included within the 'ZO 15 Public Open Space' zoning objective which state respectively.

> ZO 2 - *'To provide for new residential development in tandem with the provision of the necessary social and physical infrastructure.'*
>
> ZO 15 – *'To protect, retain and provide for passive and active recreational uses, open space, green networks, natural areas and amenity facilities.'*

Figure 01. CDP Zoning Map

02 Proposed Development

The proposed development comprises a 10-year permission for the construction of a development of 566 no. residential units consisting of 112 no. 4 bed units, 194 no. 3 bed units, 174 no. 2 bed units and 86 no. 1 bed units. The proposed development also includes a crèche facility and convenience retail outlet. Primary access to the proposed development will be via a new junction from the Greenfield Road which provides for the initial western section of the Maglin Urban Expansion Area (MUEA) Sustainable Access Corridor which can facilitate future access to further undeveloped and zoned lands within the wider MUEA. Ancillary site development works including ground works and retaining structures, foul drainage, stormwater drainage, water supply, electrical substation kiosks, boundary treatments, bicycle and car parking and landscaping. The areas of the site identified within the ZO 15 Public Open Space will be included within public open space/landscaped amenity areas, assisting in site drainage and green infrastructure proposals.

03 Summary

As stated previously, the purpose of this letter is to seek any comments the Department of Education may have that we should have regard to when preparing the EIAR for the project.

I would be grateful if you would forward any comments you may have on the proposed development to me at our office address listed below, or by email – info@hwplanning.ie. For convenience, this letter has been sent via email and hard copy to the addresses identified above.

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Please do not hesitate to contact us if you have any queries.

Yours Sincerely

John O'Brien
HW Planning

- Enclosure 1 – Site Location Mapping
- Enclosure 2 – Site Layout Plan prepared by Deady Gahan Architects.

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APPENDIX 13-2 Childcare Needs Assessment – HW Planning

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hw planning

Childcare Needs Assessment

Proposed Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork.

Client: Murnane & O'Shea Ltd

July 2025

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01 //

Introduction

1.1 Purpose of Document

This Childcare Needs Assessment has been prepared by HW Planning to accompany a planning application for the development of a Large-Scale Residential Development (LRD) of 544 no. residential units at Greenfield, Ballincollig, Co. Cork. This report has been prepared in response to Item 14 of the LRD Opinion 25-03 dated the 28th of May 2025 which requested that.

> *'Childcare Facility: Further consideration and amendment of the proposed development having regard to the submission of Cork City Childcare in relation to the detailed design of the proposed facility (See Appendix D).'*

1.2 Proposed Development

The proposed development consists of the demolition of an existing dwelling house and farmyard with associated agricultural buildings and the construction of a mixed-use residential development of 544 no. residential units consisting of 232 no. dwelling houses, 312 no. apartment/duplex units, a two storey creche facility, commercial/retail unit and all ancillary site development works. The proposed 232 no. dwelling houses will include 100 no. 4 bedroom detached/semi-detached dwelling houses, 124 no. 3 bedroom semi-detached/townhouse dwelling houses and 8 no. 2 bedroom townhouse units. The proposed 312 no. apartment/duplex units will include 61 no. 3 bedroom units, 171 no. 2 bedroom units and 80 no. 1 bedroom units, to be provided in 28 no. apartment/duplex buildings ranging in height from 3-4 storeys. One of the proposed apartment buildings (Block 3) will provide the ground floor commercial/retail unit.

Vehicular access to the proposed development will be via two entrances from Greenfields Road (L2216) with separate pedestrian/cycle connections also provided from Greenfields Road. Ancillary site works include the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex buildings, creche and commercial/retail unit, landscaping and servicing proposals including the upgrade of public footpaths/active travel infrastructure and water service infrastructure, 2 no. pedestrian crossings on Greenfields Road and the installation of a noise attenuation screen along the site's southern boundary.

1.3 Proposed Childcare Facility

In preparation of this Childcare Needs Assessment HW Planning contacted Cork City Childcare regarding the proposed creche facility required to serve the proposed development. In their correspondence dated 31st January 2025 (Appendix A of this Report), Cork City Childcare advised

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that a creche facility with a minimum of 128 no. spaces would be appropriate at the subject site given the scale and nature of the proposed development[1].

As detailed in the accompanying site plan and creche building plans prepared by Deady Gahan Architects, the proposed development provides for 128 no. child capacity creche facility with a gross floor area of 839.4 sqm in the south-central area of the site in accordance with the stated requirements of Cork City Childcare.

[1] It should be noted that when contacted, a previous draft proposal of 566 no. residential units was presented to Cork City Childcare. The proposed development now provides for 544 no. dwellings.

02 //

Planning Policy Context

2.1 Childcare Guidelines for Planning Authorities 2001

The 2001 Guidelines provide a framework to guide both local authorities in preparing development plans and assessing applications for planning permission, and developers and childcare providers in formulating development proposals. Appendix 2 of the Guidelines states that.

> *'In new communities/ new housing areas, planning authorities should require the provision of at least one childcare facility for new housing areas and other areas of residential development unless there are significant reasons to the contrary.*
>
> *An indicative standard of one childcare facility per 75 dwellings is recommended. One facility providing a minimum of 20 childcare facilities is considered to be a reasonable starting point.*
>
> *The threshold for provision should be established having had regard to the existing geographical distribution of childcare facilities and the emerging demographic profile of areas.'*

2.2 Circular PL 3/2016

In March 2016, the Government issued a circular in relation to childcare facilities under the early Childhood Care and Education (ECCE) Scheme. In accordance with the stated aspiration to increase access to childcare nationally, the circular requests that local planning authorities:

> *"Expedite all pre-planning application consultation requests from childcare facility providers in relation to proposals to extend opening hours, to increase capacity or to provide new facilities.*
>
> *Expedite, insofar as is possible, consideration of all planning applications or Section 5 declaration submissions in respect of childcare facilities in order to facilitate the expansion of required capacity as appropriate".*

2.3 Universal Design Guidelines 2019

On 10th June 2019, the Minister for Children and Youth Affairs, launched the Universal Design Guidelines for Early Learning and Care Settings. These guidelines are an important step in making all Early Learning and Care services accessible to all children. This publication offers guidance on the refurbishment, renovation and building of centres for Early Learning and Care in Ireland. The guidelines apply to both new-build and retrofit projects and provide a flexible Universal Design framework to ensure that settings are accessible, understandable and easy to use for all children, staff, families and visitors.

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- The Universal Design ELC setting comprises four quality features.
- Site Location, Approach, Entry and Site Layout
- Entering and Moving about the ELC setting
- Key Internal and External Spaces
- Elements and Systems

2.4 Sustainable Urban Housing Design Standards for New Apartments - Guidelines for Planning Authorities' (2020)

We note section 4.7 of the 2020 Apartment Guidelines which states that:

> *''One-bedroom or studio type units should not generally be considered to contribute to a requirement for any childcare provision and subject to location, this may also apply in part or whole, to units with two or more bedrooms.''*

2.5 Cork City Development Plan 2022-2028

Objective 3.21 of the Cork City Development Plan 2022-2028 (CDP) sets out to support the provision and expansion of high-quality childcare facilities throughout the city. The Council will:

> *'Require purpose-built childcare facilities as part of proposals for new residential developments of more than 75 dwelling units. However, where it can be clearly established that existing facilities are sufficient, alternative arrangements will be considered.*
>
> *Consult with the Cork City Childcare Company and the HSE on planning applications where childcare facilities are proposed.*
>
> *Require employers with more than 500 members of staff to provide childcare facilities as part of planning applications for significant new and extended development.'*

We also note Section 11.163 of the CDP which states.

> *'Purpose-built childcare facilities will generally be required as part of proposals for new residential developments of more than 75 dwelling units. However, where it can be clearly established that existing facilities are sufficient, alternative arrangements will be considered.'*

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03 //

Childcare Needs Assessment

3.1 Proposed Development

The proposed scheme will consist of the construction of 544 no. residential units comprising the following house types/accommodation mix.

Table 1. Proposed Accommodation/Unit Mix

No. Bedrooms	Unit Type	No. Units	Sub-total	Percentage
1	Duplex / Apartment	80	80	15%
2	Duplex / Apartment	171	179	33%
2	Townhouse	8		
3	Duplex / Apartment	61	185	34%
3	Semi-Detached / Townhouse	124		
4	Detached/semi-detached	100	100	18%
Total		544	548	100%

As illustrated in Table 1 above, 251 no. units are 1 or 2 bed apartment/duplex type apartments. As detailed in the accompanying Statement of Consistency prepared by HW Planning, the proposed housing mix is consistent with all national and local planning policies relating to housing mix in residential developments. It is envisaged that the primary market for the proposed units will be first time buyers, couples, or downsizers seeking to settle in the Cork area.

In accordance with standards outlined in the CDP, National Childcare Guidelines 2001 and the 2020 Apartment Guidelines which states.

> *'One-bedroom or studio type units should not generally be considered to contribute to a requirement for any childcare provision and subject to location, this may also apply in part or whole, to units with two or more bedrooms'.*

Based on this it has been calculated that the proposed development generates a potential need for approximately 101 no. childcare places[2]. For the childcare requirement a figure of 379 no. units was considered appropriate which includes all /proposed 2, 3 and 4 bedroom dwelling houses and excludes 50% (85 units) of the proposed 2 bedroom apartments and all 1 bedroom units (80 no. units). As stated previously, the proposed childcare facility of 128 no. children is in excess of this requirement.

Although not required in accordance with guidance in the National Childcare Guidelines 2001 and the 2020 Apartment Guidelines, should the Planning Authority consider that 100% of the 2-bed apartment/duplex units should be factored into the childcare needs assessment of the proposed development (464 no. units in total), this would equate to a potential need for approximately 123 no. childcare places[3]. The proposed 128 no. child creche facility is still in excess of this requirement.

3.2 Demographic Profile

As detailed in Chapter 13 of the accompanying EIAR, (Population & Human Health), and Table 2 below, the EIAR study area demographic is generally in line with that of the Cork City and Cork County Council areas reflecting a national trend of an ageing population, where declining birth rates, long life expectancy and low death rates.

Table 2. Census 2022: Population age group within study area, Cork City and Cork County and State

	Study Area	Cork City Council Area	Cork County Council Area	State
0 to 9 years	14%	11%	13%	12%
10 to 19 years	14%	12%	15%	14%
20 to 29 years	10%	16%	9%	12%
30 to 39 years	15%	16%	12%	14%
40 to 49 years	17%	14%	16%	15%
50 to 59 years	12%	12%	13%	13%
60 to 69 years	10%	10%	10%	10%
70 to 79 years	6%	7%	7%	7%
80 + years	2%	4%	4%	4%

[2] 379 units / 75 dwellings x 20 childcare places = 101 no. childcare places.
[3] 464 / 75 x 20 childcare places – 123 no. childcare places.

However, from the population pyramid in Figure 1 it is clear that despite this general pattern there are differences between the study area population and the wider Cork City Council area population, with 5% more of the study area population being children under the age of 19 years and 3% more being adults in the 40 – 49 year category, presumably their parents. Conversely, in the wider City area there is 7% more younger adults between the ages of 20 – 40 years and more older adults over the age of 70 years.

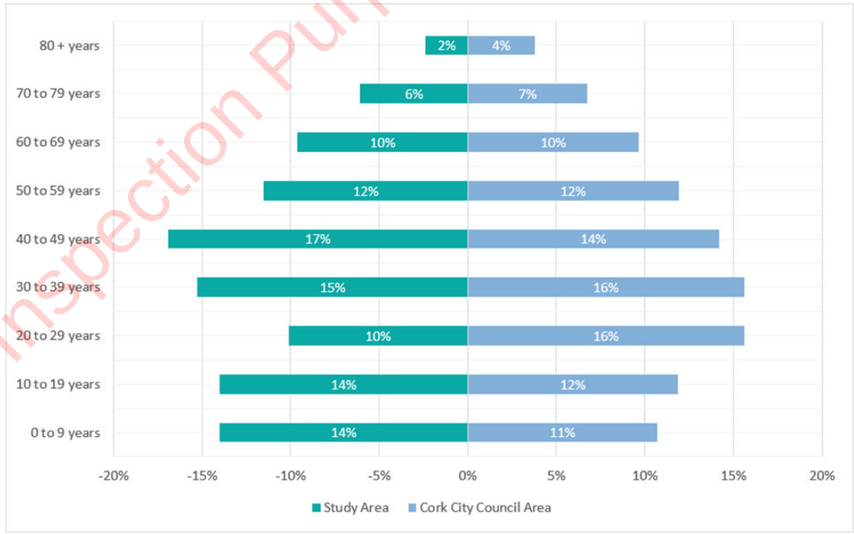

Figure 1. Ballincollig Study Area Versus Cork City Population Pyramid (Census 2022).

Figure 2. Study Area.

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3.3 Existing & Future Childcare Services in the Area

In addition to the proposed childcare facility in this application, there are also several other existing and permitted childcare facilities in the study area. In a submission to the LRD Stage 2 process, Cork City Childcare included a list of early year providers in the area, which has been used as the basis for this assessment. In addition, a review of the Tusla Childcare Register of Early Years Services by County (June 2025) and Tusla Inspection Reports was carried out to ensure the assessment was up-to-date. Based on this information it appears there are approximately 871 no. available childcare places across 16 no. childcare facilities in the study area (ref. Figure 13.11). However, 119 no. of these places are afterschool places for 4 – 12 year olds. Of the remaining 752 places, 53% cater for 2 – 6 year olds, with only 47% catering for 0-6 year olds.

Typically, attendances at childcare facilities can fluctuate significantly given the time of year with lower attendances likely during summer holidays and school mid-term breaks etc. The Cork City Childcare submission stated that across the study area only 2 of these 752 places remained available.

It should be noted that an additional 4 no. creches have been granted planning permission since 2020 in the study area. This are:

- Ref 21/7517 – extension of duration for permission for a creche alongside a 156 no. unit residential development in Codrum Hall, Grange granted under Planning Ref. 06/12722 & ABP Ref. PL04.224953 and extended under Ref. 13/4725, 18/4980. (Cork County Council).
- Ref 22/4345 – extension of duration for permission for a creche alongside 45 dwellings in Grange granted under Planning Ref. No. 07/11996 and extended under Pl. Reg. No.s 12/6410 (Cork County Council).
- Ref 23/41785 – for a change of plan to increase the permitted creche from an 80 space facility to a 107 space facility at Heathfield, Carriganarra, Ballincollig (Cork City Council).
- Ref. 24/43308 – for a 120 space creche off Maglin Road, Ballincollig. This creche may replace a 40- 50 space creche permitted under application ref 2342446 (Cork City Council).

The delivery of the 2 more recent permissions alone, would increase the childcare spaces within the study area by 227 spaces. Given the proposed provision of a 128 capacity creche as part of the subject application it concludes that the proposed development will not cause any undue pressure on the existing and planned childcare facilities. This is particularly so in the context of the decline in the pre-school age population cohort within the study area in the last intercensal period.

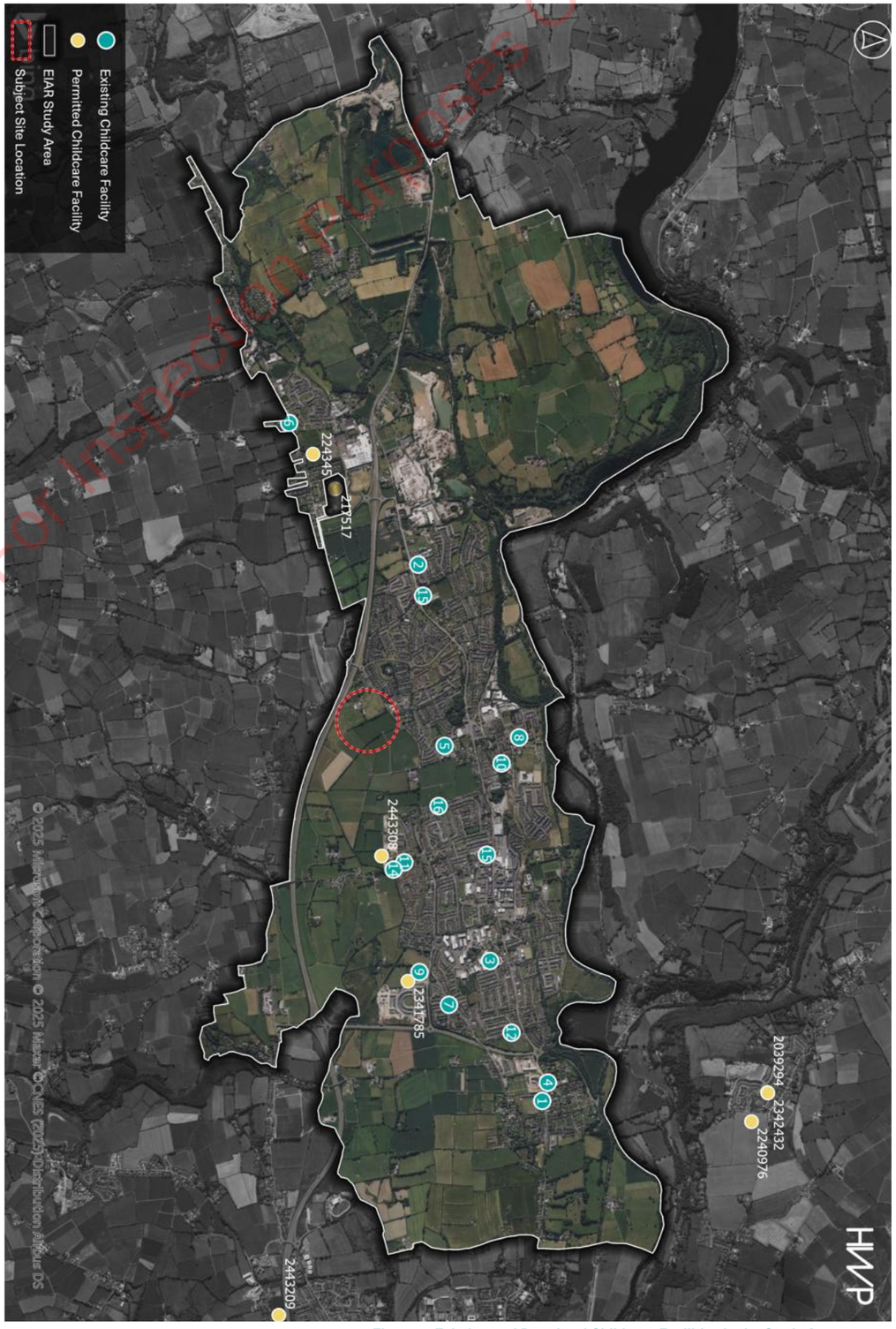

Figure 3. Existing and Permitted Childcare Facilities in the Study Area

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Table 3. Existing Childcare Services in the Study Area (based of Cork Childcare Committee Submission Information and Tusla data)

Map Ref	Ref_no	Facility	Address1	Town	Age	Capacity	Places Available
*1	TU2015CC423	The Willows Montessori	The Willows	Cork	2 - 6 years	22	2
*2	TU2015CC204	Kindercare Childcare	Unit 5	Ovens	0- 6 years	190	0
*2	TU2015CC204	Kindercare Childcare	Unit 5	Ovens	4 - 12 years	22	0
3	TU2015CC295	Naionra na n'Óga - Lighthouse Centre	Unit 3a The Link Road Business Park	Ballincollig	3 - 6 years	12	-
*4	TU2015CC093	Child Vision Pre-School	c/o Guide Dogs	Ballincollig		11	0
*5	TU2015CC182	Positive Ideas T/A Highcare Childcare	Caisleaín Drive	Ballincollig	0- 6 years	160	0
*5	TU2015CC182	Positive Ideas T/A Highcare Childcare	Caisleaín Drive	Ballincollig	4-12 years	60	0
6	TU2015CC078	Bun an Cnoic	Grange Cross	Ovens	2 - 6 years	16	-
*7	TU2015CC089	Cheeky Cherubs Early Years Schools - Ballincollig	Highfield Park	Ballincollig	2 - 6 years	40	0
*7	TU2015CC089	Cheeky Cherubs	Highfield Park	Ballincollig	4- 10 years	24	0
*8	TU2015CC188	Innishmore Family Centre CLG	Innishmore	Ballincollig		68	0
*9	TU2015CC281	Na Seoda Oga	Ballincollig Community Hall	Ballincollig	2 - 6 years	38	0
*9	TU2015CC281	Na Seoda Oga	Ballincollig Community Hall	Ballincollig	4 - 12 years	25	0
*10	TU2015CC374	Spraoi Pre-school	9 The Paddocks	Ballincollig		19	0
11	TU2015CC076	Brothers of Charity Early Intervention Services	2 Glincool Drive	Ballincollig			-
*12	TU2016CC015	Rainbow Rascals Montessori School	22 Hawthorn Ave	Ballincollig	2 - 6 years	11	0
*14	TU2015CC142	Eileen's Playschool	8 Glincool Drive	Ballincollig		22	0
*14	TU2015CC033	Ballincollig Early Years Pre-School	The Village Centre	Cork		54	0
*15		Sherpa Kilds	Gaelscoil an Chaisleáin	Ballincollig	4 - 12 years	48	0
16	TU2015CC271	Ballincollig Montessori School	85 Beech Rd., Muskerry Estate	Ballincollig	2 - 6 years	29	-
Total Spaces						842	2
Total Pre-school						723	
Total Afterschool						119	2

We note the submission of Cork City Childcare dated the 20th of May 2025 within Appendix D of Cork City Councils LRD Opinion where it is requested that a larger creche be provided for the proposed development. In preparing this Childcare Needs Assessment we also note An Board Pleanála's decision dated the 5th of June 2025 to grant permission for an LRD of 164 no. residential units at Waterfall Road, Bishopstown, Cork. (ABP-321949-25). In their assessment of the permitted development, we note that Section 8.5.16 of the Board Inspectors Report dated the 27th of May 2025 concluded that

> *"I have also reviewed the position of the Committee and acknowledge the details and analysis presented on childcare facilities in the wider area, the need for additional spaces, and for a greater range of care options. However, I do not consider it reasonable to require the applicant to provide a notably larger facility to meet demands greatly in excess (64 spaces) of what the proposed development generates (36 spaces)."*

As requested in the LRD Opinion further consideration for a revised creche facility was considered, however as stated previously in this Childcare Needs Assessment, the proposed 128 no. crèche facility is in excess of the calculated childcare generation figures of the proposed development and will positively contribute to addressing current childcare shortages in the Ballincollig Area.

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Conclusion

Having regard to Section 4.7 of the 2018 Apartment Guidelines and Appendix 2 of the Childcare Guidelines for Planning Authorities 2001, it has been established that the proposed development generates a potential need for approximately 101 no. childcare places. The proposed development provides for a 128 no. child creche in excess of this minimum requirement as agreed through consultation with Cork City Childcare.

The proposed creche facility designed by Deady Gahan Architects is in accordance with all relevant policies and objectives of the Cork County Development Plan, Childcare Guidelines for Planning Authorities 2001 and Universal Design Guidelines 2019.

Appendix A

Correspondence with Cork City Childcare – 30th January 2025

Cork City Council Planning Department. For Inspection Purposes Only!

Suite 1, John Dunlop House, Marina Commercial Park, Centre Park Road, Cork, T12 P9PV
Tel: 021 4310500, Email: info@corkcitychildcare.ie

Date: 31st January 2025

RE: Proposed Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork.

To whom it may concern,

Cork City Childcare carried out a childcare needs assessment for the Proposed Large-Scale Residential Development (LRD) at Greenfield, Ballincollig, Cork, area. The accompanying table is a list of Childcare Services located within 3 km radius surrounding this area. The childcare needs assessment was conducted with information gathered from the Tusla register on the week of 27/01/2025. The Childcare Assessment reflects the services that are in operation within 3km radius of the Greenfield, Ballincollig, Cork, area. Please note this is a mix of full day care, sessional preschools, and/or part-time childcare services, combined Early Learning and care/school aged childcare.

According to the ***Childcare Facilities Guidelines for Planning Authorities, 2001,*** a standard of one childcare facility providing for a minimum 20 childcare places per approximately 75 dwellings is a guideline provided. In terms of this development, with 480 dwellings proposed (omitting 86 one bedroom dwellings) , that would average **approximately 128 childcare spaces at a minimum.** Based on the childcare availability surrounding this location there is a need for a larger childcare facility to be considered offering a range of different service types, such as sessional/part time/full day care/drop in/after-school.

It is clear from the capacity assessment undertaken by Cork City Childcare that there are minimal places available in the area. There are 8 of these services offering preschool only sessions, operating on only a 15-hour week basis. In most cases additional childcare provision, alongside this three hour per day, is required to meet the needs of working families and parents engaged in training and education.

Within a 3km radius of of the Greenfield, Ballincollig, Cork, area there are only three services catering for full day care. Only two of these services is currently providing care for children under the age of two years. Many childcare services in the 3km radius surrounding this area operate an internal waitlist, to meet the needs of families already within the service, that often **comprises of a two year wait.** Please note this is not inclusive of the external waitlist available to additional children and families in the area. The demand for baby places is at an all-time high. The Annual Early Years Sector Profile Survey 2020/2021 report states that for every two babies enrolled in services, approximately three are placed on a waiting list (154%). A link to the full report is available here: Annual Early Years Sector Profile Survey 2020/2021 report

The Central Statistics Office Ireland (CSO, 2023) also reported there was a total of 1,704 children aged between 0-4 years, 1,913 children aged between 5-9 years and 1,887 children aged between 10-14 years residing within a 3km radius of the Greenfield, Ballincollig, Cork, area. as of, 2023. Everchanging dynamics in how young families are now living has also added to the already existing childcare demand associated with the area.

According to *Census of Population 2022 Profile 3 - Households, Families and Childcare* National

- Almost one-third (331,783) of children under the age of 15 in the State were in some form of childcare.
- A crèche or a similar facility was the most common form of childcare (42%), followed by an unpaid relative or family member (28%).
- A crèche was the most common type of childcare used among 0- to 4-year-olds. Over half (56%) used this childcare option and a further 19% used an unpaid relative or family member.
- Primary school children were most likely to be in some type of childcare (52%).

Cork City

- There were 146,235 families in Cork in April 2022, up from 138,895 (+5%) in 2016. The average number of children per family in the county was 1.32, compared with 1.34 nationally.
- There were 113,667 children aged 15 and under in Cork in April 2022. Of these, 38,604 (34%) were in childcare, compared with 33% nationally.

Based on the county average of 1.32 children per family, applying this to the 480 proposed family homes (omitting the 86 one bedroom dwellings) results in an estimate 633.6 children. Given that 34% of these children (the county average for those requiring childcare) would need childcare within a 15-year cycle, this equates to approximately 215.4 children. **Therefore, we would recommend and advocate for a larger childcare facility than the proposed 122 space one in the reports and plans for this LRD.** It is vital that Cork City has sufficient capacity to support the growing demand for childcare in lands located at the Greenfield, Ballincollig, Cork, area.

In conclusion, with reference to the Childcare Facilities Guidelines for Planning Authorities (2001), **a capacity of 128 at minimum would align with the recommendations provided.** However, given the national demand for childcare services and the significant shortage of spaces for children aged 1-3 years, we would advocate for the development of a larger facility. The area of Ballincollig has seen substantial housing growth in recent years, yet the availability of childcare services has not kept pace. We are experiencing a high volume of inquiries from parents who are facing long waiting lists, which highlights the pressing need for additional childcare spaces. We would therefore recommend a facility with greater capacity, accommodating a broader range of age groups.

Thank you for the opportunity to submit this proposal and contribute to the development of much-needed childcare services in Cork City. I am enthusiastic about the potential positive impact this facility could have on the community and its families. Please feel free to reach out if you require any further details, clarification, or additional support as you move forward with the planning and implementation of this Childcare Facility. I would be more than happy to assist in any way I can to ensure the successful development and operation of this important project.

Kind regards,

Leanne Twomey

Development Officer

Cork City Childcare Committee

Directors: Eibhlín Mhic Pharthalain, Eileen Wedel, Marian Quinn, Johanna Forde
CRO Number: 354923 Charity Number: 20204749

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Cork City Childcare- Capacity Assessment

ELC Childcare					
Name	**Address**	**Service Type**	**Age Range**	**Capacity**	**Available places**
Rainbow Rascals Montessori School	22 Hawthorn Ave, Inniscarra View, Ballincollig, Co. Cork	Sessional	2-6 yrs	11	0
Cheeky Cherubs Early Years Schools – Bishopstown	19 Uam Var Avenue, Bishopstown, Cork City, Co. Cork	Full Day/ Part Time/ Sessional	2-6 yrs	40	0
Child Vision Pre-school	c/o Guide Dogs HQ, Model Farm Road, Ballincollig, Co. Cork	Sessional	2-6 yrs	11	0
The Willows Montessori	The Willows, Model Farm Road, Co. Cork	Sessional	2-6 yrs	22	2
Kindercare Childcare	Unit 4,5,8,9,10, Classes Lake Retail Centre, Classes Lake, Ovens, Co. Cork	Full Day/ Part Time/ Sessional	0-6 yrs	190	0
Positive Ideas T/A Highcare Childcare	Caisleán Drive, Ballincollig, Co. Cork	Full Day	0-6 yrs	160	0
Eileens Playschool	8 Glincool Drive, Maglin, Ballincollig, Co. Cork	Sessional	2-6 yrs	22	0
Spraoi Pre-school	9 The Paddocks, West Village, Ballincollig, Co. Cork	Sessional	2-6 yrs	19	0
Innishmore Family Resource Centre	Innishmore, Ballincollig, Co. Cork	Sessional	2-6 yrs	68	0
Na Seoda Oga	Community Centre, Station Road, Ballincollig, Co. Cork	Sessional	2-6 yrs	38	0
Ballincollig Early Years Pre school (BRFC)	The Village Centre, Station Road, Ballincollig, Cork, Co. Cork	Sessional	2-6 yrs	54	0

School Aged Childcare					
Name	**Address**	**Service Type**	**Age Range**	**Capacity**	**Available places**
Sherpa Kids Gaelscoil an Chaisleáin	Tanner Park , Coolroe, Ballincollig, Co. Cork	Stand Alone	4-12 yrs	48	0
Cheeky Cherubs	Highfield Park, Carriganarra, Ballincollig, Co. Cork	Combined	4-10 yrs	24	0
Kindercare Childcare	Unit 8, 9 & 10, Classes Lake Retail Park, Ballincollig, Co. Cork	Combined	4-12 yrs	22	0
Na Seoda Oga	Ballincollig Community Hall, Station Road, Ballincollig, Co. Cork	Combined	4-12 yrs	25	0
Positive Ideas T/A Highcare Childcare	Caisleán Drive, Ballincollig, Co. Cork	Combined	4-12 yrs	60	0

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