CARRIGANARRA LRD

VOLUME III | EIAR

Appendices

Murnane & O'Shea Ltd.
BUILDING CONTRACTORS

HW/P
hw planning

DG
ARCHITECTS

Keohane Geological & Environmental Consultancy

egis

Lane Purcell Archaeology
LPA

SR
LA

DIXON BROSNAN
ENVIRONMENTAL CONTULTANTS

MODEL
WORKS

Trinity
Consultants

awnconsulting

DOSA
DENIS O'SULLIVAN & ASSOCIATES
CONSULTING ENGINEERS

CARRIGANARRA LRD

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LRD Meeting held on 25/01/2024 and 03/04/25 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: 188/23

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	Maglin, Carrigrohane, 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	Letter of Consent
5. Meeting attendees	<u>Applicant</u> Paudie Murnane, Murnane O'Shea Ltd. Kieran O'Donovan, Murnane O'Shea Ltd. Harry Walsh, HW Planning John O'Brien, HW Planning Eamonn Gahan, Deady Gahan Architects Ger Naughton, Deady Gahan Architects Simon Ronan, Simon Ronan Landscape Architects Liam O'Toole, DOSA Consulting Engineers <u>Cork City Council</u> Gwen Jordan, Senior Executive Planner, Development Management Hugh Killen, Executive Planner, Development Management Kate Magner, ASO, Development Management Adrian O'Neill, Executive Engineer, Environment Cathy Beecher, Senior Exec. Engineer, Parking/Public Lighting/Traffic Mgmt. Ciara Brett, Executive Archaeologist, Strategic and Economic Development Kevin Cullen, Senior Executive Architect, City Architects Niamh O'Brien, Senior Executive Engineer, Capital Projects Tony Donovan, Senior Executive Engineer, Drainage Apologies: Liam Buckley, Executive Engineer, Roads Maintenance Valerie Fenton, A/Senior Executive Engineer, Urban Roads & Street Design Gillian O'Sullivan, Senior Executive Engineer, Infrastructure Development Kieran O'Keeffe, Senior Staff Office, Housing Capital Emer O'Callaghan, Executive Horticulturist, Parks and Recreation Rosemarie McDonald, Biodiversity Officer, Parks and Recreation Tony Lynch, Senior Executive Transport Officer, Strategic & Economic Devt. Kevin O'Connor, Senior Planner, Strategic & Economic Development

	Ken Manley, MHL Consulting Engineers
6. Meeting	Via Microsoft Teams, 25/01/2024, 11.00.

DOCUMENTATION SUBMITTED

Letter of Consent, Completed Form 18, Site Location Mapping, Site Layout Plans, Architects Pre-Planning Presentation, Landscape Strategy, Infrastructure Report, Maglin Masterplan.

BRIEF DESCRIPTION OF DEVELOPMENT/PROPOSAL

Proposed development of 232 no. residential units (114 no. dwelling houses and 118 no. duplexes/apartments), a crèche and ancillary site/infrastructure works.

Land Zonings:

- ZO 01 Sustainable Residential Neighbourhoods, and
- ZO 15 Public Open Space

Site is currently in agricultural use. Proposed development includes section of and access/egress from the proposed Maglin Urban Expansion Area spine road/BRT.

RECENT PLANNING HISTORY ON SITE

N/A on site

Note adjoining sites within same landownership:

- 2241644 for 98 no. Residential units Grant
- Pre-Planning S247 Ref. 179/23 for 719 no. residential units, crèche and community building
- Land zoned ZO 12 Education within same landownership

COMPLIANCE WITH LRD THRESHOLDS

Proposed development complies with the more than 100 housing units threshold.

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

ZO1 SUSTAINABLE RESIDENTIAL NEIGHBOURHOODS
ZO15 PUBLIC OPEN SPACE

SOUTH BALLINCOLLIG URBAN EXPANSION AREA

STRATEGIC OBJECTIVE 2 DELIVERING HOMES AND SUSTAINABLE NEIGHBOURHOODS
OBJECTIVE 3.1 PLANNING FOR SUSTAINABLE NEIGHBOURHOODS
OBJECTIVE 3.2 A DIVERSE, INCLUSIVE AND EQUAL CITY
OBJECTIVE 3.3 NEW HOUSING SUPPLY
OBJECTIVE 3.4 COMPACT GROWTH
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OBJECTIVE 11.2 DWELLING SIZE MIX

OBJECTIVE 11.3 HOUSING QUALITY AND STANDARDS
OBJECTIVE 11.4 DAYLIGHT, SUNLIGHT AND OVERSHADOWING (DSO)
OBJECTIVE 11.5 PRIVATE AMENITY SPACES FOR HOUSES

OBJECTIVE 12.1 LAND USES AND FLOODING

MINISTERIAL AND OTHER GUIDELINES

Sustainable Residential Development and Compact Settlements ()

Quality Housing for Sustainable Communities (GoI, 2007)

Urban Design Manual (GoI, 2009)

Sustainable Urban Housing: Design Standards for New Apartments (GoI, 2022)

Planning for Watercourses in the Urban Environment from Inland Fisheries Ireland

MEETING AGENDA

1. **Introduction – mute mikes**

2. **Applicant Team - Overview of the proposed scheme.**

Density range and definition is not impacted by the new *Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities (January 2024).* This is a suburban urban extension area, density of 35-50units/ha should apply. The scheme density is 40 units/ha.
It is a peripheral location to Ballincollig, 10-12 minute walk from the 220 bus service.
The Housing Need and Demand Assessment identifies Ballincollig for a large proportion of 3-4 bed dwellings.

There is reasonably good connectivity to Ballincollig Town Centre, and Leo Murphy Road. Shops, schools, etc. are in reasonable walking distance. There are good connections north with the BRT and greenway routes. The BRT connects west to other development. The greenway runs along the northern boundary and extends to the existing farmhouse nodal feature.

A wider scale site plan was provided with a focus on applicant-owned sites. The Stonecrest development and other zonings are included.

Open space is provided around the standing stone and lime kiln archaeological features. The BRT route will be the focus for higher density housing and a strong street hierarchy. Character areas to the south and east will have higher scale buildings and form. There will be more traditional housing forms as you work back into the site. There is a range of 1-, 2-, 3- and 4- bed units in accordance with the CCDP.

Landscape key objectives are pedestrian connectivity, the flood zone to the south, and the greenway. Parks are well-distributed throughout the site. There will be a linear park along the greenway, and a central plaza as a public open space centrepiece. The south area will be greener and more natural with trees and meadow planting. It is a biodiversity-led landscape plan, planting follows the All-Ireland Pollinator Plan. Play is integrated into green spaces with natural play areas and incidental 'play along the way'.

3. Planning Authority Response

3a. Planning overview
Principle of the development, phasing & delivery, and integration with other sites outside the red line boundary

Land zoning ZO 01 Sustainable Residential Neighbourhoods and ZO 15 Public Open Space. The principle of development is accepted. The public open space to the south incorporates flood plain. The development must comply with the Cork City Development Plan (CCDP) and the recently published guidelines, *Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities (January 2024).* The Cork City Dev. Plan suburban density is 40-80 units/ha.

Calculations must be clear for the areas of Public Open Space to be included (active vs passive), and the space to be excluded.

Applicant Response: There is inconsistency between the CCDP and the new guidelines. As the suburban extension of a metropolitan town, the density range should be 35-50 units/ha.

The density issue will need to be revisited.

3b. Connectivity / Transport

Capital Projects

- A Sustainable Access Corridor is planned, not a BRT route as labelled on the applicant's drawings. The Sustainable Access Corridor (SAC) route has not been released yet, but this is imminent.
- A 20m cross-section is required for this route. Active frontage is not attainable on the route south of the tree grove. This must go through flood plain; the new road must drain, it cannot flood. At a high level, the tie-in with Heathfield is ok. The junction crossing at the greenway must be safe. Connectivity is important to integrate into overall development and integration with adjacent sites.

Applicant Response: When will definition on the route be available?

- The decision is imminent. The SAC will have 3m lanes to keep speeds down and leave space for a future bus lane. As well as a Road Safety Audit, a Quality Assessment will also be needed to include pedestrians and cyclists.

Traffic

- There will be no traffic impact to assess until the SAC route is set.
- The applicant should discuss the strategic planning/ proposed masterplan for this area with Tony Lynch, Senior Executive Transport Officer and the Area Engineer.

3c. Overall Layout and Open Space

Architects

The applicant should refer to 'Appendix D: Design Checklist - Key Indicators of Quality Design and Placemaking' in the *Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities (January 2024)*

Establishing Constraints: flood plain, road, archaeological features, greenway.

Greenway

- The greenway doubles in width. The applicant is asked to confirm the required minimum width of this greenway and the wayleave.
- Applicant Response: There is a 30m wayleave here for the Harbour watermain. The Greenway width is dictated by the Part 8.

Flood Plain

- The edge of the flood plain should be defined to provide scope for a coherent urban form. There is scope here for this to be better tied in.
- The wayleave for the foul sewers is another constraint.
- There are links to the north, but a more like-for-like dialogue between this development and Heathfield would give a community feel.

Designing around the archaeological features leads to an odd urban form. There is scope to explore basic architectural principles more.

Applicant Response: A workshop would be welcome. There is lots of work to do around flooding and whether the flood plain edge can be defined.

3f. Cultural Heritage - Archaeology

- Constraints could be considered as opportunities. So far, the site has been designed around features that we do not know much about.
- Further testing has not been carried out to identify an anomaly discovered through geophysics. It must be determined whether this is to remain in situ. Removal may have to be considered to achieve density.
- There is no visual expression of the standing stone. The archaeologist is satisfied with the buffer and public open space around this.
- The lime kiln is not a protected structure, but it is an aspect of the landscape. A Condition Survey is needed. More information is needed before deciding whether this should be retained.
- A percentage of the open space is required. The applicant was asked if the archaeological features were in addition to the open space provision.

Applicant Response: The archaeological features are in addition to the open space provision.

The city archaeologist is happy to meet the applicant's archaeologist onsite.
There are quite a few outbuildings in the central node.

Parks & Recreation

- Information is required on the proposed nature-based solutions.
- See 'Policy and Objective 5.1 - Public Open Space' of the new guidelines.
- Standard information is required for biodiversity:
    - AA screening
    - NIS due to the direct hydrological link to the harbour
    - Surveys are for bats, birds, wintering birds, and freshwater habitat.
    - An invasive species survey is required for on site and upstream of site. There are 2 invasive species upstream from this site.
    - An arborist tree survey.

Applicant Response: A wintering birds survey could be excessive, given the distance from the harbour.

This can be discussed.

3d. Environment

- This will be dependent on the final SAC route. A Noise Impact Analysis report, with details of façade treatment or other mitigation measures.
- Air quality on the route should be assessed, including the impact of standing traffic on the residential units.
- A Construction Environmental Management Plan, including construction waste, is required.
- An Operational Waste Statement is required.
- A Climate Action and Energy Statement is required.

3e. Flooding and Drainage

- There are high level layouts.
- The applicant is aware of CCC requirements from previous submissions and discussions with DOSA.
- Wastewater: A Statement of Design Acceptance from Uisce Éireann is required for the planning application.
- Stormwater: There are SUDS requirements to meet the objectives of the CCDP. CCC is aware of issues with the karst onsite. These must be fully explored and justified in the design with site GI.
- Flood Risk Assessment: This must consider impact of development elsewhere.
- Flood extent is based on the South Ballincollig Drainage Study. It will need to be determined for the revised road layout / location.

3g. Housing

Part V requirements will be teased out. The applicant should liaise with Housing Capital for this provision.

3h. Crèche and Education

- 80 child space crèche. The applicant should consult with Cork City Childcare. There is lack of pre-school childcare in Ballincollig.
- There is a Gaelscoil to the north and education zones to the south and southwest. Consider connections to these schools.

Applicant Response: They will examine childcare cumulatively.

4. AOB

5. Close

ATTENDEE	SIGNATURE	DATE
Kate Magner	Kate Magner	25/01/2024

*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".*

CORK CITY COUNCIL
Planning and Integrated Development Directorate
Pre-Planning Meeting Minutes

REF: LRD23-25 Carrigrohane LRD

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	Carrigrohane, Ballincollig, Cork
2. Person Requesting Meeting	Harry Walsh c/o HW Planning
3. Applicant	Murnane & O'Shea Limited
4. Person's Interest in Land/Letter of Consent	Letter of Consent provided
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) Eamonn Gahan (Deady Gahan Architects) Ger Naughton (Deady Gahan Architects) Tara O'Leary (Egis Engineering) Liam O'Toole (DOSA Engineers) Simon Ronan (Simon Ronan Landscape Architecture) **Cork City Council:** Yvonne Hogan, Executive planner, Planning Development Management Evelyn Mitchell, Senior Executive Planner, Planning Development Management Kevin Cullen, Senior Executive Architect, City Architects Tony Lynch, Senior Executive Transport Officer, Planning Policy Tony Donovan, Senior Executive Engineer, Water Services Eoghan McSweeney, Executive Engineer, Environmental Engineer Kevin O'Connor, Senior Planner, Planning Policy Ciara Brett, Executive Archaeologist, Planning Policy Anthony Angelini, Assistant Staff Officer, Planning and Integrated Development
6. Meeting	Meeting took place @ 12pm on 03/04/25 on MS Teams.

DOCUMENTATION SUBMITTED
Cover letter, application form, letter of consent, maps, site layout plan, planning statement, design statement

BRIEF DESCRIPTION OF DEVELOPMENT/PROPOSAL

LRD – 297 houses, creche

RECENT PLANNING HISTORY ON SITE

S247 Meeting January 2024

COMPLIANCE WITH LRD THRESHOLDS

Yes – in excess of 100 units

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

CORK CITY DEVELOPMENT PLAN 2022
KEY DEVELOPMENT PLAN OBJECTIVES

ZO-01 Sustainable Residential Neighbourhoods
ZO-15 Public Open Space
Walkway and cycleway to north of site
Density & Heights – Outer suburbs

Archaeology
Flooding

Chapter 3 Delivering Homes and Communities
Chapter 10 Key Growth Areas & Neighbourhood Development Sites
Ballincollig pp 392-398, Objective 10.57 South Ballincollig (Maglin) Expansion Area
Chapter 11 Placemaking and Managing Development
Chapter 12 Land Use Zoning Objectives

MINISTERIAL AND OTHER GUIDELINES

Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities, 2024
Table 3.1 - Areas and Density Ranges Dublin and Cork City and Suburbs
Section 3.4 – Refining Density
Policy and Objective 1

MEETING MINUTES

1. INTRODUCTION

- S247 meeting held in January 2024 (ref 188.23)
- Site boundary and proposed development revised from previous S247

2. APPLICANT TEAM:

Architect (Eamonn Gahan):

- The scheme is predominately a residential zoning site.
- Preference would be to move Maglin sustainable corridor/road northwards.
- Site has strong pedestrian/cycle routes to Ballincollig.
- Bus routes are regular and there is a proposed Bus Connects route for the Kilumney Road.
- Part 8 greenway located along north of site.

- Along north of boundary, there is an existing way leave for the greenway.
- Old farm building will inspire the design of the surrounding scheme.
- Western boundary respects the presence of an existing stream.
- Stronger urban form along sustainable corridor.
- Higher density along southern boundaries.
- Proposed includes a hierarchy of streetscapes.
- Variety of apartments heights.
- Density of 44.3 dph.
- Open space of 15%.
- Red line on map represents an outfall for surface water.

Planning Consultant (Harry Walsh):

- Density of 44dph is high on mid-range of 35-50 dph.

3. PLANNING AUTHORITY RESPONSE

Planning/Planning Policy:

- Key strategic growth area of the city
- Density as per the City Development Plan
- Work ongoing on variation to include alignment of road
- Realignment through a zoned open space is not a source of concern
- Variation timeline is a priority and applicant will be informed once final decision has been made

Planning/Development Management:

- *Greenway*
  Objective in the development plan
  Scheme includes bridge over Maglin River

- *Density*
  Different figures quoted in the documents. Site layout plan = 44.3 units/ha. Planning Statement (p 11) = <42.5 units/ha.
  Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities, 2024
  Table 3.1 p 22 Areas and Density Ranges Dublin and Cork City and Suburbs; Paragraph 3.4.1 p 30; Policy & Objective 3.1 p 32; Worked example in SRDCS Guidelines/Appendix - would need to calculate density as per the Guidelines
  Site may be considered peripheral presently, though with the sustainable access corridor (20m wide, future public transport route, active travel, etc) it will not be a peripheral location and will be an accessible location

- *Housing Mix*
  Would need to ensure that the housing mix complies with the development plan.

- *Creche*
  Creche in adjoining scheme (Heathfield) under construction
  Requested applicants send on the presentation which included the layout overlayed on zoning maps, and this has been received.

Transport:

- Tie-in points relative to realignment need to be consistent. Would need some further clarification from the applicant on this.
- Would also like clarity on triangle of land at top right-hand corner in relation to ownership.

Drainage:

- No comments on road or flooding until the alignment has been determined.
- Applicant team would need to include details on SuDS and flood management in their final application.

Archaeology:

- The recorded monument feature is on a statutory list – may be an issue with de-listing structure.
- Archaeological aspect of site would need to be included in EIAR.
- Would ask for further clarity on the lime kiln.
- Would emphasise the importance of recording all details of building prior to demolishing.

Architect:

- Previous discussions and input prior to the S247 meeting.

Environment:

- To properly assess the proposed development, the following details will be required:
- Construction Environmental Management Plan
- Construction and Demolition Resource Waste Management Plan
- Operational Waste Management Plan
- Energy & Climate Action Statement
- Noise Impact Assessment
- Air Quality Assessment
- EIAR

4. AOB

Comments from internal consultants unable to attend to be forwarded to agents.

5. CLOSE

ATTENDEE	SIGNATURE	DATE
Anthony Angelini Assistant Staff Officer	Anthony Angelini.	16/05/25

*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".*

ADDITIONAL COMMENTS:

Drainage:

- Storm Water

In accordance with the Cork City Development Plan 2022-2028, proposals should integrate green and blue infrastructure measures to offset peak flood flows. This includes the incorporation of SuDS, with a particular focus on Nature-Based Solutions, to limit run-off from existing and new development.
The permitted discharge rate shall be limited to the 1-in-1-year greenfield runoff rate for the effective drained area within the site (i.e. the developed area) and not the total site area.
Specific drainage requirements will be attached to the minutes of the meeting.

- Flood Risk Assessment

A flood risk assessment for the site will be required which must also assess the impact of the development on flood risk elsewhere. In particular, the discharge of storm water to the Maglin River.

Biodiversity

A list of surveys to be undertaken to include:

- River and a Fresh Water Survey due to the direct Hydrological connection to the site.
- Breeding Bird Surveys
- Winter Bird Surveys
- Bat Survey
- Habitat Mapping
- Invasive alien Plant species Survey

Tree Officer

- A BS5837:2012 tree report to include, arboricultural schedule, constraints plan, impact assessment, protection plan and method statement for all tree's, tree groups and hedgerow on and within falling distance of the site.
- Detailed tree specification should be included in the landscape plans

Environment

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

- Construction Environmental Management Plan
- Construction and Demolition Resource Waste Management Plan
- Operational Waste Management Plan
- Energy & Climate Action Statement
- Noise Impact Assessment
- Air Quality Assessment
- EIAR

Construction Environmental Management Plan

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

Construction and Demolition Resource Waste Management Plan

The developer shall prepare a Construction Resource Waste Management Plan (RWMP) as set out in the Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects (2021) including demonstration of proposals to adhere to best practice and protocols.

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.
Provisions should be made within the individual 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. Detail to be provided on who will present communal bins for collection.
Creche - Calculations are to be prepared to show quantities of waste produced versus the volume of waste storage provided. Location of creche bin storage to be identified and confirm if management company or creche operator will present this waste for collection. Drawings of vented bin storage area to be provided.
Bin storage areas for Duplexes and townhouses/terraced houses to be outlined. Bin storage areas to be screened from view and fully enclosed. Calculations to be provided to support storage area provided versus predicted waste generated.
For calculations, the developer should refer to the British standards BS 5906: 2005 in relation to waste management in buildings to ascertain capacity required for development.
All bin storage drawings to be submitted in appendix of the Operational Waste Management Plan.

Swept Path Drawing for Refuse Vehicle

A Refuse Auto-Track Drawing shall be provided illustrating movements of refuse vehicle can be facilitated within site. This drawing shall be appended to the Operational Waste Management Plan.

Energy & Climate Action Statement

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.

Noise Impact Assessment

Noise Impact Assessment - Both an inward and outward noise impact assessment required to show the impact of the development during construction and operation on the surrounding receptors. Noise from creche and play areas to be factored into assessment. Noise monitoring to be carried out on site.
Inward Noise Assessment to show potential impact of surrounding environment and existing road network and proposed Distributor Road on noise levels within the development amenity areas, apartments, balconies as well as houses and garden areas. Reference to expected levels and thresholds from Pro PG and BS8223:2014 to be included within the report.
Mitigation measures to be outlined in detail within the report. For any proposed Noise Barrier, the applicant shall outline who will manage and maintain this barrier going forward throughout the lifetime of the development. The applicant is advised to engage with TII in relation to location of any proposed Noise barrier.
Noise mapping to be included showing baseline levels and proposed levels post mitigation.

Air Quality Assessment

Air Quality Assessment to be carried out to take account of both construction and operational stages. Baseline monitoring to be carried out on site.
The assessment shall also take account of the impact of the existing road network and future distributor road on the properties and amenity areas within the proposed development. On site monitoring required to establish baseline conditions.

EIAR

EIAR to be submitted as part of the planning application. Items listed above as part of Noise Impact Assessment and Air Quality Assessment to form part of EIAR.

APPENDIX B – Section 32C LRD Meeting Minutes

Meeting held on 30/09/25 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: LRD25-06

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	Carriganarra, Carrigrohane, Ballincollig, Cork
2. Person Requesting Meeting	Harry Walsh c/o HW Planning
3. Applicant	Murnane & O'Shea Limited
4. Person's Interest in Land/Letter of Consent	Letter of Consent included.
5. Meeting attendees	**Applicant:** Harry Walsh, Harry Walsh Planning Eamonn Gahan, Deady Gahan Architects Carl Dixon, Dixon Brosnan Tara O' Leary, Egis Simon Ronan, Simon Ronan Landscaping Liam O' Toole, DOSA Consulting Engineers Avril Purcell, Lane Purcell Archaeology Musetta O' Leary, Lane Purcell Archaeology **Cork City Council:** Evelyn Mitchell, Senior Executive planner, Planning Development Management Kevin Cullen, Senior Executive Architect, City Architects Rosemarie McDonald, Biodiversity Officer, Parks and Recreation Patrick Murphy, Technician Grade 1, Environmental Management Tony Lynch, Senior Executive Transport Officer, Planning Policy Emer O' Callaghan, Senior Parks and Landscape Officer, Parks and Recreation Ciara Brett, Executive Archaeologist, Planning Policy Anthony Angelini, Assistant Staff Officer, Planning & Integrated Development **Apologies:** Tony Donovan, Senior Executive Engineer, Water Services
6. Meeting	Held on 30/09/25 @12pm via Microsoft Teams

DOCUMENTATION SUBMITTED

BRIEF DESCRIPTION OF DEVELOPMENT/PROPOSAL

Include Uses & Characteristics

The demolition of an existing agricultural building and the construction of a residential development of 307 No. residential units consisting of 138 No. dwellinghouses and 169 No. duplex/apartment units, creche facility and all ancillary site development works. Vehicular access to the proposed development will be provided via the internal road network of the Heathfield residential development with the proposed development accommodating the next section of the Maglin Urban Expansion Area Sustainable Access Corridor.

ZONING OBJECTIVES

ZO1 Sustainable Residential Neighbourhoods and Z015 Public Open Space

DEVELOPMENT PLAN OBJECTIVES

As per Chapters 10 and 11 of Cork City Development Plan 2022-2028

MEETING AGENDA

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

1. **Introduction:**

2. **Applicant Team**

2.1 Eamonn Gahan:

- Previous S.247 highlighted issues with urban form and the presence of elements of archaeological significance – informed current layout.
- Previous concerns were raised around the issue of density and urban form.
- Modest adjustment to the North of site due to archaeological discovery.
- Recording of 2 archaeological features informed urban structure.
- A lot of work done to connect Leo Murphy Road and to develop active transport connection to nearby school.
- Discussions had taken place regarding flood line to South.
- Looked to raise Southern access corridors as a flood response.
- Existing hedgerow laneway which is being proposed as a north-South access.

2.2 Simon Ronan:

- Ecological corridors along outer edge of the scheme – a linear park structure.
- Some trees by Southern route need to be removed – this will be offset by the planting of new trees (90% native).
- Wildflower meadows will also be planted, with an emphasis on pollinator friendly species.
- Open boundary with Heathfield.

2.3 Carl Dixon:

- Hedgerow is patchy and inconsistent.
- No bat roosts detected on site.

3 Planning Authority

3.1 Archaeology:

- One or two classifications regarding ringfort retention relating to potential play areas.
- May require an interpretive element.
- Methodology proposal is acceptable.

3.2 Parks and Recreation:

- Would require full details of management and maintenance plans.
- Would need to see cross sections and further details on open spaces.
- Would recommend natural play areas over play equipment.
- Would need to see further information on nature Based Solutions and green roof maintenance.
- Happy overall with current status of the application.

3.3 Biodiversity:

- Request more information relating to the biodiversity meadow e.g. seed cover, seed type.
- Hedgerow – what percentage will be retained? Would need to provide a hedgerow study.
- Breeding bird surveys would need to have taken place during breeding season to ensure findings are accurate.

3.4 Environment:

- Noise survey has been proposed – would ask that the results are provided and analysed.
- Would need to provide standard waste management plans.

3.5 Transport:

- Permeability is quite good.
- Re-alignment of distributor road is an area of concern as the area between the old and the proposed new route outside of the site has not been included in the site area/red line boundary. This re-alignment may impact adjoining landowners and the Planning Authority would suggest including the entirety of the re-aligned route in the application.

3.6 City Architects:

- Urban form is good, good edge to sustainable access corridor (SAC).
- Good north/south axis, consider accommodating pedestrian desire lines at convergence of streets/paths.
- Re. character areas, generally would expect character areas to extent to both sides of the street.
- This should be reconsidered for the main character area formed around the former farmstead.
- The character of that is important to retain, so retaining the farm building is critical – it should be clear whether this is the case.
- Suggest that a lime wet dash would be an appropriate treatment for upgrading to a dwelling, and help to secure its retention.
- This building as well as the creche and the houses bordering this space should seek to emulate the form, materiality and detailing of the vernacular i.e.
    - Simple shallow forms with A-roof, lean-tos, dormers etc...
    - Lime render, wet dash, slate, corrugated iron, metal roof trims and rainwater goods.
    - Simple flush detailing, omit pvc box gutter, barges etc for slim, flush, trim detailing.

- Similarly the arrangement of the creche, farm building and any bin/bike stores should try emulate how farmstead buildings were placed to create a courtyard or clearly defined space.
- The other main character area is the edge to the SAC, we would encourage taking the opportunity given the same developer/design team to bring some consistency in architectural expression between Carrignarra and Greenfields.
- Same comments apply to the specification, species, planting details etc. of the street trees to the SAC as per the Greenfields scheme, in particular their placement relative to the possible future bus lanes so that the trees are not lost if those bus lanes go ahead.

AOB

Close

ATTENDEE	SIGNATURE	DATE
Anthony Angelini Assistant Staff Officer	Anthony Angelini.	24/10/2025

*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.*

APPENDIX 1-2 Cork City Council LRD Opinion dated 28th May 2025

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

28/10/2025

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

RE: **LRD25-06**
Carrignarra, Carrigrohane, Ballincollig

A Chara,

With reference to your application LRD25-06 Opinion Stage at Carrignarra, Carrigrohane, Ballincollig, 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

I trust that this is in order.

Yours sincerely,

Anthony Angelini

Anthony Angelini
Assistant Staff Officer
Planning and Integrated Development

We are Cork.

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: LRD25-06

Proposed Development: Construction of a residential development of 307 no. units, creche and all ancillary site development works.

Location: Carriganarra, Carrigrohane, Ballincollig, Cork.

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 L.R.D. 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. Drainage

Further consideration and amendment of the proposed development in terms of its drainage requirements/design approach (storm drainage and flood risk) noting the detailed comments and requirements from the Drainage Section (See report in Appendix C).

2. Urban Design/Architecture

Further consideration and amendment of the proposed development in terms of its layout, urban design form and architecture noting the detailed comments from the City Architect's Section, Conservation Officer's Report, and Parks Section (Appendix C) and other items raised below.

In particular, it is recommended that a revised site layout/urban design approach be taken in certain areas of the site in order to create a strong sense of place in the proposed development.

In this regard the design approach should be based on the following considerations:

- The farm building as well as the creche and the houses bordering this space should emulate the form, materials and detailing of the vernacular.

- The associated character area should centre on the farm building and creche and extend to all the housing facing that space.

- Every effort should be made to retain the existing building.

- Similarly,the arrangement of the creche, farm building and any bin/bike stores should emulate how farmstead buildings were strategically but organically arranged to create a courtyard or clearly defined space.

The other main character area forming the edge to the SAC be extended to all areas facing that road. In terms of establishing a particular character we would encourage taking the opportunity to bring some consistency in architectural expression between this site and the development proposed in Greenfields.

It is also recommended that the same approach be taken with the specification, choice of species,planting details etc. of the street trees to the SAC as per the Greenfields scheme, in particular their placement relative to the possible future bus lanes.

In addition, further consideration and amendment to the design of the apartment blocks is recommended in terms of:
(a) the proximity of the blocks to one another/any issues regarding minimum separation distances/privacy issues that may arise and also in terms of the need to increase passive security along the access routes between the blocks.
(b) the quality of the central open space serving the apartment blocks in terms of access to daylight/sunlight.
(c) The provision of adequate communal storage facilities for bulky goods within each of the apartment blocks.
(d) The provision of green roofs to the apartment blocks.

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

T.I.I. in its submission to the Planning Authority advises that it is considers the information provided and the assessment of the interactions with the N22, both in terms of the protection of future occupants of the development and the impact of material assets associated with the N22, is inappropriate and inadequate. Further consideration and amendment of the proposed development is therefore required having regard to the submission received from T.I.I. with particular reference to the following issues:

(a) Drainage, and
(b) Amelioration of existing environment national road impacts for future residents.

See Appendix D for the detailed requirements of T.I.I.

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

Further consideration and amendment of the proposed development to take account of the changes required/transport infrastructural issues outlined in the report of the S.E.E. Strategic Transport Officer (See Appendix C) in relation to the following:

(a) Active Travel Accessibility
(b) Vehicular Accessibility
(c) Car Parking

In addition to revisions sought under Item (a) as per the report in Appendix C an amendment of the scheme is also required in order to extend the proposed cycle/pedestrian route to the boundary with the Limeworth estate as per the Walkways & Cycleways objective outlined in Map 16 of Volume 2 of the Cork City Development Plan 2022-2028.

In relation to Item (b) is noted that while it is proposed to deliver a section of the Maglin U.E.A. Sustainable Access Corridor it is on a different alignment than the route as designed by Cork City Council. Please be advised that support for the realigned route is dependent on the preparation of a detailed flood risk assessment and that any realignment maintains the same end points between adjacent landowners as the design prepared by Cork City Council (See attached Map in Appendix E).

As the proposed road realignment does not meet the Cork City Council alignment, a redesign of this aspect of the development is therefore required to either show the design matching that prepared by Cork City Council or the inclusion of additional lands within the red line site area to include the area of the S.A.C extending from the proposed site area to the point of the original route as shown on the City Council design. In this regard evidence of legal interest in the additional lands required will be required.

5. Internal Road Network and Pedestrian Safety/Traffic and Car Parking Management

Further consideration and amendment of the proposed development in terms of the issues raised in the report of the Urban Roads & Streets Design Section (See Appendix C).

6. Landscaping & Recreation

Further consideration and amendment of the proposed development in terms of the issues raised in the report of the Senior Parks & Landscape Officer's Report (See Appendix C).

7. Uisce Eireann

Further consideration and amendment of the proposed development in terms of water infrastructure procedural requirements as outlined in the report of Uisce Eireann (See Appendix D).

8. Part V

Further consideration and amendment of the proposed development in terms of the distribution and unit type proposed for allocation under Part V. In order to enable a more even ratio of houses to apartments/duplexes, the proposed 14 no. 3 bed duplex units should be replaced with 14 no. 3 bed houses pepper potted throughout the site (See report of the Housing Directorate (See Appendix C).

9. Archaeology

Further consideration and amendment of the proposed development in terms of the proposed archaeological methodology/proposals including the following:

Clarification regarding the enclosure retention, in particular further detailing is necessary in the relation to the landscape design of the play area. The possibility of interpreting the feature within the scheme design is also recommended which should be undertaken in collaboration with the consultant archaeologist and the landscape architect (See Appendix C).

10. Biodiversity

Further consideration and amendment of the design of the scheme where necessitated by the results of ecological site surveys as required the Biodiversity Officer in her report including breeding bird surveys and hedgerow assessment (See Appendix C).

11. Noise Impact/Amelioration of existing environment national road impacts for future residents.

Further consideration and possible amendment of the design of the scheme where necessitated by the results of noise survey(s) as required the Environment Section (See Appendix C) and consideration of all issues raised by TII in its submission. (Appendix D.

12. 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.

13. 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 particularly the Maglin U.E.A. S.A.C. and the creche facility.

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 amendments arising from the further consideration of the issues raised in Items 1-13 above and the reports/comments/recommendations outlined in the reports and submissions in Appendices C and D – including the submissions of U.E. and T.I.I.

2a. An overlay of the site layout plan with the zoning outlined in Map 16 of Volume 2 of the Cork City Development Plan 2022-2028.

3a. An E.I.A.R. which takes into account issues raised in Items 1-10 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. Uisce Eireann has advised that given the period of time that has past, since the issuing of the COF (nearly 19 months) as well as the increase in the number of proposed units from that on which the original assessment was based, you are required to submit a new PCE and obtain an updated COF prior to the lodgement of the formal planning application.

A SODA is recommended to be in place and submitted at full LRD planning application lodgement stage.

Please note that Uisce Eireann has requested to be consulted via an E.I.A.R. Scoping letter c. 6 months prior to the completion of the planning application.

5a. Revised drawings and details including site layout and architectural design statement and landscaping details for the S.A.C. to take into account the detailed requirements of the City Architect's Section as outlined in its report (See Appendix C) and the additional comments of the Planning Authority outlined in Item 2 above.

6a. Clarification in relation to archaeological proposals on site including the retention of the enclosure and further detailing in the relation to the landscape design of the play area and the interpretation of the feature within the scheme. An updated EIAR which incorporates this and includes detailing on buffer zones should also be submitted.

7a. A Flood Risk Assessment for the site which also assesses the impact of the development on flood risk elsewhere (and discharge of storm water to the Maglin River) and satisfies the requirements of the Drainage Section, the Strategic Transport Planning Section (See reports in Appendix C) and T.I.I.'s submission (See Appendix D).

8a. Revised drawings and full details including a clear drainage strategy for the site (Drainage Impact Assessment) to take account of all requirements as outlined in the Drainage Section's report (See Appendix C).

9a. Revised design details and proposal to take into account the requirements outlined in the Strategic Transport Planning Section's report (See Appendix C) including any necessary evidence of legal interest in the site where additional lands are required to take account of any realignment proposals through adjoining lands. In addition revised drawings and Landscape Plan which show the proposed walkway/cycleway extending to the boundary to the west as outlined in Item 4 above and Map 16 of the Cork City Development Plan 2022-2028. An updated Statement of Consistency in relation to the Walkways & Cycleways objective of the Plan should also be submitted. Note – where future connections to existing/proposed walking cycling routes are proposed these routes should be brought to the existing boundary line and where these connections are proposed to the Heathfield estate the red line site area should include the additional lands needed to allow for those connections to be fully made.

10a. Revised drawings and details (including a Quality Audit and a Road Safety Audit) to address the requirements and concerns of the Urban Streets & Roads Design Section (see Appendix C).

11a. A Public Lighting Report. (Note This should consider the need to ensure the protection of any bat species where appropriate).

12a. A Phasing Strategy which takes into account the need for in-tandem delivery of social and physical infrastructure. Clarification of the timing of the completion of this section of the proposed S.A.C. and non-residential element within the overall site construction timeline should be submitted.

13a. The following Environment/Waste Management Reports/Surveys including details of any necessary revised layouts/mitigation measures:

(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 Report including the results of the Baseline Noise Survey recommended in the submitted Pre-planning Note on Noise Assessment with dates/times of surveys to be agreed in advance with Cork City Council and including full details of all necessary mitigation proposals.
(vi) Air Quality Report.
(vii) Energy & Climate Action Statement.

14a. 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.

15a. A Universal Design Statement.

16a. An Operational Management Plan /Report (inc. Lifecycle Report).

17a. A fully comprehensive Landscape and Visual Impact Assessment and associated set of Photomontages with viewing locations selected in consultation with the Planning Authority including additional locations on the N22 and the Curraheen Road.

18a. (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) including confirmation that the breeding bird surveys where separate to the habitat mapping of the site and that the breeding bird surveys took place between mid April to early June. Where such surveys did not take place within the relevant time period updated surveys should be submitted. Clarification on the seed provenance for the proposed biodiversity meadow with seeds native to Munster should also be submitted.
(iv) Any necessary alterations to the scheme arising from the surveys and information to be provided above.

19a. A detailed Landscape Masterplan which takes into account the issues raised in the reports of the Senior Parks & Landscape Officer, the Biodiversity Officer and City Architect's Section to include amongst other items and considerations:

- A Landscape Design Rationale which should include:
  - Detailed Management and Maintenance Plans,
  - Detailed Landscape Masterplan with all details of planting species, sizes, quantities and schedules. Species should reflect biodiversity gain.
- Cross sections for all open spaces – including to adjoining sites.
- Full details of all SUDs and Nature Based Solutions.
- No tree planting should take place over any attenuation tanks,
- The provision of green roofs to the apartment blocks including full details of same.
- A Hardscape 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/Assessment.
- Tree/Hedgerow Impact and Protection Plan.
- Boundary treatment details for all parts of the site (i.e. overall and individual site boundaries). 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 S.A.C.
- 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 – see Item 6a above in this regard.
- Provision of private patio spaces for ground floor duplex/apartment units – including the landscaped delineation of the boundaries to same.

20a. Revised Part V proposals/site layout drawings to take into account the requirements of the Housing Section (See Appendix C) i.e. to show the 14 No. 3 bed duplex units replaced with 14 No. 3 bed houses pepper potted throughout the site.

21a. Additional site sections through the site to adjoining development including dwellings located within the Heathfield estate, the Limeworth estate and the permitted estate between these areas which is under construction.

22a. Measures to ensure passive surveillance to the areas/routes between the proposed apartment blocks or where same would result in loss of privacy (noting national guidance on separation distances) details of security measures in relation to these spaces.

23a. The provision of adequate communal storage facilities for each of the apartment blocks as required under the 2025 Apartment Design Guidelines.

24a. A Daylight and Sunlight Report which pays particular attention to the quality of light which would be available to the plaza area serving the apartments and including any revised drawings/details to satisfy standards in this regard.

25a. A statement on how the development has considered climate resilience from design to implementation stages.

26a. 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.'*

27a. A Taking in Charge Plan.

28a. 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.

29a. A revised Schedule of Accommodation/ Housing Quality Assessment and Housing Mix updated to reflect any design changes and to demonstrate compliance with all the relevant national minimum standards for housing and apartments.

30a. Revised design details and proposal to take into account the requirements outlined in T.I.I.'s submission (See Appendix C).

31a. Clarification on/proposals for the undergrounding of overhead electricity lines within the site/current route of same and proposed route.

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.

APPENDIX 1-3 Scoping Letters to Statutory Bodies

Connecting people.
Connecting places.

The Secretary
An Taisce – The National Trust for Ireland
Tailors' Hall
Back Lane
Dublin
D08 X2A3
Email: info@antaisce.org

29 April 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 Carriganarra, Carrigrohane, 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 Carriganarra, Carrigrohane, 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 11.36 hectares in area are situated in the townland of Carriganarra/Carrigrohane to the southeast of Ballincollig town centre. The lands are currently in agricultural use with a disused farmyard centrally located in the site. The lands are bound to the north by the Limeworth and Heathfield residential developments and undeveloped agricultural lands to the south, east and west.

The lands form part of the South Ballincollig (Maglin) Urban Expansion Area (MUEA) which is a strategic land bank of approximately 220 no. hectares to the south of the town, and north of the N22 identified in the Cork City Development Plan 2022-2028 (CDP). 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. The strategic importance of the delivery of the MUEA is reflected in CDP Objective 10.57 'South Ballincollig (Maglin) Expansion Area', which states that it is an objective of the Planning Authority.

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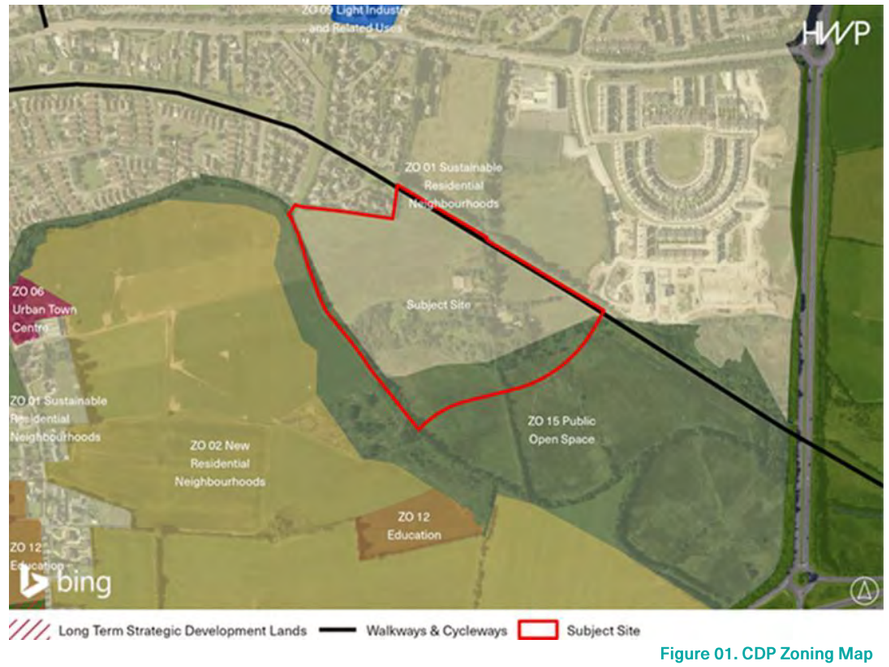


Figure 01. CDP Zoning Map

The Secretary,
Cork City Childcare,
Suite 1, John Dunlop House
Marina Commercial Park,
Centre Park Road,
Cork,
T12 P9PV
Email. info@corkcitychildcare.ie

1 August 2025

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

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

Directors:
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The subject lands of circa 11.5 hectares in area are situated in the townland of Carriganarra/Carrigrohane to the southeast of Ballincollig town centre. The lands are currently in agricultural use with a disused farmyard centrally located in the site. The lands are bound to the north by the Limeworth and Heathfield residential developments and undeveloped agricultural lands to the south, east and west.

The lands form part of the South Ballincollig (Maglin) Urban Expansion Area (MUEA) which is a strategic land bank of approximately 220 no. hectares to the south of the town, and north of the N22 identified in the Cork City Development Plan 2022-2028 (CDP). 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. The strategic importance of the delivery of the MUEA is reflected in CDP Objective 10.57 'South Ballincollig (Maglin) Expansion Area', which states that it is an objective of the Planning Authority.

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02 Proposed Development

The proposed development consists of the construction of 307 no. residential units containing 138 no. dwelling houses and 169 no. duplex/apartment units and all ancillary site development works. The proposed development includes the provision of an 100 no. child capacity creche the delivery of the next section of the Maglin Urban Expansion Area Sustainable Access Corridor which will provide primary access to the propsoed development. 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'* zoning objective will be included within public open space/landscaped amenity areas, assisting in site drainage and green infrastructure proposals.

An overview of the proposed schedule of accommodation is summarised below.

CRECHE	100 CHILD - 693.8 SQM	1

4 BEDS	58 NO. UNITS	19%
3 BEDS	92 NO. UNITS	30%
2 BEDS	94 NO. UNITS	31%
1 BEDS	63 NO. UNITS	20%
TOTAL	**307 NO. UNITS**	**100%**

UNIT TYPE SCHEDULE		
SEMI-DETACHED	126 NO. UNITS	41%
TOWNHOUSE	12 NO. UNITS	4%
DUPLEX APARTMENT	40 NO. UNITS	13%
APARTMENT BLOCK	129 NO. UNITS	42%
TOTAL	**307 NO. UNITS**	**100%**

Figure 02. Proposed Schedule of accommodation.

The proposed development includes a 100 no. child capacity, two storey creche facility with a net floor area of 694 sqm located in the north/central area of the subject site. This letter is accompanied by the propsoed creche facility building plans and Figure 03 as shown below provides an illustrative site plan of the creche site.



Figure 03. Site Plan Extract showing location of proposed creche.

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

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The Secretary
Department of Education
Marlborough Street,
Dublin 1,
D01 RC96
Email: info@education.gov.ie

29 April 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

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486211

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The Secretary
Department of Housing, Local Government and Heritage,
Custom House,
Dublin,
D01 W6X0
Email: qcsofficer@housing.gov.ie

29 April 2025

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

www.hwplanning.ie
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The Secretary
Development Application Unit
Department of Tourism, Culture, Arts,
Gaeltacht, Sport and Media
23 Kildare Street,
Dublin 2,
D02 TD30
Email: ministers.office@tcagsm.gov.ie

29 April 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.
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The Secretary
EirGrid
The Oval
160 Shelbourne Road
Ballsbridge
Dublin 4
D04 FW28
Email: info@eirgrid.com

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HW Planning
5 Joyce House,
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The Secretary,
Environmental Protection Agency (Regional Inspectorate)
Inniscarra
Co Cork
P31 VX59
Email: info@epa.ie

29 April 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 Carriganarra, Carrigrohane, Ballincollig, Cork.

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The Secretary
ESB Head Office
27 Fitzwilliam Street Lower
Dublin 2
D02 KT92
Email: esbnetworks@esb.ie

29 April 2025

HW Planning
5 Joyce House,
Barrack Square,
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Gas Networks Ireland
Gasworks Road
Cork,
T12 RX96
Email: networksinfo@gasnetworks.ie

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5 Joyce House,
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Cork
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The Secretary
Geological Survey Ireland
Booterstown Hall
Booterstown
Blackrock
Co Dublin
A94 N2R6
Email: GSIPlanning@gsi.ie

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HW Planning
5 Joyce House,
Barrack Square,
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The Secretary
The Heritage Council
Aras na hOidhreachta
Church Lane
Kilkenny
R95 X264
Email: mail@heritagecouncil.ie

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5 Joyce House,
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Sunnyside House
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P12 X602
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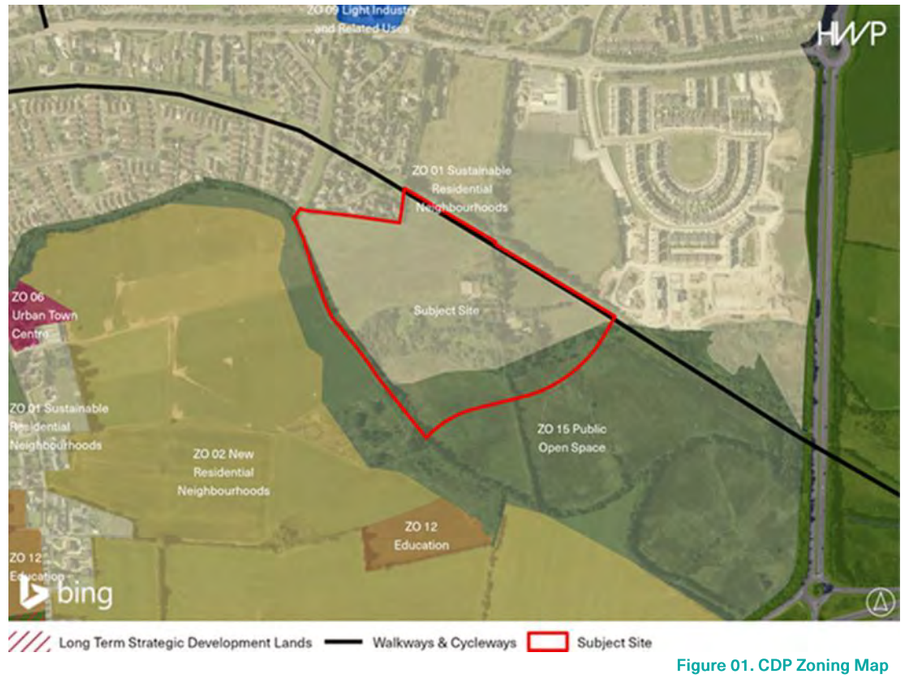


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The Secretary,
Department of the Environment, Climate and Communications,
Tom Johnson House,
Haddington Road,
Dublin
D04 K7X4
Email: customer.service@decc.gov.ie

29 April 2025

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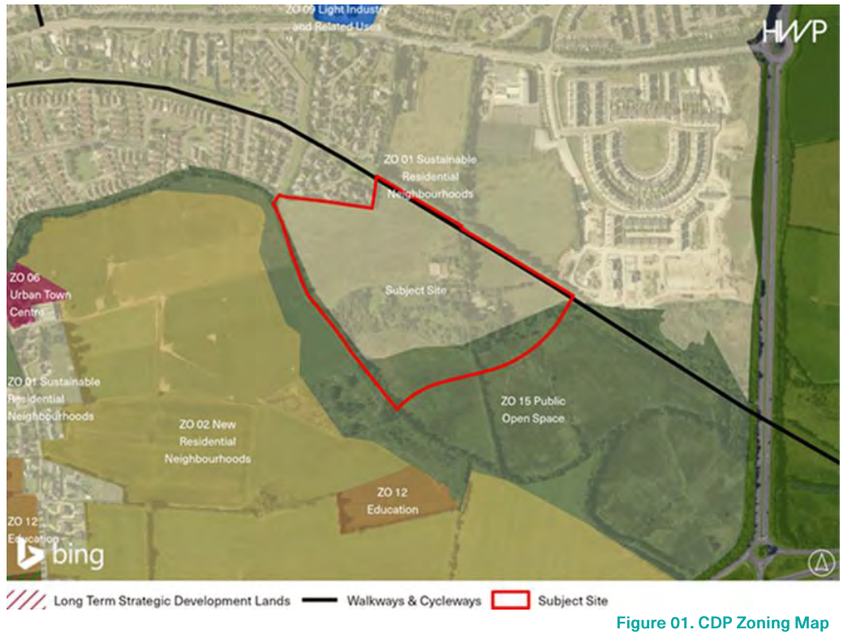


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The Secretary
National Monuments Service,
Department of Housing, Local Government and Heritage
Custom House
Dublin 1
D01 W6X0
Email: nationalmonuments@housing.gov.ie

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

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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

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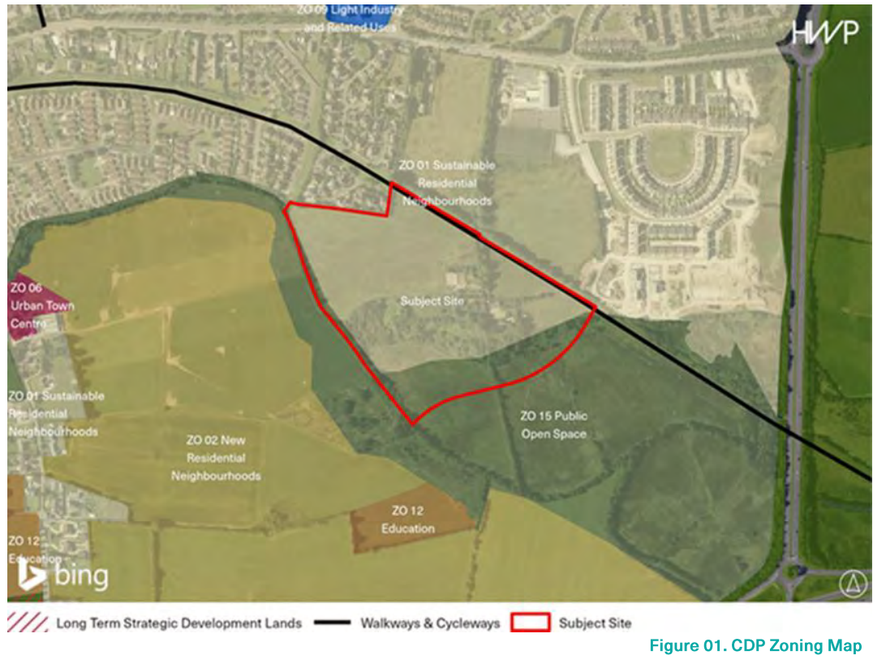


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National Transport Authority,
Dún Scéine,
Harcourt Lane,
Dublin 2,
D02 WT20
Email: info@nationaltransport.ie

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

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

29 April 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 Carriganarra, Carrigrohane, Ballincollig, Cork.

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The Secretary
Transport Infrastructure Ireland,
Parkgate Business Centre,
Parkgate Street,
Dublin 8,
D08 DK10
Email: landuseplanning@tii.ie

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HW Planning
5 Joyce House,
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The Secretary
Health & Safety Authority
3rd Floor
1A South Mall
Cork
T12 P7DE
Email: contactus@hsa.ie

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

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5 Joyce House,
Barrack Square,
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P31 KP84

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Planning Department,
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APPENDIX 1-4 Scoping Responses from Statutory Bodies

From: Michael McPartland
To: John O"Brien | HW Planning
Subject: EIAR Scoping – Proposed Large-Scale Residential Development (LRD) at Carriganarra, Carrigrohane, Ballincollig, Cork.
Date: Wednesday 30 April 2025 15:09:44
Attachments: email_852418dc-7261-46bd-8cad-0f5cfb922b46.png
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web_64d727b2-84ca-479d-bc60-45e02ad63d06.png
home_d6e0b8ad-bed2-44cf-a08c-5ceec6c9c9fe.png
external-signature_6737b7d5-5705-4554-b86d-f0ded9774efe.png
12. 250429_LTR_Carriganarra EIAR Scoping - IFI_job.pdf
04. 22148_001.pdf
05. 22148_002.pdf
06. 22148_003 - R2.pdf

A chara
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 Maglin River, its tributaries or any watercourse, their 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

Furthermore, there should be no loss of flood plain as a result of the proposed development.

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



Help us protect Ireland's rivers, lakes and coastlines by reporting illegal fishing, water pollution or invasive species.
Our confidential phone number is 0818 34 74 24, which is open 24 hours a day / 7 days a week.
To read our Privacy Policy and Email Disclaimer Notice, Please visit www.fisheriesireland.ie

From: John O'Brien | HW Planning <jobrien@hwplanning.ie>
Sent: Tuesday 29 April 2025 15:41
To: Macroom Info <Macroom@fisheriesireland.ie>
Subject: 12. EIAR Scoping – Proposed Large-Scale Residential Development (LRD) at Carriganarra, Carrigrohane, Ballincollig, Cork.

Dear Sir/Madam

Please see attached relating to a proposed 'Large-Scale Residential Development' (LRD) to be accompanied by an Environmental Impact Assessment Report (EIAR) at Carriganarra, Carrigrohane, 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

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From: INFO
To: Info
Subject: TII Ref: TII25-131331 - EIAR Scoping – Proposed Large-Scale Residential Development (LRD) at Carriganarra, Carrigrohane, Ballincollig, Cork.
Date: Monday 12 May 2025 15:27:41
Attachments: image001.png

Dear Mr. O'Brien,

Thank you for your correspondence of 29 April 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.

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 network. 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, which 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 (RDO), 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 and assessors are asked to consult TII Publications to determine whether a Road Safety Audit is required.

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)).

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 prior to the commencement of any development on site.

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.

Yours sincerely,

_____
Suzanne Cahill
Regulatory & Administration Executive

-

From: John O'Brien | HW Planning
Sent: Tuesday 29 April 2025 15:49
To: Landuse Planning
Subject: 20. EIAR Scoping – Proposed Large-Scale Residential Development (LRD) at Carriganarra, Carrigrohane, Ballincollig, Cork.

CAUTION: This email originated from outside of TII. Do not click links or open attachments unless you recognise the sender and are sure that the content is safe.

Dear Sir/Madam

Please see attached relating to a proposed 'Large-Scale Residential Development' (LRD) to be accompanied by an Environmental Impact Assessment Report (EIAR) at Carriganarra, Carrigrohane, 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

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TII processes personal data provided to it in accordance with its Data Protection Notice available at https://www.tii.ie/about/about-tii/Data-Protection/

Próiseálann BIÉ sonraí pearsanta a sholáthraítear dó i gcomhréir lena Fhógra ar Chosaint Sonraí atá ar fáil ag https://www.tii.ie/about/about-tii/Data-Protection/?set-lang=ga

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Córas r-phoist BIE: Tá an ríomhphost seo agus aon chomhaid a tharchuirtear leis faoi rún agus beartaithe lena n-úsáid ag an duine aonair nó ag an eintiteas a bhfuil siad dírithe chuige/chuici amháin. Más rud é go bhfuair tú an ríomhphost seo trí bhotún, cuir sin in iúil do postmaster@tii.ie, le do thoil, agus scrios an ríomhphost bunaidh agus aon cheangaltáin.

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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

12 May 2025

Re: EIAR Scoping – Proposed LRD at Carriganarra, Carrigrohane, Ballincollig, Co Cork
Your Ref: n/a
Our Ref: 25/62

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 29 April 2025, concerning the EIAR Scoping – Proposed LRD at Carriganarra, Carrigrohane, Ballincollig, Co 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

Soil
- Subsoils (Quaternary Geology)
- Tellus Geochemistry
- Geotechnical

Geology
- Bedrock
- Geophysics
- Bedrock & Quaternary 3D

Water

Groundwater
- Aquifers GW vulnerability, GWPSs (GWPPs)

Surface water
- Tellus Geochemistry

Estuarine & marine waters
- Marine and coastal

Flooding
- GWClimate
- Karst

Climate Change

Carbon accounting / Carbon balance
- Geothermal
- Carbon capture and storage

Climate change trends
- National coastal change assessment

Cultural Heritage

Archaeology
- Cherish

Underwater Archaeology
- Shipwrecks

Material Assets

Built Services
- Natural resources (Minerals & Aggregates)
- Active quarries

The Landscape

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

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

Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

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*

From: DIG
To: John O"Brien | HW Planning
Cc: Process Safety
Subject: FW: 09. EIAR Scoping – Proposed Large-Scale Residential Development (LRD) at Carriganarra, Carrigrohane, Ballincollig, Cork.
Date: Tuesday 20 May 2025 10:57:18
Attachments: 09. 250429_LTR_Carriganarra EIAR Scoping - GNI_job.pdf
04. 22148_001.pdf
05. 22148_002.pdf
06. 22148_003 - R2.pdf

*** [CONFIDENTIAL] ***

John

GNI have no network within the site so we have no comment to make.

Regards

Michael O Connell
GIS Super User
Gas Networks Ireland
P.O. Box 51,Gasworks Road, Cork, Ireland

M 087 3833858

From: Networksinfo <Networksinfo@gasnetworks.ie>
Sent: Tuesday 29 April 2025 15:46
To: DIG <Dig@gasnetworks.ie>
Subject: FW: 09. EIAR Scoping – Proposed Large-Scale Residential Development (LRD) at Carriganarra, Carrigrohane, Ballincollig, Cork.

*** [CONFIDENTIAL] ***

From: John O'Brien | HW Planning <jobrien@hwplanning.ie>
Sent: Tuesday 29 April 2025 15:36
To: Networksinfo <networksinfo@gasnetworks.ie>
Subject: 09. EIAR Scoping – Proposed Large-Scale Residential Development (LRD) at Carriganarra, Carrigrohane, Ballincollig, Cork.

You don't often get email from jobrien@hwplanning.ie. Learn why this is important

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Dear Sir/Madam

Please see attached relating to a proposed 'Large-Scale Residential Development' (LRD) to be accompanied by an Environmental Impact Assessment Report (EIAR) at Carriganarra, Carrigrohane, 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
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Tá an fhaisnéis á seachadadh dírithe ar an duine nó ar an eintiteas chuig a bhfuil sí seolta amháin agus féadfar ábhar faoi rún, faoi phribhléid nó ábhar atá íogair ó thaobh tráchtála de a bheith mar chuid de. Tá aon athsheachadadh nó scaipeadh den fhaisnéis, aon athbhreithniú ar nó aon úsáid eile a bhaint as, nó aon ghníomh a dhéantar ag brath ar an bhfaisnéis seo ag daoine nó ag eintitis nach dóibh siúd an fhaisnéis seo, toirimiscthe agus féadfar é a bheith neamhdhleathach. Níl Líonraí Gáis Éireann faoi dhliteanas maidir le seachadadh iomlán agus ceart na faisnéise sa chumarsáid seo nó maidir le haon mhoill a bhaineann léi. Ní ghlacann Líonraí Gáis Éireann le haon dliteanas faoi ghnímh nó faoi iarmhairtí bunaithe ar úsáid thoirmiscthe na faisnéise seo. Níl Líonraí Gáis Éireann faoi dhliteanas maidir le seachadadh ceart agus iomlán na faisnéise sa chumarsáid seo nó maidir le haon mhoill a bhaineann léi. Má fuair tú an teachtaireacht seo in earráid, más é do thoil é, déan teagmháil leis an seoltóir agus scrios an t-ábhar ó gach aon ríomhaire.
Féadfar ríomhphost a bheith soghabhálach i leith truaillithe, idircheaptha agus i leith leasaithe neamhúdaraithe. Ní ghlacann Líonraí Gáis Éireann le haon fhreagracht as athruithe nó as idircheapadh a rinneadh ar an ríomhphost seo i ndiaidh é a sheoladh nó as aon dochar do chórais na bhfaighteoirí déanta ag an teachtaireacht seo nó ag a ceangaltáin. Más é do thoil é, tabhair faoi deara chomh maith go bhféadfar monatóireacht a dhéanamh ar theachtaireachtaí chuig nó ó Líonraí Gáis Éireann chun comhlíonadh le polasaithe agus le caighdeáin Líonraí Gáis Éireann a chinntiú agus chun ár ngnó a chosaint. Líonraí Gáis Éireann cuideachta ghníomhaíochta ainmnithe, faoi theorainn scaireanna, atá corpraithe in Éirinn leis an uimhir chláraithe 555744 agus a tá hoifig

chláraithe ag Bóthar na nOibreacha Gáis, Corcaigh, T12 RX96.

Go raibh maith agat as d'aird a thabhairt.

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Thank you for your attention.

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

Your Ref: LRD Ballincollig, Co Cork
Our Ref: G Pre Planning-CK-Ballincollig LRD
(Please quote in all related correspondence)

12 June 2025

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

FAO: John O'Brien

Development: Proposed Large-Scale Residential Development (LRD) at Carriganarra, Ballincollig, County 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 heading:

Nature Conservation
These observations are intended to assist you in relation to identifying potential impacts on European sites, other nature conservation sites, and biodiversity and environmental protection in general, in the context of the current proposal. Data collected and surveys carried out in connection with this proposed development may raise other issues that have not been considered here. The observations are not exhaustive and are made without prejudice to any recommendation that may be made by this Department in the future.

Licenses

Where there are impacts on protected species and their habitats, resting or breeding places, licenses may be required under the Wildlife Act 1976-2018 or derogations under the EC (Birds and Natural Habitats) Regulations 2011, as amended.

In particular bats are subject to a regime of strict protection pursuant to the requirements of the Habitats Directive (92/43/EEC) as transposed in Irish law in Regulation 51 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). A

Aonad na nIarratas ar Fhorbairt, Oifigí an Rialtais, Bóthar 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

copy of Circular Letter NPWS 2/07 entitled "*Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 – strict protection of certain species/applications for derogation licences*" can be found on the Departmental web site at www.npws.ie/sites/default/files/general/circular-npws-02-07.pdf. It should be noted that the Regulations of 1997 have since been superseded by the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Part 6 of those Regulations is now the relevant section dealing with the protection of flora and fauna. Reference to Regulation 23 in the circular letter should be taken to mean Regulation 51 in the current Regulations.

In addition, the EIAR should take account of species protected under the Wildlife Acts regarding impacts on protected species or their resting or breeding places, in particular birds' nests and will also need to be cognisant of article 5 (d) of the Birds Directive. Very suitable bird nesting habitat is present including the wet grassland habitat towards the south of the site and in addition birds are currently nesting at the old buildings and farmyard.
In order to apply for any such licenses or derogations that may be required regarding bats and birds the results of a survey should be submitted to this Department. Such surveys are to be carried out by appropriately qualified person/s at an appropriate time of the year. Should the survey work have taken place well before construction commences, it is recommended that an additional ecological survey of the development site should take place immediately prior to construction to ensure no significant change in the findings of the baseline ecological survey has occurred. As outlined already, if there has been any significant change mitigation, this may require amendment and where a licence has expired, there will be a need for new licence applications for the protected species.

Regarding this specific site it should be noted that signs of mammal activity (including burrows) are evident (for example at the old lime kiln but hedgerow, scrub, woodland, rubble habitat all present too). The site provides a relatively undisturbed location for species in the area with lots of suitable habitat. Therefore it is important that a dedicated mammal survey take place as well as bird survey work. Due to the presence of good quality wet grassland, the Maglin River and drainage ditches frogs are likely to be present and should be surveyed for with impact, mitigation and licensing considered.

A bat survey and report will be very important due to the potential building and tree roosting sites and the semi-natural woodland and good quality hedgerow presence in particular.

It is noted that it appears from the map provided that it is not proposed to retain the existing hedgerows and the existing woodland that occurs in the centre of the site. It appears from the maps provided that all internal hedgerows and the semi-natural woodland is proposed for removal.

The hedgerow and woodland removal should be reconsidered if possible with hedgerows and the woodland instead incorporated into the design of the estate (as has been done elsewhere for other sites). As the site is currently composed of High Nature Value extensively managed farmland (with hedgerows, woodland, wet grassland etc.) maximising the retention of semi-natural habitats will be very important in terms of net biodiversity loss. The area towards the centre of the site is actually a wet woodland (Alder, Ash, Willow etc.) and it is evident from old maps that it is long established (for example see old 6 inch maps). It may possibly have links with the annexed habitat Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-padion, Alnion incanae, woodland Salicion albae) (91E0) and therefore this should be assessed. The Department has reporting obligations under Article 17 of the Directive to the European Commission on details of losses and degradation of annexed habitat and the EPA Environmental Liability Regulations may apply. Alder and Willow also dominate along the watercourse on the western side that leads to this area.

To allow the most successful retention possible of habitat proposed to be retained the EIA should address and specify the methodology during design and construction which will be used to protect and retain the hedgerows (for example temporary fencing). The wider the buffer/headland beside the hedgerows and woodland (as realistic and possible) provided the better from a biodiversity viewpoint. In addition the EIA should address lighting of and light spill onto retained hedgerows and woodland (with reducing and eliminating lighting of the retained hedgerows and woodland as much as possible the best aim from a biodiversity viewpoint). The hedgerows on site are of very good quality with multiple species and all appear on the first 6 inch maps. They are likely to be at least approx. 200-300 years old. Any fencing proposals should consider and propose future mammal access mitigation. Disturbance from lighting, noise, human access etc. should be fully assessed and addressed in the EIA.

TII Guidelines should be referenced. Regarding Lighting the procedures outlined in 'Guidance Note 08/18 Bats and Artificial Lighting in the UK' and Eurobats 'Guidelines for Consideration of Bats in Lighting Projects' provide useful guidance with respect to lighting design in ecologically sensitive locations, such as along treelines and hedgerows. Dark Sky Ireland also provide useful guidance "Best practice in public lighting" , notably that "warm" colour temperatures should be used at 2700K or less. . Lighting of the hedgerows or woodland should be avoided or minimised (this is particularly important regarding continuing usage by bat species). Minimising lighting through directional lighting, potential cowls etc. should be considered. The project should also ensure that the use of energy efficient (LED) lighting, does not have adverse effects on biodiversity by limiting lighting only to where it is required and using 'warm white' lighting with a Correlated Colour Temperature (CCT) of

below 2700 kelvins. It must have smart control systems to allow cut-off periods during hours of darkness and diming at dawn and dusk. A lighting survey and modelling should be carried out by a suitably qualified competent person. At a minimum, as well as readings taken at ground level on the horizontal plane (to give illuminance hitting the ground), data should be provided in at least one direction on the vertical plane at, for example, 1.5m or 2m above ground (to replicate the likely location of bats using the feature).

The landscape plan should have regard to the All-Ireland Pollinator Plan for 2021-2025. Regarding the choice of any proposed wildflower mix reference should be made to the data in the recent paper Barry, C.; Hodge, S. 'You Reap What You Sow: A Botanical and Economic Assessment of Wildflower Seed Mixes Available in Ireland'. Conservation 2023, 3, 73–87 (https://doi.org/10.3390/conservation3010007).

Net Biodiversity loss should be calculated.

Construction Management Plans and Mitigation

Complete project details including Construction Management Plans (CMPs) need to be provided in order to allow an adequate EIAR and appropriate assessment to be undertaken. CMPS should contain sufficient detail to avoid any post construction doubt with regard to the implementation of mitigation measures, timings and roles and responsibilities for same. Any mitigation needs to be included in detail and if being relied upon to reach conclusions must be proved to be achievable and likely to be effective in any given scenario it is needed. Proof of effectiveness will be required with examples of where similar techniques have been employed previously.

Applicants need to be able to demonstrate that CMPs and other such plans are adequate, all mitigation is included and effective and supported by scientific information and analysis and that they are feasible within the physical constraints of the site.

Construction work should not be allowed to impact on water quality and measures should be detailed in the EIAR to prevent sediment and/or fuel runoff from getting into watercourses.

Mitigation in General

Any Mitigation measures proposed for protected species need to be assessed against the adverse effects the project or plan is likely to cause (alone or in combination with other projects or plans). To assess mitigation measures, the following tasks must be completed:

- list each of the measures to be introduced (e.g. habitat compensation, timing of construction works);
- explain how the measures will avoid the adverse impacts on the species
- explain how the measures will reduce the adverse impacts on the species

Then, for each of the listed mitigation measures:

- provide evidence of how they will be secured and implemented and by whom;
- provide evidence of the degree of confidence in their likely success;
- provide a timescale, relative to the project or plan, when they will be implemented;

Where residual impacts remain, further mitigation measures may be required.

Evidence should be provided of how the mitigation measures will be monitored, and, should mitigation failure be identified, how that failure will be rectified. The applicant should not use any proposed post construction monitoring as mitigation to supplement inadequate information in the assessment. The overall approach to mitigation and survey above also applies to habitats.

Cork County Development Plan

The following parts of the CCDP appear to be relevant…

County Development Plan Objective BE 15-1: Support and comply with national biodiversity protection policies

County Development Plan Objective BE 15-2: Protect sites, habitats and species.

c) Protect and where possible enhance areas of local biodiversity value, ecological corridors and habitats that are features of the County's ecological network. This includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands as well as coastal and marine habitats.
e) Encourage, pursuant to Article 10 of the Habitats Directive, the protection and enhancement of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species.

County Development Plan Objective BE 15-6: Biodiversity and New Development. Provide for the protection and enhancement of biodiversity in the development management process and when licensing or permitting other activities by:

a) Providing ongoing support and guidance to developers on incorporating biodiversity considerations into new development through preplanning communications and the Council's guidance document 'Biodiversity and the Planning Process – guidance for developments on the management of biodiversity issues during the planning process' and any updated versions of this advice;

b) Encouraging the retention and integration of existing trees, hedgerows and other features of high natural value within new developments;
c) Requiring the incorporation of primarily native tree and other plant species, particularly pollinator friendly species in the landscaping of new developments;

d) Fulfilling Appropriate Assessment and Environmental Impact Assessment obligations and carrying out Ecological Impact Assessment in relation to development and activities, as appropriate; e) Ensuring that an appropriate level of assessment is completed in relation to wetland habitats subject to proposals which would involve drainage or reclamation. This includes lakes and ponds, watercourses, springs and swamps, marshes, heath, peatlands, some woodlands as well as some coastal and marine habitats; f) Ensuring that the implementation of appropriate mitigation (including habitat enhancement, new planting or other habitat creation initiatives) is incorporated into new development, where the implementation of such development would result in unavoidable impacts on biodiversity - supporting the principle of biodiversity net gain.

County Development Plan Objective BE 15-8: Trees and Woodlands. d) Preserve and enhance the general level of tree cover in both town and country. Ensure that development proposals do not compromise important trees and include an appropriate level of new tree planting. e) Where appropriate, to protect mature trees/groups of mature trees and mature hedgerows that are not formally protected under Tree Preservation Orders.

Green and Blue Infrastructure Principles for Cork County: • Enhance connectivity particularly through corridors or networks of green infrastructure at different scales. • Improve the multi-functional roles and benefits (ecosystem services) of existing and future green and open space assets and promote sustainable links between them.

County Development Plan Objective GI 14-1: Countywide Green and Blue Infrastructure Objectives. d) Recognise rivers and streams (and their wider riparian corridors) as one of the natural foundations for multi-functional green and blue infrastructure corridors. Seek to strengthen ecological linkages which watercourses have with other water dependent habitats as well as with hedges/treelines, woodland and scrub in the wider landscape. f) Achieve a net gain in green infrastructure through the protection and enhancement of existing assets

and through the provision of new green infrastructure as an integral part of the planning process.

14.4 Green Infrastructure and Development.

14.4.2 Any development should at a minimum seek to enhance the overall ecological value of the site. This should be informed by the best available ecological information and addressed from the start of the development process. There should be a net gain in green infrastructure. Where infrastructure is proposed proposals should demonstrate that due consideration has been given to nature-based solutions in the first instance. Where feasible this should be achieved through the protection and enhancement of existing assets/biodiversity and through the provision of new green infrastructure. GO TO CONTENTS 324 Initially the principal consideration should be to assess the potential impact of the proposed development on the existing biodiversity of the site and its surrounding context. In this regard, the Council has produced a useful guidance document 'Biodiversity and the Planning Process – guidance for developments on the management of biodiversity issues during the planning processes. Biodiversity and planning process.pdf (corkcoco.ie)
14.4.3 Proposals should seek to assess and integrate existing GBI by retaining and/or strengthening existing features particularly where these have the potential to function as connecting corridors or stepping stones to larger habitats/ core areas. Where this is not feasible mitigation may be considered where this can be justified.

County Development Plan Objective GI 14-3: Green Infrastructure and Development a) Require new development and redevelopment proposals, to contribute to the protection, management and enhancement of the existing green and blue infrastructure of the local area in terms of the design, layout and landscaping of development proposals. b) Require all development to submit a green infrastructure statement outlining how the proposal contributes to green and blue infrastructure both within its environs as well as within the wider settlement or rural area. Larger developments (multiple residential developments including Part 8 applications, retail, industrial, mineral extraction, etc) will be expected to prepare a Landscape/ Green (and Blue) Infrastructure Plan including a Landscape Design Rationale. This Plan should identify environmental assets and include proposals which protect, manage and develop green infrastructure resources in a sustainable manner.

County Development Plan Objective WM 11-11: River Channel Protection a) Ensure adequate protection measures along watercourses, keeping them free from development by ensuring development is kept 10m or other appropriate distance from stream and river banks is line with best practice for riparian corridors. Development altering the hydro morphology of a watercourse will not normally be permitted, where it may result in the deterioration in the

status of a water body through for example, impacts on water quality, quantity or flow rate, riparian habitat or protected species.

b) There will be a presumption against the use of culverts and opportunities to actively remove existing culverts and re-naturalise/ daylighting watercourses will be encouraged in development proposals. c) Where river crossings are considered necessary, clear span river crossing structures shall be used on fisheries waters where possible. The Council will consult with Inland Fisheries Ireland in relation to any such proposals

You are requested to send any further communications to this Department's Development Applications Unit (DAU) at referrals@npws.gov.ie, where used, or to the following address:

The Manager
Development Applications Unit (DAU)
Government Offices
Newtown Road
Wexford
Y35 AP90

Is mise, le meas

David O'Connor
Development Applications Unit
Administration

Uisce Éireann
Irish Water

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

Uisce Éireann
PO Box 6000
Dublin 1
D01 WA07
Ireland

T: +353 1 89 25000
F: +353 1 89 25001
www.water.ie

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

29th May 2025

By Email: jobrien@hwplanning.ie

Uisce Éireann Ref: PN25000022687

Development Location:
Carriganarra, Carrigrohane, Ballincollig, Cork.

Development Description:

Proposed development consists of the construction of 297 no. residential units, containing 140 no. dwelling houses and 153 no. duplex/apartments and all ancillary site development works. The proposed development also includes the provision for an 80 no. child capacity creche.

A Chara,

Uisce Éireann's records indicate the presence of a significant asset, a 1500 mm PSC/PCC watermain running through the project site. The presence of this asset appears to be acknowledged as the associated wayleave is identified and accounted for in the site layout and in the design, however it is our recommendation that the applicant engage with our diversions team at diversions@water.ie at an early juncture to anticipate any potential conflicts and to ensure that all Uisce Éireann minimum standards regarding planting and separation distances are observed.

In addition to the above Please note the following aspects of water & wastewater services which should be considered in the scope of an EIAR where relevant.

a) Protection of drinking water source(s) from potentially adverse impacts is a priority for Uisce Éireann. It is Uisce Éireanns current policy to maintain safe and secure drinking water supplies and ensure that development will not give rise to any deterioration in water quality. Where the development proposal has the potential to impact an Uisce Éireann Drinking Water Source(s), the applicant

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.

LH / OP6000 / 0323

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 an EIAR and/or the planning application.

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) Potential 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*) - If your proposals require a connection(s) to either a public water supply or sewage collection system, you are advised to submit a Pre-Connection Enquiry (PCE) enquiry to Uisce Éireann to determine the feasibility of connection to the Uisce Éireann network ahead of lodging your planning application. The PCE should be submitted to Uisce Éireann well in advance of lodging your planning application. Lodging a COF with your planning application helps avoids delays in the consenting process.

d) 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.

e) In relation to the management of surface water; the potential impact of surface water discharges to combined sewer networks and potential measures to stop surface waters from combined sewers. Uisce Éireann does not permit surface waters into our sewer network.

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

g) 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

Uisce Éireann is a statutory consultee under the Planning and Development Act 2000 (as amended). Uisce Éireanns job is to deliver the highest quality drinking water to taps every day and ensure that wastewater is properly treated and safely returned to the environment. To ensure the satisfactory completion of a development, any permission, approval, or consent granted pursuant to the Planning and Development Act 2000 (as amended) that requires a new connection(s) to water services should include a condition that requires the applicant or developer to enter into a connection agreement(s) with Uisce Éireann prior to the commencement of development. 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). Trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended).

h) 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.

i) 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.

j) 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.

k) 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.

l) Uisce Éireann does not permit build over of its assets. Separation distances from public infrastructure, as per Uisce Éireann's Standards, Codes and Practices must be achieved. It is the applicant's responsibility to submit a diversion enquiry to Uisce Éireann Diversions Section (diversions@water.ie) prior to construction, where a potential build over of public assets is in question and/or where the applicants proposals cannot achieve separation distances from public infrastructure as per UÉ Standards & Codes of Practice. As an applicant you are required to;

- survey the site to determine the exact location of the public assets. Any trial investigations should be carried out with the agreement and in the presence of Uisce Éireann. All queries relating to in situ public infrastructure should be directed to diversions@water.ie
- Provide evidence of separation distances between the existing Uisce Éireann assets and proposed structures, other services, trees, etc. have to be in accordance with UÉ Standards & Codes of Practice

Uisce Éireann is a statutory consultee under the Planning and Development Act 2000 (as amended). Uisce Éireanns job is to deliver the highest quality drinking water to taps every day and ensure that wastewater is properly treated and safely returned to the environment. To ensure the satisfactory completion of a development, any permission, approval, or consent granted pursuant to the Planning and Development Act 2000 (as amended) that requires a new connection(s) to water services should include a condition that requires the applicant or developer to enter into a connection agreement(s) with Uisce Éireann prior to the commencement of development. 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). Trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended).

m) 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.

n) Where new connection(s) are sought, the applicant shall enter into water and/or wastewater connection agreement(s) with Uisce Éireann prior to the commencement of this development.

Queries relating to the comments above should be directed to planning@water.ie. Queries for the Uisce Éireann Development Management Planning Team and EIAR Scoping Requests should be sent to planning@water.ie

Uisce Éireann is a statutory consultee under the Planning and Development Act 2000 (as amended). Uisce Éireanns job is to deliver the highest quality drinking water to taps every day and ensure that wastewater is properly treated and safely returned to the environment. To ensure the satisfactory completion of a development, any permission, approval, or consent granted pursuant to the Planning and Development Act 2000 (as amended) that requires a new connection(s) to water services should include a condition that requires the applicant or developer to enter into a connection agreement(s) with Uisce Éireann prior to the commencement of development. 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). Trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended).

From: Ciaran Dower
To: Info
Subject: HSA Response to proposed Large-Scale Residential Development (LRD) at Carriganarra, Carrigrohane, Ballincollig, Cork. HSA:0235000000046
Date: Wednesday 6 August 2025 10:57:28

My name is Ciarán Dower and I work in the COMAH Chemical Production & Storage (CCPS) Unit of the Health and Safety Authority.

The proposed Large-Scale Residential Development (LRD) at Carriganarra, Carrigrohane, Ballincollig, Cork, is not within the consultation distance of any notified COMAH Establishment and therefore, we have no comments to make in relation to the proposed development.

Kind Regards,

Ciarán Dower
Inspector,
COMAH, Chemical Production & Storage (CCPS)

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From: ESB Networks Customer Service (ESB Networks)
To: John O"Brien | HW Planning
Subject: Re: 08. EIAR Scoping – Proposed Large-Scale Residential Development (LRD) at Carriganarra, Carrigrohane, Ballincollig, Cork. [#1224280]
Date: Saturday 24 May 2025 12:38:24

Good Morning John,

Thank you for your email and attachments.

I have forwarded same for the attention of the local office in Cork.
They will contact you directly with regard to your query.

Ref 7006964663 has been allocated to the above.

Please contact me again if I can be of further assistance.

Kind regards,

Miriam

ESB Networks Customer Care | T: 1800372757 | +353 21 2386555 | www.esbnetworks.ie

WARNING: ESB Networks will not be liable for acting on any instructions issued via your e-mail address where it transpires that such instructions were not sent by you.

--Original Message--
From: jobrien@hwplanning.ie
Date: 29/04/2025 03:35 PM
To: esbnetworks@esb.ie
Subject: 08. EIAR Scoping – Proposed Large-Scale Residential Development (LRD) at Carriganarra, Carrigrohane, Ballincollig, Cork.

CAUTION: This message is from an EXTERNAL SENDER - be CAUTIOUS, Do NOT Click any links or Open any attachments if you were not expecting them.

Dear Sir/Madam

Please see attached relating to a proposed 'Large-Scale Residential Development' (LRD) to be accompanied by an Environmental Impact Assessment Report (EIAR) at Carriganarra, Carrigrohane, 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

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hwplanning.ie
+353 (0)21 4873250

+353 (0)87 1332570

LinkedIn

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An timpeallacht? - Smaoinigh air sula bpriontáileann tú an r-phost seo.
Please consider the Environment before printing this email.

* ** *** ** * ** *** ** * ** *** ** *
Tá an t-eolas sa ríomhphost seo agus in aon chomhad a ghabhann leis rúnda agus ceaptha le haghaidh úsáide an té nó an aonáin ar seoladh chuige iad agus na húsáide sin amháin. Is tuairimí nó dearcthaí an údair amháin aon tuairimí nó dearcthaí ann, agus ní gá gurb ionann iad agus tuairimí nó dearcthaí ESB.
Má bhfuair tú an ríomhphost seo trí earráid, ar mhiste leat é sin a chur in iúl don seoltóir. Scanann ESB ríomhphoist agus ceangaltáin le haghaidh víreas, ach ní ráthaíonn sé go bhfuil ceachtar díobh saor ó víreas agus ní glacann dliteanas ar bith as aon damáiste de dhroim víreas.
https://esbnetworks.ie/contact-us

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* ** *** ** * ** *** ** * ** *** ** *

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

Date: 22/08/2025

RE: EIAR Scoping – Proposed Large Scale Residential Development (LRD) at Carriganarra, Carrigrohane, Ballincollig, Cork

To whom it may concern,

Cork City Childcare plays a key role in supporting the development of quality Early Leaning and Care and School Age Childcare services within Cork City. We aim to ensure that Cork City has sufficient capacity to support the growing demand for childcare and support parents to access the free pre-school Early Childhood Care and Education (ECCE) scheme alongside other DCDE (Department of Children, Disability and Equality) related funding initiatives.

This letter is in relation to the proposed development of – Proposed Large Scale Residential Development (LRD) at Carriganarra, Carrigrohane, Ballincollig, Cork.

Cork City Childcare carried out a childcare needs assessment in the surrounding area of the proposed development at Carriganarra, Carrigrohane, Ballincollig, Cork. The accompanying table is a list of Childcare Services located in the surrounding area of this development. The childcare needs assessment was conducted with information gathered from the Tusla register on the week of 18/08/2025. The Childcare Assessment reflects childcare services that are in operation within Carriganarra, Carrigrohane, Ballincollig 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/Standalone School Age Settings.*

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

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

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 244 dwellings proposed (omitting 63 one bedroom dwellings) , that would average **approximately 65 childcare spaces at a minimum.**

Given the limited availability of childcare options in the surrounding area, there is a clear need to consider the development of a large, full-day childcare facility. This facility should offer a diverse range of service types, including sessional, part-time, full-day, drop-in, and after-school care, to effectively meet the varying needs of families in the community. It is important to highlight that Ballincollig has experienced significant growth and development in recent years, particularly in relation to new housing. However, the provision of childcare services has not kept pace with this expansion. The site under consideration is located adjacent to another proposed residential development, with several additional projects in the immediate vicinity. There is a particular shortage of childcare places for children aged 0–3 years, which presents a significant barrier for many parents attempting to return to work after parental leave. Securing a childcare place for this age group is increasingly difficult, and the lack of availability places considerable stress on families. It is therefore imperative that a large full-day care facility, catering to all age groups—including infants and toddlers—is incorporated into this proposed development. We strongly support and welcome the proposal to construct a two-story, 100-space childcare facility within this LRD. This area is in genuine need of such a service, and the proposed development would provide a much-needed resource for local families.

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

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

We are also in a position to assist by directing childcare service providers who are actively seeking to expand their operations toward the planners of this development. This could facilitate the timely inclusion of a suitable childcare facility within the project, ensuring that the needs of the growing community are proactively addressed.

It is clear from the capacity assessment below undertaken by Cork City Childcare that there are minimal places available in the area. There are 10 childcare 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 the area of the proposed development there are only five full day care settings. Only four of these settings is currently providing care for children under the age of two years. There is three Part-time childcare facilities, along with five School Age Childcare facility/facilities. Many of the childcare services listed below 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 2023/2024 states that There are only 17 available services for up to 1-year olds across Cork City, yet 371 babies are on waitlists. You can find more information here: https://www.pobal.ie/childcare/capacity/

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

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Tel: 021 4310500, Email: info@corkcitychildcare.ie

- 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.

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Tel: 021 4310500, Email: info@corkcitychildcare.ie

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

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Suite 1, John Dunlop House, Marina Commercial Park, Centre Park Road, Cork, T12 P9PV
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ELC Childcare Services					
Name	**Address**	**Service Type**	**Age Range**	**Capacity**	**Vacancies**
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
Cheeky Cherubs Early Years - Ballincollig	Highfield Park Carriganarra, Ballincollig, Co. Cork	Full Day/ Part Time/ Sessional	0-6 yrs	108	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

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Kindercare Childcare	Unit 4,5,8,9,10, Classes Lake Retail Centre, Classes Lake, Ovens, 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	The Village Centre, Station Road, Ballincollig, Cork, Co. Cork	Sessional	2-6 yrs	54	0
Montessori An Spiorad Naomh	Scoil an Spiorad Naomh Currraheen Road, Cork	Sessional	2-6 years	22	0

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First Steps	Bridgefield, Curraheen Road Bishopstown, Co. Cork	Full Day	0-6 years	71	0
Horizons Montessori	Curraheen Road Brigown, Curraheen Road, Bishopstown, Cork	Sessional	2-6 years	33	0

School Aged Childcare Services					
Name	**Address**	**Service Type**	**Age Range**	**Capacity**	**Vacancies**
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

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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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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 Construction Resource Waste Management Plan - – DOSA Consulting Engineers
APPENDIX 2-6 Landscape Masterplan – Simon Ronan Landscape Architecture

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

DENIS O'SULLIVAN & ASSOCIATES
CONSULTING ENGINEERS

RESIDENTIAL DEVELOPMENT, CARRIGANARRA, BALLINCOLLIG, CORK

CONSTRUCTION & ENVIRONMENTAL MANAGEMENT PLAN

DATE 10/04/2026

REVISION 8

JOB NO. 4208

Joyce House, Barrack Square, Ballincollig, Co. Cork
T 021 4871781 F 021 4874157 info@dosa.ie www.dosa.ie

DOCUMENT CONTROL

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PROJECT NUMBER: 4208

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1 Introduction

Denis O'Sullivan & Associates were engaged as Consulting Engineers for the proposed development at Carriganarra, 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.

Finally, the site compound location, construction traffic routes and parking proposals of workers along with general site considerations are also outlined. The location of the site compound, parking facilities and proposed access road are shown on the attached Proposed Construction Access & Site Facilities Drawing No. 4208-0201 in Appendix A. This CEMP will be provided to the main contractor for implementation during the site clearance and construction stages. It will be considered as a 'Live Document' and will be updated accordingly throughout the project as required.

The purpose of this CEMP is to:

- Identify stakeholder requirements.
- Ensure compliance with the grant of planning.
- Effectively avoid any potential significant adverse environmental effects during site clearance and construction; and
- Translate mitigation measures set out in the planning documentation into committed site procedures.

On appointment, the main contractor is required to implement the mitigation and protective measures set out in this document and maintain environmental monitoring records for the duration of the project which shall be made available to representatives from Cork City Council for inspection on request.

2 *Existing Situation*

The subject site is a greenfield site of a relatively flat topographical nature. The proposed extension to the Maglin Sustainable Access Corridor south-westward from Heathfield will provides access to the site from the south. The site is flanked by a permitted development and the Heathfield residential development (under construction by applicant) to the north, existing Access Corridor to the east and agricultural land to the south and west. The land to the west is zoned residential.

A snapshot of the existing site location is outlined in Figure 2.0 below.



Figure 2.0 – Site Location

3 *Proposed Development*

The development will consist of the demolition of existing agricultural buildings and the construction of a residential development of 300 no. residential units consisting of 128 no. dwellings houses, 172 no. apartment/duplex units, a two storey creche facility and all ancillary site development works. The proposed 128 no. dwelling houses will include 42 no. bedroom detached/semi-detached dwelling houses and 84 no. 3 bedroom semi-detached/townhouse dwelling houses. The proposed development also provides for the restoration of an existing vernacular farm building on site which will accommodate 2 no. 2 bedroom semi-detached units. The proposed 172 no. apartment/duplex units will include 18 no. 3 bedroom units, 109 no. 2 bedroom units and 45 no. 1 bedroom units, to be provided in 20 no. apartment/duplex buildings ranging in height from 3-4 storeys over basement level.

Vehicular access to the proposed development will be provided via the existing junction from the Killumney road serving the Heathfield residential development and existing sections of the Maglin Sustainable Access Corridor to the north. The proposed development provides for the extension of Maglin Sustainable Access Corridor and the provision of 4 no. pedestrian/cycle connections to the Heathfield residential development to the north which is under construction. Ancillary site works include the raising of existing ground levels on site, the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex and creche buildings, the delivery of active travel infrastructure, landscaping and servicing proposals including a temporary pumping station, and the undergrounding/diversion of an existing 38KV overhead ESB line which traverses the site.

A snapshot of the proposed development is outlined in Figure 3.0 below.



Figure 3.0 – Proposed Development

4 *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. The contractor will select the method of rock removal; 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 raise ground levels to facilitate the construction of the gravity drainage strives will ensure that most of the excavated material will be re-used on site and therefore minimise movements of earthworks vehicles out of the site.

4.1 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 works, with limits on the hours of operation the norm to keep noise impacts to a minimum (see section 9.2 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 9.3 below.

There is potential for some noise and dust impacts on the closest buildings adjoining the Waterfall Rd, 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.

4.2 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.

5 *Construction Works & Sequencing*

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

5.1 Phasing

It is anticipated that the works will be carried out in 3 no. phases as indicated in the Phasing Plan in Appendix B.

5.2 Working Hours

It is proposed that Construction works will be carried out between the hours of 08:00 and 18:00 from Monday to Friday and 08:00 and 14:00 on Saturdays.

No construction works will be carried out on Sundays or Bank Holidays, without the specific agreement of Cork City Council and workings hours will be confirmed by Cork City Council.

5.3 Pre-Construction Surveys

Topographical and utility surveys have been carried out for the site and are available to Contractor. The Contractor will be required to carry out pre-condition photo survey of the site which will include all perimeter boundaries, footways, existing carriageway on approach to the site. Any damage caused to existing boundaries or elements to be retained will be rectified by the Contractor in accordance with relevant standards.

5.4 Construction Site Access

Access to the works will be from the existing entrance via the existing junction from the Killumney road serving the Heathfield residential development and the internal road network of the Heathfield development as outlined in the Proposed Construction Access & Site Facilities Drawing No. 4208-0201 in Appendix A. There will be sufficient space for construction vehicles to enter onto the site for delivery of materials and collection of waste without causing an obstruction on the public road network. There will also be sufficient space for HGVs to turn within the site. Signage will be erected on the Killumney Road (in both directions) to notify motorists of the construction works ahead. Signage at the site entrance will be provided to ensure members of the public do not enter the site road mistakenly.

5.5 Construction Compound and Storage Areas

The construction compound for the development will be located within the green space area to the north of the development, so that it will not need to be moved from phase to phase. The compound will include a site office and welfare facilities for construction workers. Portaloo's will be provided in the compound initially with a dedicated toilet block installed at a later date. Electrical and potable water supply will be provided from the existing connections. Car parking will be located adjacent to the construction compound as shown on the Proposed Construction Access & Site Facilities Drawing No. 4208-0201 in Appendix A.

Waste skips will be located adjacent to the site office. Containers and skips used for construction waste handling will be moved close to the work face, as required. Incoming construction materials will be offloaded and stored in the materials compound.

5.6 Perimeter Fencing

The site will be secured using temporary fencing or hoarding at all times to ensure that the ongoing works are separated from the public. Netting will be erected on any fencing used to prevent debris and dust release from the site and provide screening of the construction and works. A secure lockable gate will be erected at the site entrance and visitors to the site will be directed to the adjacent site office. The Site management team will carry out regular inspections and maintenance of the security fencing/ hoarding while also ensuring areas are kept clean.

5.7 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.

5.8 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.

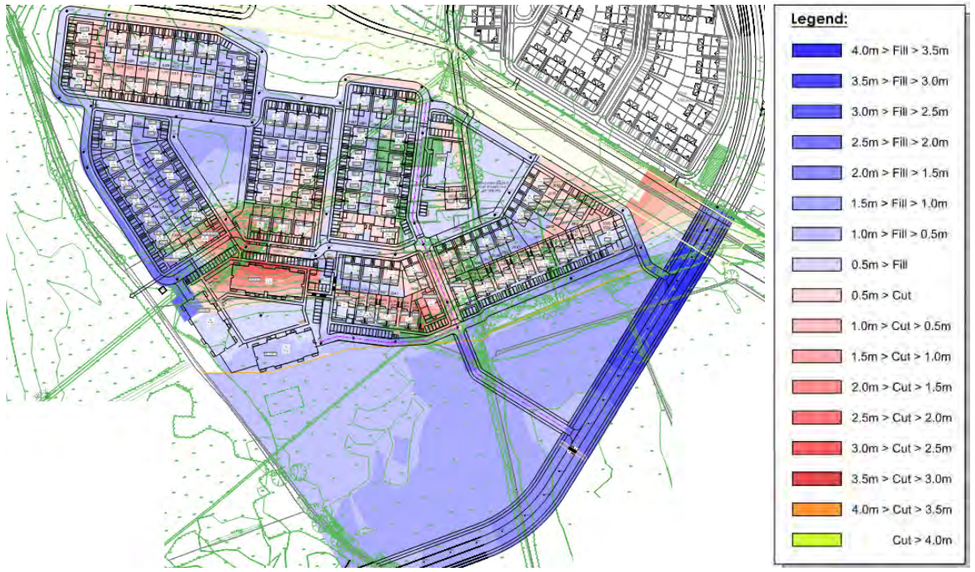


Figure 4.6 – Cut & Fill

5.8.1 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

5.8.2 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 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

5.9 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 to the existing foul sewer on the adjoining Spine Rd.
- 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 on the existing Spine Rd. 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.
- Constructing buildings and roads above the flood level to ensure that backflows through the surface water outfalls will not occur.
- The development's road network will be finished with tarmac or asphalt surface which will discharge runoff to a piped drainage system, and surface water drains will be installed in roads and streets and in pre-determined wayleaves adjacent to building structures.

- All car parking and refuel areas at the site will be located on substrate underlain with an impermeable liner to prevent contaminant leaching to groundwater.

5.10 Storage and Use of Materials

Specific areas for storage, delivery and loading/unloading of materials will be designated, which will have appropriate containment/spill protection measures where required.

- Handling and storage areas will be actively managed and fine, dry material will be stored inside enclosed shields/coverings or within central storage areas.
- A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared before and after such events to minimise any potential nuisances.
- Discharge water generated during the placement of concrete will be stored and removed off-Site for treatment and disposal.
- Prolonged exposure of contaminated soils or groundwater to the atmosphere will be avoided where practical or unnecessary.

5.11 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 (m²)
1	Outbuilding	590m²
Total GIA for Demolition		**590m²**

Table 4.10 – Demolition Areas

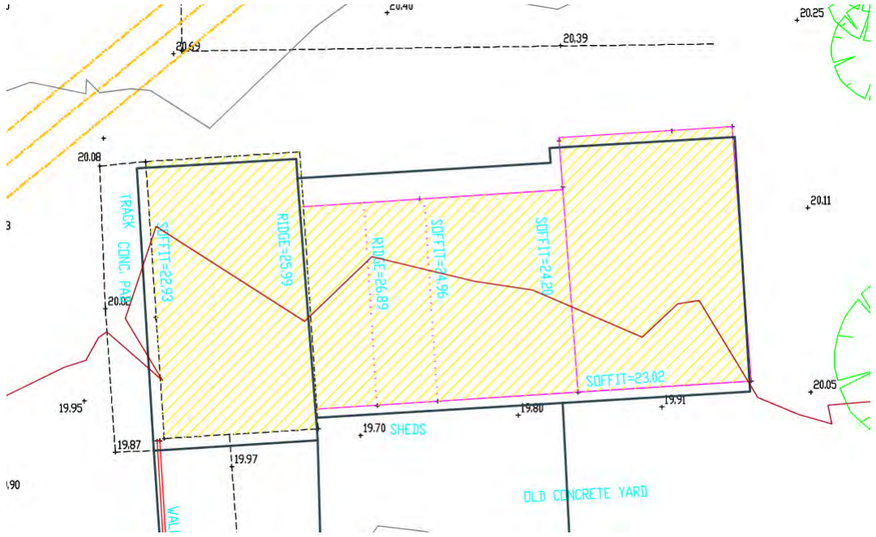


Figure 4.10.2 –Outbuilding to be Demolished

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.

5.12 Landscaping

Any trees shown on planning drawings to be retained 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.

5.13 Maintenance of Plant and Machinery

All plant and equipment will be regularly cleaned and properly maintained and there will be no washing out of any concrete trucks on site. Pumped concrete will be monitored to ensure there is no accidental discharge and will be carried out in dry weather and with impermeable pouring mats laid down where possible.

5.14 Storage and Use of Fuels, Oils, and Chemicals

Where possible, refuelling of vehicles and equipment will not be carried out on site to minimise the potential for spills or leaks to occur. However, some fuel, lubricants and hydraulic fluids will need to be stored on site during construction works for equipment such as excavators and generators.

- Appropriate bunding, storage and signage arrangements for all deleterious substances (e.g., fuels, oils, and chemicals) will be used.
- 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).
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the Site for disposal or recycling.
- Diesel tanks, used to store fuel for the various items of machinery, will be self-contained and double-walled.
- Spillage and leaks of oil from cars parked in the development during the Construction Phase Share unavoidable. To reduce the potential impacts, oil interceptors will be incorporated into the Site drainage design.
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the Site and properly disposed of.
- Refuelling will be carried out from tanks or delivery vehicles on a designated impermeable surface and will not be left unattended.
- Plant will not be left running when not in use (i.e., no idling) and plant with dust arrestment equipment will be used where practical.
- The fuel storage area will be properly secured to prevent unauthorised access or vandalism and all triggers will be locked when not in use. Spill kits and drip trays will be used during refuelling to collect any potential spills or overfills. No vehicles or containers will be left unattended during refuelling.
- Mobile fuel bowsers may be used for refuelling heavy equipment. Bowsers used will be double skinned and spill kit/drip tray equipment will be used during refuelling which will take place away from any nearby drains or watercourses and from any surface water drainage gulley's.

5.15 Spill/Environmental Response Procedures

Robust and appropriate Spill Response Plan and Site Environmental Emergency Plans (SEP) will be implemented for the duration of the works.

- Identifying fuel storage and refuelling locations on designated areas within the compound, away from drainage ditches/waterbodies, and on substrate underlain with an impermeable liner to prevent contaminant leaching to groundwater;
- Identifying spill kit locations (spill kits will be required for each piece of heavy equipment (e.g., excavators, loaders, trucks, etc.,) which will be at least 21L drum size each with spill pads, sorbent, small boom, plastic garbage bag and gloves;

- A specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on Site.
- Staff will be trained and experienced in using appropriate control measures and spill kits on-Site, and will be familiar with the location of all spill kit locations and the Site layout.

A register will be kept of all hazardous substances either used on Site or expected to be present. The register shall be always available and shall include as a minimum:

- Valid safety sheets; Health & Safety, environmental controls to be implemented when storing, handling, using and in the event of spillage of materials;
- Emergency response procedures/precautions for each material;
- Personal Protective Equipment (PPE) is required when using the material.

5.16 Training And Awareness

All site staff will be required to complete an induction prior to commencement of works on the site. The details of the site induction will be provided by the main contractor in the Construction Health & Safety Plan.

As part of the site induction, all site staff will be made aware of the presence of the sensitive ecological areas in the vicinity of the site. Employees will also be informed about the risks associated with stormwater runoff on site and will be required to ensure no runoff or chemicals will enter the adjoining network once installed.

During the project works, the Site Manager or Project Environmental Manager will deliver strategic toolbox talks focused on potential environmental and safety risks associated with the works being carried out at that stage of the project.

5.17 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.

5.18 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 several 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 apartment blocks. This is generally completed in a single pour involving several concrete trucks delivering in one day.

External Walls:

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

Internal Walls:

Construction of internal walls. These will be of either blockwork or timber frame construction and the prefabricated timber frame units will be delivered on standard trucks over a continued period as the work progresses. The units will be craned into position and braced as per the manufacturer's specification.

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:

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.

6 *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.

6.1 Surface Water Drainage

The storm water system will involve a network of underground pipelines and manholes discharging to an existing adjoining watercourse via 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 at planning stage show the proposed surface water drainage layout for the entire site.

6.1.1 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.

6.1.2 Mitigation

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

- Silt traps such as a combination of an earthen berm, silt-fencing and associated interception trenches will be installed along the extent of the southern boundary of the Site adjoining the existing spine road, such that no contaminated surface water run-off can leave the Site.
- Settlement ponds will be lined with cohesive material, with the addition of an engineered liner where a sealed drainage system is in use, and outlet by infiltration will not be permitted in order to protect the receiving groundwater at the Site.
- Under no circumstances will wastewater from equipment, wheel or surface cleaning be allowed to discharge into any drainage ditches, the ground or downslope.
- Debris and sediment captured by vehicle wheel washes will be collected and disposed of off-Site at a licensed facility.
- In addition, the below-listed measures serve to work in tandem with and complement efforts to mitigate sedimentation/siltation and the release of pollutants on Site during the Construction Phase.

- 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. All bypass separators are required by legislation to be fitted with an oil level alarm system with recommendations that the alarm is installed, tested, commissioned, and regularly serviced by a qualified technician. The alarm indicates when the separator needs immediate maintenance in order for it to continue to work effectively. The Environmental Agency's PPG3 guidelines stipulate that every 6 months, and in accordance with manufacturer's instructions, experienced personnel should carry out maintenance to both the separator and alarm. It is proposed to enter into a maintenance agreement with the bypass separator supplier will be to provide a full technical and service package including separator and alarm installation, commissioning, oil and silt removal and route service contracts.

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.

6.2 Foul Sewer Drainage

The proposed foul water drainage system is illustrated in the services drawings and will discharge to the foul network on the Killumney Rd via a new pumping station and rising main. All works will be in accordance with Irish Water Specifications and details.

6.2.1 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.

6.2.2 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 will be confirmed by preliminary 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

6.3 Potable Water

It is proposed to provide a new 200mm I.D. Ø (inside diameter) HDPE connection to the watermain located in the existing Heathfield estate adjacent to the proposed site with associated 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.

6.3.1 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.

6.3.2 Mitigation

The proposed mitigation measures are:-

- The existing water supply feeds will be always protected 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.

6.4 Bridge

A Bridge is proposed to carry the access road and services over the existing watercourse (Maglin North River) and incorporates a deck, supported on piers and abutments which are in turn supported by foundations. Abutments are formed to support the ends of the deck; piers are formed. The main Bridge elements can be steel or concrete or combinations of these. Concrete can be cast on site (in situ) or can include precast units which are transported to the site. The exact form and materials used on the Bridge is specific depending on the nature of the Bridge, the alignment of road it carries, the distances between the abutments (spans). In this case the Bridge will most likely be predominantly a precast structure delivered to site.

The road surface on the Bridge deck will be a bituminous bound pavement laid on a waterproofing coat. Bridge deck waterproofing can either be a spray applied or sheet membrane system. The spray applied system comprises a solvent free methyl methacrylate resin spray and a polymer modified bituminous based hot melt adhesive tack coat. The sheet membrane system comprises a non-woven polyester reinforced, styrene-butadene-styrene (SBS) polymer modified bitumen sheet with a solvent-based bituminous primer and blown (oxidised) bitumen bonding. A steel parapet is also fixed to the Bridge deck.

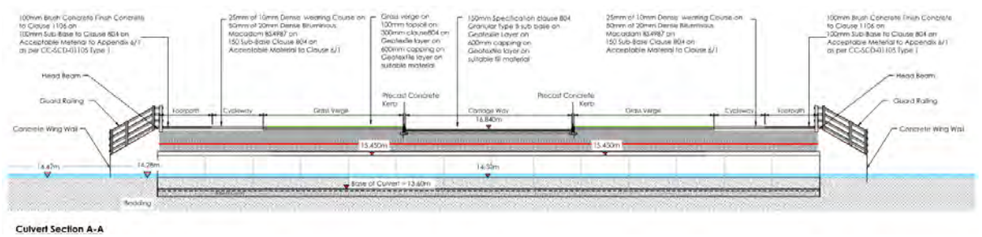


Figure 4.4.1 –Bridge Long Section

6.4.1 Bridge Construction Sequence

Construction of the Bridge will commence when the earthworks embankments on the adjacent sections of road are at abutment level. Typical Bridge construction procedures may be summarised as follows:

6.4.1.1 Bridge Foundations

Foundations are required for the abutments.Foundations can be either concrete pad or piled.

Pad footings are generally constructed as follows:

- Excavation to a depth below formation level to a suitable founding soil strata.
- Laying a concrete layer, approximately 75 mm thick, at foundation formation level over the full extent of the rectangular foundation to produce a clean, flat plain surface, capable of containing the wet structural foundation concrete. The concrete layer is transported to the site in a concrete wagon.
- Fabricating cages of steel reinforcement, which is done on site, with bars protruding vertically for subsequent concrete pours.
- Placing formwork for the foundation slab. Formwork will be comprised of wooden or metal sheets supported by wooden stakes or other props.
- Transporting concrete to the site and pouring and compacting the concrete, by vibration, to required level, in formwork.
- Leaving the concrete for a period of time to enable it to cure before stripping the formwork to form foundation base.
- Steel reinforcement is fixed for the abutments followed by shutters for the pier.
- Placing concrete for the abutments, including vibration and finish to exposed top of concrete.
- Curing fresh concrete, stripping shutters, treating concrete surface and backfilling over excavations with acceptable material and compacting using a small machine operated compactor.

Piled foundations are generally constructed as follows:

- Carry out preliminary excavations at foundation positions.
- Install foundation piles to a suitable load bearing soil strata – this can either be by driving preconstructed concrete or steel to the required depth with a pile driver, or by using a boring machine to create the void for the pile, placing a casing in the void followed by lowering steel reinforcement and pouring concrete to form the pile.
- Complete excavations to the appropriate formation level.
- Trim projecting piles to required level using mechanical saws or cutting equipment.
- Construction of a reinforcement pile cap upon which piers and abutments will be constructed follows in a similar manner as the construction of the pad footing.

6.4.1.2 Bridge Abutments

- Abutments are concrete seats upon which the Bridge beams can be supported at each end of the Bridge. Construction of abutments is generally undertaken as follows:
- Fixing a grillage of steel reinforcement for abutment walls.
- Erecting vertical formwork for abutment walls.
- Erecting vertical formwork for abutment walls.
- Placing concrete in wall formwork and compacting by vibration.

- Removing shutters, curing concrete, treating exposed surfaces and applying waterproof membrane to faces retaining soil fill – the waterproof membrane can typically be a bitumen coating applied by brush or spray.
- A drain is laid behind the abutments comprising a small pipe with a granular surround.
- Placing and compacting granular fill, behind abutments and wing walls, to road formation level.
- Preparation of seatings for Bridge beams.

6.4.1.3 Bridge Deck

Bridge decks can be several different forms, as follows:

- Concrete deck cast on site (in situ deck).
- Beam and slab, with beams being precast concrete or steel, and the deck being concrete cast in situ.
- In situ decks are generally constructed as follows:
- Erecting formwork on staging to support the wet concrete forming the deck.
- Erecting a steel reinforcement cage within the formwork.
- Pumping concrete into the formwork and compacting by vibration.
- Preparing a finish to the top surface of the wet concrete by smoothing the concrete with a float.
- Leaving the concrete for a period of time to enable it to cure before removing the staging.

Decks supported by beams are constructed as follows:

- Taking delivery of precast prestressed concrete or steel Bridge beams and erecting in position over temporary props at pier positions and abutments using cranes.
- Erecting soffit formwork, between and along outer edges of Bridge beams, and side forms for edge parapet beam and diaphragms / transverse beams.
- Fixing inserts for services and additional structural elements.
- Fixing grillage of steel reinforcement for in-situ concrete deck and parapet beam.
- Placing concrete for Bridge deck and in-situ edge beams. This is normally done as s staged process. The first stage involves the concrete pour of the main deck sections, followed by the diaphragms / transverse beams and finally the edge beams.
- Curing deck concrete, stripping formwork, treating exposed surfaces.
- Waterproofing top of structural deck.
- Completing services.
- The deck is completed with construction of the verges/footways, and placement of the deck waterproofing system as described above. The final stages of Bridge construction include erecting metal parapet elements and applying pavement markings.

6.4.1.4 Plant likely to be involved in Bridge construction includes:

- Excavators
- Dump trucks and lorries
- Piling rigs
- Mobile cranes

- Concrete wagons and pumps
- Hand compactors
- Paving machines and smooth rollers

6.5 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 incoming 10kV supply 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.

7 Health & Safety

7.1 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 design advances, a Preliminary Health and Safety Plan will be drawn up 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 co-ordinate will 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 safepass 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 consider all applicable national laws, guidelines and standards.

The Contractors must 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 shall prepare and implement the Health, Safety and Environmental (HSE) Plan and associated working instructions and procedures that will always govern their actions. 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.

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

Furthermore, the Contractors shall develop and 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.

Minimum PPE required during the construction works will include protective footwear, high visibility vests, gloves, safety glasses and hard hats. Ear defenders will be used during noise works, as required.

Further details will be set out on the Construction Health & Safety Plan to be prepared by the appointed contractor.

Signage will be erected at the site entrance to warn the public of the ongoing construction works. The signage used will be like that shown in Figure 7.1 below.



Figure 7.1 – Context Map

7.2 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 consider 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.

7.3 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.

8 Construction Traffic Management

The majority of construction traffic coming to and leaving the site will use the Killumney Road and the N-22. Transport of construction material will comprise the majority of HGV traffic movements during the construction works. Similarly, the Contractor will be required to use licenced and permitted waste management facilities within the Cork area which can accept C&D waste which will be generated from the site.

The appointed contractor will determine which facilities will provide construction materials and collect waste from the site. Suitably permitted waste contractors will be appointed to transport any waste off-site.

Construction traffic, delivering to or collecting from the site, will be able to drive into the site from the Killumney Road and turn within the site such that there will be no queuing of traffic on the adjacent road network. Drivers coming to site will be informed of the site working hours and suppliers will not be permitted to park at the site entrance awaiting the gates to open.

The N22 national route provides a link between the site and areas to the east and west. As a result, HGV's will be able to avoid entering the city centre for the most part. HGV's will be required to access the Killumney Road from the N22 where road widths are suitable for HGV vehicular movement.

There will be a noticeable increase in HGV traffic on the road network during the construction stage works as waste materials are removed from site and deliveries brought to site, however this activity will be of short duration and generally staggered. Parking will be provided within the site boundary for construction staff and no car parking will be permitted outside of the site boundary.

Visual surveys of the road network approaching the site will be carried out on a regular basis. The main contractor will carry out road sweeping operations, employing a suction sweeper or similar appropriate method, to remove any project related dirt and/or material deposited on the road network by construction/delivery vehicles. The contractor will be required to provide suitable hard standing directly within the site boundary off the main access to minimize spoil being transferred onto the public road. Nonetheless, a wheel wash system will be set up in the event there is a risk of debris deposit on the road.

Waste collection vehicles leaving the site will be required to cover their loads with a canvas to prevent waste or dust emissions from the vehicle on the road network.

9 *Environmental Management*

9.1 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.

Dust will be generated mainly from earthworks activities at the early stage of the project and to a lesser extent from new construction and traffic movements. The closest human receptors are located in properties along the Waterfall Road.

Measures will be put in place to minimise the impact of dust generated from the works with reference to best practice guidance such as the *Control of Dust from Construction and Demolition Activities* document. These measures will include:

- During periods of dry weather, the site access routes will be kept damp to minimise dust generation from construction traffic.
- Street sweepers will be employed to ensure the adjacent R474 is maintained free of dust.
- Establishing a 10 km/hr speed limit for vehicles on site.
- Minimisation of extent of working areas at any one time.
- Netting and/or hard surface hoarding around the perimeter of the site will minimise dust migration from the site at low levels.
- Stockpiling of imported materials will be limited to the volumes required to practically meet the construction schedule.
- Excavated materials will be removed from site as soon as possible to minimise potential for stockpiles to create windblown dust; and
- Daily inspections by the main contractor will be carried out to identify potential sources of dust generation along with implementation measures to remove causes where found.

It is not proposed to carry out dust deposition monitoring as it is considered that the above measures will be sufficient to ensure that there is no dust impact on local human or ecological receptors. Contact details for the site manager will be provided at the entrance to the site and local residents/public will be encouraged to report any off-site dust deposition issues. Any air quality complaints made during the works will be logged, investigated and followed up with measures to limit emissions, where appropriate.

There will also be some exhaust emissions generated from use of excavators, HGVs and vibrating rollers during the demolition and construction phase. These impacts will be temporary in duration and are not considered likely to give rise to significant air quality impacts following the implementation of the following measures:

- All machinery will be suitably maintained to ensure that emissions of engine- generated pollutants shall be kept to a minimum in accordance with Measures Against the Emission of Gaseous and Particulate Pollutants from Internal Combustion Engines to be Installed in Non-Road Mobile Machinery (2002/88/EC) and Emissions of Pollutants from Diesel Engines (2005/21/EC)
- Vehicles will not be left unnecessarily idling on the site and trucks removing demolition waste from the site will turn off engines during loading.
- Pre-start checks on all machinery will be conducted on a daily basis prior to commencement of activities.
- Low emission fuels will be used insofar as possible; and
- Mains power will be used for small plant and equipment, where possible, in preference to generators.

9.2 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 areas. 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.

9.3 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:

- 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.

9.4 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.

10 Noise Management

All works will be carried out being mindful of potential noise impacts from construction activities. Plant and machinery operating on the site will be the main source of noise during the works most notably during any earthworks, rock breaking etc. The works will be carried out in accordance with the requirements of BS5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites.

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.

10.1 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 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.

The primary measure to limit the potential impact of noise from the works will be to limit working hours to the suitable daytime hours outlined earlier in the Report. This will reduce the potential noise impact on the local human receptors by avoiding early morning noise generating activities.

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;
- Design and use of site hoarding and screens/noise barriers, to provide acoustic screening at the earliest opportunity;
- Ensuring that HGV drivers turn off engines when parked for prolonged periods on the site and turning off engines during loading of demolition waste materials.
- Choice of routes and programming for the transport of construction materials.

- Using minimal impact reversing alerts and avoiding the use of horns, where possible. These alerts, however, are essential safety measures for bust construction sites and cannot be avoided.
- Choosing equipment with reduced noise output and silencers/dampeners.
- Using radio contact across the site to avoid workers shouting or whistling.
- Maintaining plant and equipment in good condition to ensure noise emissions are as per plant specifications and that all noise attenuation features are in good working order; and
- Use of mains power supply instead of generators insofar as is possible.

Contact details for the site manager will be provided at the entrance to the site and local residents/public will be encouraged to report any noise issues. Any noise complaints made during the works will be logged, investigated and followed up with measures to limit noise emissions, where appropriate.

10.2 Noise Limits

Noise Limits to be applied for the duration of construction works are as set out in the National Roads Authority (NRA) Guidelines for Treatment of Noise and Vibration in National Roads Schemes (summarised below in Figure 9.1) and BS 5228-1:2009+A1:2014 (Code of Practice for Noise Control on Construction and Open Sites).

Days & Times	$L_{Aeq\ (1hr)}$ dB	$L_{pA(max)slow}$ dB
Monday to Friday 07:00 to 19:00hrs	70	80[2]
Monday to Friday 19:00 to 22:00hrs	60[2]	65[2]
Saturday 08:00 to 16:30hrs	65	75
Sundays and Bank Holidays 08:00 to 16:30hrs	60[2]	65[2]

Table 9.1 – NRA Guidelines for Maximum Permissible Noise Levels at the Façade of Dwellings during Construction.

BS 5228 applies a noise limit of 70 dBA between 07:00 am and 19:00 pm outside the nearest window of the occupied room closest to the site boundary in suburban areas away from main road traffic and industrial noise. For the duration of construction works, a daytime noise limit (07:00 am to 19:00 pm) of 70 dBA shall apply (in accordance with the requirements of BS 5228 and generally in agreement with the NRA guidelines).

10.3 Vibration

It is not anticipated that there will be any significant vibration impacts from the proposed works. Some minor vibrations will be generated from heavy plant and machinery but it is anticipated that there will be no piling or significant percussion plant required which could have the potential to cause vibration effects or damage.

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

Vibration Limits to be applied for the duration of construction works are as set out in BS 5228-2:2009+A1:2014 (Code of Practice for Vibration Control on Construction and Open Sites) and BS 7385: 1993 (Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration). Allowable vibration during the construction phase is summarised below in Figure 9.2. These will be checked at a minimum of twice a week.

Allowable vibration velocity (Peak Particle Velocity) at the closest part of any sensitive property to the source of vibration, at a frequency of		
Less than 10Hz	10 to 50Hz	50 to 100Hz (and above)
8 mm/s	12.5 mm/s	20 mm/s

Table 9.2 – NRA Guidelines for Allowable Vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration

11 Lighting

All temporary lighting installed within the proposed development site will be completed with sensitivity for local wildlife while still providing the necessary lighting for human usage during construction.

11.1 Lighting Mitigation Principles

Temporary lighting design should be flexible and be able to fully take into account the presence of protected species. Lighting mitigation measures will follow Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers (Bat Conservation Ireland, 2010). Therefore, appropriate lighting, as detailed below, should be used within a proposed development and adjacent areas with more sensitive lighting regimes deployed in wildlife sensitive areas in accordance with the mitigation measures outlined in the Bat Survey.

- Construction should be limited to daylight hours in order to minimise adverse effects on nocturnal fauna.
- Light Emitting Diodes (LED's) will be used and the brightness will be set as low as possible.
- Lighting will be kept to the minimum necessary for health and safety purposes
- Lighting will be only be utilised during working periods where required and will be shut down during non-working periods.
- Lighting will be directed away from landscaped areas and retained sections of hedgerows, treelines, and mature parkland areas.
- LED luminaires will be used because they are highly directional, lower intensity, good colour rendition and dimming capability.
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- The use of specialist bollard or low-level downward directional luminaires should be considered in bat sensitive areas to retain darkness above.
- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.
- Only luminaires with an upward light ratio of 0% and with good optical control should be used.
- Luminaires should always be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting should be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.
- Monitoring of light levels along the treelines and hedgerow areas will be undertaken pre-construction, during-construction and post-construction to identify any areas where light spill is affecting background levels. Where monitoring detects light spill is affecting these habitat areas, remedial measures will be implemented to ensure that background light levels are maintained. All lumina Lighting Extract - ires used should lack UV/IR elements to reduce impact.

12 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.

An Ecological Clerk of Works (ECoW) will inspect the Site in advance of works commencing and will undertake Site inspections as required during the works, to ensure that they will be completed in line with the mitigation measures detailed within this CEMP, the NIS & the Ecological Impact Statement.

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 10.1 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.

Table 10.1 – Risk Matrix

	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			

12.1 Additional Measures from Ecological Impact Assessment

12.1.1 Protection for Trees, Hedgerows and Treelines

A number of individual trees and hedgerow treelines onsite are to be retained and protected from unnecessary damage. During construction, care will be required to protect trees from both direct and indirect disturbance. The Wildlife Act 1976, as amended, provides that it is an offence to cut, grub, burn or destroy any vegetation on uncultivated land or such growing in any hedge or ditch from the 1st March to the 31st August. Exemptions include the clearance of vegetation in the course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided. Where possible, vegetation will be removed outside of the breeding season and in particular, removal during the peak-breeding season (April-June inclusive) will be avoided.

The Maglin North Stream runs along the full extent of the western site boundary and it is important that construction activities do not result in pollution of this watercourse. To prevent incidental damage by machinery or by the deposition of spoil during site works, treelines and hedgerows which are located in close proximity to working areas will be clearly marked and fenced off to avoid accidental damage during excavations and site preparation. Detailed tree protection measures are included in Tree Survey (Geotree) which accompanies this application. Tree protection measures will follow BS 5837: 2012 and the 'Tree Constraints Plan' included in Tree Survey (Geotree) will ensure that root protection areas (RPAs) are identified and protected throughout construction works. All tree protection measures will be installed prior to the commencement of any construction works.

The following protection measures will be adhered to during the works:

- Trees, treelines, and hedgerows to be retained that will be located within close proximity to the construction areas will be fenced off by effective construction proof barriers before construction works commence. These barriers will cover an area larger than the branch spread of the protected tree, with a radius of half the tree's height, measured from the trunk. These barriers will remain in place for the duration of the works to prevent accidental disturbance and define the limits for construction vehicles and other construction staff;
- Care will be required to prevent disturbance to root systems - excavation within the protected area will be done by hand and backfilled as soon as possible. No roots will be cut within these barriers. Outside of the construction proof barriers, no roots exceeding 25mm will be cut without approval.
- Where machinery access must encroach areas within proximity to the retained hedgerows / treelines or the mixed broadleaved woodland, a Root Protection Area (RPA) will be established and suitable ground protection which will be put in place to prevent any significant soil compaction or root damage.
- When tree removal is required near retained trees, felling must be carried out in small sections to avoid damage to adjacent trees.

- Trench digging or other excavation works for services etc. will not be permitted within close proximity to retained trees and hedgerows unless approved and supervised using methods outlined in BS5837: Trees in relation to design, demolition, and construction (2012);
- No materials, equipment or machinery will be stored within close proximity to retained hedgerows and trees;
- For treeline protection measures to work effectively, all personnel associated with the operation of heavy plant machinery must be familiar with the above principles for the protection of treelines;
- Care will be taken when planning site operations to ensure that wide or tall loads or plant with booms, jibs and counterweights can operate without encountering retained trees. Such contact can result in serious damage to them and might make their safe retention impossible;
- Notice boards, wires, etc. will not be attached to any trees. Site offices, materials and contractor parking will all be outside the Construction Exclusion Zone; and,
- The retained trees will be assessed following the completion of the construction works.

12.1.2 Protection & Measures for Terrestrial Mammals and Amphibians

Where deep excavations will be required on-site, appropriate measures to protect mammals and amphibians from ingress will be installed and if unidentified burrows are identified within the works area during construction, the project ECoW will be contacted for advice.

Hedgehog

- Hedgehog highways will be provided between the properties to allow free movement of small mammals through the gardens/development. This requires a small hole (c. 13cm by 13cm square) to be included at the base of garden fencing to provide passage for Hedgehogs along the boundary of development site.
- Four SCHWEGLER Hedgehog Dome (or similar) will be provided. These will be located under the retained hedgerow/treeline habitat the west and south of the site. This dome encourages Hedgehogs to settle in a particular area and provides year-round shelter, including during the winter months. This will be located somewhere protected from wind and rain. Ideally this will be filled with hay (supplied with the dome) but alternatively use dry leaves and straw, as well as cut up newspaper and wood shavings.
- These will be located adjacent or within suitable habitat but will not be situated near internal or external roads.

Common Frog

- Prior to any works being a carried out on drainage ditches and/or wet/agricultural grassland ,a search of suitable areas shall be carried out by the supervising ecologist prior to the works. If frog spawn/tadpoles are found, a licence from NPWS will be obtained to translocate the frog spawn to alternative habitat.

12.1.3 Measures for Bats

In order to ensure that the works in relation to the Proposed Development do not have significant impacts on bats, the following construction procedures and mitigation measures will be implemented. These measures are in line with the NRA (now TII) Guidance for Bats (National Roads Authority, 2006), Kelleher and Marnell (2006).

- Any trees with Potential Roost Features (PRF) to be removed will be supervised by the ECoW and will be felled using hand tools only. The ECoW will visually inspect the trees following felling for the presence of bats. Should bats be found, the NPWS will be consulted;
- The findings of any required bat surveys will be submitted to the planning authority prior to the commencement of the demolition works; and,
- Following the installation of the lighting for the Proposed Development, a suitably qualified Ecologist should undertake a further Site inspection in order to check the lighting patterns and lux levels along the Site boundaries to ensure there are no impacts to bats or other nocturnal species.
- In all cases immediately in advance of demolition/refurbishment works a bat specialist will undertake an examination of the buildings. If bats are present at the time of examination it is essential to determine the nature of the roost (i.e., number, species, whether it is a breeding population) as well as its exact location.
- If bats are recorded in building earmarked for demolition/refurbishment, special mitigation measures to protect bats will be put in place and a license to derogate from the conservation legislation will be sought from the NPWS.
- The contractor will take all required measures to ensure works do not harm individuals by altering working methods or timing to avoid bats, if necessary.
- If roosting habitat for bats is removed, replacement habitat will be provided.
- The project ecologist will work with the contractor to ensure that trees earmarked for retention are adequately protected (as per Detailed tree protection measures are included in Tree Survey (Geotree) which accompanies this application).
- Tree-felling will ideally be undertaken in the period September to late October/early November. During this period bats are capable of flight and may avoid the risks of tree-felling if proper measures are undertaken.
- Soft-felling will be implemented i.e. Felled trees will not be mulched immediately. Such trees will be left lying several hours and preferably overnight before any further sawing or mulching. This will allow any bats within the tree to emerge and avoid accidental death. The bat specialist will be on-hand during felling operations to inspect felled trees for bats. If bats are seen or heard in a tree that has been felled, work will cease and the local NPWS Conservation Ranger will be contacted.
- Tree will be retained where possible and no 'tidying up' of dead wood and spilt limbs on tree specimens will be undertaken unless necessary for health and safety.
- Treelines outside the proposed development area but adjacent to it and thus at risk, will be clearly marked by a bat specialist to avoid any inadvertent damage.
- During construction directional lighting will be employed to minimise light spill onto adjacent areas. Where practicable during night-time works, there will be no directional lighting focused towards watercourses or boundary habitats and focusing lights downwards will be utilised to minimise light spillage.
- If bats are recorded by the bat specialist within any trees no works will proceed without a relevant derogation licence from the NPWS.

12.1.4 Measures for Birds

In order to ensure no impacts, occur to breeding birds as a result of the Proposed Development, the following mitigation measures will be put in place:

- Any vegetation clearance required will take place outside of the nesting bird season (1st March to 31st August), as per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000;
- In the event that works need to be undertaken within the main breeding season, this would be undertaken in consultation with NPWS and under the supervision of the project ECoW;
- Prior to the vegetation removal the ECoW will inspect the Site and the management and removal of vegetation at the Site will be undertaken under the direction of the project ECoW in a systematic way to ensure that retained areas of vegetation are not damaged by the works; and,
- Should birds' nest within the active working area during the construction phase, works within the area will stop within the area and the project ECoW will be consulted.

It should be noted that birds may be subject to some temporary minor disturbances during construction. However, as birds are a highly mobile species, should any birds be impacted, these birds will move away from the disturbance to a more suitable area, therefore, this is not considered likely to be significant.

12.1.5 Measures for Invasive Species

The following best practice Site hygiene and biosecurity measures will be in place to avoid the spread of any Invasive Alien Plant Species (IAPS) into the Site or surrounding areas:

- As noted in **Section 8.3.5** of the EIAR, there is no statutory obligation to remove Buddleia. However, Buddleia will be removed as part of the pre-construction/construction works. Buddleia is straightforward to control using a mixture of mechanical removal and herbicide treatment. Buddleia is a plant that favours disturbed sites, physical grubbing of plants can provide ideal conditions for the germination of seeds. Therefore, care needs to be taken to ensure re-vegetation of controlled areas is undertaken swiftly. The branches of Buddleia are capable of rooting as cuttings, so care should also be taken to ensure material is disposed of in a manner to avoid this risk.
- As noted in **Section 8.3.5** of the EIAR there is no statutory obligation to remove Wild Clematis. It is noted that this plant is present on a number of mature and semi-mature trees earmarked for retention and removal of Wild Clematis within these areas will be made on a case-by-case basis with the aim of protecting mature and semi-mature trees.
- To reduce the likelihood of invasive species (IAPS) being introduced to the Site from construction works on other sites, all soils/materials being introduced to the Site will be sourced from a certified invasive flora-free source Site, to ensure no introduction of invasive plant materials to the Site occurs. All plant and equipment will be visually inspected before being permitted on Site.

- Vehicular movements will be restricted to the footprint of the Proposed Development. Construction plant and vehicles will not encroach onto areas that are not permitted for the development.
- All vehicles leaving the Site and/or transporting infested IAPS soil/materials must be thoroughly pressure-washed with clean water in a designated wash-down area before being used for other work. Mud and organic debris will not be allowed to accumulate on tyres, wheels or under wheel arches. Any machinery or equipment returning from a different construction Site will be cleaned, steam washed and visually inspected again before re-entering the Site.

It is noted that all plant and equipment will remain on-Site for the duration of the stripping and earthworks stage of the Construction Phase.

- Material handling systems and Site stockpiling of materials will be designed and laid out to minimise exposure to wind.
- Water misting or sprays will be used on stockpiles as required if particularly dusty activities are necessary during dry or windy periods to prevent seed dispersal of IAPS.
- Personnel working on the Site will ensure that all PPE including clothing and footwear brought to the Site is to be clean and dry. All PPE is to be visually inspected, and any attached vegetation or debris removed. Work boots will be dipped in or scrubbed with a disinfectant solution and thoroughly dried afterwards before being used on the Site for the first time, ensuring they are visually free from soil and organic debris, to prevent the inadvertent spread of IAPS material.
- Construction personnel involved in works are to be trained in basic relevant invasive species identification, prevention, and management.
- Where any IAPS is identified within the footprint of the work, the appointed contractor is to develop and implement an appropriate method statement with regard to managing IAPS on-Site. Fencing and/or advisory signage is to be erected. Where stands are small, comprising individual plants, the use of signage may suffice.
- Cattle (Rumble) grids will be placed at vehicular exit gates during excavation to remove spoil from truck wheels leaving the Site.
- A street sweeper will attend the Site regularly to clean the road when there are truck movements in and out of the Site.
- 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.

All IAPS management and control measures implemented on-Site during the Construction Phase are to be carried out strictly in accordance with best practice guidance as set out in 'The Management of Noxious Weeds and Non-native Invasive Species on National Roads' (TII (formerly NRA), 2010), 'The Management of Invasive Alien Plant Species on National Roads – Technical Guidance' (TII, 2020) and 'Best Practice Management Guidelines' by Invasive Species Ireland (2008).

13 Construction & Demolition Waste Management on Site

13.1 Site Clearance

The management of construction and demolition waste should reflect the waste management hierarchy, with waste prevention and minimisation being the first priority succeeded by reuse and recycling.

During site clearance and construction works, there are numerous opportunities for the beneficial reuse and recycling of the demolition materials. The subsequent use of recycled materials in construction works also reduces the quantities of waste which ultimately needs to be consigned to landfill sites.

13.2 Source of Fill & Aggregates

All fill and aggregate for the proposed development will be sourced from reputable suppliers. All suppliers will be vetted for;

- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the proposed development
- Environmental management status and
- Regulatory and legal status of the company.

13.3 Prevention of Waste

The primary effort therefore should be to engage in waste prevention and reduce the amount of waste generated in the first place i.e. minimise the resources needed to do the job.

Prevention is financially advantageous as it reduces the purchase of construction materials and obviates the need to remove wastes from site. It is important to emphasise the potential for certain purchasing procedures to contribute to a reduction in excessive material wastage on site.

Examples include:

- ensuring materials are ordered on an "as needed" basis to prevent over supply to site;
- purchasing construction materials in shape, dimensions and form that minimises the creation of excessive scrap waste on site;
- ensuring correct storage and handling of construction materials to minimise generation of damaged materials/waste, e.g. keeping deliveries packaged until they are ready to be used;
- ensuring correct sequencing of operations; and
- assigning individual responsibility (through appropriate contractual arrangements) to sub-contractors for the purchase of raw materials and for the management of wastes arising from their activities, thereby ensuring that available resources are not expended in an extravagant manner at the expense of the main contractor.

13.4 Waste Streams

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

- Re-use

- Recycle
- Landfill

Re-use

Waste material that is generated should be reused on site or salvaged for subsequent reuse to the greatest extent possible and disposal should only be considered as a last resort. Initiatives should be put in place to maximise the efficient use/reuse of materials.

Recycling

There are a number of established markets available for the beneficial use of C&D waste:

- waste timber can be:
  - recycled as shuttering or hoarding, or
  - sent for reprocessing as medium density fibreboard;
- waste concrete can be utilised as fill material for roads or in the manufacture of new concrete when arising at source; and
- in addition, the technology for the segregation and recovery of stone, for example, is well established, accessible and there is a large reuse market for aggregates as fill for roads and other construction projects.

Landfill

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

13.5 Overall Management of Construction and Demolition Waste

Waste minimisation, reuse and recycling can best be managed operationally by nominating a "Construction and Demolition Waste Manager" to take responsibility for all aspects of waste management at the different stages of the Project.

This C&D Waste Manager may well be a number of different individuals over the life-cycle of the Project, but in general is intended to be a reliable person chosen from within the Contracting Team, who is technically competent and appropriately trained, who takes the responsibility to ensure that the objectives and measures within the Project Waste Management Plan are delivered and who is assigned the requisite authority to secure achievement of this purpose.

Specifically, the function of the C&D Waste Manager will be to communicate effectively with colleagues in relation to the aims and objectives for waste management on the Project. The primary responsibility for delivery of the objectives of the Waste Management Plan will fall upon the C&D Waste Manager designated at the demolition/ construction stage. A key objective for the C&D Waste Manager should be to maintain accurate records on the quantities of waste/ surpluses arising and the real cost (including purchase) associated with waste generation and management.

The preparation, application and documentation of a Project Waste Management Plan should enable all parties - including contractors, designers, and competent authorities - to learn from the systematic implementation and assessment of best practice, particularly through the recording of summary information on performance outcomes.

13.6 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		Site Strip
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

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

13.7 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)

13.8 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	Re-used on site or sent to Landfill
Metals	Scrap Value
Plasterboard	Landfill

Construction Works	
Waste Types	**Waste Stream**
Plasterboard	Return/Landfill
Bricks/Blocks	Landfill
Timber	Recycled
Cardboard	Landfill
Mortar	Landfill
Metals	Scrap Value
Paints	Landfill
Soils	Re-used on Site/Landfill

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.

13.9 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 should ensure that any person transporting waste off the site should always have a copy of their Waste Collection Permit on the vehicle.

13.10 Permitted/Licensed Waste Collection Used

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 should ensure that any person transporting waste off the site should always have a copy of their Waste Collection Permit on the vehicle.

13.11 Permitted/Licensed Waste 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 & County Council or a Waste License issued by the EPA.

13.12 Site Recording

The Contractor shall be required to 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 fr inspection.

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.

A record of all waste movements from the site will also be maintained and copies of the waste transfer dockets will be held on site. The Project Environmental Manager will ensure that all waste haulage vehicles are identified on the waste collection permit and that the waste description and associated List of Waste code stated on the waste transfer docket are correct.

Any incidents resulting in a potential negative impact on soils or groundwater will be notified immediately to the Project Environmental Manager and the Site Manager. Spill kits will be used where possible to clean up any release and measures taken to ensure that any release does not reach a watercourse or surface water drain. Cork City Council will be notified of any such incident which has the potential to cause a negative impact.

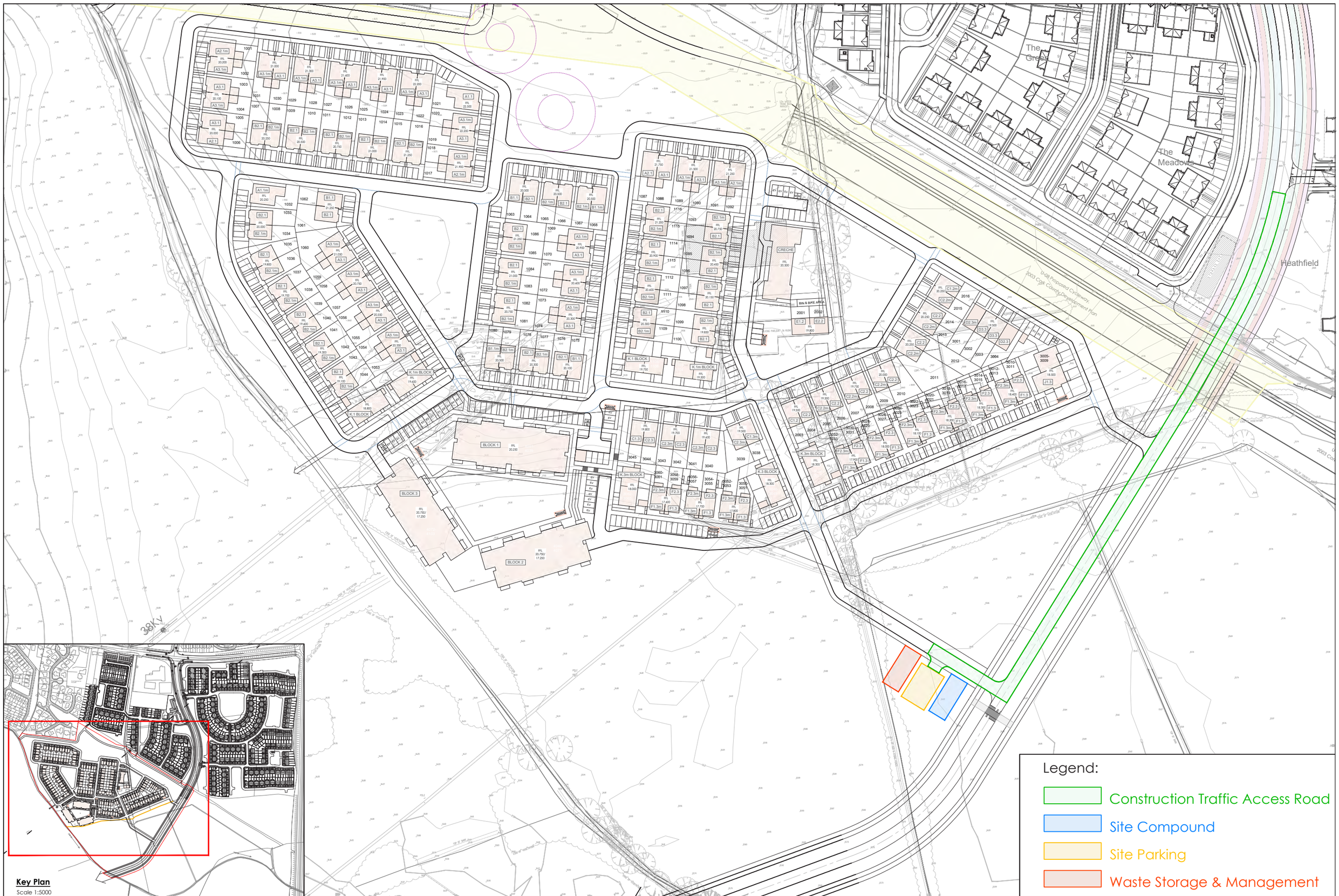
A record of any complaints received in relation to construction works will also be maintained and categorised (e.g., noise, property damage, traffic, dust etc.) within a central Site Complaints Log. The log will include the following key details:

- Name, address and contact details of the complainant (with the complainant's permission).
- Brief outline of the complaint.
- Date of complaint.
- Name of person receiving complaint details; and
- Agreed timeline for response to the complaint.

Any complaints made will be notified to the Site Manager and the Project Environmental Manager immediately and a plan put in place to investigate and seek to resolve the complaint. The Site Manager will also notify the Developer of complaints received. The complainant, Developer and other stakeholders will be kept informed of the progress in resolving the issue.

Hard copy folders will be maintained on site for inspection by the planning authority at any time.

Appendix A



Key Plan
Scale 1:5000

DOSA
DENIS O'SULLIVAN & ASSOCIATES
CONSULTING ENGINEERS

Joyce House
Barrack Square
Ballincollig
Cork
P31 KP84

021 4871781
info@dosa.ie
www.dosa.ie

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REV.	DRAWN	CHKD	APPRVD	DATE	DETAILS
B	J.M.	S.O'G.	L.O.T.	13.02.'26	LRD Planning Issue

CLIENT: MOS Homes Limited

PROJECT: Carriganarra LRD, Ballincollig, Cork.

DRAWING TITLE: Proposed Construction Access & Site Facilities

SHEET: A1

SCALE: 1:750

PROJECT NO. 4208 _ DRAWING NO. 0201 _ STATUS/ISSUE B

Appendix B

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

PHASING DETAILS

PHASE 1
- Demolition of existing farm sheds
- Complete 118 No. Units
- Complete active travel route along north of the development
- Complete creche
- Complete portion of Sustainable Access Corridor

PHASE 2
- Complete 79 No. Units
- Complete Sustainable Access Corridor

PHASE 3
- Complete 103 No. Units

PHASE 1

PHASE 2

PHASE 3

Limeworth

Carrigan

PEDESTRIAN CONNECTION TO NORTHERN DEVELOPMENT

PERMITTED DEVELOPMENT UNDER CONSTRUCTION BY APPLICANT PLANNING REF: 22/41644

PROVISION FOR FUTURE EXTENSION TO ACTIVE TRAVEL ROUTE TO WEST

PROPOSED ACTIVE TRAVEL ROUTE

PERMITTED ACTIVE TRAVEL ROUTE

PROPOSED EXTENSION TO PERMITTED ACTIVE TRAVEL ROUTE

PROPOSED PEDESTRIAN CONNECTION NORTH

COMPLETED HEATHFIELD DEVELOPMENT CONSTRUCTED BY APPLICANT PLANNING REF: 19/38923

EXISTING ESB LINES TO BE UNDERGROUNDED/ DIVERTED

PROPOSED PEDESTRIAN CONNECTION NORTH

LOCATION OF SITE NOTICE

CRECHE

PROPOSED UNCONTROLLED RAISED CROSSING

EXISTING WAYLEAVE

PROVISION FOR FUTURE PEDESTRIAN CONNECTIVITY TO WEST

SITE ENTRANCE

AGRICULTURAL LAND

PROPOSED EXTENSION TO SUSTAINABLE ACCESS CORRIDOR

NORTH

MAGLIN NORTH STREAM

PROPOSED TEMPORARY PUMPING STATION

AGRICULTURAL LAND

SITE ENTRANCE

PROPOSED UNCONTROLLED RAISED CROSSING

PROVISION FOR FUTURE EXTENSION TO SUSTAINABLE ACCESS CORRIDOR TO WEST

PROPOSED PHASING PLAN
SCALE 1:2000 @ A3

date	rev	name	chk	note
11.12.25	P1	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
CARRIGANARRA, BALLINCOLLIG,
CO. CORK

Drawing title
PROPOSED OPEN PHASING PLAN

Scale	Drawn	Checked	Date
1:2000 @ A3	GN	EJG	23.05.2025

Project No.	Drg. No.	Revision
22148	22148/P/011	P1

☐ Information \ Comments — Tender ☐
☐ Planning — Construction ☐

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

DOSA
DENIS O'SULLIVAN & ASSOCIATES
CONSULTING ENGINEERS

RESIDENTIAL DEVELOPMENT AT CARRIGANARRA, BALLINCOLLIG, CO. CORK

CONSTRUCTION TRAFFIC MANAGEMENT PLAN

DATE 10/04/2026

REVISION 8

JOB NO. 4208

Joyce House, Barrack Square, Ballincollig, Co. Cork
T 021 4871781 E info@dosa.ie W www.dosa.ie

DOCUMENT CONTROL

PROJECT NAME: Residential Development at Carriganarra, Ballincollig, Co. Cork

PROJECT NUMBER: 4208

REVISION	DATE	FILE NAME: Residential Development at Carriganarra, Ballincollig, Co. Cork			
8	10.04.2026	DESCRIPTION: Construction Traffic Management Plan			
			PREPARED	CHECKED	APPROVED
		INITIAL	SO'G	LO'T	SO'G
		DATE	10.04.2026	10.04.2026	10.04.2026
#	Insert Date	FILE NAME:			
		DESCRIPTION:			
			PREPARED	CHECKED	APPROVED
		INITIAL			
		DATE			
#	Insert Date	FILE NAME:			
		DESCRIPTION:			
			PREPARED	CHECKED	APPROVED
		INITIAL	SO'G	LO'T	SO'G
		DATE	27.06.2018	27.06.2018	27.06.2018
#	Insert Date	FILE NAME:			
		DESCRIPTION:			
			PREPARED	CHECKED	APPROVED
		INITIAL			
		DATE			
#	Insert Date	FILE NAME:			
		DESCRIPTION:			
			PREPARED	CHECKED	APPROVED
		INITIAL			
		DATE			

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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 Carriganarra, 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 approximately 8.0km southeast of Cork City Centre in Carriganarra on the southern side of Ballincollig to the south of the Link Road. The site is a greenfield site characterised by its undulating topography and its even slope rising at the southern end. The existing Limeworth and Heathfield estate which is currently being constructed runs along the site's northern edge and the site is surrounded on the other 3 sides by farmland and sheds which are in ruins.

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

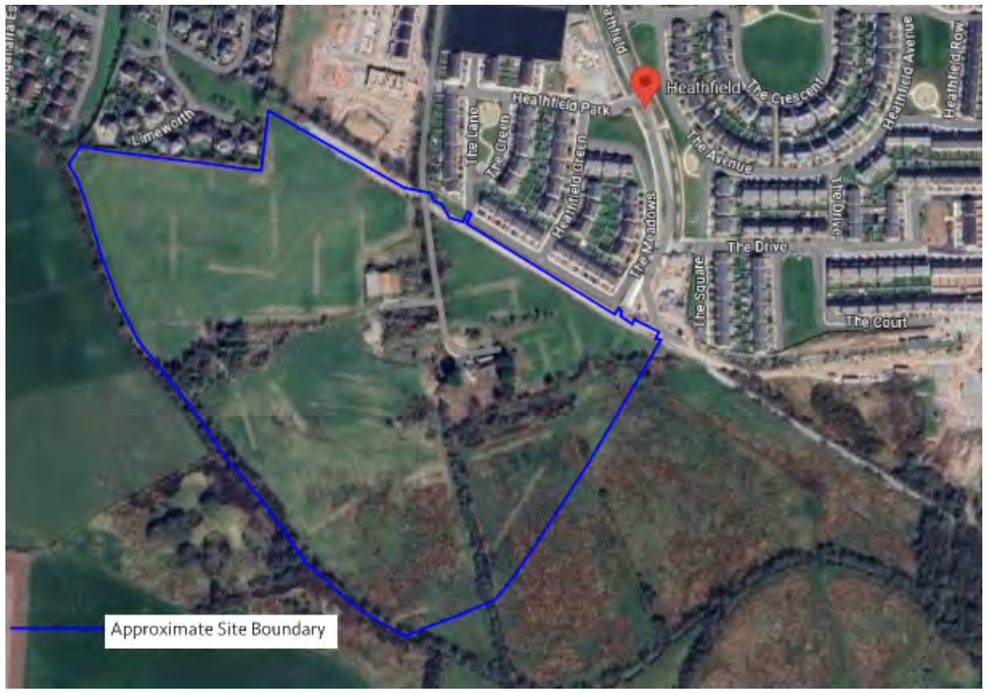


Figure 1.1 – Context Map (Source: Google Maps)

1.2 Proposed Development

A Large-Scale Residential Development (LRD) at Carriganarra, Ballincollig, Cork. The development will consist of the demolition of existing agricultural buildings and the construction of a residential development of 300 no. residential units consisting of 128 no. dwellings houses, 172 no. apartment/duplex units, a two storey creche facility and all ancillary site development works. The proposed 128 no. dwelling houses will include 42 no. bedroom detached/semi-detached dwelling houses and 84 no. 3 bedroom semi-detached/townhouse dwelling houses. The proposed development also provides for the restoration of an existing vernacular farm building on site which will accommodate 2 no. 2 bedroom semi-detached units. The proposed 172 no. apartment/duplex units will include 18 no. 3 bedroom units, 109 no. 2 bedroom units and 45 no. 1 bedroom units, to be provided in 20 no. apartment/duplex buildings ranging in height from 3-4 storeys over basement level.

Vehicular access to the proposed development will be provided via the existing junction from the Killumney road serving the Heathfield residential development and existing sections of the Maglin Sustainable Access Corridor to the north. The proposed development provides for the extension of Maglin Sustainable Access Corridor and the provision of 4 no. pedestrian/cycle connections to the Heathfield residential development to the north which is under construction. Ancillary site works include the raising of existing ground levels on site, the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex and creche buildings, the delivery of active travel infrastructure, landscaping and servicing proposals including a temporary pumping station, and the undergrounding/diversion of an existing 38KV overhead ESB line which traverses the site. The proposed development is highlighted in Figure 1.2 below.



Figure 1.2 – Proposed Development

2 Phasing/ Construction Program

It is anticipated that the works will be carried out in 3 separate phases. Details of the overall phasing plan are outlined on the Proposed Phasing Layout Drawing in Appendix A. It is anticipated that the construction access will be via the new site entrance for phase 1 which will connect to the existing junction from the Killumney road serving the Heathfield residential development and the internal road network of the Heathfield development.

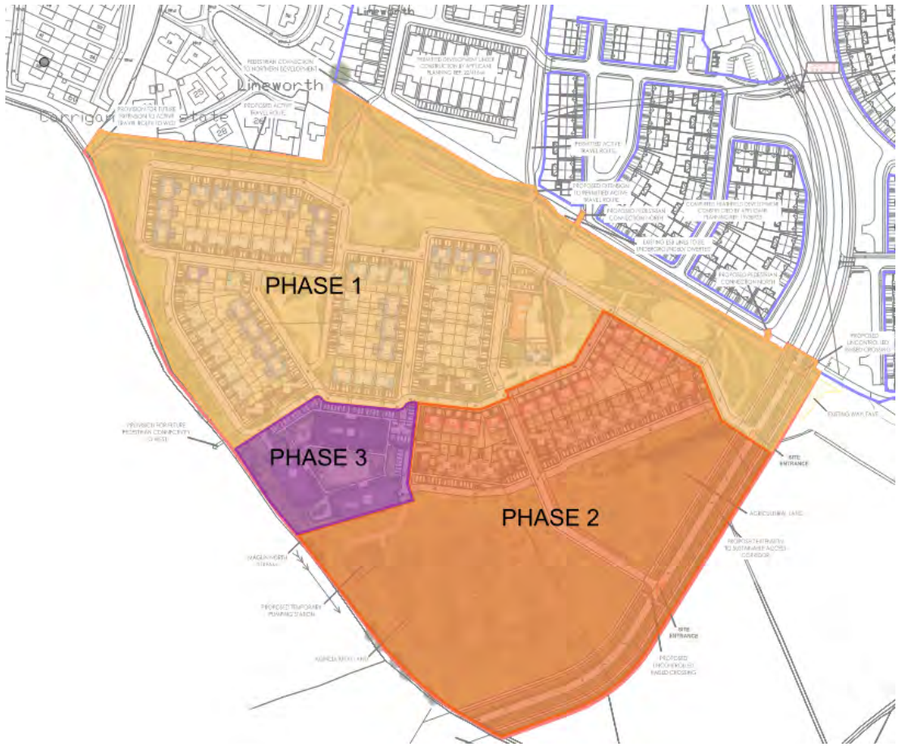


Figure 2.0 – Proposed Phasing

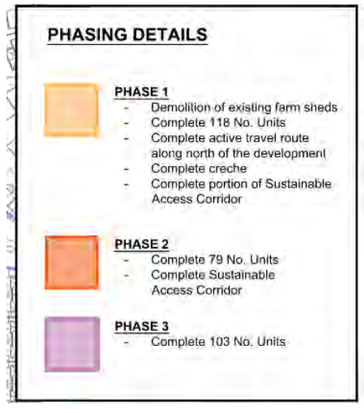


Figure 2.1 – Proposed Phasing Breakdown

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 5-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 5 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.

All construction traffic will enter the site via the existing spine road serving the Heathfield estate entrance and a new construction access road to the south of this existing estate. This access shall be wide enough to allow two-way flow into and out of the site and to provide adequate sight-distances and turning radii for vehicles entering and exiting the site. There will be no alternative access for construction traffic.

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.

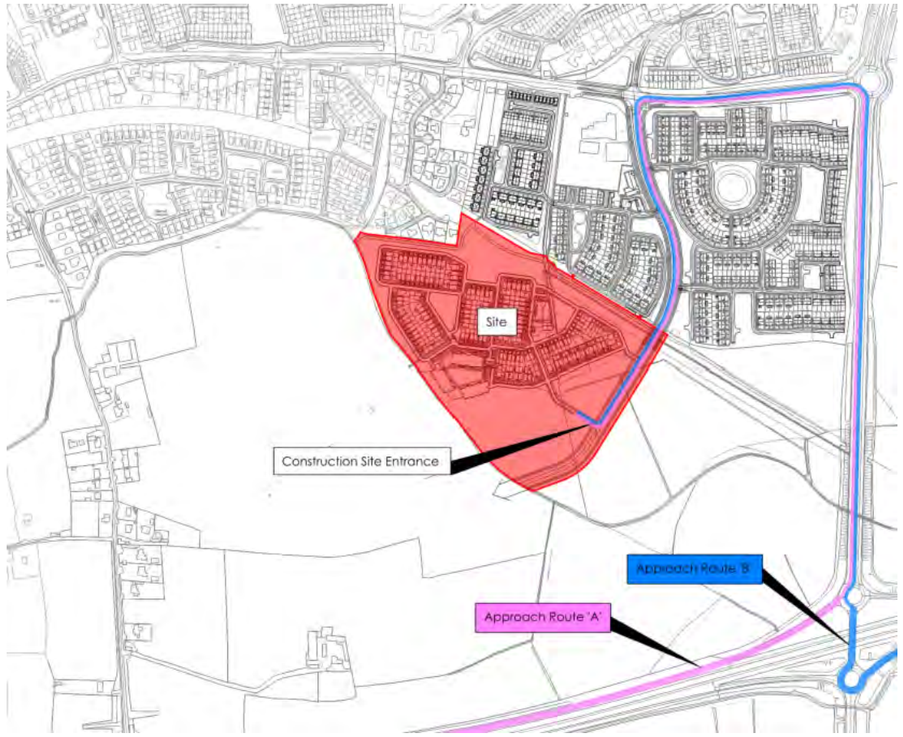


Figure 4.2 – Proposed Delivery Access Routes

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 the Killumney 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.

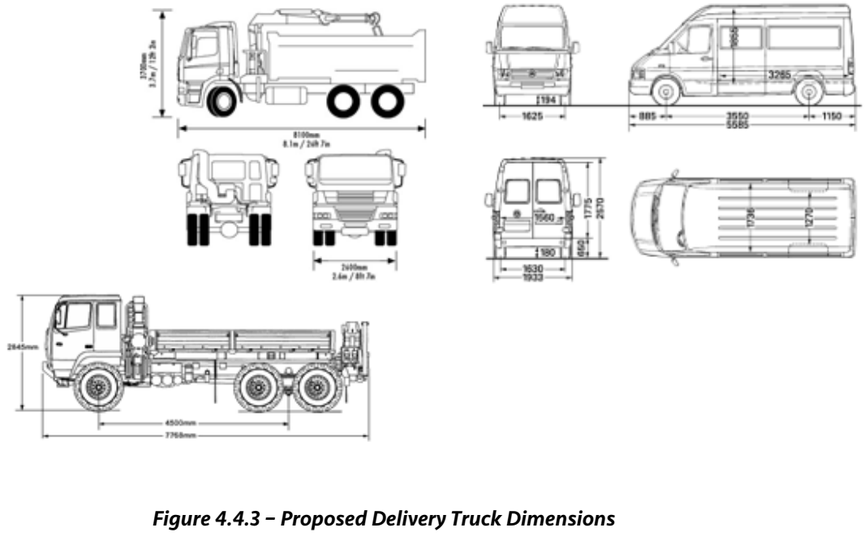


Figure 4.4.3 – Proposed Delivery Truck Dimensions

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 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 the site via the existing junction onto the Killumney Road serving the Heathfield estate.

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.

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:

- 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 5.11.

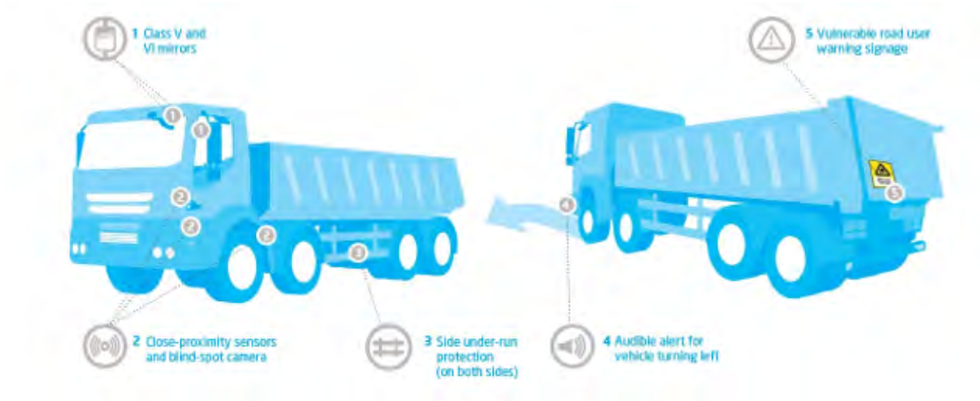


Figure 5.11 – Delivery Truck Safety Measures

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 carpooling.

Appendix A- Development Phasing Plans

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

PHASING DETAILS

PHASE 1
- Demolition of existing farm sheds
- Complete 118 No. Units
- Complete active travel route along north of the development
- Complete creche
- Complete portion of Sustainable Access Corridor

PHASE 2
- Complete 79 No. Units
- Complete Sustainable Access Corridor

PHASE 3
- Complete 103 No. Units

PHASE 1

PHASE 2

PHASE 3

PEDESTRIAN CONNECTION TO NORTHERN DEVELOPMENT

PROVISION FOR FUTURE EXTENSION TO ACTIVE TRAVEL ROUTE TO WEST

PROPOSED ACTIVE TRAVEL ROUTE

PERMITTED DEVELOPMENT UNDER CONSTRUCTION BY APPLICANT PLANNING REF: 22/41644

PERMITTED ACTIVE TRAVEL ROUTE

PROPOSED EXTENSION TO PERMITTED ACTIVE TRAVEL ROUTE

PROPOSED PEDESTRIAN CONNECTION NORTH

COMPLETED HEATHFIELD DEVELOPMENT CONSTRUCTED BY APPLICANT PLANNING REF: 19/38923

EXISTING ESB LINES TO BE UNDERGROUNDED/ DIVERTED

PROPOSED PEDESTRIAN CONNECTION NORTH

LOCATION OF SITE NOTICE

PROPOSED UNCONTROLLED RAISED CROSSING

EXISTING WAYLEAVE

SITE ENTRANCE

AGRICULTURAL LAND

PROPOSED EXTENSION TO SUSTAINABLE ACCESS CORRIDOR

PROVISION FOR FUTURE PEDESTRIAN CONNECTIVITY TO WEST

MAGLIN NORTH STREAM

PROPOSED TEMPORARY PUMPING STATION

AGRICULTURAL LAND

SITE ENTRANCE

PROPOSED UNCONTROLLED RAISED CROSSING

PROVISION FOR FUTURE EXTENSION TO SUSTAINABLE ACCESS CORRIDOR TO WEST

NORTH

date	rev	name	chk	note
11.12.25	P1	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
CARRIGANARRA, BALLINCOLLIG,
CO. CORK

Drawing title
PROPOSED OPEN PHASING PLAN

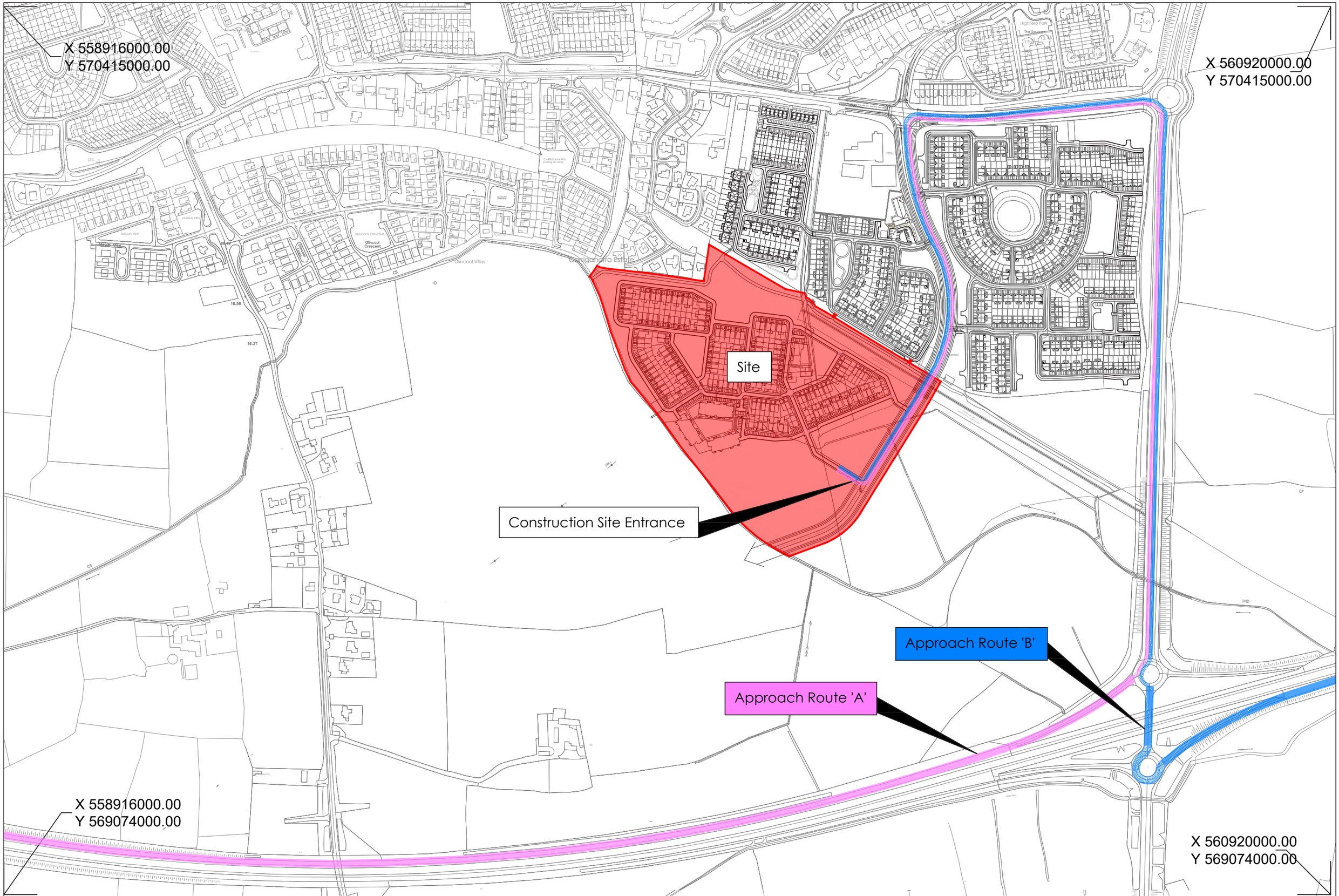
Scale	Drawn	Checked	Date
1:2000 @ A3	GN	EJG	23.05.2025

Project No.	Drg. No.	Revision
22148	22148/P/011	P1

☐ Information \ Comments — Tender ☐
■ Planning — Construction ☐

PROPOSED PHASING PLAN
SCALE 1:2000 @ A3

Appendix B – Construction Access



DOSA
DENIS O'SULLIVAN & ASSOCIATES
CONSULTING ENGINEERS

Joyce House
Barrack Square
Ballincollig
Cork
P31 KP84

021 4871781
info@dosa.ie
www.dosa.ie

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A	J.M.	S.O'G.	L.O'T.	18.12.'25	Issued For Information

CLIENT: Murnane & O'Shea Ltd.

PROJECT: Development at Carriganarra, Ballincollig, Cork.

DRAWING TITLE: Proposed Approach Route to Site

SHEET: A3

SCALE: 1:5000

PROJECT NO. 4208 _ DRAWING NO. 0202 _ STATUS/ISSUE A

APPENDIX 2-3 Proposed Site Layout – Deady Gahan Architects

Limeworth

Limeworth

Corrigamarra Estate

CRECHE

APPENDIX 2-4 Infrastructure Report – DOSA Consulting Engineers

DOSA
DENIS O'SULLIVAN & ASSOCIATES
CONSULTING ENGINEERS

RESIDENTIAL DEVELOPMENT, CARRIGANARRA, BALLINCOLLIG, CORK

INFRASTRUCTURE REPORT

DATE 10/04/2026

REVISION 8

JOB NO. 4208

Joyce House, Barrack Square, Ballincollig, Co. Cork
T 021 4871781 E info@dosa.ie W www.dosa.ie

DOCUMENT CONTROL

PROJECT NAME: Residential Development, Carriganarra, Ballincollig, Cork

PROJECT NUMBER: 4208

REVISION	DATE	FILE NAME: Residential Development, Carriganarra, Ballincollig, Cork			
8	10.04.2026	DESCRIPTION: Infrastructure Report			
			PREPARED	CHECKED	APPROVED
		INITIAL	SO'G	LO'T	SO'G
		DATE	10.04.2026	10.04.2026	10.04.2026
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		DATE			
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		DESCRIPTION:			
			PREPARED	CHECKED	APPROVED
		INITIAL			
		DATE			

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1 Introduction

Denis O'Sullivan & Associates (DOSA) were engaged as Consulting Engineers for the proposed development at Carriganarra, 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 approximately 8.0km southeast of Cork City Centre in Carriganarra on the southern side of Ballincollig to the south of the Link Road. The site is a greenfield site characterised by its undulating topography and its even slope rising at the southern end. The existing Limeworth and Heathfield estate which is currently being constructed runs along the site's northern edge and the site is surrounded on the other 3 sides by farmland and sheds which are in ruins. 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 to a low point on the south-eastern boundary which is approximately +15.87m AOD. The elevation height along the perimeter from the

north, west and southern side varies from +22.21m to +15.87m AOD. A full Topographical feature and level survey has been completed.

Figure 1.3 below shows a snip of the topographical survey.



Figure 1.3 – Site Topography

1.4 Proposed Development

A Large-Scale Residential Development (LRD) at Carriganarra, Ballincollig, Cork. The development will consist of the demolition of existing agricultural buildings and the construction of a residential development of 300 no. residential units consisting of 128 no. dwellings houses, 172 no. apartment/duplex units, a two storey creche facility and all ancillary site development works. The proposed 128 no. dwelling houses will include 42 no. bedroom detached/semi-detached dwelling houses and 84 no. 3 bedroom semi-detached/townhouse dwelling houses. The proposed development also provides for the restoration of an existing vernacular farm building on site which will accommodate 2 no. 2 bedroom semi-detached units. The proposed 172 no. apartment/duplex units will include 18 no. 3 bedroom units, 109 no. 2 bedroom units and 45 no. 1 bedroom units, to be provided in 20 no. apartment/duplex buildings ranging in height from 3-4 storeys over basement level.

Vehicular access to the proposed development will be provided via the existing junction from the Killumney road serving the Heathfield residential development and existing sections of the Maglin Sustainable Access Corridor to the north. The proposed development provides for the extension of Maglin Sustainable Access Corridor and the provision of 4 no. pedestrian/cycle connections to the Heathfield residential development to the north which is under construction. Ancillary site works include the raising of existing ground levels on site, the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex and creche buildings, the delivery of active travel infrastructure, landscaping and servicing proposals including a temporary pumping station, and the undergrounding/diversion of an existing 38KV overhead ESB line which traverses the site. The proposed development is highlighted in Figure 1.4 below.



Figure 1.4 – Proposed Development

2 *Surface Water Management*

2.1 Surface Water Design

The existing topography produces one catchment area. Groundwater flow direction is interpreted to be from the north to a low point on the south-eastern boundary. Discharge from the development site will be along the eastern boundary to the existing Maglin North watercourse with the spine road discharging directly to the ground using infiltration measures.

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 less than 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.

2.2 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.

2.3 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 Wastewater Disposal" and BS EN 752: 2008 Drain and Sewer Systems Outside Buildings.

- Return period for pipe work surcharge design 5 years
- Return period for attenuation design 100 years
- Soil Type 0.3
- Allowable Outflow 24.700 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 5-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.

2.3.1 Pre-Development Conditions

The catchment area of the proposed development site is 7.751 hectares (ha) with the spine road having an additional catchment of 1.033 hectares (ha). The runoff will be limited to that of a 1 in 1 year return period (Q1) which is less than the requirements outlined in Section 3.2.4 of the South Ballincollig Strategic Flood Risk Assessment – Drainage Study. 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

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 & Q 1 in 1 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.

2.3.2 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 (Q1) for the catchment area. The catchment areas and Q1 figures are outlined in Figure 2.3.2.1 below;

Catchment Area Reference	Catchment Area (Ha)	Catchment Area Q1
A	1.709 Ha	4.80 l/sec
B	0.682 Ha	1.90 l/sec
C	0.680 Ha	1.90 l/sec
D	2.807 Ha	7.90 l/sec
E	0.789 Ha	2.20 l/sec
F	0.344 Ha	1.00 l/sec
G	0.740 Ha	2.10 l/sec
H	1.033 Ha	2.90 l/sec

Fig 2.3.2.1 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. The location of each catchment areas are outlined in Figure 2.3.2.2 below;

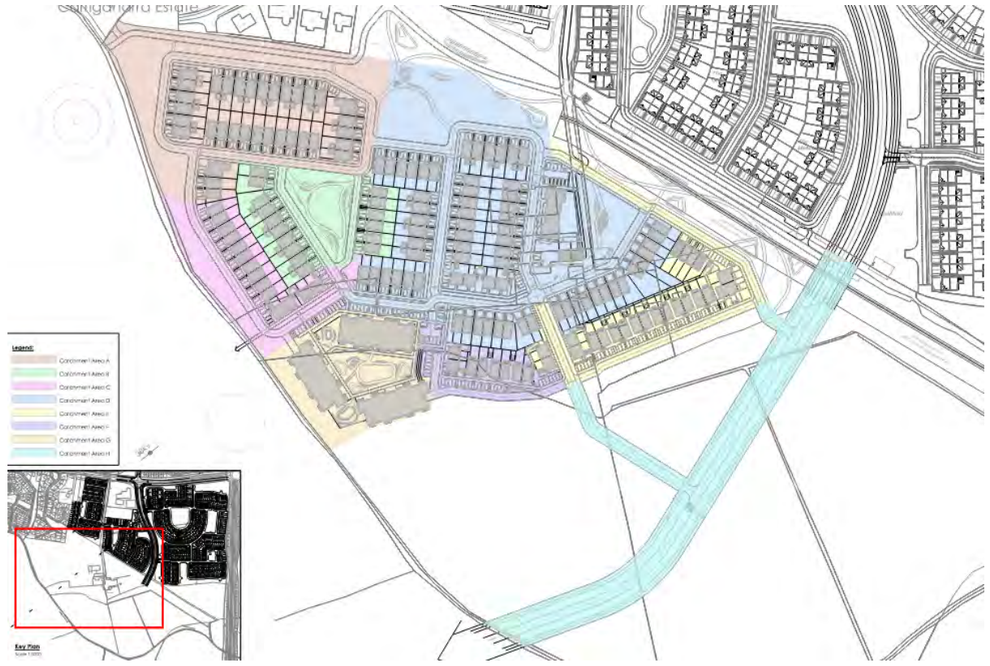


Fig 2.3.2.2 Proposed Development Catchment Areas

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 a Q 1in 1 figure of 24.700 l/second for the entire catchment area for the site of 8.784 hectares. The allowable runoff equates to 2.812 l/second/hectare.

2.4 Attenuation Tanks

2.4.1 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 Table 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.4.5 & 2.4.6 below;

Runoff Calculations	Catchment Area A		
	Area (Ha)	Runoff Factor	Net Area (Ha)
Roofs (includes private footpath)	0.335	0.800	0.268
Grass (Public Area)	0.445	0.200	0.089
Roads & Footpaths	0.531	1.000	0.531
Rain Garden	0.000	0.000	0.000
Blue/Green Roofs	0.000	0.000	0.000
Net Runoff			**0.888**

Table 2.4.1 Catchment Area A Runoff Summary

Runoff Calculations	Catchment Area B		
	Area (Ha)	Runoff Factor	Net Area (Ha)
Roofs (includes private footpath)	0.134	0.800	0.107
Grass (Public Area)	0.180	0.200	0.036
Roads & Footpaths	0.213	1.000	0.213
Rain Garden	0.000	0.000	0.000
Blue/Green Roofs	0.000	0.000	0.000
Net Runoff			**0.356**

Table 2.4.2 Catchment Area B Runoff Summary

Runoff Calculations	Catchment Area C		
	Area (Ha)	Runoff Factor	Net Area (Ha)
Roofs (includes private footpath)	0.154	0.800	0.123
Grass (Public Area)	0.225	0.200	0.045
Roads & Footpaths	0.241	1.000	0.241
Rain Garden	0.000	0.000	0.000
Blue/Green Roofs	0.000	0.000	0.000
Net Runoff			**0.409**

Table 2.4.3 Catchment Area C Runoff Summary

Runoff Calculations	Catchment Area D		
	Area (Ha)	Runoff Factor	Net Area (Ha)
Roofs (includes private footpath)	0.679	0.800	0.543
Grass (Public Area)	1.115	0.200	0.223
Roads & Footpaths	0.859	1.000	0.859
Rain Garden	0.000	0.000	0.000
Blue/Green Roofs	0.000	0.000	0.000
Net Runoff			**1.625**

Table 2.4.3 Catchment Area D Runoff Summary

Runoff Calculations	Catchment Area E		
	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	0.355	1.000	0.355
Rain Garden	0.000	0.000	0.000
Blue/Green Roofs	0.000	0.000	0.000
Net Runoff			**0.607**

Table 2.4.3 Catchment Area E Runoff Summary

Runoff Calculations	Catchment Area F		
	Area (Ha)	Runoff Factor	Net Area (Ha)
Roofs (includes private footpath)	0.098	0.800	0.078
Grass (Public Area)	0.120	0.200	0.024
Roads & Footpaths	0.134	1.000	0.134
Rain Garden	0.000	0.000	0.000
Blue/Green Roofs	0.000	0.000	0.000
Net Runoff			**0.236**

Table 2.4.3 Catchment Area F Runoff Summary

These overall capacities of the attenuation tanks to cater for the different catchment areas are summarised in Table 2.4.4 below:

Tank No.	Capacity (m^3)	Restricted Outlet (l/sec)
1	555.00	4.80 l/sec
2	228.00	1.90 l/sec
3	232.00	1.90 l/sec
4	776.00	7.90 l/sec
5	364.00	2.20 l/sec
6	88.00	1.00 l/sec

Table 2.4.4 Attenuation Tank Sizes

2.5 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	CNSB20s	8,800.0	11,111.0
Tank No. 2	CNSB10s	3,560.0	5,560.0
Tank No. 3	CNSB10s	4,090.0	5,560.0
Tank No. 4	CNSB40s	16,250.0	22,222.0
Tank No. 5	CNSB15s	6,070.0	8,335.0
Tank No. 6	CNSB4s	2,360.0	2,500.0

Table 2.5 Hydrocarbon Specifications

2.6 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.

2.7 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.

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 CDS25007329. The response to this Enquiry was issued by Uisce Eireann on 21st October 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:

  Please be advised that as part of any future connection application, it will be necessary to engage with Uisce Éireann to ensure that the gravity infrastructure to be provided within this Development is suitably sized and located to facilitate the decommissioning of the existing Heathfield / The Square WWPS. All flows (existing and proposed) through this Development shall discharge to the existing Maglin WWPS.

  Alternatively, if the Developer is to propose a connection via any adjacent third-party development lands, this will require agreement between the respective parties to ensure any potential infrastructure is designed accordingly.

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.

3.1.1 Development Breakdown

<u>300 No. Dwellings</u>

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 = (300) (446) / (24) (60) (60) = 1.548 litres/second

6DWF = 9.288 litres/second

<u>Crèche</u>

24 No Staff & 128 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 =0.630 litres/second

The overall quantity of wastewater for the proposed development is estimated at **142.9 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.

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. CDS25007329. 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 without infrastructure upgrade by Uisce Éireann

In order to provide the necessary capacity to facilitate the proposed Development, a connection to the watermain network is required approximately 260m north of the Development on Carriganarra Road. As this connection would traverse private lands, it will be the Applicants responsibility to obtain the relevant required wayleaves and permissions on any 3rd party lands for this connection between the private Development boundary and the connection point to public water infrastructure.

Please note that based on Uisce Éireann's GIS records there is an existing watermain located within the Development boundary. The layout of the development must ensure that this pipe is protected and adequate separation distances are provided between Uisce Éireann infrastructure and any structures on site. If the proposed development requires the diversion of existing infrastructure, the customer will be required to enter into a diversion agreement and grant a deed of easement over the infrastructure to Uisce Éireann's diversions department (diversions@water.ie). To facilitate your requirements and avoid delays the customer is advised to engage with Uisce Éireann as early as possible.

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 307 no. units, this should be taken as **121,500 litres.**

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 **130,620 litres or 130.62m³**

The average day/peak week demand should be taken as 1.25 times the average daily demand so this should be increased to **163.28m³**

5 Summary of Results

The storm water network was built and analysed using the Microdrainage Software application and were assessed for a 1 in 5 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 5-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 have been designed as per Irish Water Design Codes.

Appendix A -Uisce Eireann Confirmation of Feasibility (COF)

CONFIRMATION OF FEASIBILITY

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

Stephen O'Grady

Joyce House
Barrack Square
Ballincollig
Cork
P31 KP84

21 October 2025

Our Ref: CDS25007329 Pre-Connection Enquiry
Carrignarra, Ballincollig, Co. 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 307 unit(s) at Carrignarra, Ballincollig, Co. Cork **(the Development)**.

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

- **Water Connection** - Feasible without infrastructure upgrade by Uisce Éireann

  In order to provide the necessary capacity to facilitate the proposed Development, a connection to the watermain network is required approximately 260m north of the Development on Carriganarra Road. As this connection would traverse private lands, it will be the Applicants responsibility to obtain the relevant required wayleaves and permissions on any 3rd party lands for this connection between the private Development boundary and the connection point to public water infrastructure.

  Please note that based on Uisce Éireann's GIS records there is an existing watermain located within the Development boundary. The layout of the development must ensure that this pipe is protected and adequate separation distances are provided between Uisce Éireann infrastructure and any structures on site. If the proposed development requires the diversion of existing infrastructure, the customer will be required to enter into a diversion agreement and grant a deed of easement over the infrastructure to Uisce Éireann's diversions department (diversions@water.ie). To facilitate your

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
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Uisce Éireann is a designated activity company, limited by shares.
Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363.

UE / LH / OP448 / 0323

requirements and avoid delays the customer is advised to engage with Uisce Éireann as early as possible.

- **Wastewater Connection** - Feasible without infrastructure upgrade by Uisce Éireann:

  Please be advised that as part of any future connection application, it will be necessary to engage with Uisce Éireann to ensure that the gravity infrastructure to be provided within this Development is suitably sized and located to facilitate the decommissioning of the existing Heathfield / The Square WWPS. All flows (existing and proposed) through this Development shall discharge to the existing Maglin WWPS.

  Alternatively, if the Developer is to propose a connection via any adjacent third-party development lands, this will require agreement between the respective parties to ensure any potential infrastructure is designed accordingly.

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?
- **Section B -** Details of Uisce Éireann's Network(s)

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

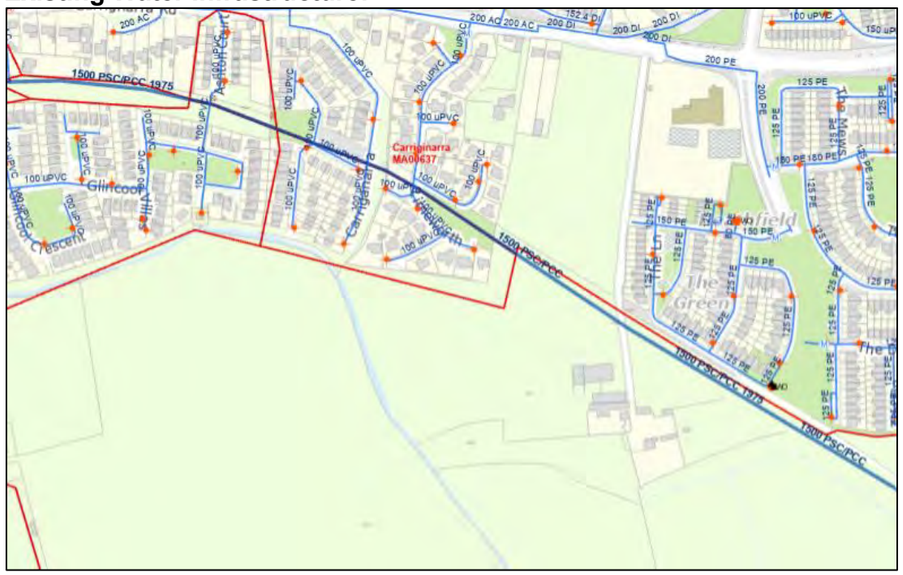
Section A - What is important to know?

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)

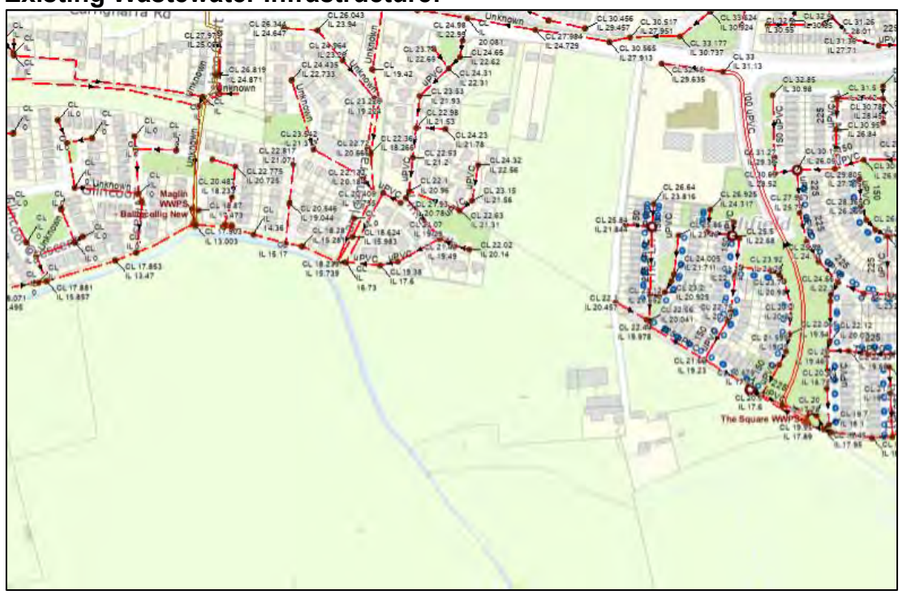
Section B – Details of Uisce Éireann's Network(s)

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

Existing Water Infrastructure:



Existing Wastewater Infrastructure:



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

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

Appendix B – Uisce Eireann Statement of Design Acceptance (SODA)

Uisce Éireann
Irish Water

Stephen O'Grady
DOSA Engineers, Joyce House
Barrack Square, Ballincollig
P31KP84
Cork
Ireland

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

29 January 2026

Re: Design Submission for Site At, Carrignarra, Ballincollig, Cork (the "Development") (the "Design Submission") / Connection Reference No: CDS25007329

Dear Stephen O'Grady,

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: James O'Sullivan
Phone:
Email: jameosull@water.ie

Yours sincerely,

Dermot Phelan
Connections and Developer Services

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 A

Document Title & Revision

- 4208 – 0220 – A Proposed Stormwater & Foul Network Layout (Sheet 1/2)
- 4208 – 0221 – A Proposed Stormwater & Foul Network Layout (Sheet 2/2)
- 4208 – 0230 – A Proposed Watermain Layout (Sheet 1/ 2)
- 4208 – 0231 – A Proposed Watermain Layout (Sheet 2/ 2)
- 4208 – 0260 – A Foul Sewer Long Sections 1/ 4)
- 4208 – 0261 – A Foul Sewer Long Sections 2/ 4)
- 4208 – 0262 – A Foul Sewer Long Sections 3/ 4)
- 4208 – 0263 – A Foul Sewer Long Sections 4/ 4)

Additional Information:

- A 1500 watermain cross the site. Detailed designs to be agreed via Diversion Agreement at connection application stage.
- Detailed design for the pumping station to be submitted at Connection Application stage.

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.

Appendix C – Allowable Runoff Q1 Values

Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Catchment Area A Carriganarra LRD Carriganarra, Ballincollig	
Date 03/12/2025 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)	1.709	Urban	0.000
SAAR (mm)	1167	Region Number	Ireland South

Results	l/s
QBAR Rural	5.7
QBAR Urban	5.7
Q100 years	10.4
Q1 year	4.8
Q30 years	9.0
Q100 years	10.4

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Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Catchment Area B Carriganarra LRD Carriganarra, Ballincollig	
Date 03/12/2025 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)	0.680	Urban	0.000
SAAR (mm)	1167	Region Number	Ireland South

Results	l/s
QBAR Rural	2.3
QBAR Urban	2.3
Q100 years	4.1
Q1 year	1.9
Q30 years	3.6
Q100 years	4.1

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Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Catchment Area C Carriganarra LRD Carriganarra, Ballincollig	
Date 03/12/2025	Designed By S.O.'Grady	
File	Checked By	
Micro Drainage	Source Control W.12.4	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	0.682	Urban	0.000
SAAR (mm)	1167	Region Number	Ireland South

Results	l/s
QBAR Rural	2.3
QBAR Urban	2.3
Q100 years	4.2
Q1 year	1.9
Q30 years	3.6
Q100 years	4.2

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Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Catchment Area D Carriganarra LRD Carriganarra, Ballincollig	
Date 03/12/2025	Designed By S.O.'Grady	
File	Checked By	
Micro Drainage	Source Control W.12.4	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	2.807	Urban	0.000
SAAR (mm)	1167	Region Number	Ireland South

Results	l/s
QBAR Rural	9.3
QBAR Urban	9.3
Q100 years	17.1
Q1 year	7.9
Q30 years	14.8
Q100 years	17.1

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Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Catchment Area E Carriganarra LRD Carriganarra, Ballincollig	
Date 03/12/2025 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)	1167	Region Number	Ireland South

Results	l/s
QBAR Rural	2.6
QBAR Urban	2.6
Q100 years	4.8
Q1 year	2.2
Q30 years	4.2
Q100 years	4.8

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Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Catchment Area F Carriganarra LRD Carriganarra, Ballincollig	
Date 03/12/2025 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)	0.344	Urban	0.000
SAAR (mm)	1167	Region Number	Ireland South

Results	l/s
QBAR Rural	1.1
QBAR Urban	1.1
Q100 years	2.1
Q1 year	1.0
Q30 years	1.8
Q100 years	2.1

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Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Catchment Area G Carriganarra LRD Carriganarra, Ballincollig	
Date 03/12/2025 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)	0.740	Urban	0.000
SAAR (mm)	1167	Region Number	Ireland South

Results	l/s
QBAR Rural	2.5
QBAR Urban	2.5
Q100 years	4.5
Q1 year	2.1
Q30 years	3.9
Q100 years	4.5

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Appendix D – 1 in 5 Year Design Sheets

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)	Time (mins)	Area (ha)
0-4	0.126	4-8	1.325	8-12	1.538	12-16	1.101	16-20	0.030

Total Area Contributing (ha) = 4.121

Total Pipe Volume (m³) = 130.205

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	47.425	0.775	61.2	0.150	5.00	0.0	0.600	o	225
S1.001	61.055	1.000	61.1	0.118	0.00	0.0	0.600	o	225
S1.002	3.415	0.030	113.8	0.000	0.00	0.0	0.600	o	225
S1.003	2.815	0.030	93.8	0.000	0.00	0.0	0.600	o	225
S1.004	47.535	0.340	139.8	0.144	0.00	0.0	0.600	o	300
S1.005	6.370	0.050	127.4	0.006	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)
S1.000	50.00	5.47	20.225	0.150	0.0	0.0	4.1	1.67	66.6	24.4
S1.001	50.00	6.08	19.450	0.268	0.0	0.0	7.3	1.68	66.7	43.5
S1.002	50.00	6.13	18.450	0.268	0.0	0.0	7.3	1.22	48.7	43.5
S1.003	50.00	6.16	18.420	0.268	0.0	0.0	7.3	1.35	53.7	43.5
S1.004	50.00	6.76	18.390	0.412	0.0	0.0	11.2	1.33	93.9	66.9
S1.005	50.00	6.83	18.050	0.418	0.0	0.0	11.3	1.39	98.4	67.9

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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)
S1.006	6.370	0.050	127.4	0.006	0.00	0.0	0.600	o	300
S1.007	6.370	0.050	127.4	0.006	0.00	0.0	0.600	o	300
S1.008	14.165	0.071	200.0	0.015	0.00	0.0	0.600	o	300
S2.000	42.235	0.750	56.3	0.137	5.00	0.0	0.600	o	225
S2.001	4.055	0.050	81.1	0.004	0.00	0.0	0.600	o	225
S2.002	4.015	0.050	80.3	0.004	0.00	0.0	0.600	o	225
S2.003	63.890	0.575	111.1	0.120	0.00	0.0	0.600	o	225
S2.004	49.725	1.146	43.4	0.108	0.00	0.0	0.600	o	225
S1.009	23.470	0.117	200.0	0.070	0.00	0.0	0.600	o	450
S1.010	4.950	0.025	200.0	0.000	0.00	0.0	0.600	o	450
S1.011	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	450
S1.012	7.030	0.035	200.0	0.000	0.00	0.0	0.600	o	225
S1.013	7.590	0.038	200.0	0.000	0.00	0.0	0.600	o	225
S1.014	7.515	0.038	200.0	0.005	0.00	0.0	0.600	o	225
S1.015	7.485	0.037	200.0	0.034	0.00	0.0	0.600	o	225
S1.016	88.580	0.497	178.2	0.180	0.00	0.0	0.600	o	300
S1.017	8.910	0.100	89.1	0.005	0.00	0.0	0.600	o	300
S1.018	14.120	0.164	86.3	0.035	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)
S1.006	50.00	6.91	18.000	0.424	0.0	0.0	11.5	1.39	98.4	68.9
S1.007	50.00	6.99	17.950	0.430	0.0	0.0	11.6	1.39	98.4	69.9
S1.008	50.00	7.20	17.900	0.445	0.0	0.0	12.1	1.11	78.3	72.3
S2.000	50.00	5.40	20.400	0.137	0.0	0.0	3.7	1.75	69.4	22.3
S2.001	50.00	5.45	19.650	0.141	0.0	0.0	3.8	1.45	57.8	22.9
S2.002	50.00	5.50	19.600	0.145	0.0	0.0	3.9	1.46	58.1	23.6
S2.003	50.00	6.35	19.550	0.265	0.0	0.0	7.2	1.24	49.3	43.1
S2.004	50.00	6.77	18.975	0.373	0.0	0.0	10.1	1.99	79.2	60.6
S1.009	50.00	7.47	17.829	0.888	0.0	0.0	24.0	1.43	228.1	144.3
S1.010	50.00	7.53	17.712	0.888	0.0	0.0	24.0	1.43	228.1	144.3
S1.011	50.00	7.54	17.200	0.888	0.0	0.0	24.0	1.43	228.1	144.3
S1.012	50.00	5.13	17.195	0.000	4.8	0.0	0.8	0.92	36.6	4.8
S1.013	50.00	5.26	17.160	0.000	4.8	0.0	1.0	0.92	36.6	5.8
S1.014	50.00	5.40	17.122	0.005	4.8	0.0	1.1	0.92	36.6	6.6
S1.015	50.00	5.54	17.084	0.039	4.8	0.0	2.0	0.92	36.6	12.1
S1.016	50.00	6.79	17.047	0.219	4.8	0.0	6.9	1.17	83.0	41.3
S1.017	50.00	6.88	16.550	0.224	4.8	0.0	7.0	1.67	117.8	42.2
S1.018	50.00	7.02	16.450	0.259	4.8	0.0	8.0	1.69	119.7	47.8

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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)
S3.000	10.365	0.070	148.1	0.042	5.00	0.0	0.600	o	225
S3.001	3.565	0.030	118.8	0.000	0.00	0.0	0.600	o	225
S3.002	54.515	0.833	65.4	0.190	0.00	0.0	0.600	o	225
S4.000	5.500	0.033	166.7	0.005	5.00	0.0	0.600	o	225
S3.003	6.415	0.032	200.0	0.000	0.00	0.0	0.600	o	300
S5.000	39.580	0.750	52.8	0.119	5.00	0.0	0.600	o	225
S5.001	6.270	0.250	25.1	0.000	0.00	0.0	0.600	o	225
S5.002	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	225
S3.004	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	300
S3.005	10.450	0.052	200.0	0.000	0.00	0.0	0.600	o	225
S3.006	9.470	0.047	200.0	0.000	0.00	0.0	0.600	o	225
S3.007	15.560	0.078	200.0	0.020	0.00	0.0	0.600	o	225
S3.008	42.142	1.032	40.8	0.130	0.00	0.0	0.600	o	225
S1.019	6.220	0.031	200.0	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)
S3.000	50.00	5.16	19.150	0.042	0.0	0.0	1.1	1.07	42.6	6.8
S3.001	50.00	5.21	19.080	0.042	0.0	0.0	1.1	1.20	47.6	6.8
S3.002	50.00	5.77	19.050	0.232	0.0	0.0	6.3	1.62	64.4	37.7
S4.000	50.00	5.09	18.250	0.005	0.0	0.0	0.1	1.01	40.2	0.8
S3.003	50.00	5.87	18.217	0.237	0.0	0.0	6.4	1.11	78.3	38.5
S5.000	50.00	5.37	19.450	0.119	0.0	0.0	3.2	1.80	71.7	19.3
S5.001	50.00	5.41	18.700	0.119	0.0	0.0	3.2	2.62	104.3	19.3
S5.002	50.00	5.42	17.505	0.119	0.0	0.0	3.2	0.92	36.6	19.3
S3.004	50.00	5.88	17.500	0.356	0.0	0.0	9.6	1.11	78.3	57.8
S3.005	50.00	5.19	17.495	0.000	1.9	0.0	0.3	0.92	36.6	1.9
S3.006	50.00	5.36	17.443	0.000	1.9	0.0	0.4	0.92	36.6	2.3
S3.007	50.00	5.64	17.395	0.020	1.9	0.0	0.9	0.92	36.6	5.5
S3.008	50.00	5.98	17.318	0.150	1.9	0.0	4.4	2.05	81.6	26.7
S1.019	50.00	7.11	16.286	0.409	6.7	0.0	12.4	1.11	78.3	74.5

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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)
S1.020	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	300
S1.021	14.915	0.050	300.0	0.000	0.00	0.0	0.600	o	300
S1.022	67.640	0.225	300.0	0.000	0.00	0.0	0.600	o	300
S1.023	13.960	0.047	300.0	0.000	0.00	0.0	0.600	o	300
S6.000	54.290	0.350	155.1	0.137	5.00	0.0	0.600	o	225
S6.001	102.855	1.577	65.2	0.320	0.00	0.0	0.600	o	300
S7.000	55.965	0.280	200.0	0.232	5.00	0.0	0.600	o	300
S7.001	6.995	0.035	200.0	0.000	0.00	0.0	0.600	o	300
S6.002	51.945	0.260	200.0	0.196	0.00	0.0	0.600	o	450
S6.003	5.380	0.027	200.0	0.000	0.00	0.0	0.600	o	450
S6.004	16.785	0.084	200.0	0.046	0.00	0.0	0.600	o	450
S6.005	9.955	0.050	200.0	0.000	0.00	0.0	0.600	o	450
S8.000	45.080	0.300	150.3	0.152	5.00	0.0	0.600	o	225
S8.001	6.182	0.050	123.6	0.005	0.00	0.0	0.600	o	225
S8.002	7.560	0.050	151.2	0.005	0.00	0.0	0.600	o	225
S8.003	82.815	1.600	51.8	0.286	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)
S1.020	50.00	7.13	15.500	0.409	6.7	0.0	12.4	1.11	78.3	74.5
S1.021	50.00	5.28	15.495	0.000	8.6	0.0	1.4	0.90	63.8	8.6
S1.022	50.00	6.52	15.445	0.000	8.6	0.0	1.7	0.90	63.8	10.3
S1.023	50.00	6.78	15.220	0.000	8.6	0.0	1.7	0.90	63.8	10.3
S6.000	50.00	5.86	19.900	0.137	0.0	0.0	3.7	1.05	41.6	22.3
S6.001	50.00	6.74	19.550	0.457	0.0	0.0	12.4	1.95	137.8	74.3
S7.000	50.00	5.84	18.200	0.232	0.0	0.0	6.3	1.11	78.3	37.7
S7.001	50.00	5.95	17.920	0.232	0.0	0.0	6.3	1.11	78.3	37.7
S6.002	50.00	7.35	17.885	0.885	0.0	0.0	24.0	1.43	228.1	143.8
S6.003	50.00	7.41	17.625	0.885	0.0	0.0	24.0	1.43	228.1	143.8
S6.004	50.00	7.60	17.599	0.931	0.0	0.0	25.2	1.43	228.1	151.3
S6.005	50.00	7.72	17.515	0.931	0.0	0.0	25.2	1.43	228.1	151.3
S8.000	50.00	5.71	19.750	0.152	0.0	0.0	4.1	1.06	42.3	24.7
S8.001	50.00	5.79	19.450	0.157	0.0	0.0	4.3	1.17	46.7	25.5
S8.002	50.00	5.91	19.400	0.162	0.0	0.0	4.4	1.06	42.2	26.3
S8.003	50.00	6.54	19.350	0.448	0.0	0.0	12.1	2.19	154.8	72.8

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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)
S8.004	11.735	0.200	58.7	0.000	0.00	0.0	0.600	o	300
S6.006	4.355	0.022	200.0	0.000	0.00	0.0	0.600	o	450
S9.000	41.870	0.750	55.8	0.106	5.00	0.0	0.600	o	225
S9.001	3.265	0.025	130.6	0.000	0.00	0.0	0.600	o	225
S9.002	46.055	0.375	122.8	0.140	0.00	0.0	0.600	o	225
S9.003	4.425	0.022	200.0	0.000	0.00	0.0	0.600	o	300
S9.004	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	300
S6.007	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	525
S6.008	10.730	0.054	200.0	0.000	0.00	0.0	0.600	o	225
S6.009	59.065	0.197	299.8	0.097	0.00	0.0	0.600	o	300
S6.010	19.120	0.064	300.0	0.013	0.00	0.0	0.600	o	300
S6.011	7.460	0.025	300.0	0.000	0.00	0.0	0.600	o	300
S6.012	90.270	0.301	300.0	0.231	0.00	0.0	0.600	o	375
S10.000	75.345	0.500	150.7	0.075	5.00	0.0	0.600	o	225
S10.001	70.615	1.500	47.1	0.100	0.00	0.0	0.600	o	225
S10.002	2.900	0.025	116.0	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)
S8.004	50.00	6.64	17.750	0.448	0.0	0.0	12.1	2.06	145.4	72.8
S6.006	50.00	7.77	17.465	1.379	0.0	0.0	37.3	1.43	228.1	224.1
S9.000	50.00	5.40	18.650	0.106	0.0	0.0	2.9	1.75	69.7	17.2
S9.001	50.00	5.45	17.900	0.106	0.0	0.0	2.9	1.14	45.4	17.2
S9.002	50.00	6.10	17.875	0.246	0.0	0.0	6.7	1.18	46.9	40.0
S9.003	50.00	6.16	17.500	0.246	0.0	0.0	6.7	1.11	78.3	40.0
S9.004	50.00	6.18	17.478	0.246	0.0	0.0	6.7	1.11	78.3	40.0
S6.007	50.00	7.78	16.700	1.625	0.0	0.0	44.0	1.58	342.1	264.1
S6.008	50.00	5.19	16.695	0.000	7.9	0.0	1.3	0.92	36.6	7.9
S6.009	50.00	6.28	16.641	0.097	7.9	0.0	4.2	0.90	63.8	25.2
S6.010	50.00	6.64	16.444	0.110	7.9	0.0	4.6	0.90	63.8	27.4
S6.011	50.00	6.78	16.381	0.110	7.9	0.0	4.6	0.90	63.8	27.4
S6.012	50.00	8.22	16.356	0.341	7.9	0.0	10.8	1.04	115.0	64.9
S10.000	50.00	6.18	19.200	0.075	0.0	0.0	2.0	1.06	42.3	12.2
S10.001	50.00	6.80	18.700	0.175	0.0	0.0	4.7	1.91	76.0	28.4
S10.002	50.00	6.84	17.200	0.175	0.0	0.0	4.7	1.21	48.2	28.4

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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)
S10.003	27.345	0.475	57.6	0.059	0.00	0.0	0.600	o	225
S10.004	26.645	0.250	106.6	0.032	0.00	0.0	0.600	o	225
S6.013	5.445	0.018	300.0	0.000	0.00	0.0	0.600	o	375
S6.014	7.250	0.024	300.0	0.000	0.00	0.0	0.600	o	375
S6.015	1.000	0.003	300.0	0.000	0.00	0.0	0.600	o	375
S6.016	48.350	0.161	300.3	0.000	0.00	0.0	0.600	o	225
S6.017	10.970	0.037	300.0	0.000	0.00	0.0	0.600	o	225
S6.018	30.040	0.100	300.0	0.000	0.00	0.0	0.600	o	225
S6.019	18.235	0.061	300.0	0.000	0.00	0.0	0.600	o	225
S6.020	27.655	0.092	300.0	0.089	0.00	0.0	0.600	o	225
S6.021	37.250	0.124	300.0	0.090	0.00	0.0	0.600	o	300
S6.022	4.575	0.015	300.0	0.000	0.00	0.0	0.600	o	300
S11.000	17.392	0.500	34.8	0.057	5.00	0.0	0.600	o	225
S11.001	8.310	0.050	166.2	0.000	0.00	0.0	0.600	o	225
S11.002	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	225
S6.023	1.000	0.003	300.0	0.000	0.00	0.0	0.600	o	300
S6.024	4.495	0.015	299.7	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)
S10.003	50.00	7.10	17.175	0.234	0.0	0.0	6.3	1.73	68.7	38.0
S10.004	50.00	7.45	16.700	0.266	0.0	0.0	7.2	1.27	50.3	43.2
S6.013	50.00	8.31	16.055	0.607	7.9	0.0	18.0	1.04	115.0	108.1
S6.014	50.00	8.42	16.037	0.607	7.9	0.0	18.0	1.04	115.0	108.1
S6.015	50.00	8.44	16.013	0.607	7.9	0.0	18.0	1.04	115.0	108.1
S6.016	50.00	6.08	16.009	0.000	10.1	0.0	1.7	0.75	29.8	10.1
S6.017	50.00	6.32	15.848	0.000	10.1	0.0	2.0	0.75	29.8	12.1
S6.018	50.00	6.99	15.812	0.000	10.1	0.0	2.0	0.75	29.8	12.1
S6.019	50.00	7.39	15.712	0.000	10.1	0.0	2.0	0.75	29.8	12.1
S6.020	50.00	8.01	15.651	0.089	10.1	0.0	4.4	0.75	29.8	26.6
S6.021	50.00	8.70	15.559	0.179	10.1	0.0	6.9	0.90	63.8	41.2
S6.022	50.00	8.78	15.434	0.179	10.1	0.0	6.9	0.90	63.8	41.2
S11.000	50.00	5.13	16.000	0.057	0.0	0.0	1.5	2.23	88.5	9.3
S11.001	50.00	5.27	15.500	0.057	0.0	0.0	1.5	1.01	40.2	9.3
S11.002	50.00	5.29	15.450	0.057	0.0	0.0	1.5	0.92	36.6	9.3
S6.023	50.00	8.80	15.419	0.236	10.1	0.0	8.4	0.90	63.8	50.5
S6.024	50.00	5.08	15.416	0.000	11.1	0.0	1.9	0.90	63.8	11.1

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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)
S6.025	51.835	0.173	300.0	0.000	0.00	0.0	0.600	o	300
S6.026	14.050	0.047	300.0	0.000	0.00	0.0	0.600	o	300
S1.024	27.635	0.092	300.0	0.000	0.00	0.0	0.600	o	300
S1.025	4.375	0.015	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)
S6.025	50.00	6.04	15.401	0.000	11.1	0.0	2.2	0.90	63.8	13.3
S6.026	50.00	6.30	15.228	0.000	11.1	0.0	2.2	0.90	63.8	13.3
S1.024	50.00	7.29	15.173	0.000	19.7	0.0	3.9	0.90	63.8	23.6
S1.025	50.00	7.37	15.081	0.000	19.7	0.0	3.9	0.90	63.8	23.6

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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)
SS5.025	22.025	1.800	1200	S1.000	20.225	225				
SS5.024	21.250	1.800	1200	S1.001	19.450	225	S1.000	19.450	225	
SS5.023	20.250	1.800	1200	S1.002	18.450	225	S1.001	18.450	225	
SS5.022	20.220	1.800	1200	S1.003	18.420	225	S1.002	18.420	225	
SS5.021	20.190	1.800	1200	S1.004	18.390	300	S1.003	18.390	225	
SS5.020	19.850	1.800	1200	S1.005	18.050	300	S1.004	18.050	300	
SS5.019	19.800	1.800	1200	S1.006	18.000	300	S1.005	18.000	300	
SS5.018	19.750	1.800	1200	S1.007	17.950	300	S1.006	17.950	300	
SS5.017	19.900	2.000	1200	S1.008	17.900	300	S1.007	17.900	300	
SS5.030	22.200	1.800	1200	S2.000	20.400	225				
SS5.029	21.450	1.800	1200	S2.001	19.650	225	S2.000	19.650	225	
SS5.028	21.400	1.800	1200	S2.002	19.600	225	S2.001	19.600	225	
SS5.027	21.350	1.800	1200	S2.003	19.550	225	S2.002	19.550	225	
SS5.026	20.775	1.800	1200	S2.004	18.975	225	S2.003	18.975	225	
SS5.016	20.040	2.211	1350	S1.009	17.829	450	S1.008	17.829	300	
							S2.004	17.829	225	
SS5.015	19.900	2.188	1350	S1.010	17.712	450	S1.009	17.712	450	
SS5.014	19.900	2.700	1350	S1.011	17.200	450	S1.010	17.687	450	487
SS5.013	19.900	2.705	1350	S1.012	17.195	225	S1.011	17.195	450	
SS5.012	19.850	2.690	1200	S1.013	17.160	225	S1.012	17.160	225	
SS5.011	19.800	2.678	1200	S1.014	17.122	225	S1.013	17.122	225	
SS5.010	19.750	2.666	1200	S1.015	17.084	225	S1.014	17.084	225	
SS5.009	19.700	2.653	1200	S1.016	17.047	300	S1.015	17.047	225	
SS5.008	18.350	1.800	1200	S1.017	16.550	300	S1.016	16.550	300	
SS5.007	18.250	1.800	1200	S1.018	16.450	300	S1.017	16.450	300	
SS5.039	20.950	1.800	1200	S3.000	19.150	225				
SS5.038	20.880	1.800	1200	S3.001	19.080	225	S3.000	19.080	225	
SS5.037	20.850	1.800	1200	S3.002	19.050	225	S3.001	19.050	225	
SS5.040	20.050	1.800	1200	S4.000	18.250	225				
SS5.036	20.100	1.883	1200	S3.003	18.217	300	S3.002	18.217	225	
							S4.000	18.217	225	
SS5.043	21.250	1.800	1200	S5.000	19.450	225				
SS5.042	20.500	1.800	1200	S5.001	18.700	225	S5.000	18.700	225	
SS5.041	20.250	2.745	1200	S5.002	17.505	225	S5.001	18.450	225	945
SS5.035	20.250	2.750	1200	S3.004	17.500	300	S3.003	18.185	300	685
							S5.002	17.500	225	
SS5.034	20.250	2.755	1200	S3.005	17.495	225	S3.004	17.495	300	
SS5.033	20.200	2.757	1200	S3.006	17.443	225	S3.005	17.443	225	
SS5.032	20.000	2.605	1200	S3.007	17.395	225	S3.006	17.395	225	
SS5.031	20.000	2.682	1200	S3.008	17.318	225	S3.007	17.318	225	
SS5.007	18.500	2.214	1200	S1.019	16.286	300	S1.018	16.286	300	1
							S3.008	16.286	225	
SS5.006	18.250	2.750	1200	S1.020	15.500	300	S1.019	16.255	300	755
SS5.005	18.250	2.755	1200	S1.021	15.495	300	S1.020	15.495	300	
SS5.004	17.500	2.055	1200	S1.022	15.445	300	S1.021	15.445	300	
SS5.003	17.250	2.030	1200	S1.023	15.220	300	S1.022	15.220	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)
SS5.073	21.700	1.800	1200	S6.000	19.900	225				
SS5.072	21.350	1.800	1200	S6.001	19.550	300	S6.000	19.550	225	
SS5.071	20.000	1.800	1200	S7.000	18.200	300				
SS5.070	19.825	1.905	1200	S7.001	17.920	300	S7.000	17.920	300	
SS5.069	19.800	1.915	1350	S6.002	17.885	450	S6.001	17.973	300	
							S7.001	17.885	300	
SS5.068	19.400	1.775	1350	S6.003	17.625	450	S6.002	17.625	450	
SS5.067	19.350	1.751	1350	S6.004	17.599	450	S6.003	17.599	450	
SS5.066	19.250	1.735	1350	S6.005	17.515	450	S6.004	17.515	450	
SS5.078	21.550	1.800	1200	S8.000	19.750	225				
SS5.077	21.250	1.800	1200	S8.001	19.450	225	S8.000	19.450	225	
SS5.076	21.200	1.800	1200	S8.002	19.400	225	S8.001	19.400	225	
SS5.075	21.150	1.800	1200	S8.003	19.350	300	S8.002	19.350	225	
SS5.074	19.550	1.800	1200	S8.004	17.750	300	S8.003	17.750	300	
SS5.065	19.350	1.885	1350	S6.006	17.465	450	S6.005	17.465	450	
							S8.004	17.550	300	
SS5.083	20.450	1.800	1200	S9.000	18.650	225				
SS5.082	19.700	1.800	1200	S9.001	17.900	225	S9.000	17.900	225	
SS5.081	19.675	1.800	1200	S9.002	17.875	225	S9.001	17.875	225	
SS5.080	19.300	1.800	1200	S9.003	17.500	300	S9.002	17.500	225	
SS5.079	19.300	1.822	1200	S9.004	17.478	300	S9.003	17.478	300	
SS5.064	19.300	2.600	1500	S6.007	16.700	525	S6.006	17.443	450	668
							S9.004	17.473	300	548
SS5.063	19.300	2.605	1500	S6.008	16.695	225	S6.007	16.695	525	
SS5.062	19.200	2.559	1200	S6.009	16.641	300	S6.008	16.641	225	
SS5.061	17.800	1.356	1050	S6.010	16.444	300	S6.009	16.444	300	
SS5.060	17.850	1.469	1050	S6.011	16.381	300	S6.010	16.381	300	
SS5.059	17.900	1.544	1350	S6.012	16.356	375	S6.011	16.356	300	
SS5.088	21.000	1.800	1200	S10.000	19.200	225				
SS5.087	20.500	1.800	1200	S10.001	18.700	225	S10.000	18.700	225	
SS5.086	19.000	1.800	1200	S10.002	17.200	225	S10.001	17.200	225	
SS5.085	18.975	1.800	1200	S10.003	17.175	225	S10.002	17.175	225	
SS5.084	18.500	1.800	1200	S10.004	16.700	225	S10.003	16.700	225	
SS5.058	18.250	2.195	1350	S6.013	16.055	375	S6.012	16.055	375	
							S10.004	16.450	225	245
SS5.057	18.250	2.213	1350	S6.014	16.037	375	S6.013	16.037	375	
SS5.056	18.250	2.237	1350	S6.015	16.013	375	S6.014	16.013	375	
SS5.055	18.250	2.241	1350	S6.016	16.009	225	S6.015	16.009	375	
SS5.054	18.000	2.152	1200	S6.017	15.848	225	S6.016	15.848	225	
SS5.053	18.000	2.188	1200	S6.018	15.812	225	S6.017	15.812	225	
SS5.052	18.000	2.289	1200	S6.019	15.712	225	S6.018	15.712	225	
SS5.051	17.750	2.099	1200	S6.020	15.651	225	S6.019	15.651	225	
SS5.050	17.700	2.141	1200	S6.021	15.559	300	S6.020	15.559	225	
SS5.049	17.300	1.866	1200	S6.022	15.434	300	S6.021	15.434	300	
SS5.090	17.800	1.800	1200	S11.000	16.000	225				
SS5.089	17.300	1.800	1200	S11.001	15.500	225	S11.000	15.500	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)
SS5.047	17.250	1.800	1200	S11.002	15.450	225	S11.001	15.450	225	
SS5.048	17.250	1.831	1200	S6.023	15.419	300	S6.022	15.419	300	
							S11.002	15.445	225	
SS5.046	17.250	1.834	1200	S6.024	15.416	300	S6.023	15.416	300	
SS5.045	17.250	1.849	1200	S6.025	15.401	300	S6.024	15.401	300	
SS5.044	17.250	2.022	1200	S6.026	15.228	300	S6.025	15.228	300	
SS5.002	17.250	2.077	1200	S1.024	15.173	300	S1.023	15.173	300	
							S6.026	15.181	300	8
SS5.001	17.250	2.169	1200	S1.025	15.081	300	S1.024	15.081	300	
SStream	16.050	0.983	0		OUTFALL		S1.025	15.067	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	SS5.025	22.025	20.225	1.575	1200
S1.001	o	225	SS5.024	21.250	19.450	1.575	1200
S1.002	o	225	SS5.023	20.250	18.450	1.575	1200
S1.003	o	225	SS5.022	20.220	18.420	1.575	1200
S1.004	o	300	SS5.021	20.190	18.390	1.500	1200
S1.005	o	300	SS5.020	19.850	18.050	1.500	1200
S1.006	o	300	SS5.019	19.800	18.000	1.500	1200
S1.007	o	300	SS5.018	19.750	17.950	1.500	1200
S1.008	o	300	SS5.017	19.900	17.900	1.700	1200
S2.000	o	225	SS5.030	22.200	20.400	1.575	1200
S2.001	o	225	SS5.029	21.450	19.650	1.575	1200
S2.002	o	225	SS5.028	21.400	19.600	1.575	1200
S2.003	o	225	SS5.027	21.350	19.550	1.575	1200
S2.004	o	225	SS5.026	20.775	18.975	1.575	1200
S1.009	o	450	SS5.016	20.040	17.829	1.761	1350
S1.010	o	450	SS5.015	19.900	17.712	1.738	1350
S1.011	o	450	SS5.014	19.900	17.200	2.250	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	47.425	61.2	SS5.024	21.250	19.450	1.575	1200
S1.001	61.055	61.1	SS5.023	20.250	18.450	1.575	1200
S1.002	3.415	113.8	SS5.022	20.220	18.420	1.575	1200
S1.003	2.815	93.8	SS5.021	20.190	18.390	1.575	1200
S1.004	47.535	139.8	SS5.020	19.850	18.050	1.500	1200
S1.005	6.370	127.4	SS5.019	19.800	18.000	1.500	1200
S1.006	6.370	127.4	SS5.018	19.750	17.950	1.500	1200
S1.007	6.370	127.4	SS5.017	19.900	17.900	1.700	1200
S1.008	14.165	200.0	SS5.016	20.040	17.829	1.911	1350
S2.000	42.235	56.3	SS5.029	21.450	19.650	1.575	1200
S2.001	4.055	81.1	SS5.028	21.400	19.600	1.575	1200
S2.002	4.015	80.3	SS5.027	21.350	19.550	1.575	1200
S2.003	63.890	111.1	SS5.026	20.775	18.975	1.575	1200
S2.004	49.725	43.4	SS5.016	20.040	17.829	1.986	1350
S1.009	23.470	200.0	SS5.015	19.900	17.712	1.738	1350
S1.010	4.950	200.0	SS5.014	19.900	17.687	1.763	1350
S1.011	1.000	200.0	SS5.013	19.900	17.195	2.255	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)
S1.012	o	225	SS5.013	19.900	17.195	2.480	1350
S1.013	o	225	SS5.012	19.850	17.160	2.465	1200
S1.014	o	225	SS5.011	19.800	17.122	2.453	1200
S1.015	o	225	SS5.010	19.750	17.084	2.441	1200
S1.016	o	300	SS5.009	19.700	17.047	2.353	1200
S1.017	o	300	SS5.008	18.350	16.550	1.500	1200
S1.018	o	300	SS5.007	18.250	16.450	1.500	1200
S3.000	o	225	SS5.039	20.950	19.150	1.575	1200
S3.001	o	225	SS5.038	20.880	19.080	1.575	1200
S3.002	o	225	SS5.037	20.850	19.050	1.575	1200
S4.000	o	225	SS5.040	20.050	18.250	1.575	1200
S3.003	o	300	SS5.036	20.100	18.217	1.583	1200
S5.000	o	225	SS5.043	21.250	19.450	1.575	1200
S5.001	o	225	SS5.042	20.500	18.700	1.575	1200
S5.002	o	225	SS5.041	20.250	17.505	2.520	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)
S1.012	7.030	200.0	SS5.012	19.850	17.160	2.465	1200
S1.013	7.590	200.0	SS5.011	19.800	17.122	2.453	1200
S1.014	7.515	200.0	SS5.010	19.750	17.084	2.441	1200
S1.015	7.485	200.0	SS5.009	19.700	17.047	2.428	1200
S1.016	88.580	178.2	SS5.008	18.350	16.550	1.500	1200
S1.017	8.910	89.1	SS5.007	18.250	16.450	1.500	1200
S1.018	14.120	86.3	SS5.007	18.500	16.286	1.914	1200
S3.000	10.365	148.1	SS5.038	20.880	19.080	1.575	1200
S3.001	3.565	118.8	SS5.037	20.850	19.050	1.575	1200
S3.002	54.515	65.4	SS5.036	20.100	18.217	1.658	1200
S4.000	5.500	166.7	SS5.036	20.100	18.217	1.658	1200
S3.003	6.415	200.0	SS5.035	20.250	18.185	1.765	1200
S5.000	39.580	52.8	SS5.042	20.500	18.700	1.575	1200
S5.001	6.270	25.1	SS5.041	20.250	18.450	1.575	1200
S5.002	1.000	200.0	SS5.035	20.250	17.500	2.525	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)
S3.004	o	300	SS5.035	20.250	17.500	2.450	1200
S3.005	o	225	SS5.034	20.250	17.495	2.530	1200
S3.006	o	225	SS5.033	20.200	17.443	2.532	1200
S3.007	o	225	SS5.032	20.000	17.395	2.380	1200
S3.008	o	225	SS5.031	20.000	17.318	2.457	1200
S1.019	o	300	SS5.007	18.500	16.286	1.914	1200
S1.020	o	300	SS5.006	18.250	15.500	2.450	1200
S1.021	o	300	SS5.005	18.250	15.495	2.455	1200
S1.022	o	300	SS5.004	17.500	15.445	1.755	1200
S1.023	o	300	SS5.003	17.250	15.220	1.730	1200
S6.000	o	225	SS5.073	21.700	19.900	1.575	1200
S6.001	o	300	SS5.072	21.350	19.550	1.500	1200
S7.000	o	300	SS5.071	20.000	18.200	1.500	1200
S7.001	o	300	SS5.070	19.825	17.920	1.605	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)
S3.004	1.000	200.0	SS5.034	20.250	17.495	2.455	1200
S3.005	10.450	200.0	SS5.033	20.200	17.443	2.532	1200
S3.006	9.470	200.0	SS5.032	20.000	17.395	2.380	1200
S3.007	15.560	200.0	SS5.031	20.000	17.318	2.457	1200
S3.008	42.142	40.8	SS5.007	18.500	16.286	1.989	1200
S1.019	6.220	200.0	SS5.006	18.250	16.255	1.696	1200
S1.020	1.000	200.0	SS5.005	18.250	15.495	2.455	1200
S1.021	14.915	300.0	SS5.004	17.500	15.445	1.755	1200
S1.022	67.640	300.0	SS5.003	17.250	15.220	1.730	1200
S1.023	13.960	300.0	SS5.002	17.250	15.173	1.777	1200
S6.000	54.290	155.1	SS5.072	21.350	19.550	1.575	1200
S6.001	102.855	65.2	SS5.069	19.800	17.973	1.527	1350
S7.000	55.965	200.0	SS5.070	19.825	17.920	1.605	1200
S7.001	6.995	200.0	SS5.069	19.800	17.885	1.615	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)
S6.002	o	450	SS5.069	19.800	17.885	1.465	1350
S6.003	o	450	SS5.068	19.400	17.625	1.325	1350
S6.004	o	450	SS5.067	19.350	17.599	1.301	1350
S6.005	o	450	SS5.066	19.250	17.515	1.285	1350
S8.000	o	225	SS5.078	21.550	19.750	1.575	1200
S8.001	o	225	SS5.077	21.250	19.450	1.575	1200
S8.002	o	225	SS5.076	21.200	19.400	1.575	1200
S8.003	o	300	SS5.075	21.150	19.350	1.500	1200
S8.004	o	300	SS5.074	19.550	17.750	1.500	1200
S6.006	o	450	SS5.065	19.350	17.465	1.435	1350
S9.000	o	225	SS5.083	20.450	18.650	1.575	1200
S9.001	o	225	SS5.082	19.700	17.900	1.575	1200
S9.002	o	225	SS5.081	19.675	17.875	1.575	1200
S9.003	o	300	SS5.080	19.300	17.500	1.500	1200
S9.004	o	300	SS5.079	19.300	17.478	1.522	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)
S6.002	51.945	200.0	SS5.068	19.400	17.625	1.325	1350
S6.003	5.380	200.0	SS5.067	19.350	17.599	1.301	1350
S6.004	16.785	200.0	SS5.066	19.250	17.515	1.285	1350
S6.005	9.955	200.0	SS5.065	19.350	17.465	1.435	1350
S8.000	45.080	150.3	SS5.077	21.250	19.450	1.575	1200
S8.001	6.182	123.6	SS5.076	21.200	19.400	1.575	1200
S8.002	7.560	151.2	SS5.075	21.150	19.350	1.575	1200
S8.003	82.815	51.8	SS5.074	19.550	17.750	1.500	1200
S8.004	11.735	58.7	SS5.065	19.350	17.550	1.500	1350
S6.006	4.355	200.0	SS5.064	19.300	17.443	1.407	1500
S9.000	41.870	55.8	SS5.082	19.700	17.900	1.575	1200
S9.001	3.265	130.6	SS5.081	19.675	17.875	1.575	1200
S9.002	46.055	122.8	SS5.080	19.300	17.500	1.575	1200
S9.003	4.425	200.0	SS5.079	19.300	17.478	1.522	1200
S9.004	1.000	200.0	SS5.064	19.300	17.473	1.527	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)
S6.007	o	525	SS5.064	19.300	16.700	2.075	1500
S6.008	o	225	SS5.063	19.300	16.695	2.380	1500
S6.009	o	300	SS5.062	19.200	16.641	2.259	1200
S6.010	o	300	SS5.061	17.800	16.444	1.056	1050
S6.011	o	300	SS5.060	17.850	16.381	1.169	1050
S6.012	o	375	SS5.059	17.900	16.356	1.169	1350
S10.000	o	225	SS5.088	21.000	19.200	1.575	1200
S10.001	o	225	SS5.087	20.500	18.700	1.575	1200
S10.002	o	225	SS5.086	19.000	17.200	1.575	1200
S10.003	o	225	SS5.085	18.975	17.175	1.575	1200
S10.004	o	225	SS5.084	18.500	16.700	1.575	1200
S6.013	o	375	SS5.058	18.250	16.055	1.820	1350
S6.014	o	375	SS5.057	18.250	16.037	1.838	1350
S6.015	o	375	SS5.056	18.250	16.013	1.862	1350
S6.016	o	225	SS5.055	18.250	16.009	2.016	1350
S6.017	o	225	SS5.054	18.000	15.848	1.927	1200
S6.018	o	225	SS5.053	18.000	15.812	1.963	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)
S6.007	1.000	200.0	SS5.063	19.300	16.695	2.080	1500
S6.008	10.730	200.0	SS5.062	19.200	16.641	2.334	1200
S6.009	59.065	299.8	SS5.061	17.800	16.444	1.056	1050
S6.010	19.120	300.0	SS5.060	17.850	16.381	1.169	1050
S6.011	7.460	300.0	SS5.059	17.900	16.356	1.244	1350
S6.012	90.270	300.0	SS5.058	18.250	16.055	1.820	1350
S10.000	75.345	150.7	SS5.087	20.500	18.700	1.575	1200
S10.001	70.615	47.1	SS5.086	19.000	17.200	1.575	1200
S10.002	2.900	116.0	SS5.085	18.975	17.175	1.575	1200
S10.003	27.345	57.6	SS5.084	18.500	16.700	1.575	1200
S10.004	26.645	106.6	SS5.058	18.250	16.450	1.575	1350
S6.013	5.445	300.0	SS5.057	18.250	16.037	1.838	1350
S6.014	7.250	300.0	SS5.056	18.250	16.013	1.862	1350
S6.015	1.000	300.0	SS5.055	18.250	16.009	1.866	1350
S6.016	48.350	300.3	SS5.054	18.000	15.848	1.927	1200
S6.017	10.970	300.0	SS5.053	18.000	15.812	1.963	1200
S6.018	30.040	300.0	SS5.052	18.000	15.712	2.064	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)
S6.019	o	225	SS5.052	18.000	15.712	2.064	1200
S6.020	o	225	SS5.051	17.750	15.651	1.874	1200
S6.021	o	300	SS5.050	17.700	15.559	1.841	1200
S6.022	o	300	SS5.049	17.300	15.434	1.566	1200
S11.000	o	225	SS5.090	17.800	16.000	1.575	1200
S11.001	o	225	SS5.089	17.300	15.500	1.575	1200
S11.002	o	225	SS5.047	17.250	15.450	1.575	1200
S6.023	o	300	SS5.048	17.250	15.419	1.531	1200
S6.024	o	300	SS5.046	17.250	15.416	1.534	1200
S6.025	o	300	SS5.045	17.250	15.401	1.549	1200
S6.026	o	300	SS5.044	17.250	15.228	1.722	1200
S1.024	o	300	SS5.002	17.250	15.173	1.777	1200
S1.025	o	300	SS5.001	17.250	15.081	1.869	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)
S6.019	18.235	300.0	SS5.051	17.750	15.651	1.874	1200
S6.020	27.655	300.0	SS5.050	17.700	15.559	1.916	1200
S6.021	37.250	300.0	SS5.049	17.300	15.434	1.566	1200
S6.022	4.575	300.0	SS5.048	17.250	15.419	1.531	1200
S11.000	17.392	34.8	SS5.089	17.300	15.500	1.575	1200
S11.001	8.310	166.2	SS5.047	17.250	15.450	1.575	1200
S11.002	1.000	200.0	SS5.048	17.250	15.445	1.580	1200
S6.023	1.000	300.0	SS5.046	17.250	15.416	1.534	1200
S6.024	4.495	299.7	SS5.045	17.250	15.401	1.549	1200
S6.025	51.835	300.0	SS5.044	17.250	15.228	1.722	1200
S6.026	14.050	300.0	SS5.002	17.250	15.181	1.769	1200
S1.024	27.635	300.0	SS5.001	17.250	15.081	1.869	1200
S1.025	4.375	300.0	SStream	16.050	15.067	0.683	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)
S1.025	SStream	16.050	15.067	15.045	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: SS5.013, DS/PN: S1.012, Volume (m³): 3.8

Design Head (m) 2.100 Hydro-Brake® Type Md4 Invert Level (m) 17.195
Design Flow (l/s) 4.8 Diameter (mm) 66

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.9	1.200	3.7	3.000	5.9	7.000	9.0
0.200	1.9	1.400	4.0	3.500	6.4	7.500	9.3
0.300	1.9	1.600	4.3	4.000	6.8	8.000	9.6
0.400	2.2	1.800	4.6	4.500	7.2	8.500	9.9
0.500	2.4	2.000	4.8	5.000	7.6	9.000	10.2
0.600	2.6	2.200	5.0	5.500	8.0	9.500	10.5
0.800	3.0	2.400	5.3	6.000	8.3		
1.000	3.4	2.600	5.5	6.500	8.7		

Hydro-Brake® Manhole: SS5.034, DS/PN: S3.005, Volume (m³): 3.1

Design Head (m) 2.000 Hydro-Brake® Type Md4 Invert Level (m) 17.495
Design Flow (l/s) 1.9 Diameter (mm) 42

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.7	1.200	1.5	3.000	2.4	7.000	3.6
0.200	0.6	1.400	1.6	3.500	2.6	7.500	3.8
0.300	0.8	1.600	1.7	4.000	2.7	8.000	3.9
0.400	0.9	1.800	1.8	4.500	2.9	8.500	4.0
0.500	1.0	2.000	1.9	5.000	3.1	9.000	4.1
0.600	1.1	2.200	2.0	5.500	3.2	9.500	4.2
0.800	1.2	2.400	2.1	6.000	3.4		
1.000	1.4	2.600	2.2	6.500	3.5		

Hydro-Brake® Manhole: SS5.005, DS/PN: S1.021, Volume (m³): 3.1

Design Head (m) 2.200 Hydro-Brake® Type Md4 Invert Level (m) 15.495
Design Flow (l/s) 8.6 Diameter (mm) 87

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	1.200	6.5	3.000	10.2	7.000	15.6
0.200	4.4	1.400	7.0	3.500	11.0	7.500	16.2
0.300	3.7	1.600	7.5	4.000	11.8	8.000	16.7
0.400	3.8	1.800	7.9	4.500	12.5	8.500	17.2
0.500	4.2	2.000	8.3	5.000	13.2	9.000	17.7
0.600	4.6	2.200	8.7	5.500	13.8	9.500	18.2
0.800	5.3	2.400	9.1	6.000	14.4		
1.000	5.9	2.600	9.5	6.500	15.0		

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Hydro-Brake® Manhole: SS5.063, DS/PN: S6.008, Volume (m³): 4.5

Design Head (m) 2.000 Hydro-Brake® Type Md4 Invert Level (m) 16.695
Design Flow (l/s) 7.9 Diameter (mm) 85

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	1.200	6.2	3.000	9.8	7.000	14.9
0.200	4.1	1.400	6.7	3.500	10.5	7.500	15.4
0.300	3.5	1.600	7.1	4.000	11.3	8.000	15.9
0.400	3.6	1.800	7.6	4.500	11.9	8.500	16.4
0.500	4.0	2.000	8.0	5.000	12.6	9.000	16.9
0.600	4.4	2.200	8.4	5.500	13.2	9.500	17.4
0.800	5.0	2.400	8.7	6.000	13.8		
1.000	5.6	2.600	9.1	6.500	14.4		

Hydro-Brake® Manhole: SS5.055, DS/PN: S6.016, Volume (m³): 3.2

Design Head (m) 1.700 Hydro-Brake® Type Md4 Invert Level (m) 16.009
Design Flow (l/s) 10.1 Diameter (mm) 99

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.0	1.200	8.4	3.000	13.2	7.000	20.2
0.200	6.1	1.400	9.0	3.500	14.3	7.500	20.9
0.300	5.4	1.600	9.7	4.000	15.3	8.000	21.6
0.400	5.1	1.800	10.2	4.500	16.2	8.500	22.3
0.500	5.5	2.000	10.8	5.000	17.1	9.000	22.9
0.600	5.9	2.200	11.3	5.500	17.9	9.500	23.5
0.800	6.8	2.400	11.8	6.000	18.7		
1.000	7.6	2.600	12.3	6.500	19.5		

Hydro-Brake® Manhole: SS5.046, DS/PN: S6.024, Volume (m³): 2.1

Design Head (m) 1.500 Hydro-Brake® Type Md4 Invert Level (m) 15.416
Design Flow (l/s) 11.1 Diameter (mm) 108

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.2	1.200	10.0	3.000	15.7	7.000	24.0
0.200	7.5	1.400	10.8	3.500	17.0	7.500	24.9
0.300	7.0	1.600	11.5	4.000	18.2	8.000	25.7
0.400	6.3	1.800	12.2	4.500	19.3	8.500	26.5
0.500	6.6	2.000	12.9	5.000	20.3	9.000	27.3
0.600	7.1	2.200	13.5	5.500	21.3	9.500	28.0
0.800	8.1	2.400	14.1	6.000	22.3		
1.000	9.1	2.600	14.7	6.500	23.2		

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Storage Structures for Storm

Tank or Pond Manhole: SS5.013, DS/PN: S1.012

Invert Level (m) 17.195

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	264.0	2.100	264.0

Tank or Pond Manhole: SS5.034, DS/PN: S3.005

Invert Level (m) 17.495

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	232.0	2.000	232.0

Tank or Pond Manhole: SS5.005, DS/PN: S1.021

Invert Level (m) 15.495

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	103.5	2.200	103.5

Tank or Pond Manhole: SS5.063, DS/PN: S6.008

Invert Level (m) 16.695

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	389.0	2.000	389.0

Tank or Pond Manhole: SS5.055, DS/PN: S6.016

Invert Level (m) 16.009

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	210.0	1.750	210.0

Tank or Pond Manhole: SS5.046, DS/PN: S6.024

Invert Level (m) 15.416

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	117.0	1.500	117.0

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Appendix E – 1 in 100 Year Design Sheets

Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Carriganarra LRD Carriganarra Ballincollig, Cork	Micro Drainage
Date 09/12/2025 File SW MODEL.MDX	Designed By S.O.'Grady Checked By	
Micro Drainage	Network W.12.4	

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)	Time (mins)	Area (ha)
0-4	0.126	4-8	1.325	8-12	1.538	12-16	1.101	16-20	0.030

Total Area Contributing (ha) = 4.121

Total Pipe Volume (m^3) = 130.205

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	47.425	0.775	61.2	0.150	5.00	0.0	0.600	o	225
S1.001	61.055	1.000	61.1	0.118	0.00	0.0	0.600	o	225
S1.002	3.415	0.030	113.8	0.000	0.00	0.0	0.600	o	225
S1.003	2.815	0.030	93.8	0.000	0.00	0.0	0.600	o	225
S1.004	47.535	0.340	139.8	0.144	0.00	0.0	0.600	o	300
S1.005	6.370	0.050	127.4	0.006	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)
S1.000	50.00	5.47	20.225	0.150	0.0	0.0	4.1	1.67	66.6	24.4
S1.001	50.00	6.08	19.450	0.268	0.0	0.0	7.3	1.68	66.7	43.5
S1.002	50.00	6.13	18.450	0.268	0.0	0.0	7.3	1.22	48.7	43.5
S1.003	50.00	6.16	18.420	0.268	0.0	0.0	7.3	1.35	53.7	43.5
S1.004	50.00	6.76	18.390	0.412	0.0	0.0	11.2	1.33	93.9	66.9
S1.005	50.00	6.83	18.050	0.418	0.0	0.0	11.3	1.39	98.4	67.9

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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)
S1.006	6.370	0.050	127.4	0.006	0.00	0.0	0.600	o	300
S1.007	6.370	0.050	127.4	0.006	0.00	0.0	0.600	o	300
S1.008	14.165	0.071	200.0	0.015	0.00	0.0	0.600	o	300
S2.000	42.235	0.750	56.3	0.137	5.00	0.0	0.600	o	225
S2.001	4.055	0.050	81.1	0.004	0.00	0.0	0.600	o	225
S2.002	4.015	0.050	80.3	0.004	0.00	0.0	0.600	o	225
S2.003	63.890	0.575	111.1	0.120	0.00	0.0	0.600	o	225
S2.004	49.725	1.146	43.4	0.108	0.00	0.0	0.600	o	225
S1.009	23.470	0.117	200.0	0.070	0.00	0.0	0.600	o	450
S1.010	4.950	0.025	200.0	0.000	0.00	0.0	0.600	o	450
S1.011	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	450
S1.012	7.030	0.035	200.0	0.000	0.00	0.0	0.600	o	225
S1.013	7.590	0.038	200.0	0.000	0.00	0.0	0.600	o	225
S1.014	7.515	0.038	200.0	0.005	0.00	0.0	0.600	o	225
S1.015	7.485	0.037	200.0	0.034	0.00	0.0	0.600	o	225
S1.016	88.580	0.497	178.2	0.180	0.00	0.0	0.600	o	300
S1.017	8.910	0.100	89.1	0.005	0.00	0.0	0.600	o	300
S1.018	14.120	0.164	86.3	0.035	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)
S1.006	50.00	6.91	18.000	0.424	0.0	0.0	11.5	1.39	98.4	68.9
S1.007	50.00	6.99	17.950	0.430	0.0	0.0	11.6	1.39	98.4	69.9
S1.008	50.00	7.20	17.900	0.445	0.0	0.0	12.1	1.11	78.3	72.3
S2.000	50.00	5.40	20.400	0.137	0.0	0.0	3.7	1.75	69.4	22.3
S2.001	50.00	5.45	19.650	0.141	0.0	0.0	3.8	1.45	57.8	22.9
S2.002	50.00	5.50	19.600	0.145	0.0	0.0	3.9	1.46	58.1	23.6
S2.003	50.00	6.35	19.550	0.265	0.0	0.0	7.2	1.24	49.3	43.1
S2.004	50.00	6.77	18.975	0.373	0.0	0.0	10.1	1.99	79.2	60.6
S1.009	50.00	7.47	17.829	0.888	0.0	0.0	24.0	1.43	228.1	144.3
S1.010	50.00	7.53	17.712	0.888	0.0	0.0	24.0	1.43	228.1	144.3
S1.011	50.00	7.54	17.200	0.888	0.0	0.0	24.0	1.43	228.1	144.3
S1.012	50.00	5.13	17.195	0.000	4.8	0.0	0.8	0.92	36.6	4.8
S1.013	50.00	5.26	17.160	0.000	4.8	0.0	1.0	0.92	36.6	5.8
S1.014	50.00	5.40	17.122	0.005	4.8	0.0	1.1	0.92	36.6	6.6
S1.015	50.00	5.54	17.084	0.039	4.8	0.0	2.0	0.92	36.6	12.1
S1.016	50.00	6.79	17.047	0.219	4.8	0.0	6.9	1.17	83.0	41.3
S1.017	50.00	6.88	16.550	0.224	4.8	0.0	7.0	1.67	117.8	42.2
S1.018	50.00	7.02	16.450	0.259	4.8	0.0	8.0	1.69	119.7	47.8

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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)
S3.000	10.365	0.070	148.1	0.042	5.00	0.0	0.600	o	225
S3.001	3.565	0.030	118.8	0.000	0.00	0.0	0.600	o	225
S3.002	54.515	0.833	65.4	0.190	0.00	0.0	0.600	o	225
S4.000	5.500	0.033	166.7	0.005	5.00	0.0	0.600	o	225
S3.003	6.415	0.032	200.0	0.000	0.00	0.0	0.600	o	300
S5.000	39.580	0.750	52.8	0.119	5.00	0.0	0.600	o	225
S5.001	6.270	0.250	25.1	0.000	0.00	0.0	0.600	o	225
S5.002	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	225
S3.004	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	300
S3.005	10.450	0.052	200.0	0.000	0.00	0.0	0.600	o	225
S3.006	9.470	0.047	200.0	0.000	0.00	0.0	0.600	o	225
S3.007	15.560	0.078	200.0	0.020	0.00	0.0	0.600	o	225
S3.008	42.142	1.032	40.8	0.130	0.00	0.0	0.600	o	225
S1.019	6.220	0.031	200.0	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)
S3.000	50.00	5.16	19.150	0.042	0.0	0.0	1.1	1.07	42.6	6.8
S3.001	50.00	5.21	19.080	0.042	0.0	0.0	1.1	1.20	47.6	6.8
S3.002	50.00	5.77	19.050	0.232	0.0	0.0	6.3	1.62	64.4	37.7
S4.000	50.00	5.09	18.250	0.005	0.0	0.0	0.1	1.01	40.2	0.8
S3.003	50.00	5.87	18.217	0.237	0.0	0.0	6.4	1.11	78.3	38.5
S5.000	50.00	5.37	19.450	0.119	0.0	0.0	3.2	1.80	71.7	19.3
S5.001	50.00	5.41	18.700	0.119	0.0	0.0	3.2	2.62	104.3	19.3
S5.002	50.00	5.42	17.505	0.119	0.0	0.0	3.2	0.92	36.6	19.3
S3.004	50.00	5.88	17.500	0.356	0.0	0.0	9.6	1.11	78.3	57.8
S3.005	50.00	5.19	17.495	0.000	1.9	0.0	0.3	0.92	36.6	1.9
S3.006	50.00	5.36	17.443	0.000	1.9	0.0	0.4	0.92	36.6	2.3
S3.007	50.00	5.64	17.395	0.020	1.9	0.0	0.9	0.92	36.6	5.5
S3.008	50.00	5.98	17.318	0.150	1.9	0.0	4.4	2.05	81.6	26.7
S1.019	50.00	7.11	16.286	0.409	6.7	0.0	12.4	1.11	78.3	74.5

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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)
S1.020	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	300
S1.021	14.915	0.050	300.0	0.000	0.00	0.0	0.600	o	300
S1.022	67.640	0.225	300.0	0.000	0.00	0.0	0.600	o	300
S1.023	13.960	0.047	300.0	0.000	0.00	0.0	0.600	o	300
S6.000	54.290	0.350	155.1	0.137	5.00	0.0	0.600	o	225
S6.001	102.855	1.577	65.2	0.320	0.00	0.0	0.600	o	300
S7.000	55.965	0.280	200.0	0.232	5.00	0.0	0.600	o	300
S7.001	6.995	0.035	200.0	0.000	0.00	0.0	0.600	o	300
S6.002	51.945	0.260	200.0	0.196	0.00	0.0	0.600	o	450
S6.003	5.380	0.027	200.0	0.000	0.00	0.0	0.600	o	450
S6.004	16.785	0.084	200.0	0.046	0.00	0.0	0.600	o	450
S6.005	9.955	0.050	200.0	0.000	0.00	0.0	0.600	o	450
S8.000	45.080	0.300	150.3	0.152	5.00	0.0	0.600	o	225
S8.001	6.182	0.050	123.6	0.005	0.00	0.0	0.600	o	225
S8.002	7.560	0.050	151.2	0.005	0.00	0.0	0.600	o	225
S8.003	82.815	1.600	51.8	0.286	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)
S1.020	50.00	7.13	15.500	0.409	6.7	0.0	12.4	1.11	78.3	74.5
S1.021	50.00	5.28	15.495	0.000	8.6	0.0	1.4	0.90	63.8	8.6
S1.022	50.00	6.52	15.445	0.000	8.6	0.0	1.7	0.90	63.8	10.3
S1.023	50.00	6.78	15.220	0.000	8.6	0.0	1.7	0.90	63.8	10.3
S6.000	50.00	5.86	19.900	0.137	0.0	0.0	3.7	1.05	41.6	22.3
S6.001	50.00	6.74	19.550	0.457	0.0	0.0	12.4	1.95	137.8	74.3
S7.000	50.00	5.84	18.200	0.232	0.0	0.0	6.3	1.11	78.3	37.7
S7.001	50.00	5.95	17.920	0.232	0.0	0.0	6.3	1.11	78.3	37.7
S6.002	50.00	7.35	17.885	0.885	0.0	0.0	24.0	1.43	228.1	143.8
S6.003	50.00	7.41	17.625	0.885	0.0	0.0	24.0	1.43	228.1	143.8
S6.004	50.00	7.60	17.599	0.931	0.0	0.0	25.2	1.43	228.1	151.3
S6.005	50.00	7.72	17.515	0.931	0.0	0.0	25.2	1.43	228.1	151.3
S8.000	50.00	5.71	19.750	0.152	0.0	0.0	4.1	1.06	42.3	24.7
S8.001	50.00	5.79	19.450	0.157	0.0	0.0	4.3	1.17	46.7	25.5
S8.002	50.00	5.91	19.400	0.162	0.0	0.0	4.4	1.06	42.2	26.3
S8.003	50.00	6.54	19.350	0.448	0.0	0.0	12.1	2.19	154.8	72.8

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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)
S8.004	11.735	0.200	58.7	0.000	0.00	0.0	0.600	o	300
S6.006	4.355	0.022	200.0	0.000	0.00	0.0	0.600	o	450
S9.000	41.870	0.750	55.8	0.106	5.00	0.0	0.600	o	225
S9.001	3.265	0.025	130.6	0.000	0.00	0.0	0.600	o	225
S9.002	46.055	0.375	122.8	0.140	0.00	0.0	0.600	o	225
S9.003	4.425	0.022	200.0	0.000	0.00	0.0	0.600	o	300
S9.004	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	300
S6.007	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	525
S6.008	10.730	0.054	200.0	0.000	0.00	0.0	0.600	o	225
S6.009	59.065	0.197	299.8	0.097	0.00	0.0	0.600	o	300
S6.010	19.120	0.064	300.0	0.013	0.00	0.0	0.600	o	300
S6.011	7.460	0.025	300.0	0.000	0.00	0.0	0.600	o	300
S6.012	90.270	0.301	300.0	0.231	0.00	0.0	0.600	o	375
S10.000	75.345	0.500	150.7	0.075	5.00	0.0	0.600	o	225
S10.001	70.615	1.500	47.1	0.100	0.00	0.0	0.600	o	225
S10.002	2.900	0.025	116.0	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)
S8.004	50.00	6.64	17.750	0.448	0.0	0.0	12.1	2.06	145.4	72.8
S6.006	50.00	7.77	17.465	1.379	0.0	0.0	37.3	1.43	228.1	224.1
S9.000	50.00	5.40	18.650	0.106	0.0	0.0	2.9	1.75	69.7	17.2
S9.001	50.00	5.45	17.900	0.106	0.0	0.0	2.9	1.14	45.4	17.2
S9.002	50.00	6.10	17.875	0.246	0.0	0.0	6.7	1.18	46.9	40.0
S9.003	50.00	6.16	17.500	0.246	0.0	0.0	6.7	1.11	78.3	40.0
S9.004	50.00	6.18	17.478	0.246	0.0	0.0	6.7	1.11	78.3	40.0
S6.007	50.00	7.78	16.700	1.625	0.0	0.0	44.0	1.58	342.1	264.1
S6.008	50.00	5.19	16.695	0.000	7.9	0.0	1.3	0.92	36.6	7.9
S6.009	50.00	6.28	16.641	0.097	7.9	0.0	4.2	0.90	63.8	25.2
S6.010	50.00	6.64	16.444	0.110	7.9	0.0	4.6	0.90	63.8	27.4
S6.011	50.00	6.78	16.381	0.110	7.9	0.0	4.6	0.90	63.8	27.4
S6.012	50.00	8.22	16.356	0.341	7.9	0.0	10.8	1.04	115.0	64.9
S10.000	50.00	6.18	19.200	0.075	0.0	0.0	2.0	1.06	42.3	12.2
S10.001	50.00	6.80	18.700	0.175	0.0	0.0	4.7	1.91	76.0	28.4
S10.002	50.00	6.84	17.200	0.175	0.0	0.0	4.7	1.21	48.2	28.4

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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)
S10.003	27.345	0.475	57.6	0.059	0.00	0.0	0.600	o	225
S10.004	26.645	0.250	106.6	0.032	0.00	0.0	0.600	o	225
S6.013	5.445	0.018	300.0	0.000	0.00	0.0	0.600	o	375
S6.014	7.250	0.024	300.0	0.000	0.00	0.0	0.600	o	375
S6.015	1.000	0.003	300.0	0.000	0.00	0.0	0.600	o	375
S6.016	48.350	0.161	300.3	0.000	0.00	0.0	0.600	o	225
S6.017	10.970	0.037	300.0	0.000	0.00	0.0	0.600	o	225
S6.018	30.040	0.100	300.0	0.000	0.00	0.0	0.600	o	225
S6.019	18.235	0.061	300.0	0.000	0.00	0.0	0.600	o	225
S6.020	27.655	0.092	300.0	0.089	0.00	0.0	0.600	o	225
S6.021	37.250	0.124	300.0	0.090	0.00	0.0	0.600	o	300
S6.022	4.575	0.015	300.0	0.000	0.00	0.0	0.600	o	300
S11.000	17.392	0.500	34.8	0.057	5.00	0.0	0.600	o	225
S11.001	8.310	0.050	166.2	0.000	0.00	0.0	0.600	o	225
S11.002	1.000	0.005	200.0	0.000	0.00	0.0	0.600	o	225
S6.023	1.000	0.003	300.0	0.000	0.00	0.0	0.600	o	300
S6.024	4.495	0.015	299.7	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)
S10.003	50.00	7.10	17.175	0.234	0.0	0.0	6.3	1.73	68.7	38.0
S10.004	50.00	7.45	16.700	0.266	0.0	0.0	7.2	1.27	50.3	43.2
S6.013	50.00	8.31	16.055	0.607	7.9	0.0	18.0	1.04	115.0	108.1
S6.014	50.00	8.42	16.037	0.607	7.9	0.0	18.0	1.04	115.0	108.1
S6.015	50.00	8.44	16.013	0.607	7.9	0.0	18.0	1.04	115.0	108.1
S6.016	50.00	6.08	16.009	0.000	10.1	0.0	1.7	0.75	29.8	10.1
S6.017	50.00	6.32	15.848	0.000	10.1	0.0	2.0	0.75	29.8	12.1
S6.018	50.00	6.99	15.812	0.000	10.1	0.0	2.0	0.75	29.8	12.1
S6.019	50.00	7.39	15.712	0.000	10.1	0.0	2.0	0.75	29.8	12.1
S6.020	50.00	8.01	15.651	0.089	10.1	0.0	4.4	0.75	29.8	26.6
S6.021	50.00	8.70	15.559	0.179	10.1	0.0	6.9	0.90	63.8	41.2
S6.022	50.00	8.78	15.434	0.179	10.1	0.0	6.9	0.90	63.8	41.2
S11.000	50.00	5.13	16.000	0.057	0.0	0.0	1.5	2.23	88.5	9.3
S11.001	50.00	5.27	15.500	0.057	0.0	0.0	1.5	1.01	40.2	9.3
S11.002	50.00	5.29	15.450	0.057	0.0	0.0	1.5	0.92	36.6	9.3
S6.023	50.00	8.80	15.419	0.236	10.1	0.0	8.4	0.90	63.8	50.5
S6.024	50.00	5.08	15.416	0.000	11.1	0.0	1.9	0.90	63.8	11.1

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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)
S6.025	51.835	0.173	300.0	0.000	0.00	0.0	0.600	o	300
S6.026	14.050	0.047	300.0	0.000	0.00	0.0	0.600	o	300
S1.024	27.635	0.092	300.0	0.000	0.00	0.0	0.600	o	300
S1.025	4.375	0.015	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)
S6.025	50.00	6.04	15.401	0.000	11.1	0.0	2.2	0.90	63.8	13.3
S6.026	50.00	6.30	15.228	0.000	11.1	0.0	2.2	0.90	63.8	13.3
S1.024	50.00	7.29	15.173	0.000	19.7	0.0	3.9	0.90	63.8	23.6
S1.025	50.00	7.37	15.081	0.000	19.7	0.0	3.9	0.90	63.8	23.6

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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)
SS5.025	22.025	1.800	1200	S1.000	20.225	225				
SS5.024	21.250	1.800	1200	S1.001	19.450	225	S1.000	19.450	225	
SS5.023	20.250	1.800	1200	S1.002	18.450	225	S1.001	18.450	225	
SS5.022	20.220	1.800	1200	S1.003	18.420	225	S1.002	18.420	225	
SS5.021	20.190	1.800	1200	S1.004	18.390	300	S1.003	18.390	225	
SS5.020	19.850	1.800	1200	S1.005	18.050	300	S1.004	18.050	300	
SS5.019	19.800	1.800	1200	S1.006	18.000	300	S1.005	18.000	300	
SS5.018	19.750	1.800	1200	S1.007	17.950	300	S1.006	17.950	300	
SS5.017	19.900	2.000	1200	S1.008	17.900	300	S1.007	17.900	300	
SS5.030	22.200	1.800	1200	S2.000	20.400	225				
SS5.029	21.450	1.800	1200	S2.001	19.650	225	S2.000	19.650	225	
SS5.028	21.400	1.800	1200	S2.002	19.600	225	S2.001	19.600	225	
SS5.027	21.350	1.800	1200	S2.003	19.550	225	S2.002	19.550	225	
SS5.026	20.775	1.800	1200	S2.004	18.975	225	S2.003	18.975	225	
SS5.016	20.040	2.211	1350	S1.009	17.829	450	S1.008	17.829	300	
							S2.004	17.829	225	
SS5.015	19.900	2.188	1350	S1.010	17.712	450	S1.009	17.712	450	
SS5.014	19.900	2.700	1350	S1.011	17.200	450	S1.010	17.687	450	487
SS5.013	19.900	2.705	1350	S1.012	17.195	225	S1.011	17.195	450	
SS5.012	19.850	2.690	1200	S1.013	17.160	225	S1.012	17.160	225	
SS5.011	19.800	2.678	1200	S1.014	17.122	225	S1.013	17.122	225	
SS5.010	19.750	2.666	1200	S1.015	17.084	225	S1.014	17.084	225	
SS5.009	19.700	2.653	1200	S1.016	17.047	300	S1.015	17.047	225	
SS5.008	18.350	1.800	1200	S1.017	16.550	300	S1.016	16.550	300	
SS5.007	18.250	1.800	1200	S1.018	16.450	300	S1.017	16.450	300	
SS5.039	20.950	1.800	1200	S3.000	19.150	225				
SS5.038	20.880	1.800	1200	S3.001	19.080	225	S3.000	19.080	225	
SS5.037	20.850	1.800	1200	S3.002	19.050	225	S3.001	19.050	225	
SS5.040	20.050	1.800	1200	S4.000	18.250	225				
SS5.036	20.100	1.883	1200	S3.003	18.217	300	S3.002	18.217	225	
							S4.000	18.217	225	
SS5.043	21.250	1.800	1200	S5.000	19.450	225				
SS5.042	20.500	1.800	1200	S5.001	18.700	225	S5.000	18.700	225	
SS5.041	20.250	2.745	1200	S5.002	17.505	225	S5.001	18.450	225	945
SS5.035	20.250	2.750	1200	S3.004	17.500	300	S3.003	18.185	300	685
							S5.002	17.500	225	
SS5.034	20.250	2.755	1200	S3.005	17.495	225	S3.004	17.495	300	
SS5.033	20.200	2.757	1200	S3.006	17.443	225	S3.005	17.443	225	
SS5.032	20.000	2.605	1200	S3.007	17.395	225	S3.006	17.395	225	
SS5.031	20.000	2.682	1200	S3.008	17.318	225	S3.007	17.318	225	
SS5.007	18.500	2.214	1200	S1.019	16.286	300	S1.018	16.286	300	1
							S3.008	16.286	225	
SS5.006	18.250	2.750	1200	S1.020	15.500	300	S1.019	16.255	300	755
SS5.005	18.250	2.755	1200	S1.021	15.495	300	S1.020	15.495	300	
SS5.004	17.500	2.055	1200	S1.022	15.445	300	S1.021	15.445	300	
SS5.003	17.250	2.030	1200	S1.023	15.220	300	S1.022	15.220	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)
SS5.073	21.700	1.800	1200	S6.000	19.900	225				
SS5.072	21.350	1.800	1200	S6.001	19.550	300	S6.000	19.550	225	
SS5.071	20.000	1.800	1200	S7.000	18.200	300				
SS5.070	19.825	1.905	1200	S7.001	17.920	300	S7.000	17.920	300	
SS5.069	19.800	1.915	1350	S6.002	17.885	450	S6.001	17.973	300	
							S7.001	17.885	300	
SS5.068	19.400	1.775	1350	S6.003	17.625	450	S6.002	17.625	450	
SS5.067	19.350	1.751	1350	S6.004	17.599	450	S6.003	17.599	450	
SS5.066	19.250	1.735	1350	S6.005	17.515	450	S6.004	17.515	450	
SS5.078	21.550	1.800	1200	S8.000	19.750	225				
SS5.077	21.250	1.800	1200	S8.001	19.450	225	S8.000	19.450	225	
SS5.076	21.200	1.800	1200	S8.002	19.400	225	S8.001	19.400	225	
SS5.075	21.150	1.800	1200	S8.003	19.350	300	S8.002	19.350	225	
SS5.074	19.550	1.800	1200	S8.004	17.750	300	S8.003	17.750	300	
SS5.065	19.350	1.885	1350	S6.006	17.465	450	S6.005	17.465	450	
							S8.004	17.550	300	
SS5.083	20.450	1.800	1200	S9.000	18.650	225				
SS5.082	19.700	1.800	1200	S9.001	17.900	225	S9.000	17.900	225	
SS5.081	19.675	1.800	1200	S9.002	17.875	225	S9.001	17.875	225	
SS5.080	19.300	1.800	1200	S9.003	17.500	300	S9.002	17.500	225	
SS5.079	19.300	1.822	1200	S9.004	17.478	300	S9.003	17.478	300	
SS5.064	19.300	2.600	1500	S6.007	16.700	525	S6.006	17.443	450	668
							S9.004	17.473	300	548
SS5.063	19.300	2.605	1500	S6.008	16.695	225	S6.007	16.695	525	
SS5.062	19.200	2.559	1200	S6.009	16.641	300	S6.008	16.641	225	
SS5.061	17.800	1.356	1050	S6.010	16.444	300	S6.009	16.444	300	
SS5.060	17.850	1.469	1050	S6.011	16.381	300	S6.010	16.381	300	
SS5.059	17.900	1.544	1350	S6.012	16.356	375	S6.011	16.356	300	
SS5.088	21.000	1.800	1200	S10.000	19.200	225				
SS5.087	20.500	1.800	1200	S10.001	18.700	225	S10.000	18.700	225	
SS5.086	19.000	1.800	1200	S10.002	17.200	225	S10.001	17.200	225	
SS5.085	18.975	1.800	1200	S10.003	17.175	225	S10.002	17.175	225	
SS5.084	18.500	1.800	1200	S10.004	16.700	225	S10.003	16.700	225	
SS5.058	18.250	2.195	1350	S6.013	16.055	375	S6.012	16.055	375	
							S10.004	16.450	225	245
SS5.057	18.250	2.213	1350	S6.014	16.037	375	S6.013	16.037	375	
SS5.056	18.250	2.237	1350	S6.015	16.013	375	S6.014	16.013	375	
SS5.055	18.250	2.241	1350	S6.016	16.009	225	S6.015	16.009	375	
SS5.054	18.000	2.152	1200	S6.017	15.848	225	S6.016	15.848	225	
SS5.053	18.000	2.188	1200	S6.018	15.812	225	S6.017	15.812	225	
SS5.052	18.000	2.289	1200	S6.019	15.712	225	S6.018	15.712	225	
SS5.051	17.750	2.099	1200	S6.020	15.651	225	S6.019	15.651	225	
SS5.050	17.700	2.141	1200	S6.021	15.559	300	S6.020	15.559	225	
SS5.049	17.300	1.866	1200	S6.022	15.434	300	S6.021	15.434	300	
SS5.090	17.800	1.800	1200	S11.000	16.000	225				
SS5.089	17.300	1.800	1200	S11.001	15.500	225	S11.000	15.500	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)
SS5.047	17.250	1.800	1200	S11.002	15.450	225	S11.001	15.450	225	
SS5.048	17.250	1.831	1200	S6.023	15.419	300	S6.022	15.419	300	
							S11.002	15.445	225	
SS5.046	17.250	1.834	1200	S6.024	15.416	300	S6.023	15.416	300	
SS5.045	17.250	1.849	1200	S6.025	15.401	300	S6.024	15.401	300	
SS5.044	17.250	2.022	1200	S6.026	15.228	300	S6.025	15.228	300	
SS5.002	17.250	2.077	1200	S1.024	15.173	300	S1.023	15.173	300	
							S6.026	15.181	300	8
SS5.001	17.250	2.169	1200	S1.025	15.081	300	S1.024	15.081	300	
SStream	16.050	0.983	0		OUTFALL		S1.025	15.067	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	SS5.025	22.025	20.225	1.575	1200
S1.001	o	225	SS5.024	21.250	19.450	1.575	1200
S1.002	o	225	SS5.023	20.250	18.450	1.575	1200
S1.003	o	225	SS5.022	20.220	18.420	1.575	1200
S1.004	o	300	SS5.021	20.190	18.390	1.500	1200
S1.005	o	300	SS5.020	19.850	18.050	1.500	1200
S1.006	o	300	SS5.019	19.800	18.000	1.500	1200
S1.007	o	300	SS5.018	19.750	17.950	1.500	1200
S1.008	o	300	SS5.017	19.900	17.900	1.700	1200
S2.000	o	225	SS5.030	22.200	20.400	1.575	1200
S2.001	o	225	SS5.029	21.450	19.650	1.575	1200
S2.002	o	225	SS5.028	21.400	19.600	1.575	1200
S2.003	o	225	SS5.027	21.350	19.550	1.575	1200
S2.004	o	225	SS5.026	20.775	18.975	1.575	1200
S1.009	o	450	SS5.016	20.040	17.829	1.761	1350
S1.010	o	450	SS5.015	19.900	17.712	1.738	1350
S1.011	o	450	SS5.014	19.900	17.200	2.250	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	47.425	61.2	SS5.024	21.250	19.450	1.575	1200
S1.001	61.055	61.1	SS5.023	20.250	18.450	1.575	1200
S1.002	3.415	113.8	SS5.022	20.220	18.420	1.575	1200
S1.003	2.815	93.8	SS5.021	20.190	18.390	1.575	1200
S1.004	47.535	139.8	SS5.020	19.850	18.050	1.500	1200
S1.005	6.370	127.4	SS5.019	19.800	18.000	1.500	1200
S1.006	6.370	127.4	SS5.018	19.750	17.950	1.500	1200
S1.007	6.370	127.4	SS5.017	19.900	17.900	1.700	1200
S1.008	14.165	200.0	SS5.016	20.040	17.829	1.911	1350
S2.000	42.235	56.3	SS5.029	21.450	19.650	1.575	1200
S2.001	4.055	81.1	SS5.028	21.400	19.600	1.575	1200
S2.002	4.015	80.3	SS5.027	21.350	19.550	1.575	1200
S2.003	63.890	111.1	SS5.026	20.775	18.975	1.575	1200
S2.004	49.725	43.4	SS5.016	20.040	17.829	1.986	1350
S1.009	23.470	200.0	SS5.015	19.900	17.712	1.738	1350
S1.010	4.950	200.0	SS5.014	19.900	17.687	1.763	1350
S1.011	1.000	200.0	SS5.013	19.900	17.195	2.255	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)
S1.012	o	225	SS5.013	19.900	17.195	2.480	1350
S1.013	o	225	SS5.012	19.850	17.160	2.465	1200
S1.014	o	225	SS5.011	19.800	17.122	2.453	1200
S1.015	o	225	SS5.010	19.750	17.084	2.441	1200
S1.016	o	300	SS5.009	19.700	17.047	2.353	1200
S1.017	o	300	SS5.008	18.350	16.550	1.500	1200
S1.018	o	300	SS5.007	18.250	16.450	1.500	1200
S3.000	o	225	SS5.039	20.950	19.150	1.575	1200
S3.001	o	225	SS5.038	20.880	19.080	1.575	1200
S3.002	o	225	SS5.037	20.850	19.050	1.575	1200
S4.000	o	225	SS5.040	20.050	18.250	1.575	1200
S3.003	o	300	SS5.036	20.100	18.217	1.583	1200
S5.000	o	225	SS5.043	21.250	19.450	1.575	1200
S5.001	o	225	SS5.042	20.500	18.700	1.575	1200
S5.002	o	225	SS5.041	20.250	17.505	2.520	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)
S1.012	7.030	200.0	SS5.012	19.850	17.160	2.465	1200
S1.013	7.590	200.0	SS5.011	19.800	17.122	2.453	1200
S1.014	7.515	200.0	SS5.010	19.750	17.084	2.441	1200
S1.015	7.485	200.0	SS5.009	19.700	17.047	2.428	1200
S1.016	88.580	178.2	SS5.008	18.350	16.550	1.500	1200
S1.017	8.910	89.1	SS5.007	18.250	16.450	1.500	1200
S1.018	14.120	86.3	SS5.007	18.500	16.286	1.914	1200
S3.000	10.365	148.1	SS5.038	20.880	19.080	1.575	1200
S3.001	3.565	118.8	SS5.037	20.850	19.050	1.575	1200
S3.002	54.515	65.4	SS5.036	20.100	18.217	1.658	1200
S4.000	5.500	166.7	SS5.036	20.100	18.217	1.658	1200
S3.003	6.415	200.0	SS5.035	20.250	18.185	1.765	1200
S5.000	39.580	52.8	SS5.042	20.500	18.700	1.575	1200
S5.001	6.270	25.1	SS5.041	20.250	18.450	1.575	1200
S5.002	1.000	200.0	SS5.035	20.250	17.500	2.525	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)
S3.004	o	300	SS5.035	20.250	17.500	2.450	1200
S3.005	o	225	SS5.034	20.250	17.495	2.530	1200
S3.006	o	225	SS5.033	20.200	17.443	2.532	1200
S3.007	o	225	SS5.032	20.000	17.395	2.380	1200
S3.008	o	225	SS5.031	20.000	17.318	2.457	1200
S1.019	o	300	SS5.007	18.500	16.286	1.914	1200
S1.020	o	300	SS5.006	18.250	15.500	2.450	1200
S1.021	o	300	SS5.005	18.250	15.495	2.455	1200
S1.022	o	300	SS5.004	17.500	15.445	1.755	1200
S1.023	o	300	SS5.003	17.250	15.220	1.730	1200
S6.000	o	225	SS5.073	21.700	19.900	1.575	1200
S6.001	o	300	SS5.072	21.350	19.550	1.500	1200
S7.000	o	300	SS5.071	20.000	18.200	1.500	1200
S7.001	o	300	SS5.070	19.825	17.920	1.605	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)
S3.004	1.000	200.0	SS5.034	20.250	17.495	2.455	1200
S3.005	10.450	200.0	SS5.033	20.200	17.443	2.532	1200
S3.006	9.470	200.0	SS5.032	20.000	17.395	2.380	1200
S3.007	15.560	200.0	SS5.031	20.000	17.318	2.457	1200
S3.008	42.142	40.8	SS5.007	18.500	16.286	1.989	1200
S1.019	6.220	200.0	SS5.006	18.250	16.255	1.696	1200
S1.020	1.000	200.0	SS5.005	18.250	15.495	2.455	1200
S1.021	14.915	300.0	SS5.004	17.500	15.445	1.755	1200
S1.022	67.640	300.0	SS5.003	17.250	15.220	1.730	1200
S1.023	13.960	300.0	SS5.002	17.250	15.173	1.777	1200
S6.000	54.290	155.1	SS5.072	21.350	19.550	1.575	1200
S6.001	102.855	65.2	SS5.069	19.800	17.973	1.527	1350
S7.000	55.965	200.0	SS5.070	19.825	17.920	1.605	1200
S7.001	6.995	200.0	SS5.069	19.800	17.885	1.615	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)
S6.002	o	450	SS5.069	19.800	17.885	1.465	1350
S6.003	o	450	SS5.068	19.400	17.625	1.325	1350
S6.004	o	450	SS5.067	19.350	17.599	1.301	1350
S6.005	o	450	SS5.066	19.250	17.515	1.285	1350
S8.000	o	225	SS5.078	21.550	19.750	1.575	1200
S8.001	o	225	SS5.077	21.250	19.450	1.575	1200
S8.002	o	225	SS5.076	21.200	19.400	1.575	1200
S8.003	o	300	SS5.075	21.150	19.350	1.500	1200
S8.004	o	300	SS5.074	19.550	17.750	1.500	1200
S6.006	o	450	SS5.065	19.350	17.465	1.435	1350
S9.000	o	225	SS5.083	20.450	18.650	1.575	1200
S9.001	o	225	SS5.082	19.700	17.900	1.575	1200
S9.002	o	225	SS5.081	19.675	17.875	1.575	1200
S9.003	o	300	SS5.080	19.300	17.500	1.500	1200
S9.004	o	300	SS5.079	19.300	17.478	1.522	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)
S6.002	51.945	200.0	SS5.068	19.400	17.625	1.325	1350
S6.003	5.380	200.0	SS5.067	19.350	17.599	1.301	1350
S6.004	16.785	200.0	SS5.066	19.250	17.515	1.285	1350
S6.005	9.955	200.0	SS5.065	19.350	17.465	1.435	1350
S8.000	45.080	150.3	SS5.077	21.250	19.450	1.575	1200
S8.001	6.182	123.6	SS5.076	21.200	19.400	1.575	1200
S8.002	7.560	151.2	SS5.075	21.150	19.350	1.575	1200
S8.003	82.815	51.8	SS5.074	19.550	17.750	1.500	1200
S8.004	11.735	58.7	SS5.065	19.350	17.550	1.500	1350
S6.006	4.355	200.0	SS5.064	19.300	17.443	1.407	1500
S9.000	41.870	55.8	SS5.082	19.700	17.900	1.575	1200
S9.001	3.265	130.6	SS5.081	19.675	17.875	1.575	1200
S9.002	46.055	122.8	SS5.080	19.300	17.500	1.575	1200
S9.003	4.425	200.0	SS5.079	19.300	17.478	1.522	1200
S9.004	1.000	200.0	SS5.064	19.300	17.473	1.527	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)
S6.007	o	525	SS5.064	19.300	16.700	2.075	1500
S6.008	o	225	SS5.063	19.300	16.695	2.380	1500
S6.009	o	300	SS5.062	19.200	16.641	2.259	1200
S6.010	o	300	SS5.061	17.800	16.444	1.056	1050
S6.011	o	300	SS5.060	17.850	16.381	1.169	1050
S6.012	o	375	SS5.059	17.900	16.356	1.169	1350
S10.000	o	225	SS5.088	21.000	19.200	1.575	1200
S10.001	o	225	SS5.087	20.500	18.700	1.575	1200
S10.002	o	225	SS5.086	19.000	17.200	1.575	1200
S10.003	o	225	SS5.085	18.975	17.175	1.575	1200
S10.004	o	225	SS5.084	18.500	16.700	1.575	1200
S6.013	o	375	SS5.058	18.250	16.055	1.820	1350
S6.014	o	375	SS5.057	18.250	16.037	1.838	1350
S6.015	o	375	SS5.056	18.250	16.013	1.862	1350
S6.016	o	225	SS5.055	18.250	16.009	2.016	1350
S6.017	o	225	SS5.054	18.000	15.848	1.927	1200
S6.018	o	225	SS5.053	18.000	15.812	1.963	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)
S6.007	1.000	200.0	SS5.063	19.300	16.695	2.080	1500
S6.008	10.730	200.0	SS5.062	19.200	16.641	2.334	1200
S6.009	59.065	299.8	SS5.061	17.800	16.444	1.056	1050
S6.010	19.120	300.0	SS5.060	17.850	16.381	1.169	1050
S6.011	7.460	300.0	SS5.059	17.900	16.356	1.244	1350
S6.012	90.270	300.0	SS5.058	18.250	16.055	1.820	1350
S10.000	75.345	150.7	SS5.087	20.500	18.700	1.575	1200
S10.001	70.615	47.1	SS5.086	19.000	17.200	1.575	1200
S10.002	2.900	116.0	SS5.085	18.975	17.175	1.575	1200
S10.003	27.345	57.6	SS5.084	18.500	16.700	1.575	1200
S10.004	26.645	106.6	SS5.058	18.250	16.450	1.575	1350
S6.013	5.445	300.0	SS5.057	18.250	16.037	1.838	1350
S6.014	7.250	300.0	SS5.056	18.250	16.013	1.862	1350
S6.015	1.000	300.0	SS5.055	18.250	16.009	1.866	1350
S6.016	48.350	300.3	SS5.054	18.000	15.848	1.927	1200
S6.017	10.970	300.0	SS5.053	18.000	15.812	1.963	1200
S6.018	30.040	300.0	SS5.052	18.000	15.712	2.064	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)
S6.019	o	225	SS5.052	18.000	15.712	2.064	1200
S6.020	o	225	SS5.051	17.750	15.651	1.874	1200
S6.021	o	300	SS5.050	17.700	15.559	1.841	1200
S6.022	o	300	SS5.049	17.300	15.434	1.566	1200
S11.000	o	225	SS5.090	17.800	16.000	1.575	1200
S11.001	o	225	SS5.089	17.300	15.500	1.575	1200
S11.002	o	225	SS5.047	17.250	15.450	1.575	1200
S6.023	o	300	SS5.048	17.250	15.419	1.531	1200
S6.024	o	300	SS5.046	17.250	15.416	1.534	1200
S6.025	o	300	SS5.045	17.250	15.401	1.549	1200
S6.026	o	300	SS5.044	17.250	15.228	1.722	1200
S1.024	o	300	SS5.002	17.250	15.173	1.777	1200
S1.025	o	300	SS5.001	17.250	15.081	1.869	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)
S6.019	18.235	300.0	SS5.051	17.750	15.651	1.874	1200
S6.020	27.655	300.0	SS5.050	17.700	15.559	1.916	1200
S6.021	37.250	300.0	SS5.049	17.300	15.434	1.566	1200
S6.022	4.575	300.0	SS5.048	17.250	15.419	1.531	1200
S11.000	17.392	34.8	SS5.089	17.300	15.500	1.575	1200
S11.001	8.310	166.2	SS5.047	17.250	15.450	1.575	1200
S11.002	1.000	200.0	SS5.048	17.250	15.445	1.580	1200
S6.023	1.000	300.0	SS5.046	17.250	15.416	1.534	1200
S6.024	4.495	299.7	SS5.045	17.250	15.401	1.549	1200
S6.025	51.835	300.0	SS5.044	17.250	15.228	1.722	1200
S6.026	14.050	300.0	SS5.002	17.250	15.181	1.769	1200
S1.024	27.635	300.0	SS5.001	17.250	15.081	1.869	1200
S1.025	4.375	300.0	SStream	16.050	15.067	0.683	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)
S1.025	SStream	16.050	15.067	15.045	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: SS5.013, DS/PN: S1.012, Volume (m³): 3.8

Design Head (m) 2.100 Hydro-Brake® Type Md4 Invert Level (m) 17.195
Design Flow (l/s) 4.8 Diameter (mm) 66

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.9	1.200	3.7	3.000	5.9	7.000	9.0
0.200	1.9	1.400	4.0	3.500	6.4	7.500	9.3
0.300	1.9	1.600	4.3	4.000	6.8	8.000	9.6
0.400	2.2	1.800	4.6	4.500	7.2	8.500	9.9
0.500	2.4	2.000	4.8	5.000	7.6	9.000	10.2
0.600	2.6	2.200	5.0	5.500	8.0	9.500	10.5
0.800	3.0	2.400	5.3	6.000	8.3		
1.000	3.4	2.600	5.5	6.500	8.7		

Hydro-Brake® Manhole: SS5.034, DS/PN: S3.005, Volume (m³): 3.1

Design Head (m) 2.000 Hydro-Brake® Type Md4 Invert Level (m) 17.495
Design Flow (l/s) 1.9 Diameter (mm) 42

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.7	1.200	1.5	3.000	2.4	7.000	3.6
0.200	0.6	1.400	1.6	3.500	2.6	7.500	3.8
0.300	0.8	1.600	1.7	4.000	2.7	8.000	3.9
0.400	0.9	1.800	1.8	4.500	2.9	8.500	4.0
0.500	1.0	2.000	1.9	5.000	3.1	9.000	4.1
0.600	1.1	2.200	2.0	5.500	3.2	9.500	4.2
0.800	1.2	2.400	2.1	6.000	3.4		
1.000	1.4	2.600	2.2	6.500	3.5		

Hydro-Brake® Manhole: SS5.005, DS/PN: S1.021, Volume (m³): 3.1

Design Head (m) 2.200 Hydro-Brake® Type Md4 Invert Level (m) 15.495
Design Flow (l/s) 8.6 Diameter (mm) 87

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	1.200	6.5	3.000	10.2	7.000	15.6
0.200	4.4	1.400	7.0	3.500	11.0	7.500	16.2
0.300	3.7	1.600	7.5	4.000	11.8	8.000	16.7
0.400	3.8	1.800	7.9	4.500	12.5	8.500	17.2
0.500	4.2	2.000	8.3	5.000	13.2	9.000	17.7
0.600	4.6	2.200	8.7	5.500	13.8	9.500	18.2
0.800	5.3	2.400	9.1	6.000	14.4		
1.000	5.9	2.600	9.5	6.500	15.0		

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Hydro-Brake® Manhole: SS5.063, DS/PN: S6.008, Volume (m³): 4.5

Design Head (m) 2.000 Hydro-Brake® Type Md4 Invert Level (m) 16.695
Design Flow (l/s) 7.9 Diameter (mm) 85

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	1.200	6.2	3.000	9.8	7.000	14.9
0.200	4.1	1.400	6.7	3.500	10.5	7.500	15.4
0.300	3.5	1.600	7.1	4.000	11.3	8.000	15.9
0.400	3.6	1.800	7.6	4.500	11.9	8.500	16.4
0.500	4.0	2.000	8.0	5.000	12.6	9.000	16.9
0.600	4.4	2.200	8.4	5.500	13.2	9.500	17.4
0.800	5.0	2.400	8.7	6.000	13.8		
1.000	5.6	2.600	9.1	6.500	14.4		

Hydro-Brake® Manhole: SS5.055, DS/PN: S6.016, Volume (m³): 3.2

Design Head (m) 1.700 Hydro-Brake® Type Md4 Invert Level (m) 16.009
Design Flow (l/s) 10.1 Diameter (mm) 99

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.0	1.200	8.4	3.000	13.2	7.000	20.2
0.200	6.1	1.400	9.0	3.500	14.3	7.500	20.9
0.300	5.4	1.600	9.7	4.000	15.3	8.000	21.6
0.400	5.1	1.800	10.2	4.500	16.2	8.500	22.3
0.500	5.5	2.000	10.8	5.000	17.1	9.000	22.9
0.600	5.9	2.200	11.3	5.500	17.9	9.500	23.5
0.800	6.8	2.400	11.8	6.000	18.7		
1.000	7.6	2.600	12.3	6.500	19.5		

Hydro-Brake® Manhole: SS5.046, DS/PN: S6.024, Volume (m³): 2.1

Design Head (m) 1.500 Hydro-Brake® Type Md4 Invert Level (m) 15.416
Design Flow (l/s) 11.1 Diameter (mm) 108

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.2	1.200	10.0	3.000	15.7	7.000	24.0
0.200	7.5	1.400	10.8	3.500	17.0	7.500	24.9
0.300	7.0	1.600	11.5	4.000	18.2	8.000	25.7
0.400	6.3	1.800	12.2	4.500	19.3	8.500	26.5
0.500	6.6	2.000	12.9	5.000	20.3	9.000	27.3
0.600	7.1	2.200	13.5	5.500	21.3	9.500	28.0
0.800	8.1	2.400	14.1	6.000	22.3		
1.000	9.1	2.600	14.7	6.500	23.2		

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Storage Structures for Storm

Tank or Pond Manhole: SS5.013, DS/PN: S1.012

Invert Level (m) 17.195

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	264.0	2.100	264.0

Tank or Pond Manhole: SS5.034, DS/PN: S3.005

Invert Level (m) 17.495

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	232.0	2.000	232.0

Tank or Pond Manhole: SS5.005, DS/PN: S1.021

Invert Level (m) 15.495

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	103.5	2.200	103.5

Tank or Pond Manhole: SS5.063, DS/PN: S6.008

Invert Level (m) 16.695

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	389.0	2.000	389.0

Tank or Pond Manhole: SS5.055, DS/PN: S6.016

Invert Level (m) 16.009

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	210.0	1.750	210.0

Tank or Pond Manhole: SS5.046, DS/PN: S6.024

Invert Level (m) 15.416

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	117.0	1.500	117.0

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Summary of Results for 30 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S1.000	SS5.025	21.514	1.064	0.000	0.71	0.0	45.2	SURCHARGED
S1.001	SS5.024	21.173	1.498	0.000	1.08	0.0	69.6	FLOOD RISK
S1.002	SS5.023	20.019	1.344	0.000	2.32	0.0	69.5	FLOOD RISK
S1.003	SS5.022	19.781	1.136	0.000	2.37	0.0	70.8	SURCHARGED
S1.004	SS5.021	19.547	0.857	0.000	1.14	0.0	100.5	SURCHARGED
S1.005	SS5.020	19.101	0.751	0.000	1.65	0.0	101.1	SURCHARGED
S1.006	SS5.019	18.937	0.637	0.000	1.67	0.0	102.6	SURCHARGED
S1.007	SS5.018	18.769	0.519	0.000	1.69	0.0	104.0	SURCHARGED
S1.008	SS5.017	18.598	0.398	0.000	1.64	0.0	106.8	SURCHARGED
S2.000	SS5.030	21.526	0.901	0.000	0.66	0.0	43.3	SURCHARGED
S2.001	SS5.029	21.280	1.405	0.000	1.23	0.0	38.9	FLOOD RISK
S2.002	SS5.028	21.207	1.382	0.000	1.34	0.0	42.2	FLOOD RISK
S2.003	SS5.027	21.133	1.358	0.000	1.38	0.0	65.8	FLOOD RISK
S2.004	SS5.026	20.108	0.908	0.000	1.21	0.0	91.6	SURCHARGED
S1.009	SS5.016	18.407	0.128	0.000	1.12	0.0	212.3	SURCHARGED
S1.010	SS5.015	18.257	0.096	0.000	1.65	0.0	211.9	SURCHARGED
S1.011	SS5.014	18.003	0.353	0.000	1.59	0.0	212.1	SURCHARGED
S1.012	SS5.013	18.002	0.582	0.000	0.11	0.0	3.0	SURCHARGED
S1.013	SS5.012	17.509	0.124	0.000	0.20	0.0	5.9	SURCHARGED
S1.014	SS5.011	17.515	0.168	0.000	0.36	0.0	10.4	SURCHARGED
S1.015	SS5.010	17.520	0.210	0.000	0.69	0.0	20.0	SURCHARGED
S1.016	SS5.009	17.509	0.162	0.000	0.97	0.0	77.5	SURCHARGED
S1.017	SS5.008	17.048	0.198	0.000	1.01	0.0	80.3	SURCHARGED
S1.018	SS5.007	16.958	0.208	0.000	0.89	0.0	88.0	SURCHARGED
S3.000	SS5.039	19.949	0.574	0.000	0.47	0.0	16.8	SURCHARGED
S3.001	SS5.038	19.931	0.626	0.000	0.70	0.0	20.9	SURCHARGED
S3.002	SS5.037	19.925	0.650	0.000	1.26	0.0	77.8	SURCHARGED
S4.000	SS5.040	18.574	0.099	0.000	0.09	0.0	2.7	SURCHARGED
S3.003	SS5.036	18.572	0.055	0.000	1.43	0.0	79.5	SURCHARGED
S5.000	SS5.043	19.588	-0.087	0.000	0.69	0.0	47.2	OK
S5.001	SS5.042	18.835	-0.090	0.000	0.67	0.0	47.2	OK
S5.002	SS5.041	18.137	0.407	0.000	1.55	0.0	46.4	SURCHARGED
S3.004	SS5.035	18.028	0.228	0.000	2.17	0.0	124.8	SURCHARGED
S3.005	SS5.034	17.870	0.150	0.000	0.03	0.0	0.8	SURCHARGED
S3.006	SS5.033	17.499	-0.169	0.000	0.04	0.0	1.1	OK
S3.007	SS5.032	17.499	-0.122	0.000	0.27	0.0	8.7	OK
S3.008	SS5.031	17.482	-0.060	0.000	0.80	0.0	62.2	OK
S1.019	SS5.007	16.839	0.253	0.000	2.49	0.0	137.1	SURCHARGED
S1.020	SS5.006	16.419	0.619	0.000	2.35	0.0	135.3	SURCHARGED
S1.021	SS5.005	16.418	0.623	0.000	0.11	0.0	5.6	SURCHARGED
S1.022	SS5.004	15.506	-0.239	0.000	0.09	0.0	5.6	OK
S1.023	SS5.003	15.294	-0.226	0.000	0.11	0.0	5.6	OK
S6.000	SS5.073	21.273	1.148	0.000	1.08	0.0	43.4	SURCHARGED
S6.001	SS5.072	20.881	1.031	0.000	0.99	0.0	133.0	SURCHARGED

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Denis O'Sullivan & Associates		Page 22
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Carriganarra LRD Carriganarra Ballincollig, Cork	
Date 09/12/2025 File SW MODEL.MDX	Designed By S.O.'Grady Checked By	
Micro Drainage	Network W.12.4	

Summary of Results for 30 minute 100 year Summer (Storm)

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
S7.000	SS5.071	19.658	1.158	0.000	0.96	0.0	71.4	SURCHARGED
S7.001	SS5.070	19.404	1.183	0.000	1.25	0.0	70.9	SURCHARGED
S6.002	SS5.069	19.327	0.991	0.000	1.18	0.0	246.1	SURCHARGED
S6.003	SS5.068	18.962	0.886	0.000	1.86	0.0	245.5	SURCHARGED
S6.004	SS5.067	18.771	0.722	0.000	1.51	0.0	254.9	SURCHARGED
S6.005	SS5.066	18.563	0.598	0.000	1.61	0.0	255.5	SURCHARGED
S8.000	SS5.078	20.767	0.792	0.000	1.22	0.0	49.3	SURCHARGED
S8.001	SS5.077	20.296	0.621	0.000	1.72	0.0	54.1	SURCHARGED
S8.002	SS5.076	20.173	0.548	0.000	1.86	0.0	58.5	SURCHARGED
S8.003	SS5.075	20.047	0.397	0.000	0.94	0.0	140.6	SURCHARGED
S8.004	SS5.074	18.652	0.602	0.000	1.23	0.0	137.3	SURCHARGED
S6.006	SS5.065	18.356	0.441	0.000	3.19	0.0	391.4	SURCHARGED
S9.000	SS5.083	19.333	0.458	0.000	0.53	0.0	35.3	SURCHARGED
S9.001	SS5.082	19.115	0.990	0.000	1.26	0.0	37.3	SURCHARGED
S9.002	SS5.081	19.056	0.956	0.000	1.70	0.0	76.1	SURCHARGED
S9.003	SS5.080	17.941	0.141	0.000	1.52	0.0	76.0	SURCHARGED
S9.004	SS5.079	17.850	0.072	0.000	1.31	0.0	75.7	SURCHARGED
S6.007	SS5.064	17.710	0.485	0.000	2.55	0.0	466.3	SURCHARGED
S6.008	SS5.063	17.709	0.789	0.000	0.18	0.0	5.6	SURCHARGED
S6.009	SS5.062	17.267	0.326	0.000	0.59	0.0	35.9	SURCHARGED
S6.010	SS5.061	17.225	0.481	0.000	0.60	0.0	33.1	SURCHARGED
S6.011	SS5.060	17.193	0.513	0.000	0.69	0.0	32.5	SURCHARGED
S6.012	SS5.059	17.177	0.446	0.000	0.87	0.0	95.2	SURCHARGED
S10.000	SS5.088	19.343	-0.082	0.000	0.69	0.0	28.3	OK
S10.001	SS5.087	19.035	0.110	0.000	0.81	0.0	59.9	SURCHARGED
S10.002	SS5.086	18.250	0.825	0.000	1.87	0.0	56.0	SURCHARGED
S10.003	SS5.085	18.108	0.708	0.000	1.07	0.0	67.9	SURCHARGED
S10.004	SS5.084	17.578	0.653	0.000	1.61	0.0	74.9	SURCHARGED
S6.013	SS5.058	16.928	0.499	0.000	2.25	0.0	169.9	SURCHARGED
S6.014	SS5.057	16.742	0.331	0.000	2.17	0.0	169.2	SURCHARGED
S6.015	SS5.056	16.627	0.239	0.000	1.85	0.0	169.1	SURCHARGED
S6.016	SS5.055	16.626	0.392	0.000	0.21	0.0	6.0	SURCHARGED
S6.017	SS5.054	16.023	-0.050	0.000	0.38	0.0	9.6	OK
S6.018	SS5.053	16.020	-0.016	0.000	0.39	0.0	10.8	OK
S6.019	SS5.052	16.045	0.109	0.000	0.51	0.0	13.6	SURCHARGED
S6.020	SS5.051	16.061	0.185	0.000	1.02	0.0	28.1	SURCHARGED
S6.021	SS5.050	15.970	0.112	0.000	1.02	0.0	60.4	SURCHARGED
S6.022	SS5.049	15.835	0.101	0.000	1.26	0.0	59.4	SURCHARGED
S11.000	SS5.090	16.082	-0.143	0.000	0.29	0.0	22.7	OK
S11.001	SS5.089	15.838	0.113	0.000	0.68	0.0	21.3	SURCHARGED
S11.002	SS5.047	15.826	0.151	0.000	0.71	0.0	21.3	SURCHARGED
S6.023	SS5.048	15.826	0.107	0.000	1.40	0.0	80.4	SURCHARGED
S6.024	SS5.046	15.825	0.109	0.000	0.16	0.0	7.4	SURCHARGED
S6.025	SS5.045	15.470	-0.230	0.000	0.12	0.0	7.3	OK
S6.026	SS5.044	15.305	-0.223	0.000	0.14	0.0	7.3	OK
S1.024	SS5.002	15.268	-0.206	0.000	0.22	0.0	12.5	OK
S1.025	SS5.001	15.185	-0.196	0.000	0.26	0.0	12.5	OK

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Appendix F – Foul Sewer Design Sheets

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	47.460	0.791	60.0	0.000	6	0.0	1.500	o	150
F1.001	61.005	1.017	60.0	0.000	4	0.0	1.500	o	150
F1.002	4.440	0.030	150.0	0.000	0	0.0	1.500	o	150
F1.003	3.880	0.026	150.0	0.000	0	0.0	1.500	o	150
F1.004	48.890	0.326	150.0	0.000	6	0.0	1.500	o	150
F1.005	6.315	0.042	150.0	0.000	0	0.0	1.500	o	150
F1.006	7.025	0.047	150.0	0.000	0	0.0	1.500	o	150
F1.007	6.875	0.046	150.0	0.000	0	0.0	1.500	o	150
F1.008	11.345	0.076	150.0	0.000	0	0.0	1.500	o	150
F2.000	42.915	0.780	55.0	0.000	4	0.0	1.500	o	150
F2.001	4.530	0.076	59.6	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)
F1.000	19.875	0.000	0.0	6	0.0	11	0.34	1.13	20.0	0.2
F1.001	19.084	0.000	0.0	10	0.0	13	0.40	1.13	20.0	0.3
F1.002	18.067	0.000	0.0	10	0.0	17	0.29	0.71	12.6	0.3
F1.003	18.037	0.000	0.0	10	0.0	17	0.29	0.71	12.6	0.3
F1.004	18.012	0.000	0.0	16	0.0	21	0.34	0.71	12.6	0.5
F1.005	17.686	0.000	0.0	16	0.0	21	0.34	0.71	12.6	0.5
F1.006	17.643	0.000	0.0	16	0.0	21	0.34	0.71	12.6	0.5
F1.007	17.597	0.000	0.0	16	0.0	21	0.34	0.71	12.6	0.5
F1.008	17.551	0.000	0.0	16	0.0	21	0.34	0.71	12.6	0.5
F2.000	20.050	0.000	0.0	4	0.0	9	0.31	1.18	20.9	0.1
F2.001	19.270	0.000	0.0	4	0.0	9	0.30	1.14	20.1	0.1

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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)
F2.002	5.255	0.088	59.7	0.000	0	0.0	1.500	o	150
F2.003	63.885	1.065	60.0	0.000	5	0.0	1.500	o	150
F2.004	49.780	0.496	100.4	0.000	5	0.0	1.500	o	150
F1.009	28.895	0.193	150.0	0.000	2	0.0	1.500	o	225
F1.010	7.865	0.052	150.0	0.000	0	0.0	1.500	o	225
F1.011	7.865	0.052	150.0	0.000	0	0.0	1.500	o	225
F1.012	7.865	0.052	150.0	0.000	1	0.0	1.500	o	225
F1.013	89.790	0.876	102.5	0.000	9	0.0	1.500	o	225
F1.014	10.235	0.100	102.4	0.000	0	0.0	1.500	o	225
F3.000	13.180	0.220	59.9	0.000	2	0.0	1.500	o	150
F3.001	66.485	1.108	60.0	0.000	8	0.0	1.500	o	150
F4.000	56.330	1.050	53.6	0.000	6	0.0	1.500	o	150
F4.001	10.540	0.578	18.2	0.000	0	0.0	1.500	o	150
F3.002	18.555	0.124	150.0	0.000	0	0.0	1.500	o	150
F3.003	57.335	1.248	45.9	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)
F2.002	19.194	0.000	0.0	4	0.0	9	0.30	1.13	20.1	0.1
F2.003	19.106	0.000	0.0	9	0.0	13	0.39	1.13	20.0	0.3
F2.004	18.041	0.000	0.0	14	0.0	18	0.37	0.87	15.4	0.4
F1.009	17.475	0.000	0.0	32	0.0	25	0.40	0.94	37.2	1.0
F1.010	17.283	0.000	0.0	32	0.0	25	0.40	0.94	37.2	1.0
F1.011	17.230	0.000	0.0	32	0.0	25	0.40	0.94	37.2	1.0
F1.012	17.178	0.000	0.0	33	0.0	26	0.40	0.94	37.2	1.0
F1.013	17.125	0.000	0.0	42	0.0	26	0.49	1.13	45.1	1.3
F1.014	16.249	0.000	0.0	42	0.0	26	0.49	1.13	45.1	1.3
F3.000	18.850	0.000	0.0	2	0.0	6	0.24	1.13	20.0	0.1
F3.001	18.630	0.000	0.0	10	0.0	13	0.40	1.13	20.0	0.3
F4.000	19.150	0.000	0.0	6	0.0	10	0.35	1.20	21.2	0.2
F4.001	18.100	0.000	0.0	6	0.0	8	0.51	2.06	36.4	0.2
F3.002	17.522	0.000	0.0	16	0.0	21	0.34	0.71	12.6	0.5
F3.003	17.398	0.000	0.0	20	0.0	16	0.52	1.70	67.4	0.6

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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)
F1.015	16.250	0.677	24.0	0.000	0	0.0	1.500	o	225
F1.016	63.255	0.316	200.0	0.000	0	0.0	1.500	o	225
F1.017	17.995	0.090	200.0	0.000	0	0.0	1.500	o	225
F5.000	54.290	0.905	60.0	0.000	6	0.0	1.500	o	150
F5.001	44.170	0.736	60.0	0.000	6	0.0	1.500	o	150
F5.002	58.685	0.391	150.0	0.000	8	0.0	1.500	o	225
F6.000	55.350	0.923	60.0	0.000	38	0.0	1.500	o	225
F6.001	9.985	0.067	150.0	0.000	0	0.0	1.500	o	225
F5.003	52.660	0.351	150.0	0.000	7	0.0	1.500	o	225
F5.004	20.655	0.138	149.2	0.000	0	0.0	1.500	o	225
F7.000	48.095	0.802	60.0	0.000	6	0.0	1.500	o	150
F7.001	7.195	0.120	60.0	0.000	0	0.0	1.500	o	150
F7.002	5.800	0.097	59.8	0.000	0	0.0	1.500	o	150
F7.003	85.045	1.417	60.0	0.000	9	0.0	1.500	o	225
F7.004	18.620	0.593	31.4	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)
F1.015	16.149	0.000	0.0	62	0.0	23	0.93	2.35	93.4	1.9
F1.016	15.472	0.000	0.0	62	0.0	37	0.44	0.81	32.2	1.9
F1.017	15.156	0.000	0.0	62	0.0	37	0.44	0.81	32.2	1.9
F5.000	19.600	0.000	0.0	6	0.0	11	0.34	1.13	20.0	0.2
F5.001	18.695	0.000	0.0	12	0.0	14	0.42	1.13	20.0	0.4
F5.002	17.959	0.000	0.0	20	0.0	20	0.34	0.94	37.2	0.6
F6.000	17.900	0.000	0.0	38	0.0	22	0.58	1.48	59.0	1.2
F6.001	16.977	0.000	0.0	38	0.0	28	0.42	0.94	37.2	1.2
F5.003	16.910	0.000	0.0	65	0.0	36	0.50	0.94	37.2	2.0
F5.004	16.559	0.000	0.0	65	0.0	36	0.50	0.94	37.3	2.0
F7.000	19.450	0.000	0.0	6	0.0	11	0.34	1.13	20.0	0.2
F7.001	18.648	0.000	0.0	6	0.0	11	0.34	1.13	20.0	0.2
F7.002	18.528	0.000	0.0	6	0.0	11	0.34	1.13	20.0	0.2
F7.003	18.431	0.000	0.0	15	0.0	15	0.43	1.48	59.0	0.5
F7.004	17.014	0.000	0.0	15	0.0	12	0.53	2.05	81.6	0.5

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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)
F8.000	41.435	0.700	59.2	0.000	6	0.0	1.500	o	150
F8.001	54.985	1.178	46.7	0.000	8	0.0	1.500	o	150
F5.005	66.480	0.722	92.1	0.000	4	0.0	1.500	o	225
F9.000	48.710	0.812	60.0	0.000	4	0.0	1.500	o	150
F9.001	30.495	0.508	60.0	0.000	4	0.0	1.500	o	150
F9.002	59.835	0.399	150.0	0.000	8	0.0	1.500	o	225
F9.003	59.840	0.399	150.0	0.000	16	0.0	1.500	o	225
F9.004	7.565	0.050	150.0	0.000	0	0.0	1.500	o	225
F9.005	16.225	0.108	150.0	0.000	0	0.0	1.500	o	225
F10.000	90.000	0.450	200.0	0.000	0	0.0	1.500	o	300
F10.001	67.230	0.336	200.0	0.000	0	0.0	1.500	o	300
F10.002	88.137	0.441	200.0	0.000	0	0.0	1.500	o	300
F10.003	34.150	0.171	200.0	0.000	0	0.0	1.500	o	300
F5.006	24.925	0.125	200.0	0.000	0	0.0	1.500	o	300
F5.007	26.775	0.134	200.0	0.000	0	0.0	1.500	o	300
F5.008	35.440	0.177	200.0	0.000	0	0.0	1.500	o	300

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)
F8.000	18.300	0.000	0.0	6	0.0	11	0.34	1.14	20.1	0.2
F8.001	17.600	0.000	0.0	14	0.0	15	0.49	1.28	22.7	0.4
F5.005	16.421	0.000	0.0	98	0.0	39	0.67	1.20	47.6	3.0
F9.000	17.600	0.000	0.0	4	0.0	9	0.30	1.13	20.0	0.1
F9.001	16.788	0.000	0.0	8	0.0	12	0.37	1.13	20.0	0.2
F9.002	16.280	0.000	0.0	16	0.0	18	0.32	0.94	37.2	0.5
F9.003	15.881	0.000	0.0	32	0.0	25	0.40	0.94	37.2	1.0
F9.004	15.482	0.000	0.0	32	0.0	25	0.40	0.94	37.2	1.0
F9.005	15.432	0.000	0.0	32	0.0	25	0.40	0.94	37.2	1.0
F10.000	16.721	0.000	0.0	0	0.0	0	0.00	0.98	69.2	0.0
F10.001	16.271	0.000	0.0	0	0.0	0	0.00	0.98	69.2	0.0
F10.002	15.935	0.000	0.0	0	0.0	0	0.00	0.98	69.2	0.0
F10.003	15.494	0.000	0.0	0	0.0	0	0.00	0.98	69.2	0.0
F5.006	15.323	0.000	0.0	130	0.0	49	0.53	0.98	69.2	4.0
F5.007	15.199	0.000	0.0	130	0.0	49	0.53	0.98	69.2	4.0
F5.008	15.065	0.000	0.0	130	0.0	49	0.53	0.98	69.2	4.0

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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)
F5.009	12.630	0.063	200.0	0.000	0	0.0	1.500	o	300
F11.000	23.785	0.825	28.8	0.000	4	0.0	1.500	o	150
F5.010	9.285	0.046	200.0	0.000	0	0.0	1.500	o	300
F5.011	53.165	0.266	200.0	0.000	0	0.0	1.500	o	300
F5.012	15.795	0.079	200.0	0.000	0	0.0	1.500	o	300
F1.018	21.825	0.109	200.0	0.000	0	0.0	1.500	o	300
F1.019	5.010	0.025	200.0	0.000	0	0.0	1.500	o	300

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)
F5.009	14.888	0.000	0.0	130	0.0	49	0.53	0.98	69.2	4.0
F11.000	15.650	0.000	0.0	4	0.0	7	0.38	1.64	28.9	0.1
F5.010	14.825	0.000	0.0	134	0.0	50	0.54	0.98	69.2	4.2
F5.011	14.778	0.000	0.0	134	0.0	50	0.54	0.98	69.2	4.2
F5.012	14.512	0.000	0.0	134	0.0	50	0.54	0.98	69.2	4.2
F1.018	14.433	0.000	0.0	196	0.0	60	0.60	0.98	69.2	6.1
F1.019	14.324	0.000	0.0	196	0.0	60	0.60	0.98	69.2	6.1

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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)
FFS.049	22.025	2.150	1200	F1.000	19.875	150				
FFS.048	21.250	2.166	1200	F1.001	19.084	150	F1.000	19.084	150	
FFS.047	20.250	2.183	1200	F1.002	18.067	150	F1.001	18.067	150	
FFS.046	20.220	2.183	1200	F1.003	18.037	150	F1.002	18.037	150	
FFS.045	20.190	2.178	1200	F1.004	18.012	150	F1.003	18.012	150	
FFS.044	19.850	2.164	1200	F1.005	17.686	150	F1.004	17.686	150	
FFS.043	19.800	2.157	1200	F1.006	17.643	150	F1.005	17.643	150	
FFS.042	19.750	2.153	1200	F1.007	17.597	150	F1.006	17.597	150	
FFS.041	19.900	2.349	1200	F1.008	17.551	150	F1.007	17.551	150	
FFS.054	22.200	2.150	1200	F2.000	20.050	150				
FFS.053	21.420	2.150	1200	F2.001	19.270	150	F2.000	19.270	150	
FFS.052	21.360	2.166	1200	F2.002	19.194	150	F2.001	19.194	150	
FFS.051	21.330	2.224	1200	F2.003	19.106	150	F2.002	19.106	150	
FFS.050	20.775	2.734	1200	F2.004	18.041	150	F2.003	18.041	150	
FFS.040	20.040	2.565	1200	F1.009	17.475	225	F1.008	17.475	150	
							F2.004	17.545	150	
FFS.039	19.850	2.568	1200	F1.010	17.283	225	F1.009	17.283	225	
FFS.038	19.800	2.570	1200	F1.011	17.230	225	F1.010	17.230	225	
FFS.037	19.750	2.572	1200	F1.012	17.178	225	F1.011	17.178	225	
FFS.036	19.700	2.575	1200	F1.013	17.125	225	F1.012	17.125	225	
FFS.035	18.350	2.101	1200	F1.014	16.249	225	F1.013	16.249	225	
FFS.060	20.950	2.100	1200	F3.000	18.850	150				
FFS.059	20.850	2.220	1200	F3.001	18.630	150	F3.000	18.630	150	
FFS.058	21.250	2.100	1200	F4.000	19.150	150				
FFS.057	20.200	2.100	1200	F4.001	18.100	150	F4.000	18.100	150	
FFS.056	20.000	2.478	1200	F3.002	17.522	150	F3.001	17.522	150	
							F4.001	17.522	150	
FFS.055	20.000	2.602	1200	F3.003	17.398	225	F3.002	17.398	150	
FFS.034	18.250	2.101	1200	F1.015	16.149	225	F1.014	16.149	225	
							F3.003	16.150	225	1
FFS.033	17.500	2.028	1200	F1.016	15.472	225	F1.015	15.472	225	
FFS.032	17.250	2.094	1200	F1.017	15.156	225	F1.016	15.156	225	
FFS.018	21.700	2.100	1200	F5.000	19.600	150				
FFS.017	21.350	2.655	1200	F5.001	18.695	150	F5.000	18.695	150	
FFS.016	20.670	2.711	1200	F5.002	17.959	225	F5.001	17.959	150	
FFS.015	20.000	2.100	1200	F6.000	17.900	225				
FFS.014	19.825	2.848	1200	F6.001	16.977	225	F6.000	16.977	225	
FFS.013	19.800	2.890	1200	F5.003	16.910	225	F5.002	17.568	225	657
							F6.001	16.910	225	
FFS.012	19.400	2.841	1200	F5.004	16.559	225	F5.003	16.559	225	
FFS.023	21.550	2.100	1200	F7.000	19.450	150				
FFS.022	21.250	2.602	1200	F7.001	18.648	150	F7.000	18.648	150	
FFS.021	21.200	2.672	1200	F7.002	18.528	150	F7.001	18.528	150	
FFS.020	21.150	2.719	1200	F7.003	18.431	225	F7.002	18.431	150	
FFS.019	19.550	2.536	1200	F7.004	17.014	225	F7.003	17.014	225	
FFS.025	20.400	2.100	1200	F8.000	18.300	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)
FFS.024	19.700	2.100	1200	F8.001	17.600	150	F8.000	17.600	150	
FFS.011	19.250	2.829	1200	F5.005	16.421	225	F5.004	16.421	225	
							F7.004	16.421	225	
							F8.001	16.422	150	
FFS.031	19.700	2.100	1200	F9.000	17.600	150				
FFS.030	19.000	2.212	1200	F9.001	16.788	150	F9.000	16.788	150	
FFS.029	18.500	2.220	1200	F9.002	16.280	225	F9.001	16.280	150	
FFS.028	18.000	2.119	1200	F9.003	15.881	225	F9.002	15.881	225	
FFS.027	17.900	2.418	1200	F9.004	15.482	225	F9.003	15.482	225	
FFS.026	17.850	2.418	1200	F9.005	15.432	225	F9.004	15.432	225	
FFS.064	19.890	3.169	1200	F10.000	16.721	300				
FFS.063	19.075	2.804	1200	F10.001	16.271	300	F10.000	16.271	300	
FFS.062	18.400	2.465	1200	F10.002	15.935	300	F10.001	15.935	300	
FFS.061	18.000	2.506	1200	F10.003	15.494	300	F10.002	15.494	300	
FFS.010	17.800	2.477	1200	F5.006	15.323	300	F5.005	15.699	225	301
							F9.005	15.323	225	
							F10.003	15.323	300	
FFS.009	17.750	2.551	1200	F5.007	15.199	300	F5.006	15.199	300	
FFS.008	17.700	2.635	1200	F5.008	15.065	300	F5.007	15.065	300	
FFS.007	17.800	2.912	1200	F5.009	14.888	300	F5.008	14.888	300	
FFS.032	17.750	2.100	1200	F11.000	15.650	150				
FFS.006	17.250	2.425	1200	F5.010	14.825	300	F5.009	14.825	300	
							F11.000	14.825	150	
FFS.005	17.250	2.472	1200	F5.011	14.778	300	F5.010	14.778	300	
FFS.004	17.250	2.738	1200	F5.012	14.512	300	F5.011	14.512	300	
FFS.003	17.250	2.817	1200	F1.018	14.433	300	F1.017	15.066	225	558
							F5.012	14.433	300	
FFS.002	17.250	2.926	1200	F1.019	14.324	300	F1.018	14.324	300	
FFS.001	17.250	2.951	0		OUTFALL		F1.019	14.299	300	

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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	FFS.049	22.025	19.875	2.000	1200
F1.001	o	150	FFS.048	21.250	19.084	2.016	1200
F1.002	o	150	FFS.047	20.250	18.067	2.033	1200
F1.003	o	150	FFS.046	20.220	18.037	2.033	1200
F1.004	o	150	FFS.045	20.190	18.012	2.028	1200
F1.005	o	150	FFS.044	19.850	17.686	2.014	1200
F1.006	o	150	FFS.043	19.800	17.643	2.007	1200
F1.007	o	150	FFS.042	19.750	17.597	2.003	1200
F1.008	o	150	FFS.041	19.900	17.551	2.199	1200
F2.000	o	150	FFS.054	22.200	20.050	2.000	1200
F2.001	o	150	FFS.053	21.420	19.270	2.000	1200
F2.002	o	150	FFS.052	21.360	19.194	2.016	1200
F2.003	o	150	FFS.051	21.330	19.106	2.074	1200
F2.004	o	150	FFS.050	20.775	18.041	2.584	1200
F1.009	o	225	FFS.040	20.040	17.475	2.340	1200
F1.010	o	225	FFS.039	19.850	17.283	2.343	1200
F1.011	o	225	FFS.038	19.800	17.230	2.345	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	47.460	60.0	FFS.048	21.250	19.084	2.016	1200
F1.001	61.005	60.0	FFS.047	20.250	18.067	2.033	1200
F1.002	4.440	150.0	FFS.046	20.220	18.037	2.033	1200
F1.003	3.880	150.0	FFS.045	20.190	18.012	2.028	1200
F1.004	48.890	150.0	FFS.044	19.850	17.686	2.014	1200
F1.005	6.315	150.0	FFS.043	19.800	17.643	2.007	1200
F1.006	7.025	150.0	FFS.042	19.750	17.597	2.003	1200
F1.007	6.875	150.0	FFS.041	19.900	17.551	2.199	1200
F1.008	11.345	150.0	FFS.040	20.040	17.475	2.415	1200
F2.000	42.915	55.0	FFS.053	21.420	19.270	2.000	1200
F2.001	4.530	59.6	FFS.052	21.360	19.194	2.016	1200
F2.002	5.255	59.7	FFS.051	21.330	19.106	2.074	1200
F2.003	63.885	60.0	FFS.050	20.775	18.041	2.584	1200
F2.004	49.780	100.4	FFS.040	20.040	17.545	2.345	1200
F1.009	28.895	150.0	FFS.039	19.850	17.283	2.343	1200
F1.010	7.865	150.0	FFS.038	19.800	17.230	2.345	1200
F1.011	7.865	150.0	FFS.037	19.750	17.178	2.347	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)
F1.012	o	225	FFS.037	19.750	17.178	2.347	1200
F1.013	o	225	FFS.036	19.700	17.125	2.350	1200
F1.014	o	225	FFS.035	18.350	16.249	1.876	1200
F3.000	o	150	FFS.060	20.950	18.850	1.950	1200
F3.001	o	150	FFS.059	20.850	18.630	2.070	1200
F4.000	o	150	FFS.058	21.250	19.150	1.950	1200
F4.001	o	150	FFS.057	20.200	18.100	1.950	1200
F3.002	o	150	FFS.056	20.000	17.522	2.328	1200
F3.003	o	225	FFS.055	20.000	17.398	2.377	1200
F1.015	o	225	FFS.034	18.250	16.149	1.876	1200
F1.016	o	225	FFS.033	17.500	15.472	1.803	1200
F1.017	o	225	FFS.032	17.250	15.156	1.869	1200
F5.000	o	150	FFS.018	21.700	19.600	1.950	1200
F5.001	o	150	FFS.017	21.350	18.695	2.505	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)
F1.012	7.865	150.0	FFS.036	19.700	17.125	2.350	1200
F1.013	89.790	102.5	FFS.035	18.350	16.249	1.876	1200
F1.014	10.235	102.4	FFS.034	18.250	16.149	1.876	1200
F3.000	13.180	59.9	FFS.059	20.850	18.630	2.070	1200
F3.001	66.485	60.0	FFS.056	20.000	17.522	2.328	1200
F4.000	56.330	53.6	FFS.057	20.200	18.100	1.950	1200
F4.001	10.540	18.2	FFS.056	20.000	17.522	2.328	1200
F3.002	18.555	150.0	FFS.055	20.000	17.398	2.452	1200
F3.003	57.335	45.9	FFS.034	18.250	16.150	1.875	1200
F1.015	16.250	24.0	FFS.033	17.500	15.472	1.803	1200
F1.016	63.255	200.0	FFS.032	17.250	15.156	1.869	1200
F1.017	17.995	200.0	FFS.003	17.250	15.066	1.959	1200
F5.000	54.290	60.0	FFS.017	21.350	18.695	2.505	1200
F5.001	44.170	60.0	FFS.016	20.670	17.959	2.561	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)
F5.002	o	225	FFS.016	20.670	17.959	2.486	1200
F6.000	o	225	FFS.015	20.000	17.900	1.875	1200
F6.001	o	225	FFS.014	19.825	16.977	2.623	1200
F5.003	o	225	FFS.013	19.800	16.910	2.665	1200
F5.004	o	225	FFS.012	19.400	16.559	2.616	1200
F7.000	o	150	FFS.023	21.550	19.450	1.950	1200
F7.001	o	150	FFS.022	21.250	18.648	2.452	1200
F7.002	o	150	FFS.021	21.200	18.528	2.522	1200
F7.003	o	225	FFS.020	21.150	18.431	2.494	1200
F7.004	o	225	FFS.019	19.550	17.014	2.311	1200
F8.000	o	150	FFS.025	20.400	18.300	1.950	1200
F8.001	o	150	FFS.024	19.700	17.600	1.950	1200
F5.005	o	225	FFS.011	19.250	16.421	2.604	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)
F5.002	58.685	150.0	FFS.013	19.800	17.568	2.007	1200
F6.000	55.350	60.0	FFS.014	19.825	16.977	2.623	1200
F6.001	9.985	150.0	FFS.013	19.800	16.910	2.665	1200
F5.003	52.660	150.0	FFS.012	19.400	16.559	2.616	1200
F5.004	20.655	149.2	FFS.011	19.250	16.421	2.604	1200
F7.000	48.095	60.0	FFS.022	21.250	18.648	2.452	1200
F7.001	7.195	60.0	FFS.021	21.200	18.528	2.522	1200
F7.002	5.800	59.8	FFS.020	21.150	18.431	2.569	1200
F7.003	85.045	60.0	FFS.019	19.550	17.014	2.311	1200
F7.004	18.620	31.4	FFS.011	19.250	16.421	2.604	1200
F8.000	41.435	59.2	FFS.024	19.700	17.600	1.950	1200
F8.001	54.985	46.7	FFS.011	19.250	16.422	2.678	1200
F5.005	66.480	92.1	FFS.010	17.800	15.699	1.876	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)
F9.000	o	150	FFS.031	19.700	17.600	1.950	1200
F9.001	o	150	FFS.030	19.000	16.788	2.062	1200
F9.002	o	225	FFS.029	18.500	16.280	1.995	1200
F9.003	o	225	FFS.028	18.000	15.881	1.894	1200
F9.004	o	225	FFS.027	17.900	15.482	2.193	1200
F9.005	o	225	FFS.026	17.850	15.432	2.193	1200
F10.000	o	300	FFS.064	19.890	16.721	2.869	1200
F10.001	o	300	FFS.063	19.075	16.271	2.504	1200
F10.002	o	300	FFS.062	18.400	15.935	2.165	1200
F10.003	o	300	FFS.061	18.000	15.494	2.206	1200
F5.006	o	300	FFS.010	17.800	15.323	2.177	1200
F5.007	o	300	FFS.009	17.750	15.199	2.251	1200
F5.008	o	300	FFS.008	17.700	15.065	2.335	1200
F5.009	o	300	FFS.007	17.800	14.888	2.612	1200
F11.000	o	150	FFS.032	17.750	15.650	1.950	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)
F9.000	48.710	60.0	FFS.030	19.000	16.788	2.062	1200
F9.001	30.495	60.0	FFS.029	18.500	16.280	2.070	1200
F9.002	59.835	150.0	FFS.028	18.000	15.881	1.894	1200
F9.003	59.840	150.0	FFS.027	17.900	15.482	2.193	1200
F9.004	7.565	150.0	FFS.026	17.850	15.432	2.193	1200
F9.005	16.225	150.0	FFS.010	17.800	15.323	2.252	1200
F10.000	90.000	200.0	FFS.063	19.075	16.271	2.504	1200
F10.001	67.230	200.0	FFS.062	18.400	15.935	2.165	1200
F10.002	88.137	200.0	FFS.061	18.000	15.494	2.206	1200
F10.003	34.150	200.0	FFS.010	17.800	15.323	2.177	1200
F5.006	24.925	200.0	FFS.009	17.750	15.199	2.251	1200
F5.007	26.775	200.0	FFS.008	17.700	15.065	2.335	1200
F5.008	35.440	200.0	FFS.007	17.800	14.888	2.612	1200
F5.009	12.630	200.0	FFS.006	17.250	14.825	2.125	1200
F11.000	23.785	28.8	FFS.006	17.250	14.825	2.275	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)
F5.010	o	300	FFS.006	17.250	14.825	2.125	1200
F5.011	o	300	FFS.005	17.250	14.778	2.172	1200
F5.012	o	300	FFS.004	17.250	14.512	2.438	1200
F1.018	o	300	FFS.003	17.250	14.433	2.517	1200
F1.019	o	300	FFS.002	17.250	14.324	2.626	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)
F5.010	9.285	200.0	FFS.005	17.250	14.778	2.172	1200
F5.011	53.165	200.0	FFS.004	17.250	14.512	2.438	1200
F5.012	15.795	200.0	FFS.003	17.250	14.433	2.517	1200
F1.018	21.825	200.0	FFS.002	17.250	14.324	2.626	1200
F1.019	5.010	200.0	FFS.001	17.250	14.299	2.651	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	FFS.001	17.250	14.299	14.299	0	0

Simulation Criteria for Foul - Main

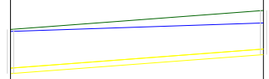
Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

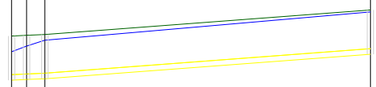
Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

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Appendix G – Storm Water Longitudinal Sections

Denis O'Sullivan & Associates		Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Carriganarra LRD Carriganarra Ballincollig, Cork	Micro Drainage
Date 09/12/2025 File SW MODEL.MDX	Designed By S.O.'Grady Checked By	
Micro Drainage	Network W.12.4	

MH Name	SS5.024	SS5.025	
Hor Scale 1150 Ver Scale 250 Datum (m) 15.000			
PN		S1.000	
Dia (mm)		225	
Slope (1:X)		61.2	
Cover Level (m)	21.250	22.025	
Invert Level (m)	19.450	20.225	
Length (m)		47.425	

MH Name	SS5.021	SS5.024	
Hor Scale 1150 Ver Scale 250 Datum (m) 14.000			
PN		S1.001	
Dia (mm)		225	
Slope (1:X)		61.1	
Cover Level (m)	20.190	21.250	
Invert Level (m)	18.450	19.450	
Length (m)		61.055	

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MH Name	SS5.015	SS5.016	SS5.017				SS5.021	
Hor Scale 1150 Ver Scale 250 Datum (m) 13.000			2.004					
PN		S1.009	S1.008				S1.004	
Dia (mm)		450	300				300	
Slope (1:X)		200.0	200.0				139.8	
Cover Level (m)	19.900	20.040	19.900	19.750	19.800	19.850	20.190	
Invert Level (m)		17.712	17.829	17.829	17.900	17.950	18.000	18.050	18.050	18.390	
Length (m)		23.470	14.165				47.535	

MH Name	SS5.009						
Hor Scale 1150 Ver Scale 250 Datum (m) 13.000							
PN							
Dia (mm)							
Slope (1:X)							
Cover Level (m)	19.700	19.750	19.800	19.850	19.900	19.900	
Invert Level (m)		17.084	17.122	17.160	17.195	17.712	
Length (m)							

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MH Name	SS5.008			SS5.009	
Hor Scale 1150 Ver Scale 250 Datum (m) 12.000					
PN				S1.016	
Dia (mm)				300	
Slope (1:X)				175.8	
Cover Level (m)	18.250	18.300	18.350	19.700	
Invert Level (m)		16.500	16.550	16.550	17.047	
Length (m)				87.395	

MH Name	SS5.003	SS5.004	SS5.005			
Hor Scale 1150 Ver Scale 250 Datum (m) 11.000				3.008		
PN		S1.023	S1.022			
Dia (mm)		300	300			
Slope (1:X)		300.0	300.0			
Cover Level (m)	17.250	17.500	18.250	18.500	18.250	
Invert Level (m)		15.220	15.445	15.445	15.495	16.286	16.286	16.450	
Length (m)		67.640	14.915			

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MH Name	SStream		SS5.002	SS5.003	
Hor Scale 1150 Ver Scale 250 Datum (m)10.000				6.026	
PN			S1.025	S1.024	
Dia (mm)			300	300	
Slope (1:X)			300.0	300.0	
Cover Level (m)	16.050	17.250	17.250	17.250	
Invert Level (m)		15.081	15.081 15.173	15.173 15.220	
Length (m)			27.635	13.960	

MH Name	SS5.027			SS5.030	
Hor Scale 1150 Ver Scale 250 Datum (m)15.000					
PN				S2.000	
Dia (mm)				225	
Slope (1:X)				56.3	
Cover Level (m)	21.350			22.200	
Invert Level (m)			19.650	20.400	
Length (m)				42.235	

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MH Name	SS5.026	SS5.027	
Hor Scale 1150 Ver Scale 250 Datum (m)14.000			
PN		S2.003	
Dia (mm)		225	
Slope (1:X)		111.1	
Cover Level (m)	20.775	21.350	
Invert Level (m)	18.975	19.550	
Length (m)		63.890	

MH Name	SS5.016	SS5.026	
Hor Scale 1150 Ver Scale 250 Datum (m)14.000		1.008	
PN		S2.004	
Dia (mm)		225	
Slope (1:X)		43.4	
Cover Level (m)	20.040	20.775	
Invert Level (m)	17.829	18.975	
Length (m)		49.725	

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MH Name	SS5.032				SS5.037			
Hor Scale 1150 Ver Scale 250 Datum (m) 13.000					4.000 5.002			
PN					S3.002			
Dia (mm)					225			
Slope (1:X)					65.4			
Cover Level (m)	20.000	20.200	20.250	20.100	20.850		20.950	
Invert Level (m)		17.395	17.443	17.495	18.217	18.217	19.050	19.080	19.150
Length (m)					54.515			

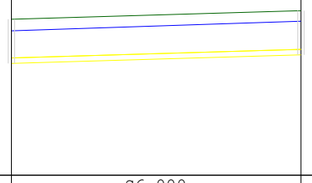
MH Name	SS5.007	SS5.031	SS5.032	
Hor Scale 1150 Ver Scale 250 Datum (m) 12.000		1.019		
PN		S3.008	S3.007	
Dia (mm)		225	225	
Slope (1:X)		40.8	200.0	
Cover Level (m)	18.500	20.000	20.000	
Invert Level (m)		16.286	17.318	17.318	17.395
Length (m)		42.142	15.560	

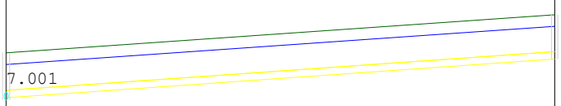
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MH Name	SS5.036		
Hor Scale 1150 Ver Scale 250 Datum (m) 13.000		3.002	
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	20.100	20.050	
Invert Level (m)		18.250	
Length (m)			

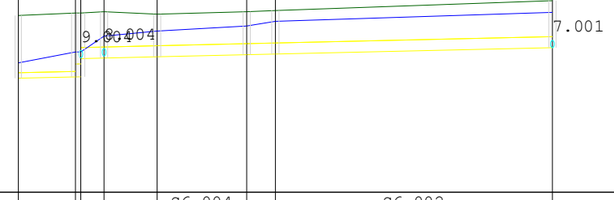
MH Name	SS5.035		SS5.043	
Hor Scale 1150 Ver Scale 250 Datum (m) 14.000		3.003		
PN			S5.000	
Dia (mm)			225	
Slope (1:X)			52.8	
Cover Level (m)	20.250	20.500	21.250	
Invert Level (m)		18.700	18.700	19.450
Length (m)			39.580	

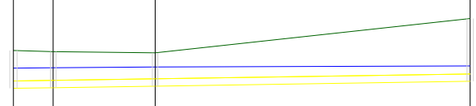
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MH Name	SS5.072	SS5.073	
Hor Scale 1150 Ver Scale 250 Datum (m)15.000			
PN		S6.000	
Dia (mm)		225	
Slope (1:X)		155.1	
Cover Level (m)	21.350	21.700	
Invert Level (m)	19.550	19.900	
Length (m)		54.290	

MH Name	SS5.069	SS5.072	
Hor Scale 1150 Ver Scale 250 Datum (m)14.000			
PN		S6.001	
Dia (mm)		300	
Slope (1:X)		65.2	
Cover Level (m)	19.800	21.350	
Invert Level (m)	17.973	19.550	
Length (m)		102.855	

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MH Name	SS5.062			SS5.067		SS5.069	
Hor Scale 1150 Ver Scale 250 Datum (m)12.000							
PN				S6.004		S6.002	
Dia (mm)				450		450	
Slope (1:X)				200.0		200.0	
Cover Level (m)	19.200	19.300	19.350	19.250	19.350	19.400	19.800
Invert Level (m)		16.641	16.695	17.465	17.465	17.515	17.515	17.599	17.625	17.625	17.885
Length (m)					16.785		51.945	

MH Name	SS5.059		SS5.061	SS5.062	
Hor Scale 1150 Ver Scale 250 Datum (m)12.000					
PN			S6.010	S6.009	
Dia (mm)			300	300	
Slope (1:X)			300.0	299.8	
Cover Level (m)	17.900	17.850	17.800	19.200	
Invert Level (m)		16.381	16.381	16.444	16.444	16.641
Length (m)			19.120	59.065	

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MH Name	SS5.055			SS5.059	
Hor Scale 1150 Ver Scale 250 Datum (m) 11.000				10.004	
PN				S6.012	
Dia (mm)				375	
Slope (1:X)				300.0	
Cover Level (m)	18.250	18.250	18.250	17.900	
Invert Level (m)		16.037	16.055	16.055 16.356	
Length (m)				90.270	

MH Name	SS5.052	SS5.053		SS5.055	
Hor Scale 1150 Ver Scale 250 Datum (m) 11.000					
PN		S6.018		S6.016	
Dia (mm)		225		225	
Slope (1:X)		300.0		300.3	
Cover Level (m)	18.000	18.000	18.000	18.250	
Invert Level (m)		15.712	15.812 15.812	15.848 15.848 16.009	
Length (m)		30.040		48.350	

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MH Name	SS5.045			SS5.050	SS5.051	SS5.052	
Hor Scale 1150 Ver Scale 250 Datum (m) 11.000				11.002			
PN				S6.021	S6.020	S6.019	
Dia (mm)				300	225	225	
Slope (1:X)				300.0	300.0	300.0	
Cover Level (m)	17.250	17.250	17.300	17.700	17.750	18.000	
Invert Level (m)		15.416	15.434	15.434 15.559	15.559 15.651	15.651 15.712	
Length (m)				37.250	27.655	18.235	

MH Name	SS5.002	SS5.044		SS5.045	
Hor Scale 1150 Ver Scale 250 Datum (m) 10.000		1.024			
PN		S6.026		S6.025	
Dia (mm)		300		300	
Slope (1:X)		300.0		300.0	
Cover Level (m)	17.250	17.250		17.250	
Invert Level (m)		15.181	15.228 15.228	15.401	
Length (m)		14.050		51.835	

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MH Name	SS5.069		SS5.071	
Hor Scale 1150 Ver Scale 250 Datum (m)13.000		6.001		
PN			S7.000	
Dia (mm)			300	
Slope (1:X)			200.0	
Cover Level (m)	19.800	19.825	20.000	
Invert Level (m)		17.920	17.920 18.200	
Length (m)			55.965	

MH Name	SS5.075			SS5.078	
Hor Scale 1150 Ver Scale 250 Datum (m)15.000					
PN				S8.000	
Dia (mm)				225	
Slope (1:X)				150.3	
Cover Level (m)	21.150	21.200	21.250	21.550	
Invert Level (m)		19.400	19.450 19.450	19.750	
Length (m)				45.080	

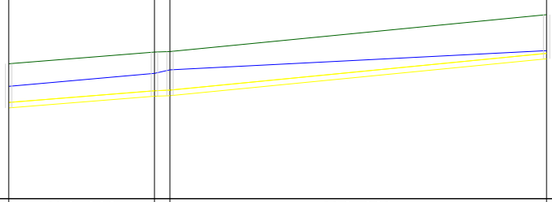
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MH Name	SS5.065		SS5.075	
Hor Scale 1150 Ver Scale 250 Datum (m)14.000		6.005		
PN			S8.003	
Dia (mm)			300	
Slope (1:X)			51.8	
Cover Level (m)	19.350	19.550	21.150	
Invert Level (m)		17.550	17.750 17.750	19.350
Length (m)			82.815	

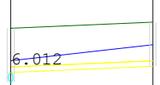
MH Name	SS5.064		SS5.081	SS5.083	
Hor Scale 1150 Ver Scale 250 Datum (m)13.000		6.006			
PN			S9.002	S9.000	
Dia (mm)			225	225	
Slope (1:X)			122.8	55.8	
Cover Level (m)	19.300	19.300	19.675	20.450	
Invert Level (m)		17.500	17.500 17.875	17.900 18.650	
Length (m)			46.055	41.870	

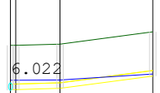
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MH Name	SS5.087	SS5.088	
Hor Scale 1150 Ver Scale 250 Datum (m) 14.000			
PN		S10.000	
Dia (mm)		225	
Slope (1:X)		150.7	
Cover Level (m)	20.500	21.000	
Invert Level (m)		18.700	19.200
Length (m)		75.345	

MH Name	SS5.084	SS5.085	SS5.087	
Hor Scale 1150 Ver Scale 250 Datum (m) 13.000				
PN		S10.003	S10.001	
Dia (mm)		225	225	
Slope (1:X)		57.6	47.1	
Cover Level (m)	18.500	18.975	20.500	
Invert Level (m)		16.700	17.175	17.200	18.700
Length (m)		27.345	70.615	

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MH Name	SS5.058	SS5.084	
Hor Scale 1150 Ver Scale 250 Datum (m) 12.000			
PN		S10.004	
Dia (mm)		225	
Slope (1:X)		106.6	
Cover Level (m)	18.250	18.500	
Invert Level (m)		16.450	16.700
Length (m)		26.645	

MH Name	SS5.048	SS5.090	
Hor Scale 1150 Ver Scale 250 Datum (m) 11.000			
PN		S11.000	
Dia (mm)		225	
Slope (1:X)		34.8	
Cover Level (m)	17.250	17.300	17.800
Invert Level (m)		15.500	15.500	16.000
Length (m)		17.392	

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Appendix H – Foul Sewer Longitudinal Sections

Denis O'Sullivan & Associates			Page 1
Unit 5, Joyce House Barrack Square Ballincollig, Co. Cork	Foul Sewer Design Carriganarra LRD Carriganarra, Ballinco...		Micro Drainage
Date 03/12/2025 File FS MODEL.MDX	Designed By S.O.'Grady Checked By		
Micro Drainage	Network W.12.4		

MH Name	FFS.042		FFS.045		FFS.048	FFS.049	
Hor Scale 2000 Ver Scale 1000 Datum (m)-3.000							
PN			F1.004		F1.001	F1.000	
Dia (mm)			150		150	150	
Slope (1:X)			150.0		60.0	60.0	
Cover Level (m)	19.750		20.190		21.250	22.025	
Invert Level (m)			17.686	18.012	18.067 19.084	19.084	19.875
Length (m)			48.890		61.005	47.460	

MH Name	FFS.034		FFS.036			FFS.040			
Hor Scale 2000 Ver Scale 1000 Datum (m)-5.000		3.003					2.004		
PN			F1.013			F1.009			
Dia (mm)			225			225			
Slope (1:X)			102.5			150.0			
Cover Level (m)	18.250	18.350	19.700	19.750	19.800	19.850	20.040	19.900	
Invert Level (m)		16.249	16.249 17.125	17.178	17.230	17.283	17.283 17.475	17.551	
Length (m)			89.790				28.895		

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MH Name	FFS.001				FFS.033		
Hor Scale 2000 Ver Scale 1000 Datum (m)-7.000				5.012			3.003
PN					F1.016		
Dia (mm)					225		
Slope (1:X)					200.0		
Cover Level (m)	17.250		17.250	17.250	17.500	18.250	
Invert Level (m)		14.324	14.433	15.066	15.156	15.472	15.472	16.149	
Length (m)					63.255		

MH Name	FFS.040	FFS.050	FFS.051		FFS.054	
Hor Scale 2000 Ver Scale 1000 Datum (m)-3.000		1.008				
PN		F2.004	F2.003		F2.000	
Dia (mm)		150	150		150	
Slope (1:X)		100.4	60.0		55.0	
Cover Level (m)	20.040	20.775	21.330		22.200	
Invert Level (m)		17.545	18.041	18.041	19.106	19.270	20.050
Length (m)		49.780	63.885		42.915	

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MH Name	FFS.034	FFS.055		FFS.059		
Hor Scale 2000 Ver Scale 1000 Datum (m)-4.000		1.014		4.001		
PN		F3.003		F3.001		
Dia (mm)		225		150		
Slope (1:X)		45.9		60.0		
Cover Level (m)	18.250	20.000	20.000	20.850	20.950	
Invert Level (m)		16.150	17.398	17.398	17.522	17.522	18.630	18.850	
Length (m)		57.335		66.485		

MH Name	FFS.056		FFS.058	
Hor Scale 2000 Ver Scale 1000 Datum (m)-4.000		3.001		
PN			F4.000	
Dia (mm)			150	
Slope (1:X)			53.6	
Cover Level (m)	20.000	20.200	21.250	
Invert Level (m)		18.100	18.100	19.150	
Length (m)			56.330	

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MH Name	FFS.013	FFS.016	FFS.017	FFS.018	
Hor Scale 2000 Ver Scale 1000 Datum (m)-4.000		6.001			
PN		F5.002	F5.001	F5.000	
Dia (mm)		225	150	150	
Slope (1:X)		150.0	60.0	60.0	
Cover Level (m)	19.800	20.670	21.350	21.700	
Invert Level (m)		17.568 17.959	17.959 18.695	18.695 19.600	
Length (m)		58.685	44.170	54.290	

MH Name	FFS.009	FFS.010	FFS.011		FFS.013	
Hor Scale 2000 Ver Scale 1000 Datum (m)-6.000		6.000	6.003	6.004	6.001	
PN		F5.006	F5.005		F5.003	
Dia (mm)		300	225		225	
Slope (1:X)		200.0	92.1		150.0	
Cover Level (m)	17.750	17.800	19.250	19.400	19.800	
Invert Level (m)		15.199 15.323	15.699 16.421	16.421 16.559	16.559 16.910	
Length (m)		24.925	66.480		52.660	

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MH Name	FFS.003		FFS.005			FFS.008	FFS.009	
Hor Scale 2000 Ver Scale 1000 Datum (m)-7.000		1.017			11.000			
PN			F5.011			F5.008	F5.007	
Dia (mm)			300			300	300	
Slope (1:X)			200.0			200.0	200.0	
Cover Level (m)	17.250	17.250	17.250	17.250	17.800	17.700	17.750	
Invert Level (m)		14.433 14.512	14.512 14.778	14.825	14.888 14.888	15.065	15.065 15.199	
Length (m)			53.165			35.440	26.775	

MH Name	FFS.013		FFS.015	
Hor Scale 2000 Ver Scale 1000 Datum (m)-5.000		5.002		
PN			F6.000	
Dia (mm)			225	
Slope (1:X)			60.0	
Cover Level (m)	19.800	19.825	20.000	
Invert Level (m)		16.977 16.977	17.900	
Length (m)			55.350	

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MH Name	FFS.011		FFS.020			FFS.023	
Hor Scale 2000 Ver Scale 1000 Datum (m)-4.000		5.004					
PN			F7.003			F7.000	
Dia (mm)			225			150	
Slope (1:X)			60.0			60.0	
Cover Level (m)	19.250	19.550	21.150			21.550	
Invert Level (m)		16.421 17.014	17.014 18.431			18.648 19.450	
Length (m)			85.045			48.095	

MH Name	FFS.011	FFS.024	FFS.025	
Hor Scale 2000 Ver Scale 1000 Datum (m)-5.000		5.004		
PN		F8.001	F8.000	
Dia (mm)		150	150	
Slope (1:X)		46.7	59.2	
Cover Level (m)	19.250	19.700	20.400	
Invert Level (m)		16.422 17.600	17.600 18.300	
Length (m)		54.985	41.435	

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MH Name	FFS.028	FFS.029	FFS.030	FFS.031	
Hor Scale 2000 Ver Scale 1000 Datum (m)-5.000					
PN		F9.002	F9.001	F9.000	
Dia (mm)		225	150	150	
Slope (1:X)		150.0	60.0	60.0	
Cover Level (m)	18.000	18.500	19.000	19.700	
Invert Level (m)		15.881 16.280	16.280 16.788	16.788 17.600	
Length (m)		59.835	30.495	48.710	

MH Name	FFS.010			FFS.028	
Hor Scale 2000 Ver Scale 1000 Datum (m)-6.000		5.003			
PN				F9.003	
Dia (mm)				225	
Slope (1:X)				150.0	
Cover Level (m)	17.800	17.850	17.900	18.000	
Invert Level (m)		15.323 15.432	15.482 15.482	15.881	
Length (m)				59.840	

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MH Name	FFS.062	FFS.063	FFS.064	
Hor Scale 2000 Ver Scale 1000 Datum (m)-5.000				
PN		F10.001	F10.000	
Dia (mm)		300	300	
Slope (1:X)		200.0	200.0	
Cover Level (m)	18.400	19.075	19.890	
Invert Level (m)		15.935	16.271 16.271	16.721
Length (m)		67.230	90.000	

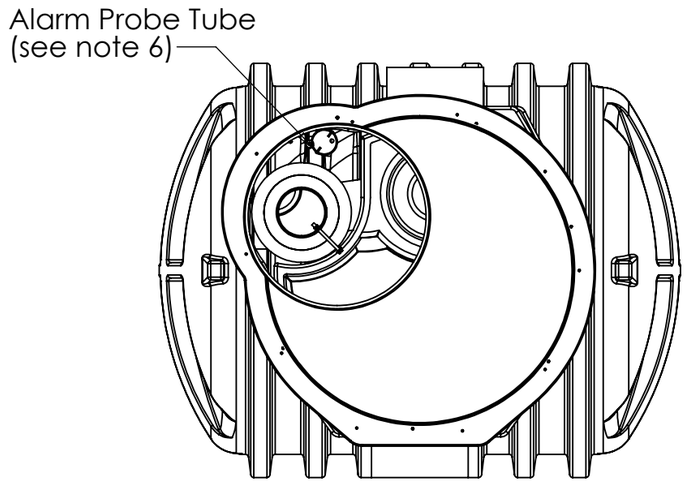
MH Name	FFS.010	FFS.061	FFS.062	
Hor Scale 2000 Ver Scale 1000 Datum (m)-6.000		5.005 5.005		
PN		F10.003	F10.002	
Dia (mm)		300	300	
Slope (1:X)		200.0	200.0	
Cover Level (m)	17.800	18.000	18.400	
Invert Level (m)		15.323 15.494	15.494	15.935
Length (m)		34.150	88.137	

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MH Name	FFS.006		
Hor Scale 2000 Ver Scale 1000 Datum (m)-7.000		5.009	
PN			
Dia (mm)			
Slope (1:X)			
Cover Level (m)	17.250	17.750	
Invert Level (m)		14.825	15.650
Length (m)			

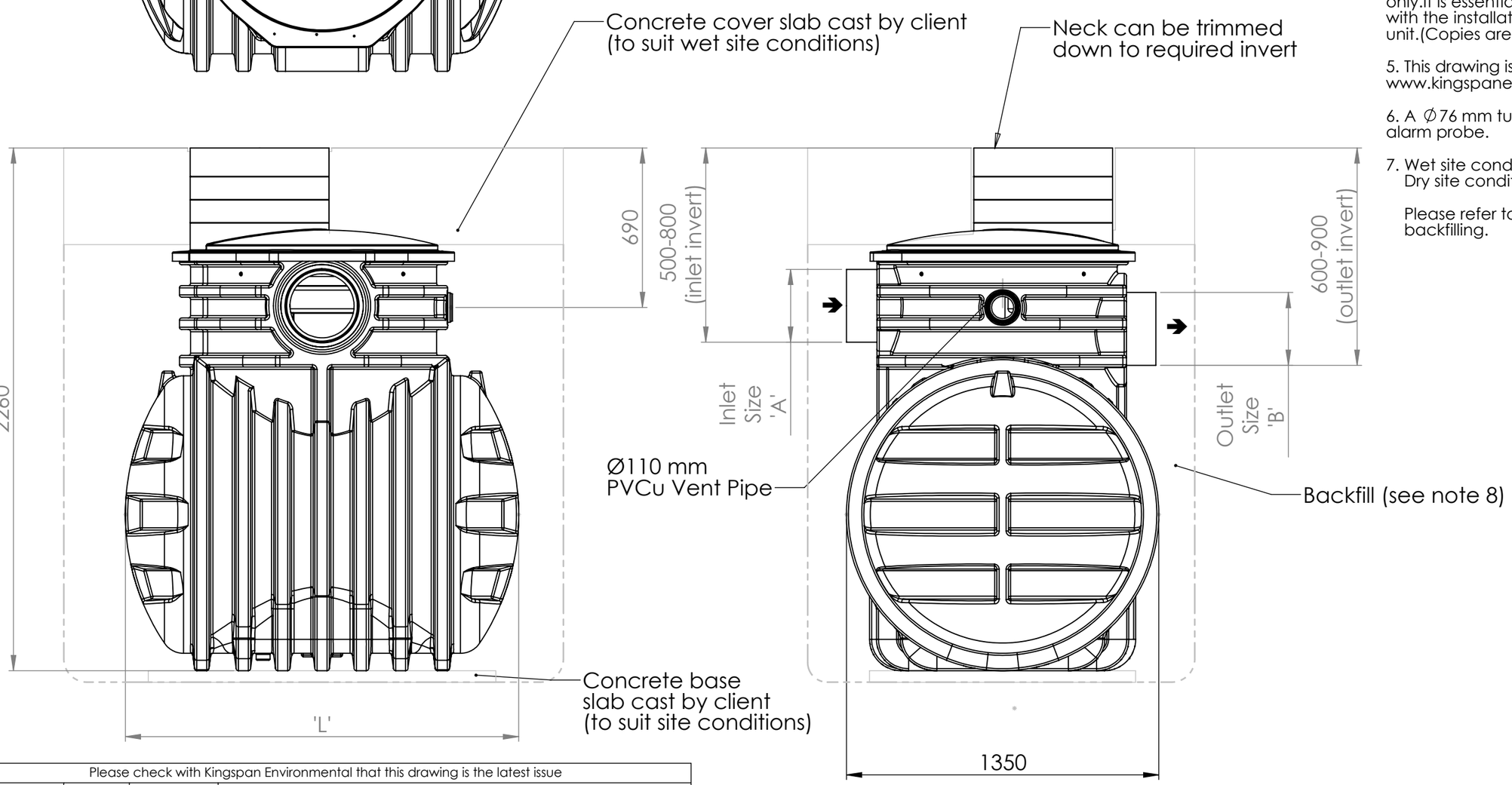
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Appendix J – Petrol Interceptor Details



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

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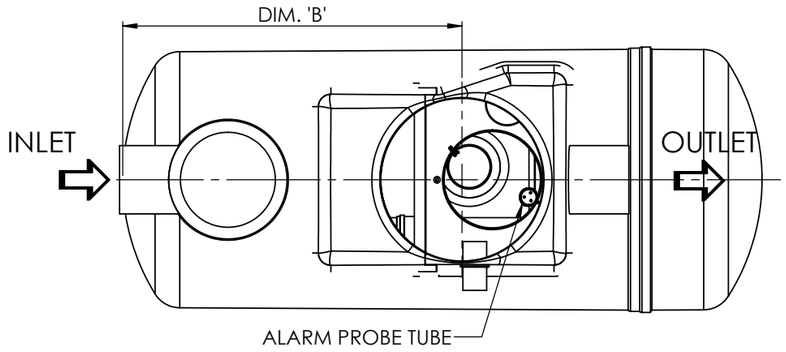
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Finish : n/a	Thickness : n/a
Weight : Kgs n/a	Surface Area : n/a

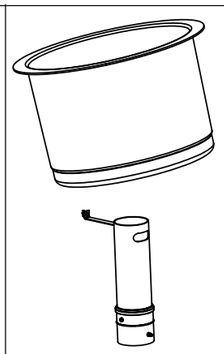
Drawing : NSBP003,004 & 006 Sales Drawing

Drg No: DSO993

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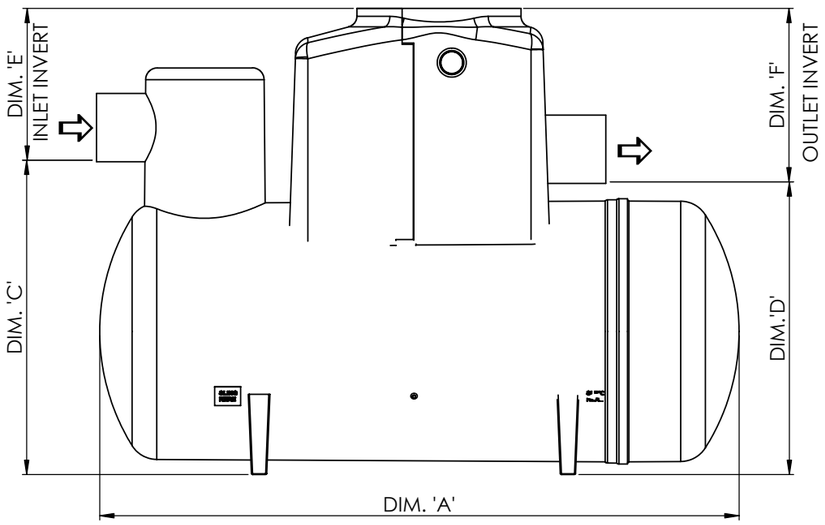
Kingspan Environmental

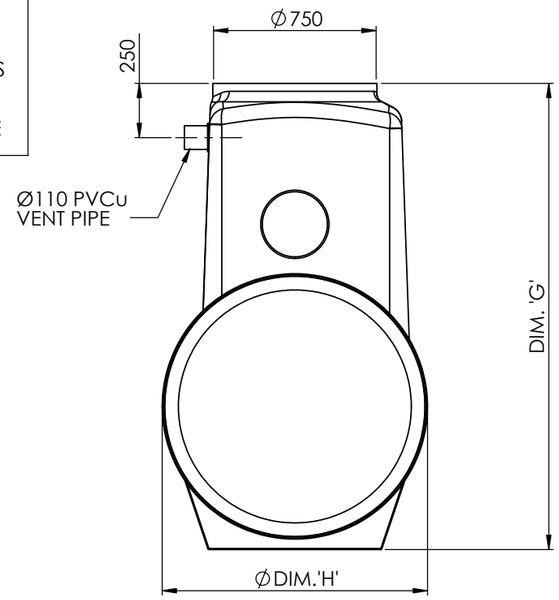




EXTENSION PARTS (IF REQUIRED) INCLUDED IN PRODUCT CODE

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

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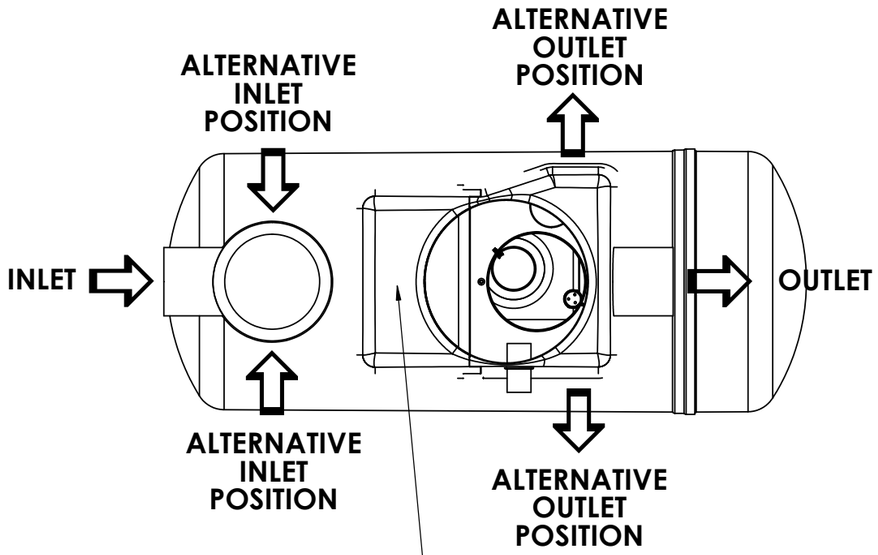
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Finish :	Thickness : n/a
Weight :	Surface Area :

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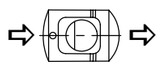
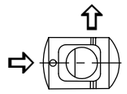
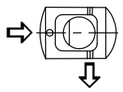
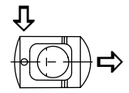
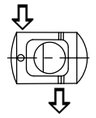
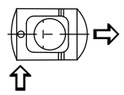
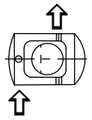
Drawing : DS1155

NSBE010 - NSBE030 Bypass Separators

Kingspan Environmental



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 

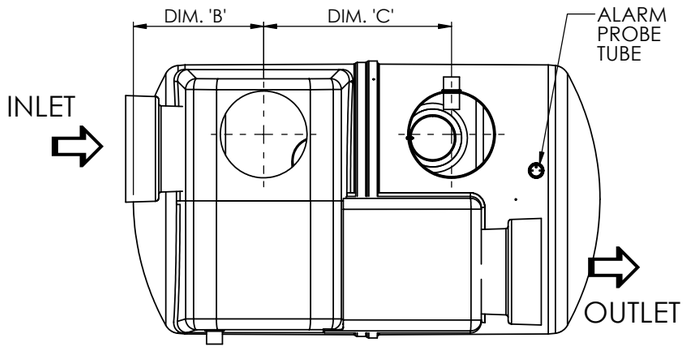
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Modelled By :		

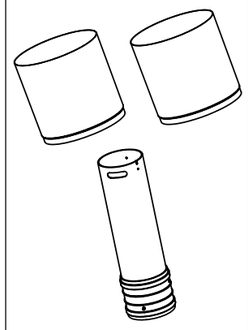
All Dimensions In mm | Scale: Do Not Scale | Third Angle Projection

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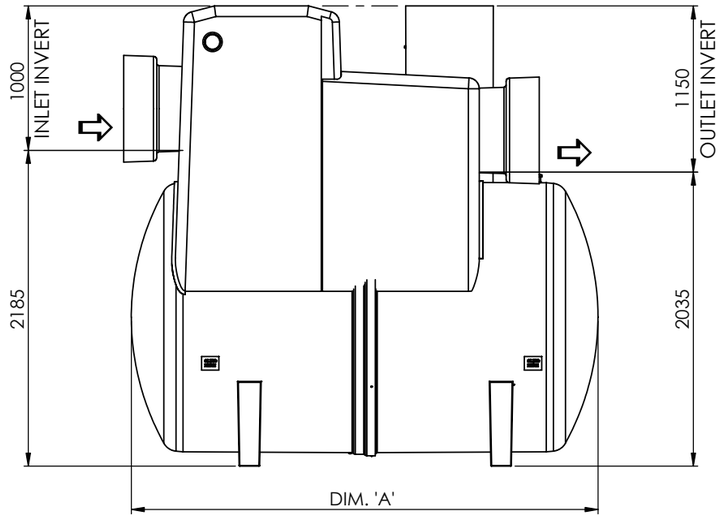
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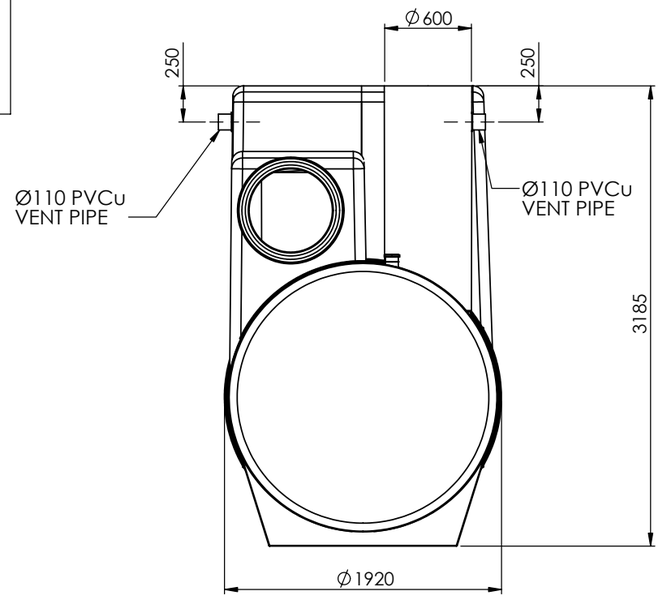




EXTENSION PARTS (IF REQUIRED) INCLUDED IN PRODUCT CODE

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.
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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

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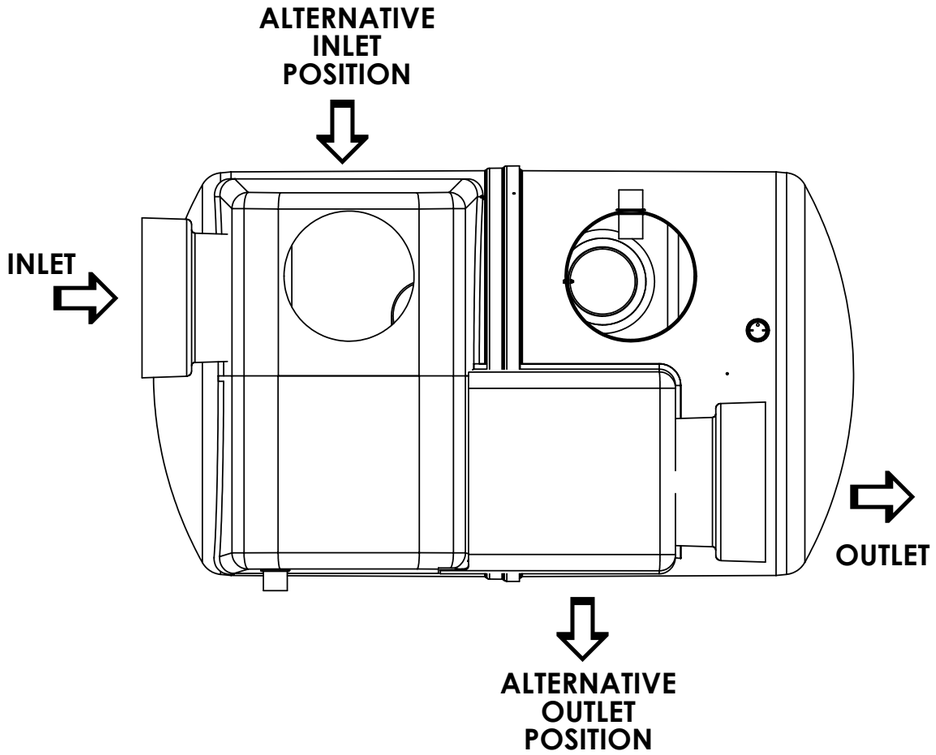
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Finish :	Thickness : n/a
Weight : 608.07 Kg	Surface Area : m²
Modelled By : Name	

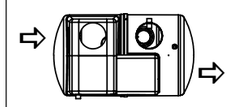
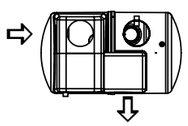
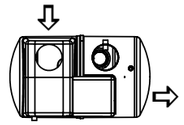
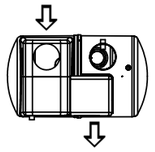
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Drawing : DS1224

NSBE040 & NSBE050 Bypass Separators

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z = Pipe Orientation Options	
OPTION A 	OPTION C 
OPTION D 	OPTION F 

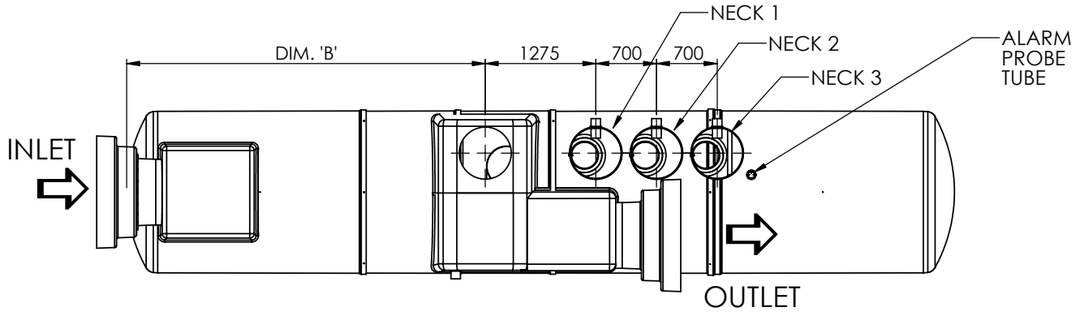
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Finish :	Thickness : n/a	
Weight : 608.07 Kg	Surface Area : m²	**NSBE040 & NSBE050 Bypass Separators**
Modelled By : Name		

All Dimensions In mm	Scale: Do Not Scale	Third Angle Projection

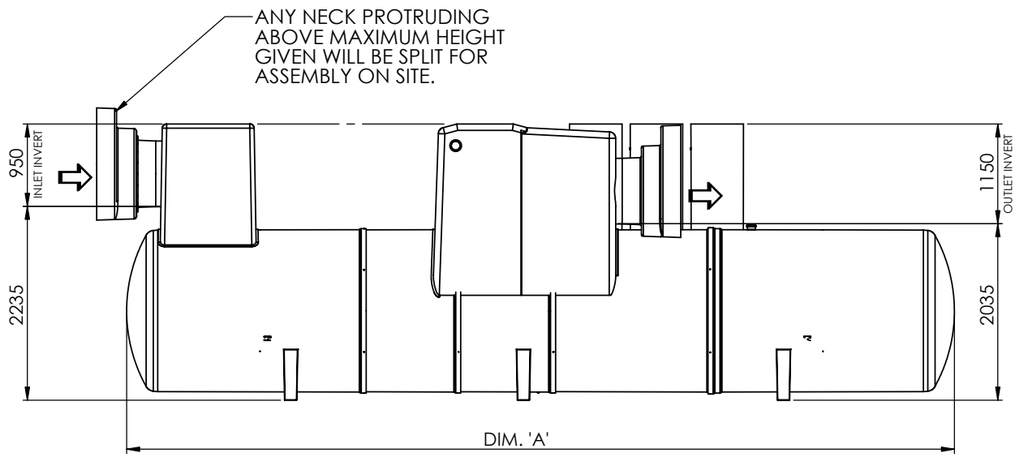
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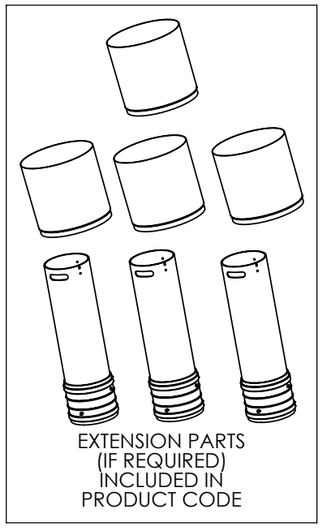
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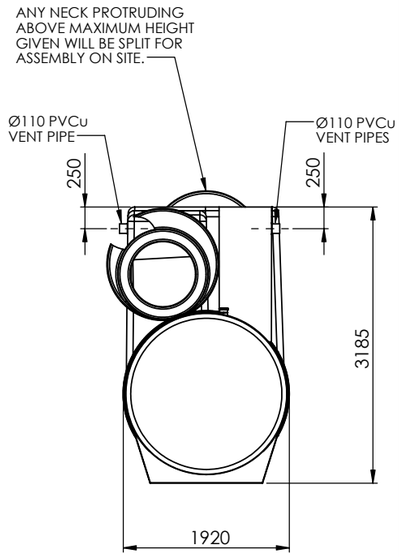
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5. THIS DRAWING SHOULD BE USED FOR DIMENSIONAL INFORMATION ONLY.
6. A Ø76mm TUBE IS SUPPLIED TO HOUSE AN OIL ALARM PROBE.







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

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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

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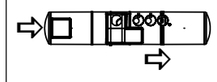
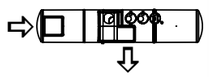
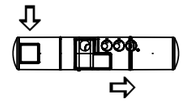
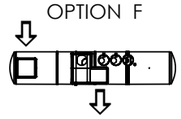
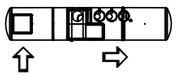
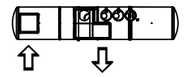
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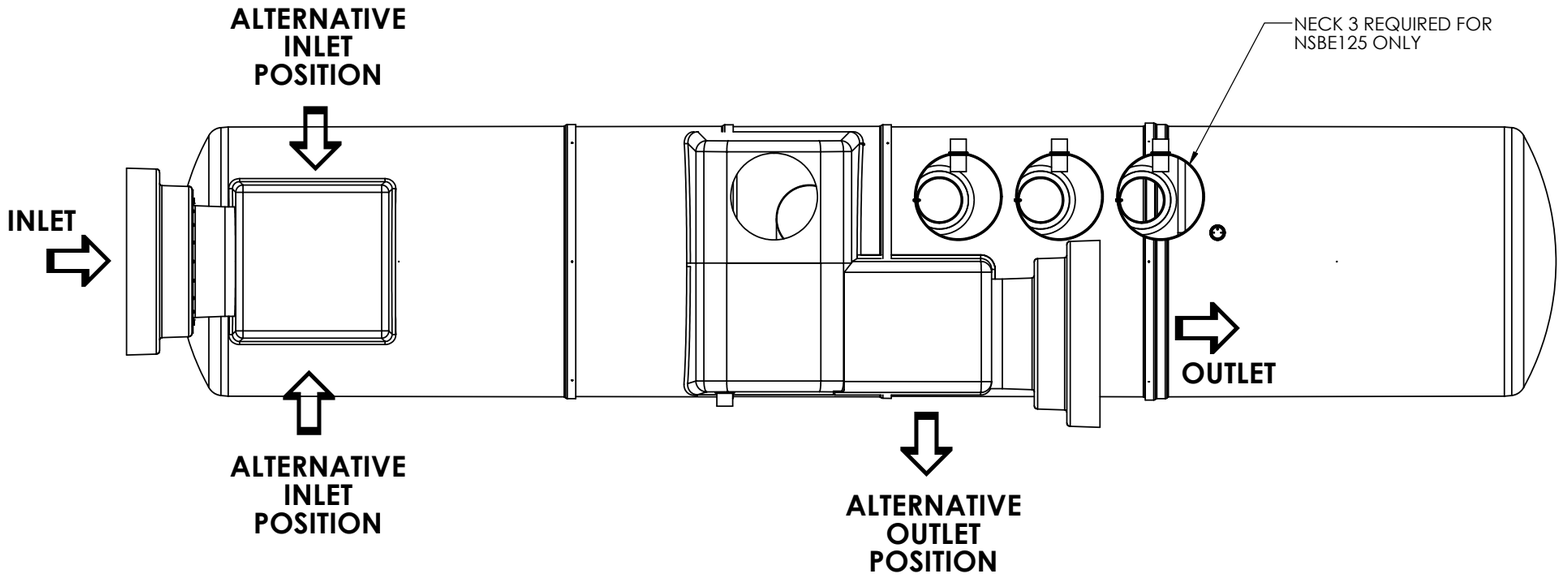
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Drawing : DS1225

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



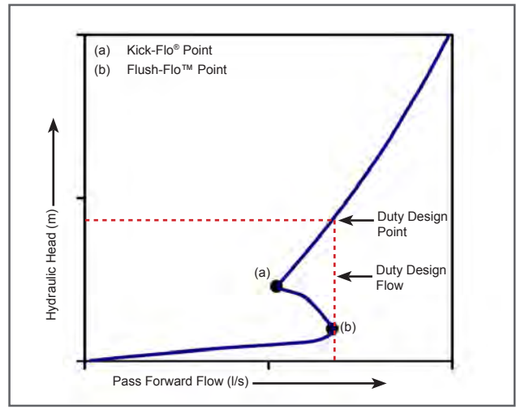
BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE No 08/4599

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

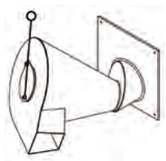
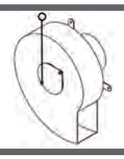
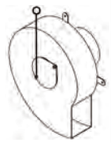
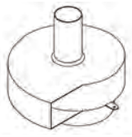
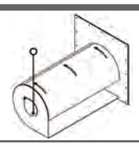
To ensure correct implementation a multiple design-point specification, defining the main hydraulic features of the selected flow control, can be provided by HRD Technologies Ltd. This should include at least the following information:

- 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.

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	**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.
Md2			
Md4			
Md14			
Md5	**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.
Md6			
Md7			
Md12			
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	**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.
Md9			
Md11			
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.	

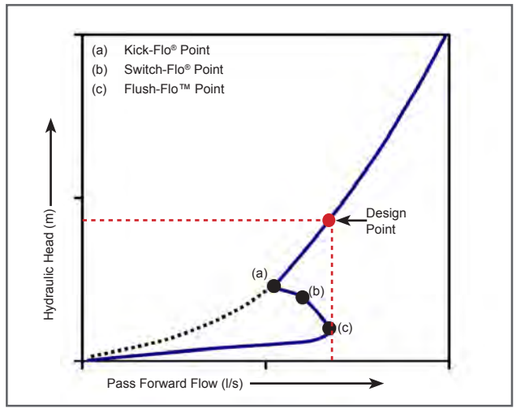
The information provided here is intended for the purposes of general guidance only - individual application requirements may differ. **If in doubt, please contact HRD Technologies Ltd.**

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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.

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HRD Technologies Ltd
HRD Technologies Ltd • Tootenhill House • Rathcoole • Co. Dublin • Ireland
Tel: +353 (0) 1 4013964 • Fax: +353 (0) 1 4013978 • www.hrdtec.com
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MOLLOY

MES4061 BURKES HOUSING DEVELOPMENT

Ballincollig, Co. Cork

FOUL WATER PUMP SUMP – PROPOSAL













MES4061_Report_211125

21/11/2025

Molloy Environmental Systems
Coleraine, Clara Rd.
Tullamore, Co. Offaly
Ireland, R35 D956

IE +353 57 93 26000
UK +44 3300 272225

info@molloyprecast.com
www.molloyprecast.com

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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:	774 housing units	**= 237,607 litres**
	Creche - 60 children x 60 litres	**= 5,400 litres**
	30 staff x 60 litres	
	Equivalent of 812 housing units.	**= 243,007 litres**
Rising main length:	875 m	
Static head:	19.35 m (inc. pump sump)	
Total head:	27.50 m	
Flow rate:	15.55 l/s	
Rising main:	150mm HDPE SDR17	
Inlet pipe:	300 mm	
Inlet invert	2.100 m 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 2,700 litres per discharge. Assuming the daily hydraulic load is concentrated over a 10-hour period the hourly flow rate would be 24,300 litres per hour. This would equate to approximately 10 starts per hour (circa 5 starts per pump per hour). This

pump will run for approx. 2.9 minutes per discharge (2,700 litres/cycle/15.55l/s = 173 seconds; or 2.9 minutes).

4 Proposed Tankage

This proposal consists of approximately 250,000 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		32.76	29m775	203.98
Risers		1.21	1,231	12.08
Overburden (stone)		1.47	2,940	28.84
Total	V_p	35.44	24,945	244.71

Minimum required force to prevent floatation (FOS of	F_r=	417.15	kN	$F_r=V_pX1.2X9.81$
Difference between req. and provided force	F_d=	172.44	kN	$F_d=F_r-F_p$
Required volume of concrete to prevent flotation	C_v=	12.32	m^3	$C_v=(F_d/(D_c-D_w)$
Comments	13m3 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		210.03	155,708	1527.50
Risers		14.03	11,050	108.40
Overburden (stone)		130.58	261,166	2562.04
Total	V_p	354.64	427,924	4197.93
Minimum required force to prevent floatation (FOS of	F_r=	4174.84	kN	$F_r=V_pX1.2X9.81$
Difference between req. and provided force	F_d=	-23.09	kN	$F_d=F_r-F_p$
Required volume of concrete to prevent flotation	C_v=	-1.65	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		2.32		3,846	37.73
Risers		5.38		4,224	41.44
Total	V_p	7.6949		8,070	79.17
Minimum required force to prevent floatation (FOS of	F_r=	90.58	kN	$F_r=V_pX1.2X9.81$	
Difference between req. and provided force	F_d=	11.42	kN	$F_d=F_r-F_p$	
Required volume of concrete to prevent flotation	C_v=	0.82	m^3	$C_v=(F_d/(D_c-D_w)$	
Comments	1.0m3 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 6.06m deep 2.4m 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.
- 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 NP 3153 8.5kW foul submersible pumps.
- 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 150mm discharge connection
- The design should limit the number of starts to 10 per hour
- 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
- DN150 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 300mm dia. high level overflow is to be provided
- A 300mm 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 (DN150 Siemens Mag 5100)
- Ductile iron pipework complete with fittings, etc. to link valve chamber to rising main

4.7 Control Kiosk

Control kiosk measuring 4.4m 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
• 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

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.

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.

1. Min. volume to avoid septicity = **134 units**

Anti-septicity calculations were carried out to ensure the suitable of the proposed system. See below calculations based on proposed loadings.

	Units	Min. release
Rising main internal diameter	mm	141
Rising main length	m	785
Low level Pump Sump volume	m3	1.06
Volume per day Vd	m3	243
Design Pump Flow Rate lit/sec	L/s	16.12
Volume of rising main + pump sump low level	m3	14.7
Longest retention time 24/(Vm/Vd) RTt	Hr	1.45
Mean Retention time (RTt+1)/2 Rtm	Hr	0.72

Estimated volume pumped per day	V_d
Volume retained in the rising main + pump sump low level	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
- 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

















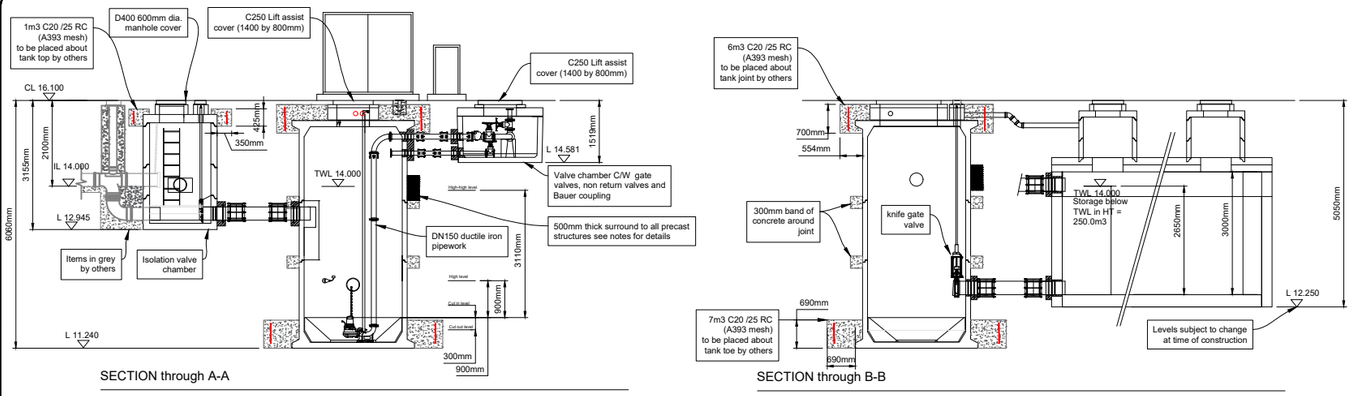
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Molloy Environmental Systems
Coleraine, Clara Rd.
Tullamore, Co. Offaly
Ireland, R35 D956

IE +353 57 93 26000

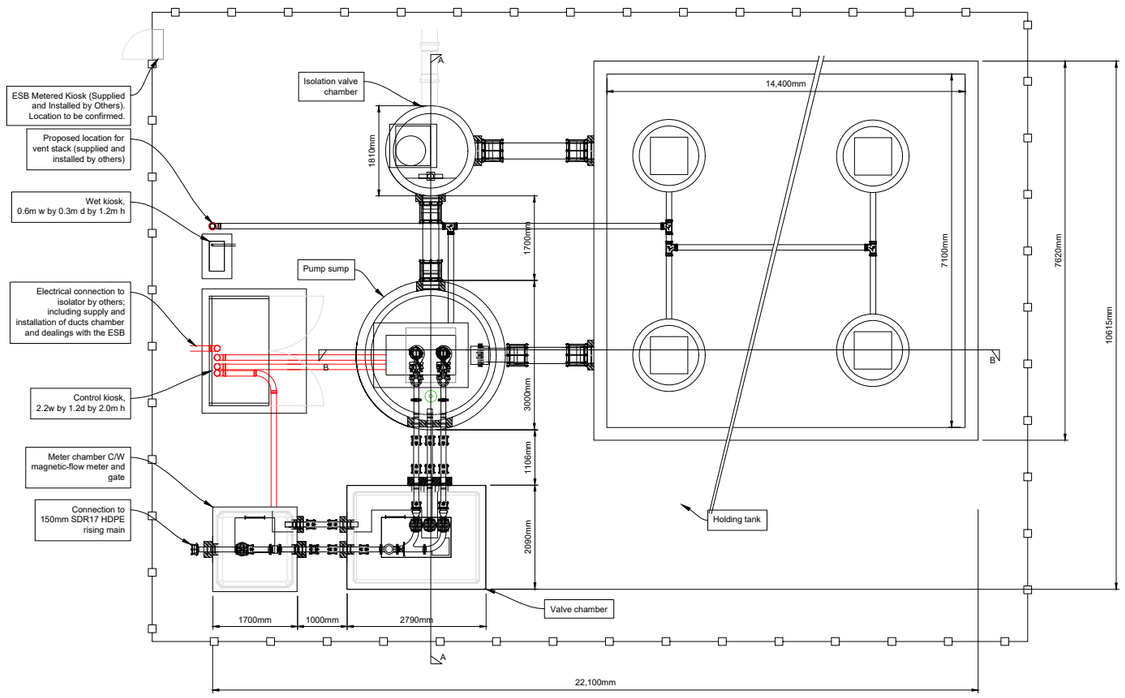
UK +44 3300 272225

info@molloyprecast.com
www.molloyprecast.com



SECTION through A-A

SECTION through B-B



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

MOLLOY
ENVIRONMENTAL SYSTEMS
Clara Rd., Tullamore, Co. Offaly
T: 057 9326000 E: info@molloyprecast.com
F: 057 9326060 W: www.molloyprecast.com

Title: Burkes Housing Development Proposed Foul Water Pump Station

Drg. no.: MES4061_FPS_211125

Date: 21/11/2025

Drawn by: CM

APPENDIX 2-5 Construction Resource Waste Management Plan - – DOSA Consulting Engineers

DOSA
DENIS O'SULLIVAN & ASSOCIATES
CONSULTING ENGINEERS

RESIDENTIAL DEVELOPMENT AT CARRIGANARRA, BALLINCOLLIG, CORK

CONSTRUCTION RESOURCE & WASTE MANAGEMENT PLAN

DATE 10/04/2026

REVISION 8

JOB NO. 4208

Joyce House, Barrack Square, Ballincollig, Co. Cork
T 021 4871781 F 021 4874157 info@dosa.ie www.dosa.ie

DOCUMENT CONTROL

PROJECT NAME: Residential Development At Carriganarra, Ballincollig, Cork

PROJECT NUMBER: 4208

REVISION	DATE	FILE NAME: Residential Development, At Carriganarra, Ballincollig, Co. Cork			
8	10.04.2026	DESCRIPTION: Construction Resource & Waste Management Plan			
			PREPARED	CHECKED	APPROVED
		INITIAL	SO'G	LO'T	LO'T
		DATE	10.04.2026	10.04.2026	10.04.2026
#	Insert Date	FILE NAME:			
		DESCRIPTION: Insert description			
			PREPARED	CHECKED	APPROVED
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		DATE	Insert Date	Insert Date	Insert Date
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		DESCRIPTION: Insert description			
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		INITIAL	Initials	Initials	Initials
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			PREPARED	CHECKED	APPROVED
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		DATE	Insert Date	Insert Date	Insert Date

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1 Introduction

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

This document comprises the Construction Resource & Waste Management Plan (CRWMP) and the principal objective of this CRWMP is to provide a framework at the planning stage of the project to facilitate the further development of a project specific Detailed C&D RWMP by the Contractor. The following waste management considerations will apply for the entire life-cycle of this construction project.

1.1 Aim of the Plan

The purpose of this plan is to provide sufficient information to ensure that the management of construction waste is undertaken in accordance with all relevant legislation and best practice standards (as set out in Section 2 of this document). The principal aim of this plan is to ensure efficient use of material resources, reduce waste at source and reduce the quantity of waste that requires final off-site disposal to landfill in accordance with the waste hierarchy. A secondary aim is to facilitate the transition to a more circular economy thereby minimising the need for new inputs of virgin materials and energy, while reducing environmental pressures linked to resource extraction, emissions and waste management.

1.2 Methodology

This document has been prepared in accordance with the relevant industry standard guidance document; 'Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects' (EPA, 2021). This guidance supersedes the 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects' (Department of Environment, Heritage and Local Government (DoEHLG), 2006);

In addition, the following relevant best practice guidance documents have also been consulted;

- Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' (EPA, 2018);
- A review of Design and Construction Waste Management Practices on Selected Case Studies – Lessons Learned' (EPA, 2015);
- Design out Waste: Preparation of Waste Reduction Factsheets for Design Teams' (EPA, 2015); and,
- Development of an Audit Methodology to Generate Construction Waste Projection Indicators for the Irish Construction Industry' (EPA, 2009).

1.3 Need for the Plan

Within Section 3.1 of the guidance (EPA, 2021), it states that 'it is recommended that planning authorities stipulate that a Resource and Waste Management Plan (RWMP) shall be submitted for all construction and demolition projects as best practice to inform the planning consent process. It is recommended that all planning permissions granted include compliance with the RWMP as a standard condition of planning.'

The level of detail presented in the RWMP should be reflective of the scale and complexity of the project and whether the project is within Tier 1 (smaller scale projects) or Tier 2 (larger scale projects) threshold. Tier 2: Larger scale projects are defined by the EPA as those 'including Strategic Infrastructure Developments, Strategic Housing Developments, infrastructure projects (road, rail, gas, energy)' or any project above the relevant Tier 1 thresholds. The proposed development comprises 544 no. residential dwellings / units, therefore this project is classed as a Tier 2 development.

This document applies only to the construction stage of the proposed development.

1.4 Format of the Plan

This is a live document which will be updated and added to throughout the project lifecycle. This document will provide a framework for waste management and will clearly identify the processes that will be implemented onsite, whilst also seeking to ensure compliance with relevant waste legislation, government policy objectives and project specific waste objectives. The Plan will provide a mechanism for monitoring and auditing waste management performance and compliance for the duration of the project.

The evolution of a single plan through a project lifecycle is recommended to ensure preventative and resource efficiency initiatives are undertaken, data are captured, and targets are set and measured throughout the project. This plan will evolve through the project from initial pre-construction phase followed by implementation at construction phase.

This construction resource and waste management plan (CRWMP) will be added to by the contractor. The CRWMP needs to be regularly revisited throughout a project's lifecycle so that opportunities to maximise waste reduction/ efficiencies are exploited throughout, and that data is added to on an ongoing basis so that it is as accurate as possible.

2 *Policies, Legislation and Guidance*

2.1 National Level

The implementation of the Waste Management Act in 1996 provided a legal basis for waste management, practice and infrastructure in Ireland. Following the implementation of this Act, government policy moved from primarily relying on landfill disposal towards a more sustainable system of waste treatment through the promotion of recycling and recovery. The policy document entitled 'Changing our ways' (DoEHLG, 1998) set specific targets for recycling and consolidated the now familiar waste hierarchy of prevention, minimisation, reuse/recycling, energy recovery and disposal. This approach was supported by subsequent legislation.

In 2002, the policy statement 'Preventing and Recycling Waste: Delivering Change' (DoEHLG, 2002) specifically focused on waste prevention and recycling. This document emphasised the importance of adopting a hierarchical approach, with prevention highlighted as the most desirable option. Various national waste prevention programmes and best practice guidance documents were subsequently delivered by the government.

The relevant guidance document in respect of the preparation of waste management plans for the construction sector was subsequently published by the DoEHLG in 2006, entitled 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects'. The purpose of these guidelines was to promote an integrated approach to the management of C&D waste which all parties from planners, designers, contractors and regulators can adopt throughout the project lifecycle, to ultimately minimise the generation of C&D waste and to establish specific thresholds for the requirement of Waste Management Plans.

In 2011 the revised EU Waste Framework Directive was transposed into Irish law by the European Commission (Waste Framework Directive) Regulations 2011 (SI 126 of 2011) (EC, 2008). The Waste Framework Directive focussed on sustainable and efficient materials management strategy and provides a legal basis for the waste hierarchy. Therefore, the waste hierarchy presented in Figure 2.1 should be applied as a priority in Ireland.

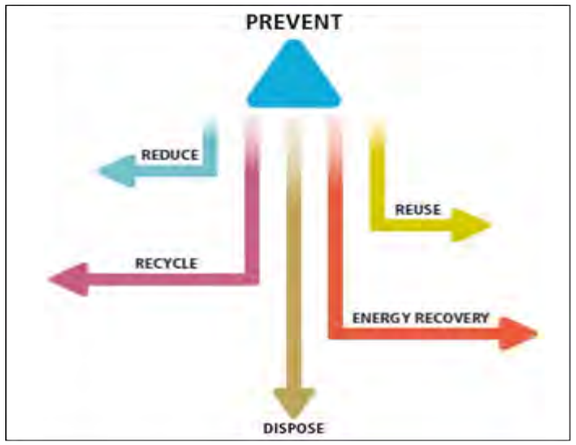


Figure 2.1 – Accepted Best Practice Waste Hierarchy (EPA, 2018)

In 2012 the Government published a new policy document entitled 'A Resource Opportunity Waste Management Policy in Ireland' (DoECLG, 2012). This document sets out the steps to be implemented on a national scale to make further progress on resource efficiency and seeking the elimination of landfilling of municipal waste in Ireland. This approach is further supported by subsequent guidance including the EPA publication 'Green Procurement: Guidance for the Public Sector' (EPA, 2014) which clearly states the following Core Green Public Procurement (GPP) Criteria for the Construction sector:

- Construction environmental management plan;
- Staff training;
- Management of fuel and hazardous substances;
- Use of secondary aggregate and recycled materials;
- Water Management; and,
- Waste Management.

This EPA (2014) publication 'Green Procurement: Guidance for the Public Sector' clearly sets out the responsibility of the Contractor with regard to waste management and disposal, as follows:

'The Contractor must apply appropriate measures in order to reduce and recover waste that is produced during the construction activity. The Contractor shall prepare and submit a waste management plan with its tender which shall form part of the Construction Management Plan to be agreed with the Contracting Authority in advance of the commencement of works. The waste management plan must be prepared in accordance with the Department of Environment, Community and Local Government Best practice guidelines on the preparation of waste management plans for construction and demolition projects (2006)'. Contractors are responsible for disposing of all waste generated under the contract in accordance with the Waste Management Act 1996 as amended. The Contractor must have full use of, or access to, waste disposal facilities with appropriate licenses and permits. The Contractor must provide copies of valid EPA Waste licences and Local Authority Waste Permits (including those relating to their subcontractors or brokers, where applicable) for collection and waste treatment/disposal/export facilities'.

According to the EPA (2021) 'Green Public Procurement: Guidance for the Public Sector' *'Ireland has committed to implementing green public procurement (GPP) in all tenders using public funds by 2023'.* The Department of Communication, Climate Action and Environment published *'A Waste Action for a Circular Economy – Ireland's National Waste Policy 2020-2025*' report, in September 2020. This document was prepared in response to the 'European Green Deal' and sets out a roadmap for the transition to a new economy, where climate and environmental challenges are instead seen as opportunities. This report replaces the previous National Waste Management Plan *'A Resource Opportunity Waste Management Policy in Ireland' (2012).*

The 'Waste Action for a Circular Economy' report focuses on transition to a circular economy, shown in Figure 2.2, and the need to plan for C&D waste management at the earliest possible stage in a construction project, ideally at concept stage.

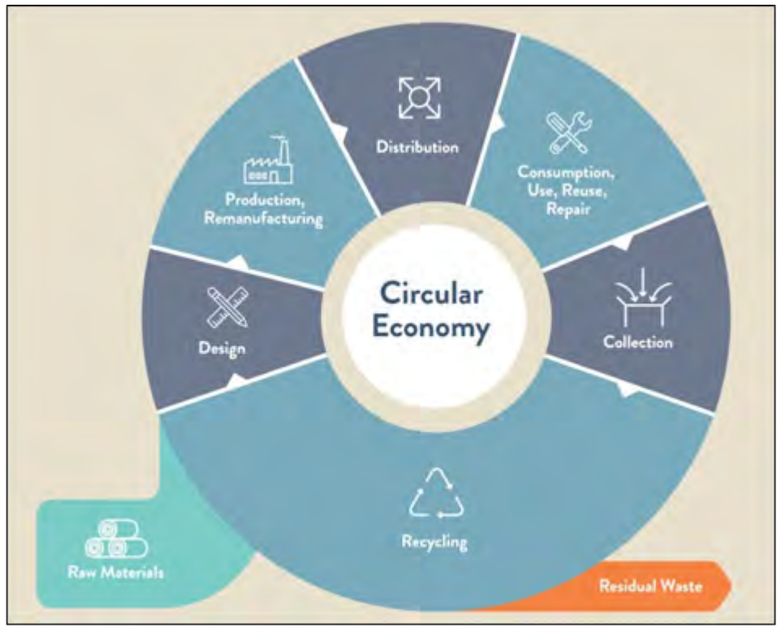


Figure 2.2 - The Circular Economy (DoCCAE, 2020)

he overarching objectives of this action plan are to:

- *'Shift the focus away from waste disposal and treatment to ensure that materials and products remain in productive use for longer thereby preventing waste and supporting reuse through a policy framework that discourages the wasting of resources and rewards circularity;*
- *Make producers who manufacture and sell disposable goods for profit environmentally accountable for the products they place on the market;*
- *Ensure that measures support sustainable economic models (for example by supporting the use of recycled over virgin materials); harness the reach and influence of all sectors including the voluntary sector, R&D, producers / manufacturers, regulatory bodies, civic society; and,*
- *Support clear and robust institutional arrangements for the waste sector, including through a strengthened role for Local Authorities (LAs).'*

The headline points on C&D waste in the Waste Action Plan are as follows:

- *'Project Ireland 2040 sets out the State's development goals over the next 20 years which allows for the opportunity to forecast large, specific C&D waste streams with a focus on preventing or efficiently managing the waste from these areas;*
- *Prevention of soil arisings which are a significant financial burden on the sector are to progress by placing value on the used material where possible. There is a strong focus on Article 27 by-product and Article 28 end-of-waste decision making process. These processes are to be streamlined and detailed guidance will be developed for specific problematic materials;*

- *The use of recycled construction materials will be incentivised (potentially by introducing a levy on virgin aggregates);*
- *The plan looks to make national end-of-waste decisions for specific construction and demolition waste streams at the earliest possible stage; and,*
- *The 2006 Best Practice Guidelines for construction and demolition waste will be revised to improve the Preparation of Waste Management Plans for Construction and Demolition Waste Projects'.*

2.2 Relevant Guidance

The EPA (2021) *'Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects'* supersedes the Department of Environmental, Heritage and Local Government (DoEHLG) (2006) *'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects'.*

Since the publication of the 2006 guidelines, waste policy in Europe has shifted from the established linear economic model to a circular economic model. *'Circular economy-inspired interventions focus not only on increasing recycling quantitatively but also on:*

- *Reducing the use of virgin resources;*
- *Keeping materials in the economy as long as possible;*
- *Maintaining their intrinsic value/quality as high as possible; and,*
- *Reducing hazardous substances in products and waste'. (EPA, 2021).*

The resource and waste management approaches presented in the EPA (2021) guidelines are based on international principles of optimising resources and reducing waste on construction projects through:

- Prevention;
- Reuse;
- Recycling;
- Green Procurement Principles;
- Off-Site Construction;
- Materials Optimisation; and,
- Flexibility and Deconstruction.

These principles are applied to the Resource and Waste Management Plan (RWMP) through both the pre- construction phase and the construction phase. The evolution of a single plan through a project lifecycle is recommended to ensure preventative and resource efficiency initiatives are undertaken, data is captured, and targets set and measured throughout the project. The evolution of the plan through the project from initial pre- construction phase (in green) followed by implementation at construction phase (in orange) is illustrated in Figure 2.3 below.

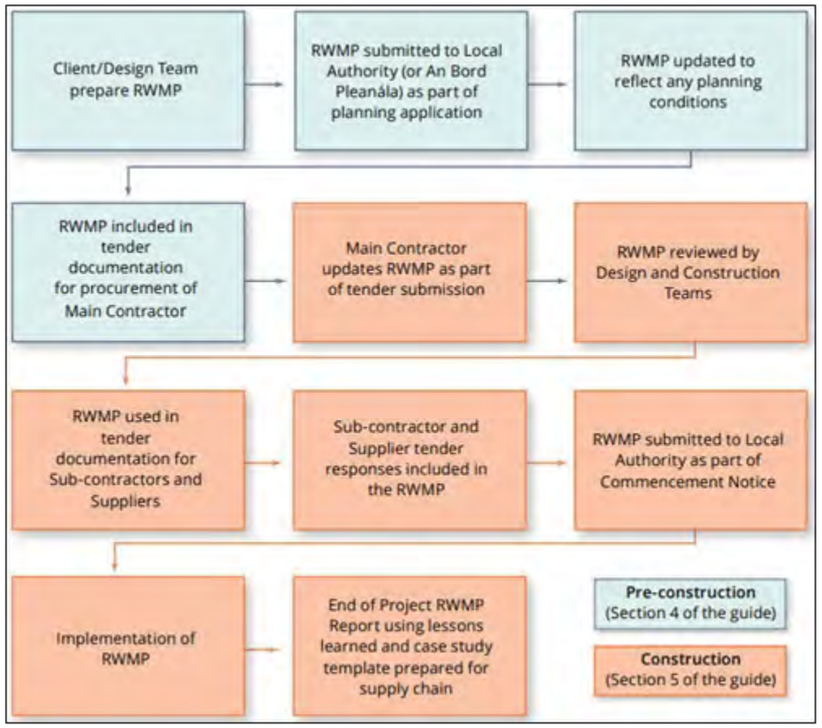


Figure 2.3 - Project Life Cycle of the RWMP (EPA, 2021)

According to the EPA (2021) the level of detail presented in the RWMP should be reflective of the scale and complexity of the project and whether the project is within the following Tier 1 or Tier 2 thresholds.

- Tier 1: Smaller scale projects, below the following thresholds:
  - New residential development of less than 10 dwellings;
  - Retrofit of 20 dwellings or less;
  - New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m^2;
  - Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m^2; and,
  - Demolition projects generating in total less than 100m^3 in volume of C&D waste.
- Tier-2 projects: Larger scale projects, including Strategic Infrastructure Developments, Strategic Housing Developments, infrastructure projects (road, rail, gas, energy) or any project above Tier 1 thresholds (presented above).

2.3 Waste Legislation

It will be the Contractor's responsibility to ensure that they are familiar and comply with the requirements of all relevant waste legislation for the duration of the project. The following non-exhaustive list of legislative requirements typically apply to the construction stage of major developments:

- Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste, as amended, 2018 (S.I. 2018/851);
- European Communities (Waste Directive) Regulations (Directive 2008/98/EC) 2011 (SI 126 of 2011) as amended 2016 (S.I 315 of 2016), as amended, 2018 (S.I. 2018/851), as amended 2020 (S.I. No. 323 of 2020);
- Waste Management Act of 1996, 2001 and 2003;
- Litter Pollution Act of 1997, and as amended in 2009 and 2017;
- Litter Pollution Regulations 1999, S.I. No. 359 of 1999);
- European Communities (Waste Electrical and Electronic Equipment) Regulations 2011 (S.I. 355 of 2011), as amended 2011 (S.I. No. 397 of 2011) 2013, (S.I. No. 32 of 2013);
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014) and 2019 (S.I No. 233 of 2019);
- Waste Management (Facility Permit and Registration) Regulations 2007, S.I. No. 821 of 2007, as amended, 2008 (S.I. No. 86 of 2008), 2015 (S.I. No. 198 of 2015), 2019 (S.I. No. 250 of 2019);
- Waste Management (Collection Permit) Regulations 2007, S.I. No. 820 of 2007), as amended, 2015 (S.I. No. 197 of 2015), 2016 (S.I. No. 24 of 2016);
- Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended 2010 (S.I. No. 350 of 2010);
- Waste Management (Miscellaneous Provisions) Regulations, 1998, S.I. No. 164 of 1998;
- Waste Management (Landfill Levy) Regulations 2008, S.I. No. 199 of 2008, as amended 2009, (S.I. No. 550 of 2009), 2010 (S.I. No. 31 of 2010), 2012 (S.I. No. 221 of 2012), 2013 (S.I. No. 194 of 2013), 2015 (S.I. No. 189 of 2015), 2019 (S.I. No.182 of 2019);
- Waste Management (Hazardous Waste) Regulations, 1998, as amended, 2000 (S.I. No. 73 of 2000);
- Waste Management (Shipment of Waste) Regulations 2007, S.I. No. 419 of 2007;
- Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998);
- European Communities (Shipments of Hazardous Waste Exclusively within Ireland) Regulations 2011, S.I. No 324 of 2011;
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (S.I. No. 121 of 1994);
- Waste Management (Transfrontier Shipment of Waste) Regulations 1998, as amended, 2014 (S.I. No. 861 of 2014);
- Waste Management (Tyres and Waste Tyres) Regulations 2007 (S.I. No. 664 of 2007), 2017, as amended (S.I. No. 400 of 2017) and 2018 (S.I. No. 96/2018);
- European Union (Batteries and Accumulators) Regulations 2014, S.I. No. 283 of 2014, as amended, 2014 (S.I. No. 349 of 2014), 2015 (S.I. No. 347 of 2015);
- Waste Management (Registration of Brokers and Dealers) Regulations 2008, SI No. 113 of 2008;

- Waste Management (Prohibition of Material Disposal by burning) Regulations 2009, S.I No. 286 of 2009, as amended 2013 (S.I. No. 504 of 2013), 2017 (S.I. No. 599 of 2017);
- European Waste Catalogue (EWC) and Hazardous Waste List 2002;
- Waste Management (Food Waste) Regulations 2009, S.I. No 508 of 2009, as amended, 2015 (S.I. No. 430 of 2015);
- European Union (Properties of Waste Which Render It Hazardous) Regulations 2015, S.I. No. 233 of 2015 as amended 2018 (S.I. No. 383/2018);
- Air Pollution Act, 1987 (Emission Limit Values for use of Asbestos) Regulations, 1990, S.I. No. 28 of 1990, as amended 1996 (S.I. No. 264/1996);
- EC (Control of Emissions of Gaseous & Particulate Pollutants from Non-Road Mobile Machinery) Regulations 2007, S.I. No.147 of 2007, as amended, 2011 (S.I. No. 263 of 2011), 2012 (S.I. No. 407 of 2012), 2013 (S.I No. 417 of 2013), 2016 (S.I. No. 2016/1628);
- The EU Regulation 2037/2000 (CFC's, HCFC's, Halons) - Ozone Depleting Substances. Control of Substances that Deplete the Ozone Layer Regulations 2006, S.I. No 281 of 2006, as amended, 2011 (S.I. No. 465 of 2011);
- EU F Gas Regulations 2014, S.I. No. 517 of 2014;
- Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended 2015 (S.I No 542 of 2015);
- Planning and Development Acts 2000 to 2015, as amended 2018, 2019 and 2020;
- Protection of Environment Act 1992 as amended 2003 and 2017;
- European Union (Ship Recycling) (Waste) Regulations 2019 (SI. No 13/2019);
- European Union (Environmental Impact Assessment) (Waste) Regulations 2013 SI. No. 505 of 2013;
- Industrial Emissions Directive 2010/75/EU; and,
- Landfill Directive 1999/31/EC.

2.4 Waste Soils Classification

According to the EPA Document 'Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous *'correct classification is the foundation for ensuring that the collection, transportation, storage and treatment of waste is carried out in a manner that provides protection for the environment and human health and in compliance with legal requirements'* (EPA, 2018).

The waste classification system within this EPA guidance document applies across the EU and is the basis for all national and international waste reporting obligations.

Since 2015, waste classification is based on:

- Commission Decision of 18 December 2014, amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European parliament and of the Council (2014/955/EEC) [referred to hereafter as 'The List of Waste (LoW)'].

Commission Regulation (EU) No 1357/2014 of 18 December 2014, replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives.

Soils requiring offsite disposal should be appropriately characterised, prior to transport and disposal, as follows;

- Representative chemical analytical results are input into a waste classification tool (to determine the relevant List of Waste (LoW) Code) and if the waste soils are hazardous or non-hazardous;
- Representative Waste Acceptance Criteria (WAC) analytical results are then separately screened against the relevant screening values (as established under the European Communities Council Decision ((EC) 92003/33/EC) 'COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC); and,
- All waste soils removed from site must be transported by appropriately permitted hauliers and must be disposed of to an appropriately authorised disposal / recovery facility (via. valid Certificate of Registration, Waste Facility Permit, or Waste Facility Licence).

3 *Project Description*

3.1 Site Location & Surrounding Land Use

The subject site (currently greenfield) is located approximately 8.0km southeast of Cork City Centre in Carriganarra on the southern side of Ballincollig to the south of the Link Road. The site is a greenfield site characterised by its undulating topography and its even slope rising at the southern end. The existing Limeworth and Heathfield estate which is currently being constructed runs along the site's northern edge and the site is surrounded on the other 3 sides by farmland and sheds which are in ruins. A snapshot of the application boundary is outlined in Figure 3.1 below.



Figure 3.1 – Context Map (Source: Google Maps)

3.2 Proposed Development

The development will consist of the demolition of existing agricultural buildings and the construction of a residential development of 300 no. residential units consisting of 128 no. dwellings houses, 172 no. apartment/duplex units, a two storey creche facility and all ancillary site development works. The proposed 128 no. dwelling houses will include 42 no. bedroom detached/semi-detached dwelling houses and 84 no. 3 bedroom semi-detached/townhouse dwelling houses. The proposed development also provides for the restoration of an existing vernacular farm building on site which will accommodate 2 no. 2 bedroom semi-detached units. The proposed 172 no. apartment/duplex units will include 18 no. 3 bedroom units, 109 no. 2 bedroom units and 45 no. 1 bedroom units, to be provided in 20 no. apartment/duplex buildings ranging in height from 3-4 storeys over basement level.

Vehicular access to the proposed development will be provided via the existing junction from the Killumney road serving the Heathfield residential development and existing sections of the Maglin Sustainable Access Corridor to the north. The proposed development provides for the extension of Maglin Sustainable Access Corridor and the provision of 4 no. pedestrian/cycle connections to the Heathfield residential development to the north which is under construction. Ancillary site works include the raising of existing ground levels on site, the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex and creche buildings, the delivery of active travel infrastructure, landscaping and servicing proposals including a temporary pumping station, and the undergrounding/diversion of an existing 38KV overhead ESB line which traverses the site.

The proposed development is highlighted in Figure 3.2 below.



Figure 3.2 – Proposed Development

3.2.1 Details of the Non-Hazardous Wastes to be produced

Waste materials generated during the construction stage will primarily comprise topsoil and excavated subsoil during the installation of structural foundations, installation of the storm water (including attenuation area) and foul water drainage works, watermains and laying of cable ducts, surplus general building waste materials, and waste generated by construction workers.

In accordance with good practice, excavated soils will be reused onsite where feasible, including for boundary treatment and landscaping purposes, if suitable. Any surplus soils will be disposed of offsite in accordance with all relevant waste management legislation and best practice requirements.

Should any ground contamination be encountered during the construction phase of the development the Employer and Employers Representative, and the Resource Manager should be immediately notified and consulted with. Appropriate measures must be put in place, as set out below, including appropriate transport and disposal of such waste materials to a suitably licenced facility in accordance with all relevant waste legislation.

According to the EPA 'Correct classification is the foundation for ensuring that the collection, transportation, storage and treatment of waste is carried out in a manner that provides protection for the environment and human health and in compliance with legal requirements. Hence soils requiring offsite disposal must be characterised as per the requirements of the relevant Waste Acceptance Criteria (WAC) under the European Communities Council Decision ((EC) 92003/33/EC) 'COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC'. Soils requiring offsite disposal will also require waste classification in strict accordance with the requirements of the EPA as set out in the following document 'Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous' (EPA, 2018). All waste soils removed from site must be transported by appropriately permitted hauliers and must be disposed of to an appropriately authorised disposal / recovery facility (via. valid Certificate of Registration, Waste Facility Permit, or Waste Facility Licence).

Surplus construction materials including concrete blocks, cladding, metals, tiles, glass, plastics, packaging, and timber will be generated during the Construction Phase. Materials will be segregated and recycled were possible; all other materials will be disposed of offsite in accordance with all relevant waste management legislation and best practice requirements. Additional waste generated by onsite personnel during the construction works will broadly include the following; canteen waste, waste arising from temporary onsite self- contained welfare facilities, and a minor volume of waste electrical and electronic equipment. A breakdown of the likely waste streams which will be generated is presented in Section 6.

3.2.2 Details of Potentially Hazardous Wastes to be produced

3.2.2.1 Fuels, Oils and Chemicals

Hazardous materials (fuels, oils and chemicals) will be used at the site during the Construction Phase. As per industry standards any fuel and oils temporarily stored onsite will be stored in double skinned / appropriately bunded storage tanks, in a secure dedicated fuel storage location onsite. All other chemicals including paints, varnishes, glues, adhesives, degreasing agents and cleaning agents will be securely stored in a dedicated temporary bunded chemical store onsite. All machinery

including any generators / pumps used onsite should be checked at the start of each work shift for evidence of any fuel or oil leaks (and removed offsite for any repairs as may be required).

Fuel, oil and chemical spill kits should be available at the designated storage areas, along with the relevant Safety Data Sheet (SDS). SDS documents contain information on the potential hazards (health, fire, reactivity and environmental) and how to work safely with the relevant chemical. All site operatives should receive training in appropriate refuelling methods and machinery checks, and chemical handling methods to be implemented onsite. Taking account of these control measures, along with the fact that the volumes of paints, varnishes, glues, adhesives etc. will be minor, it is not expected that any waste fuel, oil or chemicals will be generated during the Construction Phase.

3.2.2.2 Contaminated Soils

Based on available information no potential sources of significant onsite ground contamination associated with current or historic land-use have been identified. Therefore, the risk of encountering significant ground contamination (i.e. hazardous soils) beneath the site is considered to be highly unlikely at this preliminary juncture.

Nonetheless excavation works during the Construction Phase should be monitored and in the highly unlikely event that contaminated materials are encountered these will need to be segregated from all uncontaminated soils, temporarily stored (any stockpiles should be lined and covered by heavy duty 1000-gauge plastic), sampled and analysed for relevant parameters (Waste Acceptance Criteria suite e.g. Rilta Disposal Suite). Any contaminated soils must be characterised as per the requirements of the relevant Waste Acceptance Criteria (WAC) under the relevant European Communities Council Decision (EC) (92003/33/EC) and classified in accordance with the requirements of the EPA as set out in the following documents 'Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous' (EPA, 2018). Any contaminated soils must be transported by appropriately permitted hauliers and disposed of to an appropriate EPA licensed Waste Facility in accordance with all relevant waste management legislation.

3.2.2.3 Non-native Invasive Species

The Site was surveyed by an Ecologist for invasive plant species listed on the third schedule of the EC (Birds and Natural Habitats) Regulations 2011 S.I. No. 477/ 2011. Species surveyed for included Japanese knotweed (Reynoutria japonica) and associated hybrids. Surveys were undertaken during April 2024 & January 2025 which is within the seasonally appropriate window to assess the Site for the presence of invasive plant species.

No evidence of third schedule invasive plant species were recorded within the extents of the Site. However, in the highly unlikely event that any non-native invasive species including Japanese knotweed (Fallopia japonica) are identified prior to or during construction activity, appropriate measures (designed, scoped and managed by a relevant specialist) will be required in order to remediate any identified Japanese Knotweed stems and any soils impacted by the plant roots.

In regard to non-native invasive species the following points should be noted;

- Regulations 49 and 50 of Part 6 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) outlines the legal context for the prohibition of the introduction and dispersal of certain plant and animal species.

Specifically, Section 49, paragraph 2 states that any person without the required licence "who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow" any plant species listed in Part 1 of the Third Schedule within the State shall be guilty of an offence.

- Under Section 50 paragraph 1, a person without the required licence "shall be guilty of an offence if he or she has in his or her possession for sale, or for the purposes of breeding, reproduction or propagation, or offers or exposes for sale, transportation, distribution, introduction or release" of any plant species listed in Part 1 of the Third Schedule or anything from which "a plant referred to in Part 1 of the Third Schedule can be reproduced or propagated or "a vector material listed in Part 3 of the Third Schedule".

4 Roles & Responsibilities

For the purposes of clarity, the roles and responsibilities of the project team for the proposed development should be determined at the very outset of the construction stage of this project. Key roles are typically performed by the Client, Engineer, and Contractor as presented in Table 4-1 below. Specific details will be determined during the Detailed Design and Contract stage.

Employer		Planning Agents	
The Client:	Murnane & O'Shea Limited	The Planner:	HW Planning
Tel:	027-54110	Tel:	021-4873250
Contact:	Paudie Murnane	Contact:	Harry Walsh
Employers Representative		Design Team	
The Engineer:	DOSA	The Architect:	Deady Gahan Architects
Tel:	021-4871781	Tel:	021-4355016
Contact:	Liam O'Toole	Contact:	Ger Naughton
Project Supervisor for the Design Process (PSDP)		Civil, Structural and Environmental Team	
The Engineer:	to be confirmed	Consultant:	DOSA
Tel:	to be confirmed	Tel:	021-4871781
Contact:	to be confirmed	Contact:	Liam O'Toole
Masterplan Architect		Landscape Architect	
The Architect:	Deady Gahan Architects	The Landscape Architect:	SRLA
Tel:	021-4355016	Tel:	086 0563434
Contact:	Ger Naughton	Contact:	Simon Ronan
Project Supervisor Construction Stage (PSCS)		Contractor	
The Contractor:	to be confirmed	The Contractor:	to be confirmed
Tel:	to be confirmed	Tel:	to be confirmed
Contact:	to be confirmed	Contact:	to be confirmed

Table 4-1 - Roles and Responsibilities

The EPA (2021) *'Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects'* state that a number of responsibilities for the development of resource & waste management plans are identified for parties under Waste Framework Directive 2008/98/EC including the following:

- *'Original Waste Producer means anyone whose activities produce waste or anyone who carries out pre-processing, mixing or other operations resulting in a change in the nature or composition of this waste (in this case the Client); and,*
- *Waste Holder means the waste producer or the natural or legal person who is in possession of the waste (the Client)'.*

The EPA (2021) *'Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects'*, highlights the responsibilities of the following key personnel for implementing resource & waste management plans.

4.1 Client

The responsibilities of the client are as follows:

- Require the preparation and submission of an RWMP as part of the design and planning submission;
- Require the preparation and submission of an updated RWMP as part of the construction tendering process;
- Ensure that the RWMP is agreed and submitted to the local authority prior to commencement of works on site; and,
- Request the end-of-project RWMP from the Contractor.

4.2 Design Team

The responsibilities of the design team are as follows:

- Drafting and maintaining the RWMP through the design, planning and procurement phases of the project;
- Appointing a Resource Manager (RM) to track and document the design process, inform the Design Team and prepare the RWMP;
- Include details and estimated quantities of all projected waste streams;
- Incorporate relevant conditions imposed in the planning permission into the RWMP;
- Handover of the RWMP to the Contractor at commencement of construction for the development of the RWMP in a similar fashion to how the safety file is handed over to the Contractor; and,
- Work with the Contractor as required to meet the performance targets for the project.

4.3 Contractor

The responsibilities of the contractors are as follows:

- Adding to, implementing and reviewing the RWMP through construction (including the management of all suppliers and sub-contractors) as per the requirements of these guidelines;
- Identifying a designated and suitably qualified Resource Manager (RM) who will be responsible for implementing the RWMP;

- Identifying all hauliers to be engaged to transport each of the resources / wastes off-site;
- End-of-waste and by-product notifications addressed with EPA where required;
- Clarification of any other statutory waste management obligations, which could include on-site processing; Full records of all resources (both wastes and other resources) should be maintained for the duration of the project;
- Carry out training and site inductions; and,
- Preparing a RWMP Implementation Review Report at project handover.

5 Design Approach

5.1 Design for Reuse and Recycling

The site preparation works will involve excavation for the installation of foul and surface water drainage system works, structural foundations, internal roads and underground utilities during the construction phase.

In accordance with good practice, excavated soils will be reused onsite where feasible, including for boundary treatment and landscaping purposes, if suitable. Any excess topsoil to be transported offsite will be transported to an appropriately licenced, permitted or registered facility. The soil will be characterised in accordance with EPA, 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' and Council Decision, 2003 on establishing criteria and procedures for the acceptance of waste at landfills.

An application may be made to the EPA under Article 27 of the European Communities (Waste Directive) Regulations 2011 for the use of excess soil or materials as a by-product if a definite use and need for this material can be determined. Also an application may be made to the EPA under Article 28 which sets out the grounds by which a material, which is recovered or recycled from waste, can be deemed to be no longer a waste and complies with a set of end-of-waste criteria (substance/ object to be used for specific purposes, a market or demand exists, fulfils technical requirements and no overall adverse impact to human health or the environment).

During the construction, the contractor will review availability of recycled aggregates and other materials in the local area and decide on the most sustainable options, for example, the use of an on-site crusher for recycling of residual concrete to generate aggregates for use on site (subject to the appropriate waste consent, such as an Article 28 end of waste decision and once processing is industry standard practice, such as ensuring the aggregate outputs comply with the specifications of IS EN 13242).

The contractor will review 'new' materials to be used as part of the proposed development, which contain a recommended percentage of recycled content if they meet the functional, performance and regulatory requirements and are available locally at a reasonable cost.

Design for Reuse and Recycling is the most efficient way of designing low carbon infrastructure and feeds into the circular economy as opposed to a linear economy where product is treated as 'waste' at the end of its life. Standardised internal dry lining systems, standardised flooring systems and internal doors have all been considered within the design.

5.2 Design for Green Procurement

When selecting suppliers, it is essential to assess the technical capabilities required for the products or services being procured. This is valuable from the buyers' point of view as suppliers that clearly cannot meet the requirements will be eliminated. In addition, it is also useful for the suppliers to get a clear understanding of how committed the Client is to protect sustainability and what will be essential for any submission to be successful.

At an early stage (pre-procurement), the client will have discussion with potential contractors, subcontractors and suppliers regarding the following:

- Waste prevention and minimisation during the construction stage;
- Proposed design solutions to encourage innovation in tenders and incentivise competitions to recognise sustainable approaches;
- Use ordering procedures that avoid waste, i.e. no over-ordering, take-back schemes for both material surplus and offcuts;
- Discuss options for packaging reduction with subcontractors and suppliers using measures such as 'Just-in-Time' delivery; and,
- Set reuse and recycling rates.

Green procurement integrates environmental considerations that include a combination of cost and quality into the procurement process. In order to help achieve this, both operational and embodied carbon targets for this project will be set out early on in collaboration with the design team in order to ensure that green procurement can take place. Through comparative data on embodied carbon, low carbon materials options will be favoured where possible. A sustainable construction plan will be developed that addresses all aspects of construction relating to design from reducing demolition, considering reuse / upcycling and recycling of existing materials to approaching suppliers for green construction materials e.g. Responsible Steel and adopt Design of Off-Site Construction. *'The use of off-site manufacturing reduces residual wastes by up to 90% (volumetric building versus traditional)'* (EPA, 2021). Low carbon additives to industry standard components will also be considered as part of this process e.g. the use of GGBS in concrete can be a way to reduce its carbon footprint whilst still achieving the structural and fire benefits of concrete.

5.3 Design for Material Optimisation

As stated in the EPA (2021) guidelines the key design principle for design for material optimisation *'is to ensure manufacturers and construction companies adopt lean production models, including maximising the reuse of materials onsite. This helps to reduce the environmental impacts associated with transportation of materials and from waste management activities.'*

Design for material optimisation includes the use of standardised sizes for certain materials to help reduce the number of offcuts produced on site, focusing on promotion and development of off-site manufacture.

5.4 Deign for Flexibility and Deconstruction

It will be the contractor's responsibility to ensure that all products (including buildings) only contain materials that can be recycled and are designed to be easily disassembled, where possible. As per the EPA (2021) guidelines, the design team will '*consider material efficiency for the duration and end of life of a building project; flexible, adaptable spaces that enable a resource-efficient, low-waste future change of use; durability of materials and how they can be recovered effectively when maintenance and refurbishment are undertaken and during disassembly/deconstruction'.*

6 *Key Material & Quantities*

6.1 Type of Waste

The waste generated onsite is surplus or waste materials arising from either the materials imported to site or from those generated on site. Imported materials are those which are imported to site for inclusion into the temporary and permanent works (such as concrete, construction aggregates, asphalt and cabling etc.). Included within this waste stream is product packaging. This waste stream is produced from a range of potentially preventable activities. Such activities include damaged materials and the over ordering of materials. This waste stream is described as construction (C) waste within the RWMP. Site generated materials are those which exist within the proposed works footprint such as topsoil and sub-soil etc. This waste stream is categorised as excavated (E) waste within the RWMP. Refer to Table 6-1 for the breakdown of types of waste. For both groups of materials there are a number of 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 data.

Type of waste	Description
Imported material	Where possible, consideration should be given to the re-use of material back into the project development works. Any waste produced through the importation of materials needs to be monitored and included in the RWMP under construction works. Where possible, consideration should be given to the use of recycled imported material such as concrete, which has a higher recycled content.
Excavated materials (E)	Materials such as excavated soils should be segregated during the excavation process. Appropriately experienced staff should supervise the excavation works to manage the segregation of soil materials. Site-derived materials of a similar nature should be stockpiled together and any changes in the physical and/or chemical properties should prompt further segregation. Soils should be placed in clearly identified stockpiles and chemical testing undertaken to confirm the potential for re-use on site, or, if considered inappropriate for re-use (due to geotechnical or chemical properties or being surplus), to inform off site treatment and/or disposal routes. Where soil materials meet the geotechnical and chemical criteria for re-use given the proposed end use scenario, such materials may be re-used on site, if required. Any surplus materials should be removed from site for either direct beneficial use elsewhere (such as land remediation schemes) where an application may be made to the EPA under Article 27 of the European Communities (Waste Directive) Regulations 2011 for the use of excess soil as a by-product if a definite use and need for this material can be determined or for recycling or recovery at an appropriately permitted off-site facility. Where excavated materials are affected by contamination, such materials should be separated and sent for either treatment, where appropriate, or disposal at appropriately permitted facilities. Disposal of excavated material will be by licensed carriers, to licensed landfill sites and handled in accordance with the Waste Management Regulations.
Concrete	This waste will be generated by works and the buildings for the proposed project.
Wood	Packaging such as pallets.
Packaging	From construction materials, etc.
Plastic	Offcuts of pipework/ducting etc.

Vegetation	The majority of the existing trees along the boundary are being retained for the proposed project with planting of hedgerow and ornamental shrub and Herbaceous plants proposed. Additionally meadow planting is proposed as well as amenity grass and open spaces. Further landscape details are included in the Landscape Design for the proposed project. Where vegetation / landscaping elements are being removed, re-use of such materials should be considered where possible. E.g. suitable vegetation could be turned into mulch or compost to be re-used for landscape purposes.
Metals	Offcuts from reinforced concrete for building foundations. Metal components or assets removed for site clearance.
Paper and Cardboard	Packaging from components delivered to site.
Segregated Haz Waste	Nominal 1% to account for packaging that contained hazardous material such as oils, solvents, sealants etc.

Table 6-1 - Breakdown of Types of Waste

In relation to the overall works particular attention is drawn to the following waste/soil related activities:

- The site location deliveries/ removals are to phone ahead; Just-in-Time' (JIT) delivery processes; receive precise directions and named person to liaise with on site. The Contractor is to erect required signage approaching site and ensure deliveries are programmed to cause minimal disruption;
- Hazardous manual handling operations are to be avoided so far as is reasonably practicable; and,
- Note that waste generated by the project will be managed in compliance with Waste Management Act 1996, Waste Management (amended) Act 2003 and associated Regulations.

6.2 Summary of Potential Waste Streams (LoW / EWC Codes)

It is understood that all the waste arising from the construction works will be transported off site by an approved waste contractor holding all the necessary waste collection and transportation permits. All the waste arisings requiring reuse, recycling, recovery or disposal will be brought to facilities holding the appropriate Certificate of Registration, Waste Licence or Waste Permit, as required.

A summary of the main hazardous and non-hazardous waste streams which could arise during the Construction Phase are presented in Table 6-2, along with the relevant List of Waste (LoW) code. The LoW code (also referred to as European Waste Catalogue (EWC) code) serves as a common method of characterising various waste streams. Assignment of waste codes will determine how and where the generated waste can be disposed of. LoW codes must be selected for each waste type – a full description of each code is available on the EPA website1.

It should be noted that the summary list presented in Table 6-2 is a non-exhaustive list and it will be the Contractors responsibility to ensure all waste streams generated onsite during the Construction Phase for this project are appropriately characterised, managed and disposed of in accordance with all relevant waste management legislation.

Waste Material	LoW Code
Concrete, bricks, tiles and ceramics	
Concrete	17 01 01
Bricks	17 01 02
tiles and ceramics	17 01 03
mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	17 01 07
Wood, glass and plastic	
Wood	17 02 01
Glass	17 02 02
Plastic	17 02 03
Bituminous mixtures, coal tar and tarred products	
bituminous mixtures	17 03 02
metals (including their alloys)	
mixed metals	17 04 07
Soil (including excavated soil from contaminated sites), stones and dredging spoil	
soil and stones containing hazardous substances	17 05 03*
soil and stones other than those mentioned in 17 05 03	17 05 04
Gypsum-based construction material	
Gypsum-based construction material	17 08 02
Other construction and demolition wastes	
mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	17 09 04
Wastes from electrical and electronic equipment	
discarded equipment containing chlorofluorocarbons, HCFC, HFC	16 02 11*
discarded equipment containing free asbestos	16 02 12*

discarded equipment containing hazardous components (16) other than those mentioned in 16 02 09 to 16 02 12	16 02 13*
discarded equipment other than those mentioned in 16 02 09 to 16 02 13	16 02 14
hazardous components removed from discarded equipment	16 02 15*
components removed from discarded equipment other than those mentioned in 16 02 15	16 02 16
Miscellaneous Waste	
Paper and cardboard	20 01 01
biodegradable waste (Green waste)	20 02 01
batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	20 01 33*
batteries and accumulators other than those mentioned in 20 01 33	20 01 34
Waste fuel oil and diesel	13 07 01*
Waste petrol	13 07 02*
Waste other fuels (including mixtures)	13 07 03*
Chemicals – Solvents	20 01 13*
Chemicals – Pesticides	20 01 19*
Chemicals - paint, inks, adhesives and resins containing hazardous substances	20 01 27*
Chemicals - paint, inks, adhesives and resins other than those mentioned in 20 01 27	20 01 28
Chemicals - detergents containing hazardous substances	20 01 29*
Chemicals - detergents other than those mentioned in 20 01 29	20 01 30
fluorescent tubes and other mercury-containing waste	20 01 21*
insulation materials other than those mentioned in 17 06 01 and 17 06 03	17 06 04

Table 6-2 - Summary list of LoW Codes, which may be relevant to the site

6.3 Soil Generation

The site preparation works will comprise the stripping of topsoil across the Site, excavation of subsoil and pouring of foundations for the residential units, installation of the storm water (including infiltration basin) and foul water drainage works, watermains and laying of cable ducts, and piling as required.

All such material will be removed and disposed offsite to a suitably permitted / licenced waste recovery / disposal facility in accordance with relevant waste management legislation (including but not limited to the Waste Management Act of 1996, 2001 and 2003 and all subsequent waste management regulations as amended).

Any soil transported off-site will be characterised in accordance with EPA guidance, 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' and Council Decision, 2003 on establishing criteria and procedures for the acceptance of waste at landfills. An application may be made to the EPA under Article 27 of the European Communities (Waste Directive) Regulations 2011 for the use of excess soil as a by-product if a definite use and need for this material can be determined.

6.4 Construction Waste Generation

A typical breakdown of C&D wastes generated during construction of this development type in Ireland is presented in Figure 6.1 below (EPA, 2009). This figure indicates the percentage breakdown of waste from New residential construction.

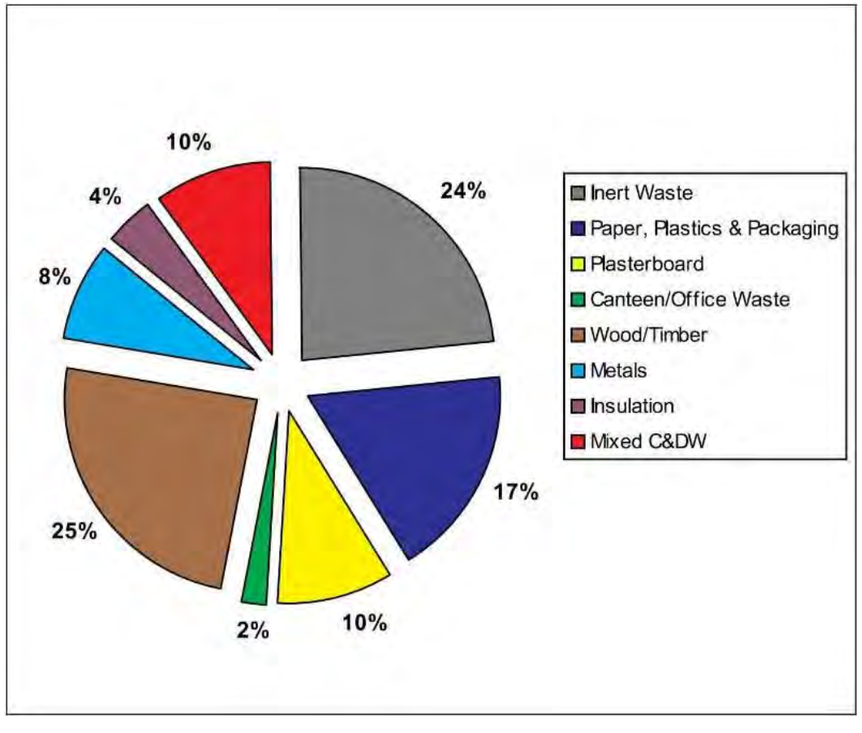


Figure 6.1 - New residential construction composition by volume (m3) (C&D Waste) (EPA, 2009).

Taking account of an average generated waste factor of 0.107m3 per m2 (of completed floor space) for 'new residential construction' (EPA, 2009), and based on the building floor space areas for the proposed development provided by the Architecture team, preliminary waste volumes have been calculated, and are estimated to be ca. 1942m3.

It is noted that these volumes are based on literature values for representative Irish construction sites and are an approximate guideline only. In addition, no specific allowance has been made for C&D waste arising from the construction of access roads, utilities and services or any commercial units. Final volumes can only be confirmed via. site audited waste disposal / recovery records.

Each waste stream will be managed onsite as follows. Table 6-4 shows the potential recycling/re-use targets of each waste stream for the proposed project.

Each waste stream will be managed onsite as follows.

6.4.1 Native Non-Contaminated Soils

The estimated volume of soil generated during the construction phase has yet to be determined, however will be minimised by reducing / eliminating the need for excavation and importing of capping layers. The balance of soil materials excavated from the site will be reused where possible for landscaping purposes, and infill where appropriate, ensuring that any residual soil waste is kept to a minimum. Any surplus soil will be characterised and removed offsite in accordance with all relevant waste management legislation.

6.4.2 Mixed C&D Waste

Following segregation onsite, any residual mixed C&D waste will be collected in containers specifically for mixed C&D waste; these will be removed offsite for subsequent offsite separation and disposal at a waste disposal / recovery facility.

6.4.3 Wood / Timber

Timber waste will be segregated in order to prevent contamination by other wastes and will be stored so as to limit the potential for this material to rot. Wooden pallets will be returned to relevant suppliers where possible. Timber offcuts will be reused onsite where feasible. A covered receptible for waste wood will be placed in the waste storage area, prior to removal from site for recycling. All such timber will be free from chemical treatment.

6.4.4 Metals

Metal waste will be generated during the project, particularly arising from the use of rebar. All waste metal will be segregated offsite at the waste disposal / recovery facility for reuse and recycling. Given the significant scrap value associated with metal waste, this waste will be stored in a dedicated container within a secure part of the site, and regular collections from site to the waste recycling facility will limit the potential for unauthorised entry and theft.

6.4.5 Paper, plastics and Packaging

Packaging wastes will be removed (paper / cardboard / plastic / general waste) offsite for subsequent offsite separation and disposal at a waste disposal / recovery facility. Waste packaging will be stored in dedicated containers in the waste storage area for collection and subsequent segregation and recycling.

6.4.6 Canteen / Office Waste

Onsite staff canteens will generate food and packaging waste. Dedicated containers will be provided at each canteen to permit easy segregation of these wastes; brown bins will be provided for compostable food waste, green bins will be provided for dry recyclables (packaging, hard plastic, paper, cardboard, tetrapak etc.) and black bins will be provided for any residual waste.

6.4.7 Other wastes

In addition to the above waste streams, other waste materials will be generated during the construction phase. These residual wastes will typically comprise non- recycling waste such as soiled paper / cardboard / plastics / cloth, canteen food waste, fibreglass, polystyrene insulations and plasterboard. These materials will be stored separately to all other waste streams in order to prevent any cross contamination.

All C&D waste materials will be segregated onsite into the various waste streams, via. dedicated skips and storage areas. Waste will be removed from site by a suitably permitted waste haulage contractor. The Contractor should clearly identify all proposed waste haulage contractors within the project specific. Detailed RWMP. Each waste haulage contractor must hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO). All waste materials generated during the Construction Phase must be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility.

Waste type	Recycling/ Reuse %* (*WRAP best practice recovery rates)
Imported material	70-90
Excavated material	70-100
Concrete, track ballast etc	50-90
Wood	90
Packaging	95
Plastic	95
Metals	100
Paper and Cardboard	100
Haz soil	50
Foul waste	100

Table 6-4 - Potential Recycling/Re-use Targets

6.4.8 Tracking and Documentation Procedures for Off-Site Waste

All waste transport and disposal / recovery must be carried out in accordance with relevant waste management legislation (outlined in Section 2) and any subsequent future legislation which may apply. A nominated Waste Manager for the project will be responsible for ensuring correct tracking and documentation procedures are undertaken for all waste removed from site during the project. Each consignment of waste removed from site will be tracked and recorded. A site record detailing the date, truck registration, waste type, estimated volume and destination will be filed onsite for each consignment, along with the corresponding truck docket and weighbridge record at the offsite disposal/recovery destination. A copy of the relevant waste collection permits and waste permit / waste licence for the relevant disposal / recovery facilities will be available onsite for the duration of the project.

6.4.9 Construction Waste Management Costs

Under the Waste Framework Directive 2008/98/EC and in accordance with the polluter-pays principle, there is a legal requirement that the costs of disposing of waste must be borne by the holder of waste or by the producers of the product from which the waste came, thereby placing the legal obligation for the management of the waste on the Client.

In terms of waste management and disposal costs, at this preliminary juncture it would not be feasible to estimate the total cost of waste management and disposal associated with the proposed development. Estimated costs will be determined by the Contractor.

7 Site Management

7.1 Resource / Environmental Manager - Responsibilities

The Contractor will nominate a Resource Manager for the duration of the Construction Phase. The Resource Manager will be responsible for the efficient operation of onsite waste management procedures; they will also be responsible for ensuring that all waste removed offsite is appropriately characterised (under the correct LoW / EWC code), transported and disposed of in accordance with all relevant waste management legislation. It will be the Waste Managers responsibility to maintain all waste management and disposal / recovery records onsite throughout the project. These site records should be made available for viewing by the Client, Employers Representative and statutory consultees (DLRCC, WCC, EPA) as required.

The Resource Manager should be appropriately trained in the correct documentary procedure, waste auditing and best practice methods in onsite waste minimisation and waste management toolbox talks with site operatives to highlight any specific waste management concerns will also be carried out should the need arise.

7.2 Site Compound Location

All C&D waste materials will be segregated onsite into the various waste streams, via. labelled dedicated skips and storage areas. Waste will be removed from site by a suitably permitted waste haulage contractor. The Contractor should clearly identify all proposed waste haulage contractors within the project specific RWMP. Each waste haulage contractor must hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO).

The proposed locations of the site compounds are indicated in the CEMP. The locations of the site compounds are selected to avoid any potential impacts to environmental receptors and to reduce any potential for impact on sensitive human receptors. The site compounds will also act as a storage centre for construction materials.

7.3 Training

All site personnel should receive waste management information and environmental induction before commencing work on the project, which will include a module on resource management as part of their initial site briefing from the Resources Manager. The initial briefing should include a discussion of the key points set out in the RWMP, along with the specific procedures to be implemented onsite to segregate and appropriately store the generated waste and key control measures such as refuelling procedures and oil, fuel and chemical storage requirements. This will ensure that all onsite personnel are familiar with the site-specific waste management strategy.

As a minimum the following will be included in the induction, as per the EPA (2021) guidelines:

- *'Scope and content of the RWMP;*
- *Project commitments and targets;*
- *List of anticipated resources and wastes and volumes to be generated;*
- *Procedures for the proper identification and segregation of resources and wastes;*
- *Temporary storage and the location of the WSAs; and,*

- *Clear instruction on hazardous wastes will be incorporated into the training programme and the particular dangers of each hazardous waste.'*

The environmental induction shall be provided and delivered by the Contractor and be tailored to suit the tasks and responsibilities of site personnel from management and supervisory level through to site operatives. Toolbox talks on resource management should be provided on a continuous basis. Regular toolbox talks shall ensure site staff are aware of the resource management practices associated with their work and the appropriate control measures that are required to carry out their work in compliance with the RWMP.

7.3.1 Disposal / Recycling Proposals for Each Waste Stream

All C&D waste materials will be segregated onsite into the various waste streams, via. dedicated skips and storage areas. Waste will be removed from site by a suitably permitted waste haulage contractor. Each waste haulage contractor must hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO).

All waste materials generated during the Construction Phase must be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility.

7.3.2 Proposed Management Strategy for each Waste Stream

Key principles set out in the guidelines (EPA, 2021) include optimising resources and reducing waste on construction projects through:

- Prevention
- Reuse;
- Recycling;
- Green Procurement Principles;
- Off-Site Construction;
- Materials Optimisation; and,
- Flexibility and Deconstruction.

These principles are applied to the RWMP through both the pre-construction phase and the construction phase. Therefore, every effort should be made to prevent and limit the amount of waste generated at the very outset of the project. At the preparatory phase of the Construction Phase the following measures will aid the prevention of waste in the first instance;

- *Select procurement routes to minimise unnecessary packaging – for example applying 'Just-in-Time' (JIT) delivery processes to minimise material spoilage;*
- *Use of 'consolidation centres' to support JIT delivery – these are strategically-located storage and distribution facilities where materials can be stored prior to JIT delivery to sites;*
- *Implement ordering procedures and supply chain systems that avoid waste, i.e. no over-ordering, use of take-back schemes for packaging, material surplus and offcuts;*
- *Select procurement routes that minimise unnecessary packaging; and,*
- *Plan the work sequence to reduce the potential for on-site residual resource generation.*

7.4 Record Keeping

The Contractor, through the appointed Resource Manager, will be responsible for ensuring that the full details of all materials deliveries, materials movements and C&D waste generated is recorded during the Demolition and Construction Phases. Each C&D waste consignment removed from and to site will be tracked and documented to ensure full traceability of the material from site to the final destination. A single record will be completed for each individual consignment.

The Contractor will also receive printed receipts / weighbridge records from the waste disposal / recovery facilities for each individual consignment. These records will enable the Contractor to accurately quantify the total volume of waste removed for offsite disposal / recovery for each individual waste stream. These records will be maintained onsite and will be made available for auditing.

The type of information to be recorded in the site tracking system is described below in accordance with relevant guidelines and legislation:

- For each movement of resource off-site, a signed docket/invoice will be obtained by the RM from the haulier/contractor detailing the following:
  - Name the resource / waste stream.
  - List of Waste (Low) Code for each stream (where applicable).
  - Quantity of material moved off-site by the haulier/contractor (tonnes).
- The name and authorisation of the haulier to transport the material – in the case of a 'waste' this requires a valid Waste Collection Permit (WCP). In the case of by-product or other materials that are not a waste, no WCP is required. In both cases the vehicle registration number should also be recorded for each load of material removed from site.
- The name and authorisation of the destination site for the resource – again for a 'waste' this requires a valid Cert of Registration, Waste Permit or Waste Licence and in the case of by-product the relevant by-product determination.
- The waste contractors must be required to provide details of end-use or waste treatment in waste reports.
- This recording will be carried out for each resource type and the system will also be linked with the delivery records. In this way, the percentage of residual resource generated for each material can be determined.
- The system will allow the comparison of these figures with the targets established for the prevention, reuse and recovery of resources to highlight successes or failures against these targets.

7.5 Communications

The following communication tasks are recommended for the Resource Manager through the construction phase as per the EPA (2021) guidelines:

- *'Internal reporting of resource statistics to the Client and the Contractor management. This includes performance relative to agreed targets and objectives which should be included as an agenda item at site meetings;*

- *Engaging with relevant local authority on any site inspection or enforcement audits undertaken at the site. All follow-up actions and corrective actions should be logged and reported to the local authority.*
- *Engaging with other stakeholders (EPA, public, etc.) as appropriate in relation to the resource management on site; and,*
- *Upon completion of construction, the RM will prepare a final report summarising the outcomes of resource management processes adopted, the total reuse and recovery figures and the final destinations of all resources taken off-site. This report will be issued to the Client, Contractor management and the local authority. The local authority may make such a requirement a condition of planning and require the formal sign-off of same by the local authority for full planning compliance.'*

7.6 Outline Waste Audit Procedures

According to EPA (2021) a resource Audit represents a systematic study of the waste management practices applied in the Project and is required to highlight firstly, the potential issues that can arise during the waste management process and secondly, the benefits of waste prevention and minimisation. Therefore, waste audits should be carried out routinely onsite by the Resource Manager. These audits will cover work practices, record keeping, and off-site tracking as follows in accordance with the EPA (2021) guidelines:

- When materials arrive on site, they will be properly recorded including the assignment of such materials to specific uses within the works;
- A review will be undertaken of onsite waste management practices to identify any improvements which may be required;
    - *'Ensure adequacy of site signage and need for any repairs or upgrades.*
    - *Adequacy of storage infrastructure and need for any repairs or upgrades.*
    - *Compliance with resource segregation protocols and observed contamination in any resource streams.*
    - *Assessment of observed Contractor and Sub-contractor work practices for compliance with the RWMP' (EPA, 2021).*
- Onsite waste management processes / material management from materials delivery through to waste disposal / recovery (including the quantity, type and composition of all waste) will be reviewed to identify any opportunities for waste reduction;
- Corrective actions will be highlighted and implemented following each audit. Such actions include applying 'lessons learned' regarding efficient waste management on this project to other projects in the future to enable further waste reduction;
- The key steps and findings from each waste audit should be presented in a summary report.

8 Consultation with Relevant Bodies

Appropriate consultation should be undertaken with relevant bodies by various members of the project team as required throughout the project. Relevant consultees include, but are not limited to, the following;

- Cork City Council (as the relevant local authorities for waste matters);
- The EPA (as relevant regulatory body for environmental matters);
- NWCPO;
- Permitted hauliers; and,
- Suitably permitted / licenced waste disposal / recovery facilities.

APPENDIX 2-6 Landscape Masterplan – Simon Ronan Landscape Architecture



LEGEND

- Site Boundary
- Rimini Railing
- 00.00m Proposed Levels
- Herbaceous Planting & Shrubs
- Lawn
- Meadow
- High Quality Paving
- Soft Pour Play Area
- Shared Surface
- In-Situ Concrete Paving
- Asphalt Road
- Crossing Points
- Active Travel Route - Coloured Asphalt
- Parking
- Parking - Paving
- Seating
- Fence and Gates
- SUDs Infiltration Basin
- SUDs Raingarden
- SUDs Filter Drain
- SUDs Green/Blue Roof
- Grasscrete
- Bird Boxes
- Bee Boxes
- Bat Boxes
- Insect Hotel
- Hedgehog Domes
- Log Pile
- Existing Trees To Be Retained
- Existing Hedgerow To Be Retained
- Proposed Native Hedge
- Proposed Trees

Qr	Quercus robur -	WRB 20-25cm girth
Ps	Pinus sylvestris-	WRB 200-250cm
Ph	Platanus × hispanica-	WRB 200-250cm
Sa	Sorbus aucuparia-	WRB 200-250cm
Bp	Betula pendula-	WRB 300-350cm
Ca	Corylus avellana-	WRB 200-250cm
Iq	Ilex aquifolium-	WRB 200-250cm

REFERENCE: THIS DRAWING IS NOT FOR CONSTRUCTION

SR LA

SIMON RONAN LANDSCAPE ARCHITECTS

Cork Office
Levis Quay
Skibbereen
Co.Cork
Ireland
A94A431
simon@simonronan.com

Dublin Office
25 Glengarriff Parade
Phibsborough
Dublin 7
Ireland
D07 XF25
+353 86 056 3434

GENERAL LANDSCAPE PLAN L- 100
1:1000@A1

REV/00

PROPOSED LRD
CARRIGANARRA, BALLINCOLLIG, CO. CORK

PURPOSE OF DRAWING: PLANNING

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APRIL 2026

CHAPTER THREE

LANDSCAPE & VISUAL

APPENDIX 3-1 Tree Report, Tree Protection Plan & Tree Constraints Plan – Geotree

APPENDIX 3-1 Tree Report, Tree Protection Plan & Tree Constraints Plan – Geotree

Project Name:

Tree Report and Arboricultural Assessment for Carriganarra LRD, Ballincollig, Cork

Date:

14/04/26

Prepared For:

Murnane & O' Shea Ltd,

Link Road Business Centre,

Link Road,

Ballincollig,

Cork

George Earle, BSc Forestry, Dip Arb, MSIF, MArborA,

GEOTREE Ltd,

Tower,

Co. Cork,

Tel: 0214381618

Mob: 0873328019

Website: www.geotree.ie

Email: info@geotree.ie

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1.1: Client Brief

GEOTREE Ltd was asked to carry out a tree survey and arboricultural impact assessment at a site at Carriganarra, Ballincollig. With the details obtained in the survey to prepare an Arboricultural Assessment and Method Statement that can be used to make sound arboricultural decisions relating to the design and construction of a new development of houses to be built in connection with an LRD project proposed for this location.

1.2: Site Description

The site is located on the East side of Ballincollig. It is a greenfield for the most part and partially includes a derelict farm yard. It is just over 12 ha in size. It is located South of a new development of houses called Heathfield. There is a South-westerly aspect to the site. On the South and East is the National primary road N22. This is the main connecting route that connects Cork to Kerry. The trees on the site are generally of the fair to good category. There are good quality hedgerows in some sections. Alder (*Alnus glutinosa*) grows freely along a running stream on the West boundary. Grey willow (*Salix cinerea*) grows as scrub, pioneering in any open space , particularly around the farmyard where few species are to grow.

1.3: Methodology

The survey methodology follows the recommendations contained within BS: 5837 (2012), Trees in relation to design, demolition and construction. This provides a colour coded system that can be easily followed. It also includes the calculation of the Root Protection Area (RPA) of trees that were tagged. This is an indication of the extent of the root system and helps to offer guidance helping to protect the lifespan of any trees on site. 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). Diameter is measured in mm at 1.5 m on the tree trunk. Height is measured in metres using an altimeter. Recommendations will be provided based on the survey. Aluminium tree tags were placed on the trees that were surveyed. They number from 401 - 471. They are placed at 1.5m high on the North side of the tree stem wherever possible. Height is measured accurately by using an altimeter. The coordinates of each tree were captured using the Trimble Catalyst DA2 GNSS Antenna and the survey details and images were recorded using the KOREC Capture data capture application on an iPhone. Trees coordinates were plotted using the Irish Transverse Mercator (ITM) Co-ordinate System.

The Hedgerows were appraised using the Hedgerow Appraisal System (HAS). Using the guidelines provided in The Hedgerow Appraisal System Best Practise Guidance On Hedgerow Surveying, Data Collation and Appraisal by Neil Foulkes, Janice Fuller, Declan Little, Shawn McCourt, Paul Murphy. This system is endorsed by The Heritage Council Of Ireland. The objective of the methodology is to record the extent (i.e. Quantitative survey) and floristic composition, context, physical structure, condition, and management of hedgerows (i.e. Qualitative survey) in any given locality. The system is based on ranking the significance of a hedgerow on a scale of 0 – 4 (0 being the lowest) in different categories: Historical Significance, Species Diversity, Structure, Construction and Associated Features (e.g. Walls, drains etc), Habitat Connectivity Significance and Landscape Significance. A score of 4 in any category indicates a hedge of high significance (Heritage Hedgerow). Hedges can also be considered of high significance (Heritage Hedgerow) if they achieve a cumulative score of 6 or greater in the Historical, Species Diversity, or Structural Categories or a cumulative score of 16 or greater in the five categories. These hedges should be considered as high priority in terms of retention, management action etc.

The hedgerows were also colour coded and classified using the BS 5837: 2012 (A, B, C, U) system and given a condition rating based on the structure, health, management, appearance and overall contribution to the site.

1.4: Limitations of the survey/Disclaimer

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 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. All findings are based on the knowledge and expertise of George Earle. 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 in this survey that problems or deficiencies of the trees 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
- A tree of the willow or poplar species planted and maintained solely for fuel under a short rotation coppice
- 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 – the removal of which is specified in a grant of planning permission
- 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.

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.

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

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

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 0401 to 0471 so the first number would be T0401.

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.

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

1.9: Report Overview

Completed Inspections Summary

The following is a breakdown of the Inspections completed by Species

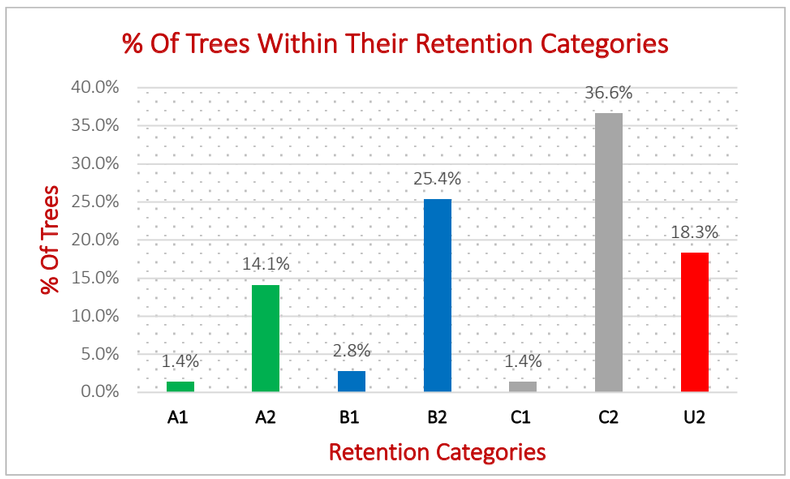
Species	Count	%
Alder (*Alnus glutinosa*)	31	43.7 %
Ash (*Fraxinus excelsior*)	13	18.3 %
Elder (*Sambucus nigra*)	2	2.8 %
Elm (*Ulmus minor*)	2	2.8 %
Hawthorn (*Crataegus monogyna*)	8	11.3 %
Leyland cypress (x *Cupressocyparis leylandii*)	1	1.4 %
Sycamore (*Acer pseudoplatanus*)	11	15.5 %
Willow sp. (*Salix* sp.)	3	4.2 %
Total	**71**	**100 %**

Retention Summary

Overall tree retention by category

Category	Count
A1 (40+)	1
A2	10
B1 (20+)	2
B2	18
C1 (10+)	1
C2	26
U2	13

Breakdown of Tree within their retention categories



2.0: Tree Classification Key

Tag No	Tree number on a metal disk placed at 1.5 m on the tree trunk
Species	Species type of the tree, common name and Latin name
Age Profile	Young (Y), Semi-mature (SM), Early mature (EM), Mature (M)
Height	Height of the tree, in metres, measured with and altimeter
Diameter	Diameter of trunk, measured in mm, taken at 1.5 m on the trunk
Crown Spread (N E S W)	Length in metres, of the branch extension to the cardinal points N,E,S,W
Easting	Displayed in the Irish Transverse Mercator coordinates
Northing	Displayed in the Irish Transverse Mercator coordinates
Root Protection Area	Size of the Root Protection Area (RPA) presented in metres squared
Root Protection Area Radius	Size of the Root Protection Area (RPA) radius presented in metres
Structural Condition	The condition on the mechanical structural observed using the VTA method
Physiological Condition	The physiological health of the tree, relating to the overall health appearance
Vigor	Relating to the capacity of the tree to grow
Est. Remaining Contribution	Estimated remaining years that the tree will be able to contribute to the site
Ground Condition	The surrounding observable ground and soil conditions in which the tree grows
Retention Category	Retention category 1, 2, or 3, in accordance with BS 5837 - 2012
Retention Class	Retention class A, B or C, in accordance with BS 5837 – 2012
Fell This Tree	Yes or No
Reason for Felling	Arboricultural or Development
Comments	Observations and remarks based on the surveyor's knowledge and experience
Recommendations	Recommendations for tree works to improve the tree's health and public safety
Ash Dieback	*Hymenoscyphus fraxineus* – A chronic fungal disease of ash trees

2.1: Tree Classification Schedule

Tag No	T401
Species	Ash *(Fraxinus excelsior)*
Age Profile	Mature
Height	11 m
Diameter	350 mm
Crown Spread (N E S W)	Even 5/5/5/5
Crown Clearance	1 m
Easting	560132.479
Northing	569949.587
Root Protection Area	81.351434 m^2
Root Protection Area Radius	5.09 m
Structural Condition	Fair
Physiological Condition	Fair
Vigor	Good
Est. Remaining Contribution	10 Years
Ground Condition	Poor
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Twin stem from the base, was coppiced in the past, good crown formation, minor dieback in the centre due to shade, presently healthy, low quality specimen
Recommendations	Clean crown of any deadwood, crown raise to 2.5 m



Tag No	T402
Species	Sycamore *(Acer pseudoplatanus)*
Age Profile	Early Mature
Height	6 m
Diameter	260 mm
Crown Spread (N E S W)	Even 2/2/2/2
Crown Clearance	2 m
Easting	560135.195
Northing	569920.285
Root Protection Area	30.566016 m^2
Root Protection Area Radius	3.12 m
Structural Condition	Poor
Physiological Condition	Fair
Vigor	Poor
Est. Remaining Contribution	2 Years
Ground Condition	Poor
Retention Category	U2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Arboricultural
Comments	Tree was cut to 5 m in the past, poor branch formation, large stem has broken out at the base, stem is now decayed, stem failure potential is high
Recommendations	Fell tree and remove



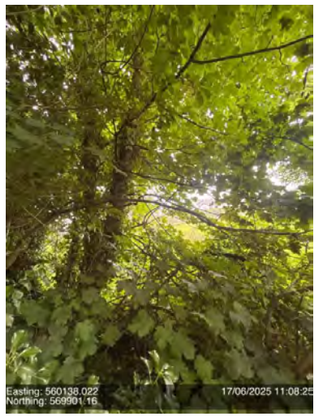
Tag No	T403
Species	Ash *(Fraxinus excelsior)*
Age Profile	Mature
Height	9 m
Diameter	700 mm
Crown Spread (N E S W)	Uneven 5/3/1/3
Crown Clearance	2 m
Easting	560135.888
Northing	569903.74
Root Protection Area	221.5584 m^2
Root Protection Area Radius	8.4 m
Structural Condition	Poor
Physiological Condition	Poor
Vigor	Bad
Est. Remaining Contribution	1 Years
Ground Condition	Poor
Retention Category	U2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Arboricultural
Comments	Tree was pollarded at 6 m on the past, poor re-growth, large cavity at the base of the stem, tree is structurally unsafe
Recommendations	Fell tree and remove



Tag No	T404
Species	Ash *(Fraxinus excelsior)*
Age Profile	Mature
Height	16 m
Diameter	650 mm
Crown Spread (N E S W)	Uneven 5/8/8/7
Crown Clearance	3 m
Easting	560136.675
Northing	569901.676
Root Protection Area	191.0376 m^2
Root Protection Area Radius	7.8 m
Structural Condition	Poor
Physiological Condition	Poor
Vigor	Poor
Est. Remaining Contribution	1 Years
Ground Condition	Poor
Retention Category	U2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Arboricultural
Comments	Large tree, extensive basal decay at the base of the stem , stem collapse is a potential hazard
Recommendations	Fell tree and remove



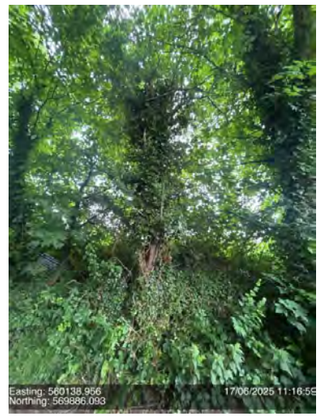
Tag No	T405
Species	Sycamore *(Acer pseudoplatanus)*
Age Profile	Early Mature
Height	10 m
Diameter	260 mm
Crown Spread (N E S W)	Uneven 0/4/4/1
Crown Clearance	1 m
Easting	560138.022
Northing	569901.16
Root Protection Area	43.686506 m^2
Root Protection Area Radius	3.73 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	15 Years
Ground Condition	Poor
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Poorly formed tree, twin stem from the base, unbalanced crown, low quality specimen
Recommendations	Crown raise to 2.5 m, reduce height by 3 m, cut back Easterly branches by 2 m



Tag No	T406
Species	Sycamore *(Acer pseudoplatanus)*
Age Profile	Semi Mature
Height	9 m
Diameter	170 mm
Crown Spread (N E S W)	Even 3/3/3/3
Crown Clearance	1 m
Easting	560138.26
Northing	569889.784
Root Protection Area	13.067424 m^2
Root Protection Area Radius	2.04 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	15 Years
Ground Condition	Poor
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Self-seeded tree, grows among rubble at the base, heavy ivy on stem, a subdominant tree to an adjacent larger Sycamore
Recommendations	Remove ivy, no further work presently



Tag No	T407
Species	Hawthorn *(Crataegus monogyna)*
Age Profile	Mature
Height	6 m
Diameter	200 mm
Crown Spread (N E S W)	Uneven 0.5/2/1/0.5
Crown Clearance	1 m
Easting	560138.956
Northing	569886.093
Root Protection Area	18.0864 m^2
Root Protection Area Radius	2.4 m
Structural Condition	Poor
Physiological Condition	Poor
Vigor	Poor
Est. Remaining Contribution	0 Years
Ground Condition	Poor
Retention Category	U2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Arboricultural
Comments	Extensive basal decay on stem, tree has potential to collapse under its own (static) weight
Recommendations	Fell tree and remove



Tag No	T408
Species	Sycamore *(Acer pseudoplatanus)*
Age Profile	Early Mature
Height	12 m
Diameter	180 mm
Crown Spread (N E S W)	Uneven 3/5/2/5
Crown Clearance	1 m
Easting	560139.128
Northing	569884.027
Root Protection Area	36.2984 m^2
Root Protection Area Radius	3.4 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	20 Years
Ground Condition	Poor
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Multi stemmed (3) from .5 m, heavy ivy growth on stems, suppressed crown, poorly developed tree, grows on top of a stone wall
Recommendations	Remove ivy, crown raise to 2.5 m



Tag No	T409
Species	Sycamore *(Acer pseudoplatanus)*
Age Profile	Early Mature
Height	10 m
Diameter	200 mm
Crown Spread (N E S W)	Uneven 1/5/6/6
Crown Clearance	2 m
Easting	560139.686
Northing	569880.495
Root Protection Area	56.71625 m^2
Root Protection Area Radius	4.25 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	20 Years
Ground Condition	Poor
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Tree grows on an old stone wall, coppiced in the past, multi stemmed (3) from the base, heavy ivy on stem, poorly formed crown, will grow too big for this space in the medium term
Recommendations	Remove ivy, crown raise to 2.5 m



Tag No	T410
Species	Sycamore *(Acer pseudoplatanus)*
Age Profile	Early Mature
Height	11 m
Diameter	220 mm
Crown Spread (N E S W)	Uneven 3/4/5/3
Crown Clearance	2 m
Easting	560129.682
Northing	569914.658
Root Protection Area	45.820136 m^2
Root Protection Area Radius	3.82 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	20 Years
Ground Condition	Poor
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Tree grows on a sod and stone embankment, twin stem from .5m, heavy ivy on stems, restricted branch growth on the North, suppressed crown
Recommendations	Remove ivy, crown raise to 2.5 n, cut back branches on the East and South by 2 m



Tag No	T411
Species	Sycamore *(Acer pseudoplatanus)*
Age Profile	Mature
Height	16 m
Diameter	850 mm
Crown Spread (N E S W)	Even 7/7/7/7
Crown Clearance	2 m
Easting	560131.632
Northing	569891.437
Root Protection Area	326.6856 m^2
Root Protection Area Radius	10.2 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	40 Years
Ground Condition	Poor
Retention Category	A1
Retention Class	Arboricultural
Fell This Tree	No
Reason for Felling	NA
Comments	Large tree, grows on a sod and stone embankment, enormous lower bole relative to the height, very heavy ivy growth on stem restricts visibility, 3 no. Stems from 2 m, well developed branch structure, symmetrical crown
Recommendations	Remove ivy and re inspect, crown raise to 2.5 m, cut back lower branches by 2 m all around and reshape the crown



Tag No	T412
Species	Ash *(Fraxinus excelsior)*
Age Profile	Mature
Height	16 m
Diameter	750 mm
Crown Spread (N E S W)	Uneven 3/8/9/7
Crown Clearance	2 m
Easting	560121.002
Northing	569943.37
Root Protection Area	254.34 m^2
Root Protection Area Radius	9 m
Structural Condition	Poor
Physiological Condition	Poor
Vigor	Fair
Est. Remaining Contribution	0 Years
Ground Condition	Poor
Retention Category	U2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Arboricultural
Comments	Large tree that grows on top of a sod and stone embankment, large basal cavity evident on the main stem, tree has the potential for stem failure over the laneway Southwards
Recommendations	Fell tree and remove



Tag No	T413
Species	Willow sp. *(Salix sp.)*
Age Profile	Mature
Height	5 m
Diameter	200 mm
Crown Spread (N E S W)	Uneven 2/0.5/3/3
Crown Clearance	1 m
Easting	560118.099
Northing	569967.477
Root Protection Area	18.0864 m^2
Root Protection Area Radius	2.4 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	15 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Self-seeded pioneering specimens, growing on derelict ground, low quality trees
Recommendations	Remove ivy from stem, no further work at this time



Tag No	T414
Species	Hawthorn *(Crataegus monogyna)*
Age Profile	Mature
Height	6 m
Diameter	220 mm
Crown Spread (N E S W)	Uneven 2/4/4/2
Crown Clearance	2 m
Easting	560119.723
Northing	569966.51
Root Protection Area	32.1536 m^2
Root Protection Area Radius	3.2 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	10 Years
Ground Condition	Poor
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Tree grows .5 m from a laneway, heavy ivy on stems, asymmetrical crown
Recommendations	Remove ivy, no further work required



Tag No	T415
Species	Ash *(Fraxinus excelsior)*
Age Profile	Semi Mature
Height	8 m
Diameter	180 mm
Crown Spread (N E S W)	Even 2.5/2.5/2.5/2.5
Crown Clearance	175 m
Easting	560110.66
Northing	569970.624
Root Protection Area	14.649984 m^2
Root Protection Area Radius	2.16 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	20 Years
Ground Condition	Good
Retention Category	B1
Retention Class	Arboricultural
Fell This Tree	No
Reason for Felling	NA
Comments	Free standing ash tree, straight stem, symmetrical form, signs of very early stages of ash dieback
Recommendations	No work presently , re inspect in one year's time



Tag No	T416
Species	Willow sp. *(Salix sp.)*
Age Profile	Over Mature
Height	22 m
Diameter	650 mm
Crown Spread (N E S W)	Uneven 5/4/11/4
Crown Clearance	3 m
Easting	559985.307
Northing	570063.922
Root Protection Area	382.015226 m^2
Root Protection Area Radius	11.03 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	25 Years
Ground Condition	Fair
Retention Category	B2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Large tree for this species, 2 no. very large stems that lean South @ 70 degrees, heavy loading on the basal union, large branch ripped from stem at 1 m South side, very heavy ivy growth on stems, minor deadwood throughout the crown, heavy end weight on the stems
Recommendations	Reduce height by 5 m, remove ivy, clean crown of any dead or defective branches



Tag No	T417
Species	Ash *(Fraxinus excelsior)*
Age Profile	Mature
Height	20 m
Diameter	700 mm
Crown Spread (N E S W)	Uneven 10/6/8/7
Crown Clearance	3 m
Easting	559824.246
Northing	570018.058
Root Protection Area	221.5584 m^2
Root Protection Area Radius	8.4 m
Structural Condition	Poor
Physiological Condition	Poor
Vigor	Fair
Est. Remaining Contribution	1 Years
Ground Condition	Fair
Retention Category	U2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Arboricultural
Comments	Large tree, well developed bole, good crown formation with evenly distributed primary branches, large wound on the Northside of the main stem is 3 m in length, exposed dysfunctional sapwood and decay evident, tree is an immediate hazard, also showing early signs of ash dieback infection
Recommendations	Fell tree and remove



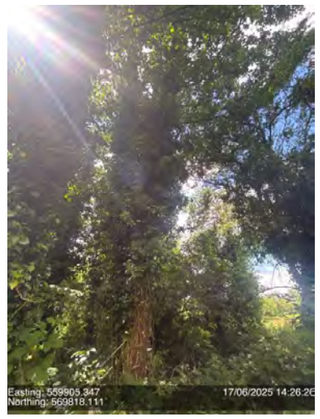
Tag No	T418
Species	Ash *(Fraxinus excelsior)*
Age Profile	Early Mature
Height	15 m
Diameter	400 mm
Crown Spread (N E S W)	Even 6/6/6/6
Crown Clearance	5 m
Easting	559856.161
Northing	569855.441
Root Protection Area	72.3456 m^2
Root Protection Area Radius	4.8 m
Structural Condition	Fair
Physiological Condition	Fair
Vigor	Fair
Est. Remaining Contribution	5 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Well-formed tree, grows on a sod and stone embankment, good crown structure, is showing the early signs of ash dieback
Recommendations	No work at this time, re inspect in one year from now



Tag No	T419
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	12 m
Diameter	350 mm
Crown Spread (N E S W)	Even 4/4/4/4
Crown Clearance	5 m
Easting	559887.113
Northing	569822.406
Root Protection Area	55.3896 m^2
Root Protection Area Radius	4.2 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Fair
Est. Remaining Contribution	25 Years
Ground Condition	Fair
Retention Category	B2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Tree grows on the edge of a steep embankment to a stream of water, heavy ivy on stem, poor crown development, top heavy tree, minor dieback in the outer branch tips
Recommendations	Remove ivy, no further work at this time



Tag No	T420
Species	Alder *(Alnus glutinosa)*
Age Profile	Early Mature
Height	15 m
Diameter	320 mm
Crown Spread (N E S W)	Uneven 4/2/3/4
Crown Clearance	5 m
Easting	559905.347
Northing	569818.111
Root Protection Area	46.301184 m^2
Root Protection Area Radius	3.84 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	40 Years
Ground Condition	Fair
Retention Category	A2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Twin stem from .5 m, very heavy ivy growth on stems, poor lower crown formation, top heavy weight on stems
Recommendations	Fell and remove



Tag No	T421
Species	Alder *(Alnus glutinosa)*
Age Profile	Early Mature
Height	14 m
Diameter	270 mm
Crown Spread (N E S W)	Uneven 1/3/3/2
Crown Clearance	5 m
Easting	559906.514
Northing	569816.281
Root Protection Area	32.962464 m^2
Root Protection Area Radius	3.24 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	25 Years
Ground Condition	Fair
Retention Category	B2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Tree grows as a subdominant to T420, very heavy ivy growth on stem, asymmetrical crown development
Recommendations	Fell and remove



Tag No	T422
Species	Sycamore *(Acer pseudoplatanus)*
Age Profile	Early Mature
Height	12 m
Diameter	300 mm
Crown Spread (N E S W)	Uneven 5/2/1/4
Crown Clearance	1 m
Easting	559934.131
Northing	569849.777
Root Protection Area	40.6944 m^2
Root Protection Area Radius	3.6 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	30 Years
Ground Condition	Poor
Retention Category	B2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Poorly formed tree, heavy ivy on stem, tree leans North 80 degrees, restricted branch growth on the South, unbalanced grown with heavy weight in the North side
Recommendations	Fell and remove



Tag No	T423
Species	Sycamore *(Acer pseudoplatanus)*
Age Profile	Early Mature
Height	12 m
Diameter	250 mm
Crown Spread (N E S W)	Uneven 3/2/1/1
Crown Clearance	3 m
Easting	559935.255
Northing	569849.818
Root Protection Area	28.26 m^2
Root Protection Area Radius	3 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	20 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Poorly formed tree, branches have only developed on one side of the crown (North), tree leans North 80 degrees top heavy tree
Recommendations	Fell and remove



Tag No	T424
Species	Alder *(Alnus glutinosa)*
Age Profile	Early Mature
Height	10 m
Diameter	240 mm
Crown Spread (N E S W)	Uneven 1/2.5/3/3
Crown Clearance	2.5 m
Easting	559924.322
Northing	569783.471
Root Protection Area	54.339584 m^2
Root Protection Area Radius	4.16 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	40 Years
Ground Condition	Good
Retention Category	A2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Free standing tree, twin stem from 1 m, well-formed crown with good branch structure, branches on the North were cut to clear power lines in the past, asymmetrical crown now as a result
Recommendations	Remove ivy on lower bole



Tag No	T425
Species	Alder *(Alnus glutinosa)*
Age Profile	Early Mature
Height	10 m
Diameter	350 mm
Crown Spread (N E S W)	Even 3/3/3/3
Crown Clearance	1.5 m
Easting	559926.168
Northing	569779.063
Root Protection Area	55.3896 m^2
Root Protection Area Radius	4.2 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	40 Years
Ground Condition	Good
Retention Category	A2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Free standing tree, well developed branch structure, symmetrical form, growing 7 m from a stream that runs North to South, grows in its natural habitat
Recommendations	No work required presently



Tag No	T426
Species	Alder *(Alnus glutinosa)*
Age Profile	Early Mature
Height	4 m
Diameter	200 mm
Crown Spread (N E S W)	Uneven 2/10/2/2
Crown Clearance	1 m
Easting	559928.509
Northing	569773.935
Root Protection Area	18.0864 m^2
Root Protection Area Radius	2.4 m
Structural Condition	Poor
Physiological Condition	Fair
Vigor	Fair
Est. Remaining Contribution	0 Years
Ground Condition	Poor
Retention Category	U2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Arboricultural
Comments	Tree has fallen over from the Westerly bank of the stream, now rests across the stream on the ground, still alive, no potential apart from ecologically
Recommendations	Fell tree and remove



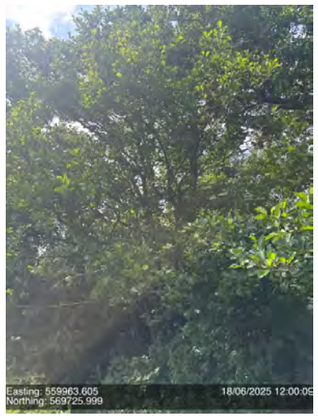
Tag No	T427
Species	Willow sp. *(Salix sp.)*
Age Profile	Mature
Height	10 m
Diameter	220 mm
Crown Spread (N E S W)	Uneven 3/5/3/1
Crown Clearance	1 m
Easting	559930.133
Northing	569767.777
Root Protection Area	48.004634 m^2
Root Protection Area Radius	3.91 m
Structural Condition	Poor
Physiological Condition	Fair
Vigor	Fair
Est. Remaining Contribution	10 Years
Ground Condition	Good
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Twin stem from .5 m, multiple branch failure in the mid crown, stem failure at 1 m, tree has been badly damaged by storms
Recommendations	Reduce to 1 m in height and allow to grow again



Tag No	T428
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	11 m
Diameter	220 mm
Crown Spread (N E S W)	Even 4/4/4/4
Crown Clearance	1 m
Easting	559952.509
Northing	569739.578
Root Protection Area	62.459624 m^2
Root Protection Area Radius	4.46 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	40 Years
Ground Condition	Fair
Retention Category	A2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Multi stemmed (3) from the base, symmetrical form, well developed crown, healthy tree
Recommendations	Crown raise to 2.5 m



Tag No	T429
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	9 m
Diameter	200 mm
Crown Spread (N E S W)	Even 4/4/4/4
Crown Clearance	1 m
Easting	559963.605
Northing	569725.999
Root Protection Area	108.563616 m^2
Root Protection Area Radius	5.88 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	30 Years
Ground Condition	Good
Retention Category	B2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Multi stemmed (6) from .5 m, poorly formed tree, suppressed crown, growing in its natural habitat on the bank of a running stream
Recommendations	Crown raise to 2.5 m



Tag No	T430
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	9 m
Diameter	300 mm
Crown Spread (N E S W)	Uneven 3/3/2/2
Crown Clearance	1 m
Easting	559966.298
Northing	569721.672
Root Protection Area	76.93785 m^2
Root Protection Area Radius	4.95 m
Structural Condition	Poor
Physiological Condition	Fair
Vigor	Fair
Est. Remaining Contribution	10 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Multi stemmed (4) from the base, two stems have large wounds that show extensive decay within the stems, two smaller stems have heavy ivy growth
Recommendations	Reduce height to 1 m, remove stems with decay



Tag No	T431
Species	Ash *(Fraxinus excelsior)*
Age Profile	Mature
Height	8 m
Diameter	540 mm
Crown Spread (N E S W)	Uneven 6/8/6/2
Crown Clearance	1 m
Easting	559970.456
Northing	569718.08
Root Protection Area	131.849856 m^2
Root Protection Area Radius	6.48 m
Structural Condition	Poor
Physiological Condition	Fair
Vigor	Fair
Est. Remaining Contribution	2 Years
Ground Condition	Poor
Retention Category	U2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Arboricultural
Comments	Tree has fallen over in an Easterly direction, now lays on the ground, showing signs of ash dieback infection
Recommendations	Fell tree and remove



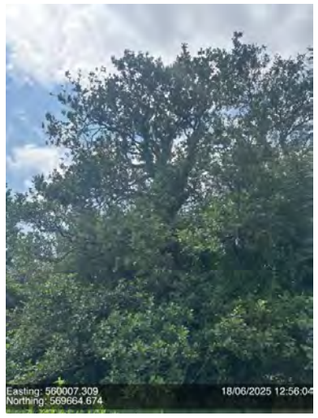
Tag No	T432
Species	Elder *(Sambucus nigra)*
Age Profile	Mature
Height	7 m
Diameter	180 mm
Crown Spread (N E S W)	Uneven 2/4/4/2
Crown Clearance	0.5 m
Easting	559971.294
Northing	569714.912
Root Protection Area	43.921064 m^2
Root Protection Area Radius	3.74 m
Structural Condition	Fair
Physiological Condition	Fair
Vigor	Fair
Est. Remaining Contribution	10 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Large Elder bush, growing on the bank of a running stream, ivy growth on stems, minor decay at the base of one stem, minor deadwood in the lower crown
Recommendations	Remove ivy, clean crown of any deadwood, crown raise to 2.5 m



Tag No	T433
Species	Hawthorn *(Crataegus monogyna)*
Age Profile	Mature
Height	8 m
Diameter	300 mm
Crown Spread (N E S W)	Uneven 5/5/1/2
Crown Clearance	1 m
Easting	560007.252
Northing	569664.594
Root Protection Area	40.6944 m^2
Root Protection Area Radius	3.6 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	30 Years
Ground Condition	Fair
Retention Category	B2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Large hawthorn bush/small tree, growing in the edge of a running stream, grows as a subdominant to T434 Alder that grows 1 m South, restricted branch growth, unbalanced crown
Recommendations	Crown raise to 2.5 m



Tag No	T434
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	12 m
Diameter	650 mm
Crown Spread (N E S W)	Uneven 4/3/4/2
Crown Clearance	1 m
Easting	560007.309
Northing	569664.674
Root Protection Area	191.0376 m^2
Root Protection Area Radius	7.8 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	40 Years
Ground Condition	Fair
Retention Category	A2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Large lower bole, well developed crown with large primary branches growing in different directions, healthy tree growing in its natural environment
Recommendations	Crown raise to 2.5 m



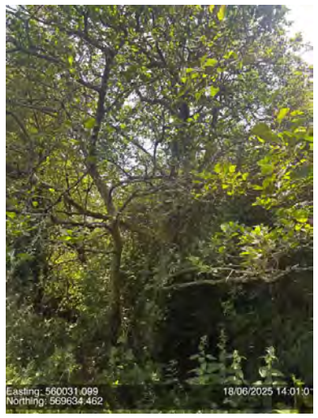
Tag No	T435
Species	Alder *(Alnus glutinosa)*
Age Profile	Semi Mature
Height	8 m
Diameter	220 mm
Crown Spread (N E S W)	Uneven 4/4/3/2
Crown Clearance	2 m
Easting	560014.017
Northing	569654.897
Root Protection Area	21.884544 m^2
Root Protection Area Radius	2.64 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	40 Years
Ground Condition	Good
Retention Category	A2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Tree grows on the bank of a running stream, clean stem to 2 m, restricted branch growth on the West from adjacent Hawthorn on the West bank of the stream, good branch formation, potential to develop well
Recommendations	Crown raise 2.5 m, remove ivy from stem



Tag No	T436
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	15 m
Diameter	550 mm
Crown Spread (N E S W)	Uneven 5/8/7/3
Crown Clearance	0.5 m
Easting	560025.905
Northing	569643.241
Root Protection Area	136.7784 m^2
Root Protection Area Radius	6.6 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	40 Years
Ground Condition	Good
Retention Category	A2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Tree grows on the edge of a stream, twin stem from .5 m, well developed crown, lower branches are 1.5 m from ground level, healthy tree
Recommendations	Crown raise 2.5 m, cut back lower branches by 2 m on North and East sides



Tag No	T437
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	10 m
Diameter	400 mm
Crown Spread (N E S W)	Even 5/5/5/5
Crown Clearance	1 m
Easting	560031.099
Northing	569634.462
Root Protection Area	72.3456 m^2
Root Protection Area Radius	4.8 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	35 Years
Ground Condition	Fair
Retention Category	B2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Tree grows out from the edge of an embankment, showing a lack of vigour in the crown, well developed branch structure
Recommendations	Crown raise to 2.5 m



Tag No	T438
Species	Hawthorn *(Crataegus monogyna)*
Age Profile	Mature
Height	6 m
Diameter	420 mm
Crown Spread (N E S W)	Even 3/3/3/3
Crown Clearance	0.5 m
Easting	560033.351
Northing	569632.917
Root Protection Area	79.761024 m^2
Root Protection Area Radius	5.04 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	35 Years
Ground Condition	Fair
Retention Category	B2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Mature tree that grows on the bank of a running stream, well developed branch structure, healthy tree
Recommendations	Crown raise to 2.5 m



Tag No	T439
Species	Alder *(Alnus glutinosa)*
Age Profile	Semi Mature
Height	6 m
Diameter	180 mm
Crown Spread (N E S W)	Uneven 5/5/2/1
Crown Clearance	2 m
Easting	560039.049
Northing	569630.011
Root Protection Area	14.649984 m^2
Root Protection Area Radius	2.16 m
Structural Condition	Dead
Physiological Condition	Dead
Vigor	Bad
Est. Remaining Contribution	0 Years
Ground Condition	Poor
Retention Category	U2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Arboricultural
Comments	Dead tree
Recommendations	Fell and remove



Tag No	T440
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	11 m
Diameter	280 mm
Crown Spread (N E S W)	Uneven 5/5/4/1
Crown Clearance	0.5 m
Easting	560048.724
Northing	569620.271
Root Protection Area	63.585 m^2
Root Protection Area Radius	4.5 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	40 Years
Ground Condition	Good
Retention Category	A2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Twin stem from the base, restricted branch growth on the West, heavier weight of branches on the North and East, unbalanced crown
Recommendations	Crown raise to 2.5 m, cut back length of branches on the North and East by 2m



Tag No	T441
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	9 m
Diameter	340 mm
Crown Spread (N E S W)	Uneven 6/5/3/4
Crown Clearance	0.5 m
Easting	560051.826
Northing	569616.65
Root Protection Area	98.4704 m^2
Root Protection Area Radius	5.6 m
Structural Condition	Fair
Physiological Condition	Fair
Vigor	Poor
Est. Remaining Contribution	10 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Twin stemmed from .5 m, heavy ivy on stem, poorly formed tree, dieback of branches throughout the crown, tree lacks vigour and has limited time left remaining to contribute apart from ecological benefits
Recommendations	Reduce length of lower branches by 2 m, clean crown of any dead or defective branches



Tag No	T442
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	12 m
Diameter	240 mm
Crown Spread (N E S W)	Uneven 4/4/2/1
Crown Clearance	0.5 m
Easting	560069.583
Northing	569605.053
Root Protection Area	76.93785 m^2
Root Protection Area Radius	4.95 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	40 Years
Ground Condition	Good
Retention Category	A2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Grows on the bank of a running stream, multi stemmed (4) from the base, well developed branch structure on 3 sides, restricted branch growth on the West
Recommendations	Fell and remove



Tag No	T443
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	9 m
Diameter	400 mm
Crown Spread (N E S W)	Uneven 4/3/3/1
Crown Clearance	0.5 m
Easting	560072.813
Northing	569601.887
Root Protection Area	72.3456 m^2
Root Protection Area Radius	4.8 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	25 Years
Ground Condition	Fair
Retention Category	B2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	A subdominant tree, crown is suppressed on the West side, lower branches grow out West from .5 m
Recommendations	Fell and remove



Tag No	T444
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	10 m
Diameter	350 mm
Crown Spread (N E S W)	Uneven 3/3/1/3
Crown Clearance	0.5 m
Easting	560080.392
Northing	569599.406
Root Protection Area	55.3896 m^2
Root Protection Area Radius	4.2 m
Structural Condition	Fair
Physiological Condition	Fair
Vigor	Poor
Est. Remaining Contribution	10 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Straight stem, good branch structure, tree is showing a clear sign of diminishing vigour
Recommendations	Fell and remove



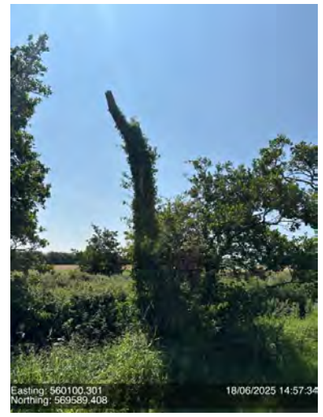
Tag No	T445
Species	Alder *(Alnus glutinosa)*
Age Profile	Early Mature
Height	8 m
Diameter	200 mm
Crown Spread (N E S W)	Uneven 3/2/2/0.5
Crown Clearance	1 m
Easting	560081.553
Northing	569597.901
Root Protection Area	40.018986 m^2
Root Protection Area Radius	3.57 m
Structural Condition	Fair
Physiological Condition	Fair
Vigor	Poor
Est. Remaining Contribution	10 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Suppressed tree, showing a clear lack of vigour, low quality specimen
Recommendations	Fell and remove



Tag No	T446
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	10 m
Diameter	340 mm
Crown Spread (N E S W)	Uneven 3/4/6/3
Crown Clearance	0.5 m
Easting	560088.682
Northing	569595.88
Root Protection Area	104.539706 m^2
Root Protection Area Radius	5.77 m
Structural Condition	Dead
Physiological Condition	Dead
Vigor	Bad
Est. Remaining Contribution	1 Years
Ground Condition	Poor
Retention Category	U2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Arboricultural
Comments	Two large stumps remain of a once large tree, some live epicormic regrowth from the base on the North side
Recommendations	Fell tree and remove, retain the live regrowth at the base



Tag No	T447
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	8 m
Diameter	400 mm
Crown Spread (N E S W)	Even 1.5/1.5/1.5/1.5
Crown Clearance	8 m
Easting	560100.301
Northing	569589.408
Root Protection Area	72.3456 m^2
Root Protection Area Radius	4.8 m
Structural Condition	Dead
Physiological Condition	Dead
Vigor	Bad
Est. Remaining Contribution	1 Years
Ground Condition	Poor
Retention Category	U2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Arboricultural
Comments	Dead tree stump, some live epicormic growth from the base
Recommendations	Fell tree stump



Tag No	T448
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	14 m
Diameter	250 mm
Crown Spread (N E S W)	Even 5/5/5/5
Crown Clearance	1 m
Easting	560139.214
Northing	569570.845
Root Protection Area	84.9056 m^2
Root Protection Area Radius	5.2 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Fair
Est. Remaining Contribution	20 Years
Ground Condition	Fair
Retention Category	B2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Multi stemmed (3) from the base, well developed branch structure, tree is lacking vigour, top heavy stems
Recommendations	Reduce height by 2 m, reduce length of outer branches by 2 m



Tag No	T449
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	15 m
Diameter	500 mm
Crown Spread (N E S W)	Even 8/8/8/8
Crown Clearance	1 m
Easting	560150.51
Northing	569565.343
Root Protection Area	113.04 m^2
Root Protection Area Radius	6 m
Structural Condition	Fair
Physiological Condition	Fair
Vigor	Poor
Est. Remaining Contribution	10 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Large tree, large primary branches grow from main stem at .5 m, well-formed crown, symmetrical appearance, tree is showing a clear lack of vigour, dieback evident on branches throughout the crown
Recommendations	Crown raise to 2.5 m, cut back lower branches by 2 m all around , remove any dead or defective branches in the crown



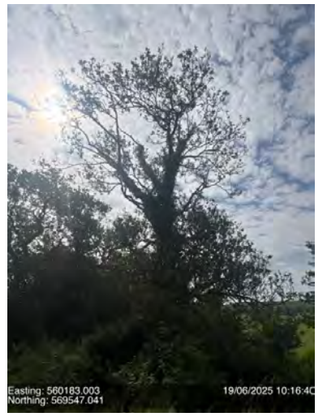
Tag No	T450
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	15 m
Diameter	250 mm
Crown Spread (N E S W)	Uneven 5/5/6/7
Crown Clearance	0.5 m
Easting	560163.535
Northing	569557.549
Root Protection Area	56.449664 m^2
Root Protection Area Radius	4.24 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Fair
Est. Remaining Contribution	25 Years
Ground Condition	Fair
Retention Category	B2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Twin stemmed from the base, branches are growing from low on the bole, ivy growth on stems, a squat formed tree
Recommendations	Crown raise to 2.5 m, cut back lower branches by 2 m all around



Tag No	T451
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	15 m
Diameter	300 mm
Crown Spread (N E S W)	Uneven 7/8/8/3
Crown Clearance	0.5 m
Easting	560167.604
Northing	569555.216
Root Protection Area	114.173226 m^2
Root Protection Area Radius	6.03 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Fair
Est. Remaining Contribution	25 Years
Ground Condition	Fair
Retention Category	B2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Multi stemmed (4) from the base, tree was coppiced in the past, large amount of branches growing vertically like stems, tree has a squat like form
Recommendations	Crown raise to 2.5 m, cut back lower branches by 2 m all around



Tag No	T452
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	11 m
Diameter	370 mm
Crown Spread (N E S W)	Even 5/5/5/5
Crown Clearance	2 m
Easting	560183.003
Northing	569547.041
Root Protection Area	83.928746 m^2
Root Protection Area Radius	5.17 m
Structural Condition	Fair
Physiological Condition	Fair
Vigor	Poor
Est. Remaining Contribution	10 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Twin stem from the base, grows on the side of an embankment next to a running stream, top heavy weight on branches, tree is lacking vigour
Recommendations	Clear bramble from around the base, remove ivy growth on stem



Tag No	T453
Species	Alder *(Alnus glutinosa)*
Age Profile	Early Mature
Height	9 m
Diameter	350 mm
Crown Spread (N E S W)	Uneven 3/2/5/4
Crown Clearance	0.5 m
Easting	560157.177
Northing	569754.738
Root Protection Area	55.3896 m^2
Root Protection Area Radius	4.2 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	20 Years
Ground Condition	Poor
Retention Category	C2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Tree grows in a congested space, restricted branch growth on the North side, asymmetrical crown
Recommendations	Fell and remove



Tag No	T454
Species	Hawthorn *(Crataegus monogyna)*
Age Profile	Mature
Height	8 m
Diameter	200 mm
Crown Spread (N E S W)	Uneven 3/3/1/3
Crown Clearance	0.5 m
Easting	560156.578
Northing	569755.91
Root Protection Area	36.085194 m^2
Root Protection Area Radius	3.39 m
Structural Condition	Fair
Physiological Condition	Fair
Vigor	Good
Est. Remaining Contribution	20 Years
Ground Condition	Poor
Retention Category	C2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Tree grows in a congested space, restricted branch growth on the South side, very heavy ivy growth on stems prevents closer inspection, dense crown of branches
Recommendations	Fell and remove



Tag No	T455
Species	Sycamore *(Acer pseudoplatanus)*
Age Profile	Early Mature
Height	10 m
Diameter	280 mm
Crown Spread (N E S W)	Uneven 6/4/2/1
Crown Clearance	3 m
Easting	560117.436
Northing	569828.667
Root Protection Area	35.449344 m^2
Root Protection Area Radius	3.36 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Fair
Est. Remaining Contribution	25 Years
Ground Condition	Poor
Retention Category	B2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Poorly formed tree, grows among rubble at the base, grows .5 m East of another tree, both trees competing for the same nutrient, restricted branch growth on the South and West
Recommendations	Fell and remove



Tag No	T456
Species	Hawthorn *(Crataegus monogyna)*
Age Profile	Mature
Height	8 m
Diameter	170 mm
Crown Spread (N E S W)	Uneven 5/6/3/2
Crown Clearance	3 m
Easting	560115.33
Northing	569829.891
Root Protection Area	13.067424 m^2
Root Protection Area Radius	2.04 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Fair
Est. Remaining Contribution	20 Years
Ground Condition	Poor
Retention Category	B2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Tree grows .5 m from another tree, poorly developed crown, stem is not well developed at 1.5 m, has been compressed by another tree in the past and is poorly formed, this is a structural weakness, however the tree is sheltered by the adjacent Sycamore
Recommendations	Fell and remove



Tag No	T457
Species	Elder *(Sambucus nigra)*
Age Profile	Over Mature
Height	7 m
Diameter	220 mm
Crown Spread (N E S W)	Uneven 5/3/3/5
Crown Clearance	0.5 m
Easting	560172.375
Northing	569846.333
Root Protection Area	68.186984 m^2
Root Protection Area Radius	4.66 m
Structural Condition	Poor
Physiological Condition	Poor
Vigor	Fair
Est. Remaining Contribution	5 Years
Ground Condition	Poor
Retention Category	C2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Tree grows on a raised earth mound, dense growth of stinging nettle (*Urtica dioica*) at the base, very heavy ivy growth in stems, decay evident at the base of the stems, another elder in the same condition grows 1 m to the West
Recommendations	Fell and remove



Tag No	T458
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	16 m
Diameter	400 mm
Crown Spread (N E S W)	Uneven 3/6/1/6
Crown Clearance	4 m
Easting	560142.769
Northing	569780.314
Root Protection Area	72.3456 m^2
Root Protection Area Radius	4.8 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	30 Years
Ground Condition	Poor
Retention Category	B2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Tree grows among rubble at the base, restricted branch growth on the South, another tree grows .5 m to the South, heavy ivy on stem, well-formed branch structure in three sides
Recommendations	Fell and remove



Tag No	T459
Species	Alder *(Alnus glutinosa)*
Age Profile	Mature
Height	16 m
Diameter	220 mm
Crown Spread (N E S W)	Uneven 1/6/6/6
Crown Clearance	3 m
Easting	560143.138
Northing	569779.032
Root Protection Area	87.206906 m^2
Root Protection Area Radius	5.27 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	30 Years
Ground Condition	Poor
Retention Category	B2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Tree grows among rubble at the base, twin stem from 1 m, restricted branch growth on the North, well-formed crown on three sides, heavy ivy growth on stems, minor deadwood at 4 m, and mid crown
Recommendations	Fell and remove



Tag No	T460
Species	Hawthorn *(Crataegus monogyna)*
Age Profile	Mature
Height	11 m
Diameter	320 mm
Crown Spread (N E S W)	Uneven 5/5/5/7
Crown Clearance	0.5 m
Easting	560144.275
Northing	569771.47
Root Protection Area	46.301184 m^2
Root Protection Area Radius	3.84 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	30 Years
Ground Condition	Poor
Retention Category	B2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Large tree for this species, tree leans slightly West 80 degrees, two large branches grow West from the base, well-formed crown
Recommendations	Remove ivy, crown raise to 2.5m, cut back outer branches by 2 m all around to reshape the crown



Tag No	T461
Species	Alder *(Alnus glutinosa)*
Age Profile	Early Mature
Height	11 m
Diameter	260 mm
Crown Spread (N E S W)	Uneven 1/1/4/4
Crown Clearance	3 m
Easting	560143.462
Northing	569773.942
Root Protection Area	30.566016 m^2
Root Protection Area Radius	3.12 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	25 Years
Ground Condition	Poor
Retention Category	B2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Tree grows as a sub dominant to adjacent larger trees, suppressed crown, stem digresses multiple times
Recommendations	None at this time



Tag No	T462
Species	Sycamore *(Acer pseudoplatanus)*
Age Profile	Mature
Height	16 m
Diameter	500 mm
Crown Spread (N E S W)	Uneven 9/7/10/9
Crown Clearance	3 m
Easting	560171.792
Northing	569779.786
Root Protection Area	168.248736 m^2
Root Protection Area Radius	7.32 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Fair
Est. Remaining Contribution	35 Years
Ground Condition	Poor
Retention Category	B1
Retention Class	Arboricultural
Fell This Tree	No
Reason for Felling	NA
Comments	Medium sized tree, large lower bole, twin stem from .5 m, symmetrical form, good branch structure, tree is showing a slight lack of vigour
Recommendations	No work at this time



Tag No	T463
Species	Elm *(Ulmus procera)*
Age Profile	Mature
Height	10 m
Diameter	300 mm
Crown Spread (N E S W)	Even 1/1/1/1
Crown Clearance	0 m
Easting	560174.674
Northing	569780.454
Root Protection Area	40.6944 m^2
Root Protection Area Radius	3.6 m
Structural Condition	Dead
Physiological Condition	Dead
Vigor	Bad
Est. Remaining Contribution	0 Years
Ground Condition	Poor
Retention Category	U2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Arboricultural
Comments	Standing dead tree
Recommendations	Fell tree and remove



Tag No	T464
Species	Leyland cypress *(x Cupressocyparis leylandii)*
Age Profile	Mature
Height	14 m
Diameter	600 mm
Crown Spread (N E S W)	Even 3/3/3/3
Crown Clearance	3 m
Easting	560189.836
Northing	569791.11
Root Protection Area	162.7776 m^2
Root Protection Area Radius	7.2 m
Structural Condition	Poor
Physiological Condition	Fair
Vigor	Fair
Est. Remaining Contribution	5 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	Arboricultural
Comments	Tree leans North 80 degrees, multiple limb failure, broken branches litter the ground, twin stem from 2 m, top heavy stems, poorly formed tree
Recommendations	Clean crown of all dead or broken branches, reduce height by 2 m, retain for the short term, re inspect in one year from now



Tag No	T465
Species	Ash *(Fraxinus excelsior)*
Age Profile	Mature
Height	20 m
Diameter	380 mm
Crown Spread (N E S W)	Even 12/12/12/12
Crown Clearance	4 m
Easting	560190.797
Northing	569785.635
Root Protection Area	221.5584 m^2
Root Protection Area Radius	8.4 m
Structural Condition	Fair
Physiological Condition	Fair
Vigor	Fair
Est. Remaining Contribution	5 Years
Ground Condition	Poor
Retention Category	C1
Retention Class	Arboricultural
Fell This Tree	No
Reason for Felling	NA
Comments	Very large tree, four large stems from the base, was coppiced a long time ago, very heavy ivy growth on stems, crown thinning and showing early signs of ash dieback infection
Recommendations	Remove ivy, retain for the short term, re-inspect in one year from now and assess the infection of ash dieback



Tag No	T466
Species	Elm *(Ulmus procera)*
Age Profile	Mature
Height	9 m
Diameter	270 mm
Crown Spread (N E S W)	Even 1/1/1/1
Crown Clearance	0 m
Easting	560198.218
Northing	569791.514
Root Protection Area	32.962464 m^2
Root Protection Area Radius	3.24 m
Structural Condition	Dead
Physiological Condition	Dead
Vigor	Bad
Est. Remaining Contribution	0 Years
Ground Condition	Poor
Retention Category	U2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Arboricultural
Comments	Standing dead tree, will become a windthrow hazard
Recommendations	Fell tree and remove



Tag No	T467
Species	Ash *(Fraxinus excelsior)*
Age Profile	Mature
Height	12 m
Diameter	350 mm
Crown Spread (N E S W)	Even 7/7/7/7
Crown Clearance	3 m
Easting	560202.384
Northing	569791.968
Root Protection Area	55.3896 m^2
Root Protection Area Radius	4.2 m
Structural Condition	Good
Physiological Condition	Fair
Vigor	Fair
Est. Remaining Contribution	5 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Straight stem, symmetrical form, well developed crown, restricted branch growth on the North side, crown is thinning slightly and tree is showing early signs of ash dieback infection
Recommendations	Retain for the short term, re inspect in one year from now



Tag No	T468
Species	Hawthorn *(Crataegus monogyna)*
Age Profile	Mature
Height	10 m
Diameter	180 mm
Crown Spread (N E S W)	Uneven 3/6/5/6
Crown Clearance	0.5 m
Easting	560236.761
Northing	569805.887
Root Protection Area	106.359336 m^2
Root Protection Area Radius	5.82 m
Structural Condition	Good
Physiological Condition	Good
Vigor	Good
Est. Remaining Contribution	40 Years
Ground Condition	Fair
Retention Category	A2
Retention Class	Landscape
Fell This Tree	No
Reason for Felling	NA
Comments	Very large tree for this species, large lower bole, heavy ivy growth on the stems, dead wood in the centre at 2 m and 7 m, dense branch growth throughout the crown
Recommendations	Remove ivy, clean crown of all dead or defective branches, crown raise to 2.5 m, reduce frown all around by 1 m and reshape



Tag No	T469
Species	Ash *(Fraxinus excelsior)*
Age Profile	Mature
Height	14 m
Diameter	580 mm
Crown Spread (N E S W)	Even 10/10/10/10
Crown Clearance	3 m
Easting	560271.798
Northing	569817.537
Root Protection Area	265.192154 m^2
Root Protection Area Radius	9.19 m
Structural Condition	Fair
Physiological Condition	Poor
Vigor	Poor
Est. Remaining Contribution	5 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Medium sized tree, two large stems from the base, symmetrical form, showing signs of ash dieback infection
Recommendations	Fell and remove



Tag No	T470
Species	Ash *(Fraxinus excelsior)*
Age Profile	Semi Mature
Height	9 m
Diameter	160 mm
Crown Spread (N E S W)	Uneven 3/2/3/3
Crown Clearance	3 m
Easting	560280.171
Northing	569823.491
Root Protection Area	11.575296 m^2
Root Protection Area Radius	1.92 m
Structural Condition	Fair
Physiological Condition	Good
Vigor	Fair
Est. Remaining Contribution	5 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Tree grows among the hedgerow, no lower or mid crown branch growth, top heavy tree
Recommendations	Fell and remove



Tag No	T471
Species	Ash *(Fraxinus excelsior)*
Age Profile	Semi Mature
Height	10 m
Diameter	20 mm
Crown Spread (N E S W)	Uneven 3/4/4/2
Crown Clearance	3 m
Easting	560282.411
Northing	569822.485
Root Protection Area	0.180864 m^2
Root Protection Area Radius	0.24 m
Structural Condition	Fair
Physiological Condition	Fair
Vigor	Fair
Est. Remaining Contribution	5 Years
Ground Condition	Fair
Retention Category	C2
Retention Class	Landscape
Fell This Tree	Yes
Reason for Felling	Felled for the development
Comments	Tree leans slightly East, heavy ivy on stem, symmetrical form, crown is thinning out, showing early signs of ash dieback infection
Recommendations	Fell and remove

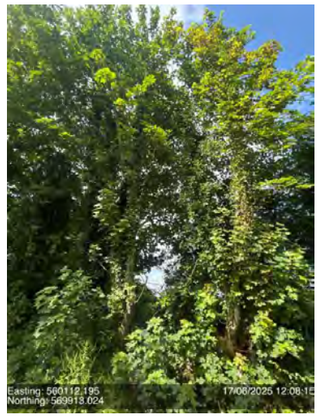


2.2: Tree Groups

Group No	G1
Species	Sycamore (*Acer pseudoplatanus*),Willow sp. (*Salix* sp.),Elder (*Sambucus nigra*)
Approximate Number of Trees	2
Height Range	5 m
Average Stem Diameter	15
Life Stage	Semi Mature
Structural Condition	Fair
Physiological Condition	Fair
Retention Category	U2
Retention Class	Landscape
Trees to be Felled	2
Reason for Felling	Arboricultural
Comments	Overgrown pioneering species proliferation, low quality specimens with no potential to contribute in arboricultural terms
Recommendations	Fell and remove all low scrub, bushes and poorly formed small trees



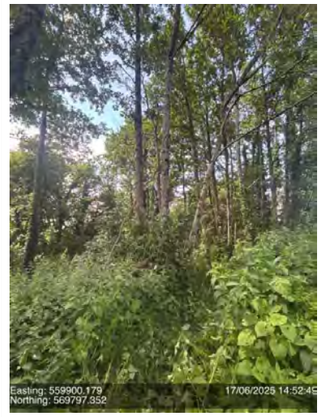
Group No	G2
Species	Sycamore (*Acer pseudoplatanus*)
Approximate Number of Trees	3
Height Range	12 m
Average Stem Diameter	300
Life Stage	Early Mature
Structural Condition	Fair
Physiological Condition	Fair
Retention Category	C2
Retention Class	Landscape
Trees to be Felled	3
Reason for Felling	Felled for the development
Comments	3 no. sycamore trees, self-seeded, growing in a sod and stone embankment, poorly formed heavy ivy on stems, large wound at the base of one tree, low quality trees
Recommendations	Fell and remove



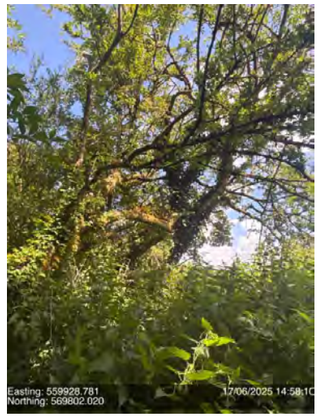
Group No	G3
Species	Sycamore (*Acer pseudoplatanus*)
Approximate Number of Trees	3
Height Range	8 m
Average Stem Diameter	200
Life Stage	Semi Mature
Structural Condition	Fair
Physiological Condition	Fair
Retention Category	C2
Retention Class	Landscape
Trees to be Felled	3
Reason for Felling	Felled for the development
Comments	Self-seeded pioneering specimens, multi stemmed, poorly formed, low quality trees growing among rubble at the base
Recommendations	Fell and remove



Group No	G4
Species	Alder (*Alnus glutinosa*)
Approximate Number of Trees	10
Height Range	14 m
Average Stem Diameter	250
Life Stage	Early Mature
Structural Condition	Good
Physiological Condition	Good
Retention Category	A2
Retention Class	Landscape
Trees to be Felled	10
Reason for Felling	Felled for the development
Comments	Small Alder woodland, stream runs North to South along the Western boundary, damp ground conditions have led to a proliferation of pioneering species including herbaceous field layer to this section
Recommendations	Fell and remove



Group No	G5
Species	Hawthorn (*Crataegus monogyna*)
Approximate Number of Trees	6
Height Range	5 m
Average Stem Diameter	300
Life Stage	Mature
Structural Condition	Fair
Physiological Condition	Fair
Retention Category	C2
Retention Class	Landscape
Trees to be Felled	6
Reason for Felling	Felled for the development
Comments	Mature Elder trees, heavy lean on the stems, heavy ivy growth on the stems, top heavy bushes, broken branch hangs in one crown, diminishing vigour evident
Recommendations	Fell and remove



Group No	G6
Species	Hawthorn (*Crataegus monogyna*),Hazel (*Corylus avellana*),Elder (*Sambucus nigra*)
Approximate Number of Trees	30
Height Range	4 m
Average Stem Diameter	200
Life Stage	Mature
Structural Condition	Fair
Physiological Condition	Good
Retention Category	B2
Retention Class	Landscape
Trees to be Felled	30
Reason for Felling	Felled for the development
Comments	Dense growth of Hawthorn predominantly, large amount of under-storey field layer herbaceous pioneering species such as stinging nettle, derelict section of the site with uneven ground and rubble present underfoot
Recommendations	Fell and remove



Group No	G7
Species	Hawthorn (*Crataegus monogyna*)
Approximate Number of Trees	3
Height Range	5 m
Average Stem Diameter	180
Life Stage	Mature
Structural Condition	Fair
Physiological Condition	Good
Retention Category	B2
Retention Class	Landscape
Trees to be Felled	0
Reason for Felling	NA
Comments	3 no. Large hawthorn bushes that grow on the edge of a running stream, good crown formation, healthy specimens
Recommendations	None at this time



Group No	G8
Species	Alder (*Alnus glutinosa*)
Approximate Number of Trees	4
Height Range	10 m
Average Stem Diameter	250
Life Stage	Early Mature
Structural Condition	Good
Physiological Condition	Good
Retention Category	B2
Retention Class	Landscape
Trees to be Felled	0
Reason for Felling	NA
Comments	Line of 4 no. Medium sized Alders, growing on the bank of a running stream, straight stems, growing in close proximity to each other, healthy trees
Recommendations	Retain, crown raise to 2.5 m



Group No	G9
Species	Blackthorn (*Prunus spinosa*)
Approximate Number of Trees	0
Height Range	4 m
Average Stem Diameter	60
Life Stage	Mature
Structural Condition	Good
Physiological Condition	Good
Retention Category	B2
Retention Class	Landscape
Trees to be Felled	0
Reason for Felling	NA
Comments	Large group of Blackthorn bushes grouped together, growing on the side of a running stream
Recommendations	None at this time



Group No	G10
Species	Alder (*Alnus glutinosa*)
Approximate Number of Trees	3
Height Range	10 m
Average Stem Diameter	450
Life Stage	Mature
Structural Condition	Good
Physiological Condition	Good
Retention Category	A2
Retention Class	Landscape
Trees to be Felled	0
Reason for Felling	NA
Comments	A small group of 3 no. Mature Alders, medium sized trees that grow in the corner of the field, one tree furthest South is nearly dead, the other two are in good condition
Recommendations	None at this time



Group No	G11
Species	Hawthorn (*Crataegus monogyna*)
Approximate Number of Trees	6
Height Range	6 m
Average Stem Diameter	250
Life Stage	Mature
Structural Condition	Poor
Physiological Condition	Poor
Retention Category	U2
Retention Class	Landscape
Trees to be Felled	6
Reason for Felling	Arboricultural
Comments	Small trees that have been damaged in a storm, broken branches, broken stems and dead trees litter the ground and hang in the crowns
Recommendations	Fell and remove 6 no. Trees



Group No	G12
Species	Willow sp. (*Salix* sp.)
Approximate Number of Trees	5
Height Range	5 m
Average Stem Diameter	180
Life Stage	Mature
Structural Condition	Fair
Physiological Condition	Fair
Retention Category	C2
Retention Class	Landscape
Trees to be Felled	5
Reason for Felling	Felled for the development
Comments	A dereliction section of ground that has seen the growth and proliferation of pioneering specialist species, poor quality small trees/bushes
Recommendations	Fell and remove



Group No	G13
Species	Alder (*Alnus glutinosa*),Willow sp. (*Salix* sp.),Willow sp. (*Salix* sp.),Ash (*Fraxinus excelsior*)
Approximate Number of Trees	10
Height Range	9 m
Average Stem Diameter	250
Life Stage	Early Mature
Structural Condition	Fair
Physiological Condition	Fair
Retention Category	C2
Retention Class	Landscape
Trees to be Felled	10
Reason for Felling	Felled for the development
Comments	Group of self-seeded pioneering specimens, the water table is high in this section, the damp ground has allowed species that can adapt to wet conditions to proliferate, large Grey willow, small Alder, low quality specimens
Recommendations	Fell and remove



Group No	G14
Species	Ash (*Fraxinus excelsior*),Sycamore (*Acer pseudoplatanus*),Willow sp. (*Salix* sp.)
Approximate Number of Trees	15
Height Range	6 - 9 m
Average Stem Diameter	200
Life Stage	Semi Mature
Structural Condition	Poor
Physiological Condition	Poor
Retention Category	U2
Retention Class	Landscape
Trees to be Felled	15
Reason for Felling	Arboricultural
Comments	Self-seeded pioneering specimens, in poor health, low quality small trees, some are dead, some are covered with bindweed
Recommendations	Fell and remove



Group No	G15
Species	Leyland cypress (x *Cupressocyparis leylandii*)
Approximate Number of Trees	3
Height Range	22 m
Average Stem Diameter	500
Life Stage	Mature
Structural Condition	Poor
Physiological Condition	Fair
Retention Category	U2
Retention Class	Landscape
Trees to be Felled	3
Reason for Felling	Arboricultural
Comments	Large trees that have produced long stems, top heavy end weight on the stems, large stem failure has occurred, trees are a hazard for any targets, potential for reoccurring stem failure is high
Recommendations	Fell 3 no. Cypress trees in the interest of safety



Group No	G16
Species	Leyland cypress (x *Cupressocyparis leylandii*)
Approximate Number of Trees	5
Height Range	22 m
Average Stem Diameter	500
Life Stage	Mature
Structural Condition	Poor
Physiological Condition	Good
Retention Category	C2
Retention Class	Landscape
Trees to be Felled	5
Reason for Felling	Felled for the development
Comments	Very large trees, multiple branch failures evident, large branches grow East and West , taking up a large foot print in this section, one tree on the south side has fallen over and has multiple damaged stems
Recommendations	Fell and remove



Group No	G17
Species	Ash (*Fraxinus excelsior*)
Approximate Number of Trees	2
Height Range	9 m
Average Stem Diameter	240
Life Stage	Semi Mature
Structural Condition	Fair
Physiological Condition	Fair
Retention Category	C2
Retention Class	Landscape
Trees to be Felled	0
Reason for Felling	NA
Comments	2 no. Small trees growing in the hedgerow, both are infected with ash dieback
Recommendations	Retain for the short term, re inspect in one year from now



Group No	G18
Species	Ash (Fraxinus excelsior)
Approximate Number of Trees	6
Height Range	8 m
Average Stem Diameter	220
Life Stage	Semi Mature
Structural Condition	Fair
Physiological Condition	Poor
Retention Category	C2
Retention Class	Landscape
Trees to be Felled	6
Reason for Felling	Felled for the development
Comments	Small trees, all showing the signs of ash dieback infection
Recommendations	Fell and remove



2.3: Hedgerows

Hedgerow No	H1
Latitude	51.88044019
Longitude	-8.57917197
Species	Hawthorn (*Crataegus monogyna*)
Height	4
Width	4
Age Profile	Mature
Condition	Fair
Historical	1
Species Diversity	3
Structure Habitat	2
Connectivity	2
Landscape	2
Total	10
Comments	Hedgerow is comprised of mature Hawthorn mixed with self-seeded Sycamore and Elm saplings, large gaps in places, larger early mature and mature trees also populate the hedgerow
Recommendations	Remove 15.4 m for the development. Cut back sides by 1 m on East and West, in fill the spaces with new Hawthorn and Blackthorn whips



Hedgerow No	H2
Latitude	51.8803515
Longitude	-8.57911635
Species	Blackthorn (*Prunus spinosa*),Ash (*Fraxinus excelsior*),Hawthorn (*Crataegus monogyna*),Elm (*Ulmus procera*), Elder (*Sambucus nigra*)
Height	4
Width	4
Age Profile	Mature
Condition	Fair
Historical	1
Species Diversity	2
Structure Habitat	2
Connectivity	2
Landscape	2
Total	9
Comments	Mixed species of early mature and mature small trees/bushes, large gaps in the hedgerow in places, larger trees also populate this hedgerow
Recommendations	Remove 18.4 m. Cut back sides on East and West by 1 m, reduce height to 3 m, replant by infilling the gaps with Hawthorn and Blackthorn whips



Hedgerow No	H3
Latitude	51.88119137
Longitude	-8.58122129
Species	Hawthorn (*Crataegus monogyna*)
Height	5
Width	3
Age Profile	Mature
Condition	Fair
Historical	1
Species Diversity	1
Structure Habitat	2
Connectivity	2
Landscape	2
Total	8
Comments	Hedgerow comprised of some mature hawthorn bushes, large gaps/spaces exist within the hedgerow, the bushes grow on top of a sod and stone embankment that defines the boundary
Recommendations	Infill spaces with Hawthorn and Blackthorn whips, reduce sides by 1 m on the East and West, reduce height to 4 m and maintain to these dimensions going forward



Hedgerow No	H4
Latitude	51.88071835
Longitude	-8.5812529
Species	Blackthorn (*Prunus spinosa*),Hawthorn (*Crataegus monogyna*),Elder (*Sambucus nigra*),Blackthorn (*Prunus spinosa*),Elder (*Sambucus nigra*)
Height	5
Width	3
Age Profile	Mature
Condition	Good
Historical	1
Species Diversity	2
Structure Habitat	3
Connectivity	2
Landscape	3
Total	11
Comments	Hedgerow that is made up with mature Hawthorn and Blackthorn bushes with some Elder also present, healthy with some gaps within the hedge
Recommendations	Cut back branches on the South side by 1.5 m, reduce height to 4 m, maintain to these dimensions going forward



Hedgerow No	H5
Latitude	51.88082407
Longitude	-8.58306906
Species	Griselinia
Height	3
Width	2
Age Profile	Early Mature
Condition	Good
Historical	0
Species Diversity	1
Structure Habitat	1
Connectivity	1
Landscape	1
Total	4
Comments	Hedge planted on an old stone wall, domestic species of shrub that can be purchased in a nursery, well maintained hedge
Recommendations	None at this time



Hedgerow No	H6
Latitude	51.88076634
Longitude	-8.58381624
Species	Blackthorn (*Prunus spinosa*),Hawthorn (*Crataegus monogyna*),Ash (*Fraxinus excelsior*),Alder (*Alnus glutinosa*),Hazel (*Corylus avellana*),Wild rose (*Rosa cantina*)
Height	5
Width	3
Age Profile	Mature
Condition	Good
Historical	1
Species Diversity	2
Structure Habitat	3
Connectivity	3
Landscape	3
Total	12
Comments	Healthy densely formed hedgerow, comprised of native species, diverse and contributing well in well, grows on a sod and stone embankment West side of a stream that runs North to South
Recommendations	Remove 15.8 m. Cut back sides by 1 m, reduce height to 4 m, maintain by cutting g back to these dimensions yearly



Hedgerow No	H7
Latitude	51.87942212
Longitude	-8.58294586
Species	Blackthorn (*Prunus spinosa*),Alder (*Alnus glutinosa*)
Height	5
Width	4
Age Profile	Mature
Condition	Good
Historical	1
Species Diversity	3
Structure Habitat	3
Connectivity	3
Landscape	3
Total	14
Comments	Dense growth of mainly Blackthorn, a deep land drain runs North to South at the base of the hedgerow
Recommendations	Cut back sides by 1 m, reduce height to 4 m, maintain to these dimensions going forward



Hedgerow No	H8
Latitude	51.87954424
Longitude	-8.58152759
Species	Hawthorn (*Crataegus monogyna*),Elm (*Ulmus procera*)
Height	4
Width	10
Age Profile	Mature
Condition	Poor
Historical	1
Species Diversity	2
Structure Habitat	1
Connectivity	1
Landscape	1
Total	6
Comments	Area taken over by pioneering herbaceous field layer species, stinging nettle(*Urtica dioica*), bramble (*Rubus fruticosus*), 4 no. Hawthorn bushes and 1 no. Dead Elm
Recommendations	Remove 83 m for the development.



Hedgerow No	H9
Latitude	51.87672179
Longitude	-8.57826527
Species	Blackthorn (*Prunus spinosa*),Hawthorn (*Crataegus monogyna*),Holly (*Ilex aquifolium*)
Height	6
Width	10
Age Profile	Mature
Condition	Good
Historical	1
Species Diversity	3
Structure Habitat	3
Connectivity	4
Landscape	4
Total	15
Comments	Large swaths of Blackthorn has proliferated in the open ground, hedgerow is well formed, good quality Hawthorn bushes with some Holly growing in places, good quality hedgerow
Recommendations	Remove 25.6 m. Cut back branches on the East and West by 1 m, reduce height to 4 m, maintain to these dimensions going forward



Hedgerow No	H10
Latitude	51.87740502
Longitude	-8.57858584
Species	Hawthorn (*Crataegus monogyna*),Blackthorn (*Prunus spinosa*)
Height	6
Width	6
Age Profile	Mature
Condition	Good
Historical	2
Species Diversity	3
Structure Habitat	3
Connectivity	3
Landscape	3
Total	14
Comments	Dense growth of healthy Blackthorn and Hawthorn bushes, good example of a healthy native hedgerow
Recommendations	Remove 100.6 m. Cut back branches on the East and West by 1 m, reduce height to 4 m , maintain to these dimensions going forward



Hedgerow No	H11
Latitude	51.87943393
Longitude	-8.57824044
Species	Hawthorn (*Crataegus monogyna*)
Height	7
Width	3
Age Profile	Mature
Condition	Poor
Historical	2
Species Diversity	1
Structure Habitat	2
Connectivity	1
Landscape	1
Total	7
Comments	Hedgerow with large spaces where bushes have died, dead hawthorn trees rest on the ground, remaining trees are poorly formed and in fair health
Recommendations	Remove any dead trees



Hedgerow No	H12
Latitude	51.8788384
Longitude	-8.57840474
Species	Hawthorn (*Crataegus monogyna*)
Height	4
Width	3
Age Profile	Mature
Condition	Fair
Historical	1
Species Diversity	2
Structure Habitat	3
Connectivity	4
Landscape	3
Total	13
Comments	Hawthorn bushes that grow along with larger trees in the hedgerow, poorly formed and suppressed under the larger trees
Recommendations	Cut back sides by 1 m, reduce height to 4 m



Hedgerow No	H13
Latitude	51.87897278
Longitude	-8.57796405
Species	Hawthorn (*Crataegus monogyna*)
Height	5
Width	4
Age Profile	Mature
Condition	Fair
Historical	1
Species Diversity	2
Structure Habitat	4
Connectivity	4
Landscape	3
Total	14
Comments	Hedgerow has many large gaps/spaces in between Hawthorn bushes, comprised of mainly large hawthorn bushes/small trees and semi mature ash trees
Recommendations	Remove to Facilitate the Development



2.4: Identification of Preliminary Tree Constraints

- Please read in conjunction the topographical AutoCAD file 'Tree Constraints Plan' also see Tree Constraints Plan in appendix Fig 14 & Fig 15 page 79.
- **Please note that 18 no. stand-alone trees are recommended to be removed to facilitate the development, see Section 2.7 Arboricultural Assessment**
- **There will be RPA infringement for 17 no. trees, T401, T405, T406, T408, T409, T410, T411, T413, T414, T415, T460, T461, T462, T464, T465, T467, T468. Please refer to Section 2.5: Tree Protection Instructions and Preliminary Plan and Section 2.9 Extra root protection measures.**

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 magenta dashed circle around each tree in the supplied Tree Constraints map 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' The BS 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.

2.5: Tree Protection Instructions and preliminary plan

- Please read in conjunction with the topographical AutoCAD file 'Tree Protection Plan' also Tree Protection Plan in appendix Fig 16 & Fig 17 page 80
- **There will be RPA infringement for 17 no. trees, T401, T405, T406, T408, T409, T410, T411, T413, T414, T415, T460, T461, T462, T464, T465, T467, T468. Please refer to Section 2.9 Extra root protection measures.**
- **Please also refer to Section 2.8.2 Tree Protection Plan and the CAD file Tree Protection Plan**

Protection of trees. Section 6.2.2 of BS 5832: 2012 states that 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 3 & Fig 4 supplied), shall be erected around the base of all trees to be retained on site. Section 6.2.2.4 states that 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 in the AutoCAD file Tree Protection Plan. No construction traffic, materials or debris will be permitted within this zone of protection. See below for example of RPA and tree protection signage



Example of tree protection signage

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.

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 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, approximately 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 1 and Fig 2 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.

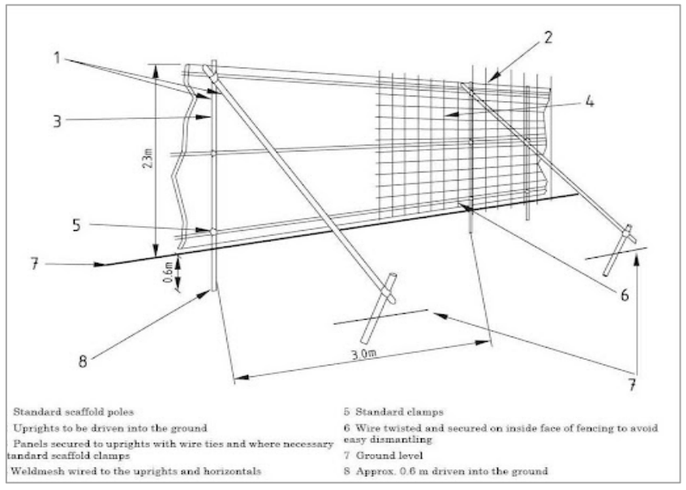


Fig 1: Tree Protective Barrier

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 image 1 and 2. Heras fencing is a reliable option or a similar structure of sturdy, wooden construction would be acceptable. It should typically comprise of the following:

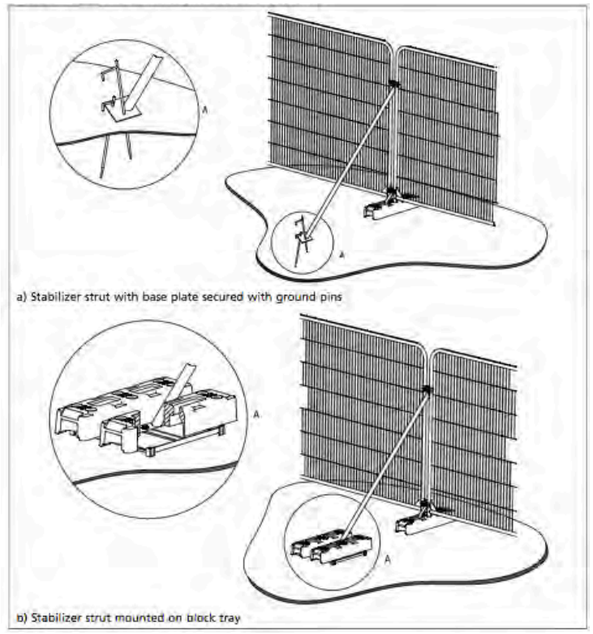


Fig 2: Temporary Protective Fencing

- 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

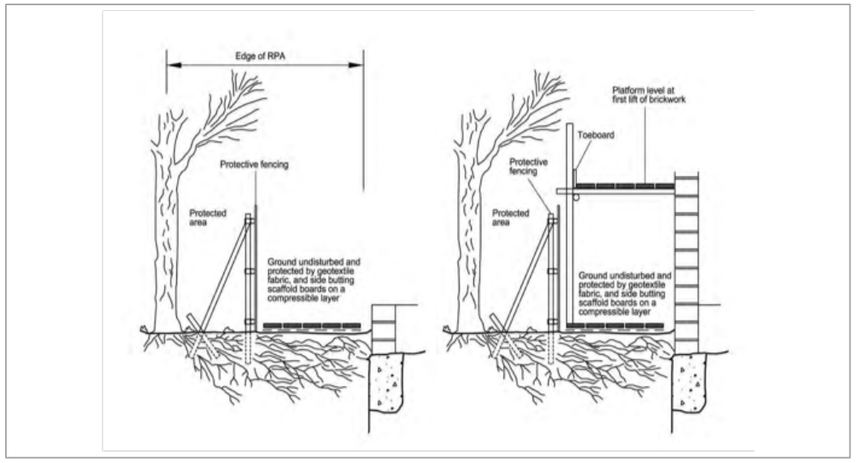


Fig 3: Temporary Protective Scaffold

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.

2.6: Arboricultural Method Statement

Roadway/Driveway

If the case arises whereby a driveway or roadway has to be moved or situated within the RPA of a tree 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.

2.7: Arboricultural Impact Assessment

Total Tree Quantities for the Survey in Their Categories

Retention Category	A High Value	B Moderate Value	C Low Value	U Removal
Quantity	11	20	27	13

Fig 4

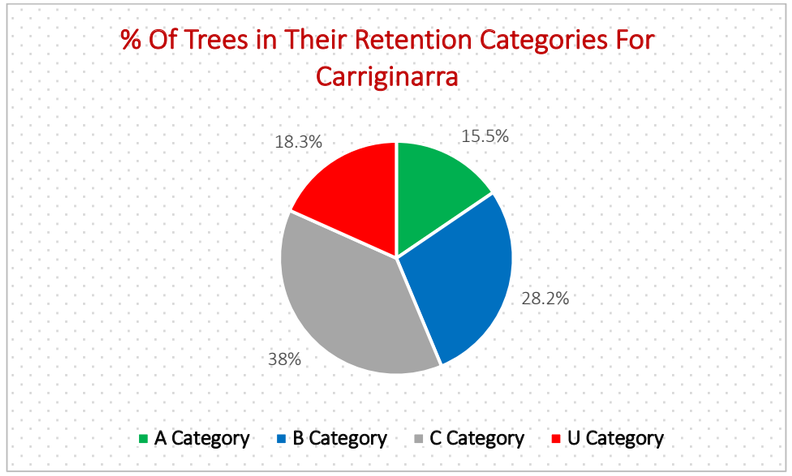


Fig 5:

Trees To be Felled for *Arboricultural* reasons (Including Tree Groups)

Tag/Group No	Category	Colour	Reason	Quantity
T402	U		Arboricultural	1
T403	U		Arboricultural	1
T404	U		Arboricultural	1
T407	U		Arboricultural	1
T412	U		Arboricultural	1
T417	U		Arboricultural	1
T426	U		Arboricultural	1

T431	U		Arboricultural	1
T439	U		Arboricultural	1
T446	U		Arboricultural	1
T447	U		Arboricultural	1
T463	U		Arboricultural	1
T466	U		Arboricultural	1
G1	U		Arboricultural	2
G11	U		Arboricultural	6
G14	U		Arboricultural	15
G15	U		Arboricultural	3
G16	C		Arboricultural	1
			Total	**41 (22 %)**

Fig 6

Hedgerow removal in linear metres recommended to be removed to *facilitate the development*

Hedgerow Number	Condition	Colour	Age	Reason	Length meters
H01	Fair		M	Roadway	15.4
H02	Fair		M	Roadway	23
H06	Good		M	Open Space Development	15.8
H10	Good		M	Open Space Development	100
H11	Poor		M	Open Space Development	55.6
H13	Fair		M	Open Space Development	18.5
				Total	**228.3**

Fig 7

Total Stand – Alone Tree Quantities in their Categories For Felling *To Facilitate The Development* (Not including trees in groups)

Retention Category	A High Value	B Moderate Value	C Low Value	U Removal
Quantity	2 (2.8 %)	7 (9.9 %)	9 (12.7 %)	NA

Fig 8

Total quantity of trees recommended to be felled to *facilitate the development* (Including trees in groups)

Tag/Group No	Category	Colour	Age	Reason For Felling	Quantity
T420	A		EM	To Facilitate the Development	1
T421	B		EM	To Facilitate the Development	1
T422	B		EM	To Facilitate the Development	1
T423	C		EM	To Facilitate the Development	1
T442	A		M	To Facilitate the Development	1
T443	B		M	To Facilitate the Development	1
T444	C		M	To Facilitate the Development	1
T445	C		EM	To Facilitate the Development	1
T453	C		EM	To Facilitate the Development	1
T454	C		M	To Facilitate the Development	1
T455	B		EM	To Facilitate the Development	1
T456	B		M	To Facilitate the Development	1
T457	C		OM	To Facilitate the Development	1
T458	B		M	To Facilitate the Development	1
T459	B		M	To Facilitate the Development	1
T469	C		M	To Facilitate the Development	1
T470	C		SM	To Facilitate the Development	1
T471	C		SM	To Facilitate the Development	1
G02	C		EM	To Facilitate the Development	3
G03	C		SM	To Facilitate the Development	3
G05	C		M	To Facilitate the Development	6
G06	B		M	To Facilitate the Development	30
G12	C		M	To Facilitate the Development	5
G13	C		EM	Ground Level Change	10
G16	C		M	To Facilitate the Development	5
G18	C		SM	Ground Level Change	6
				Total	**86 (46 %)**

Fig 9

2.7.1: Summary

Fig 4 shows the quantities of stand-alone trees that were surveyed within their respective retention categories for the tree survey at Carriginarra.

Fig 5 shows a visual representation of the percentages of these quantities of the overall total of 71 no. stand-alone trees that were surveyed.

Fig 6 shows the total number of trees including trees in groups that are recommended to be felled and removed for arboricultural reasons. Please refer to the tree and group classification schedule for details on the condition of any particular tree or group. The total recommended for removal is 41 no. trees. This is 22 % of the total number of trees that were surveyed on site including stand-alone specimens that were surveyed individually and trees surveyed in groups. The total of all trees surveyed was 71 no. – stand-alone + 116 no. for trees in groups equals a total of 187 no. trees. 41 no. to be removed for arboricultural reasons is 22 % of 187 no.

Fig 7 shows the total number of linear metres of hedgerow that is recommended to be removed to facilitate the development. There are different reasons as can be seen in the table in Fig 7. It should be noted that generally, the hedgerows on site were of fair condition. Two hedgerows in that are considered in good condition are recommended to be removed. H06 partial removal and H10 a removal of 100 linear m.

Fig 8 shows the total number of individual, stand-alone trees that are recommended to be removed to facilitate the development within their respective categories. Percentages of the total of 71 no. for stand-alone trees are given in this table also. It can be seen that only 2 no. trees within the A category (2.8 %) are recommended to be removed. All others are fair to good or fair totalling 16 no. or 22.6 % of 71 no. stand-alone trees onsite.

Fig 9 shows all trees within their retention categories that are recommended to be removed to facilitate the development, including trees in groups. The total is 86 no. and this equates to 46 % of the total number of trees that were surveyed onsite.

It can be said that generally the tree specimens that were surveyed at Carriginarra were of fair and fair to good (Moderate) condition. This can be seen in Fig 4 and Fig 5 with 66.2 % of the total. Mitigation measures such as replanting of well-chosen tree species from good stock will greatly improve the diversity of tree species on site and offer a broader tapestry of arboricultural contribution that will do well aesthetically and ecologically. Ash (*Fraxinus excelsior*), field elm (*Ulmus minor*) and leyland cypress (X *Cupressuscyparis leylandii*) contribute to a total of 22 .5 % of the species onsite. The leylandii is in fair condition, and both ash and elm will be susceptible to disease in the future. A broadening of species diversity can only enhance a species mix that is presently limited in biodiversity value over the long-term.

If you have any questions please do not hesitate to contact me, my details are below.

George Earle, *BSc Forestry*, *Dip Arb, MSIF, MArborA*

GEOTREE Ltd, Tower, Co. Cork, Mobile: 087 332 8019, Email. info@geotree.ie

Appendix 1

2.8: Maps



Fig 10: General Site Location



Fig 11: Site Boundary



Fig 12: Tree Numbers and their Locations



Fig 13: Groups & Hedgerows

2.8.1: Tree Constraints Plan



Fig 14: Tree Constraints Plan – World Imagery



Fig 15: Tree Constraints Plan AutoCAD - PDF

2.8.2: Tree Protection Plan



Fig 16: Tree Protection Plan – World Imagery



Fig 17: Tree Protection Plan – AutoCAD

Appendix 2

2.9: Extra Tree Protection Measures

There will be RPA infringement for 17 no. trees, T401, T405, T406, T408, T409, T410, T411, T413, T414, T415, T460, T461, T462, T464, T465, T467, T468. Please refer to Sections 2.9.1 through 2.9.6 for extra protection measures required to ensure root, and trunk protection.

2.9.1: Reduction In RPA: In BS 5837: 2012 - Tree Protection Plan section 5.5.2 states that in the situation where construction activity cannot be fully excluded from the RPA additional physical measures can be taken to ensure the protection of the tree.

BS 5837: 2012 section 6.2.1.1 states that all trees that are being retained on site should be protected by barriers and/or ground protection before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers should be erected to create a construction exclusion zone. Where, due to site constraints, construction activity cannot be fully or permanently excluded in this manner from all or part of a tree's RPA, appropriate ground protection should be installed. Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). Barriers should be maintained to ensure that they remain rigid and complete.

The amber dashed lines in the Tree Protection Plan indicates the Heras fencing that should be placed around the RPA of each tree. However, it is acceptable to move this fencing if construction activity prevents the placing of the fencing around the RPA. Please note that every effort should be made to maintain the RPA to its fullest.

Section 6.2.3 states that an example of an adequate protective measure in situations where construction cannot be avoided within the RPA would be a 2 m tall welded mesh panel on rubber or concrete feet. Section 8.8.1 of BS 5837: 2012 states that pre-emptive pruning may be necessary to branches but also to roots. Ripping up of tree roots by machinery is not allowed. Hand digging only is allowed within the RPA.

Exposure to roots should be taken seriously. Fibrous roots are responsible for the absorption of water and nutrient from the soil. They dry out quickly and die. Place a layer of mulch of

between 100 mm to 200 mm thick around these roots and keep moist at all times, see section 2.8.3 Temporary Ground Protection Measures below.

2.9.2: Avoid Physical Damage to The Roots during demolition or Construction

In BS 5837: 2012 Section 7.2.1 states that to avoid damage to tree roots, existing ground levels should be retained within the RPA. Intrusion into soil (other than for piling) within the RPA is generally not acceptable, and topsoil within it should be retained in situ. However, limited manual excavation within the RPA might be acceptable, subject to justification. Such excavation should be undertaken carefully, using hand-held tools and preferably by compressed air soil displacement.

7.2.2 states that roots, whilst exposed, should immediately be wrapped or covered to prevent desiccation and to protect from them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should take places as soon as possible.

7.2.3 states that roots smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (eg. Bypass secateurs or handsaw), except where they occur in clumps. Roots occurring in clumps or of 25 mm diameter and over should be severed only following consultation with an arboriculturist, as such roots might be essential to the trees' health and safety

7.2.4 states that prior to backfilling, retained roots should be surrounded with topsoil or uncompacted sharp sand, (builder's sand should not be used because of it's high salt content, which is toxic to tree roots) or other loose inert granular fill, before soil or other suitable material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to the tree roots

2.9.3: Temporary Ground Protection Measures

Tree number will need temporary ground protection measures

Temporary ground protection measures should be employed for trees that will have root protection area (RPA) infringement and where damage from vehicular traffic may occur

BS 5837: 2012 states the following

6.2.3.3 New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.

NOTE The ground protection might comprise one of the following:

a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;

b) for pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;

c) for wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected

(Standards, 2012)

If infringement into the RPA of trees **T401, T405, T406, T408, T409, T410, T411, T413, T414, T415, T460, T461, T462, T464, T465, T467, T468** will involve the possible movement of vehicular equipment then it will be necessary to install root protection in the form of a geocellular material. Please see the following guidlelines as per recommendations in the Arboricultural Association Guidance Note 12

2.9.4: Temporary Ground Protection and Geo-cellular material for Root Protection
BS 5837:2012 – Trees in Relation to Design, Demolition and Construction and the Arboricultural

Principles

- No excavation of existing soil within the RPA.
- Preservation of soil structure by avoiding compaction.
- Permeability maintained throughout the build-up to allow water and gas exchange for root health.

- Load distribution achieved through a cellular confinement system filled with no-fines aggregate.
- Edge restraint formed above ground without excavation.

Construction Method

- Pre-Works
- Hand-clear vegetation/turf only; no mechanical stripping.
- Protect soil from compaction with ground protection boards during works.

Mark off RPA working zone and brief contractors.

- Base Build-Up
- Lay a separation geotextile membrane directly over existing soil.
- Install a cellular confinement system (e.g. 75–100 mm deep geocell panel, Cellweb TRP or equivalent).
- Fix panels with pins/staples as per manufacturer's instructions.
- Infill cells with angular, clean, no-fines stone (e.g. 4/20 mm or 20/40 mm).

Do not use Type 1 or any material containing fines.

- Light compaction only by "tracking in" with a light roller (no vibrating plates).

Wearing Course – Porous Asphalt

- Lay a 25–40 mm open-graded binder course (e.g. 10 mm porous asphalt, designed for pedestrian/light traffic use).

Association Guidance Note 12 states the following;

- Asphalt must be porous/permeable, not standard dense macadam.
- Ensure joints are sealed to maintain permeability.

Edge Restraint

- Provide above-ground edge restraint using pinned timber boards, pinned steel edging, or containment by adjacent features.
- Avoid kerbs or excavated haunches within the RPA.

Finishing

- Ensure final surface level is at or above existing ground (never reduced levels).
- Do not raise levels against tree buttresses or cover root flares.
- Maintain a setback of ~500 mm from the tree stem.

Aftercare

- Inspect surface annually for settlement or clogging.
- If porosity reduces, clean using suction/sweeping, not jet washing.
- Avoid use of de-icing salts within the RPA.

Compliance & References

BS 5837:2012 – Trees in relation to design, demolition and construction

Arboricultural Association Guidance Note 12 (2020): Driveways, paths & parking areas near trees

Cellweb TRP Installation Guide (Geosynthetics Ltd.)

2.9.5: Damage to the trunk of the tree should be avoided. Machinery damage against the bark (cambium) will allow disease to enter and could mean the death of the tree.

If damage to the tree truck is likely then it is recommended to use a protective measure named Trunk Protecta. This is sold by Green Grid Systems in the UK. See URL: https://greengridsystems.com/products/trunk-protecta

This barrier is easy to install and meets the criteria set out in BS 5837 see below

The Protecta is designed for use in conjunction with ground protection where the standard CEZ (construction exclusion zone) cannot be maintained and construction activity cannot be fully or permanently excluded from the RPA. (BS5837:2012 - clause 5.5.2). It also meets 6.2.1.1 and 6.2.2.1 in the standard, see above.

2.9.6: Tree Box Protection Image

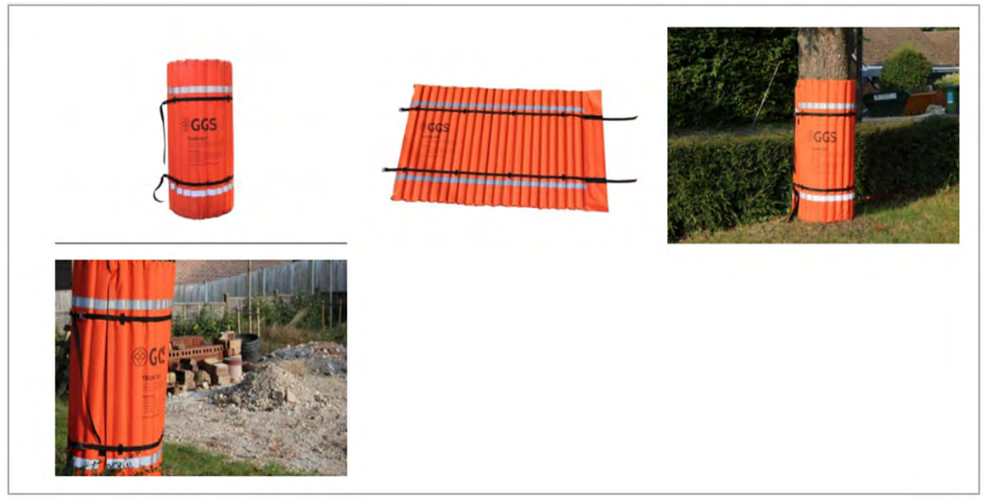


Fig 18: Proteca Image (Solutions 2014)

Citations

Solutions, G. G. (2024). *Tree Ptotecta.* Winchester: Green Grid Solutions.

Standards, B. (2012). *BS 5837: 2012.* BSI.

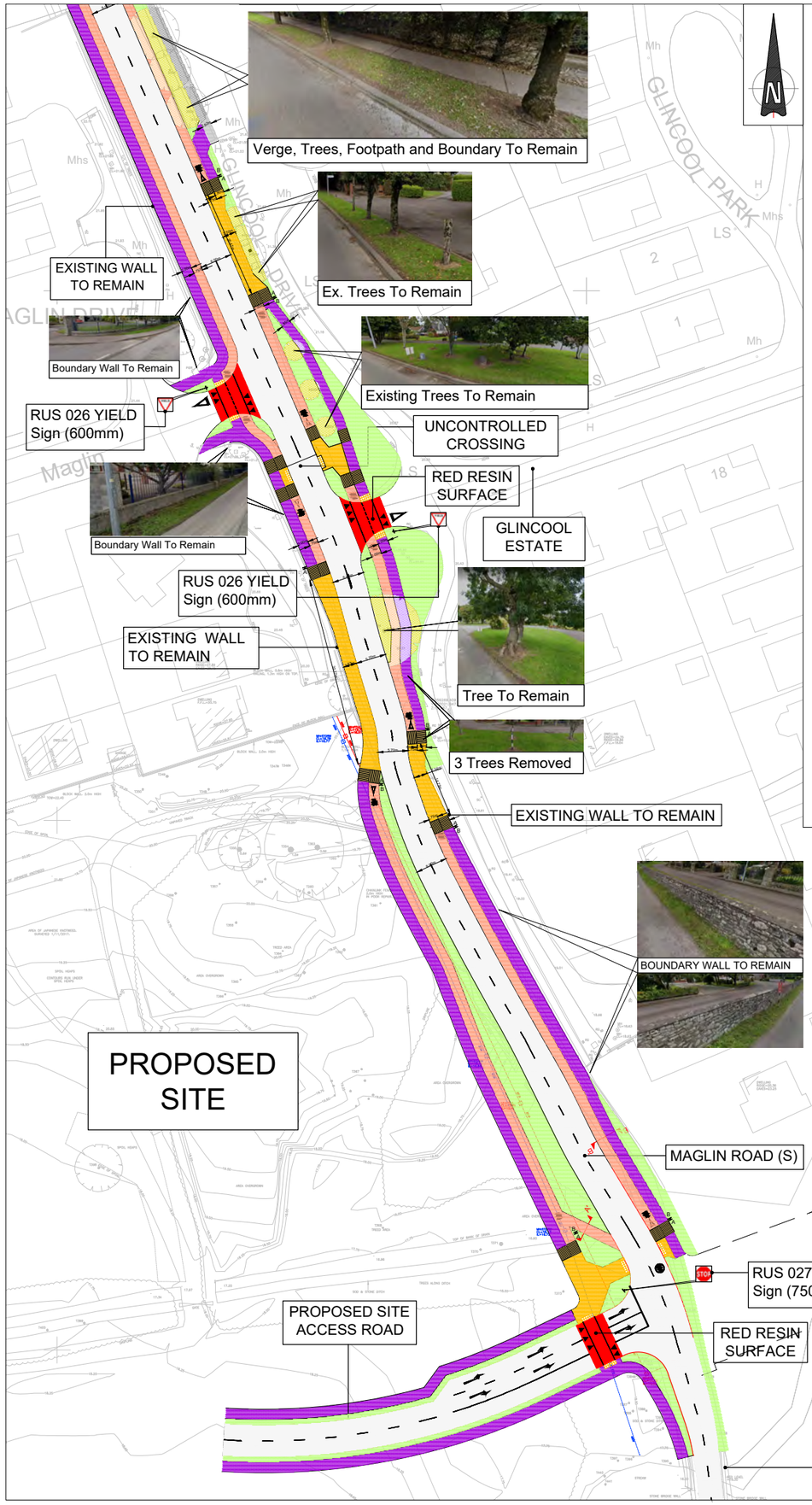
CHAPTER FOUR

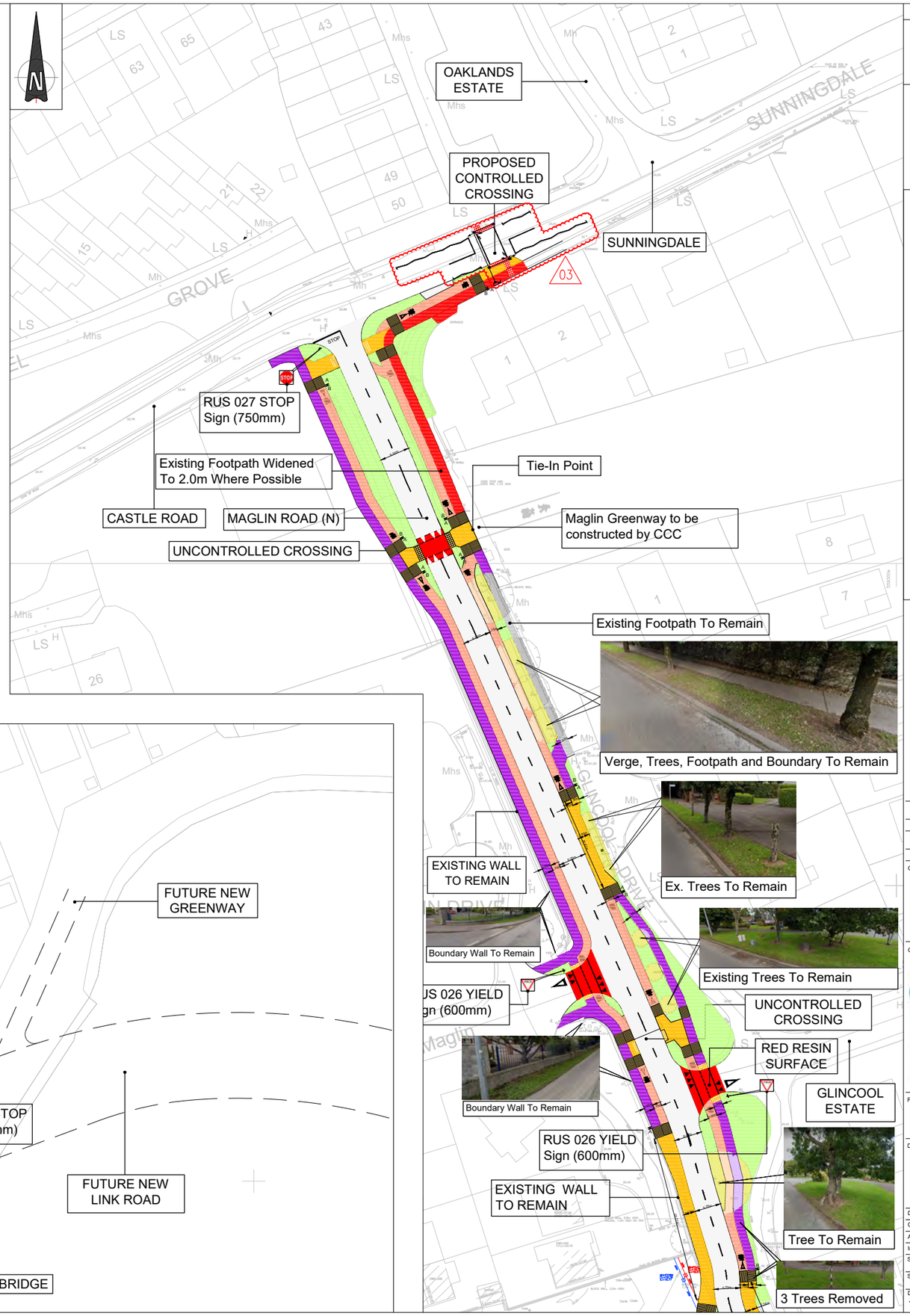
MATERIAL ASSETS – TRAFFIC & TRANSPORTATION

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 Developments
APPENDIX 4-7 Trip Distribution for the Proposed Development
APPENDIX 4-8 Trip Generation for the Proposed Development

APPENDIX 4-1 Permitted Road Works on Maglin Road under Stonecrest Phase 1 Development

Appendix 4A – Permitted Road Works on Maglin Road under Stonecrest Phase 1 Development





BIM QUALITY SHEET NO.: PIM-JBB-00-XX-TP-Z-0003

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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

or

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 : \\work\dc03\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)

Appendix 4B – Site Layout of Proposed Development (Including Proposed Road Works)

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	13.5 Ha
DEV. AREA	6.67 Ha
NO.UNITS	300
OPEN SPACE	15% Usable
DENSITY	45 Unit/Ha

PEDESTRIAN CONNECTION TO NORTHERN DEVELOPMENT

PERMITTED DEVELOPMENT UNDER CONSTRUCTION BY APPLICANT PLANNING REF: 22/41644

PROVISION FOR FUTURE EXTENSION TO ACTIVE TRAVEL ROUTE TO WEST

PROPOSED ACTIVE TRAVEL ROUTE

PERMITTED ACTIVE TRAVEL ROUTE

PROPOSED EXTENSION TO PERMITTED ACTIVE TRAVEL ROUTE

ARCHAEOLOGICAL FEATURE TO BE RETAINED

ARCHAEOLOGICAL FEATURE TO BE RETAINED

OPEN SPACE

OPEN SPACE

OPEN SPACE

COMPLETED HEATHFIELD DEVELOPMENT CONSTRUCTED BY APPLICANT PLANNING REF: 19/38923

LOCATION OF SITE NOTICE

PROPOSED UNCONTROLLED RAISED CROSSING

EXISTING WAYLEAVE

PROVISION FOR FUTURE PEDESTRIAN CONNECTIVITY TO WEST

PROPOSED LOCATION FOR ESB MAST

SITE ENTRANCE

EXISTING AGRICULTURAL LAND

38KV

PROPOSED EXTENSION TO SUSTAINABLE ACCESS CORRIDOR

EXISTING AGRICULTURAL LAND

PROPOSED TEMPORARY PUMPING STATION

SITE ENTRANCE

PROPOSED UNCONTROLLED RAISED CROSSING

PROVISION FOR FUTURE EXTENSION TO SUSTAINABLE ACCESS CORRIDOR TO WEST

Character Area 1 - Crescent Park

Character Area 2 - Hamlet Square

Character Area 3 - Maglin View

FOR LOCATION OF SITE NOTICES - REFER TO LOCATION MAPS - DWG NO. 22148/P/001A & 22148/P/001B

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

Denotes area of land under applicants ownership

NORTH

date	rev	name	chk	note
13.11.25	P1	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
CARRIGANARRA, 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
22148	22148/P/003	P1

☐ Information \ Comments — Tender ☐
☐ Planning — Construction ☐

PROPOSED SITE PLAN - MASTERPLAN

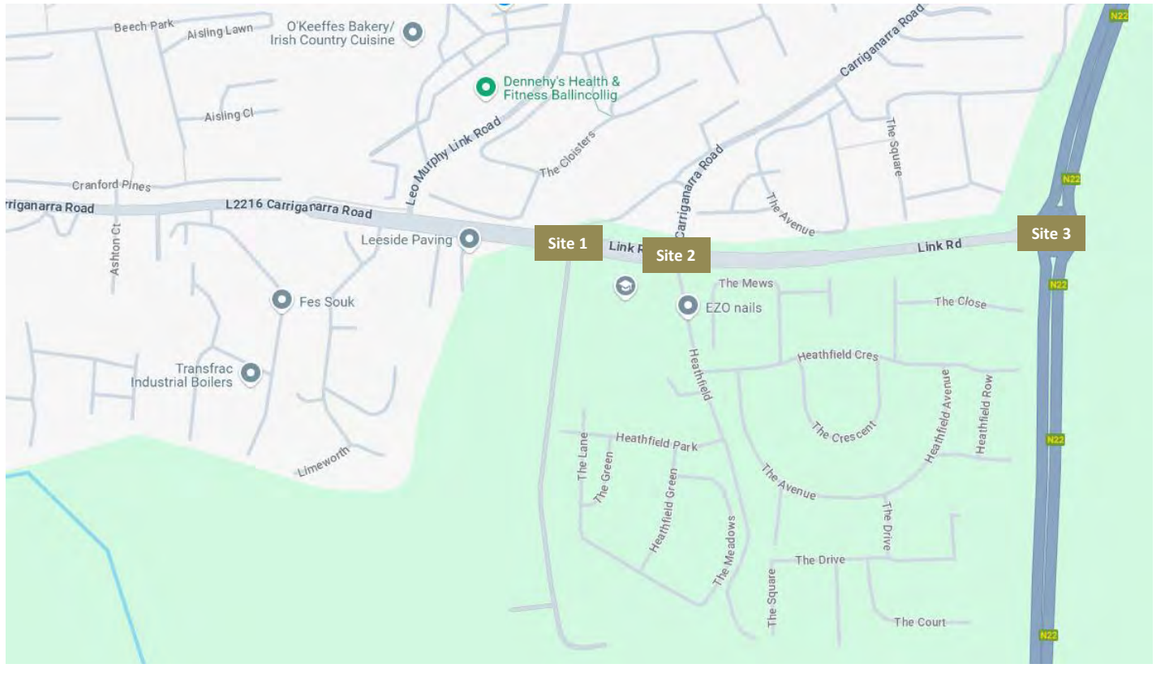
SCALE 1:1000 @ A1

APPENDIX 4-3 Traffic Count Data

Appendix 4C – Traffic Count Data

IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Date: Tue 16 Apr 2024





IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 1
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										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	16	2	4	0	0	0	22	24	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	0	0	0	0	0	0	0	0	0	29	10	2	1	0	0	42	44.3	0	0	0	2	0	0	0	0	2	2	0	0	9	3	0	0	0	0	12	12
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07:45	0	0	0	0	0	0	0	0	0	0	0	1	38	5	5	0	0	0	49	50.9	0	0	0	0	0	0	0	0	0	0	0	0	12	1	0	0	0	0	13	13
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	121	23	15	2	0	0	162	171.5	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	0	0	0	0	0	0	0	0	1	0	49	4	0	1	0	0	55	55.5	0	0	1	0	0	0	0	0	1	1	0	0	12	6	0	0	1	0	19	20
08:15	0	0	0	0	0	0	0	0	0	0	0	0	41	5	0	1	0	0	47	48.3	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	60	6	0	1	0	0	67	68.3	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	77	10	4	1	0	0	92	95.3	0	0	0	0	0	0	0	0	0	0	0	0	26	4	0	0	0	0	30	30
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	227	25	4	4	0	0	261	267.4	0	0	2	0	0	0	0	0	2	2	0	0	83	17	1	0	3	0	104	107.5
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09:15	0	0	0	0	0	0	0	0	0	0	0	0	34	6	1	1	0	0	42	43.8	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	0	0	0	0	0	0	0	0	0	0	28	8	2	2	0	0	40	43.6	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	0	34	8	2	1	0	0	45	47.3	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	0	0	0	0	0	0	0	0	0	0	156	25	12	5	0	0	198	210.5	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	0	0	0	0	0	0	0	0	0	38	9	4	1	0	0	52	55.3	0	0	0	1	0	0	0	0	1	1	0	0	14	3	0	0	0	0	17	17
10:15	0	0	0	0	0	0	0	0	0	0	0	0	34	11	3	0	0	0	48	49.5	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	29	7	3	1	0	0	40	42.8	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	0	0	0	0	0	0	0	0	0	0	29	10	3	1	0	0	43	45.8	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	0	0	0	0	0	0	0	0	0	0	130	37	13	3	0	0	183	193.4	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	35	6	3	3	0	0	47	52.4	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	40	7	1	0	0	0	48	48.5	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	0	0	0	0	0	0	0	0	0	0	33	5	1	0	0	0	39	39.5	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	37	10	2	1	0	0	50	52.3	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	0	0	0	0	0	0	0	0	0	0	145	28	7	4	0	0	184	192.7	0	0	1	1	0	0	0	0	2	2	0	0	110	22	2	0	0	0	134	135
12:00	0	0	0	0	0	0	0	0	0	0	0	0	40	2	3	1	0	0	46	48.8	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	26	9	1	2	0	0	38	41.1	0	0	0	0	0	0	0	0	0	0	0	0	32	6	0	0	0	0	38	38
12:30	0	0	0	0	0	0	0	0	0	0	0	0	45	10	5	0	0	0	60	62.5	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	0	0	0	0	0	0	0	0	1	0	46	2	3	1	0	0	53	55	0	0	3	0	0	0	0	0	3	3	0	0	40	2	2	0	0	0	44	45
H/TOT	0	0	0	0	0	0	0	0	0	0	1	0	157	23	12	4	0	0	197	207.4	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	0	0	0	0	0	0	0	0	0	55	6	1	0	0	0	62	62.5	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	0	0	0	0	0	0	0	0	1	0	34	10	0	0	0	0	45	44.2	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	0	0	0	0	0	0	0	0	0	0	43	4	0	1	0	0	48	49.3	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	0	0	0	0	0	0	0	0	1	0	48	5	0	1	0	0	55	55.5	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	0	0	0	0	0	0	0	0	2	0	180	25	1	2	0	0	210	211.5	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	0	0	0	0	0	0	0	0	0	44	5	3	0	0	0	52	53.5	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	0	0	49	8	0	1	0	0	58	59.3	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	53	0	4	0	0	0	57	59	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	1	36	4	1	2	0	0	44	46.5	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	0	0	0	0	0	0	0	0	1	182	17	8	3	0	0	211	218.3	0	0	0	1	0	0	0	0	1	1	1	2	108	13	2	0	0	0	126	125
15:00	0	0	0	0	0	0	0	0	0	0	0	0	49	5	0	1	0	0	55	56.3	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	0	0	0	0	0	0	0	0	0	1	39	8	0	0	0	0	48	47.4	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	0	52	9	2	0	0	0	63	64	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	47	11	1	1	0	0	60	61.8	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	0	0	0	0	0	0	0	0	0	1	187	33	3	2	0	0	226	229.5	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	2	74	8	1	0	0	0	85	84.3	0	0	0	0	0	0	0	0	0	0	0	0	68	1	0	0	0	0	69	69
16:15	0	0	0	0	0	0	0	0	0	0	0	1	63	4	0	1	0	0	69	69.7	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	0	0	0	0	0	0	0	0	0	1	70	6	0	1	0	0	78	78.7	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	51	5	0	1	0	0	57	58.3	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	0	0	0	0	0	0	0	0	0	4	258	23	1	3	0	0	289	291	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	0	0	0	0	0	0	0	0	0	1	89	2	0	0	0	0	92	91.4	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	1	61	8	1	0	0	0	71	70.9	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	83	5	0	0	0	0	88	88	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	0	0	0	0	0	0	0	0	1	48	4	0	0	0	0	53	52.4	0	0	0	1	0	0	0	0	1	1	0	0	35	2	0	0	0	0	37	37
H/TOT	0	0	0	0	0	0	0	0	0	0	0	3	281	19	1	0	0	0	304	302.7	0	0	2	1	0	0	0	0	3	3	0	0	190	9	2	0	0	0	201	202
18:00	0	0	0	0	0	0	0	0	0	0	0	0	44	4	1	0	0	0	49	49.5	0	0	1	0	0	0	0	0	1	1	0	0	41	4	0	0	0	0	45	45
18:15	0	0	0	0	0	0	0	0	0	0	0	0	54	3	0	0	0	0	57	57	0	0	1	0	0	0	0	0	1	1	0	0	38	1	0	0	0	0	39	39
18:30	0	0	0	0	0	0	0	0	0	0	0	0	49	0	0	0	0	0	49	49	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	30	2	0	0	0	0	32	32	0	0	0	0	0	0	0	0	0	0	0	0	32	0	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	0	0	3	0	0	0	0	0	3	3	0	0	151	5	0	0	0	0	156	156
12 TOT	0	0	0	0	0	0	0	0	0	0	4	10	2201	287	78	32	0	0	2612	2683.4	0	0	29	7	0	0	0	0	36	36	4	7	1446	162	25	6	4	0	1654	1670.9



IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 1
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										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	12	7	0	2	0	0	21	23.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	2	0	0	0	0	11	11
07:15	0	0	22	7	2	0	0	0	31	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	3	1	0	0	0	16	16.5
07:30	0	0	36	10	3	1	0	0	50	52.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	6	0	1	0	0	26	27.3
07:45	0	1	61	5	1	0	0	0	68	67.9	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	34	5	1	0	0	0	40	40.5
H/TOT	0	1	131	29	6	3	0	0	170	176.3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	74	16	2	1	0	0	93	95.3
08:00	0	0	54	6	4	1	0	0	65	68.3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	41	4	0	0	0	0	45	45
08:15	0	0	58	8	2	1	0	0	69	71.3	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	4	4	0	1	43	4	0	0	0	0	48	47.4
08:30	0	0	93	8	2	0	0	0	103	104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	64	7	1	0	0	0	73	72.7
08:45	0	0	87	6	1	0	0	0	94	94.5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	75	8	0	0	0	0	83	83
H/TOT	0	0	292	28	9	2	0	0	331	338.1	0	0	0	0	0	0	0	0	0	0	0	0	3	4	0	0	0	0	7	7	1	1	223	23	1	0	0	0	249	248.1
09:00	0	0	83	4	4	2	1	0	94	99.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	61	5	4	0	2	0	73	76.2
09:15	0	0	64	11	3	1	0	0	79	81.8	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	2	0	0	67	4	1	0	0	0	72	72.5
09:30	0	0	37	6	1	2	0	0	46	49.1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	34	2	0	0	0	0	36	36
09:45	1	0	48	11	5	2	0	0	67	71.3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	36	3	1	0	0	0	40	40.5
H/TOT	1	0	232	32	13	7	1	0	286	301.8	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	6	6	1	0	198	14	6	0	2	0	221	225.2
10:00	0	0	48	9	2	1	0	0	60	62.3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	47	4	0	0	0	0	51	51
10:15	0	0	38	13	5	1	0	0	57	60.8	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	32	2	0	0	0	0	34	34
10:30	0	0	28	9	1	3	0	0	41	45.4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	48	4	0	0	0	0	52	52
10:45	0	0	43	8	3	1	0	0	55	57.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	3	0	0	0	0	33	33
H/TOT	0	0	157	39	11	6	0	0	213	226.3	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	3	3	0	0	157	13	0	0	0	0	170	170
11:00	0	0	38	8	1	0	0	0	47	47.5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	42	6	0	0	0	0	48	48
11:15	0	0	36	10	3	0	0	0	49	50.5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	51	5	0	0	0	0	56	56
11:30	1	0	47	9	4	2	0	0	63	66.8	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	47	4	2	0	1	0	55	56.4
11:45	0	0	46	11	2	1	1	0	61	64.3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	42	1	0	0	0	0	44	43.4
H/TOT	1	0	167	38	10	3	1	0	220	229.1	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4	0	2	182	16	2	0	1	0	203	203.8
12:00	0	0	39	7	3	1	0	0	50	52.8	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	52	6	0	0	0	0	58	58
12:15	0	0	50	7	6	0	0	0	63	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61	5	1	0	0	0	67	67.5
12:30	0	0	42	6	2	2	0	0	52	55.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	1	0	0	0	0	58	58
12:45	0	0	40	5	3	0	0	0	48	49.5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	46	7	1	0	0	0	54	54.5
H/TOT	0	0	171	25	14	3	0	0	213	223.9	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	216	19	2	0	0	0	237	238
13:00	0	0	44	5	2	1	0	0	52	54.3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	1	0	41	7	1	0	0	0	50	49.7
13:15	0	0	40	9	1	0	0	0	50	50.5	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	3	3	0	0	52	3	0	0	0	0	55	55
13:30	0	0	47	8	1	0	0	0	56	56.5	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	49	9	0	0	0	0	58	58
13:45	0	0	49	3	1	0	0	0	53	53.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	52	3	0	1	0	0	59	58.3
H/TOT	0	0	180	25	5	1	0	0	211	214.8	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	0	0	0	8	8	2	2	194	22	1	1	0	0	222	221
14:00	0	0	62	11	0	0	0	0	73	73	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	91	5	0	0	1	0	97	98
14:15	0	0	57	9	6	1	0	0	73	77.3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	1	45	1	1	0	0	0	48	47.9
14:30	0	0	34	8	1	3	0	0	46	50.4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	39	5	2	1	0	0	47	49.3
14:45	0	0	45	8	3	1	0	0	57	59.8	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4	4	0	0	48	6	0	0	0	0	54	54
H/TOT	0	0	198	36	10	5	0	0	249	260.5	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	0	0	9	9	0	1	223	17	3	1	1	0	246	249.2
15:00	1	0	76	10	2	0	0	0	89	89.2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	2	0	102	1	0	0	5	0	110	113.4
15:15	0	0	65	6	3	2	0	0	76	80.1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	77	3	0	1	0	0	81	82.3
15:30	0	0	76	9	3	0	0	0	88	89.5	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4	4	0	0	66	3	0	0	0	0	69	69
15:45	1	1	60	13	2	0	0	0	77	76.6	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0	6	6	0	3	84	9	1	0	0	0	97	95.7
H/TOT	2	1	277	38	10	2	0	0	330	335.4	0	0	0	0	0	0	0	0	0	0	0	0	9	3	0	0	0	0	12	12	2	3	329	16	1	1	5	0	357	360.4
16:00	0	0	73	6	4	1	0	0	84	87.3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	2	100	6	1	0	0	0	109	108.3
16:15	0	1	61	6	2	0	0	0	70	70.4	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4	4	0	1	97	6	0	1	1	0	106	107.7
16:30	0	0	43	8	0	0	0	0	51	51	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4	0	1	82	6	0	0	0	0	89	88.4
16:45	0	0	62	8	0	0	0	0	70	70	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	73	9	0	0	0	0	82	82
H/TOT	0	1	239	28	6	1	0	0	275	278.7	0	0	0	0	0	0	0	0	0	0	0	0	12	1	0	0	0	0	13	13	0	4	352	27	1	1	1	0	386	386.4
17:00	0	1	62	10	1	0	0	0	74	73.9	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	1	0	95	10	1	0	1	0	108	108.7
17:15	0	1	54	5	0	0	0	0	60	59.4	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	2	0	0	83	18	0	0	0	0	101	101
17:30	0	0	53	3	1	0	0	0	57	57.5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	2	0	89	2	0	0	0	0	93	91.4
17:45	0	0	57	5	0	0	0	0	62	62	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	93	6	0	0	0	0	99	99
H/TOT	0	2	226	23	2	0	0	0	253	252.8	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	0	0	9	9	3	0	360	36	1	0	1	0	401	400.1
18:00	0	0	55	2	1	0	0	0	58	58.5	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	0	90	4	0	0	0	0	94	94
18:15	0	0	54	2	0	0	0	0	56	56	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	0	1	71	5	1	0	0	0	78	77.9
18:30	0	1	41	2	0	0	0	0	44	43.4	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	69	4	0	0	0	0	73	73
18:45	0	0	41	3	0	0	0	0	44	44	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	61	3	0	0	0	0	65	64.4
H/TOT	0	1	191	9	1	0	0	0	202	201.9	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	9	9	0	2	291	16	1	0	0	0	310	309.3
12 TOT	4	6	2461	350	97	33	2	0	2953	3039.6	0	0	0	0	0	0	0	0	0	0	0	0	66	17	0	0	0	0	83	83	9	15	2799	235	21	5	11	0	3095	3106.8



IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 1
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										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	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	0	1	0	0	0	0	0	1	1
07:15	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	0	0	0	0	0	0	0
07:30	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	0	0	0	0	0	0	0
07:45	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	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
08:00	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	2	0	0	0	0	2	2
08:15	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	1	0	0	0	0	1	1
08:30	0	0	3	0	0	0	0	0	3	3	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2
08:45	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	1	0	0	0	0	1	1
H/TOT	0	0	4	0	0	0	0	0	4	4	0	0	20	0	0	0	0	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0	0	0	6	6
09:00	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	1	0	0	0	0	1	1
09:15	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	1	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
09:45	0	0	0	1	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	0	0	1	0	0	0	0	1	1
H/TOT	0	0	1	1	0	0	0	0	2	2	0	0	5	3	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	4
10:00	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	0	0	0	1	0	0	0	1	1
10:15	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	0	0	0	0	0	0	0
10:30	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
10:45	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	0	0	0	0	0	0	0	0	0
H/TOT	0	0	2	0	0	0	0	0	2	2	0	0	4	1	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2
11:00	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	0	0	0	0	0	0	0
11:15	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	0	0	0	0	0	0	0	0	0
11:30	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	0	0	0	0	0	0	0
11:45	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	1	1	0	0	0	2	2
H/TOT	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	0	0	1	1	0	0	0	2	2
12:00	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	1	1	0	0	0	2	2
12:15	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	0	0	1	1	0	0	0	2	2
12:30	0	0	0	1	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2
12:45	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	0	0	1	0	0	0	0	1	1
H/TOT	0	0	2	1	0	0	0	0	3	3	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	4	3	0	0	0	7	7
13:00	0	0	1	0	0	0	0	0	1	1	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
13:15	0	0	1	1	0	0	0	0	2	2	0	0	2	1	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
13:30	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	0	0	0	0	0	0	0	0	0
13:45	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	0	0	0	0	0	0	0	0	0
H/TOT	0	0	4	1	0	0	0	0	5	5	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	0	0	2	2
14:00	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	1	0	0	0	0	1	1
14:15	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	0	0	0	0	0	0	0	0	0
14:30	0	0	1	0	0	0	0	0	1	1	0	0	3	0	1	0	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
14:45	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2
H/TOT	0	0	3	0	0	0	0	0	3	3	0	0	7	1	1	0	0	0	9	9.5	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	4	4
15:00	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	0	0	1	0	0	0	0	1	1
15:15	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	5	5	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	1	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
15:45	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	0	0	1	0	0	0	0	1	1
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	4	4	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
16:00	0	0	2	1	0	0	0	0	3	3	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
16:15	0	0	1	1	0	0	0	0	2	2	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
16:30	0	0	1	0	0	0	0	0	1	1	0	0	2	1	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
16:45	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
H/TOT	0	0	5	2	0	0	0	0	7	7	0	0	5	2	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	6	6
17:00	0	0	2	0	0	0	0	0	2	2	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
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	1	0	0	0	0	1	1
17:30	0	0	1	0	0	0	0	0	1	1	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
17:45	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	1	0	0	0	0	1	1
H/TOT	0	0	3	0	0	0	0	0	3	3	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3
18:00	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	0	0	0	0	0	0	0	0	0
18:15	0	0	0	2	0	0	0	0	2	2	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
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
18:45	0	0	4	0	0	0	0	0	4	4	0	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	0	1	1
H/TOT	0	0	5	2	0	0	0	0	7	7	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
12 TOT	0	0	30	7	0	0	0	0	37	37	0	0	75	13	1	0	0	0	89	89.5	0	0	0	0	0	0	0	0	0	0	0	0	33	8	0	0	0	41	41



IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 1
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



IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 2
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



IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 2
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
14:30	0	0	11	2	0	1	0	0	14	15.3	0	0	0	0	0	0	0	0	0	0	0	0	9	1	0	0	0	0	10	10	0	0	68	17	3	4	2	0	94	102.7
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
16:30	0	0	11	4	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	6	2	1	0	0	0	9	9.5	0	1	86	10	0	0	0	0	97	96.4
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 2
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	1	0	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	0	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



IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 2
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										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	4	0	0	1	0	0	5	6.3	0	0	40	8	4	0	0	0	52	54	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
07:15	1	0	8	0	0	0	0	0	9	8.2	0	0	53	12	2	1	0	0	68	70.3	0	0	3	1	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
07:30	0	0	11	4	0	0	0	0	15	15	0	0	83	6	5	1	0	0	95	98.8	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
07:45	0	0	16	5	0	0	1	0	22	23	0	1	90	12	6	0	0	0	109	111.4	0	0	9	2	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	39	9	0	1	1	0	51	52.5	0	1	266	38	17	2	0	0	324	334.5	0	0	16	3	0	0	0	0	19	19	0	0	0	0	0	0	0	0	0	0
08:00	0	0	31	2	0	0	0	0	33	33	0	0	90	8	1	1	0	0	100	101.8	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	19	1	0	0	0	0	20	20	0	0	69	8	1	1	0	0	79	80.8	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
08:30	0	0	25	1	0	0	0	0	26	26	0	0	62	9	0	1	0	0	72	73.3	0	0	2	1	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
08:45	0	0	21	2	1	0	0	0	24	24.5	0	0	78	9	4	1	0	0	92	95.3	0	0	11	2	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	96	6	1	0	0	0	103	103.5	0	0	299	34	6	4	0	0	343	351.2	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	26	1	1	0	0	0	28	28.5	0	0	68	4	5	1	0	0	78	81.8	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
09:15	0	0	16	1	0	0	0	0	17	17	0	0	66	8	2	1	0	0	77	79.3	0	0	10	1	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
09:30	0	0	15	1	0	0	0	0	16	16	0	0	61	11	2	2	1	0	77	81.6	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
09:45	0	0	9	2	2	0	0	0	13	14	0	0	45	13	0	1	0	0	59	60.3	0	0	5	1	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	66	5	3	0	0	0	74	75.5	0	0	240	36	9	5	1	0	291	303	0	0	26	2	0	0	0	0	28	28	0	0	0	0	0	0	0	0	0	0
10:00	0	0	17	2	1	0	0	0	20	20.5	0	0	55	9	3	1	0	0	68	70.8	0	0	7	3	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
10:15	0	1	14	2	1	0	0	0	18	17.9	0	0	50	7	1	0	0	0	58	58.5	0	0	6	3	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
10:30	0	0	11	1	0	0	0	0	12	12	0	0	45	8	7	1	0	0	61	65.8	0	0	8	1	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
10:45	0	0	15	0	0	0	0	0	15	15	0	0	47	13	2	1	0	0	63	65.3	0	0	5	1	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	57	5	2	0	0	0	65	65.4	0	0	197	37	13	3	0	0	250	260.4	0	0	26	8	0	0	0	0	34	34	0	0	0	0	0	0	0	0	0	0
11:00	0	0	9	1	0	0	0	0	10	10	0	0	48	10	3	3	0	0	64	69.4	0	0	2	1	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
11:15	0	0	13	3	0	0	0	0	16	16	0	1	55	9	3	0	0	0	68	68.9	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
11:30	0	0	15	1	0	0	0	0	16	16	0	0	54	9	3	0	0	0	66	67.5	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
11:45	0	0	24	2	1	0	0	0	27	27.5	0	0	50	16	2	1	0	1	70	72.3	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	61	7	1	0	0	0	69	69.5	0	1	207	44	11	4	0	1	268	278.1	0	0	14	1	0	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0
12:00	0	0	20	0	0	0	0	0	20	20	0	0	49	7	4	1	0	0	61	64.3	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	1	0	0	0	0	11	11	0	0	46	12	1	2	1	0	62	66.1	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
12:30	1	0	15	2	0	0	0	0	18	17.2	0	0	56	13	5	0	0	0	74	76.5	0	0	12	0	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
12:45	0	0	17	0	0	0	0	0	17	17	0	0	71	5	2	1	0	0	79	81.3	0	0	5	1	1	0	0	0	7	7.5	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	62	3	0	0	0	0	66	65.2	0	0	222	37	12	4	1	0	276	288.2	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	15	4	0	0	0	0	19	19	0	0	57	5	1	0	0	0	63	63.5	0	0	10	1	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
13:15	1	0	23	5	0	0	0	0	29	28.2	0	0	49	8	0	0	0	0	57	57	0	0	7	1	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
13:30	0	0	17	1	0	0	0	0	18	18	0	0	51	9	2	0	1	0	63	65	0	0	4	2	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
13:45	0	1	18	0	0	0	0	0	19	18.4	0	0	68	7	0	2	0	0	77	79.6	1	0	6	0	0	0	0	0	7	6.2	0	0	0	0	0	0	0	0	0	0
H/TOT	1	1	73	10	0	0	0	0	85	83.6	0	0	225	29	3	2	1	0	260	265.1	1	0	27	4	0	0	0	0	32	31.2	0	0	0	0	0	0	0	0	0	0
14:00	1	0	24	2	0	0	0	0	27	26.2	0	0	75	6	3	0	0	0	84	85.5	0	0	10	1	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
14:15	0	0	30	1	0	0	0	0	31	31	0	0	52	13	1	1	0	0	67	68.8	0	0	7	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0
14:30	0	0	14	0	0	0	0	0	14	14	0	0	73	2	4	0	0	0	79	81	0	0	2	0	0	0	1	0	3	4	0	0	0	0	0	0	0	0	0	0
14:45	0	0	22	0	0	0	0	0	22	22	0	1	57	7	2	2	0	0	69	72	0	0	5	1	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
H/TOT	1	0	90	3	0	0	0	0	94	93.2	0	1	257	28	10	3	0	0	299	307.3	0	0	24	2	0	0	1	0	27	28	0	0	0	0	0	0	0	0	0	0
15:00	0	0	30	2	0	0	0	0	32	32	0	0	86	9	1	1	0	0	97	98.8	0	0	7	2	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
15:15	0	0	24	2	0	0	0	0	26	26	0	1	74	11	2	0	0	0	88	88.4	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
15:30	0	0	30	1	0	0	0	0	31	31	0	0	72	11	2	0	0	0	85	86	0	0	11	1	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0
15:45	0	0	18	1	1	0	0	0	20	20.5	0	0	65	14	3	1	0	0	83	85.8	0	0	6	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	102	6	1	0	0	0	109	109.5	0	1	297	45	8	2	0	0	353	359	0	0	32	3	0	0	0	0	35	35	0	0	0	0	0	0	0	0	0	0
16:00	0	0	52	2	0	0	0	0	54	54	0	1	78	10	1	0	0	0	90	89.9	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
16:15	0	0	17	2	0	0	0	0	19	19	0	2	82	12	0	1	0	0	97	97.1	0	0	5	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0
16:30	0	1	15	0	0	0	0	0	16	15.4	0	0	85	17	1	2	0	0	105	108.1	0	0	13	0	1	0	0	0	14	14.5	0	0	0	0	0	0	0	0	0	0
16:45	0	0	39	0	0	0	0	0	39	39	0	0	55	10	1	1	0	0	67	68.8	1	0	9	0	0	0	0	0	10	9.2	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	123	4	0	0	0	0	128	127.4	0	3	300	49	3	4	0	0	359	363.9	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	32	0	0	0	0	0	32	32	0	1	102	7	0	0	0	0	110	109.4	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
17:15	0	0	25	6	0	0	0	0	31	31	0	1	67	6	1	0	0	0	75	74.9	0	0	8	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
17:30	0	0	28	6	0	0	0	0	34	34	0	0	95	4	0	0	0	0	99	99	0	0	20	0	0	0	0	0	20	20	0	0	0	0	0	0	0	0	0	0
17:45	0	0	20	0	0	0	0	0	20	20	0	1	63	4	0	0	0	0	68	67.4	0	0	11	0	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	105	12	0	0	0	0	117	117	0	3	327	21	1	0	0	0	352	350.7	0	0	49	0	0	0	0	0	49	49	0	0	0	0	0	0	0	0	0	0
18:00	0	0	24	1	0	1	0	0	26	27.3	0	0	69	7	2	0	0	0	78	79	0	0	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0
18:15	0	0	24	2	0	0	0	0	26	26	0	0	63	4	0	0	0	0	67	67	0	0	10	3	0	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0
18:30	0	0	22	3	0	0	0	0	25	25	0	0	65	0	0	0	0	0	65	65	0	0	10	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0
18:45	0	0	18	1	0	0	0	0	19	19	0	0	41	1	0	0	0	0	42	42	0	0	8	1	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	88	7	0	1	0	0	96	97.3	0	0	238	12	2	0	0	0	252	253	0	0	32	4	0	0	0	0	36	36	0	0	0	0	0	0	0	0	0	0
12 TOT	4	3	962	77	8	2	1	0	1057	1059.6	0	10	3075	410	95	33	3	1	3627	3714.4	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 3
Location: Killumney Link East Roundabout
Date: Tue 16-Apr-2024

Arm A - N22
Arm B - N22
Arm C - Link Rd

	A => A										A => B										A => C										B => A										B => B									
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAV AN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAV AN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAV AN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAV AN	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	CARAV AN	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	0	0	3	2	0	0	0	0	5	5	0	0	99	16	4	2	0	0	121	125.6	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	129	32	1	2	0	0	164	167.1	0	0	8	3	1	0	0	0	12	12.5	0	1	165	27	5	2	0	0	200	204.5	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	127	27	1	5	1	0	161	169	0	0	10	4	0	0	0	0	14	14	0	0	175	24	3	6	0	0	208	217.3	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	1	123	27	4	4	0	0	159	165.6	0	0	6	4	0	0	0	0	10	10	0	0	240	25	1	2	0	0	268	271.1	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	486	111	8	12	1	0	619	639	0	0	27	13	1	0	0	0	41	41.5	0	1	679	92	13	12	0	0	797	818.5	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	129	26	3	4	0	0	162	168.7	0	0	15	2	0	0	0	0	17	17	0	0	202	24	3	1	1	0	231	234.8	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	142	19	2	5	0	0	168	175.5	0	0	13	1	0	0	0	0	14	14	0	0	209	21	2	4	0	0	236	242.2	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	173	15	4	3	0	0	195	200.9	0	0	21	3	0	0	0	0	24	24	0	0	191	15	3	4	0	0	213	219.7	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	139	22	5	2	0	0	168	173.1	0	0	15	2	0	0	0	0	17	17	0	0	190	17	3	6	0	0	216	225.3	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	583	82	14	14	0	0	693	718.2	0	0	64	8	0	0	0	0	72	72	0	0	792	77	11	15	1	0	896	922	0	0	1	0	0	0	0	0	1	1
09:00	0	0	0	0	0	0	0	0	0	0	0	0	133	20	5	4	0	0	162	169.7	0	0	9	1	0	0	0	0	10	10	0	0	150	22	4	5	1	0	182	191.5	0	0	1	0	0	0	0	0	1	1
09:15	0	0	0	0	0	0	0	0	0	0	0	1	116	26	10	3	2	0	158	168.3	0	0	10	5	0	0	0	0	15	15	0	0	154	11	3	2	2	0	172	178.1	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0	0	0	127	19	3	5	0	0	154	162	0	0	8	0	0	1	0	0	9	10.3	0	0	110	21	4	2	1	0	138	143.6	0	0	0	0	0	0	0	0	0	0
09:45	0	0	1	0	0	0	0	0	1	1	0	0	107	17	4	3	0	0	131	136.9	0	0	14	2	1	0	0	0	17	17.5	0	1	105	14	6	4	0	0	130	137.6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1	0	1	483	82	22	15	2	0	605	636.9	0	0	41	8	1	1	0	0	51	52.8	0	1	519	68	17	13	4	0	622	650.8	0	0	1	0	0	0	0	0	1	1
10:00	0	0	0	0	0	0	0	0	0	0	0	0	89	11	3	4	0	0	107	113.7	0	0	12	1	0	1	0	0	14	15.3	0	0	108	15	3	9	1	0	136	150.2	0	0	0	0	0	0	0	0	0	0
10:15	0	0	1	0	0	0	0	0	1	1	0	0	94	15	7	2	1	0	119	126.1	0	0	9	0	0	0	0	0	9	9	0	0	73	13	5	5	0	0	96	105	0	0	0	0	1	0	0	0	1	1
10:30	0	0	0	0	0	0	0	0	0	0	0	0	92	11	2	1	1	0	107	110.3	0	0	6	2	1	1	0	0	10	11.8	0	0	76	19	3	4	2	0	104	112.7	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	3	92	11	0	3	0	0	109	111.1	0	0	12	2	0	0	0	0	14	14	0	0	83	16	2	8	0	0	109	120.4	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1	0	3	367	48	12	10	2	0	442	461.2	0	0	39	5	1	2	0	0	47	50.1	0	0	340	63	13	26	3	0	445	488.3	0	0	0	0	1	0	0	0	1	1
11:00	0	0	0	0	0	0	0	0	0	0	0	1	86	14	1	9	1	0	112	124.6	0	0	12	2	0	0	0	0	14	14	0	0	104	15	3	5	0	0	127	135	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	2	75	13	2	5	1	0	98	105.3	0	0	16	0	0	0	0	0	16	16	0	0	76	14	3	5	0	0	98	106	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	1	103	11	3	4	0	0	122	128.1	0	0	16	3	1	0	0	0	20	20.5	0	1	101	10	2	6	2	0	122	132.2	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	96	15	3	8	0	0	122	133.9	0	0	15	1	0	0	0	0	16	16	0	0	88	14	4	6	0	0	112	121.8	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	4	360	53	9	26	2	0	454	491.9	0	0	59	6	1	0	0	0	66	66.5	0	1	369	53	12	22	2	0	459	495	0	0	0	0	0	0	0	0	0	0
12:00	0	0	1	0	0	0	0	0	1	1	1	0	99	21	3	9	0	0	133	145.4	0	0	21	4	0	0	0	0	25	25	0	0	73	9	3	4	0	0	89	95.7	0	0	1	0	0	0	0	0	1	1
12:15	0	0	0	0	0	0	0	0	0	0	0	1	129	14	11	7	0	1	163	177	0	0	14	2	0	0	0	0	16	16	0	0	81	6	3	8	0	0	98	109.9	0	0	1	0	0	0	0	0	1	1
12:30	0	0	0	0	0	0	0	0	0	0	0	0	108	20	5	6	0	0	139	149.3	0	0	14	0	0	0	0	0	14	14	0	0	98	9	5	1	0	1	114	117.8	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	104	9	4	8	1	0	126	139.4	0	0	14	1	0	0	0	0	15	15	0	0	93	16	5	5	0	0	119	128	0	0	1	0	0	0	0	0	1	1
H/TOT	0	0	1	0	0	0	0	0	1	1	1	1	440	64	23	30	1	1	561	611.1	0	0	63	7	0	0	0	0	70	70	0	0	345	40	16	18	0	1	420	451.4	0	0	3	0	0	0	0	0	3	3
13:00	0	0	0	0	0	0	0	0	0	0	0	0	108	5	2	4	1	0	120	127.2	0	0	18	0	0	0	0	0	18	18	0	2	83	21	3	4	0	0	113	118.5	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	134	19	3	3	1	0	160	166.4	0	0	18	3	0	0	0	0	21	21	0	0	78	15	2	3	0	0	98	102.9	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	131	21	2	4	0	0	158	164.2	0	0	18	1	0	0	0	0	19	19	0	1	107	18	6	8	1	0	141	154.8	0	0	0	0	0	0	0	0	0	0
13:45	0	0	1	0	0	0	0	0	1	1	0	0	134	16	1	8	0	0	159	169.9	0	0	25	2	0	0	0	0	27	27	0	0	114	15	5	4	3	0	141	151.7	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1	0	0	507	61	8	19	2	0	597	627.7	0	0	79	6	0	0	0	0	85	85	0	3	382	69	16	19	4	0	493	527.9	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	132	18	2	4	2	0	158	166.2	0	0	18	2	0	0	1	0	21	22	0	0	114	25	4	4	0	0	147	154.2	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	2	112	13	2	4	0	0	133	138	0	0	11	2	0	0	0	0	13	13	0	0	96	13	3	8	1	0	121	133.9	0	0	0	1	0	0	0	0	1	1
14:30	0	0	0	0	0	0	0	0	0	0	0	0	119	11	5	0	0	0	135	141.5	0	0	21	2	1	1	0	0	25	26.8	0	0	110	24	3	5	0	0	142	150	0	0	0	0	0	0	0	0	0	0
14:45	0	0	2	0	0	0	0	0	2	2	0	0	119	14	5	3	2	0	143	151.4	0	0	20	3	0	0	0	0	23	23	0	1	123	16	4	4	0	0	148	154.6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	2	0	0	0	0	0	2	2	0	2	482	56	9	16	4	0	569	597.1	0	0	70	9	1	1	1	0	82	84.8	0	1	443	78	14	21	1	0	558	592.7	0	0	1	0	0	0	0	0	1	1
15:00	0	0	0	1	0	0	0	0	1	1	0	0	168	22	3	5	0	0	198	206	0	0	13	1	0	0	0	0	14	14	0	0	116	31	6	4	0	0	157	165.2	0	0	0	0	0	0	0	0	0	0
15:15	0	0	1	0	0	0	0	0	1	1	0	2	153	18	6	2	1	0	182	187.4	0	0	20	1	0	0	0	0	21	21	0	0	131	23	8	7	1	0	170	184.1	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	154	20	4	4	1	0	183	191.2	0	0	25	6	0	0	0	0	31	31	0	0	120	20	7	6	0	0	153	164.3	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	169	20	4	0	0	0	193	195	0	1	40	4	2	0	0	0	47	47.4	0	0	148	26	6	6	1	0	187	198.8	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	1	0	0	0	0	2	2	0	2	644	80	17	11	2	0	756	779.6	0	1	98	12	2	0	0	0	113	113.4	0	0	515	100	27	23	2	0	667	712.4	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	231	28	3	4	3	0	269	278.7	0	0	40	1	0	0	1	0	42	43	0	2	133	27	1	4	0	0	167	171.5	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	211	29	4	3	3	0	250	258.9	0	0	35	2	0	0	0	0	37	37	0	0	114	25	3	2	0	0	144	148.1	0	0	1	0	0	0	0	0	1	1
16:30	0	0	0	0	0	0	0	0	0	0	0	0	211	15	3	5	1	0	235	244	0	1	39	3	0	0	0	0	43	42.4	0	1	162	22	1	1	0	0	187	188.2	0	0	0	0	0	0	0	0	0	0
16:45	0	0	1	0	0	0	0	0	1	1	0	1	172	12	1	4	0	0	190	195.1	0	0	28	6	0	0	0	0	34	34	0	0	117	26	4	1	1	0	149	153.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	0	1	1	0	1	825	84	11	16	7	0	944	976.7	0	1	142	12	0	0	1	0	156	156.4	0	3	526	100	9	8	1	0	647	661.1	0	0	1	0	0	0	0	0	1	1
17:00	0	0	0	0	0	0	0	0	0	0	0	1	187	20	3	1	0	0	212	214.2	0	0	40	2	0	0	0	0	42	42	0	0	134	25	2	0	2	0	163	166	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	187	16	3	5	0	0	211	219	0	0	22	4	0	0	0	0	26	26	0	1	148	23	2	1	0	0	175	176.7	0	0	1	0	0	0	0	0	1	1
17:30	0	0	0	0	0	0	0	0	0	0	0	0	197	16	1	1	0	0	215	216.8	0	0	34	3	0	0	0	0	37	37	0	0	141	15	2	2	0	0	160	163.6	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	208	24	1	3	0	0	236	240.4	0	0	33	2	0	0	0	0	35	35	0	0	142	17	0	0	1	0	160	161	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	779	76	8	10	0	0	874	890.4	0	0	129	11	0	0	0	0	140	140	0	1	565	80	6	3	3	0	658	667.3	0	0	1	0	0	0	0	0	1	1
18:00	0	0	0	0	0	0	0	0	0	0	0	0	166	16	0	0	0	0	182	182	0	0	22	1	0	0	0	0	23	23	0	0	137	15	3	1	0	0	156	158.8	0	0	0	0	0	0	0	0	0	0
18:15	0	0	1	1	0	0	0	0	2	2	0	0	156	11	1	1	0	0	169	170.8	0	0	15	3	0	0	0	0	18	18	0	0	149	12	1	2	0	0	164	167.1	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0	148	17	3	4	0	0	172	178.7	0	0	23	1	0	0	0	0	24	24	0	0	121	9	1	0	0	1	132	132.5	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0	147	4	1	0	0	0	152	152.5	0	0	11	2	0	0	0	0	13	13	0	0	98	7	0	1	0	0	106	107.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	1	0	0	0	0	2	2	0	0	617	48	5	5	0	0	675	684	0	0	71	7	0	0	0	0	78	78	0	0	505	43	5	4	0	1	558	565.7	0	0	0	0	0	0	0	0	0	0
12 TOT	0	0	9	2	0	0	0	0	11	11	1	16	6573	845	146	184	23	1	7789	8113.8	0	2	882	104	7	4	2	0	1001	1010.5	0	11	5980	863	159	184	21	2	7220	7553.1	0	0	8	1	0	0	0	0	9	9



IDASO

Survey Name: 24178 - Ballincollig, Co. Cork
Site: Site 3
Location: Killumney Link East Roundabout
Date: Tue 16-Apr-2024

Arm A - N22
Arm B - N22
Arm C - Link Rd

	B => C										C => A										C => B										C => C									
TIME	**P/C**	**M/C**	**CAR**	**LGV**	**OGV1**	**OGV2**	**PSV**	**CARAV AN**	**TOT**	**PCU**	**P/C**	**M/C**	**CAR**	**LGV**	**OGV1**	**OGV2**	**PSV**	**CARAV AN**	**TOT**	**PCU**	**P/C**	**M/C**	**CAR**	**LGV**	**OGV1**	**OGV2**	**PSV**	**CARAV AN**	**TOT**	**PCU**	**P/C**	**M/C**	**CAR**	**LGV**	**OGV1**	**OGV2**	**PSV**	**CARAV AN**	**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	0	0	41	12	4	0	0	0	57	59	0	0	0	0	0	0	0	0	0	0
07:15	0	0	39	13	3	0	0	0	55	56.5	0	0	22	2	0	0	0	0	24	24	0	0	49	11	1	1	0	0	62	63.8	0	0	0	0	0	0	0	0	0	0
07:30	0	1	50	14	2	3	0	0	70	74.3	0	0	38	2	1	0	0	0	41	41.5	0	0	79	6	5	1	0	0	91	94.8	0	0	0	0	0	0	0	0	0	0
07:45	0	0	79	8	5	0	0	0	92	94.5	0	0	41	5	0	0	0	0	46	46	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	200	43	10	5	0	0	259	269.9	0	0	112	9	1	0	0	0	122	122.5	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	70	12	4	1	0	0	87	90.3	0	0	36	3	0	0	0	0	39	39	0	0	105	8	2	0	0	0	115	116	0	0	0	0	0	0	0	0	0	0
08:15	0	1	92	11	2	2	0	0	108	111	0	0	44	1	0	0	0	0	45	45	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	141	11	4	0	0	0	156	158	0	0	27	3	0	0	0	0	30	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	90	8	4	1	3	0	106	112.3	0	0	23	1	0	0	0	0	24	24	0	0	81	9	4	1	0	0	95	98.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	393	42	14	4	3	0	457	471.6	0	0	130	8	0	0	0	0	138	138	0	0	354	36	7	5	0	0	402	412	0	0	0	0	0	0	0	0	0	0
09:00	0	0	64	10	4	3	1	0	82	88.9	0	0	21	0	0	0	0	0	21	21	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	66	13	3	0	0	0	82	83.5	0	0	13	2	1	0	0	0	16	16.5	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	57	6	5	2	0	0	70	75.1	0	0	12	2	1	0	1	0	16	17.5	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	67	10	4	2	0	0	83	87.6	0	0	17	3	0	0	0	0	20	20	0	0	48	11	0	2	0	0	61	63.6	0	0	0	0	1	0	0	0	1	1
H/TOT	0	0	254	39	16	7	1	0	317	335.1	0	0	63	7	2	0	1	0	73	75	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	63	8	2	0	0	0	73	74	0	0	14	3	0	0	0	0	17	17	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	47	14	4	2	0	0	67	71.6	0	0	16	0	0	0	0	0	16	16	0	0	48	7	2	0	0	0	57	58	0	0	0	0	0	0	0	0	0	0
10:30	0	0	62	10	2	2	0	0	76	79.6	0	0	11	1	3	0	0	0	15	16.5	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	55	11	4	1	0	0	71	74.3	0	0	14	1	0	0	0	0	15	15	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	227	43	12	5	0	0	287	299.5	0	0	55	5	3	0	0	0	63	64.5	0	0	190	37	13	5	0	0	245	258	0	0	0	0	0	0	0	0	0	0
11:00	0	0	46	10	1	0	0	0	57	57.5	0	0	6	3	2	0	0	0	11	12	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	65	16	4	1	0	0	86	89.3	0	1	15	3	1	0	0	0	20	19.9	0	0	56	9	2	0	0	0	67	68	0	0	0	0	0	0	0	0	0	0
11:30	0	1	65	12	5	1	0	0	84	87.2	0	0	14	1	0	0	0	0	15	15	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	65	9	2	2	0	0	78	81.6	0	0	13	4	1	0	0	0	18	18.5	0	0	46	13	2	1	0	1	63	65.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	241	47	12	4	0	0	305	315.6	0	1	48	11	4	0	0	0	64	65.4	0	0	197	39	9	5	0	1	251	262	0	0	0	0	0	0	0	0	0	0
12:00	0	0	73	10	4	0	0	0	87	89	0	0	15	3	0	0	0	0	18	18	0	0	53	4	4	0	0	0	61	63	0	0	1	0	0	0	0	0	1	1
12:15	0	0	77	10	6	0	0	0	93	96	0	0	13	3	0	0	0	0	16	16	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	73	7	4	3	0	0	87	92.9	0	0	9	2	0	0	0	0	11	11	0	0	62	12	6	0	0	0	80	83	0	0	0	0	0	0	0	0	0	0
12:45	0	0	62	9	3	0	0	0	74	75.5	0	0	11	1	0	0	0	0	12	12	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	285	36	17	3	0	0	341	353.4	0	0	48	9	0	0	0	0	57	57	0	0	228	30	13	5	1	0	277	291	0	0	1	0	0	0	0	0	1	1
13:00	0	0	69	9	2	1	0	0	81	83.3	0	0	13	2	0	0	0	0	15	15	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	82	16	0	0	0	0	98	98	0	0	13	1	0	0	0	0	14	14	0	0	38	6	0	0	0	0	44	44	0	0	0	0	0	0	0	0	0	0
13:30	0	0	77	9	1	0	0	0	87	87.5	0	0	11	2	0	0	0	0	13	13	0	0	55	10	2	1	0	0	68	70.3	0	0	0	1	0	0	1	0	2	3
13:45	0	1	85	5	1	1	1	0	94	96.2	0	0	25	0	0	0	0	0	25	25	0	0	63	10	0	2	0	0	75	77.6	0	0	0	0	0	0	0	0	0	0
H/TOT	0	1	313	39	4	2	1	0	360	365	0	0	62	5	0	0	0	0	67	67	0	0	211	30	3	3	0	0	247	252.4	0	0	0	1	0	0	1	0	2	3
14:00	0	1	68	12	3	0	0	0	84	84.9	0	0	22	3	0	0	0	0	25	25	0	0	71	4	4	0	0	0	79	81	0	0	0	0	0	0	0	0	0	0
14:15	0	0	76	12	5	1	0	0	94	97.8	0	0	16	3	0	0	0	0	19	19	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	69	18	2	4	2	0	95	103.2	0	0	20	0	0	0	0	0	20	20	0	0	61	2	4	0	0	0	67	69	0	0	1	0	0	0	0	0	1	1
14:45	0	0	77	14	4	1	0	0	96	99.3	0	0	13	3	0	0	0	0	16	16	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	290	56	14	6	2	0	369	385.2	0	0	71	9	0	0	0	0	80	80	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	11	2	0	0	0	97	98	0	0	35	4	0	0	0	0	39	39	0	0	84	12	1	1	0	0	98	99.8	0	0	0	0	0	0	0	0	0	0
15:15	0	0	88	9	3	2	0	0	102	106.1	0	0	21	3	1	0	0	0	25	25.5	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	100	12	3	0	0	0	115	116.5	0	0	18	2	0	0	0	0	20	20	0	0	72	12	2	0	0	0	86	87	0	0	0	0	0	0	0	0	0	0
15:45	0	1	105	14	3	1	0	0	124	126.2	0	0	22	4	1	0	0	0	27	27.5	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	377	46	11	3	0	0	438	446.8	0	0	96	13	2	0	0	0	111	112	0	1	282	46	7	2	0	0	338	343.5	0	0	0	0	0	0	0	0	0	0
16:00	0	3	92	10	3	2	0	0	110	112.3	0	0	25	3	1	0	0	0	29	29.5	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	83	7	3	0	0	0	94	94.9	0	0	17	5	0	0	0	0	22	22	0	1	88	9	0	2	0	0	100	102	0	0	0	0	0	0	0	0	0	0
16:30	0	0	76	13	0	0	0	0	89	89	0	0	26	7	1	1	0	0	35	36.8	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	88	9	1	0	0	0	98	98.5	0	0	13	3	0	0	0	0	16	16	0	0	62	12	2	1	0	0	77	79.3	0	0	0	0	0	0	0	0	0	0
H/TOT	0	4	339	39	7	2	0	0	391	394.7	0	0	81	18	2	1	0	0	102	104.3	0	3	306	53	5	4	0	0	371	376.9	0	0	0	0	0	0	0	0	0	0
17:00	0	1	107	10	2	0	0	0	120	120.4	0	1	17	2	0	0	0	0	20	19.4	0	0	96	9	0	0	0	0	105	105	0	0	0	0	0	0	0	0	0	0
17:15	0	1	107	14	0	0	0	0	122	121.4	0	0	13	1	0	0	0	0	14	14	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	119	5	1	0	0	0	125	125.5	0	0	14	0	0	0	0	0	14	14	0	0	95	4	0	0	0	0	99	99	0	0	1	0	0	0	0	0	1	1
17:45	0	0	106	6	0	0	0	0	112	112	0	0	14	0	0	0	0	0	14	14	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	439	35	3	0	0	0	479	479.3	0	1	58	3	0	0	0	0	62	61.4	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	121	5	1	0	0	0	127	127.5	0	0	15	1	0	0	0	0	16	16	0	0	72	9	2	0	0	0	83	84	0	0	0	0	0	0	0	0	0	0
18:15	0	0	100	4	1	0	0	0	105	105.5	0	0	11	2	0	0	0	0	13	13	0	0	70	5	0	0	0	0	75	75	0	0	0	0	0	0	0	0	0	0
18:30	0	1	95	5	0	0	0	0	101	100.4	0	0	15	0	0	0	0	0	15	15	0	0	64	1	0	0	0	0	65	65	0	0	0	0	0	0	0	0	0	0
18:45	0	1	84	5	0	0	0	0	90	89.4	0	0	16	0	0	0	0	0	16	16	0	0	47	1	0	0	0	0	48	48	0	0	0	0	0	0	0	0	0	0
H/TOT	0	2	400	19	2	0	0	0	423	422.8	0	0	57	3	0	0	0	0	60	60	0	0	253	16	2	0	0	0	271	272	0	0	0	0	0	0	0	0	0	0
12 TOT	0	14	3758	484	122	41	7	0	4426	4538.9	0	2	881	100	14	1	1	0	999	1007.1	0	8	3123	409	98	40	1	1	3680	3777.2	0	0	3	2	0	0	1	0	6	7

APPENDIX 4-4　TRICS output result

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.*

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	0.000	3	63	0.000	0.000	3	63	0.011	0.000
07:00 - 08:00	24	74	0.162	0.000	24	74	0.087	0.000	24	74	0.249	0.000
08:00 - 09:00	**24**	**74**	**0.224**	**0.000**	24	74	0.195	0.000	**24**	**74**	**0.419**	**0.000**
09:00 - 10:00	24	74	0.087	0.000	24	74	0.081	0.000	24	74	0.168	0.000
10:00 - 11:00	24	74	0.029	0.000	24	74	0.020	0.000	24	74	0.049	0.000
11:00 - 12:00	24	74	0.032	0.000	24	74	0.025	0.000	24	74	0.057	0.000
12:00 - 13:00	24	74	0.078	0.000	24	74	0.084	0.000	24	74	0.162	0.000
13:00 - 14:00	24	74	0.056	0.000	24	74	0.081	0.000	24	74	0.137	0.000
14:00 - 15:00	24	74	0.030	0.000	24	74	0.030	0.000	24	74	0.060	0.000
15:00 - 16:00	24	74	0.056	0.000	24	74	0.052	0.000	24	74	0.108	0.000
16:00 - 17:00	24	74	0.102	0.000	24	74	0.112	0.000	24	74	0.214	0.000
17:00 - 18:00	24	74	0.180	0.000	**24**	**74**	**0.228**	**0.000**	24	74	0.408	0.000
18:00 - 19:00	23	76	0.010	0.000	23	76	0.046	0.000	23	76	0.056	0.000
19:00 - 20:00	1	70	0.014	0.000	1	70	0.143	0.000	1	70	0.157	0.000
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	0.000			1.184	0.000			2.255	0.000

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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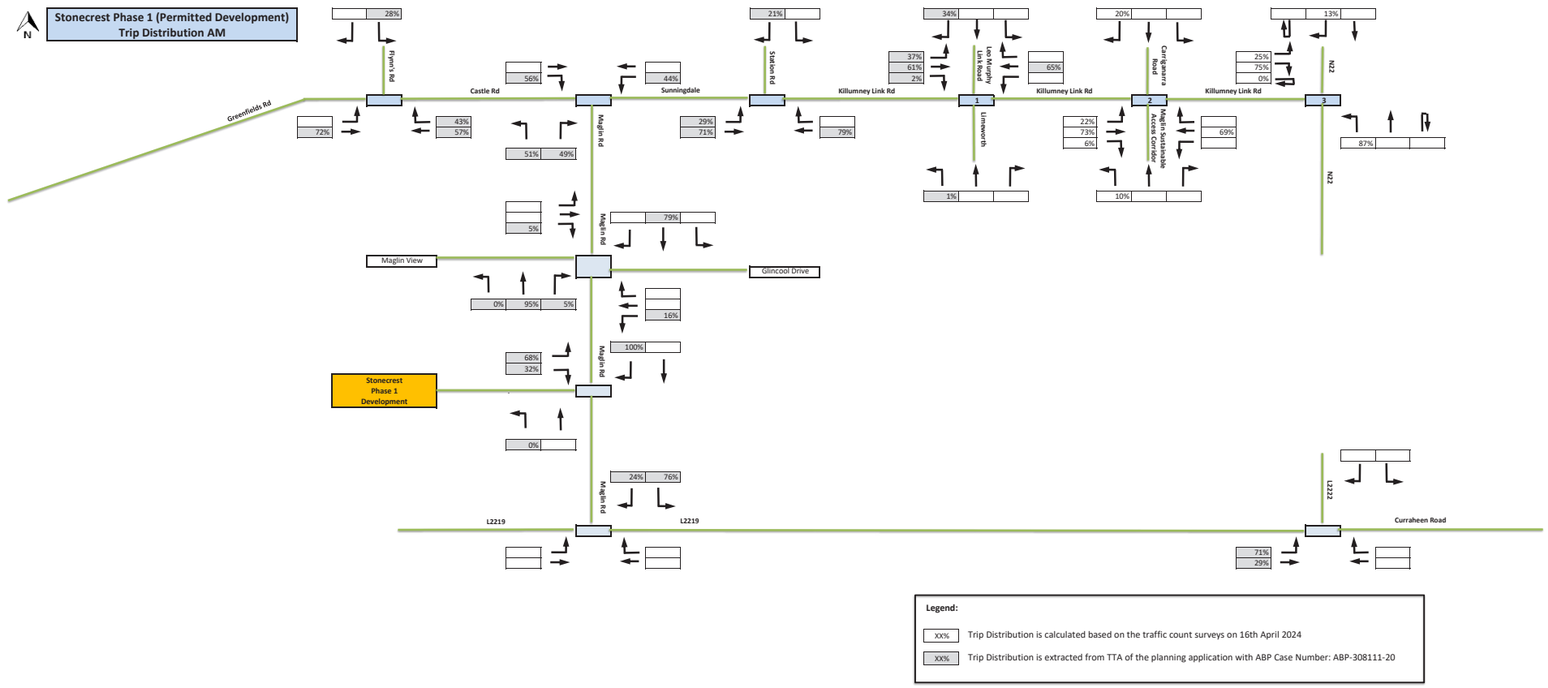
Parameter summary

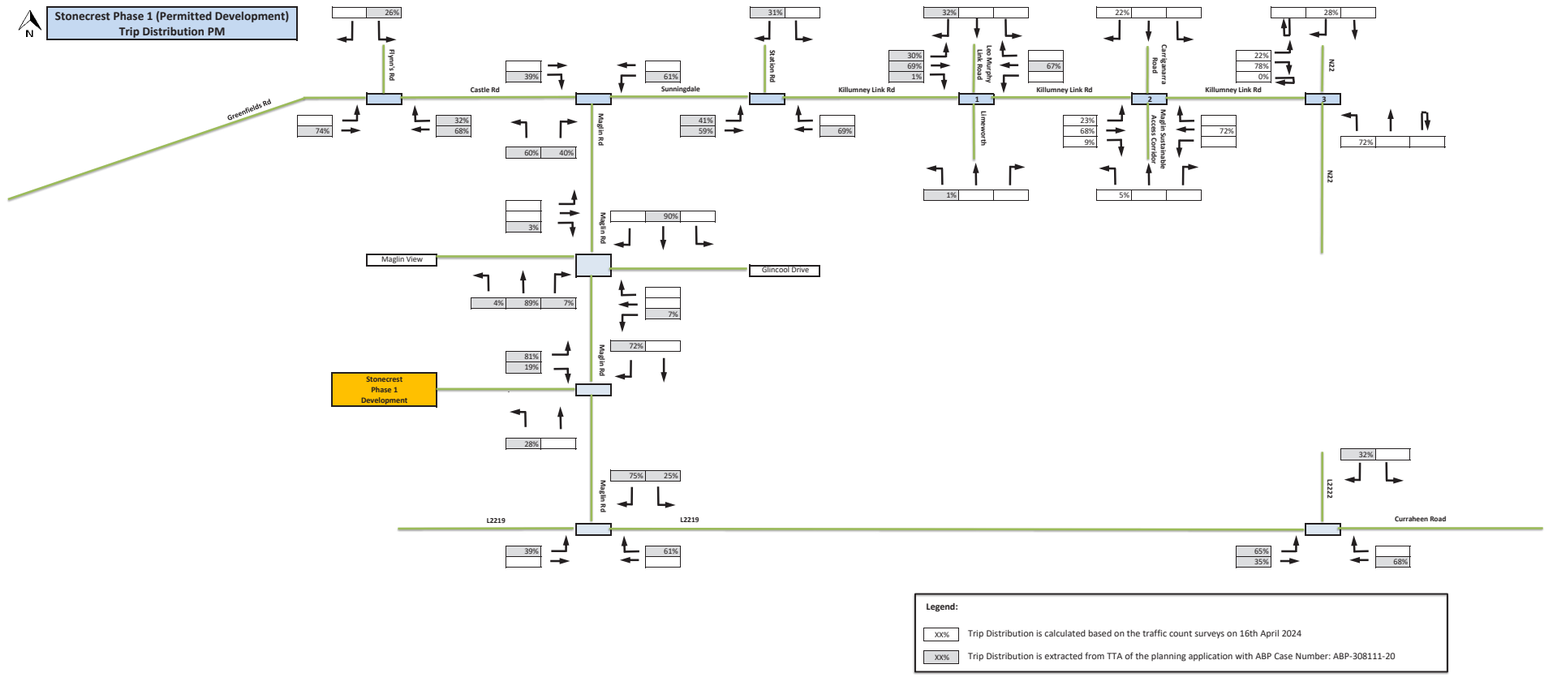
Trip rate parameter range selected:	25 - 210 (units:)
Survey date date range:	01/01/16 - 06/09/23
Number of weekdays (Monday-Friday):	24
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

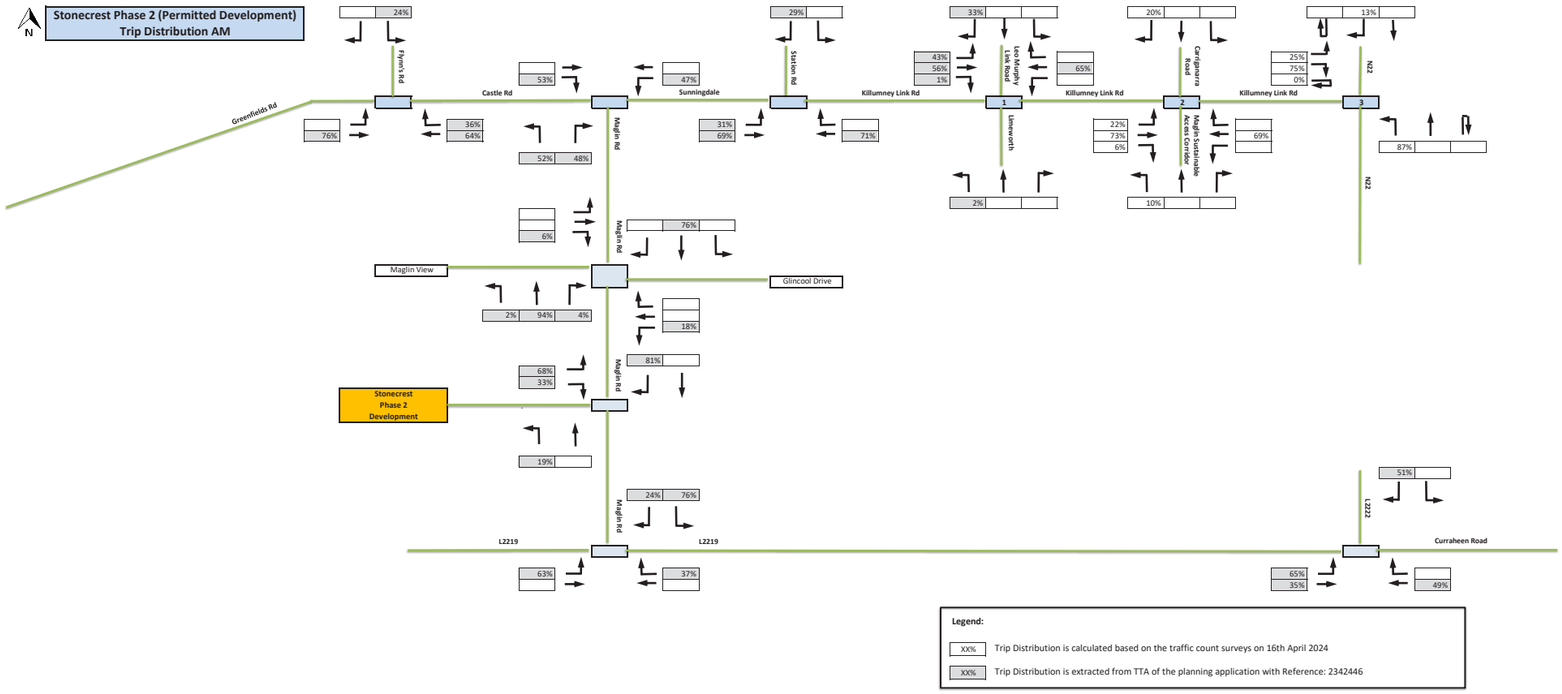
This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected 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.

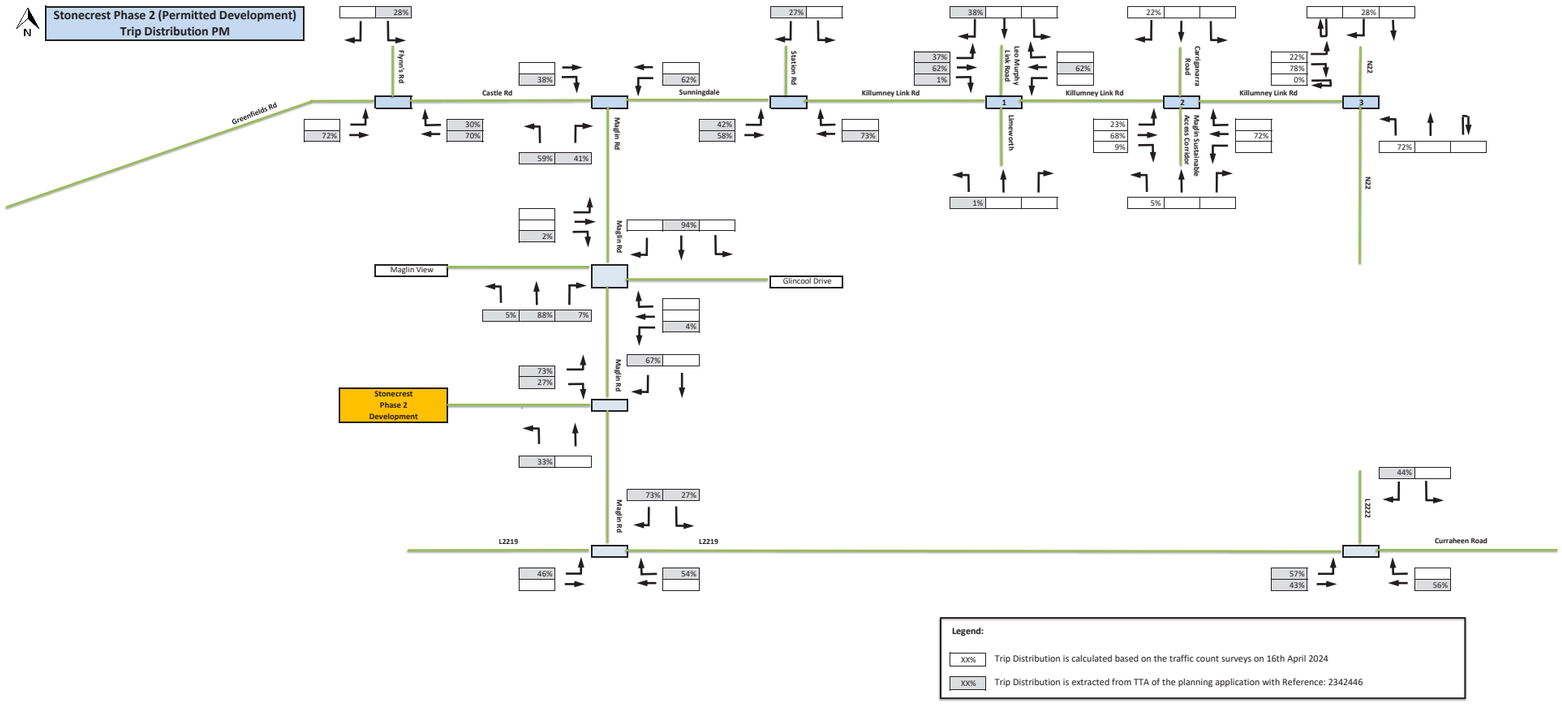
APPENDIX 4-5 Trip Distribution for the Permitted Developments

Appendix 4E – Trip Distribution for the Permitted Developments

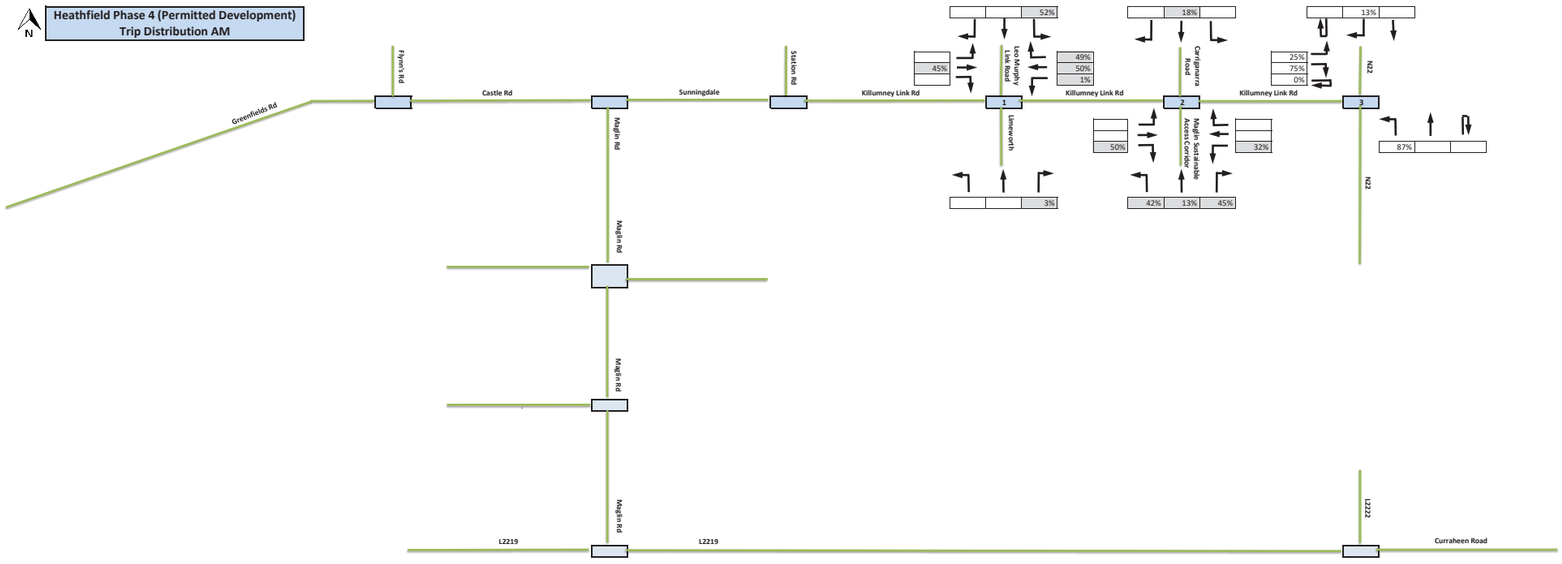

Stonecrest Phase 1 (Permitted Development)
Trip Distribution AM
N
Greenfields Rd
Flynn's Rd
Castle Rd
Sunningdale
Maglin Rd
Station Rd
Killumney Link Rd
Lee Murphy Link Road
Limewor th
Carrigaguira Road
Maglin Sustainable Access Corridor
R22
Maglin View
Glincool Drive
Stonecrest Phase 1 Development
L2219
L2222
Curraheen Road
28%
56%
44%
43%
57%
72%
51%
49%
21%
29%
71%
79%
34%
37%
61%
2%
65%
1%
20%
22%
73%
6%
69%
10%
13%
25%
75%
0%
87%
5%
79%
0%
95%
5%
16%
100%
68%
32%
0%
24%
76%
71%
29%
Legend:
XX% Trip Distribution is calculated based on the traffic count surveys on 16th April 2024
XX% Trip Distribution is extracted from TTA of the planning application with ABP Case Number: ABP-308111-20


Stonecrest Phase 1 (Permitted Development)
Trip Distribution PM
N
Flynn's Rd
Castle Rd
Sunningdale
Station Rd
Killumney Link Rd
Lon Murphy Link Road
Limeworth
Carrigtwohill Road
Maglin Sustainable Access Corridor
N624
N624
Greenfields Rd
Maglin Rd
Maglin View
Glincool Drive
Stonecrest Phase 1 Development
L2219
L2219
L2222
Curraheen Road
26%
74%
32%
68%
39%
61%
60%
40%
31%
41%
59%
69%
32%
30%
69%
1%
67%
1
Limeworth
1%
22%
23%
68%
9%
2
Carrigtwohill Road
5%
72%
Maglin Sustainable Access Corridor
28%
22%
78%
0%
3
N624
72%
N624
3%
90%
4%
89%
7%
7%
81%
19%
72%
28%
75%
25%
39%
61%
32%
L2222
65%
35%
68%
Legend:
XX%
Trip Distribution is calculated based on the traffic count surveys on 16th April 2024
XX%
Trip Distribution is extracted from TTA of the planning application with ABP Case Number: ABP-308111-20


Stonecrest Phase 2 (Permitted Development)
Trip Distribution AM
N
Greenfields Rd
Flynn's Rd
Castle Rd
Sunningdale
Station Rd
Killumney Link Rd
Leo Murphy Link Road
Lisnaworth
Carrigaourra Road
Maglin Sustainable Access Corridor
N22
Maglin Rd
Maglin View
Glincool Drive
Stonecrest Phase 2 Development
L2219
L2222
Curraheen Road
24%
53%
47%
29%
33%
43%
56%
1%
65%
20%
13%
25%
75%
0%
76%
36%
64%
52%
48%
31%
69%
71%
22%
73%
6%
69%
87%
2%
10%
6%
76%
2%
94%
4%
18%
81%
68%
33%
19%
24%
76%
63%
37%
51%
65%
35%
49%
1
2
3
Legend:
XX%
Trip Distribution is calculated based on the traffic count surveys on 16th April 2024
XX%
Trip Distribution is extracted from TTA of the planning application with Reference: 2342446


Stonecrest Phase 2 (Permitted Development)
Trip Distribution PM
N
Greenfields Rd
Castle Rd
Sunningdale
Killumney Link Rd
Killumney Link Rd
Killumney Link Rd
Flynn's Rd
Station Rd
Leo Murphy Link Road
Carrigaourra Road
N22
N22
Maglin Rd
Maglin Rd
Maglin Rd
Maglin Rd
Maglin View
Glincool Drive
Stonecrest Phase 2 Development
Lisnaworth
Maglin Sustainable Access Corridor
L2219
L2219
L2222
Curraheen Road
28%
27%
38%
22%
28%
38%
62%
62%
72%
30%
70%
59%
41%
42%
58%
73%
37%
62%
1%
1%
23%
68%
9%
72%
5%
22%
78%
0%
72%
2%
94%
5%
88%
7%
4%
67%
73%
27%
33%
73%
27%
46%
54%
44%
57%
43%
56%
Legend:
XX% Trip Distribution is calculated based on the traffic count surveys on 16th April 2024
XX% Trip Distribution is extracted from TTA of the planning application with Reference: 2342446

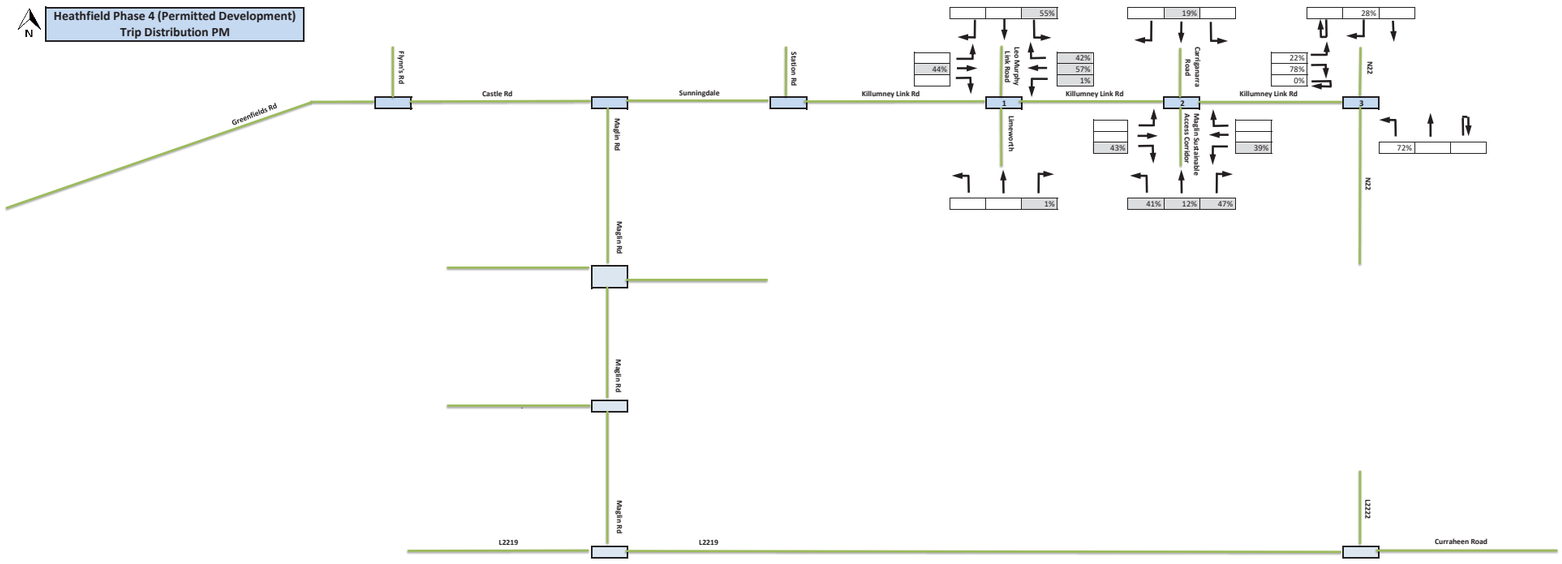
Heathfield Phase 4 (Permitted Development)
Trip Distribution AM



Legend:

XX%	Trip Distribution is calculated based on the traffic count surveys on 16th April 2024
XX%	Trip Distribution is calculated from TTA of the planning application with Reference: 2241611

Heathfield Phase 4 (Permitted Development)
Trip Distribution PM

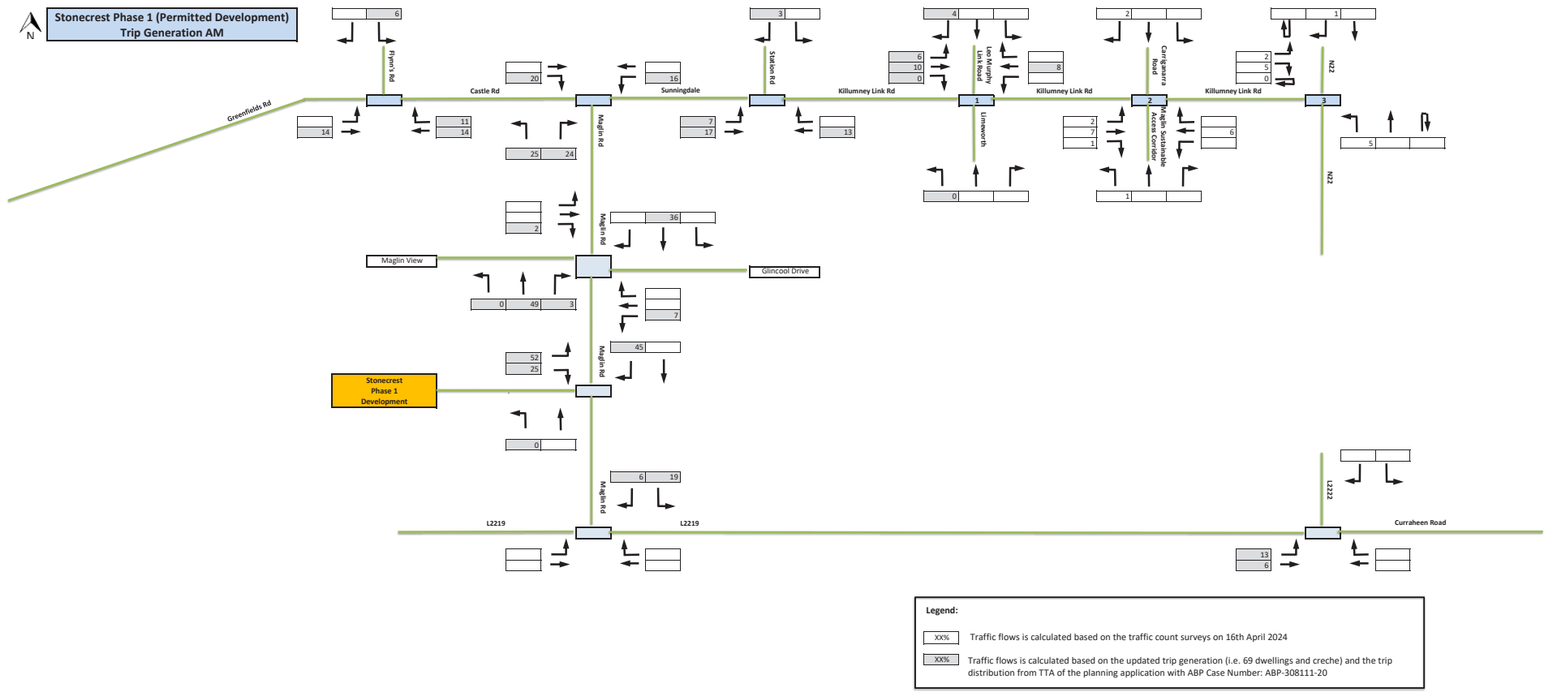


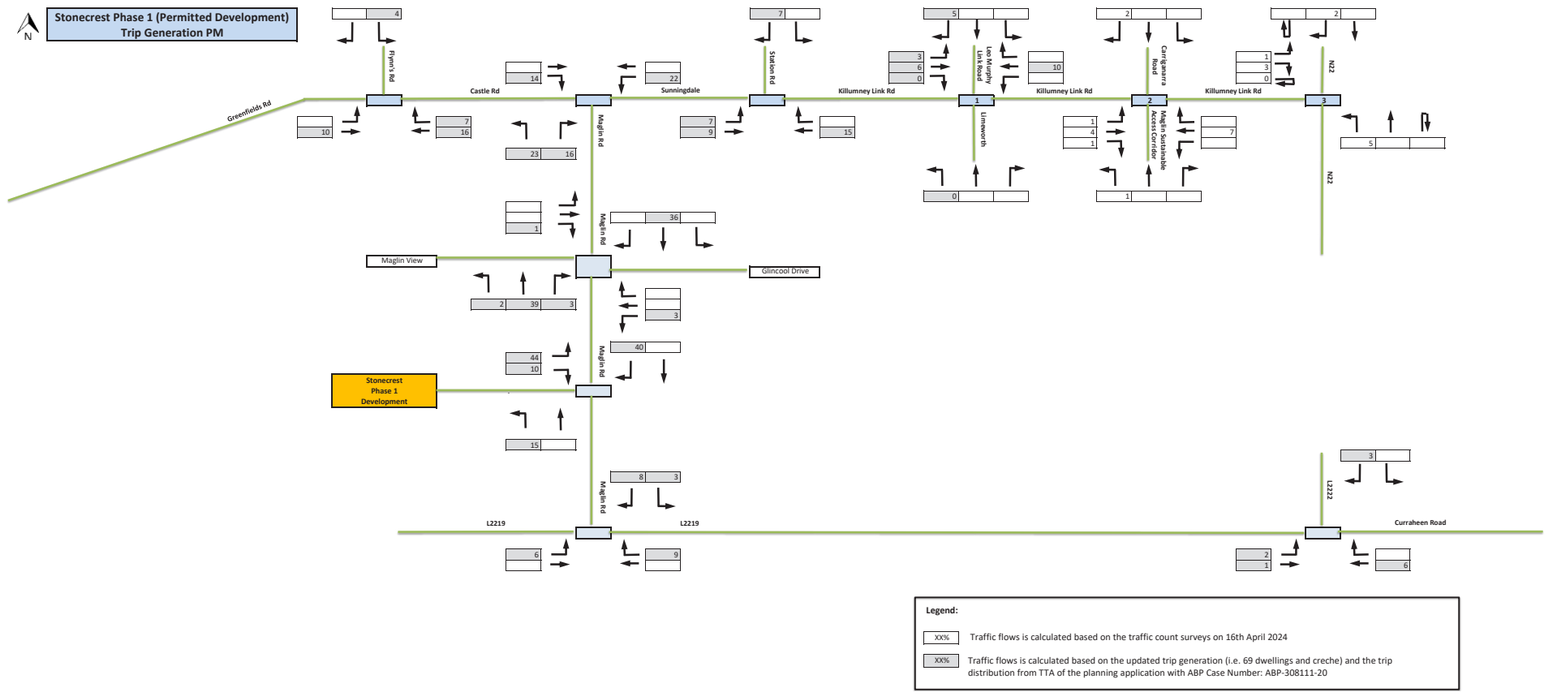
Legend:

XX%	Trip Distribution is calculated based on the traffic count surveys on 16th April 2024
XX%	Trip Distribution is calculated from TTA of the planning application with Reference: 2241611

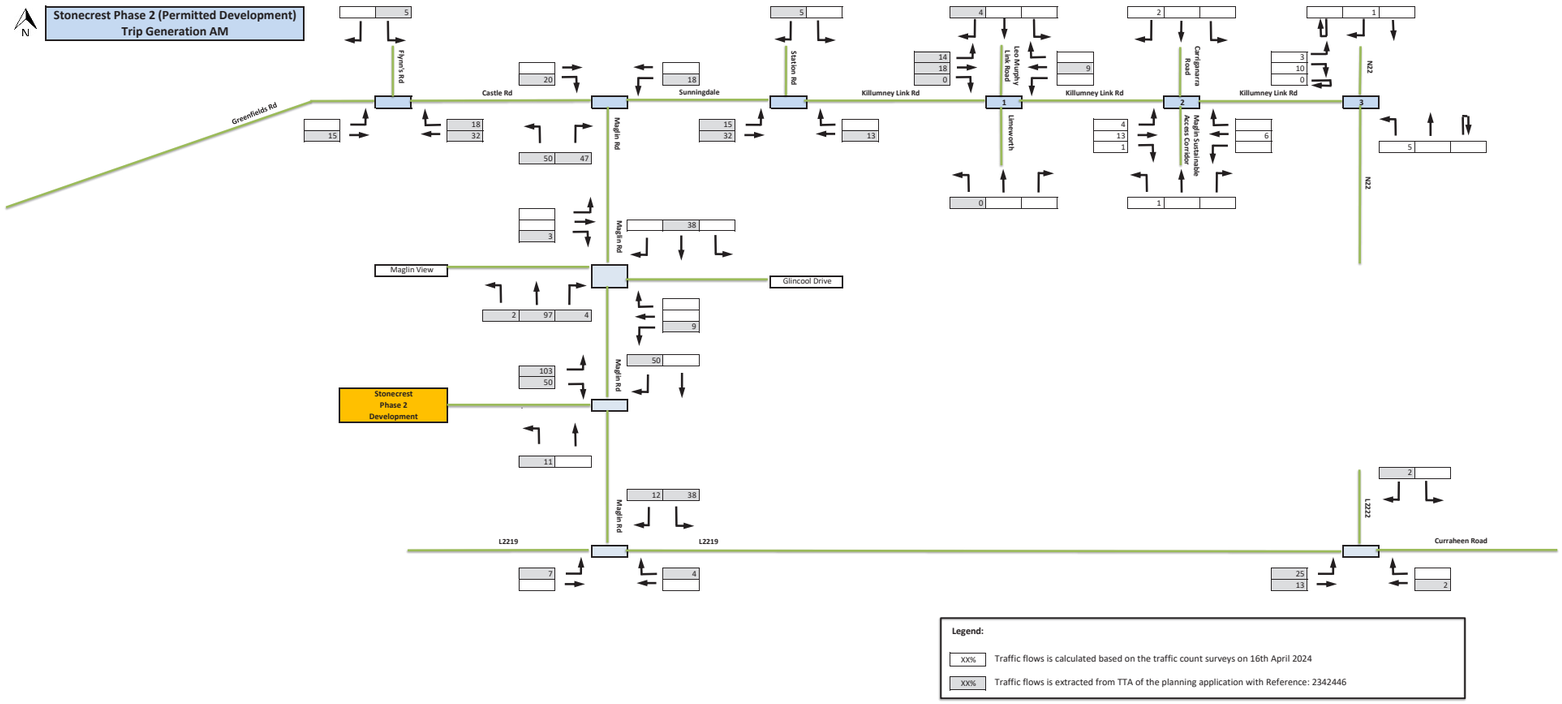
APPENDIX 4-6 Trip Generation for the Permitted Developments

Appendix 4F – Trip Generation for the Permitted Developments


Stonecrest Phase 1 (Permitted Development)
Trip Generation AM
N
Greenfields Rd
Flynn's Rd
Castle Rd
Sunningdale
Maglin Rd
Station Rd
Killumney Link Rd
Leo Murphy Link Road
Limeworth
Carrigaguira Road
Maglin Sustainable Access Corridor
N22
Maglin View
Glincool Drive
Stonecrest Phase 1 Development
L2219
L2222
Curraheen Road
Legend:
XX%
Traffic flows is calculated based on the traffic count surveys on 16th April 2024
XX%
Traffic flows is calculated based on the updated trip generation (i.e. 69 dwellings and creche) and the trip distribution from TTA of the planning application with ABP Case Number: ABP-308111-20

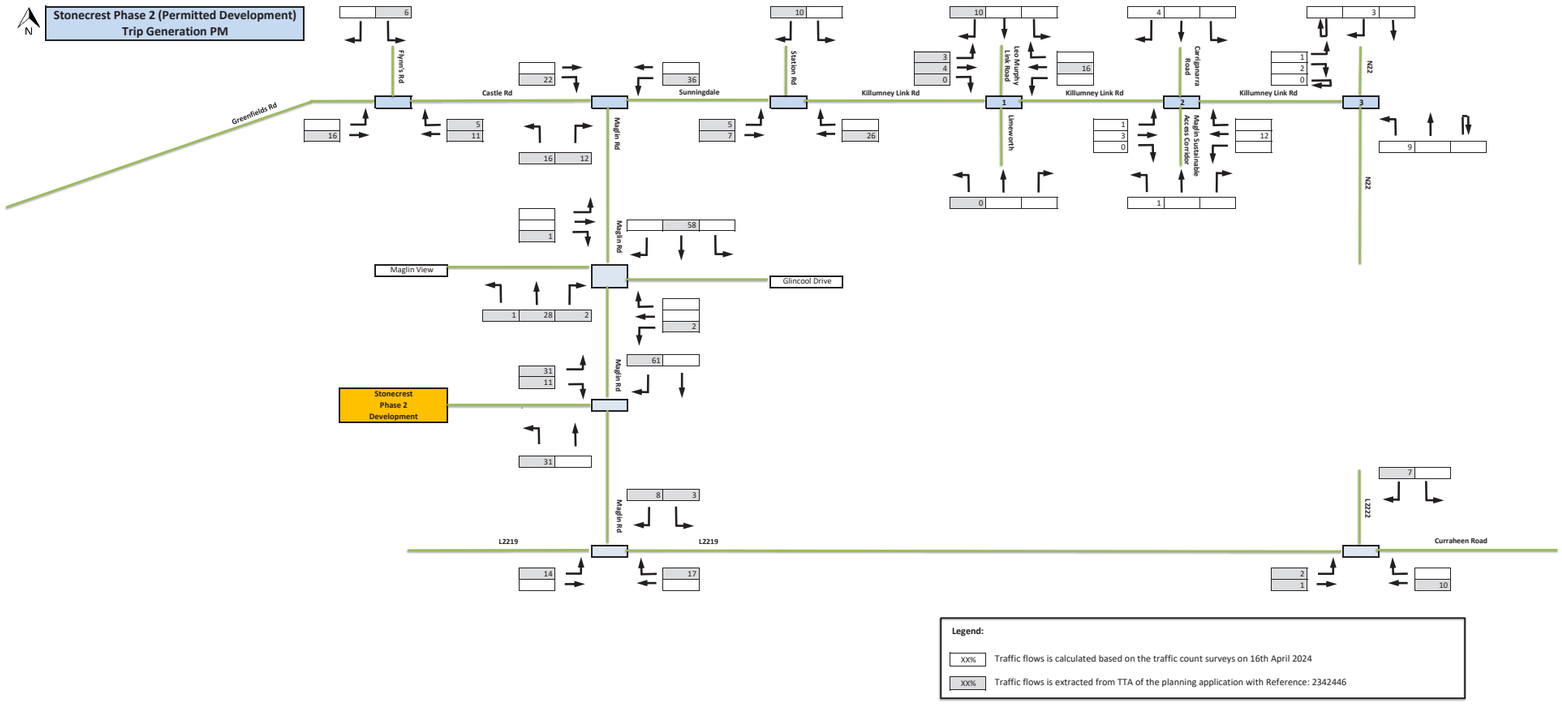

Stonecrest Phase 1 (Permitted Development)
Trip Generation PM
N
Flynn's Rd
Castle Rd
Sunningdale
Station Rd
Killumney Link Rd
Leo Murphy Link Road
Carrigaeara Road
Maglin Sustainable Access Corridor
R22
Greenfields Rd
Maglin Rd
Limewor th
Maglin View
Glincool Drive
Stonecrest Phase 1 Development
L2219
L2222
Curraheen Road
Legend:
XX%
Traffic flows is calculated based on the traffic count surveys on 16th April 2024
XX%
Traffic flows is calculated based on the updated trip generation (i.e. 69 dwellings and creche) and the trip distribution from TTA of the planning application with ABP Case Number: ABP-308111-20

Stonecrest Phase 2 (Permitted Development)
Trip Generation AM

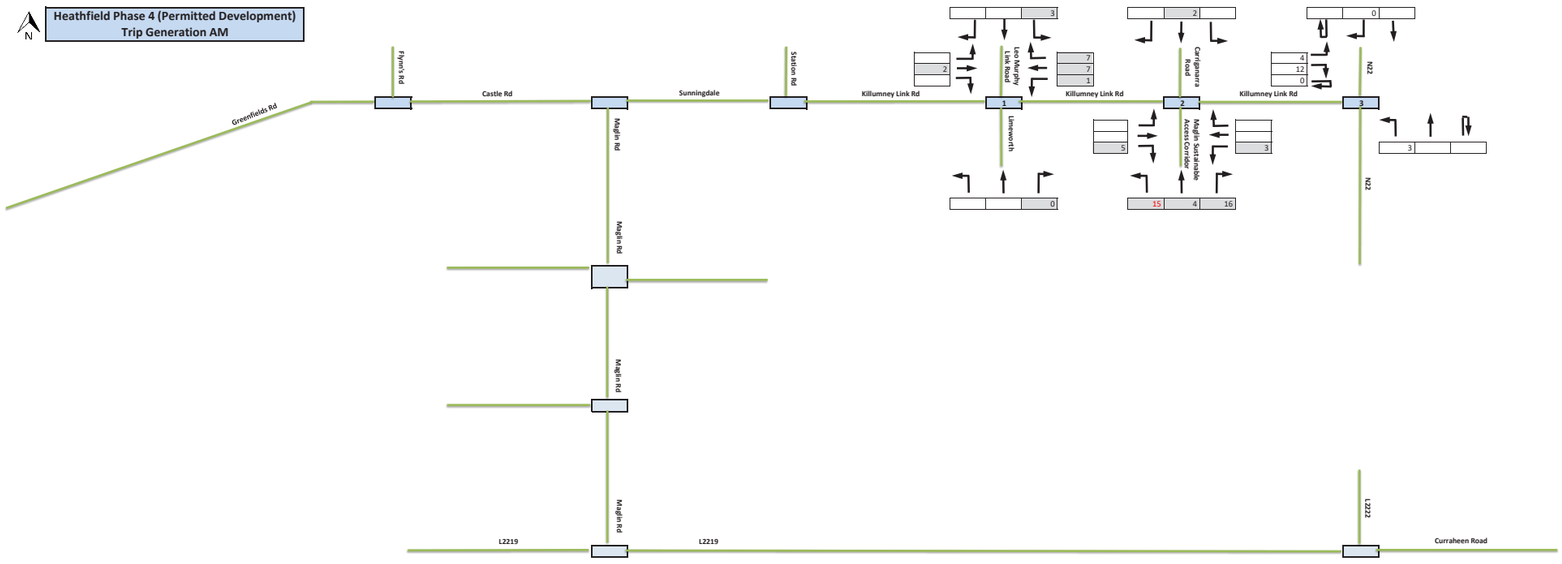


Legend:

XX%	Traffic flows is calculated based on the traffic count surveys on 16th April 2024
XX%	Traffic flows is extracted from TTA of the planning application with Reference: 2342446


Stonecrest Phase 2 (Permitted Development)
Trip Generation PM
N
Flynn's Rd
Castle Rd
Greenfields Rd
Maglin Rd
Sunningdale
Station Rd
Killumney Link Rd
Leo Murphy Link Road
Lisnaworth
Carrigaparra Road
Maglin Sustainable Access Corridor
N22
Maglin View
Glincool Drive
Stonecrest Phase 2 Development
L2219
L2222
Curraheen Road
Legend:
XX% Traffic flows is calculated based on the traffic count surveys on 16th April 2024
XX% Traffic flows is extracted from TTA of the planning application with Reference: 2342446

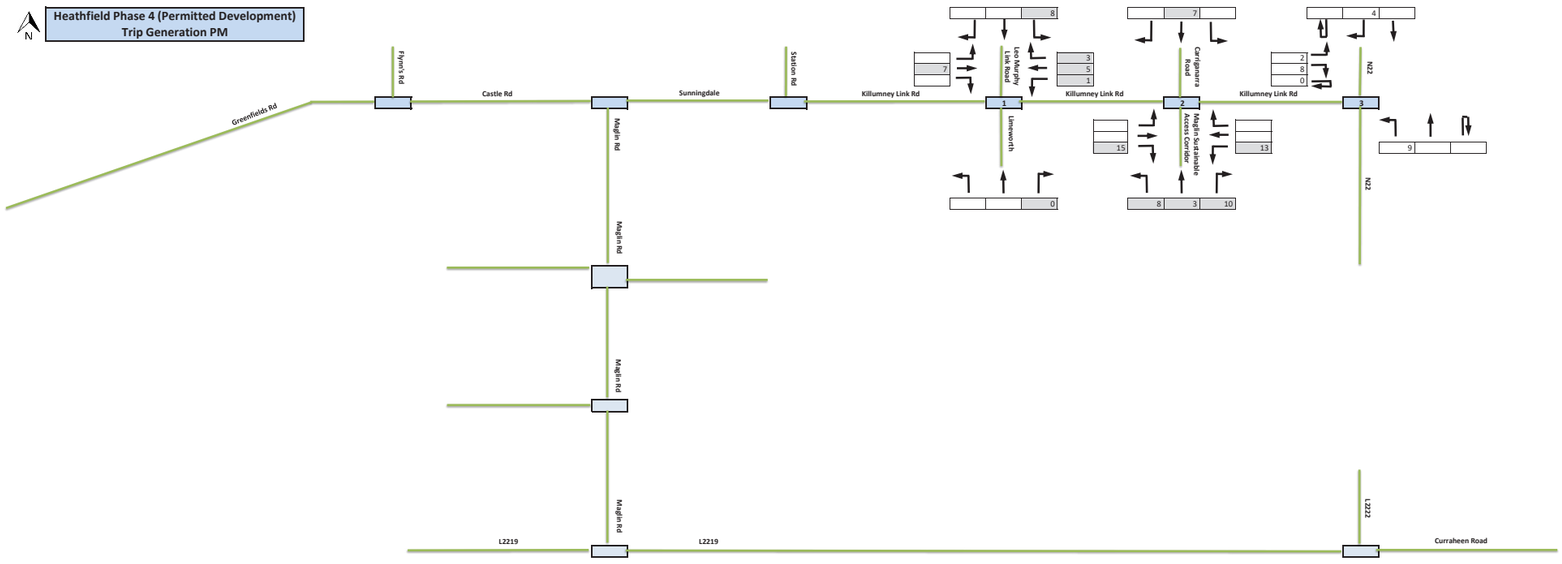
Heathfield Phase 4 (Permitted Development)
Trip Generation AM



Legend:

XX%	Traffic flows is calculated based on the traffic count surveys on 16th April 2024
XX%	Traffic flows is extracted from TTA of the planning application with Reference: 2342446

Heathfield Phase 4 (Permitted Development)
Trip Generation PM



Legend:

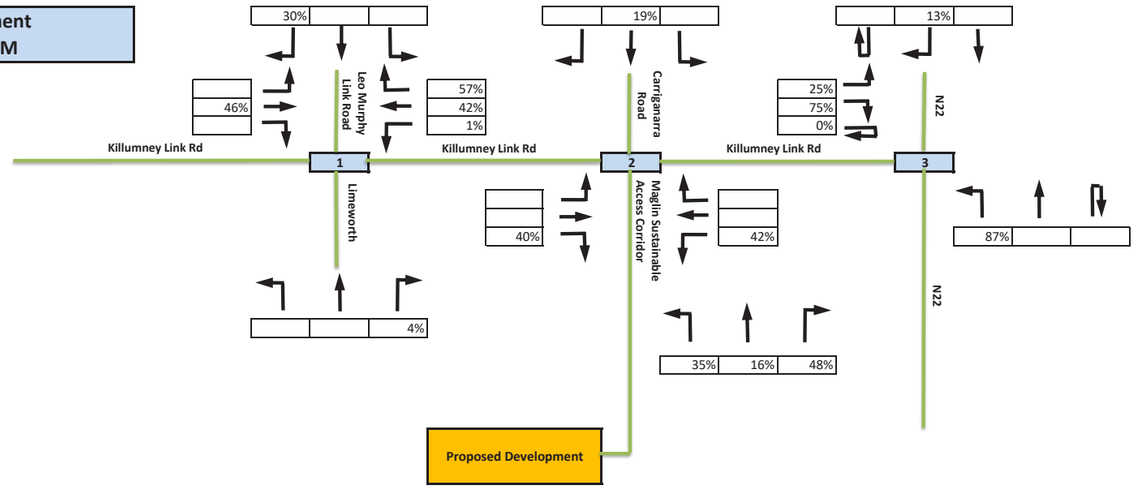
XX%	Traffic flows is calculated based on the traffic count surveys on 16th April 2024
XX%	Traffic flows is extracted from TTA of the planning application with Reference: 2342446

APPENDIX 4-7 Trip Distribution for the Proposed Development

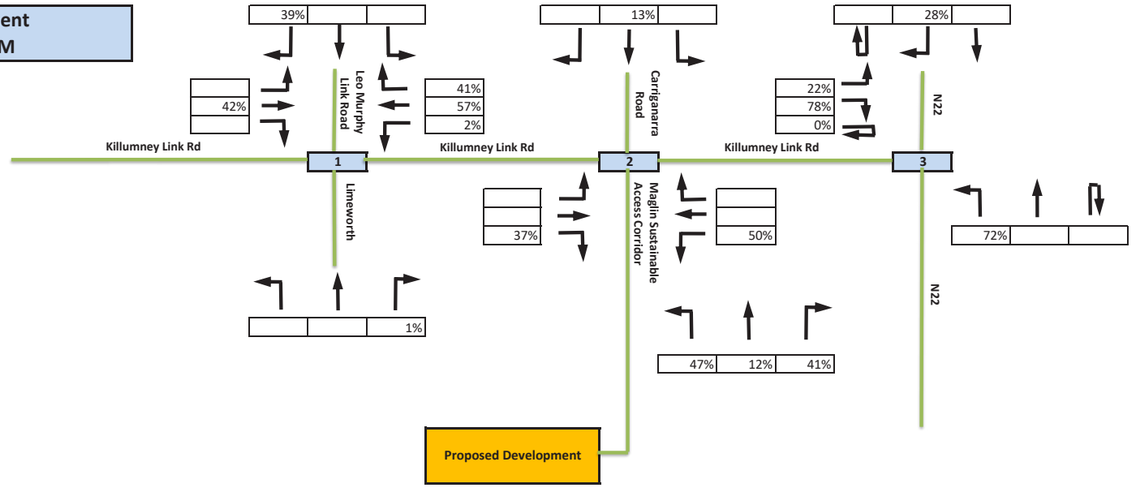
Appendix 4G – Trip Distribution for the Proposed Development

N

Proposed Development
Trip Distribution AM



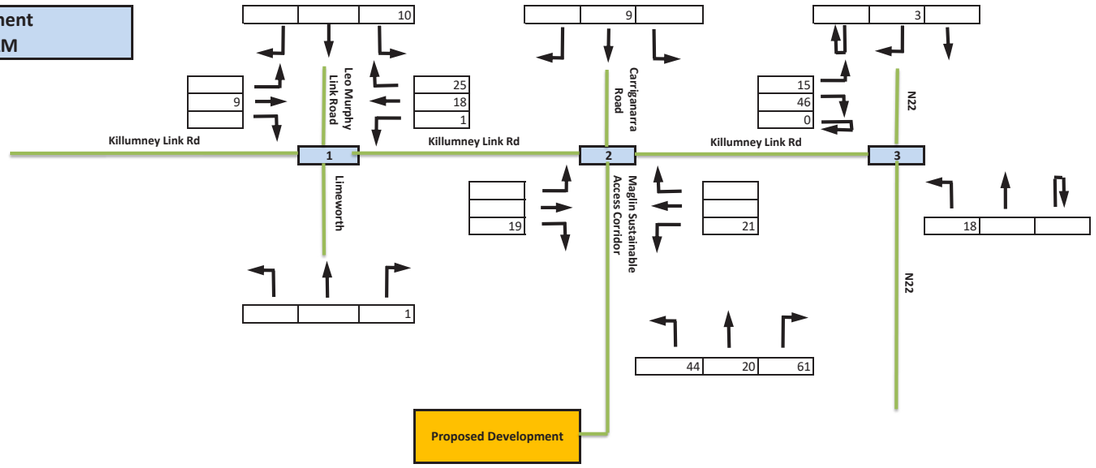
Proposed Development
Trip Distribution PM



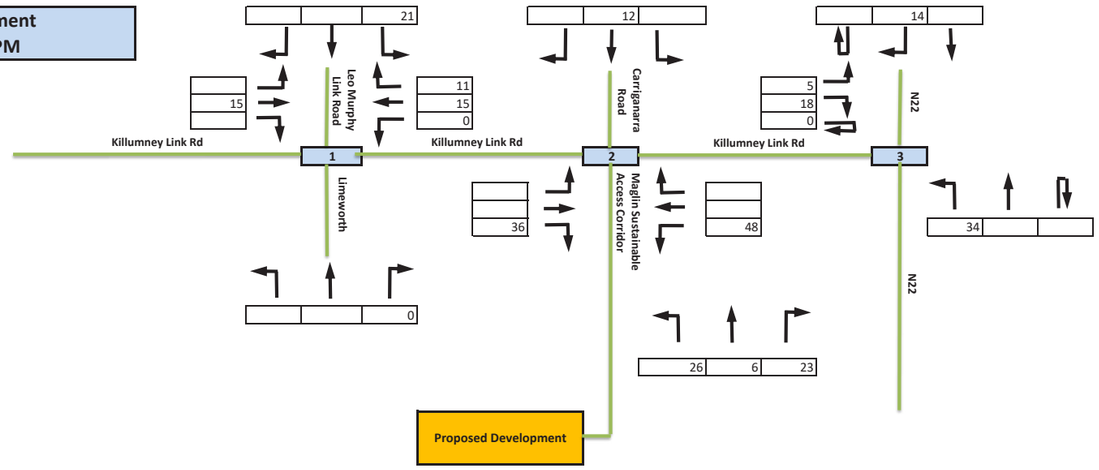
APPENDIX 4-8 Trip Generation for the Proposed Development

Appendix 4H – Trip Generation for the Proposed Development

Proposed Development
Trip Generation AM



Proposed Development
Trip Generation PM



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

APPENDIX 5-1 Proposed Surface Water Drainage & Wastewater Layout Drawings - DOSA Consulting Engineers

anarra Estate

LIMEWORTH

LIMEWORTH

MATCHLINE

MATCHLINE

15m x 25m Pumping station Compound

22 x 12 x 2 10m Attenuation Tank 01 (555m³ required) Restricted Outlet 4.80 L/Sec

14.5 x 8 x 2m Attenuation Tank 02 (232m³ required) Restricted Outlet 1.90 L/Sec

11.5x 9 x 2.20m Attenuation Tank 03 (228m³ required) Restricted Outlet 1.90 L/Sec Cumulative outlet 6.80 L/Sec (1.90 L/Sec & 4.90 L/Sec from tank 01 & 1.90L/Sec from tank 02)

13 x 4.5 x 1.50m Attenuation Tank 06 (88m³ required) Restricted Outlet 1.00 L/Sec Cumulative outlet 11.10 L/Sec (1.00 L/Sec & 7.90 L/Sec from tank 04 & 2.20 L/Sec from tank 02)

Restricted outlet from Blue Roof = 2.10Lsecond

100mmØ Rising main

Key Plan

Scale 1:5000

REV.	DRAWN	CHKD	APPRVD	DATE	DETAILS
P	K.M.	S.O'G.	L.O'T.	10.04.'26	LRD Planning Application Issue

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DENIS O'SULLIVAN & ASSOCIATES
CONSULTING ENGINEERS

Joyce House
Barrack
Square
Ballincollig
Co Cork
P31 KP84

021 4871781
info@dosa.ie
www.dosa.ie

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CLIENT
MOS Homes Limited

PROJECT
Carriganarra LRD, Ballincollig, Cork.

DRAWING TITLE
Proposed Stormwater & Foul Network Layout (Sheet 1 of 2)

SHEET	SCALE	DRAWN	CHECKED	APPROVED	PROJECT NO.	DRAWING NO.	STATUS/ISSUE
@A1	1:500	K.M.	S.O'G.	L.O'T.	4208	0220	P

Legend:

Wasteater Details:

- FS — Denotes Foul Pipe
- FS F001 — Denotes Foul Manhole
- FS — Denotes Foul Sewer (Concrete encased)
- F IC — Denotes Ex. Foul Sewer
- Denotes Inspection Chamber

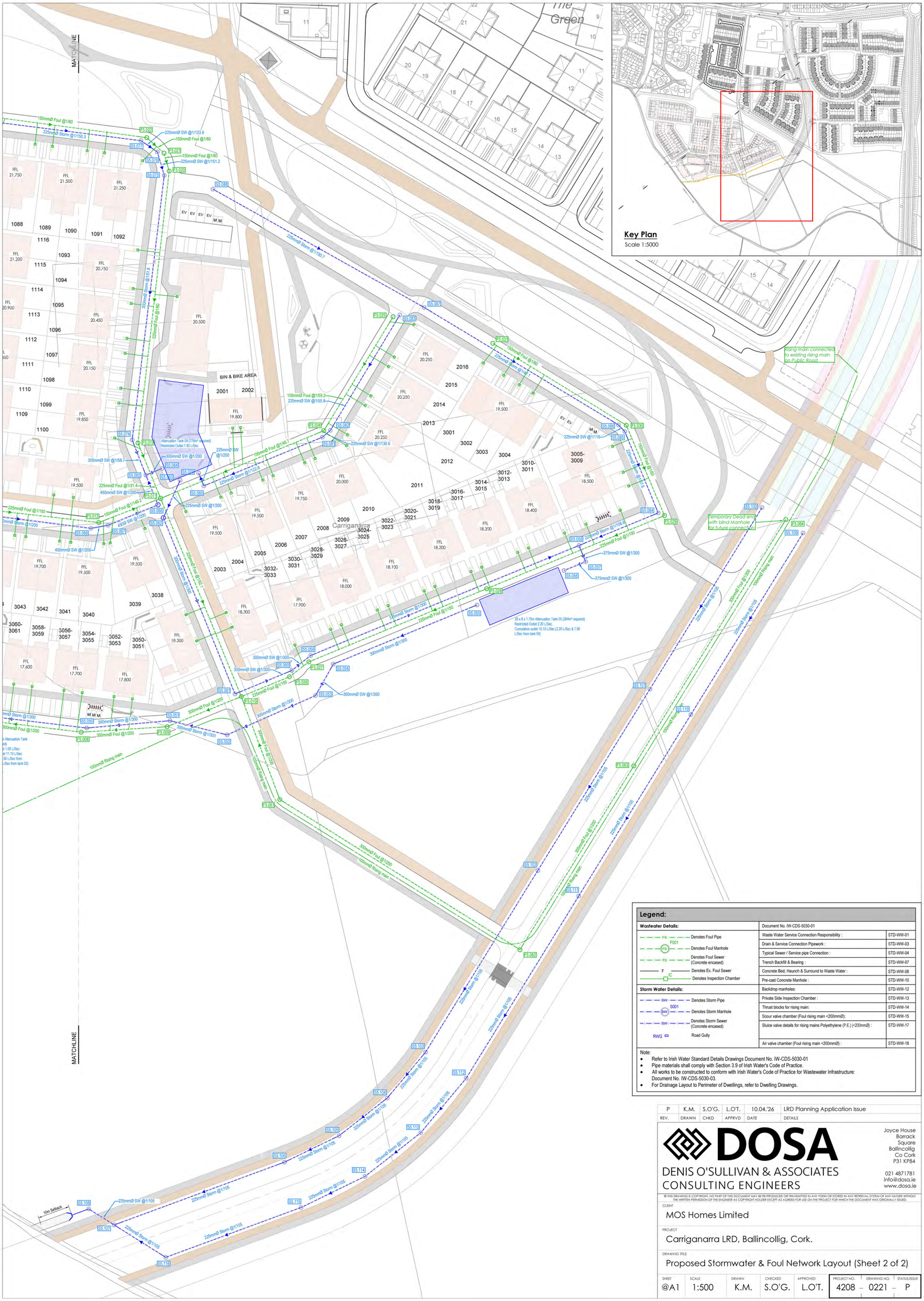
Storm Water Details:

- SW — Denotes Storm Pipe
- SW S001 — Denotes Storm Manhole
- SW — Denotes Storm Sewer (Concrete encased)
- RWG — Road Gully

Document No. IW-CDS-5030-01	
Waste Water Service Connection Responsibility :	STD-WW-01
Drain & Service Connection Pipework :	STD-WW-03
Typical Sewer / Service pipe Connection :	STD-WW-04
Trench Backfill & Bearing :	STD-WW-07
Concrete Bed, Haunch & Surround to Waste Water :	STD-WW-08
Pre-cast Concrete Manhole :	STD-WW-10
Backdrop manholes:	STD-WW-12
Private Side Inspection Chamber :	STD-WW-13
Thrust blocks for rising main:	STD-WW-14
Scour valve chamber (Foul rising main <200mmØ):	STD-WW-15
Sluice valve details for rising mains Polyethylene (P.E.) (<200mmØ) :	STD-WW-17
Air valve chamber (Foul rising main <200mmØ) :	STD-WW-18

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.
- For Drainage Layout to Perimeter of Dwellings, refer to Dwelling Drawings.



Legend:

Wasteater Details:	Document No. IW-CDS-5030-01
FS — Denotes Foul Pipe	Waste Water Service Connection Responsibilty : STD-WW-01
F001 FS — Denotes Foul Manhole	Drain & Service Connection Pipework : STD-WW-03
FS — Denotes Foul Sewer (Concrete encased)	Typical Sewer / Service pipe Connection : STD-WW-04
F — Denotes Ex. Foul Sewer	Trench Backfill & Bearing : STD-WW-07
IC — Denotes Inspection Chamber	Concrete Bed, Haunch & Surround to Waste Water : STD-WW-08
	Pre-cast Concrete Manhole : STD-WW-10
Storm Water Details:	Backdrop manholes: STD-WW-12
SW — Denotes Storm Pipe	Private Side Inspection Chamber : STD-WW-13
S001 SW — Denotes Storm Manhole	Thrust blocks for rising main: STD-WW-14
SW — Denotes Storm Sewer (Concrete encased)	Scour valve chamber (Foul rising main <200mmØ): STD-WW-15
	Sluice valve details for rising mains Polyethylene (P.E.) (<200mmØ) : STD-WW-17
RWG — Road Gully	Air valve chamber (Foul rising main <200mmØ) : STD-WW-18

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.
- For Drainage Layout to Perimeter of Dwellings, refer to Dwelling Drawings.

REV.	DRAWN	CHKD	APPRVD	DATE	DETAILS
P	K.M.	S.O'G.	L.O'T.	10.04.'26	LRD Planning Application Issue

DOSA
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CLIENT
MOS Homes Limited

PROJECT
Carriganarra LRD, Ballincollig, Cork.

DRAWING TITLE
Proposed Stormwater & Foul Network Layout (Sheet 2 of 2)

SHEET	SCALE	DRAWN	CHECKED	APPROVED	PROJECT NO.	DRAWING NO.	STATUS/ISSUE
@A1	1:500	K.M.	S.O'G.	L.O'T.	4208	0221	P

APPENDIX 5-2 Proposed Water Supply Drawings – DOSA Consulting Engineers

anarra Estate

LIMEWORTH

LIMEWORTH

MATCHLINE

MATCHLINE

100mmØ (I.D.) HDPE Watermain

150mmØ (I.D.) HDPE WM

Watermain Thrust & Support Blocks Detail (STD-W-28)

Trench Backfill & Bedding Detail (STD-W-13)

Off-line Air Valve for Polyethylene pipe (P.E.) at high point (STD-W-22)

Off-line hydrant for Polyethylene (P.E.) Pipe Detail (STD-W-19)

General Pipe Connection Detail (Type 6 STD-W-07)

Marker Posts/ Plates Detail (STD-W-27)

Sluice Valve for Polyethylene (P.E.) Pipe Detail (STD-W-15)

K.1 BLOCK

K.1m BLOCK

K.3m BLOCK

BLOCK 1

BLOCK 2

BLOCK 3

Legend:

Watermain Details:		
SB00 Denotes Connection Pipe (25mm O.D. PE Pipe)	Document No. IW-CDS-5020-01	
SB00 Denotes Connection Pipe (32mm O.D. PE Pipe)	Water Service Connection Responsibility :	STD-W-01
SB00 Denotes Connection Pipe (80mm O.D. PE Pipe)	Customer Connection & Boundary Box :	STD-W-03
	Marker Posts & Plates :	STD-W-27
Denotes 100mm I.D. HDPE Watermain	General Pipe Connections :	STD-W-04
	General Pipe Connections :	STD-W-05
Denotes 150mm I.D. HDPE Watermain	General Pipe Connections :	STD-W-07
Denotes 200mm I.D. HDPE Watermain	Trench Backfill and Bedding :	STD-W-13
	Watermain Thrust & Support Blocks :	STD-W-28
SV Denotes Sluice Valve	Sluice Valve :	STD-W-15
	Marker Posts & Plates :	STD-W-27
WH Denotes Washout Hydrant	Washout Hydrant :	STD-W-30A
NRV Denotes Non-Return Valve	On Line Hydrant :	STD-W-18
FH Denotes Fire Hydrant	Off Line Hydrant :	STD-W-19
	Marker Posts & Plates :	STD-W-27
A Denotes Air Valve	Air Valve :	STD-W-22
Me Denotes Water Meter	Meter Chamber :	STD-W-28/28A
	Marker Posts & Plates :	STD-W-27
W 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
N.T.S.

REV.	DRAWN	CHKD	APPRVD	DATE	DETAILS
P	K.M.	S.O'G.	L.O'T.	10.04.'26	LRD Planning Application Issue

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021 4871781
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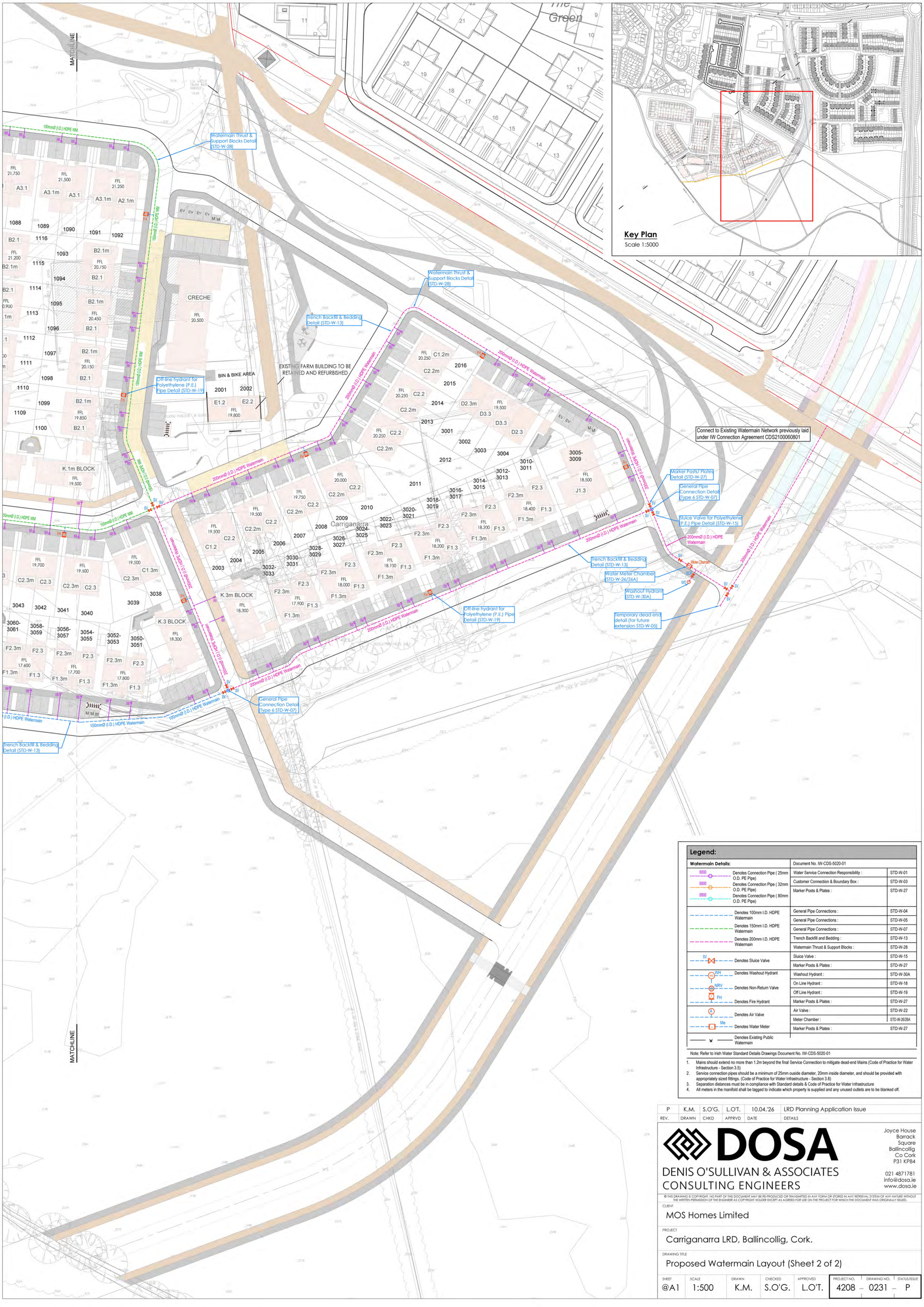
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CLIENT
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PROJECT
Carriganarra LRD, Ballincollig, Cork.

DRAWING TITLE
Proposed Watermain Layout (Sheet 1 of 2)

SHEET	SCALE	DRAWN	CHECKED	APPROVED	PROJECT NO.	DRAWING NO.	STATUS/ISSUE
@A1	1:500	K.M.	S.O'G.	L.O'T.	4208	0230	P



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
Denotes Connection Pipe (80mm O.D. PE Pipe)	Marker Posts & Plates :	STD-W-27
Denotes 100mm I.D. HDPE Watermain	General Pipe Connections :	STD-W-04
Denotes 150mm I.D. HDPE Watermain	General Pipe Connections :	STD-W-05
Denotes 200mm I.D. HDPE Watermain	General Pipe Connections :	STD-W-07
	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.

REV.	DRAWN	CHKD	APPRVD	DATE	DETAILS
P	K.M.	S.O'G.	L.O'T.	10.04.'26	LRD Planning Application Issue

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CLIENT
MOS Homes Limited

PROJECT
Carriganarra LRD, Ballincollig, Cork.

DRAWING TITLE
Proposed Watermain Layout (Sheet 2 of 2)

SHEET	SCALE	DRAWN	CHECKED	APPROVED	PROJECT NO.	DRAWING NO.	STATUS/ISSUE
@A1	1:500	K.M.	S.O'G.	L.O'T.	4208	0231	P

APPENDIX 5-3 Public Lighting Strategy – Molloys Engineering

DATE:	**8 March 2026**
DESIGNER:	**James Molloy**
PROJECT No:	**PL257**
PROJECT NAME:	**DOSA Carrignarra LRD**

Molloy Consulting Engineers

LOCATION: Carriganarra, Ballincollig, Cork, Ireland

DOCUMENT NO.: PL2573-MEC-HLG-SWI-EO-CA-00001

Proposed Lighting Calculation in accordance with the requirement of Cork City Council Exterior Lighting Design Requirements Guidance Revision 10.

Required Levels:
Grid 1 & 2 P3: Eav = 7.50 to 11.25, Emin = 1.50
Grid 3 & 4 P4: Eav = 5.00 to 7.50, Emin = 1.00

Outdoor Lighting Report

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	560172.28	569667.69	103.59	290.91	1.48	1.50
2	Grid 2	560016.19	569615.95	103.59	197.06	1.48	1.49
3	Grid 3	559891.48	570147.48	303.93	269.65	1.50	1.50
4	Grid 4	560111.30	570009.85	304.32	242.23	1.50	1.50

Luminaires



Luminaire A Data

Supplier	
Type	BGP291 DW50
Lamp(s)	LED-HB 5.2S 727
LampFlux(klm)/Colour	4.40 2700/70
File Name	LumiStreet Gen2 Micro_BGP291_DW50_5800_20LED_5.2S_CLO_L90_727.ldt
Maintenance Factor	0.76
Imax70,80,90(cd/klm)	609.4, 39.0, 0.0
No. in Project	95

Luminaire B 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	0.83
Imax70,80,90(cd/klm)	415.9, 39.5, 0.0
No. in Project	16

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	559911.87	569818.27	6.00	218.00	0.00	0.00	0.50			
2	A	559941.07	569823.19	6.00	305.00	0.00	0.00	0.50			
3	A	559891.64	569848.97	6.00	214.00	0.00	0.00	0.50			
5	A	559870.16	569883.46	6.00	206.00	0.00	0.00	0.50			
6	A	559866.50	569915.36	6.00	176.00	0.00	0.00	0.50			
7	A	559870.05	569936.56	6.00	264.00	0.00	0.00	0.50			
8	A	559958.30	569846.82	6.00	34.00	0.00	0.00	0.50			
9	A	559992.85	569833.50	6.00	263.00	0.00	0.00	0.50			
10	A	559936.19	569880.18	6.00	28.00	0.00	0.00	0.50			
12	A	559921.01	569912.93	6.00	348.00	0.00	0.00	0.50			
13	A	559903.15	569932.34	6.00	264.00	0.00	0.00	0.50			
14	A	559846.42	569967.64	6.00	171.00	0.00	0.00	0.50			
15	A	559851.03	569994.48	6.00	79.00	0.00	0.00	0.50			
16	A	559885.64	569990.06	6.00	82.00	0.00	0.00	0.50			
17	A	559926.06	569985.17	6.00	82.00	0.00	0.00	0.50			
18	A	559958.45	569979.91	6.00	56.00	0.00	0.00	0.50			
19	A	559984.43	569965.33	6.00	27.00	0.00	0.00	0.50			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
20	A	559981.24	569939.56	6.00	349.00	0.00	0.00	0.50			
21	A	559986.47	569918.81	6.00	136.00	0.00	0.00	0.50			
22	A	559951.68	569926.45	6.00	265.00	0.00	0.00	0.50			
23	A	560006.58	569932.86	6.00	84.00	0.00	0.00	0.50			
24	A	559979.85	569893.97	6.00	171.00	0.00	0.00	0.50			
25	A	559975.64	569859.22	6.00	166.00	0.00	0.00	0.50			
26	A	560038.01	569929.02	6.00	84.00	0.00	0.00	0.50			
27	A	560052.65	569945.92	6.00	85.00	0.00	0.00	0.50			
28	A	560083.91	569942.12	6.00	83.00	0.00	0.00	0.50			
29	A	560035.93	569904.95	6.00	354.00	0.00	0.00	0.50			
30	A	560031.75	569870.98	6.00	352.00	0.00	0.00	0.50			
31	A	559929.72	569797.25	6.00	28.00	0.00	0.00	0.50			
32	A	560099.70	569921.28	6.00	349.00	0.00	0.00	0.50			
33	A	560094.26	569880.46	6.00	347.00	0.00	0.00	0.50			
34	A	560091.57	569849.55	6.00	14.00	0.00	0.00	0.50			
35	A	560099.84	569825.40	6.00	116.00	0.00	0.00	0.50			
36	A	560136.89	569840.44	6.00	116.00	0.00	0.00	0.50			
37	A	560161.00	569852.14	6.00	142.00	0.00	0.00	0.50			
38	A	560174.69	569876.12	6.00	150.00	0.00	0.00	0.50			
39	A	560128.20	569919.68	6.00	54.00	0.00	0.00	0.50			
40	A	560157.55	569902.12	6.00	58.00	0.00	0.00	0.50			
41	A	560193.44	569883.37	6.00	57.00	0.00	0.00	0.50			
42	A	560219.86	569867.34	6.00	58.00	0.00	0.00	0.50			
43	A	560245.23	569850.81	6.00	20.00	0.00	0.00	0.50			
44	A	560109.74	569804.25	6.00	24.00	0.00	0.00	0.50			
45	A	560121.28	569776.64	6.00	26.00	0.00	0.00	0.50			
46	A	560099.51	569769.09	6.00	262.00	0.00	0.00	0.50			
47	A	560069.23	569772.81	6.00	264.00	0.00	0.00	0.50			
48	A	560041.87	569762.44	6.00	110.00	0.00	0.00	0.50			
49	A	560038.56	569790.95	6.00	173.00	0.00	0.00	0.50			
50	A	560028.56	569845.68	6.00	351.00	0.00	0.00	0.50			
51	A	560037.61	569834.94	6.00	262.00	0.00	0.00	0.50			
52	A	560067.39	569821.79	6.00	82.00	0.00	0.00	0.50			
53	A	560144.13	569746.95	6.00	207.00	0.00	0.00	0.50			
54	A	560170.67	569727.70	6.00	234.00	0.00	0.00	0.50			
55	A	560198.44	569710.60	6.00	239.00	0.00	0.00	0.50			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
56	A	560151.69	569789.00	6.00	294.00	0.00	0.00	0.50			
57	A	560188.17	569803.91	6.00	293.00	0.00	0.00	0.50			
58	A	560224.42	569818.81	6.00	295.00	0.00	0.00	0.50			
59	A	560256.15	569823.05	6.00	114.00	0.00	0.00	0.50			
60	B	560086.64	569611.27	10.00	297.00	0.00	0.00	0.50			
61	B	560107.79	569592.99	10.00	122.00	0.00	0.00	0.50			
62	B	560134.38	569628.92	10.00	292.00	0.00	0.00	0.50			
63	B	560145.29	569606.84	10.00	113.00	0.00	0.00	0.50			
64	B	560170.33	569649.27	10.00	320.00	0.00	0.00	0.50			
65	B	560188.55	569633.11	10.00	142.00	0.00	0.00	0.50			
66	B	560195.47	569684.30	10.00	322.00	0.00	0.00	0.50			
67	B	560215.67	569671.12	10.00	154.00	0.00	0.00	0.50			
68	B	560216.37	569718.51	10.00	332.00	0.00	0.00	0.50			
69	B	560238.55	569708.45	10.00	155.00	0.00	0.00	0.50			
70	B	560244.38	569763.54	10.00	323.00	0.00	0.00	0.50			
71	B	560264.81	569750.32	10.00	151.00	0.00	0.00	0.50			
72	B	560270.94	569806.61	10.00	321.00	0.00	0.00	0.50			
73	B	560291.82	569794.06	10.00	151.00	0.00	0.00	0.50			
74	B	560297.99	569851.48	10.00	322.00	0.00	0.00	0.50			
75	B	560319.08	569839.45	10.00	153.00	0.00	0.00	0.50			
76	A	559846.37	569942.03	6.00	180.00	0.00	0.00	0.50			
77	A	559961.76	569818.29	6.00	122.00	0.00	0.00	0.50			
78	A	559996.51	569817.19	6.00	83.00	0.00	0.00	0.50			
79	A	560026.14	569812.65	6.00	83.00	0.00	0.00	0.50			
80	A	559957.16	569786.39	6.00	37.00	0.00	0.00	0.50			
81	A	559992.24	569793.60	6.00	260.00	0.00	0.00	0.50			
82	A	559973.52	569761.43	6.00	36.00	0.00	0.00	0.50			
83	A	560007.86	569770.02	6.00	107.00	0.00	0.00	0.50			
84	A	560017.15	569797.28	6.00	352.00	0.00	0.00	0.50			
85	A	559816.76	570009.70	6.00	133.00	0.00	0.00	0.50			
86	A	559848.62	570008.66	6.00	84.00	0.00	0.00	0.50			
87	A	559889.77	570003.16	6.00	76.00	0.00	0.00	0.50			
88	A	559932.10	569997.52	6.00	84.00	0.00	0.00	0.50			
89	A	559972.62	569991.90	6.00	84.00	0.00	0.00	0.50			
90	A	559991.33	570021.62	6.00	149.00	0.00	0.00	0.50			
91	A	560008.83	570032.06	6.00	234.00	0.00	0.00	0.50			

975014822S

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
92	A	560032.79	570010.79	6.00	237.00	0.00	0.00	0.50			
93	A	560058.80	569994.95	6.00	240.00	0.00	0.00	0.50			
94	A	560097.21	569982.40	6.00	259.00	0.00	0.00	0.50			
95	A	559944.97	569893.70	6.00	192.00	0.00	0.00	0.50			
96	A	559962.44	569911.26	6.00	265.00	0.00	0.00	0.50			
97	A	559963.89	569876.32	6.00	224.00	0.00	0.00	0.50			
98	A	560125.78	569943.95	6.00	5.00	0.00	0.00	0.50			
99	A	560159.40	569956.33	6.00	148.00	0.00	0.00	0.50			
100	A	560165.56	569944.08	6.00	234.00	0.00	0.00	0.50			
101	A	560139.71	569961.26	6.00	221.00	0.00	0.00	0.50			
102	A	560195.47	569926.01	6.00	240.00	0.00	0.00	0.50			
103	A	560231.77	569904.88	6.00	243.00	0.00	0.00	0.50			
104	A	560266.68	569883.70	6.00	239.00	0.00	0.00	0.50			
105	A	560289.58	569872.97	6.00	238.00	0.00	0.00	0.50			
106	A	560139.93	569881.89	6.00	187.00	0.00	0.00	0.50			
107	A	560114.66	569907.28	6.00	84.00	0.00	0.00	0.50			
108	A	560151.34	569890.95	6.00	199.00	0.00	0.00	0.50			
109	A	560140.26	569852.22	6.00	99.00	0.00	0.00	0.50			
110	A	560108.32	569852.12	6.00	281.00	0.00	0.00	0.50			
111	A	560125.71	569988.97	6.00	184.00	0.00	0.00	0.50			
112	A	559974.89	569743.98	6.00	118.00	0.00	0.00	0.50			
113	A	559980.78	569777.94	6.00	195.00	0.00	0.00	0.50			

DATE: 8 March 2026 DESIGNER: James Molloy

PROJECT No: PL257 PROJECT NAME: DOSA Carrignarra LRD

Molloy Consulting Engineers

Horizontal Illuminance (lux)

Grid 1

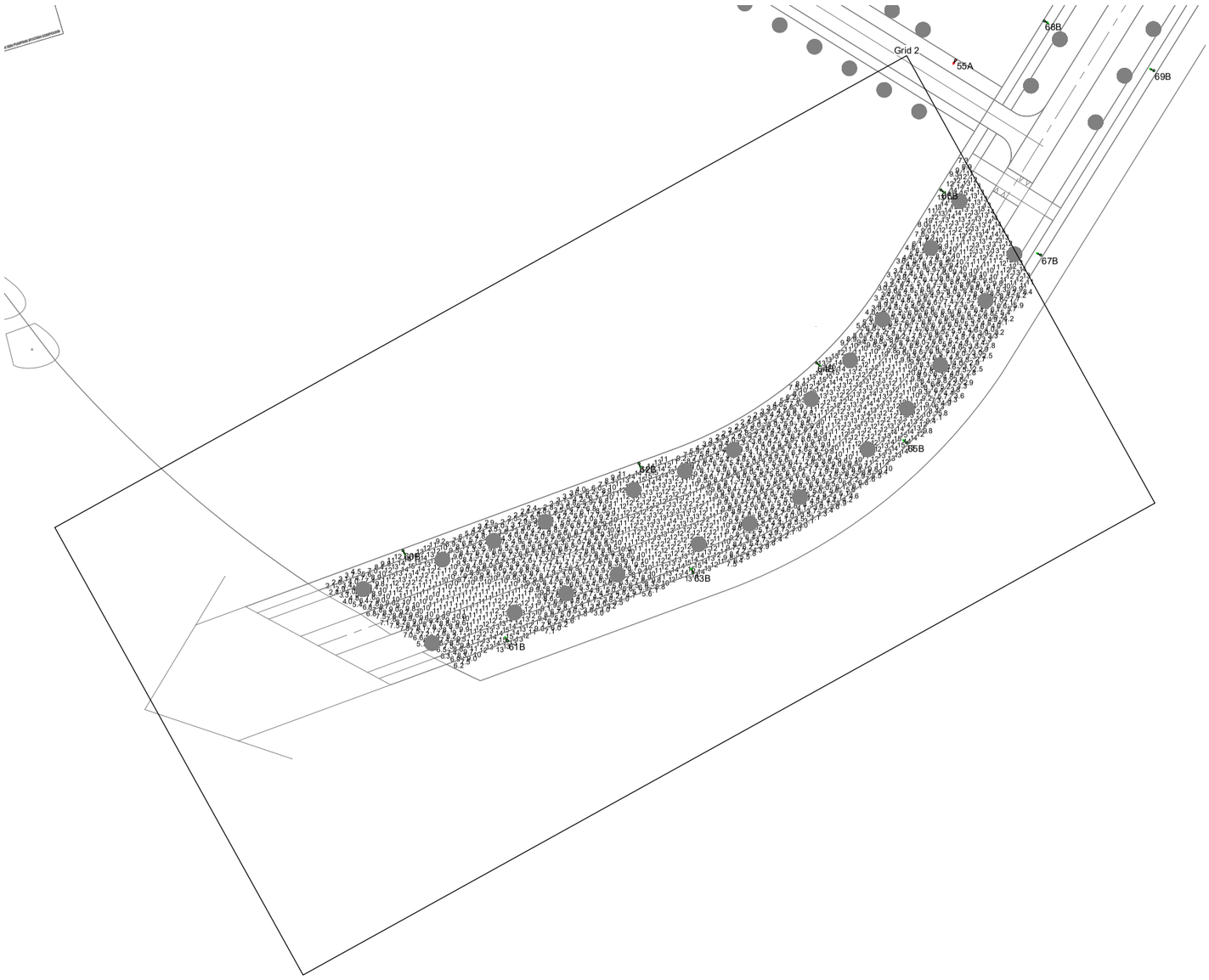


Results

Eav	8.21
Emin	1.83
Emax	15.07
Emin/Emax	0.12
Emin/Eav	0.22

Horizontal Illuminance (lux)

Grid 2



Results

Eav	8.77
Emin	2.13
Emax	15.01
Emin/Emax	0.14
Emin/Eav	0.24

Horizontal Illuminance (lux)

Grid 3



Results

Eav	6.04
Emin	1.33
Emax	13.73
Emin/Emax	0.10
Emin/Eav	0.22

975014822S

Horizontal Illuminance (lux)

Grid 4



Results

Eav	5.86
Emin	1.27
Emax	12.70
Emin/Emax	0.10
Emin/Eav	0.22

APPENDIX 5-4 Operational Waste Management Plan – AWN Consulting

REPORT

Operational Waste Management Plan

Project Title: Large-Scale Residential Development (LRD) at Carriganarra, Carrigrohane & Maglin, Ballincollig, Cork.

CLIENT	DOCUMENT REFERENCE	DATE
MOS Homes Limited	257501.0274WMR01	11/02/2026

AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

DOCUMENT CONTROL SHEET

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Revision	Revision Date	Description

Details	Written by	Approved by
Signature	Isabel Gogarty Meade	
Name	Isabel Gogarty Meade	Chonaill Bradley
Title	Environmental Consultant	Associate
Date	11/02/2026	11/02/2026

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.

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1. INTRODUCTION

AWN Consulting, a Trinity Consultants Team, has prepared this Operational Waste Management Plan (OWMP) on behalf of MOS Homes Limited (the Client) for the proposed Large-Scale Residential Development (LRD) (the Proposed Development) at Carriganarra, Carrigrohane & Maglin (townlands), Ballincollig, Cork (the site).

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)* (2025) [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.

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 2025 National Circular Economy and Waste Statistics web resource, which is the most recent study published, along with the national waste statistics web resource (2025) reported the following key statistics for 2023:

- *Ireland generated 3.13 million tonnes of municipal waste in 2023, relatively unchanged compared to the 3.19 million tonnes generated in 2022.*
- *Between 2016 and 2023, municipal waste increased from 2.7 million tonnes to 3.13 million tonnes.*
- *Some 1.3 million tonnes of municipal waste generated in Ireland was recycled in 2023, resulting in a recycling rate of 42%. This indicates that we face significant challenges to meet the upcoming EU recycling targets for 2025 to 2035.*
- *Of the municipal waste recycled in 2023, over 814,000 tonnes went for material recycling (approximately the same as 2022) and over 480,000 tonnes were treated by composting/anaerobic digestion (approximately the same as 2022 but up 37% on 2020).*
- *A rounded 1.3 million tonnes of Ireland's municipal waste went for incineration with energy recovery in 2023. This tonnage is 43% of municipal waste managed.*
- *Ireland's landfill rate for municipal waste managed was 14% in 2023. This is a 1% decrease from 2022's rate of 15%.*
- *There has been a steep decline in Ireland's landfill rate for municipal waste from over 80% in 2001. Ireland must reduce the share of municipal waste landfilled to 10% or less by 2035, which includes waste landfilled at each step along the waste treatment process in Ireland and abroad.*
- *An estimated 42% (1.2 million tonnes) of all municipal waste managed was exported abroad in 2023, an increase from the 39% in 2022. Of the waste exported, most went for recycling (49%) or energy recovery (36%) while 11% went for composting or anaerobic digestion.*

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 national waste management plan for Ireland.

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:

<u>Objectives:</u>

- ***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, crèche tenants 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*
- *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 Coimisiún Pleanála (ACP) (previously An Bord Pleanála) in 2018. However, the project has been subject to legal challenge, and the High Court subsequently quashed ACP's decision in relation to case PA0045. The application was remitted to ACP for a fresh determination under a new number (318802), and the applicant is currently re-engaged in that process.

The Proposed Development has a number of bring back centres located in the surrounding area. Quishes Supervalu Ballincollig Bring back centre is located c. 2.9 km northwest 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 c. 10.2 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 PROPOSED DEVELOPMENT

3.1 Location, Size and Scale of the Development

The Proposed Development consists of the demolition of existing agricultural buildings and the construction of a residential development of 300 no. residential units consisting of 128 no. dwellings houses, 172 no. apartment/duplex units, a two storey crèche facility and all ancillary site development works. The proposed 128 no. dwelling houses will include 42 no. bedroom detached/semi-detached dwelling houses and 84 no. 3 bedroom semi-detached/townhouse dwelling houses. The Proposed Development also provides for the restoration of an existing vernacular farm building on site which will accommodate 2 no. 2 bedroom semi-detached units.

The proposed 172 no. apartment/duplex units will include 18 no. 3 bedroom units, 109 no. 2 bedroom units and 45 no. 1 bedroom units, to be provided in 20 no. apartment/duplex buildings ranging in height from 3-4 storeys over basement level.

Vehicular access to the Proposed Development will be provided via the existing junction from the Killumney road serving the Heathfield residential development and existing sections of the Maglin Sustainable Access Corridor to the north. The Proposed Development provides for the extension of Maglin Sustainable Access Corridor and the provision of 4 no. pedestrian/cycle connections to the Heathfield residential development to the north which is under construction.

Ancillary site works include the raising of existing ground levels on site, the provision of bicycle parking and bin storage facilities serving the proposed apartment/duplex and crèche buildings, the delivery of active travel infrastructure, landscaping and servicing proposals including a temporary pumping station, and the undergrounding/diversion of an existing 38KV overhead ESB line which traverses the site. The Proposed Development also provides for a bridge crossing of the Maglin North stream to the south of the site.



Figure 3.1 Proposed Site Layout & Redline Boundary (Source: Deady Gahan Architects, 2025)

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 Proposed 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 crèche 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*
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 crèche 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 Unit (Individual WSA)	2-Bed Unit (Individual WSA)	3-Bed Unit (Individual WSA)
Organic Waste	0.01	0.02	0.02
DMR	0.08	0.11	0.13
Glass	0.01	0.01	0.01
MNR	0.05	0.07	0.08
Total	**0.15**	**0.21**	**0.24**

Table 4.2 Estimated Waste Generation for the Residential Units of the Proposed Development

Waste Type	Waste Volume (m^3 / week)		
	4-Bed Unit (Individual WSA)	Apartment Block 1 (Shared WSA)	Apartment Block 2 (Shared WSA)
Organic Waste	0.02	0.59	0.38
DMR	0.18	4.18	2.69
Glass	0.01	0.11	0.07
MNR	0.09	2.20	1.41
Total	**0.30**	**7.08**	**4.55**

Table 4.3 Estimated Waste Generation for the Residential Units of the Proposed Development

Waste Type	Waste Volume (m^3 / week)		
	Apartment Block 3 (Shared WSA)	J Block Unit (Shared WSA)	K/L Block Units (Shared WSAs)
Organic Waste	0.38	0.08	0.06
DMR	2.69	0.57	0.39
Glass	0.07	0.02	0.01
MNR	1.41	0.33	0.23
Total	**4.55**	**1.01**	**0.69**

Table 4.4 Estimated Waste Generation for the Crèche Unit of the Proposed Development

Waste Type	Waste Volume (m^3 / week)
	Crèche Unit (Individual WSA)
Organic Waste	0.10
DMR	3.61
Glass	0.01
MNR	1.97
Total	**5.69**

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* (2025) [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 Block 1 units which is located externally at ground floor level;
- There is one (1 no.) shared WSA for the Apartment Block 2 units which is located internally at basement level;
- There is one (1 no.) shared WSA for the Apartment Block 3 units which is located internally at basement level;
- There is one (1 no.) shared WSA for the J block units which is located externally at ground floor level;
- There are seven (7 no.) shared WSAs for the K/L block units which are located externally at ground floor level; and
- There is a separate WSA designated for the crèche unit which is located externally at ground floor level.

Residential houses and duplex units with access to individual waste storage areas will have designated spaces either at the front or rear of their unit for storing their bins.

Facilities management will supply all residents with shared WSAs and crèche 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 Proposed 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

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 Block 1 (Shared WSA)	2 no. 1100 L	4 no. 1100 L	1 no. 120 L	3 no. 240 L
Apartment Block 2 (Shared WSA)	2 no. 1100 L	3 no. 1100 L	1 no. 120 L	2 no. 240 L
Apartment Block 3 (Shared WSA)	2 no. 1100 L	3 no. 1100 L	1 no. 120 L	2 no. 240 L
J Block Units (Shared WSA)	1 no. 1100 L	1 no. 1100 L	1 no. 120 L	1 no. 120 L
K/L Block Units (Shared WSAs)	1 no. 240 L	1 no. 1100 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
Crèche Unit WSA	2 no. 1100 L	4 no. 1100 L	1 no. 120 L	1 no. 120 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 crèche 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 crèche 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 – Crèche Unit

The crèche tenants will be required to segregate their waste into the following main waste categories within their own units:

- Organic waste;
- DMR;
- Glass; and

- MNR.

The crèche 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 and in the appendices of this report.

Suppliers for the crèche 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 crèche 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; and
- Dish-wash and Glass-wash 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 crèche WSA.

All bins / containers in the crèche tenants' areas as well as in the WSA 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 crèche WSA 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 crèche WSA 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.

Deposit Return Scheme
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.

At the shops you can either return the containers:

- Using a Reverse Vending Machine (RVM); or
- 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 crèche 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 crèche 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 crèche unit, where appropriate. The crèche 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 crèche unit 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 crèche unit. It is anticipated that crèche 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 crcehe tenants and residents will be responsible for disposing of waste textiles appropriately.

Waste Cooking Oil
If the crèche 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 crèche 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 Proposed 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 WSAs and crèche WSA 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;
- 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, crèche 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, crèche tenants and any facilities management team appointed*:*

- Provision of a Waste Management Plan document, prepared by the facilities manager to all residents, crèche 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 Proposed Development;
- Provision and maintenance of appropriate graphical signage to inform residents and crèche tenants of their obligation to reduce waste, segregate waste and in the correct bin;
- Preparation of a waste management report for all residents and crèche 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 Proposed 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 Proposed 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 the Proposed Development. All waste generated within the Proposed 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 Proposed Development is carried out in accordance with the requirements of the *CCC Waste Bye-Laws.*

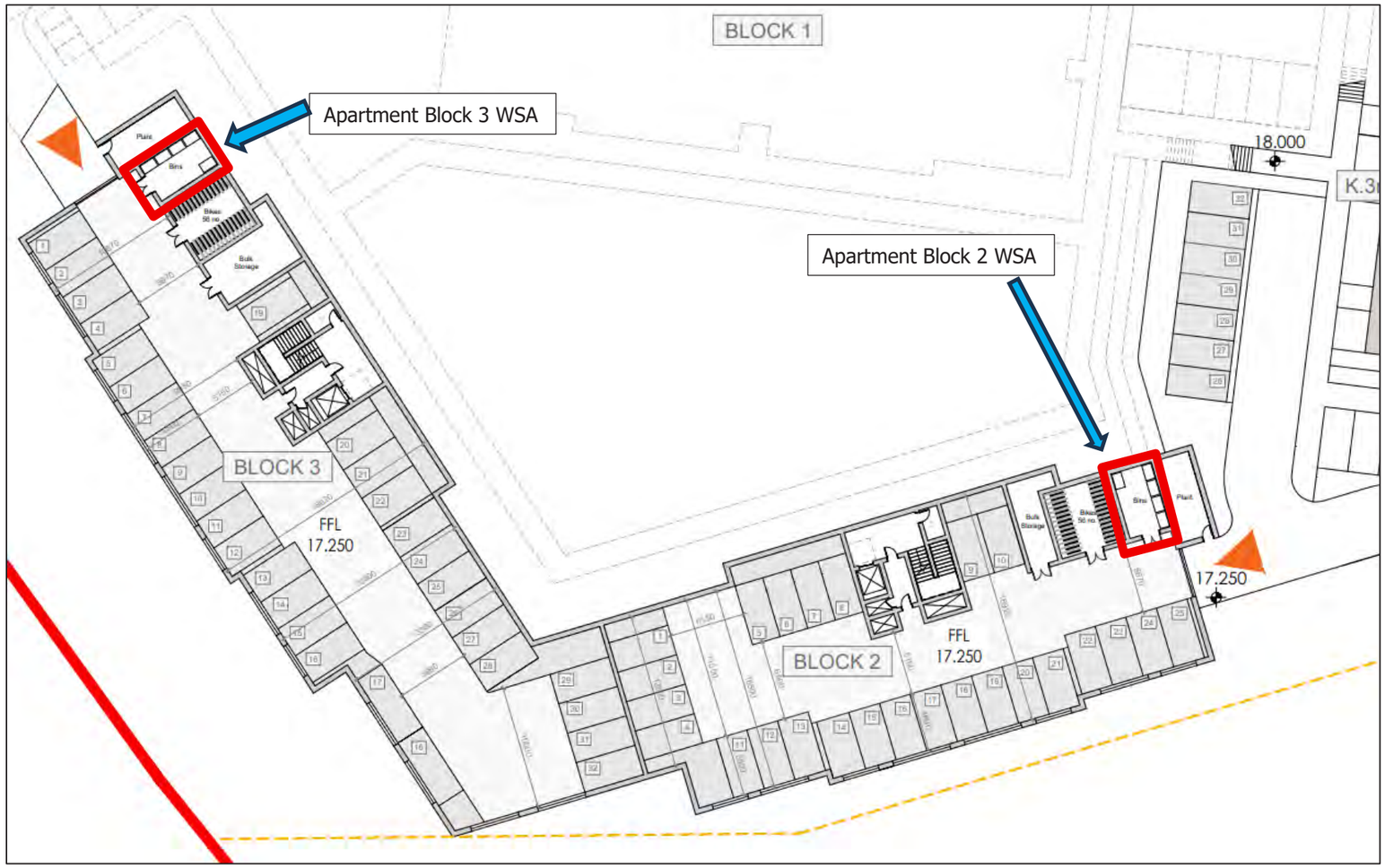
The waste strategy presented in this document will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated areas for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy.

7. REFERENCES

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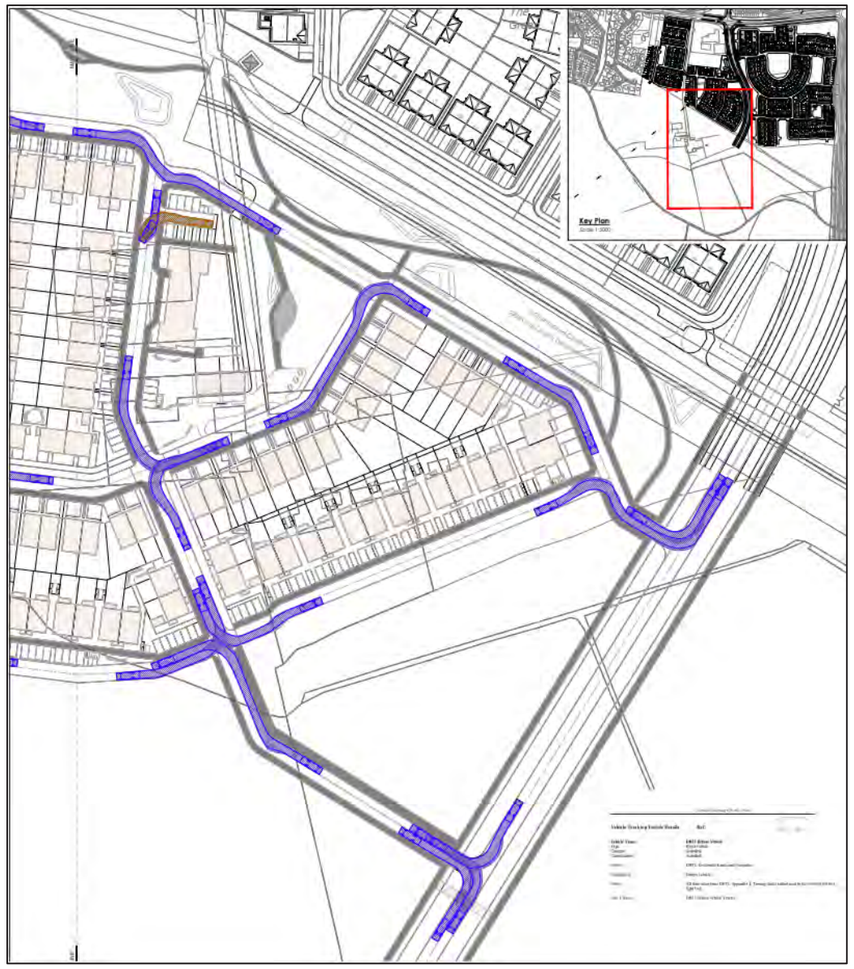
APPENDIX A. WASTE STORAGE AREA LOCATIONS




BLOCK 1
Apartment Block 3 WSA
Apartment Block 2 WSA
18.000
BLOCK 3
FFL
17.250
BLOCK 2
FFL
17.250
17.250

APPENDIX B. ROAD SWEEP ANALYSIS




Key Plan

CHAPTER SIX

LAND & SOILS

APPENDIX 6-1 Ground Investigation Reports

APPENDIX 6-1 Ground Investigation Reports

Carriganarra LRD

Geophysical Survey Report

Report Number: P24077_Gp_Rp_Rev03

Project ID: P24077

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.

REPORT CONTROL SHEET

Project Client	M&OS Group					
Terra Survey Client	Priority Geotechnical Ltd.					
Project Name	Carriganarra LRD					
Document Type	Technical Report					
Project Number	P24077					
This Report Comprises of	**TOC**	**Text**	**No. of Volume**	**No. of Appendices**	**Drawings**	**Electronic data**
	1	14	1	1	6	*.dwg, *.pdf

Revision	Status	Author(s)	Approved by	Issue Date
Rev01	Draft	DH	HP	20/09/2024
Rev02	Draft	CN	HP	22/04/2025
Rev03	Draft	CN	HP	05/06/2025

Rev.03 includes corrected direct investigation locations used to improve geophysical interpretation.

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Acronyms

- bgl – below ground level
- ERT – Electrical Resistivity Tomography
- Res – Resistivity
- SRP – Seismic Refraction Profiling
- ITM – Irish Transverse Mercator
- OD Malin – metres above Ordnance Datum Malin (OSGM15)

A) Executive Summary

Terra Survey was instructed by Priority Geotechnical Ltd. on behalf of M&OS Group to undertake a geophysical investigation at Carriganarra LRD, Cork. The main objectives of the geophysical survey were to provide information on rock and soil profile and to identify any anomalies which could represent potential karst and/ or fracture features.

The survey employed a suite of geophysical techniques in accordance with established industry standards (BS5930[1], BS7022[2]) and best practices (Geological Society Engineering Group Working Party Report on Engineering Geophysics). These techniques included Seismic Refraction Profiling (SRP) and Electrical Resistivity Tomography (ERT).

The survey was carried out between 24th June and 1st July 2024. The survey profile locations are shown in Figure B-1 below.

The survey consisted of 28 no. SRP profiles with a 3m geophone spacing and a total of 1990m survey length and 5 no. ERT profiles with a 5m electrode spacing with a total of 2015m ERT survey length.

The survey locations and geophysical sections / interpretations are provided in APPENDIX A: Drawing No. P24077_Gp_D01 to P24077_Gp_D06.

Based on the inverted Electrical Resistivity Tomography (ERT) and Seismic Refraction Profiles (SRP), the subsurface structure has been interpreted as a sequence of overburden layers overlying bedrock. The overburden has been interpreted as sandy gravelly CLAY, with varying thicknesses ranging from c.2 meters to 30 meters. The bedrock is composed of LIMESTONE exhibiting varying degrees of weathering.

The geophysical interpretation has identified potential karst zones within the subsurface. These anomalies are characterised by sharp changes in measured properties and are highlighted on the presented cross sections. The extent of these features may be limited due to the detection capabilities of the methods used.

Possible karst zones filled with overburden material exhibit lower Vp and higher Res values compared to the surrounding overburden. Several specific karst zones with high resistivity, indicative of void spaces, have been identified along profiles R1, R2, R4, and R5.

This report takes into consideration all direct investigations that have been carried out within 20m radius of each surveyed profile.

[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.*

B) Introduction

Terra Survey was instructed by Priority Geotechnical Ltd. on behalf of M&OS Group to undertake a geophysical investigation at Carriganarra LRD, Cork.

The survey consisted of seismic refraction and electrical resistivity tomography in accordance with BS5930 and BS7022 and the Geological Society Engineering Group Working Party Report on Engineering Geophysics. The survey profile locations are shown in Figure B-1 below. The survey followed transects provided by the client. A part of the survey along R4, extending NE-SW, was revised by the client due to dense tree coverage.

The survey was carried out between 24th June and 1st July 2024.



Figure B-1: Location map showing surveyed geophysical profiles in red (ERT), in blue (SRP). Proposed lines by the client are shown in purple.

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 anomalies which could represent potential karst and/ or fracture features.

B.2) Site Topography

The site consists of several grazing fields, separated by dense hedgerows with elevations ranging from 15.1m OD to 22.5m 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 considers all relevant site investigation results. Ground investigation logs have been supplied to Terra Survey from Priority Geotechnical Ltd. The relevant site investigation logs are overlain on the cross sections when they were within 20m distance of the ERT profiles.

B.5) Site Geology

According to the GSI 100k Geology Map (see Figure B-2) the survey area is underlain by two main formations known as the "Little Island Formation" shown in light green, described as "Massive and crinoidal fine LIMESTONE", and "Waulsortian Limestones", shown in light blue, described as "Massive unbedded LIME-MUDSTONE". There is a crossing fault indicated by black arrow across several profiles. This fault zone is also interpreted in the geophysical sections provided in APPENDIX A.

Areas of outcrop are also noted on the background GSI mapping within the survey area.