



Engineering Assessment Report

Cherry Orchard Point – Phase 3 of Proposed Development at
Sites 4 and 5, Park West Avenue, Dublin 10

September 2026

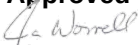
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Client Name: The Land Development Agency
Document Reference: 22-010r.047 Engineering Assessment Report Phase 3
Project Number: 22-010

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015 and BS EN ISO 14001: 2015)

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- A. Uisce Eireann Confirmation of Feasibility
- B. FLOW (Causeway) Model for the Proposed Development
- C. ABG Ltd. Blue & Blue-Green Roof Specialist Design
- D. ABG Ltd. General Maintenance Blue Roof Systems
- E. RoadPlan Quality Audit

1. Introduction

This engineering assessment report has been prepared by Waterman Moylan as part of the planning documentation for the Proposed Phase 3 development of the Cherry Orchard Point Masterplan development at Sites 4 and 5, Park West Avenue, Dublin 10.

This report assesses the existing and proposed civil services for the proposed development including foul and surface water drainage, water supply infrastructure, and details of the criteria used to design the proposed services.

The design of the above noted infrastructure has been undertaken in accordance with, and cognisant of, the following documents:

- Dublin City Council Development Plan (2022-2028).
- Park West & Cherry Orchard LAP (2019).
- Ground investigation details as per the Site Investigation Reports.
- Site Specific Topographic Survey.
- Uisce Éireann existing foul infrastructure maps.
- Uisce Éireann existing watermain infrastructure maps.
- Uisce Éireann Confirmation of Feasibility Letter.
- Uisce Éireann Code of Practice for Wastewater (August 2025 Rev 3).
- Uisce Éireann Code of Practice for Water Infrastructure (August 2025 Rev 3).
- Uisce Éireann Wastewater Standard Details.
- Uisce Éireann Water Standard Details.
- Building Regulations Technical Guidance Document Part H.
- Dublin City Council's Sustainable Drainage Design and Evaluation Guide (2021).
- Dublin City Council's Green and Blue Roof Guide (2021).
- Dublin City Council's SuDS Property Level Guide (2023).
- CIRIA The SuDS Manual (2015 Version 5).
- DEHLG/OPW Guidelines on the Planning Process and Flood Risk Management.
- Greater Dublin Regional Code of Practice for Drainage Works (Version Draft 6.0)
- Greater Dublin Strategic Drainage Study, Regional Drainage Policies Technical Volume, Volume II New Developments (March 2005).

2. Masterplan Lands

2.1 Cherry Orchard Point Site Location and Description

The subject masterplan development is comprised of two sites. Site 4 & Site 5 are bisected by Park West Avenue and lie to the west and east of this roadway respectively. Site 4 is shown as per the blue shaded area of the masterplan development indicated on Figure 2-1: Site Location Map (Source: Google Maps). The proposed Phase 3 subject site is located within Site 5: Barnville of the masterplan development, which is shown within the redline boundary in the below figure. Site 5 is accessed via a secured gate from Cedar Brook Way.

The proposed Phase 3 development is bound by Park West Avenue to the west, the realigned Cedar Brook Way (completed under the Approved Phase 1 development with ref. ABP-318607-23 which is currently under construction) to the north, Cherry Orchard Green (previously Barnville Park) to the east, and Barnville Park, residential dwellings, and the Dublin-Kildare Rail Line to the south.

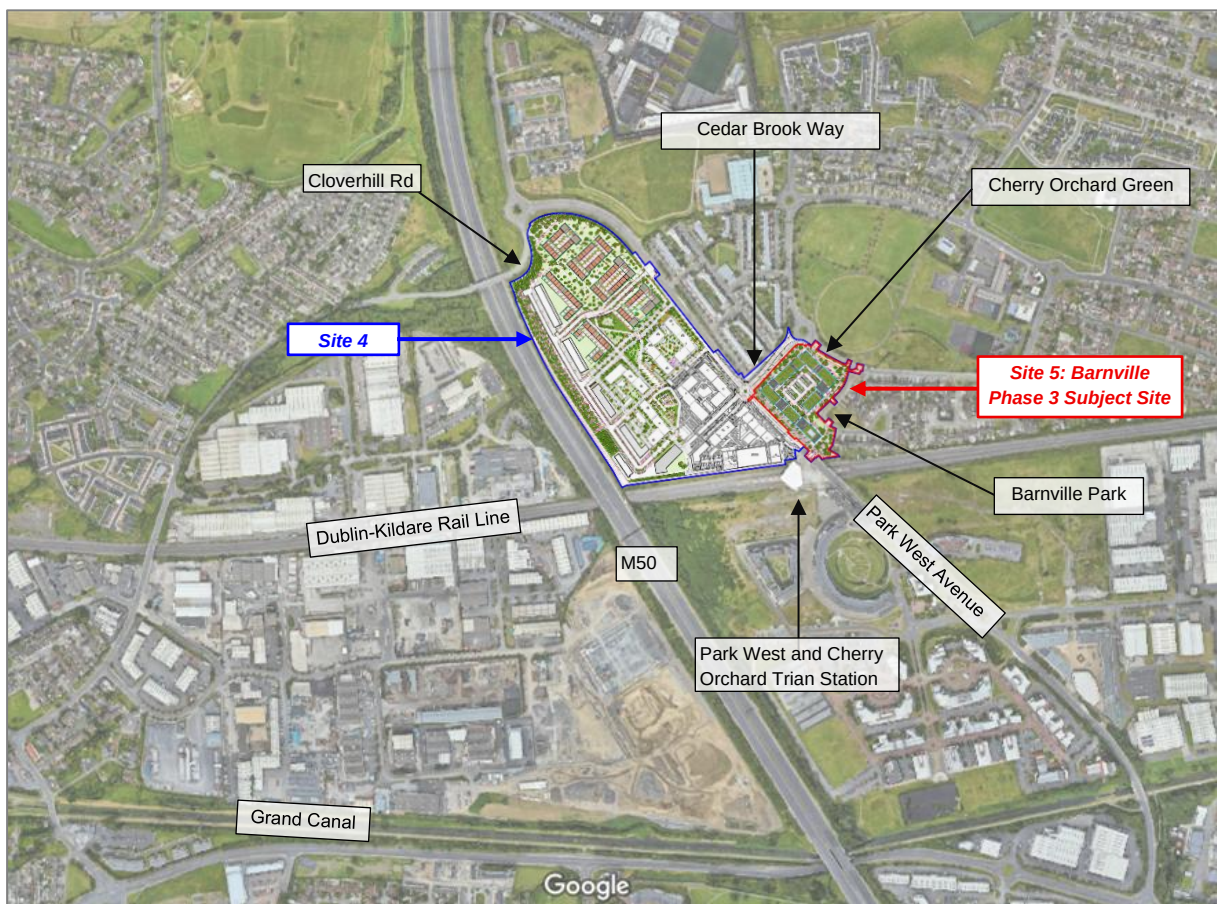


Figure 2-1: Site Location Map (Source: Google Maps)

The overall masterplan development area as per the blue line boundaries is c. 14.24 ha, with Site 5 being c. 1.72 ha. The area of the subject application indicated by the redline boundary in the above figure, including for works in the public domain, is 1.72 ha.

2.2 Indicative Phasing

The indicative phasing of the 4-phase masterplan development is illustrated in Figure 2-2: Indicative Masterplan Development Phasing Layout, below.

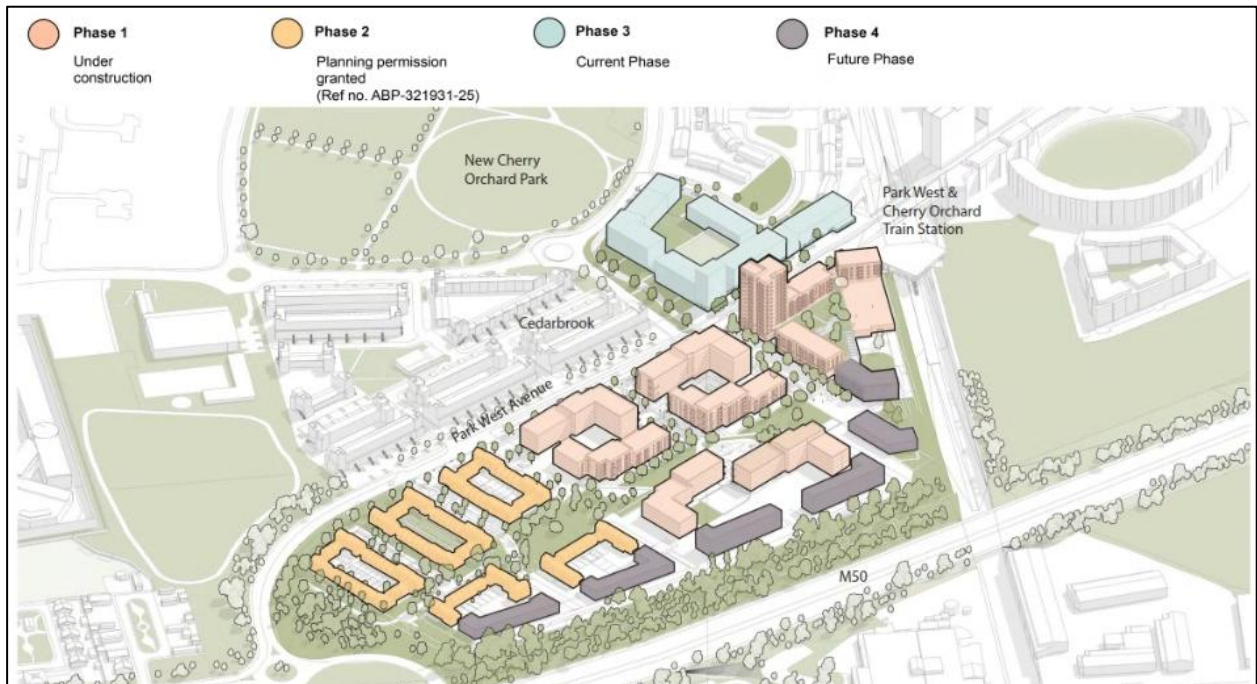


Figure 2-2: Indicative Masterplan Development Phasing Layout

2.3 Proposed Masterplan Development

A description of each of the 4-Phases is included below:

Approved Phase 1 (Under Construction)

Is a medium and high-density area located on Site 4 which will provide a total of 708 no. residential units ranging in size from studio to 3-bed apartments, a 2,523m² supermarket, a combined area of 373m² for retail over 7 units, a 672m² creche and 1,222m² of community spaces over 13 buildings. It is noted that the trunk foul and surface water drainage, including attenuation storage, to serve phases 2, 3, & 4 are part-provided under the planning application submission for Phase 1.

Phase 1 of Cherry Orchard Point was approved in July 2024 under ABP Ref. 318607-23 and is currently under construction.

Approved Phase 2 (Under Construction)

Is a low-density housing area located to the north of Site 4 and is proposed to contain 137 no. residential units comprising a mix of apartment/duplex units and houses.

Phase 2 of Cherry Orchard Point was granted planning permission in September 2025 under ABP Ref. 321931-25 and had recently commenced construction at the time of writing this report.

Phase 3 (Subject Site)

The subject development, Cherry Orchard Point - Phase 3, Is located on Site 5, and comprises 312 residential units, local retail and commercial units, and landscaped public and communal open space.

The subject development, Cherry Orchard Point – Phase 3 will be referred to as the “proposed Phase 3 development” or “subject site” within this report.

Proposed Phase 4 (Future Development)

Phase 4 of the masterplan lands is located along the western edge of Site 4 and will consist of the construction of commercial office space over 6 blocks.

2.4 Topographical Details

The Phase 3 subject site is located within Site 5 of the masterplan development (refer to Figure 2-1).

The latest Site Investigation Report undertaken by Ground Investigations Ireland (GII) in August of 2024, included as an appendix to the Preliminary Construction Environmental Management Plan submitted under a separate cover, has determined that Site 5 is predominantly a brownfield site, with fill material found.

For Site 4, the topographic survey of the area indicates that the low point of the site has a level of 55.70m OD. This is located on the eastern site boundary approximately 140m north of the junction of Park West Avenue and Cedar Brook Way. The remainder of the site generally slopes to this location owing to the embankments and subsequent site grading from the Dublin-Kildare Rail line to the south, M50 to the west, and approach road to the overpass on the M50 to the north. A local high point of the site has a level of 62.65m OD located at the northeast of Site 4.

Site 5 has a central high point with a level of 58.04m OD in the centre of the site and isolated high points at the southwest of the site. Generally, the site slopes from the centre outwards to all boundaries. The boundaries of Site 5 typically have levels between 54.55m and 60.78m, with the highest of these levels being located at the southwest of Site 5, adjacent to the retaining wall of the Park West Avenue Bridge over the rail lines.

Refer to Figure 2-3: Existing Site Topography of the Subject Site Lands for an extract of the topographical survey of the development showing spot elevations throughout Sites 4 and 5.



Figure 2-3: Existing Site Topography of the Subject Site Lands

3. Proposed Development

3.1 Development Description

The proposed development will consist of the construction of a residential led mixed-use scheme containing 312no. residential apartments comprising 244no. cost rental and 68no. social units, 8no. local retail and commercial units, landscaped public and communal open space. The proposed development includes a new principal access via Barnville Park to the south, providing entry to an internal undercroft parking court, upgraded pedestrian and cycle footpaths, Barnville link connecting the Park West Avenue and Cherry Orchard railway station and all associated site and public realm works. The proposed development represents Phase 3 of the overall planned development at Cherry Orchard Pointe for Development Sites 4 and 5 of the LAP lands. Phase 1 of the overall planned development was granted permission in July 2024 (ACP Case Ref: 318607-23) and Phase 2 was granted in September 2025 (ACP Ref. 31-395-2025). The proposed development comprises the works to be undertaken on Site 5: Barnville, which forms the subject of this planning application.

The proposed development (Total GFA c. 28,413 sq.m) involves construction of 312no. residential apartments (c. 24,556 sq.m), across 7 blocks consisting of 4 to 10 floors, comprising 16no. studio units, 146no. one-bed units, 139no. two-bed units (15no. two-bed three-person and 124no. two-bed four person), 9no. 3-bed units (three four-person) and 2no. 4-bed units (one four-bed seven-person) together with 8no. Local Retail and Commercial units (c. 1,441 sq.m GFA), and all ancillary and sundry accommodation (c. 2,416sq.m total GFA). The proposed development also includes the provision of landscaped public open space of 1691 sq.m and 6519sq.m of communal open space. The communal open space has been designed to provide a high-quality amenity area, incorporating a community garden seating and play areas and fitness facilities, and associated landscaping. The scheme also provides private open space for all residential units.

The proposed development will involve the provision of car parking (including accessible and EV car parking spaces), car sharing spaces, bicycle parking spaces, motorbike spaces, motorcycle parking spaces, and loading bays. The scheme includes a Barnville link to the south of the site connecting Barnville Park with Park West Avenue and providing direct pedestrian access to the railway station, along with over 40no. pedestrian crossing points connecting Park West Avenue, Barnville Park and New Cherry Orchard Park.

The development will also provide for all associated ancillary site development infrastructure including site clearance, boundary treatment, associated public lighting, internal roads and pathways, substations, switch room, water tank rooms, storage room, rainwater/surface water attenuation, stormwater, bin storage, bicycle stores, hard and soft landscaping, play equipment, boundary walls, attenuation area, green and blue roof systems, photovoltaic panels and all associated works and infrastructure to facilitate the development including connection to foul and surface water drainage and water supply.

Refer to the enclosed statutory notices for a full description of development as part of this planning application.

3.2 Site Investigation Details and Infiltration Rates

3.2.1 Barnville Park Site Investigation

A site investigation for Site 5 was commissioned by Dublin City Council and undertaken by Ground Investigations Ireland (GII) in January of 2018. The report details are included below:

- Ground Investigations Ireland Barnville Park Cherry Orchard Ground Investigation Report Revision A (issued 29 January 2018)

The scope of the works undertaken in the 2018 Site Investigation Report included trial pits, soakaways, cable percussion boreholes, geotechnical and environmental laboratory testing, and a report with recommendations.

The Site Investigation Report is submitted as part of this application as an appendix to the Preliminary Construction Environmental Management Plan.

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An extract of the test location site map included under Appendix 1 of the Site Investigation Report is included in Figure 3-1: Barnville Park Site Investigation Test Locations, below. The map has been modified to include annotations at each test location including information related to the existing ground level, made ground level (MGL), made ground depth (MGD), topsoil level (TSL), and topsoil depth (TSD) taken from the test results found under Appendix 2 of the Report.

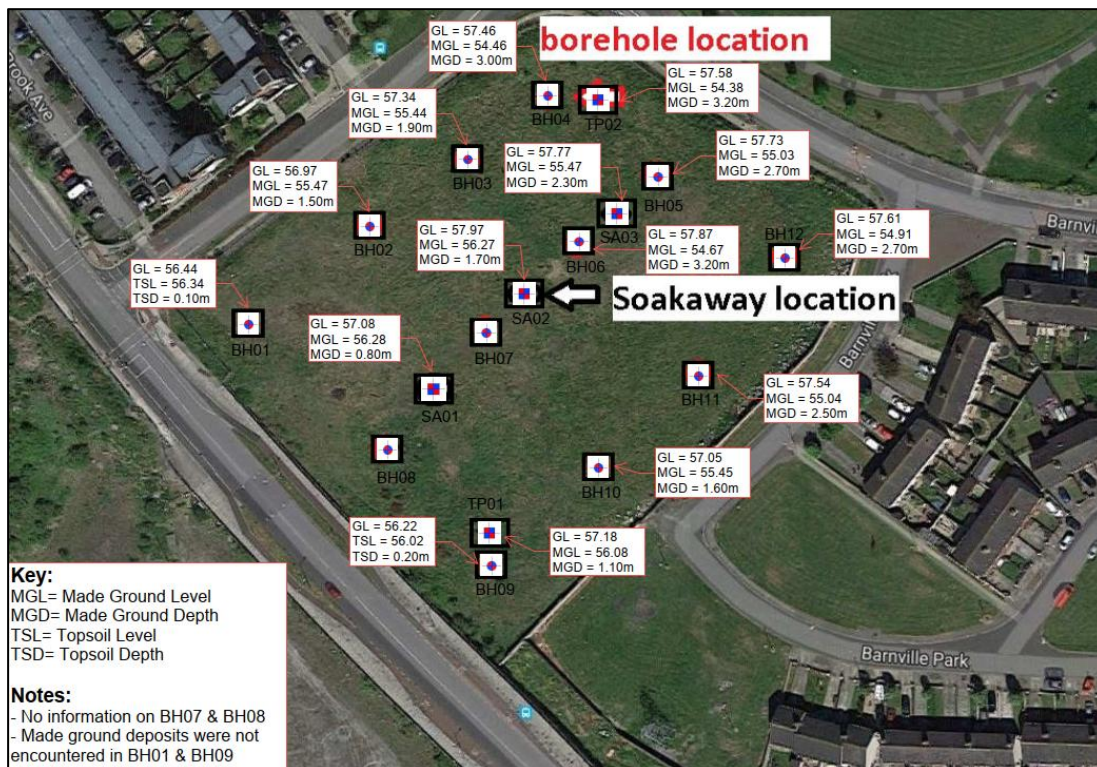


Figure 3-1: Barnville Park Site Investigation Test Locations and Annotations

Report findings – Soil Infiltration Results

Under *Chapter 5.0 Recommendations & Conclusions* of the Report, the following is stated regarding the soakaway testing:

“At the locations of SA01, SA02 and SA03 the water level dropped too slowly to allow calculation of the soil infiltration rate. These locations are therefore not recommended as suitable for soakaway design and construction.”

No groundwater was noted during the investigation.

3.2.2 Cherry Orchard Site 4 and 5 Phase 2 Site Investigation

As part of the Approved Phase 2 Development (ABP Ref. 321931-25), site investigations for the masterplan lands (including Site 5) were undertaken in August of 2024 by Ground Investigations Ireland (GII). Two reports were issued by GII, the details of which are included below:

- Ground Investigations Ireland Cherry Orchard Site 4 and 5 Phase 2 Ground Investigation Report Revision C (issued 28 August 2024)
- Ground Investigations Ireland Cherry Orchard Site 4 and 5 Phase 2 Waste Classification Report Revision B (issued 22 August 2024)

These Site Investigation Reports are submitted as part of this application as an appendix to the Preliminary Construction Environmental Management Plan.

The scope of the works undertaken in the 2024 Site Investigation Report included trial pits, soakaways, slit trenches, window sample boreholes, cable percussion boreholes, rotary core boreholes, geotechnical and environmental laboratory testing, and a report with recommendations.

An extract of the test location site map included under Appendix 1 of the Site Investigation Report (and for which shows the location of the tests undertaken on the proposed Phase 3 development) is included in Figure 3-2: Cherry Orchard Site 4 and 5 Site Investigation Test Locations, below.

The map shows that no soakaway testing was undertaken on Site 5 as part of this investigation.



Figure 3-2: Cherry Orchard Site 4 and 5 Site Investigation Test Locations

Report findings – Soil Infiltration Results

5-no. soakaway tests were however undertaken on the Site 4 lands to the west and recorded the following regarding the infiltration rate of Site 4:

“At the locations of SA A, SA B, SA C, SA D, and SA E the water level dropped too slowly to allow calculation of ‘f’ the soil infiltration rate. These locations are therefore not recommended as suitable for soakaway design and construction.”

3.2.3 Cherry Orchard Site 5 Phase 3 Site Investigation

As part of the Proposed Phase 3 development further Site investigation was undertaken by GII in August 2026 at the Site 5: Barnville subject site and is submitted as part of this application as an appendix to the Preliminary Construction Environmental Management Plan. The test locations within the subject site are shown in the figure below.



Figure 3-3: 2026 Cherry Orchard Site 5: Barnville Site Investigation Test Locations

Report findings – Soil Infiltration Results

A total of four soakaway tests were undertaken with the area outlined in the above figure. The soakaway tests undertaken are in-line with those of the previous site investigations discussed above.

At all soakaway locations, the water level dropped too slowly to allow calculation of 'f' the soil infiltration rate. The soil infiltration rates on site are not recommended as suitable for soakaway designs.

3.2.4 Site Investigations Soil Infiltration Rate Conclusion

It can be concluded from the above Site Investigation Reports that the Masterplan Lands (Sites 4 and 5) do not contain soils that provide adequate infiltration rates for surface water management features relying solely on infiltration. However, localised infiltration within Sustainable Urban Drainage Systems (SuDS) can be incorporated into the design where features such as engineered rain gardens, swales, or bioretention tree pits are designed with appropriate overflow mechanisms and positive drainage connections to the main surface water network.

4. Foul Water Network

4.1 Uisce Éireann Consultation

4.1.1 Masterplan Development

Confirmation of Feasibility Letter for Masterplan development (October 2022)

A pre-connection enquiry was submitted with a Confirmation of Feasibility (COF) letter received from Uisce Éireann on 21 October 2022. The COF, with CDS ref. no. CDS22004824, stated that the Masterplan development foul water connections were feasible subject to upgrades. The COF included provision for a multi/mixed use development of 1,293 units in total across Sites 4 & 5.

Uisce Éireann, as part of their COF, have instructed that both Sites 4 & 5 must connect to the foul water infrastructure on Cedar Brook Way / Cherry Orchard Green (previously named Barnville Park). In order to meet this connection strategy for both sites, Uisce Éireann have confirmed that it is acceptable for Site 4 to be served by a 300mm diameter trunk sewer laid at a gradient of 1/300.

The COF further advised that Uisce Éireann has a project underway which will provide the necessary upgrades and capacity to service the entirety of the Masterplan development. As part of these upgrades 106m of the existing 225mm diameter on Barnville Park is to be upsized to a 1050mm diameter tank sewer, in order to act as a storage tank during peak flow periods. The COF stated that it was expected that the upgrade project would be completed by Q1 2026.

The Phase 1A development of the Masterplan development has been permitted by Uisce Éireann to proceed in advance of these upgrade works and connects into the existing foul water network.

Confirmation of Feasibility Letter for Approved Phase 2 development (March 2024)

A pre-connection enquiry for the foul demands of the approved Phase 2 was issued to Uisce Éireann and a COF letter for this enquiry received from Uisce Éireann on 26 March 2024 (CDS ref. no. CDS24001410). The COF stated that the connection would be feasible subject to upgrades (the same upgrades mentioned in the masterplan COF with ref. no CDS22004824 discussed above). However, the upgrade project date of completion was updated from Q1 of 2026 to Q3 of 2028.

Uisce Éireann Consultation (June 2026)

In correspondence between Uisce Éireann and the LDA on 08 June 2026, Uisce Éireann confirmed that the planned upgrade works within the greater Cherry Orchard/Ballyfermot area (as illustrated on the map below) can be delivered independently of one another. Uisce Éireann also advised that upgrade works associated with Parcels 4 and 5 are currently anticipated to be ready for construction in late 2026. Parcel 4 relates to Site 4 and Parcel 5 relates to Site 5. This represents a significant advancement from previous advice, which indicated that these works may not be ready until as late as 2028. The foul water upgrade works will be completed in advance of the proposed developments construction.

Refer to the below Figure for details on the Uisce Éireann Parcels 4 and 5.

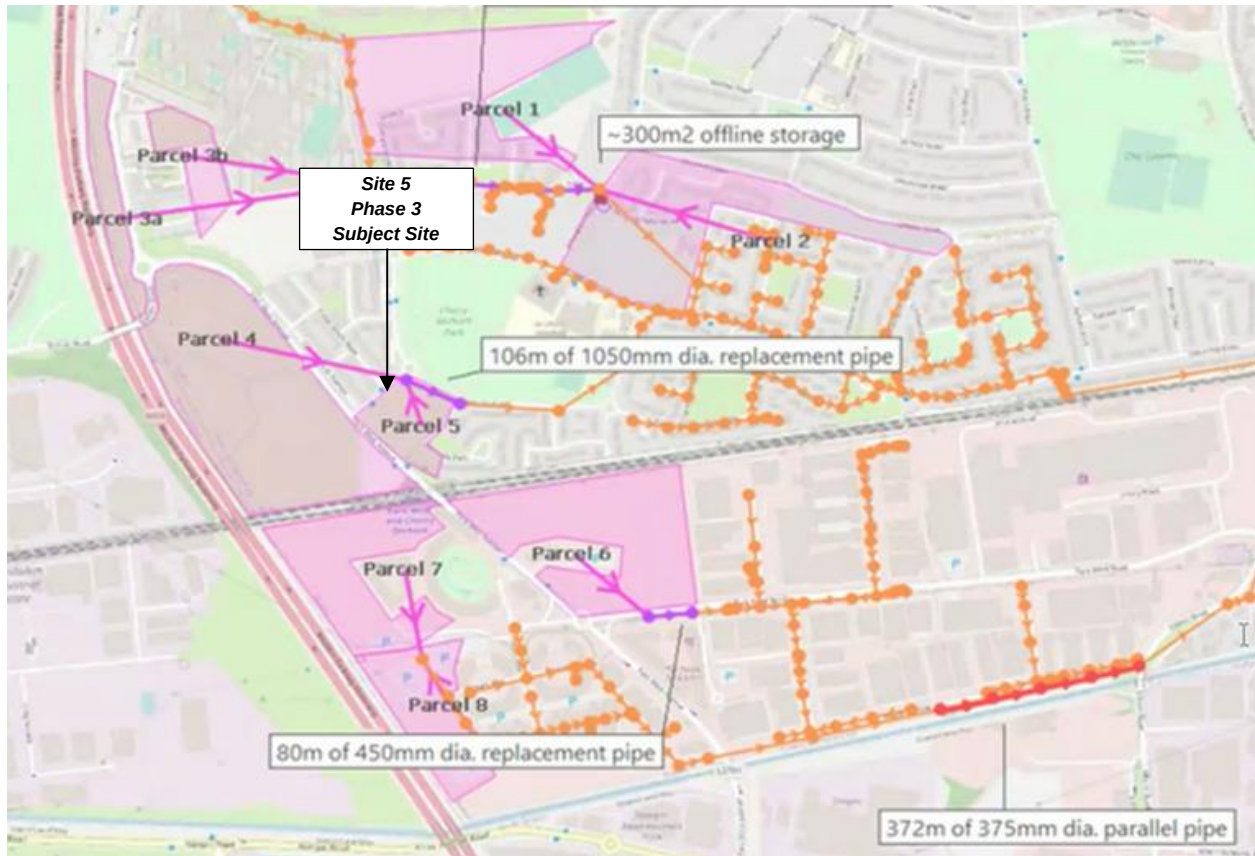


Figure 4-1: Uisce Éireann Upgrade Works Map

4.1.2 Subject Development

Confirmation of Feasibility Letter for Proposed Phase 3 development

A Pre-Connection Enquiry for the proposed Phase 3 development was submitted to Uisce Éireann on 04 June 2026. The enquiry included provision for 312 no. units and non-residential use corresponding to the schedule of accommodation at the time of submission.

The 05 August 2026 Confirmation of Feasibility, reference CDS26004704, confirms that the proposed foul water demand can be accommodated subject to completion of the planned public foul water network upgrades. Uisce Éireann's current programme indicates that the relevant upgrade works are scheduled for completion in early 2027, subject to change. The CoF further states that the connection point is to be confirmed at the Connection Application Stage.

4.2 Existing Foul Water Network

The Masterplan development has foul water infrastructure currently under construction as part of the Approved Phase 1 development works. As part of these works a 300mm diameter foul water outfall sewer is constructed within Cedar Brook Way connecting to the existing 225mm diameter public foul water network at the intersection of Cedar Brook Way and Cherry Orchard Green (previously named Barnville Park). This outfall has been constructed to facilitate the development on Site 4. An existing 225mm diameter foul water network is located to the south of the proposed development with Barnville Park, for which the development is proposed to connect into.

An illustration of the existing foul water infrastructure in the surrounding area, based on Uisce Éireann's network records, is provided in Figure 4-2 below.

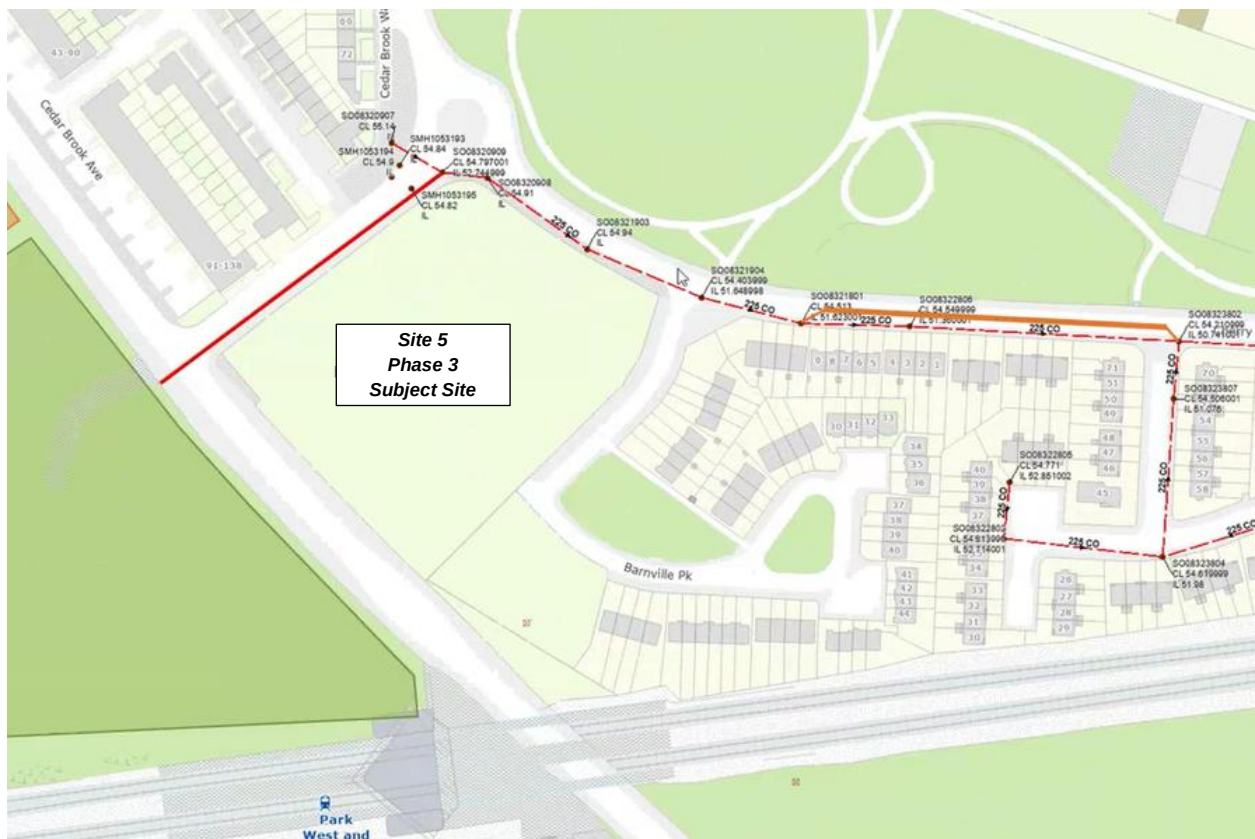


Figure 4-2: Existing Foul Water Infrastructure in the surrounding area - Uisce Éireann

An illustration of the existing foul water infrastructure in the immediate vicinity of the subject site is included in Figure 4-3 below.

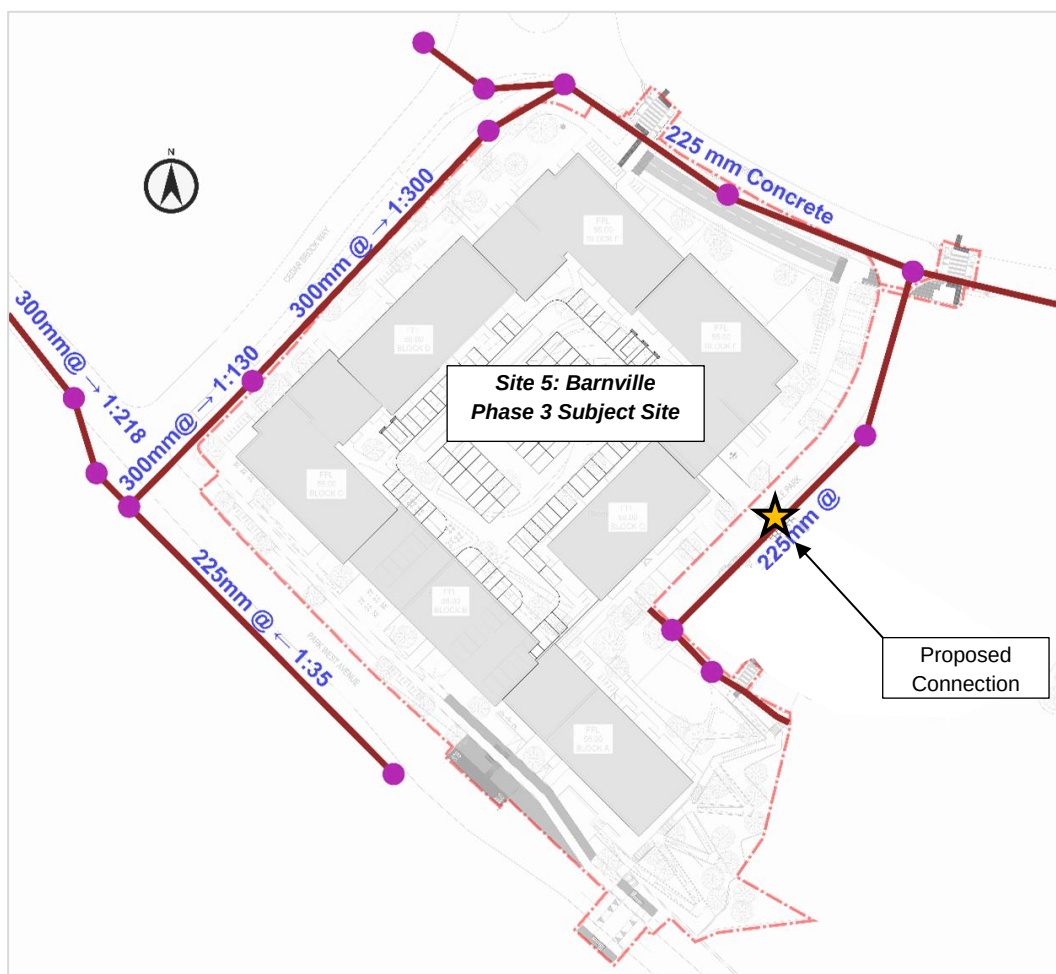


Figure 4-3: Existing Foul Water Infrastructure in immediate vicinity of the Subject Site

4.3 Proposed Foul Water Network

4.3.1 Masterplan Development

It is proposed for the masterplan development that Site 4 be drained via a series of 150mm and 225mm diameter sewers which will connect to a 300mm diameter trunk sewer in Cedar Brook Way. This trunk sewer connects into the existing 225mm diameter foul network at the intersection of Cedar Brook Way and Cherry Orchard Green (previously named Barnville Park).

Site 5, the Subject Site, is the subject of a separate detailed planning application and is currently proposed to be drained via a network of 150mm and 225mm diameter pipes with one 225mm outfall pipe to connect to the existing 225mm diameter foul network within Barnville Park, to the south to the proposed development.

All networks are proposed to drain by gravity, and there is no requirement for pumping of the proposed foul networks.

The proposed foul water drainage network is designed and sized in accordance with the Uisce Éireann Code of Practice for Wastewater Infrastructure and the Uisce Éireann Wastewater Infrastructure Standard Details.

4.3.2 Subject Development

As previously noted, Uisce Éireann has advised that it has a project underway which will provide the necessary upgrades and capacity for the masterplan lands and is scheduled for completion in early 2027.

It is proposed that the Phase 3 development will drain by gravity via a network of 150mm and 225mm diameter foul water sewers, which will connect to the existing foul water network to the south within Barnville Park via a new foul water manhole. The proposed outfall from the development comprises a 225mm diameter foul water sewer. The existing foul water invert at the proposed new connection is 53.006m.

The existing invert level of the public network at the proposed connection point **shall be confirmed** on site before construction commences.

This connection is not anticipated to be affected by the planned foul water network upgrades within Cherry Orchard Green, located to the east of the proposed development.

The foul water network design for the proposed Phase 3 development can be seen in Waterman Moylan Drawing No. COP-WMC-PH3-00-DR-P-0200 – Proposed Drainage Layout.

The Phase 3 subject site is proposed to connect to the existing foul water network indicated by a star in Figure 4-3, above.

4.4 Proposed Foul Water Calculations

4.4.1 Subject Development

The proposed Phase 3 development is proposed to be a mixed-use residential development with a total of 312 no. residential units and non-residential space. Domestic wastewater loads for all phases have been calculated based on 2.7 persons per unit with a per capita wastewater flow of 150 litres per head per day, as per Appendix C of the Uisce Éireann Code of Practice for Wastewater Infrastructure. A population equivalent (PE) of 1 PE per 50m² has been applied to the non-residential floor areas.

The flows have also incorporated a 10% infiltration allowance, in line with Section 3.6 of the Uisce Éireann Code of Practice for Wastewater Infrastructure.

Based on the Uisce Éireann Code of Practice for Wastewater Infrastructure, the subject development's foul water flows generated are outlined in Table 4-1: Calculation of Subject Development's Foul Water Flow Demand, below.

Table 4-1: Calculation of Subject Development's Foul Water Flow Demand

	Description	Total Population	Load per Capita	Daily Load	Total DWF	Peak Flow
		No. People	l/day	l/day	l/s	l/s
Phase 3	312 no. residential units	842	150	138,930	1.61	9.65
	2,065.50m ² non-residential uses	42	90	4,158	0.05	0.29
	Total				1.66	9.94

The total dry weather flow from the proposed Phase 3 development has been calculated as 1.66 l/s, with a peak flow of 9.94 l/s.

4.5 Foul Water Drainage – General

The proposed internal foul drainage network has been designed and sized in accordance with the Uisce Éireann Code of Practice for Wastewater Infrastructure and Standard Details. No private drainage will be located within public areas.

Drains will be laid to comply with the requirements of the latest Building Regulations, and in accordance with the recommendations contained in the Technical Guidance Document H of the Building Regulations (2016).

5. Surface Water Network

5.1 Dublin City Council Consultation

5.1.1 Masterplan Development

Meetings were held with the Drainage Department of Dublin City Council in 2022, 2023 and 2024 to agree the principles of the surface water drainage and Sustainable Drainage Systems (SuDS) strategy for the masterplan lands, with particular focus on the approved Phase 1 and Phase 2 developments, which are currently under construction.

It was agreed that the outflow rate be set at a maximum of 2 l/s/ha as per Dublin City Council requirements. This is in accordance with Dublin City Council's "SuDS Design and Evaluation Guide", which instructs in their Flow Control Discharge Limits Table (page 43), that the 1-in-100-year maximum outflow rate shall be limited to 2 l/s/ha.

5.1.2 Subject Development

The surface water strategy was developed in consultation with Dublin City Council and a preliminary surface water drainage and SuDS strategy for the proposed Phase 3 development was issued to the Drainage Division of Dublin City Council on 08 July 2026. The specialist designer blue and blue-green roof design supplied by AGB Geosynthetics was submitted to the Drainage Division on 16 July 2026 for review.

5.2 Site Conditions and Existing Surface Water Network

As discussed in Section 3.2 of this report, the GII Site Investigation Reports undertaken for the masterplan lands and the subject development indicate that the prevailing ground conditions are not conducive to achieving infiltration rates sufficient to support surface water management features that rely solely on infiltration.

However, localised infiltration as part of the SuDS strategy can be incorporated into the design where features such as engineered rain gardens, permeable paving, and bioretention tree pits are designed with appropriate underdrainage, overflow arrangements, and positive connections to the main surface water drainage network. Such features would provide partial infiltration where ground conditions permit, while ensuring that excess runoff is safely conveyed during larger rainfall events.

5.3 Surface Water Catchments & Allowable Discharge Rates

5.3.1 Masterplan Development

For stormwater management purposes, the Masterplan Lands (Site 4 and Site 5) have been divided into five separate catchments, as shown in Figure 5-1, below. As can be seen from the Figure, Site 4 consists of surface water Catchments 1A, 1B, 2, and 4.

The overall catchment area for the Subject Site, located on Site 5, has an approximately area of 1.61 ha and is indicatively shown in Figure 5-2. The subject site is further sub-divided into two catchments, namely, Catchment A and Catchment B. Details on these two catchments are discussed in the section to follow, Section 5.3.2.

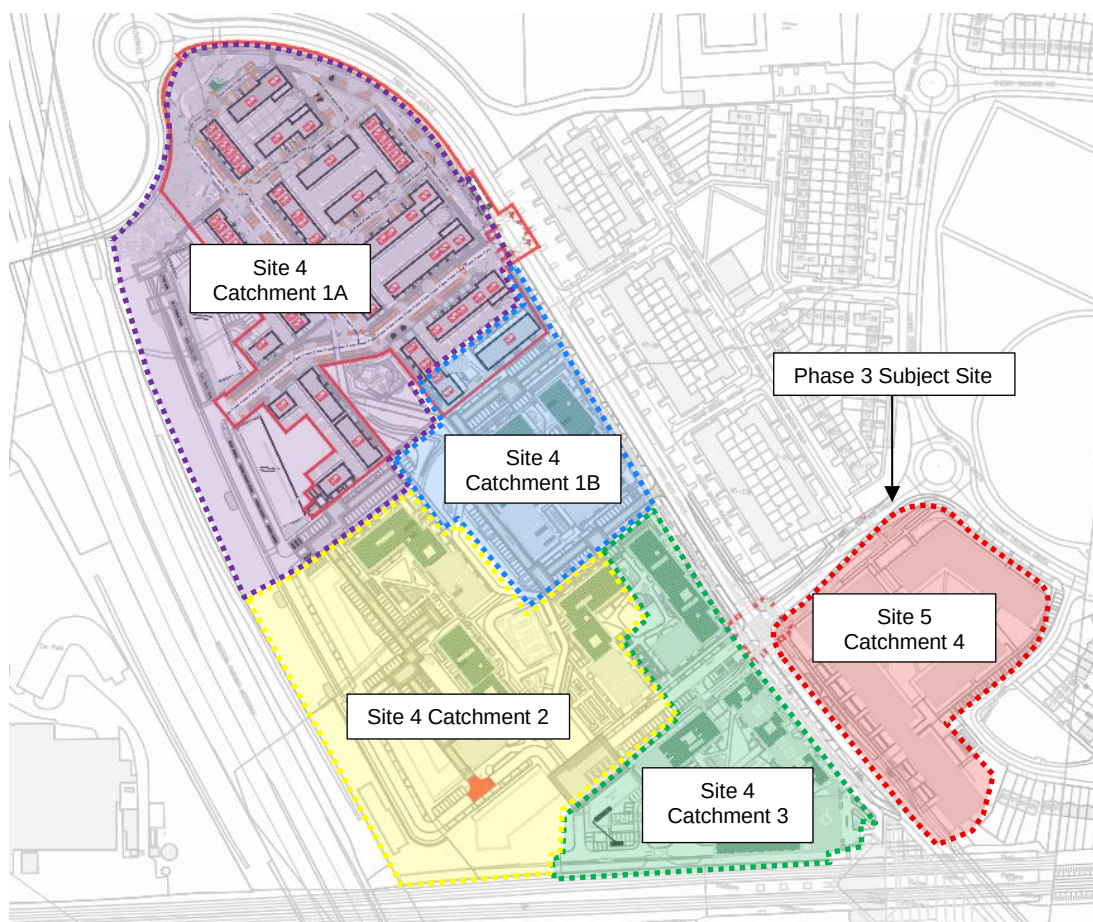


Figure 5-1: Indicative Layout of Surface Water Catchments on Site 4 and Site 5

In line with DCC requirements the attenuation calculations undertaken have limited the outflow rate to a maximum of 2.0 l/s/ha. This is in accordance with Dublin City Council's "SuDS Design and Evaluation Guide", which instructs in their Flow Control Discharge Limits Table (page 43), that the 1-in-100-year maximum outflow rate shall be limited to 2 l/s/ha.

The allowable outflow rate for each surface water catchment within the masterplan lands is shown in the below table.

Table 5-1: Allowable Outflow Rates for the Masterplan Lands Surface Water Catchments

Catchment	Location / Phases Included	Area (Ha)	Allowable Discharge Rate
Site 4			
Catchment 1A	North of Site 4	4.58 ha	8.60 l/s
Catchment 1B	Centrally-east of Site 4	1.36 ha	3.20 l/s
Catchment 2	South-west of Site 4	3.79 ha	7.55 l/s
Catchment 3	South of Site 4	1.67 ha	3.33 l/s
Site 5 (Subject Site)			
Catchment 4	Site 5	1.61 ha *	3.20 l/s

* The redline boundary of the proposed Phase 3 development is 1.72 ha; however, the effective surface water catchment for the proposed development is 1.61 ha.

5.3.2 Subject Development

The proposed Phase 3 development is divided into two principal surface water catchments. Catchment A discharges to the existing 225mm diameter surface water sewer within Park West Avenue at the northwest of the site. Catchment B discharges to the proposed 300mm diameter surface water sewer, which comprises the relocated section of the existing 300mm diameter surface water sewer currently located beneath the parking bays along Barnville Park, with the ultimate outfall connection point of Catchment B into the public network is at the existing 450mm surface water network in Cherry Orchard Green, to the east of the subject site.

Each surface water sub-catchment will collect, attenuation, and restrict surface water runoff to the required allowable outfall rate, 2 l/s/ha, with a flow control device proposed at each sub-catchment outfall location. Refer to Figure 5-2 below which illustrates the proposed surface water catchments and outfall locations for each catchment within the proposed Phase 3 development. Catchment A is shown in green while Catchment B is shown in purple.



Figure 5-2: Subject Site Surface Water Sub-Catchments

The allowable outflow rate for each surface water sub-catchment within the proposed Phase 3 development is shown in the below table.

Table 5-2: Allowable Outflow Rates for the Subject Development

Catchment	Area of Catchment (m ²)	Allowable Discharge Rate (rounded up to nearest decimal)
Catchment A	2,640	0.5 l/s
Catchment B	13,430	2.7 l/s
Total	16,070	3.20 l/s

Storm water from each catchment will be attenuated and discharge at a controlled rate, limited to a maximum of 2 l/s/ha, to ultimately outfall to the existing surface water networks at Park West Avenue and Cherry Orchard Green.

5.4 Proposed Surface Water Network Design

The proposed Phase 3 surface water drainage network comprises an internal drainage network within the building undercroft parking area, located between the proposed building cores/blocks, together with an external surface water drainage network surrounding the building. The external surface water drainage network is designed to collect and convey runoff from the emergency roof overflows, proposed hardstanding areas, and landscaped open spaces.

The proposed networks will consist of surface water pipe diameters ranging from 225 mm to 300 mm. The proposed drainage strategy has been developed to generally follow the finished site levels, with each network independently conveying runoff to a dedicated outfall connection.

The proposed undercroft drainage network design can be seen in Waterman Moylan Drawing No. COP-WMC-PH3-00-DR-C-P0201 - Proposed Undercroft Drainage Layout and the proposed drainage network design can be seen in Waterman Moylan Drawing No. COP-WMC-PH3-00-DR-C-P0200 - Draft Proposed Drainage Layout, both of which are submitted as part of this planning application.

Surface water runoff from the proposed development will be managed using a SuDS treatment train comprising blue roofs, swales, bioretention tree pits, permeable paving, an above ground detention basin with below ground stone void storage, and rain gardens. These SuDS measures provide both attenuation storage and water quality treatment prior to runoff entering the piped drainage network.

The attenuated runoff from each drainage network will subsequently pass through a dedicated flow control chamber incorporating an orifice plate to restrict the discharge to the permitted discharge rate for each surface water sub-catchment before discharging to the public surface water sewer network.

The proposed outfall arrangements are summarised below:

- Catchment A discharges to the existing 225mm diameter public surface water sewer located in Park West Avenue via a 225mm diameter pipe.
- Catchment B discharges to a 300mm diameter surface water sewer (relocated existing sewer) located along the northern boundary of Barnville Park, to the south of the subject site. The ultimate outfall for the Catchment B is a connection to the existing 450 mm diameter surface water sewer located within Cherry Orchard Green, to the east of the subject site.

Hydraulic analysis of the proposed surface water drainage network has been undertaken using a Causeway FLOW model. Pipe sizes, gradients and attenuation requirements have been determined based on runoff generated from roofs, roads, parking areas, landscaped areas and other impermeable surfaces.

Surface water drainage from private areas such as the proposed buildings roofs and podium and the defensible space surrounding the proposed building will be kept separate from the proposed network serving public areas as far as practicable before discharging into the catchment outfall.

Strict separation of surface water and foul water drainage will be maintained throughout the development. All proposed surface water drainage infrastructure and SuDS features have been designed in accordance with the Greater Dublin Regional Code of Practice for Drainage Works (Version 6.0), the Dublin City Council SuDS Design and Evaluation Guide, the Dublin City Council Green and Blue Roof Guide, CIRIA C753 – The SuDS Manual, Technical Guidance Document H of the Building Regulations, and the Greater Dublin Strategic Drainage Study (GSDSDS).

5.5 Proposed Surface Water Attenuation Storage

5.5.1 Climate Change Allowance

The surface water drainage design has been undertaken in accordance with the Greater Dublin Strategic Drainage Study (GSDSDS), which recommends a 20% climate change allowance for the 1-in-100-year rainfall event. However, according to the Environmental Engineers, AWN Consultancy, within the Design Team for the Proposed Phase 3 development, more recent climate projections for Ireland, including outputs derived from CMIP5-based datasets (e.g. TRANSLATE, 2023), indicate potential increases in extreme short-duration rainfall events in the order of approximately 26% to 40% over the mid- to late-century period.

The 30% allowance provides a precautionary and proportionate uplift on the GSDSDS 20% requirement, reflecting more recent prejections of a 26-40% increase in extreme short-duration rainfall and providing additional resilience against future climate uncertainty. Refer to the Environmental Engineers' reports for a detailed explanation of the basis for adopting the 30% climate change allowance for the proposed development.

In this context, and in line with a precautionary approach to climate resilience, an increased climate change allowance to a total of 30% has been considered within the assessment. This uplift is intended to provide additional robustness in accounting for uncertainty in future rainfall intensity and to ensure the long-term performance of the drainage infrastructure under projected climate conditions.

Accordingly, the proposed on-site surface water drainage network and associated SuDS features have been designed to accommodate the 1-in-100-year rainfall event, including a 30% allowance for climate change in accordance with the Greater Dublin Strategic Drainage Study (GSDSDS), together with a further 10% climate change uplift in accordance with AWN's recommendation.

5.5.2 Rainfall Data

The hydrological modelling for the proposed Phase 3 development has been undertaken using FLOW (Causeway) software, which is widely recognised as an industry-standard hydraulic modelling package. The rainfall analysis within the model has been based on the Flood Studies Report (FSR) rainfall methodology, with a runoff coefficient (Cv) of 1.0 applied to both summer and winter rainfall events to provide a conservative assessment of runoff. Figure 5-3 below presents a screenshot from the model illustrating the rainfall parameters adopted.

Rainfall Methodology	FSR	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
Rainfall Events	Singular	100	30	0	0
FSR Region	Scotland & Ireland				
M5-60 (mm)	16.600				
Ratio-R	0.276				
Summer CV	☒ 1.000				
Winter CV	☒ 1.000				
Analysis Speed	Normal				

Figure 5-3: FLOW Model Rainfall Parameters

5.5.3 Required Surface Water Attenuation Volumes

A breakdown of the required and provided attenuation storage volumes for each surface water catchment is included in the table below. Required attenuation storage for each catchment, as mentioned, is calculated using the industry standard software, FLOW (Causeway). Refer to Appendix B of this report for a copy of the FLOW model for the Subject Site.

It should be noted that the attenuation storage reported by the hydraulic model represents the activated (or utilised) storage volume required within a SuDS feature during the design storm event. This differs from the total storage capacity physically provided by the SuDS feature, which reflects the maximum available storage volume. As a result, the activated storage identified by the hydraulic model is typically less than the total storage capacity provided, with the remaining volume acting as additional resilience and accommodating uncertainties associated with future operational conditions or more extreme rainfall events.

Refer to Table 5-3 below for a summary of the required (activated) and overall provided attenuation storage for the proposed Phase 3 development.

Table 5-3: Required and Provided Attenuation Storage for the Subject Development

Catchment	Area (m ²)	Attenuation Storage Volume	
		Required & Activated (m ³)	Provided (m ³)
Catchment A	2,640	208	226
Catchment B	13,430	1,353	1,474
Site 5 Total	16,070 m ²	1,561 m ³	1,700 m ³

As can be seen from the above table, each sub-catchment has been designed to provide above the attenuation storage requirement.

A total of 1,561m³ of surface water storage is required for the proposed Phase 3 development with a total of 1,700m³ storage provided using various nature-based sustainable urban drainage systems. The additional

The provided attenuation storage for Site 5 is considered acceptable as it meets the required volume of storage of 1,561m³ with the remaining volume of 139m³ acting as additional resilience and accommodating uncertainties associated with future operational conditions or more extreme rainfall events.

These calculations are based on the 1-in-100-year extreme storm event with 30% climate change allowance.

5.5.4 Blue and Blue-Green Roof Specialist Design

The attenuation calculations presented above for the proposed surface water drainage network and SuDS features, including the blue and blue-green roofs, provide an accurate assessment of the development's overall surface water attenuation requirements. However, the hydraulic performance of the blue and blue-green roof systems must be modelled and verified by a specialist designer using project-specific design software. As a result, the detailed blue and blue-green roof modelling may differ from the indicative FLOW model outputs presented herein, while still achieving the required overall attenuation performance for the development.

The specialist design has been undertaken by ABG Ltd. Creative Geosynthetic Engineering for the blue and blue-green roofs. Refer to Appendix C for copies of the design calculations for each roof and the podium level drainage board.

A summary of the design calculations is included below:

Table 5-4: ABG Ltd. - Blue & Blue-Green Roof Calculations

Block	Roof Type	Catchment (m ²)	Attenuation (m ²)	System Depth (mm)	Storage (m ³)	Discharge Rate (l/s)
A	Blue-Green	523	450	180	72	0.18
A	Blue	232	190	180	30.4	0.12
B	Blue-Green	507	435	180	69.6	0.18
B	Blue	296	240	180	38.4	0.12
C	Blue-Green	610	530	180	84.8	0.23
C	Blue	237	195	180	31.2	0.12
D	Blue-Green	676	600	180	96	0.23
E	Blue-Green	620	530	180	84.8	0.23
E	Blue	244	195	180	31.2	0.12
F	Blue-Green	627	530	208	101.76	0.18
F	Blue	312	245	180	39.2	0.12
G	Blue-Green	600	520	208	99.84	0.18
Podium		3290	3000	208	576	0.66
Total		8774	7660		1355.2	2.67

As per the above table, the proposed blue and blue-green roof systems are designed with storage depths ranging from 180 mm to 208 mm, a void ratio of 95%, and a maximum half-empty time of 24 hours. The podium drainage board is designed with a storage depth of 208 mm, a void ratio of 95%, and a maximum half-empty time of 48 hours.

The longer half-empty time associated with the podium drainage board results from restricting the discharge to 0.66 l/s, corresponding to the allowable discharge rate of 2 l/s/ha, thereby maximising attenuation while maintaining compliance with the site discharge criteria. It should be noted that, in order to maintain this discharge rate, the blue and blue-green roof systems provide attenuation storage in excess of the minimum volume required. For example, the podium requires 358.1 m³ of attenuation storage based on the drainage design but provides approximately 576 m³, representing an increase of approximately 61% above the required volume.

As such, an appropriate balance should ultimately be achieved between the attenuation volume provided and the corresponding half-empty time, which is reliant upon the allowable discharge rate.

The specialist blue and blue-green roof design was submitted to the Drainage Department of DCC for review in July 2026.

5.6 Proposed SuDS Design

5.6.1 Sustainable Urban Drainage Systems (SUDS)

The Council's SuDS Design & Evaluation Guide advises that: *"Sustainable Drainage or SuDS is a way of managing rainfall that minimises the negative impacts on the quantity and quality of runoff while maximising the benefits of amenity and biodiversity for people and the environment."* These Sustainable Drainage System (SuDS) are considered a collection of water management practices that aim to align modern drainage systems with natural water processes.

SuDS facilities are designed to prevent pollution of streams and rivers and to slow down runoff from sites, therefore helping to prevent downstream flooding and improve water quality. This closely mimics natural catchment behaviour where rainfall either infiltrates through the soil or runs off slowly over the ground surface to the nearest watercourse. This is known as the "treatment train" approach. SuDS devices should be placed at source, site, and regional levels. SuDS can also provide amenity benefits to local communities and benefits for biodiversity simultaneously.

Dublin City Council's Development Plan (2022-2028) has identified SuDS as the preferred method of managing rainfall from new developments. The proposed SuDS for the subject application have been incorporated and designed in accordance with Dublin City Council's SuDS Design and Evaluation Guide.

In the following sections of the assessment report, it will be outlined in detail how SuDS devices have been utilised and incorporated as an integral part of the overall plan for the proposed development, and how their inclusion will mitigate the risk of localised and downstream flooding, while also promoting residential amenity and biodiversity.

The proposed SuDS measures have been assessed for suitability, designed, and incorporated in accordance with CIRIA Report C753 The SuDS Manual, Dublin City Council's SuDS Property Level Guide (2023), and Dublin City Council's SuDS Design and Evaluation Guide, and Green & Blue Roof Guide, in order to develop a nature-based approach to surface water management for the proposed development.

5.6.2 Subject Development's Proposed SUDS

The following SuDS features are proposed for the proposed Phase 3 development:

- Permeable surfacing/paving at open green space hardstanding areas and for all parking bays;
- Blue and blue green roof systems at roof and podium level;
- Bio-retention rain gardens in private (defensible spaces) and public areas (open green space);
- Bio-retention tree pit systems in public areas between parking spaces and adjacent to public footpaths;
- An above ground detention basin with below ground stone void storage within an open green space area.

Surface water runoff from private and public areas will be kept separate before connecting into the outfall location proposed for each surface water sub-catchment.

The SuDS layout that is included in the design of the Phase 3 development can be seen in Figure 5-4, below.



Figure 5-4: Indicative SuDS Layout for the Proposed Phase 3 Development

In accordance with the CIRIA SuDS Manual (C753), the proposed drainage strategy adopts the principles of the SuDS management train or “treatment train” by incorporating a range of interconnected SuDS features throughout the development. These features collectively provide runoff control, attenuation, water quality treatment and conveyance, with each component contributing to the overall performance of the drainage system.

The treatment train is typically described in three stages:

- *Source Control* – managing runoff as close to source as possible (e.g. green blue roofs, permeable paving, rain gardens, bio-retention systems)
- *Site Control* – managing runoff from larger areas (e.g. swales, detention basins, ponds).
- *Regional Control* – managing runoff from multiple sites or catchments (e.g. wetlands, large attenuation ponds).

The proposed drainage strategy adopts a source control approach throughout the development, with runoff managed as close as practicable to where it is generated through the use of distributed SuDS features. This approach aligns with the management train principles set out in the CIRIA SuDS Manual (C753) and represents current best practice in sustainable surface water management.

The SuDS features proposed at each treatment train stage are discussed below.

5.6.3 Source Control

Blue and Blue Green Roofs

Blue roofs are roof-based attenuation systems designed to temporarily store rainfall at roof level and release it at a controlled rate to the downstream drainage network. By attenuating runoff at source, blue roofs reduce peak discharge rates, lower downstream attenuation requirements, and contribute to the overall SuDS strategy.

A total blue roof area of 1,065 m² is proposed over the net roof area of all blocks and a blue drainage board is proposed at podium level covering a total area of 3000 m².

Blue-green roofs combine the temporary attenuation function of a blue roof with the environmental benefits of a vegetated green roof. In addition to providing controlled storage and release of rainfall, blue-green roofs incorporate a growing medium and vegetation that promote interception, evapotranspiration, biodiversity, urban cooling, and water quality improvements, while reducing peak runoff rates.

A total blue-green roof area of 3,595 m² is proposed over the net roof area of all blocks.

The proposed building cores / blocks and podium level will attenuate the full surface water storage requirement for these hardstanding surfaces at roof and podium level.

Refer to Figure 5-6 for an extract of a blue-green roof buildup detail taken from the DCC Sustainable Drainage Design & Evaluation Guide (2021).

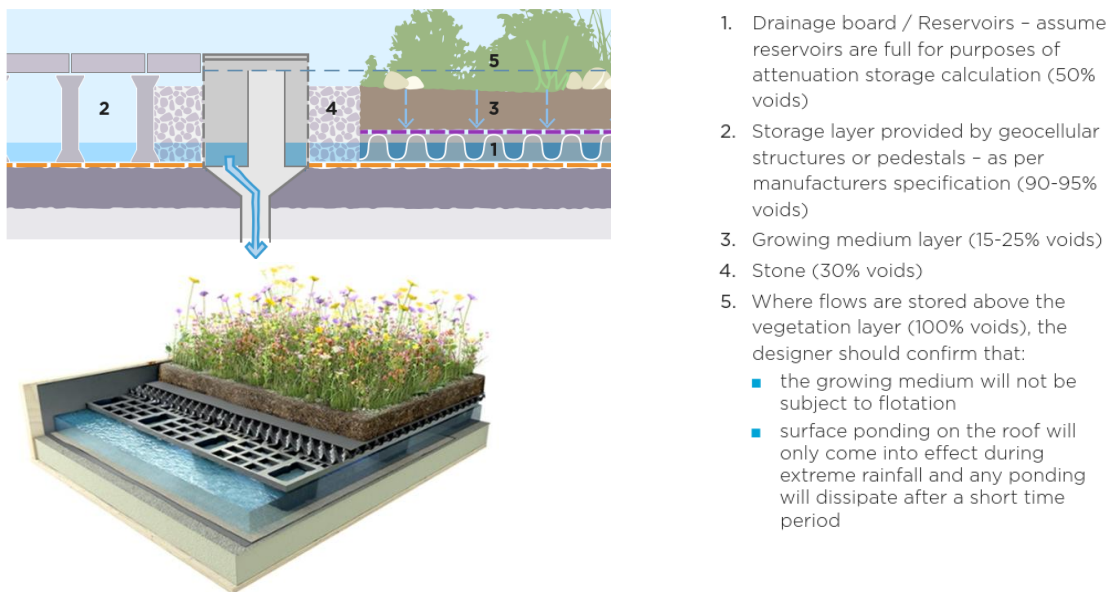


Figure 5-5: Typical Blue-Green Roof Buildup Details

Permeable Paving

It is proposed to introduce permeable paving below all parking spaces, cycle parking and strategically chosen hardstanding spaces within open green space areas.

The goal of permeable paving is to control stormwater at the source to reduce runoff. In addition to reducing surface runoff, permeable paving has the dual benefit of improving water quality by trapping suspended solids and filtering pollutants in the substrata layers.

Refer to Figure 5-6 for an extract of a permeable paving buildup detail and installed permeable paving taken from the DCC Sustainable Drainage Design & Evaluation Guide (2021).

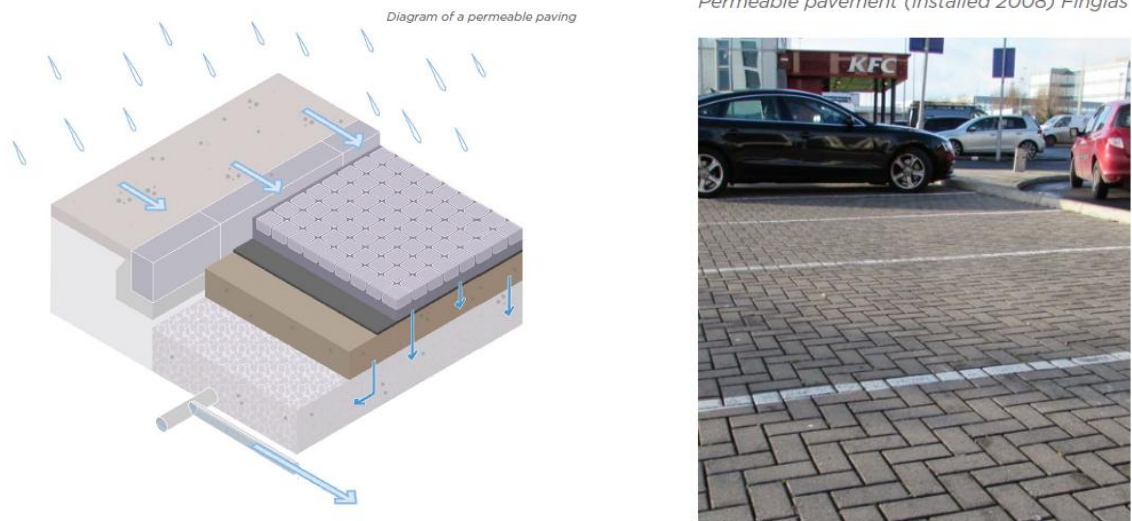


Figure 5-6: Illustration of Permeable Paving Buildup and Installation

Bio-retention Tree Pits

It is proposed to provide roadside bio-retention tree pits and tree pits adjacent to hardstanding areas such as public footpaths and cycle tracks throughout the development. Trees can help control storm water runoff because their leaves, stems, and roots slow rain from reaching the ground and capture and store rainfall to be released later. Trees help to attenuate flows, trap silts and pollutants, promote infiltration, and prevent erosion. Incorporating tree planting offers multiple benefits, including attractive planting features, improved air quality and increased biodiversity whilst helping to ensure adaptation to climate change.

Refer to Figure 5-7 for an extract of a tree pit buildup detail and an installed roadside tree pit taken from the DCC Sustainable Drainage Design & Evaluation Guide (2021).



Figure 5-7: Illustration of SuDS Tree Pit Buildup Detail and Installation

Bio-retention Raingarden Systems

Bio-retention planted areas are proposed within the subject site adjacent to the building footprint within defensive areas and within the open green space area on the south of the proposed development.

The bio-retention rain gardens adjacent to the building will intercept, collect, treat, and slow runoff from adjacent private hardstanding areas and may also collect runoff from emergency overflow pipes from the roofs. The bio-retention rain gardens in open green space areas will collect surface water runoff from adjacent public hardstanding areas such as footpaths and green areas.

Refer to Figure 5-8 for an extract of a rain garden detail taken from the DCC Sustainable Drainage Design & Evaluation Guide (2021).

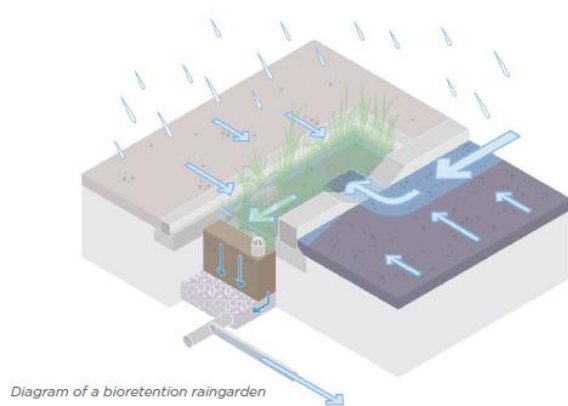


Figure 5-8: Illustration of Rain Garden Buildup Detail and Installation

5.6.4 Site Control

Detention Basin

A landscaped surface storage feature that temporarily attenuates stormwater runoff and releases it at a controlled rate, reducing peak flows to the receiving drainage network. In addition to their hydraulic function, detention basins provide a range of wider SuDS benefits. They encourage settlement of suspended sediments and associated pollutants, improving the quality of runoff prior to discharge. Where appropriately landscaped, they can create valuable habitat, enhance biodiversity, and contribute to the ecological value of the development. Detention basins also provide visual amenity by integrating drainage infrastructure into open green spaces, offering an attractive landscape feature rather than relying solely on below-ground infrastructure.

The detention basin is proposed to collect runoff from the surrounding green space area and public footpaths proposed on the south of the development. The basin is designed with a below ground stone void area that will assist with temporary attenuation storage during storm events.

Refer to Figure 5-9 for an extract of a rain garden detail taken from the Department of Housing, Local Government and Heritage (2022), Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas.



A well-established and well-maintained detention basin adds amenity (The Way, Citywest Avenue, Citywest, Dublin 24)

Figure 5-9: Image of a Detention Basin in Dublin 24

Petrol Interceptor

A petrol interceptor provides water quality treatment by removing hydrocarbons and other light liquid pollutants from surface water runoff prior to discharge, reducing the risk of pollution to downstream drainage infrastructure and receiving waters. It is typically provided where runoff is generated from areas with a heightened risk of hydrocarbon contamination, such as vehicle parking and service areas.

The site is proposed to include blue and blue-green roof systems, bio-retention rain gardens, bio-retention tree pits, permeable paving, and a detention basin with below ground stone void storage. If required by the Local Authority, the additional of petrol interceptors can be included in the design, installed upstream of the catchment outfalls.

5.6.5 SuDS Maintenance Regime

Surface SuDS features can typically be maintained as part of the regular maintenance of the landscape, incorporating litter picking, grass cutting, and inspections. Figure 5-10: Regular Maintenance Requirements for SuDS, is an extract taken from Section 12.3 of the SuDS Design & Evaluation Guide and generally describes the regular maintenance aspect for the SuDS.

Type	Activity	Normal site care (Site) or SuDS-specific maintenance (SuDS)	Suggested frequency
Regular Maintenance			
Litter	Pick up all litter in SUDS Landscape areas along with remainder of the site – remove from site	Site	1 visit monthly
Grass	Mow all grass verges, paths and amenity grass at 35-50mm with 75mm max. Leaving cuttings in situ	Site	As required or 1 visit monthly
Grass	Mow all dry swales, dry SUDS basins and margins to low flow channels and other SUDS features at 100mm with 150mm max. Cut wet swales or basins annually as wildflower areas – 1st and last cuts to be collected	Site	4-8 visits per year or as required
Grass	Wildflower areas strimmed to 100mm in Sept or at end of school holidays – all cuttings removed Or Wildflower areas strimmed to 100mm on 3 year rotation – 30% each year – all cuttings removed	Site	1 visit annually 1 visit annually
Inlets & outlets	Inspect monthly, remove silt from slab aprons and debris. Strim 1m round for access	SuDS	1 visit monthly
Permeable paving	Sweep all paving regularly to keep surface tidy	Site	1 visit annually or as required

Figure 5-10: Regular Maintenance Requirements for SuDS

There will still be a remaining requirement for more intensive maintenance tasks to be undertaken however, the severity of these tasks can be reduced by regular inspections and proactive responses being incorporated as a part of the regular maintenance regime discussed above. A table showing the typical requirements for the occasional maintenance tasks and remedial works is extracted from the SuDS Design & Evaluation Guide to Figure 5-11: Further Maintenance Requirements for SuDS.

Occasional Tasks			
Permeable paving	Sweep and suction brush permeable paving when ponding occurs	SuDS	As required - estimate 10-15 year intervals
Flow controls	Annual inspection of control chambers - remove silt and check free flow	SuDS	1 visit annually
Wetland & pond	Wetland vegetation to be cut at 100mm on 3 - 5 year rotation or 30% each year. All cuttings to be removed to wildlife piles or from site.	Site	As required
Silt	Inspect swales, ponds, wetlands annually for silt accumulation	Site & SuDS	1 visit annually
Silt	Excavate silt, stack and dry within 10m of the SuDS feature, but outside the design profile where water flows. Spread, rake and overseed.	Site & SuDS	As required
Native planting	Remove lower branches where necessary to ensure good ground cover to protect soil profile from erosion.	SuDS	1 visit annually
Remedial Work			
General SuDS	Inspect SuDS system to check for damage or failure when carrying out other tasks. Undertake remedial work as required.	SuDS	Monthly As required

Figure 5-11: Further Maintenance Requirements for SuDS

Further to the above extracts on SuDS maintenance requirements, maintenance schedules for the particular SuDS features proposed within the Phase 3 development, bio-retention rain gardens, bio-retention tree pits, permeable paving, and a detention basin with below ground stone void storage have been sourced from The SuDS Manual (CIRIA C753) and summarised in the tables to follow.

The maintenance requirements for blue and blue-green roofs are supplied by the specialist designer of these SuDS features. Refer to Appendix D of this report for a copy of the General Maintenance Blue Roof Systems guide supplied by ABG Ltd.

Table 5-5: Hydro-brake Maintenance Schedule

	Maintenance Period	Maintenance Task	Frequency
Hydro-brake	Regular	Inspect for blockages (silt, debris, or rags)	Quarterly, or after major storm events
		Clean debris and sediment from around and within the unit	Quarterly, or as required
		Check for corrosion or physical damage	Quarterly
		Verify correct operation (flow restriction and bypass, if any)	Bi-annually
	Occasional	Full system inspection during low-flow periods	Annually, or as required
	Remedial actions	Repair or replace damaged components	As required
		Reseal or recoat to prevent corrosion (if applicable)	Every 5 years or as needed

Table 5-6: Permeable Surfacing / Pavement Maintenance Schedule

Permeable Surfacing	Maintenance Period	Maintenance Task	Frequency
	Regular	Brushing and vacuuming (standard cosmetic sweep over the whole surface)	Once a year, after autumn leaf fall, or as required, based on site specific observations of clogging or manufacturer's recommendations.
	Occasional	Removal of weeds	As required
	Remedial actions	Remediation work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users	As required
	Monitoring	Inspect silt accumulation rates and establish appropriate brushing frequencies. Monitor inspection chambers.	Annually

Table 5-7: Rain Gardens Maintenance Schedule

Rain Garden	Maintenance Period	Maintenance Task	Frequency
	Regular	Check operation of underdrains by inspection of flows after rain	Annually
	Regular	Remove litter and surface debris and weeds	As required
	Occasional	Replace any plants, to maintain planting density	As required
	Remedial actions	Infill any holes or scour in the filter medium, improve erosion protection if required	As required
	Monitoring	Remove and replace filter medium and vegetation above	As required

Table 5-8: Bio-Retention Tree Pit Maintenance Schedule

Bio-Retention Tree Pit	Maintenance Period	Maintenance Task	Frequency
	Regular	Remove the litter and debris	Monthly, or as required
		Cut grass – to retain height within specified design range.	Monthly (during growing season), or as required
		Manage other vegetation and remove nuisance plants.	Monthly at start, then as required
		Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
		Inspect infiltration coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
		Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
	Occasional	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required
	Remedial actions	Repair erosion or other damage by re-turfing or re-seeding	As required
		Re-level uneven surfaces and reinstate design levels	As required
		Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
		Remove and dispose of oils or petrol residues using safe standards practices	As required

Table 5-9: Detention Basin Maintenance Schedule

	Maintenance Period	Maintenance Task	Frequency
Attenuation Basin	Regular	Remove the litter and debris	Monthly
		Cut grass – for spillways and access routes	Monthly (during growing season), or as required
		Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
		Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
		Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
		Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Monthly (for first year), then annually or as required
		Check any penstocks and other mechanical devices	Annually
		Tidy all dead growth before start of growing season	Annually
		Remove sediment from inlets, outlet and forebay	Annually (or as required)
		Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
	Occasional	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required
		Prune and trim any trees and remove cuttings	Every 2 years, or as required
		Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required
	Remedial actions	Repair erosion or other damage by re-turfing or re-seeding	As required
		Realignment of rip-rap	As required
		Repair/rehabilitation of inlets, outlets and overflows	As required
		Relevel uneven surfaces and reinstate design levels	As required

5.7 Surface Water – General

Surface water sewers will generally consist of PVC (to IS 123) or concrete socket and spigot pipes (to IS 6) and laid strictly in accordance with Dublin City Council requirements for taking in charge. It is intended that all sewers within the public domain will be handed over to Dublin City Council for taking in charge.

All private outfall manholes will be built in accordance with the Greater Dublin Regional Code of Practice for Drainage Works (V6.0). No private drainage will be located within public areas.

Drains will be laid in accordance with the requirements Technical Guidance Document H of the Building Regulations (2016).

5.8 Flood Risk Assessment

A site-specific Flood Risk Assessment has been carried out for the proposed Phase 3 development and accompanies this submission under a separate cover.

6. Water Supply

6.1 Uisce Éireann Consultation

6.1.1 Masterplan Development

Confirmation of Feasibility Letter for Masterplan development (October 2022)

A Pre-Connection Enquiry (PCE) was submitted with a Confirmation of Feasibility (COF) letter received from Uisce Éireann on 21 October 2022. The COF, with CDS ref. no. CDS22004824, stated that the masterplan developments water supply and connections were feasible without required upgrades. The COF included provision for a multi/mixed use development of 1,293 units in total. The following was stated within the COF letter:

“Water Connection – Feasible without infrastructure upgrade by Uisce Éireann

Site 4 is to be connected (Via a new 200mm connection main) to the existing 300mm ductile iron spur off of the 450mm DI Trunk Main in Park West Avenue opposite the Cherry Orchard Green junction (Purple line in mapping below). A new DMA will be required here with a minimum 200mm spine main within the development. Metering and telemetry will be required at this new connection.”

Refer to Appendix A for a copy of the masterplan lands Uisce Éireann COF Letter.

6.1.2 Subject Development

Confirmation of Feasibility Letter for Subject Development (awaited)

A pre-connection enquiry for the proposed Phase 3 development was issued to Uisce Éireann on 19 February 2026. The enquiry included provision for 300 no. units corresponding to the schedule of accommodation at the time. The reference number associated with this submission is CDS26001527. No COF letter has been received for this submission by Uisce Éireann.

A Confirmation of Feasibility (CoF), dated 14 July 2026, was subsequently received confirming that the proposed water demand can be accommodated without the need for infrastructure upgrades. The relevant Uisce Éireann reference for this enquiry is CDS26001527. A copy of the CoF is included in Appendix A of this report.

An updated pre-connection enquiry for the proposed Phase 3 development was issued to Uisce Éireann on 04 June 2026. The enquiry included provision for 312 no. units and commercial space corresponding to the schedule of accommodation at the time of submission. The reference number associated with this submission is CDS26004704. A COF letter is awaited by Uisce Éireann.

6.2 Existing Water Supply

An illustration of the existing water supply infrastructure in the surrounding area, based on Uisce Éireann's network records, is provided in Figure 6-1 below.

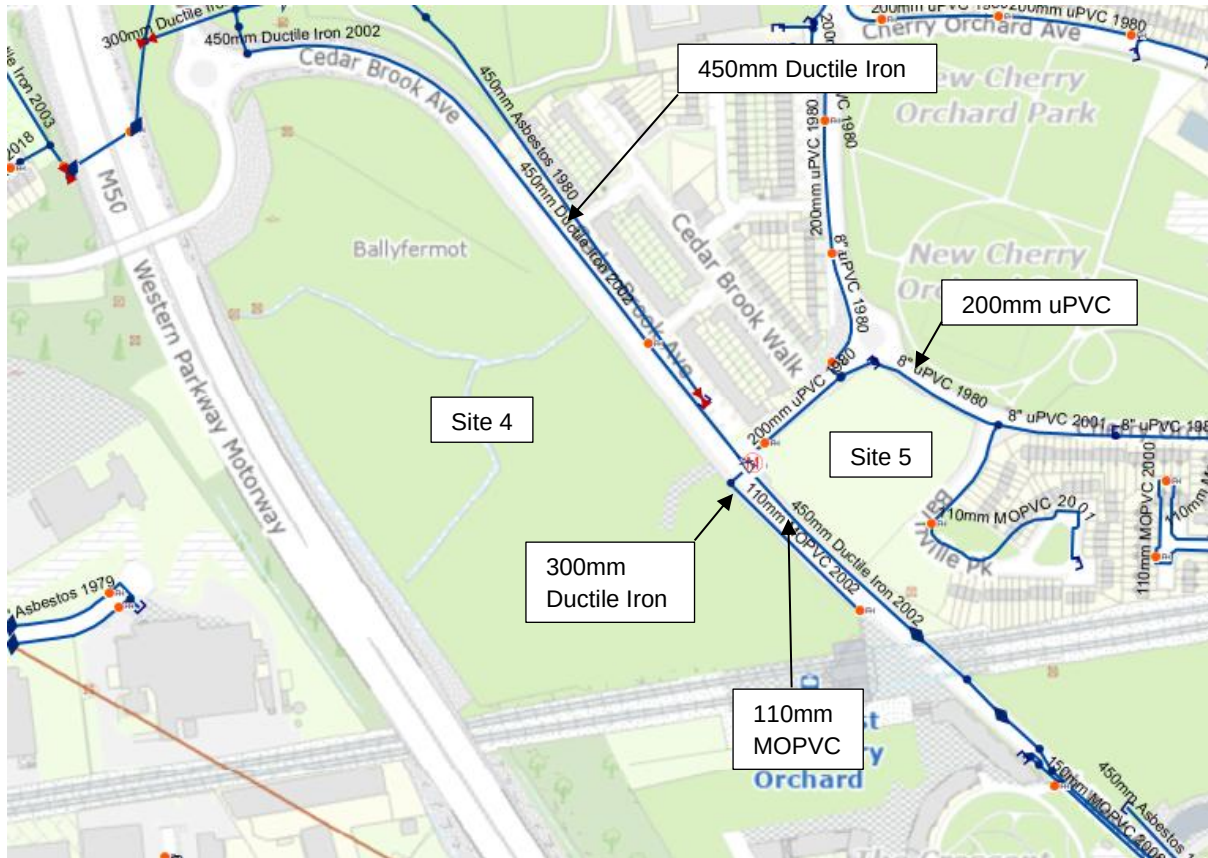


Figure 6-1: Existing Water Supply Infrastructure in the surrounding area - Uisce Éireann

An illustration of the existing water supply infrastructure in the immediate vicinity of the subject site is included in Figure 6-2 below.

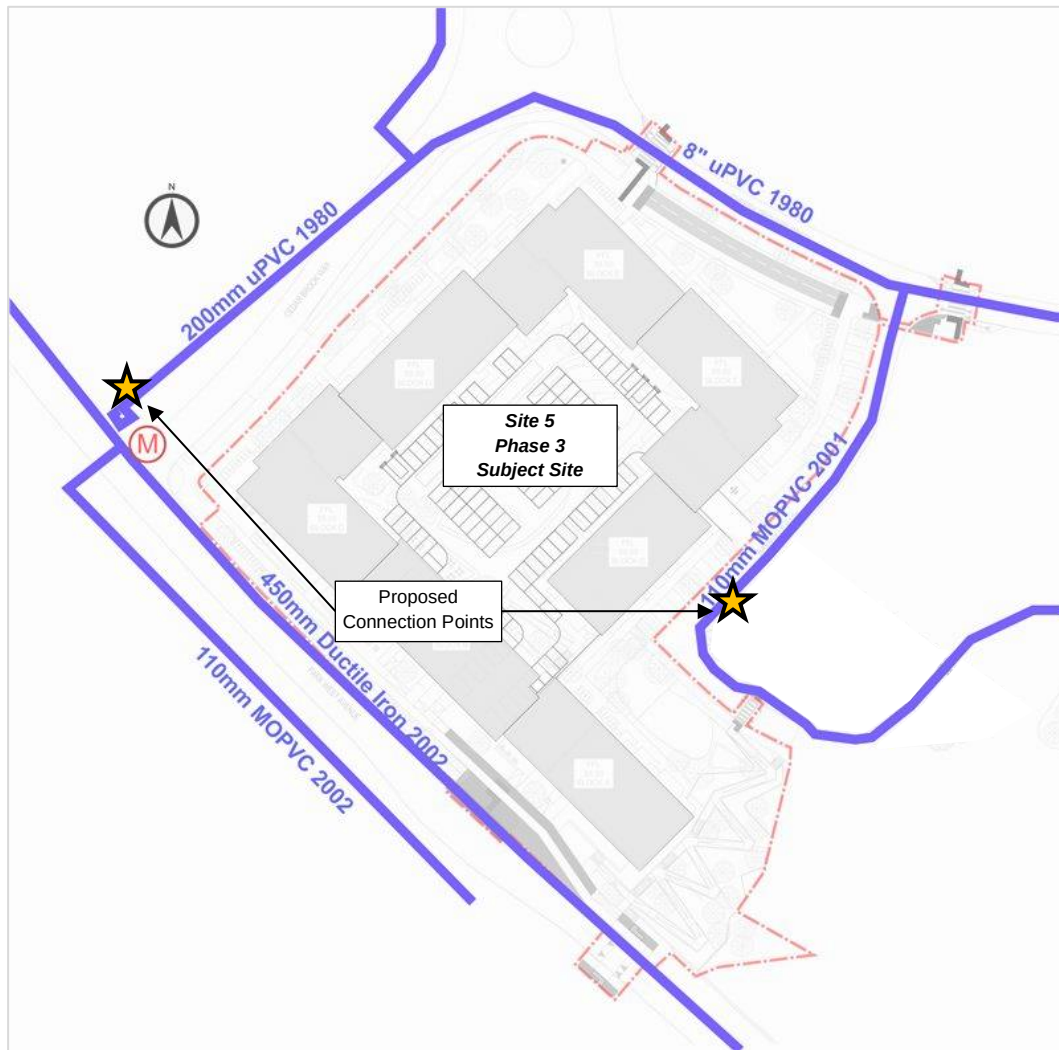


Figure 6-2: Existing Water Supply Infrastructure in immediate vicinity of the Subject Site

6.3 Proposed Water Supply

6.3.1 Masterplan Development

Site 4 will be served by two 200mm diameter connections to the existing 300mm diameter ductile iron watermain, as required by Uisce Éireann. Construction of the Site 4 watermain network is currently underway, with both connections to the existing public network already completed. Commissioning of the network is anticipated to be completed before January 2027. The proposed 200mm diameter watermain will follow the primary vehicular circulation route through the site and will be supplemented by a network of 150mm and 100mm diameter looped and branched watermains to provide adequate coverage and network resilience.

The water supply network proposed for Site 5 is discussed below.

6.3.2 Subject Development

The proposed water supply network within the subject site will comprise 100mm diameter looped watermains connected to the existing public water supply network at two locations. The first connection is

proposed at the north-western boundary of the subject site to the existing 450mm diameter ductile iron watermain within Park West Avenue, while the second connection is proposed at the southern boundary to the existing 110mm diameter MOPVC watermain within Barnville Park. Meters will be installed at connection points in line with Uisce Éireann requirements.

Refer to Figure 6-2 for an illustration of the two proposed connection points for the proposed Phase 3 development into the existing water supply infrastructure, represented by stars.

The water supply network will be designed in accordance with the Uisce Éireann Code of Practice for Water Infrastructure Rev 3 (August 2025) and Uisce Éireann Water-Standard-Details Rev 2 (July 2020).

6.4 Proposed Water Supply Calculations

6.4.1 Subject Development

The subject development is proposed to be a residential development with a total of 312 no. residential units. The average domestic demand has been established based on an average occupancy ratio of 2.7 persons per dwelling with a daily domestic per capita consumption of 165 litres per head per day, as per Appendix C of the Uisce Éireann Code of Practice for Water Infrastructure.

The average day/peak week demand has been taken as 1.25 times the average daily domestic demand, while the peak demand has been taken as 5 times the average day/peak week demand, as per Section 3.7.2 of the Uisce Éireann Code of Practice for Water Infrastructure.

Based on the Uisce Éireann Code of Practice for Water Infrastructure, the subject development's water supply demands are outlined in Table 6-1, below.

Table 6-1: Calculation of Subject Development's Water Demand

	Description	Total Population	Water demand	Average Demand	Average Peak Demand	Peak Demand
		No. People	l/day	l/s	l/s	l/s
Phase 3	312 no. residential units	842	126,300	1.46	1.83	9.13
	2,065.50m ² non-residential uses	42	3,780	0.04	0.05	0.25
	Total				1.88	9.38

The average demand for water supply from the proposed Phase 3 development is 1.88 l/s, with a peak demand of 9.38 l/s.

6.5 Water Supply – General

All watermains will be laid strictly in accordance with Uisce Éireann requirements for taking in charge as per the Uisce Éireann Code of Practice for Water Infrastructure (August 2025, Revision 3) and the Uisce Éireann Water Infrastructure Standard Details (August 2025 Revision 5).

Valves, hydrants, scour and sluice valves, and bulk water meters will be provided in accordance with the requirements of Uisce Éireann within the above-mentioned documents.

6.6 Water Conservation

The water demand for the Phase 3 subject site residential development can be subdivided as follows:

- Potable / Non-potable Breakdown

Detailed studies have quantified the breakdown between potable and non-potable uses for residential uses. According to the guideline: Promoting Sustainable Household Water Consumption, issued by Irish Water in September 2019, Figure 2.3 of the document (shown in Figure 6-3 below) illustrates the water use patterns that have been documented for a three-person household in the UK (insufficient data is available from Ireland households).

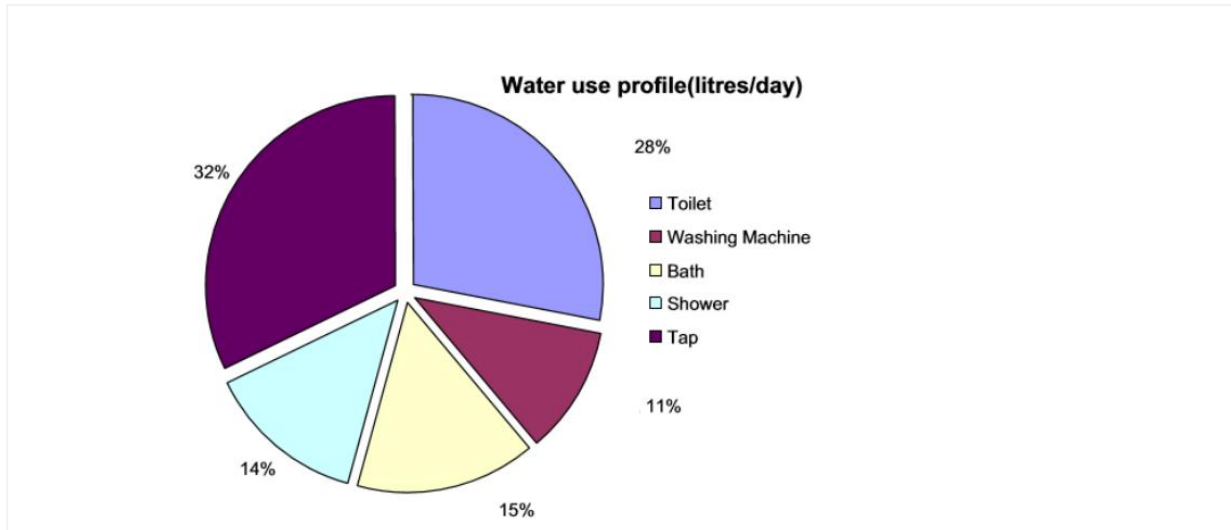


Figure 6-3: Water use patterns for 3-person households

The following water conservation measures will be used, to reduce overall water demand – water saving device installations including:

- Kitchen tap swivel aerator
- Water saving shower heads
- Spray taps
- Low volume flush / dual flush WC's
- Draw off tap controls
- Leak detection measures – through the metering of supply

7. Transport

7.1 Transportation Related Reports

A detailed Traffic and Transport Assessment (TTA), Mobility Management Plan (MMP), Travel Plan (TP), and DMURS Statement have been prepared by Waterman Moylan and are submitted as part of this planning application under separate cover.

These reports provide a comprehensive assessment of the transport implications of the proposed development, including the existing transport environment, the proposed car and cycle parking provision, parking demand, trip generation, and the anticipated impact on the surrounding transport network. Reference should be made to these documents for further detail.

7.2 Quality Audit

A Quality Audit undertaken by RoadPlan is submitted under a separate cover as part of this application. A Quality Audit is a comprehensive assessment of the proposed development's transportation and street design arrangements, undertaken to review the quality, safety and functionality of the proposed movement network for all road users. The assessment considers the needs of pedestrians, cyclists and vehicular traffic, including road safety, accessibility, permeability, connectivity, DMURS principles and the interaction between different modes of transport. The Quality Audit incorporates the relevant Road Safety Audit and provides recommendations to ensure that the proposed development facilitates a safe, accessible and well-connected environment for all users.

All recommendations within the audit have been incorporated into the development's site design.

A copy of the Quality Audit can be found under Appendix E of this report

APPENDICES

A. Uisce Eireann Confirmation of Feasibility

CONFIRMATION OF FEASIBILITY

Penelope Ingle
Waterman Moylan
Block S
Eastpoint Business Park
Alfie Bryne Road
Dublin
D03H3F4

5 August 2026

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

**Our Ref: CDS26004704 Pre-Connection Enquiry Cherry Orchard
Phase 3, Park West Avenue, Cherry Orchard, Dublin**

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 Multi/Mixed Use Development of 314 unit(s) at Cherry Orchard Phase 3, Park West Avenue, Cherry Orchard, Dublin, (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
- **Wastewater Connection** - Feasible Subject to upgrades
 - In order to accommodate the proposed connection at the Premises, upgrade works are required to increase the capacity of the Uisce Éireann network. Uisce Éireann currently has a project which will provide the necessary upgrade and capacity. This upgrade project is scheduled to be completed early 2027 (this may be subject to change) and the proposed connection could be completed as soon as possibly practicable after this date.
 - Connection Point to be confirmed at Connection Application Stage.

Stiúrthóirí / Directors: Jerry Grant (Cathaoirleach / Chairperson), Niall Gleeson (POF / CEO), Douglas Millican, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Michael Walsh, Rena O'Sullivan and Orlagh Nevin.

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

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/

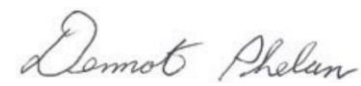
Where can you find more information?

- **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 and Developer Services

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 <u>and be granted and sign</u> 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 <i>the Uisce Éireann Connections and Developer Services Standard Details and Codes of Practice</i>, 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



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

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.

B. FLOW (Causeway) Model for the Proposed Development

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	16.600	Minimum Backdrop Height (m)	0.200
Ratio-R	0.276	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	✓

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	240
M5-60 (mm)	16.600	Additional Storage (m³/ha)	0.0
Ratio-R	0.276	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

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

Node 9 -- HB Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.006	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0068-2700-1800-2700
Invert Level (m)	52.099	Min Outlet Diameter (m)	0.100
Design Depth (m)	1.800	Min Node Diameter (mm)	1200
Design Flow (l/s)	2.7		

Node *BG Roof 3.1 (B) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.180	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.3		
Invert Level (m)	58.700	Diameter (m)	0.018		

Node *BG Roof 3.1 (C) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.180	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.1		
Invert Level (m)	58.650	Diameter (m)	0.010		

Node *BG Roof 3.1 (D) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.180	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		
Invert Level (m)	58.700	Diameter (m)	0.015		

Node *BG Roof 3.1 (E) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.180	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		
Invert Level (m)	58.700	Diameter (m)	0.015		

Node *BG Roof 3.1 (F) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.180	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		
Invert Level (m)	58.700	Diameter (m)	0.015		

Node *BG Roof 3.1 (G) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.180	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		
Invert Level (m)	58.700	Diameter (m)	0.015		

Node *Podium 3.1 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.180	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		
Invert Level (m)	55.700	Diameter (m)	0.015		

Node Bioretention Area 4.1 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.200	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.1		
Invert Level (m)	54.400	Diameter (m)	0.006		

Node Perm Paving 4.1 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.550	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.4		
Invert Level (m)	53.750	Diameter (m)	0.030		

Node Perm Paving 4.2 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.550	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.3		
Invert Level (m)	53.850	Diameter (m)	0.013		

Node Bioretention Area 4.2 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.200	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.1		
Invert Level (m)	53.800	Diameter (m)	0.006		

Node **BG Roof 2.1 (A) Online Orifice Control

Flap Valve	x	Design Depth (m)	0.180	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.1		
Invert Level (m)	59.500	Diameter (m)	0.010		

Node SW MH-3 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.800	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		
Invert Level (m)	53.575	Diameter (m)	0.010		

Node *BG Roof 3.1 (B) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	58.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	1260

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	450.0	450.0	0.180	450.0	463.5	0.181	0.0	463.5

**Node *BG Roof 3.1 (C) Depth/Area Storage Structure**

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	58.650
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	610.0	610.0	0.180	610.0	625.8	0.181	0.0	625.8

Node *BG Roof 3.1 (D) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	58.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	600.0	600.0	0.180	600.0	615.6	0.181	0.0	615.6

Node *BG Roof 3.1 (E) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	58.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	725.0	725.0	0.180	725.0	742.2	0.181	0.0	742.2

Node *BG Roof 3.1 (F) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	58.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	775.0	775.0	0.180	775.0	792.8	0.181	0.0	792.8

Node *BG Roof 3.1 (G) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	58.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	520.0	520.0	0.180	520.0	534.6	0.181	0.0	534.6

Node *Podium 3.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	55.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	3000.0	3000.0	0.200	3000.0	3038.8	0.201	0.0	3038.8

Node Bioretention Area 4.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	54.400
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	113.0	113.0	1.000	113.0	150.7	1.001	0.0	150.7

**Node Perm Paving 4.1 Depth/Area Storage Structure**

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	53.750
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	216

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	170.0	170.0	0.550	170.0	195.4	0.551	0.0	195.4

Node Perm Paving 4.2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	53.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	348.0	348.0	0.550	348.0	384.4	0.551	0.0	384.4

Node Bioretention Area 4.2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	53.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	0

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	37.0	37.0	0.800	37.0	54.3	0.801	0.0	54.3

Node **BG Roof 2.1 (A) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	59.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	430.0	430.0	0.180	430.0	443.2	0.181	0.0	443.2

Node SW MH-3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	53.575
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	720

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	0.0	0.0	1.100	0.0	0.0	1.101	110.0	110.0	1.425	150.0	150.8

Node SW MH-3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	53.525
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	90.0	90.0	0.800	90.0	116.9	0.801	0.0	116.9

Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Level (m)	Depth (m)	Node Vol (m³)	Flood (m³)	Status
8640 minute summer	**BG Roof 2.1 (A)	59.654	0.154	62.7256	0.0000	OK
10080 minute summer	*BG Roof 3.1 (C)	58.808	0.158	91.6693	0.0000	SURCHARGED
5760 minute summer	*BG Roof 3.1 (B)	58.803	0.103	43.8495	0.0000	SURCHARGED
10080 minute summer	*BG Roof 3.1 (D)	58.852	0.152	86.4999	0.0000	SURCHARGED
7200 minute winter	*BG Roof 3.1 (E)	58.863	0.163	112.1980	0.0000	SURCHARGED
8640 minute winter	*BG Roof 3.1 (F)	58.869	0.169	124.6121	0.0000	SURCHARGED
7200 minute summer	*BG Roof 3.1 (G)	58.845	0.145	71.8311	0.0000	SURCHARGED
10080 minute winter	*Podium 3.1	55.898	0.198	565.4929	0.0000	OK
960 minute summer	1	53.903	1.011	1.1430	0.0000	SURCHARGED
960 minute summer	2	53.903	1.653	2.3649	0.0000	SURCHARGED
960 minute summer	4	53.903	0.423	0.4782	0.0000	SURCHARGED
960 minute summer	6	53.903	0.588	0.6647	0.0000	SURCHARGED
960 minute summer	7	53.903	1.711	2.4479	0.0000	SURCHARGED
1440 minute summer	8	53.903	1.758	2.5154	0.0000	SURCHARGED
960 minute summer	*9	53.903	0.503	0.5684	0.0000	SURCHARGED
960 minute summer	10	53.903	0.512	0.5787	0.0000	SURCHARGED
960 minute summer	11	53.903	0.369	0.4170	0.0000	SURCHARGED
15 minute summer	15	54.404	0.029	0.0328	0.0000	OK
15 minute summer	14	54.216	0.044	0.0502	0.0000	OK
15 minute summer	13	54.031	0.048	0.0540	0.0000	OK
960 minute summer	12	53.903	0.304	0.3436	0.0000	SURCHARGED
7200 minute winter	Bioretention Area 4.1	55.497	1.097	39.5698	0.0000	FLOOD RISK
480 minute summer	Perm Paving 4.1	54.138	0.388	23.1143	0.0000	SURCHARGED
4320 minute winter	Perm Paving 4.2	54.319	0.469	57.1828	0.0000	SURCHARGED
720 minute summer	Bioretention Area 4.2	53.838	0.038	0.4931	0.0000	OK
2160 minute winter	SW MH-3	54.722	1.147	32.1922	0.0000	FLOOD RISK

US Node	DS Node	Outflow (l/s)	Velocity (m/s)
**BG Roof 2.1 (A)	4	0.1	0.000
*BG Roof 3.1 (C)	*9	0.1	0.511
*BG Roof 3.1 (B)	*9	0.2	0.713
*BG Roof 3.1 (D)	*9	0.2	0.764
*BG Roof 3.1 (E)	*9	0.2	0.855
*BG Roof 3.1 (F)	*9	0.2	0.990
*BG Roof 3.1 (G)	*9	0.2	0.964
*Podium 3.1	*9	0.2	0.523
1	2	2.4	0.546
2	7	2.8	0.261
4	6	0.9	0.352
6	2	1.4	0.391
7	8	3.0	0.188
8	9 -- HB	3.1	0.049
*9	1	1.8	0.559
10	9 -- HB	3.3	0.632
11	10	2.8	0.529
15	14	1.3	0.438
14	13	3.1	0.559
13	12	3.5	0.586
12	11	1.6	0.382
Bioretention Area 4.1	14	0.1	0.353
Perm Paving 4.1	12	1.2	0.488
Perm Paving 4.2	7	0.2	0.353
Bioretention Area 4.2	11	0.2	0.158
SW MH-3	4	0.6	0.230

Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Level (m)	Depth (m)	Node Vol (m³)	Flood (m³)	Status
960 minute summer	9 -- HB	53.903	1.804	2.5810	0.0000	SURCHARGED
960 minute summer	EX. OUTFALL SW MH	52.062	0.034	0.0000	0.0000	OK
		US Node	DS Node	Outflow (l/s)	Velocity (m/s)	
		9 -- HB	EX. OUTFALL SW MH	2.7	0.453	

**Design Settings**

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	16.600	Minimum Backdrop Height (m)	0.200
Ratio-R	0.276	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	240
M5-60 (mm)	16.600	Additional Storage (m³/ha)	0.0
Ratio-R	0.276	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

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

Node Bioretention Area 1.1 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.800	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.1		
Invert Level (m)	55.950	Diameter (m)	0.007		

Node Bioretention Area 1.2 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.900	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.1		
Invert Level (m)	57.050	Diameter (m)	0.007		

Node Perm Paving 1.1 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.550	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.9		
Invert Level (m)	56.350	Diameter (m)	0.024		

Node Control Device 1.1 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.750	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.5		
Invert Level (m)	55.809	Diameter (m)	0.016		

Node BG Roof 1.1 Online Orifice Control

Flap Valve	x	Invert Level (m)	59.800	Diameter (m)	0.010
Downstream Link	5.000	Design Depth (m)	0.180	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.1		

Node BG Roof 1.2 Online Orifice Control

Flap Valve	x	Invert Level (m)	59.800	Diameter (m)	0.010
Downstream Link	2.000	Design Depth (m)	0.180	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.1		

Node BG Roof 1.3 Online Orifice Control

Flap Valve	x	Invert Level (m)	59.800	Diameter (m)	0.010
Downstream Link	1.000	Design Depth (m)	0.180	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.1		

Node Bioretention Area 1.2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	57.050
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	84.0	84.0	0.900	84.0	113.2	0.901	0.0	113.2

Node Bioretention Area 1.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	55.950
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	300

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	92.0	92.0	0.900	92.0	122.6	0.901	0.0	122.6

Node Perm Paving 1.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	56.350
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	130.0	130.0	0.550	130.0	152.2	0.551	0.0	152.2

Node BG Roof 1.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	59.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	350.0	350.0	0.180	350.0	361.9	0.181	0.0	361.9

Node BG Roof 1.2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	59.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	370.0	370.0	0.180	370.0	382.3	0.181	0.0	382.3

Node BG Roof 1.3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	59.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	280.0	280.0	0.180	280.0	290.7	0.181	280.0	290.7

Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 98.22%

Node Event	US Node	Level (m)	Depth (m)	Node Vol (m³)	Flood (m³)	Status
7200 minute winter	BG Roof 1.1	59.912	0.112	37.2284	0.0000	OK
10080 minute winter	BG Roof 1.2	59.948	0.148	51.8847	0.0000	OK
7200 minute summer	BG Roof 1.3	59.971	0.171	45.5198	0.0000	FLOOD RISK
2160 minute summer	Perm Paving 1.1	56.826	0.476	24.7573	0.0000	SURCHARGED
10080 minute winter	Bioretention Area 1.1	56.405	0.455	16.7543	0.0000	SURCHARGED
4320 minute summer	Bioretention Area 1.2	57.895	0.845	28.4026	0.0000	SURCHARGED
4320 minute summer	1	56.993	0.010	0.0111	0.0000	OK
7200 minute summer	2	56.898	0.013	0.0150	0.0000	OK
15 minute summer	4	56.900	0.000	0.0000	0.0000	OK
15 minute summer	3	56.798	0.039	0.0439	0.0000	OK
2160 minute summer	6	56.790	0.471	0.5324	0.0000	SURCHARGED
2160 minute summer	5	56.790	0.579	0.6544	0.0000	SURCHARGED
2160 minute summer	7	56.789	0.964	1.0907	0.0000	FLOOD RISK
2160 minute summer	Control Device 1.1	56.789	0.980	1.1083	0.0000	FLOOD RISK
2160 minute summer	DUMMY OUT 1.1	55.774	0.018	0.0000	0.0000	OK

US Node	DS Node	Outflow (l/s)	Velocity (m/s)
BG Roof 1.1	5	0.1	0.718
BG Roof 1.2	2	0.1	0.681
BG Roof 1.3	2	0.1	0.459
Perm Paving 1.1	6	0.3	0.372
Bioretention Area 1.1	7	-0.3	-0.042
Bioretention Area 1.2	1	0.1	0.281
1	2	0.1	0.245
2	3	0.3	0.353
4	3	0.0	0.000
3	5	6.0	1.184
6	5	0.3	0.389
5	7	0.7	0.202
7	Control Device 1.1	0.5	0.109
Control Device 1.1	DUMMY OUT 1.1	0.5	0.340

C. ABG Ltd. Blue & Blue-Green Roof Specialist Design

BLUE ROOF Estimate DESIGN

Cherry Orchard P3 S5 - Block A Roof Blue

Prepared for:	Waterman Moylan		
ABG Project ID:	COrchP3-Dublin-001	Calculator version:	1.21
Issue status:	Estimate	Revision:	1.03
Designed by:	MH	Checked by:	
Design date:	16/07/2026	Check date:	

Brief:

Catchment area, attenuation area and location taken from email sent by c.maher@waterman-moylan.ie on 20/04/2026 along with attached drawing "COP-WMC-PH3-00-DR-C-P0205 Revision P01" and updates on 09/06/2026, 18/06/2026 & 13/07/2026. 2 bluroof attenuation chambers required. Design to limit discharge to the lowest possible using a 180mm blue roof system. Additional passive overflow chambers as required. FSR data utilised with R value and M5-60 taken from Phase 1 compliance document.

Input Parameters - Rainfall Information (Custom)		
Return period:	100 years	As supplied by Client
Allowance for Climate Change:	20 %	As supplied by Client
Rainfall Data Source:	FSR method (M5-60:16.8 , R=0.277)	

Input Parameters - Roof Information		
Catchment area:	232 m ²	As supplied by Client
Storage area:	190 m ²	As supplied by Client
Maximum allowable runoff:	0.12 l/s	As supplied by Client
Blue roof system:	ABG bluroof VF HD 180mm	Proposed

Output - Rainfall Calculation				
Duration	Rainfall (l/s/m ²)	Storage Required (l/m ²)	Time to Empty	Restricted Outflow (l/s)
15 mins	0.0245	29	30 hours and 50 minutes	0.06
30 mins	0.0170	40	39 hours and 10 minutes	0.07
1 hour	0.0110	50	46 hours and 30 minutes	0.08
2 hours	0.0069	62	53 hours and 40 minutes	0.09
4 hours	0.0043	74	60 hours and 40 minutes	0.10
6 hours	0.0032	81	64 hours and 20 minutes	0.10
12 hours	0.0020	92	69 hours and 50 minutes	0.11
24 hours	0.0012	98	72 hours and 40 minutes	0.11
48 hours	0.0007	92	69 hours and 50 minutes	0.11
72 hours	0.0006	80	63 hours and 30 minutes	0.10

Total storage required: 18.7m ³	Total storage provided: 30.4m ³
Half empty time: 8 hours and 40 minutes.	

- Notes:
1. This document contains an estimate which has been prepared by ABG Ltd and is illustrative only and not a detailed design.
 2. Further details on the theories used in this estimate are available upon request from ABG. The values given are indicative and correspond to nominal results obtained in our laboratories and testing institutes. In line with our policy of continuous improvement the right is reserved to make changes without notice at any time.
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 6. No guarantee or liability can be drawn from the information in this report.
 7. Final determination of the suitability of any information is the sole responsibility of the user. ABG will be pleased to discuss the use of this or any other product but responsibility for selection of a material and its application in any specific project remains with the user.

BLUE ROOF Estimate DESIGN

Cherry Orchard P3 S5 - Block A Roof Green/Blue

Prepared for:	Waterman Moylan		
ABG Project ID:	COrchP3-Dublin-001	Calculator version:	1.21
Issue status:	Estimate	Revision:	1.03
Designed by:	MH	Checked by:	
Design date:	16/07/2026	Check date:	

Brief:

Catchment area, attenuation area and location taken from email sent by c.maher@waterman-moylan.ie on 20/04/2026 along with attached drawing "COP-WMC-PH3-00-DR-C-P0205 Revision P01" and updates on 09/06/2026, 18/06/2026 & 13/07/2026. 2 bluroof attenuation chambers required. Design to limit discharge to the lowest possible using a 180mm blue roof system. Additional passive overflow chambers as required. FSR data utilised with R value and M5-60 taken from Phase 1 compliance document.

Input Parameters - Rainfall Information (Custom)		
Return period:	100 years	As supplied by Client
Allowance for Climate Change:	20 %	As supplied by Client
Rainfall Data Source:	FSR method (M5-60:16.8 , R=0.277)	

Input Parameters - Roof Information		
Catchment area:	523 m ²	As supplied by Client
Storage area:	450 m ²	As supplied by Client
Maximum allowable runoff:	0.18 l/s	As supplied by Client
Blue roof system:	ABG bluroof VF HD 180mm	Proposed

Output - Rainfall Calculation				
Duration	Rainfall (l/s/m ²)	Storage Required (l/m ²)	Time to Empty	Restricted Outflow (l/s)
15 mins	0.0245	28	47 hours and 10 minutes	0.08
30 mins	0.0170	38	59 hours and 50 minutes	0.10
1 hour	0.0110	48	71 hours and 20 minutes	0.11
2 hours	0.0069	60	82 hours and 40 minutes	0.13
4 hours	0.0043	72	94 hours and 0 minutes	0.14
6 hours	0.0032	80	100 hours and 30 minutes	0.15
12 hours	0.0020	93	110 hours and 50 minutes	0.16
24 hours	0.0012	104	118 hours and 50 minutes	0.17
48 hours	0.0007	108	121 hours and 30 minutes	0.17
72 hours	0.0006	103	118 hours and 10 minutes	0.17

Total storage required: 48.5m ³	Total storage provided: 72m ³
Half empty time: 20 hours and 0 minutes.	

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BLUE ROOF Estimate DESIGN

Cherry Orchard P3 S5 - Block B Roof Blue

Prepared for:	Waterman Moylan		
ABG Project ID:	COrchP3-Dublin-001	Calculator version:	1.21
Issue status:	Estimate	Revision:	1.03
Designed by:	MH	Checked by:	
Design date:	16/07/2026	Check date:	

Brief:

Catchment area, attenuation area and location taken from email sent by c.maher@waterman-moylan.ie on 20/04/2026 along with attached drawing "COP-WMC-PH3-00-DR-C-P0205 Revision P01" and updates on 09/06/2026, 18/06/2026 & 13/07/2026. 2 bluroof attenuation chambers required. Design to limit discharge to the lowest possible using a 180mm blue roof system. Additional passive overflow chambers as required. FSR data utilised with R value and M5-60 taken from Phase 1 compliance document.

Input Parameters - Rainfall Information (Custom)		
Return period:	100 years	As supplied by Client
Allowance for Climate Change:	20 %	As supplied by Client
Rainfall Data Source:	FSR method (M5-60:16.8 , R=0.277)	

Input Parameters - Roof Information		
Catchment area:	296 m ²	As supplied by Client
Storage area:	240 m ²	As supplied by Client
Maximum allowable runoff:	0.12 l/s	As supplied by Client
Blue roof system:	ABG bluroof VF HD 180mm	Proposed

Output - Rainfall Calculation				
Duration	Rainfall (l/s/m ²)	Storage Required (l/m ²)	Time to Empty	Restricted Outflow (l/s)
15 mins	0.0245	30	39 hours and 20 minutes	0.06
30 mins	0.0170	40	49 hours and 50 minutes	0.07
1 hour	0.0110	51	59 hours and 10 minutes	0.08
2 hours	0.0069	63	68 hours and 30 minutes	0.09
4 hours	0.0043	76	77 hours and 40 minutes	0.10
6 hours	0.0032	84	82 hours and 50 minutes	0.10
12 hours	0.0020	96	90 hours and 40 minutes	0.11
24 hours	0.0012	106	96 hours and 10 minutes	0.11
48 hours	0.0007	106	96 hours and 0 minutes	0.11
72 hours	0.0006	97	91 hours and 0 minutes	0.11

Total storage required: 25.4m ³	Total storage provided: 38.4m ³
Half empty time: 15 hours and 0 minutes.	

- Notes:
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BLUE ROOF Estimate DESIGN

Cherry Orchard P3 S5 - Block B Roof Green/Blue

Prepared for:	Waterman Moylan		
ABG Project ID:	COrchP3-Dublin-001	Calculator version:	1.21
Issue status:	Estimate	Revision:	1.03
Designed by:	MH	Checked by:	
Design date:	16/07/2026	Check date:	

Brief:

Catchment area, attenuation area and location taken from email sent by c.maher@waterman-moylan.ie on 20/04/2026 along with attached drawing "COP-WMC-PH3-00-DR-C-P0205 Revision P01" and updates on 09/06/2026, 18/06/2026 & 13/07/2026. 2 bluroof attenuation chambers required. Design to limit discharge to the lowest possible using a 180mm blue roof system. Additional passive overflow chambers as required. FSR data utilised with R value and M5-60 taken from Phase 1 compliance document.

Input Parameters - Rainfall Information (Custom)		
Return period:	100 years	As supplied by Client
Allowance for Climate Change:	20 %	As supplied by Client
Rainfall Data Source:	FSR method (M5-60:16.8 , R=0.277)	

Input Parameters - Roof Information		
Catchment area:	507 m ²	As supplied by Client
Storage area:	435 m ²	As supplied by Client
Maximum allowable runoff:	0.18 l/s	As supplied by Client
Blue roof system:	ABG bluroof VF HD 180mm	Proposed

Output - Rainfall Calculation				
Duration	Rainfall (l/s/m ²)	Storage Required (l/m ²)	Time to Empty	Restricted Outflow (l/s)
15 mins	0.0245	28	45 hours and 40 minutes	0.08
30 mins	0.0170	38	58 hours and 0 minutes	0.10
1 hour	0.0110	49	69 hours and 0 minutes	0.11
2 hours	0.0069	60	80 hours and 0 minutes	0.13
4 hours	0.0043	72	91 hours and 0 minutes	0.14
6 hours	0.0032	80	97 hours and 10 minutes	0.15
12 hours	0.0020	93	107 hours and 0 minutes	0.16
24 hours	0.0012	104	114 hours and 40 minutes	0.17
48 hours	0.0007	107	116 hours and 50 minutes	0.17
72 hours	0.0006	102	113 hours and 10 minutes	0.17

Total storage required: 46.5m ³	Total storage provided: 69.6m ³
Half empty time: 18 hours and 40 minutes.	

- Notes:
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BLUE ROOF Estimate DESIGN

Cherry Orchard P3 S5 - Block C Roof Blue

Prepared for:	Waterman Moylan		
ABG Project ID:	COrchP3-Dublin-001	Calculator version:	1.21
Issue status:	Estimate	Revision:	1.03
Designed by:	MH	Checked by:	
Design date:	16/07/2026	Check date:	

Brief:

Catchment area, attenuation area and location taken from email sent by c.maher@waterman-moylan.ie on 20/04/2026 along with attached drawing "COP-WMC-PH3-00-DR-C-P0205 Revision P01" and updates on 09/06/2026, 18/06/2026 & 13/07/2026. 2 bluroof attenuation chambers required. Design to limit discharge to the lowest possible using a 180mm blue roof system. Additional passive overflow chambers as required. FSR data utilised with R value and M5-60 taken from Phase 1 compliance document.

Input Parameters - Rainfall Information (Custom)		
Return period:	100 years	As supplied by Client
Allowance for Climate Change:	20 %	As supplied by Client
Rainfall Data Source:	FSR method (M5-60:16.8 , R=0.277)	

Input Parameters - Roof Information		
Catchment area:	237 m ²	As supplied by Client
Storage area:	195 m ²	As supplied by Client
Maximum allowable runoff:	0.12 l/s	As supplied by Client
Blue roof system:	ABG bluroof VF HD 180mm	Proposed

Output - Rainfall Calculation				
Duration	Rainfall (l/s/m ²)	Storage Required (l/m ²)	Time to Empty	Restricted Outflow (l/s)
15 mins	0.0245	29	31 hours and 40 minutes	0.06
30 mins	0.0170	40	40 hours and 0 minutes	0.07
1 hour	0.0110	50	47 hours and 30 minutes	0.08
2 hours	0.0069	62	55 hours and 0 minutes	0.09
4 hours	0.0043	74	62 hours and 0 minutes	0.10
6 hours	0.0032	81	66 hours and 0 minutes	0.10
12 hours	0.0020	92	71 hours and 40 minutes	0.11
24 hours	0.0012	99	74 hours and 40 minutes	0.11
48 hours	0.0007	93	72 hours and 10 minutes	0.11
72 hours	0.0006	81	65 hours and 50 minutes	0.10

Total storage required: 19.3m ³	Total storage provided: 31.2m ³
Half empty time: 9 hours and 0 minutes.	

- Notes:
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BLUE ROOF Estimate DESIGN

Cherry Orchard P3 S5 - Block C Roof Green/Blue

Prepared for:	Waterman Moylan		
ABG Project ID:	COrchP3-Dublin-001	Calculator version:	1.21
Issue status:	Estimate	Revision:	1.03
Designed by:	MH	Checked by:	
Design date:	16/07/2026	Check date:	

Brief:

Catchment area, attenuation area and location taken from email sent by c.maher@waterman-moylan.ie on 20/04/2026 along with attached drawing "COP-WMC-PH3-00-DR-C-P0205 Revision P01" and updates on 09/06/2026, 18/06/2026 & 13/07/2026. 2 bluroof attenuation chambers required. Design to limit discharge to the lowest possible using a 180mm blue roof system. Additional passive overflow chambers as required. FSR data utilised with R value and M5-60 taken from Phase 1 compliance document.

Input Parameters - Rainfall Information (Custom)		
Return period:	100 years	As supplied by Client
Allowance for Climate Change:	20 %	As supplied by Client
Rainfall Data Source:	FSR method (M5-60:16.8 , R=0.277)	

Input Parameters - Roof Information		
Catchment area:	610 m ²	As supplied by Client
Storage area:	530 m ²	As supplied by Client
Maximum allowable runoff:	0.23 l/s	As supplied by Client
Blue roof system:	ABG bluroof VF HD 180mm	Proposed

Output - Rainfall Calculation				
Duration	Rainfall (l/s/m ²)	Storage Required (l/m ²)	Time to Empty	Restricted Outflow (l/s)
15 mins	0.0245	28	41 hours and 20 minutes	0.11
30 mins	0.0170	38	52 hours and 30 minutes	0.13
1 hour	0.0110	48	62 hours and 30 minutes	0.15
2 hours	0.0069	59	72 hours and 30 minutes	0.17
4 hours	0.0043	71	82 hours and 20 minutes	0.19
6 hours	0.0032	79	87 hours and 50 minutes	0.20
12 hours	0.0020	91	96 hours and 30 minutes	0.21
24 hours	0.0012	100	102 hours and 40 minutes	0.22
48 hours	0.0007	102	103 hours and 30 minutes	0.22
72 hours	0.0006	95	99 hours and 0 minutes	0.22

Total storage required: 53.9m ³	Total storage provided: 84.8m ³
Half empty time: 14 hours and 0 minutes.	

- Notes:
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BLUE ROOF Estimate DESIGN

Cherry Orchard P3 S5 - Block D Roof Green/Blue

Prepared for:	Waterman Moylan		
ABG Project ID:	COrchP3-Dublin-001	Calculator version:	1.21
Issue status:	Estimate	Revision:	1.03
Designed by:	MH	Checked by:	
Design date:	16/07/2026	Check date:	

Brief:

Catchment area, attenuation area and location taken from email sent by c.maher@waterman-moylan.ie on 20/04/2026 along with attached drawing "COP-WMC-PH3-00-DR-C-P0205 Revision P01" and updates on 09/06/2026, 18/06/2026 & 13/07/2026. 2 bluroof attenuation chambers required. Design to limit discharge to the lowest possible using a 180mm blue roof system. Additional passive overflow chambers as required. FSR data utilised with R value and M5-60 taken from Phase 1 compliance document.

Input Parameters - Rainfall Information (Custom)		
Return period:	100 years	As supplied by Client
Allowance for Climate Change:	20 %	As supplied by Client
Rainfall Data Source:	FSR method (M5-60:16.8 , R=0.277)	

Input Parameters - Roof Information		
Catchment area:	676 m ²	As supplied by Client
Storage area:	600 m ²	As supplied by Client
Maximum allowable runoff:	0.23 l/s	As supplied by Client
Blue roof system:	ABG bluroof VF HD 180mm	Proposed

Output - Rainfall Calculation				
Duration	Rainfall (l/s/m ²)	Storage Required (l/m ²)	Time to Empty	Restricted Outflow (l/s)
15 mins	0.0245	28	46 hours and 10 minutes	0.11
30 mins	0.0170	37	58 hours and 40 minutes	0.13
1 hour	0.0110	47	69 hours and 50 minutes	0.15
2 hours	0.0069	58	81 hours and 0 minutes	0.17
4 hours	0.0043	70	92 hours and 10 minutes	0.19
6 hours	0.0032	78	98 hours and 30 minutes	0.20
12 hours	0.0020	90	108 hours and 40 minutes	0.21
24 hours	0.0012	101	116 hours and 30 minutes	0.22
48 hours	0.0007	104	118 hours and 50 minutes	0.23
72 hours	0.0006	99	115 hours and 20 minutes	0.22

Total storage required: 62.4m³	Total storage provided: 96m³
Half empty time: 17 hours and 30 minutes.	

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BLUE ROOF Estimate DESIGN

Cherry Orchard P3 S5 - Block E Roof Blue

Prepared for:	Waterman Moylan		
ABG Project ID:	COrchP3-Dublin-001	Calculator version:	1.21
Issue status:	Estimate	Revision:	1.03
Designed by:	MH	Checked by:	
Design date:	16/07/2026	Check date:	

Brief:

Catchment area, attenuation area and location taken from email sent by c.maher@waterman-moylan.ie on 20/04/2026 along with attached drawing "COP-WMC-PH3-00-DR-C-P0205 Revision P01" and updates on 09/06/2026, 18/06/2026 & 13/07/2026. 2 bluroof attenuation chambers required. Design to limit discharge to the lowest possible using a 180mm blue roof system. Additional passive overflow chambers as required. FSR data utilised with R value and M5-60 taken from Phase 1 compliance document.

Input Parameters - Rainfall Information (Custom)		
Return period:	100 years	As supplied by Client
Allowance for Climate Change:	20 %	As supplied by Client
Rainfall Data Source:	FSR method (M5-60:16.8 , R=0.277)	

Input Parameters - Roof Information		
Catchment area:	244 m ²	As supplied by Client
Storage area:	195 m ²	As supplied by Client
Maximum allowable runoff:	0.12 l/s	As supplied by Client
Blue roof system:	ABG bluroof VF HD 180mm	Proposed

Output - Rainfall Calculation				
Duration	Rainfall (l/s/m ²)	Storage Required (l/m ²)	Time to Empty	Restricted Outflow (l/s)
15 mins	0.0245	30	32 hours and 20 minutes	0.06
30 mins	0.0170	41	40 hours and 50 minutes	0.07
1 hour	0.0110	52	48 hours and 30 minutes	0.08
2 hours	0.0069	63	56 hours and 0 minutes	0.09
4 hours	0.0043	76	63 hours and 10 minutes	0.10
6 hours	0.0032	84	67 hours and 10 minutes	0.10
12 hours	0.0020	95	73 hours and 0 minutes	0.11
24 hours	0.0012	102	76 hours and 20 minutes	0.11
48 hours	0.0007	97	73 hours and 50 minutes	0.11
72 hours	0.0006	84	67 hours and 40 minutes	0.10

Total storage required: 19.9m ³	Total storage provided: 31.2m ³
Half empty time: 10 hours and 20 minutes.	

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BLUE ROOF Estimate DESIGN

Cherry Orchard P3 S5 - Block E Roof Green/Blue

Prepared for:	Waterman Moylan		
ABG Project ID:	COrchP3-Dublin-001	Calculator version:	1.21
Issue status:	Estimate	Revision:	1.03
Designed by:	MH	Checked by:	
Design date:	16/07/2026	Check date:	

Brief:

Catchment area, attenuation area and location taken from email sent by c.maher@waterman-moylan.ie on 20/04/2026 along with attached drawing "COP-WMC-PH3-00-DR-C-P0205 Revision P01" and updates on 09/06/2026, 18/06/2026 & 13/07/2026. 2 bluroof attenuation chambers required. Design to limit discharge to the lowest possible using a 180mm blue roof system. Additional passive overflow chambers as required. FSR data utilised with R value and M5-60 taken from Phase 1 compliance document.

Input Parameters - Rainfall Information (Custom)		
Return period:	100 years	As supplied by Client
Allowance for Climate Change:	20 %	As supplied by Client
Rainfall Data Source:	FSR method (M5-60:16.8 , R=0.277)	

Input Parameters - Roof Information		
Catchment area:	620 m ²	As supplied by Client
Storage area:	530 m ²	As supplied by Client
Maximum allowable runoff:	0.23 l/s	As supplied by Client
Blue roof system:	ABG bluroof VF HD 180mm	Proposed

Output - Rainfall Calculation				
Duration	Rainfall (l/s/m ²)	Storage Required (l/m ²)	Time to Empty	Restricted Outflow (l/s)
15 mins	0.0245	28	41 hours and 50 minutes	0.11
30 mins	0.0170	38	53 hours and 10 minutes	0.13
1 hour	0.0110	49	63 hours and 10 minutes	0.15
2 hours	0.0069	60	73 hours and 10 minutes	0.17
4 hours	0.0043	72	83 hours and 10 minutes	0.19
6 hours	0.0032	80	88 hours and 40 minutes	0.20
12 hours	0.0020	92	97 hours and 30 minutes	0.21
24 hours	0.0012	102	103 hours and 50 minutes	0.23
48 hours	0.0007	103	104 hours and 40 minutes	0.23
72 hours	0.0006	97	100 hours and 20 minutes	0.22

Total storage required: 54.9m ³	Total storage provided: 84.8m ³
Half empty time: 15 hours and 10 minutes.	

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BLUE ROOF Estimate DESIGN

Cherry Orchard P3 S5 - Block F Roof Blue

Prepared for:	Waterman Moylan		
ABG Project ID:	COrchP3-Dublin-001	Calculator version:	1.21
Issue status:	Estimate	Revision:	1.03
Designed by:	MH	Checked by:	
Design date:	16/07/2026	Check date:	

Brief:

Catchment area, attenuation area and location taken from email sent by c.maher@waterman-moylan.ie on 20/04/2026 along with attached drawing "COP-WMC-PH3-00-DR-C-P0205 Revision P01" and updates on 09/06/2026, 18/06/2026 & 13/07/2026. 2 bluroof attenuation chambers required. Design to limit discharge to the lowest possible using a 180mm blue roof system. Additional passive overflow chambers as required. FSR data utilised with R value and M5-60 taken from Phase 1 compliance document.

Input Parameters - Rainfall Information (Custom)		
Return period:	100 years	As supplied by Client
Allowance for Climate Change:	20 %	As supplied by Client
Rainfall Data Source:	FSR method (M5-60:16.8 , R=0.277)	

Input Parameters - Roof Information		
Catchment area:	312 m ²	As supplied by Client
Storage area:	245 m ²	As supplied by Client
Maximum allowable runoff:	0.12 l/s	As supplied by Client
Blue roof system:	ABG bluroof VF HD 180mm	Proposed

Output - Rainfall Calculation				
Duration	Rainfall (l/s/m ²)	Storage Required (l/m ²)	Time to Empty	Restricted Outflow (l/s)
15 mins	0.0245	31	41 hours and 0 minutes	0.06
30 mins	0.0170	41	52 hours and 0 minutes	0.07
1 hour	0.0110	53	61 hours and 40 minutes	0.08
2 hours	0.0069	65	71 hours and 20 minutes	0.09
4 hours	0.0043	78	81 hours and 0 minutes	0.10
6 hours	0.0032	86	86 hours and 20 minutes	0.10
12 hours	0.0020	100	94 hours and 40 minutes	0.11
24 hours	0.0012	110	100 hours and 30 minutes	0.12
48 hours	0.0007	111	100 hours and 50 minutes	0.12
72 hours	0.0006	103	96 hours and 20 minutes	0.11

Total storage required: 27.1m ³	Total storage provided: 39.2m ³
Half empty time: 17 hours and 50 minutes.	

- Notes:
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BLUE ROOF Estimate DESIGN

Cherry Orchard P3 S5 - Block F Roof Green/Blue

Prepared for:	Waterman Moylan		
ABG Project ID:	COrchP3-Dublin-001	Calculator version:	1.21
Issue status:	Estimate	Revision:	1.03
Designed by:	MH	Checked by:	
Design date:	16/07/2026	Check date:	

Brief:

Catchment area, attenuation area and location taken from email sent by c.maher@waterman-moylan.ie on 20/04/2026 along with attached drawing "COP-WMC-PH3-00-DR-C-P0205 Revision P01" and updates on 09/06/2026, 18/06/2026 & 13/07/2026. 2 bluroof attenuation chambers required. Design to limit discharge to the lowest possible using a 208mm blue roof system. Additional passive overflow chambers as required. FSR data utilised with R value and M5-60 taken from Phase 1 compliance document.

Input Parameters - Rainfall Information (Custom)		
Return period:	100 years	As supplied by Client
Allowance for Climate Change:	20 %	As supplied by Client
Rainfall Data Source:	FSR method (M5-60:16.8 , R=0.277)	

Input Parameters - Roof Information		
Catchment area:	627 m ²	As supplied by Client
Storage area:	530 m ²	As supplied by Client
Maximum allowable runoff:	0.18 l/s	As supplied by Client
Blue roof system:	ABG bluroof VF HD 208mm	Proposed

Output - Rainfall Calculation				
Duration	Rainfall (l/s/m ²)	Storage Required (l/m ²)	Time to Empty	Restricted Outflow (l/s)
15 mins	0.0245	29	56 hours and 50 minutes	0.08
30 mins	0.0170	39	72 hours and 10 minutes	0.10
1 hour	0.0110	49	86 hours and 10 minutes	0.11
2 hours	0.0069	61	100 hours and 0 minutes	0.13
4 hours	0.0043	74	114 hours and 0 minutes	0.14
6 hours	0.0032	82	122 hours and 0 minutes	0.15
12 hours	0.0020	96	135 hours and 20 minutes	0.16
24 hours	0.0012	110	146 hours and 40 minutes	0.17
48 hours	0.0007	117	152 hours and 40 minutes	0.18
72 hours	0.0006	115	151 hours and 20 minutes	0.18

Total storage required: 62m ³	Total storage provided: 101.76m ³
Half empty time: 17 hours and 10 minutes.	

- Notes:
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Technical

BLUE ROOF Estimate DESIGN

Cherry Orchard P3 S5 - Block G Roof Green/Blue

Prepared for:	Waterman Moylan		
ABG Project ID:	COrchP3-Dublin-001	Calculator version:	1.21
Issue status:	Estimate	Revision:	1.03
Designed by:	MH	Checked by:	
Design date:	16/07/2026	Check date:	

Brief:

Catchment area, attenuation area and location taken from email sent by c.maher@waterman-moylan.ie on 20/04/2026 along with attached drawing "COP-WMC-PH3-00-DR-C-P0205 Revision P01" and updates on 09/06/2026, 18/06/2026 & 13/07/2026. 2 bluroof attenuation chambers required. Design to limit discharge to the lowest possible using a 208mm blue roof system. Additional passive overflow chambers as required. FSR data utilised with R value and M5-60 taken from Phase 1 compliance document.

Input Parameters - Rainfall Information (Custom)		
Return period:	100 years	As supplied by Client
Allowance for Climate Change:	20 %	As supplied by Client
Rainfall Data Source:	FSR method (M5-60:16.8 , R=0.277)	

Input Parameters - Roof Information		
Catchment area:	600 m ²	As supplied by Client
Storage area:	520 m ²	As supplied by Client
Maximum allowable runoff:	0.18 l/s	As supplied by Client
Blue roof system:	ABG bluroof VF HD 208mm	Proposed

Output - Rainfall Calculation				
Duration	Rainfall (l/s/m ²)	Storage Required (l/m ²)	Time to Empty	Restricted Outflow (l/s)
15 mins	0.0245	28	54 hours and 40 minutes	0.08
30 mins	0.0170	38	69 hours and 40 minutes	0.10
1 hour	0.0110	48	83 hours and 10 minutes	0.11
2 hours	0.0069	60	96 hours and 30 minutes	0.13
4 hours	0.0043	72	110 hours and 0 minutes	0.14
6 hours	0.0032	80	117 hours and 50 minutes	0.15
12 hours	0.0020	94	130 hours and 30 minutes	0.16
24 hours	0.0012	106	141 hours and 20 minutes	0.17
48 hours	0.0007	113	146 hours and 40 minutes	0.17
72 hours	0.0006	111	145 hours and 0 minutes	0.17

Total storage required: 58.8m ³	Total storage provided: 99.84m ³
Half empty time: 13 hours and 50 minutes.	

- Notes:
1. This document contains an estimate which has been prepared by ABG Ltd and is illustrative only and not a detailed design.
 2. Further details on the theories used in this estimate are available upon request from ABG. The values given are indicative and correspond to nominal results obtained in our laboratories and testing institutes. In line with our policy of continuous improvement the right is reserved to make changes without notice at any time.
 3. This estimate is specific to the characteristics of ABG products and may not be applicable to other products.
 4. The copyright in this document belongs to ABG Ltd.
 5. The estimate given in this report is based on the stated parameters as per the brief. If these parameters are not correct or have changed, ABG should be contacted to provide a revised estimate.
 6. No guarantee or liability can be drawn from the information in this report.
 7. Final determination of the suitability of any information is the sole responsibility of the user. ABG will be pleased to discuss the use of this or any other product but responsibility for selection of a material and its application in any specific project remains with the user.

BLUE ROOF Estimate DESIGN

Cherry Orchard P3 S5 - Podium

Prepared for:	Waterman Moylan		
ABG Project ID:	COrchP3-Dublin-001	Calculator version:	1.21
Issue status:	Estimate	Revision:	1.03
Designed by:	MH	Checked by:	
Design date:	16/07/2026	Check date:	

Brief:

Catchment area, attenuation area and location taken from email sent by c.maher@waterman-moylan.ie on 20/04/2026 along with attached drawing "COP-WMC-PH3-00-DR-C-P0205 Revision P01" and updates on 09/06/2026, 18/06/2026 & 13/07/2026. 7 bluroof attenuation chambers required. Design to limit discharge to the lowest possible using a 208mm blue roof system. Additional passive overflow chambers as required. FSR data utilised with R value and M5-60 taken from Phase 1 compliance document.

Input Parameters - Rainfall Information (Custom)		
Return period:	100 years	As supplied by Client
Allowance for Climate Change:	20 %	As supplied by Client
Rainfall Data Source:	FSR method (M5-60:16.8 , R=0.277)	

Input Parameters - Roof Information		
Catchment area:	3290 m ²	As supplied by Client
Storage area:	3000 m ²	As supplied by Client
Maximum allowable runoff:	0.66 l/s	As supplied by Client
Blue roof system:	ABG bluroof VF HD 208mm	Proposed

Output - Rainfall Calculation				
Duration	Rainfall (l/s/m ²)	Storage Required (l/m ²)	Time to Empty	Restricted Outflow (l/s)
15 mins	0.0245	27	83 hours and 10 minutes	0.30
30 mins	0.0170	37	106 hours and 0 minutes	0.35
1 hour	0.0110	46	126 hours and 50 minutes	0.40
2 hours	0.0069	57	147 hours and 40 minutes	0.45
4 hours	0.0043	70	168 hours and 50 minutes	0.50
6 hours	0.0032	78	181 hours and 30 minutes	0.53
12 hours	0.0020	92	202 hours and 50 minutes	0.58
24 hours	0.0012	107	223 hours and 10 minutes	0.62
48 hours	0.0007	119	238 hours and 50 minutes	0.66
72 hours	0.0006	123	243 hours and 20 minutes	0.67

Total storage required: 358.1m ³	Total storage provided: 576m ³
Half empty time: 33 hours and 50 minutes.Greater than 24 hours	

- Notes:
1. This document contains an estimate which has been prepared by ABG Ltd and is illustrative only and not a detailed design.
 2. Further details on the theories used in this estimate are available upon request from ABG. The values given are indicative and correspond to nominal results obtained in our laboratories and testing institutes. In line with our policy of continuous improvement the right is reserved to make changes without notice at any time.
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Technical

D. ABG Ltd. General Maintenance Blue Roof Systems

ABG bluroof - General Maintenance

All roofing systems and areas (regardless of whether a blue roof SuDS attenuation system is present or not) require a minimum of two inspections per year to ensure their ongoing performance. Also as part of a new development's planning requirements, an ongoing maintenance programme for any SuDS methods implemented must be submitted.

Successful long-term operation of the ABG bluroof system is dependent upon on-going biannual maintenance. It should be noted that warranties might become void if the blue roof system is not maintained in accordance with the maintenance schedule and best practise. It is recommended that each maintenance visit is formally recorded along with photographs (refer to page 2 for guidance/example).

ABG bluroof Maintenance Procedure

Roof Evaluation:

- Visual inspection of the blue roof area/s surface finishes to determine if there are any obvious areas of concern; ponding, movement in surface finishes etc

Inspection:

- Of the ABG bluroof Restrictor Chambers, orifices and roof outlets; with removal of any debris or vegetation to enable water to flow freely to the rainwater outlet.
- Of the ABG bluroof Restrictor Chamber particle filter boards, replacing as necessary.
- Where a 'Parapet' version of the Restrictor Chamber has been used, the discharge point should be inspected and cleared as required.
- Make sure the Restrictor Chamber lid is securely fitted once inspections complete.
- Identification and reporting back of any general roof issues to the building owner, to include obvious maintenance requirements or defects that may require additional remedial work.
- Of the ABG Rainwater Diffuser (if applicable). Remove lid, remove any debris, clear filter board, replacing where necessary. Check downpipe connected to the Diffuser is allowing water to flow freely to the blue roof (no obvious obstructions).

Note:

- Any additional roof or plant installations, roofing remedial work, or change of use must be discussed and approved by ABG's technical team before the installation/commencement of works.
- The Restrictor Chamber should be either visible from the surface finish or its location clearly marked, for example if it terminates below an independent manhole cover or paving, to enable ease of maintenance.
- If the orifice size is <10mm it would be recommended to increase the number of maintenance visits from 2 to 4 per annum.

ABG Ltd

With nearly two decades of experience in the design, manufacture, supply & maintenance of blue roofs throughout the UK, ABG can offer unparalleled experience and expertise in blue roof maintenance.

To discuss your specific maintenance requirements, please call our Buildings Team on 01484 852096, alternatively send the team an email at: enquiries@abgltd.com or visit; <https://abg-geosynthetics.com/products/roof-systems/abg-bluroof-blue-roof-system/>

Bluroof Maintenance Photo Checklist

Project Details:

Project Name:

Project Location:

Client:

N° of Bluroof Restriction
Chambers:

Date Maintenance
Commenced:

Date Maintenance
Completed:

List areas / roofs that have been maintained:

List areas / roofs that could not be maintained or accessed and why?

Bluroof Maintenance - Photo Checklist

(Tick Applicable)

Signature

Water
Restrictor
Chamber

Filter strip checked & replaced if required

Yes: ☐ No: ☐

Dirt / Gravel / Debris removed from inside the chamber
(Circle Relevant)

Yes: ☐ No: ☐

Is the outlet blocked?

Yes: ☐ No: ☐

List of blocked outlets:

Chamber lid reinstated

Yes: ☐ No: ☐

Diffuser
Chamber

Filter bag checked & replaced if required

Yes: ☐ No: ☐

Dirt / Gravel / Debris removed from inside the chamber
(Circle Relevant)

Yes: ☐ No: ☐

Is the diffuser blocked?

Yes: ☐ No: ☐

List of blocked outlets:

Chamber lid reinstated

Yes: ☐ No: ☐

Notes / Comments:

I certify that the photo requirements listed above have been taken and recorded for future reference.

Supervisor Signature: _____

Date: _____

E. RoadPlan Quality Audit

26176-01-001

**PROPOSED RESIDENTIAL DEVELOPMENT
PARK WEST AVENUE, CHERRY ORCHARD,
DUBLIN 10**

Stage 1 Quality Audit

**(Incorporating a DMURS Street Design Audit, and Audits
of Accessibility, Cycling, Walking and Road Safety)**

for

WATERMAN MOYLAN

on behalf of

**DUBLIN CITY COUNCIL &
LAND DEVELOPMENT AGENCY**

SEPTEMBER 2026



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DOCUMENT CONTROL SHEET

Project Title	Proposed Development at Park West Avenue, Cherry Orchard, Dublin 10
Project No.	26176-01
Document Title	Stage 1 Quality Audit
Document No.	26176 -01-001

Status	Author(s)	Reviewed By	Approved By	Issue Date
Draft 1	GH / GF	GF	GF	28/8/2026
Final	GH / GF	GF	GF	9/9/2026

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1. INTRODUCTION

- 1.1 Roadplan Consulting has been commissioned by Waterman Moylan on behalf of Dublin City Council (DCC) and Land Development Agency (LDA) to carry out a Quality Audit on a proposed development at Park West Avenue, Cherry Orchard, Dublin 10.
- 1.2 The proposed development comprises the construction of 312 no. residential units. The development will also include dedicated car parking spaces, bike parking spaces, and communal gardens.
- 1.3 The development is situated on West Park Avenue, Cherry Orchard.
- 1.4 Figure 1 below is a layout drawing of the development. Park West Avenue has a speed limit of 50 km/h in the area of the proposed development.

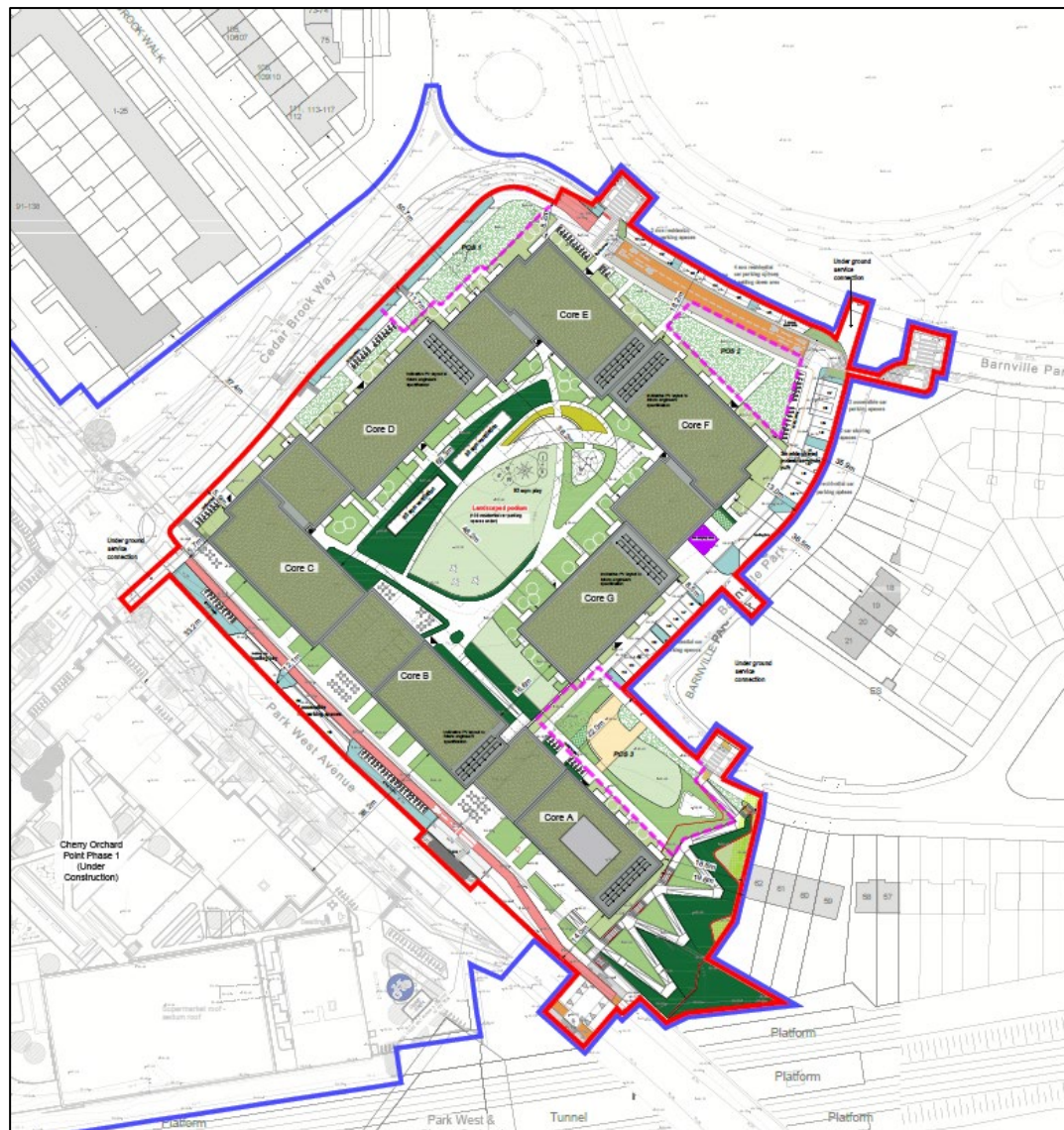


Figure 1.1– Site Location Map and Site Layout for the development

2. QUALITY AUDIT

- 2.1 Quality Audit is a defined process, independent of, but involving, the design team that, through planning, design, construction and management stages of a project provides a check that high quality places are delivered and maintained by all relevant parties, for the benefit of all end users. Quality Audit is a process, applied to urban roads, traffic management or development schemes, which systematically reviews projects using a series of discrete but linked evaluations and ensures that the broad objectives of place, functionality, maintenance and safety are achieved.
- 2.2 Quality Audit was introduced in the publication Design Manual for Urban Roads and Streets following concerns that in the design of new streets provisions made for motor vehicles frequently led to a poorly designed public realm. In an urban area there is a high level of competing demand from different classes of road users. A well-balanced street will have minimal visual clutter and obstacles; it will use durable materials and most importantly, will encourage a degree of negotiation between road users as they make their way through it.
- 2.3 Quality Audit involves various assessments of the impacts of a street scheme in terms of road safety, visual quality and the use of streets by the community. Access for disabled people, pedestrians, cyclists and drivers of motor vehicles is considered.
- 2.4 In the context of a Quality Audit, road safety assessment is considered to be an appropriate method of examining road safety issues as it incorporates both the hazard identification techniques used in road safety audit and formal risk assessment techniques. This allows the opportunity at an early stage for road safety issues to be considered in a more dynamic way within the design process, and to ensure that safety issues are considered as part of the design rather than after design work is completed.
- 2.5 The Quality Audit Team reports findings with suggestions for future action. It should be noted that, in a Quality Audit, it is not the intention that suggestions would be binding on the design team; they are offered for detailed consideration in the design process.
- 2.6 DMURS states that Quality Audits should consist of the following parts:
- DMURS Street Design Audit
 - Individual Design Audits
 - Quality Audit Report

In the case of this report the individual design audits comprise a Road Safety Audit, an Accessibility audit, a Walking audit and a Cycle audit.

3. METHODOLOGY

3.1 The Audit Team was as follows:

- George Frisby Chartered Engineer MIEI
- Glenn Hingerty Chartered Engineer MIEI

3.2 Road safety, non-motorised users, visual quality, access for disabled and functionality were considered in the Quality Audit. This exercise focused on issues such as:

- the design rationale as it related to vehicle, cycle and pedestrian movements;
- pedestrian desire lines both to and through the site;
- access requirements for all modes of transport;
- access requirements for disabled people and other vulnerable users;
- any road safety concerns associated with the scheme;
- how the scheme is experienced by those entering it and moving around within the street, including how this affects road user behaviour; and
- any other issues considered relevant to each constituent element of the Quality Audit process.

3.3 The site visit for this quality audit was carried out on 23rd August 2026

The documents provided for the audit were:

Drawing Number	Rev	Drawing Title
2539-COP-PH3-BL-ZZZ-DR-VDA-A-101		Block PH3 – Ground Floor Plan
COP-PH3-CCK-00-DR-A-1020		Site Layout
COP-PH3-CCK-00-DR-A-1020		Car & Bicycle Parking Layout
COP-WMC-PH3-00-DR-C-P0101		Proposed General Arrangement & Site Levels
COP-WMC-PH3-00-DR-C-P0111		Proposed Road Markings and Signage
COP-WMC-PH3-00-DR-C-P0115		Swept Path Analysis Refuse Vehicle
COP-WMC-PH3-00-DR-C-P0116		Swept Path Analysis Fire Tender

Copies of these audited drawings are contained in Appendix A.

Details of drainage or road lighting are not provided. It is assumed that adequate layouts will be provided for each.

In accordance with DMURS Advice Note No. 4 May 2019 (contained on <https://www.dmurs.ie/supplementary-material>) a Quality Audit should always contain a DMURS Street Design Audit and Other Design Audits (as required). Section 4 of this report contains the Street Design Audit and Section 5, 6, 7, and 8 contains the Other Design Audits (Road Safety, Walking, Cycling, Accessibility). The Street Design Audit is in the format provided as a template on the DMURS website.

STREET DESIGN AUDIT

CONNECTIVITY			
Key Issues	Key DMURS Reference	Audit Suggestion	Design Team Response
Strategic routes/major desire lines been identified and are clearly incorporated into the design.	3.1 – Integrated Street Network 3.2.1 – Movement Function 3.3.1 – Street layouts 3.3.4 - Wayfinding	3.1 Street network is proposed to be integrated with surrounding streets. There is one entry/exit to the development for vehicles.	
Multiple points of access are provided to the site/place, in particular for sustainable modes.	3.3.1 – Street Layouts 3.3.3 – Retrofitting ¹	3.3.1 There is only one point of access to the main site.	
Accessibility throughout the site is maximised for pedestrians and cyclists, ensuring route choice.	3.3.1 – Street Layouts 3.3.2 – Block Sizes 3.4.1 – Vehicle Permeability	3.3.2 – Block Sizes appear large with a robust offering of cycle and pedestrian permeability.	
Through movements by private vehicles on local streets are discouraged by an appropriate level of traffic calming measures.	3.2.1 – Movement Function 3.2.2 – Place Context 3.4.1 – Vehicle Permeability	3.2.1 – The development will function as a cul-de-sac with no scope for vehicular traffic or rat-running.	

¹ When connecting with existing communities a detailed analysis and extensive community consultation should be carried out to identify the optimal location for connections (refer also to the NTA Permeability in Existing Urban Areas: Best Practice Guide).

SELF-REGULATING STREET ENVIRONMENT			
Key Issues	Key DMURS Reference	Audit Suggestion	Design Team Response
A suitable range of design speeds have been applied with regard to context and function.	3.2.1 – Movement Function 3.2.2 – Place Context 4.1.1 – A Balanced Approach to Speed ²	3.2.1 It is presumed that the design speed will be 30 km/h.	
The street environment will facilitate the creation of a traffic calmed environment via the use of 'softer' or passive measures. ³	4.2.1 – Building Height and Street Width 4.2.2 – Street Trees 4.2.3 – Active Street Edges 4.2.4 – Signage and Line Marking 4.2.7 – Planting 4.4.2 – Carriageway Surfaces 4.4.9 – On-Street Parking Advice Note 1 – Transitions and Gateways	4.2.1 No information has been made available on building height. 4.2.2 Some information on street trees have been made available. Care should be taken to ensure that planting does not obstruct the visibility splay at the house entrances or the entrance to the development. 4.2.2 Trees should be installed in appropriate tree pits. Surface Rooting varieties should be avoided to reduce the risk of differential lifting of footways/cycleways.	
A suitable range of design standards/ measures have been applied that are consistent with the applied design speeds.	4.4.1 – Carriageway Widths 4.4.4 – Forward Visibility 4.4.5 – Visibility Splays 4.4.6 – Alignment and curvature 4.4.7 – Horizontal and Vertical Deflections Advice Note 1 – Transitions and Gateways	4.4.5 Visibility splays may be compromised by proposed trees and formal parking in proposed designated parking bays on Barneville Park.	

² Refer also to the National Speed Limit Guidelines

³ In retrofit situations a detailed analysis should be carried out to establish what measures exist, what their likely effectiveness is and level of intervention required to achieve the designed design speed.

PEDESTRIAN AND CYCLING ENVIRONMENT			
Key Issues	Key DMURS Reference	Audit Suggestion	Design Team Response
The built environment contributes to the creation of a safe and comfortable pedestrian environment.	4.2.1 – Building Height and Street Width 4.2.3 – Active Street Edges 4.2.5 – Street Furniture 4.4.9 – On-Street parking	4.2.1 No information has been made available on building height.	
Footpaths are continuous and wide enough to cater for the anticipated number of pedestrian movements.	3.2.1 – Movement Function 3.2.2 – Place Context 4.2.5 – Street Furniture 4.3.1 - Footways, Verges and Strips 4.3.2 - Pedestrian Crossings	3.2.1 It is unclear what the proposed size of the footways are. Given the reduced parking availability relative to the development size, it is unclear if there is adequate cross-sectional width.	
Cycling facilities will cater for cyclists of all ages and abilities.	3.2.1 – Movement Function 3.2.2 – Place Context 4.3.5 - Cycle facilities	4.3.5 Given the reduced parking availability relative to the development size, it is unclear if there is adequate cycle storage. 4.3.5 Given the reduced parking availability relative to the development size, it is unclear if there is adequate cargo cycle storage.	
The particular needs of visually and mobility impaired users been identified and incorporated in the design.	4.2.5 - Street Furniture 4.3.1 - Footways, Verges and Strips 4.3.2 - Pedestrian Crossings 4.3.4 - Pedestrianised and Shared Surfaces	4.3.2 – Incorrect usage of buff coloured tactile paving is proposed in the development which may result in user confusion causing disorientation. 4.2.5 – Adequate separation between footways and Sheffield stands should be provided to ensure ease of navigation for white cane users.	

VISUAL QUALITY			
Key Issues	Key DMURS Reference	Audit Suggestion	Design Team Response
The landscape plan responds to the street hierarchy and the value of the place.	3.2.1 – Movement Function 3.2.2 – Place Context 4.2.2 – Street Trees 4.2.7 – Planting Advice Note 1 – Transitions and Gateways	3.2.1 No information has been submitted regarding the swept path of either the fire tender or the refuse truck on the internal road network of this development. 4.2.2 Some information on street trees have been made available. Care should be taken to ensure that planting does not obstruct the visibility splay at the house entrances or the entrance to the development.	
Street furniture is orderly placed.	3.2.1 – Movement Function 3.2.2 – Place Context 4.2.5 - Street Furniture 4.3.1 - Footways, Verges and Strips	4.2.5 It appears that no EV charging points for electric vehicles are being proposed in this development. Current guidelines suggest that all developments should provide facilities for charging battery operated cars at a rate of up to 10% of the total car parking spaces. 4.2.5 It appears that no EV charging points for electric vehicles are being proposed in this development. Such Spaces should be included in such a layout that trailing sockets do not pose a tripping hazard.	
The use of signage and line marking has been minimised.	3.2.1 – Movement Function. 3.2.2 – Place Context. 4.2.4 - Signage and Line Marking.	No COmment	

VISUAL QUALITY

Key Issues	Key DMURS Reference	Audit Suggestion	Design Team Response
Materials and finishes used throughout the scheme have been selected from a limited palette and respond to the value of the place?	3.2.1 – Movement Function 3.2.2 – Place Context 4.2.6 – Materials and Finishes 4.2.8 – Historic Contexts 4.3.2 – Pedestrian Crossings 4.4.2 – Carriageway Surfaces Advice Note 2 – Materials and Specifications	4.2.6 – Incorrect usage of Tactile Paving at crossing points may result in confusion for white cane users.	

ADDITIONAL COMMENTS

--

5. ROAD SAFETY AUDIT

5.1 **Problem**

It is unclear what the proposed drainage arrangement will be at proposed raised crossings. Ponding of water and silting can pose a slipping hazard, especially for vulnerable road users.

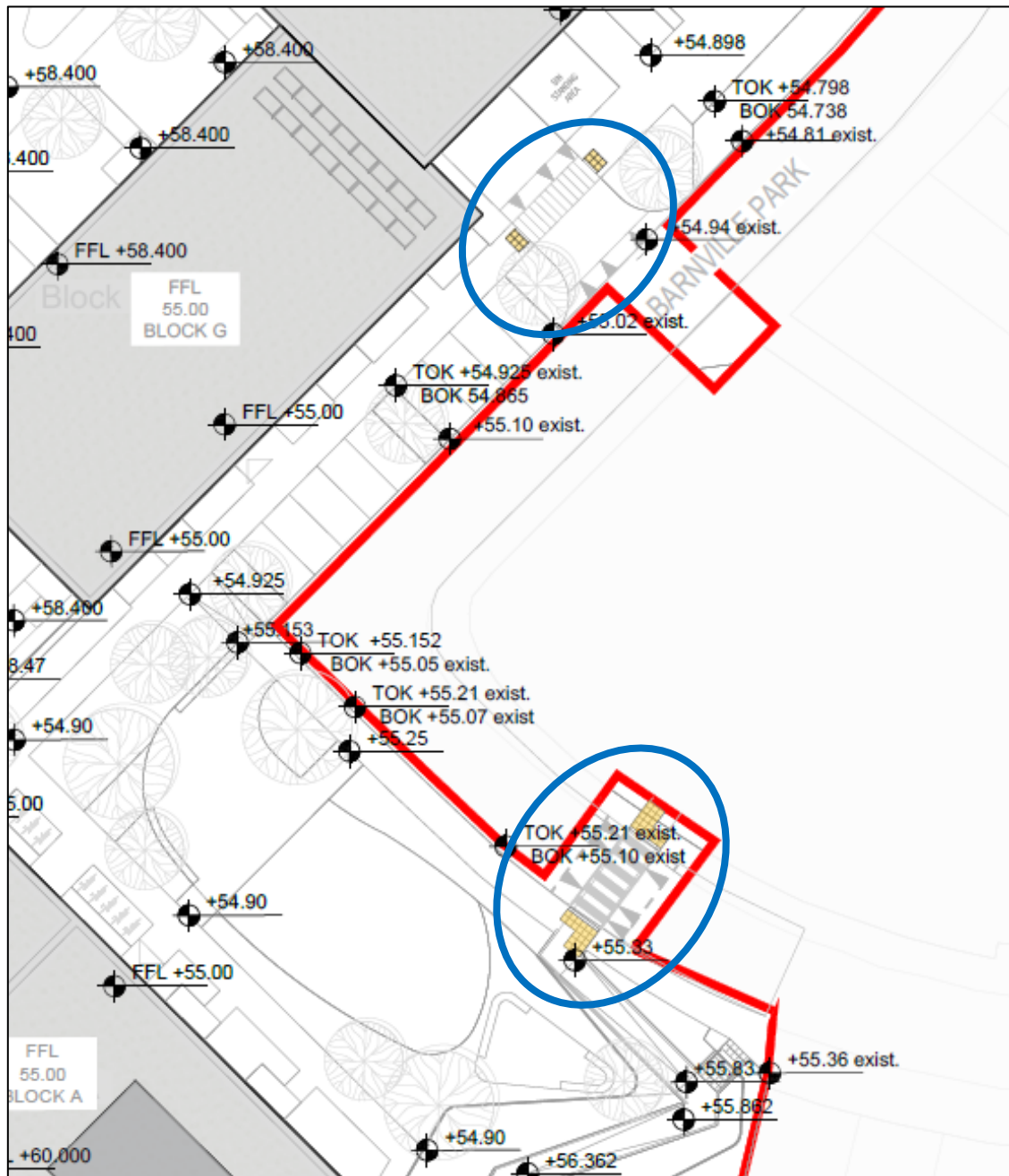


Figure 5.1 Drainage

Recommendation

Ensure adequate drainage measures at all proposed raised crossings throughout the scheme.

5.2 Problem

The existing Cherry Orchard Green / Barnville Park junction is not provided with road markings. The absence of appropriate road markings may result in uncertainty regarding junction priority and vehicle positioning, which could lead to driver confusion, inappropriate manoeuvres, and an increased risk of collisions.

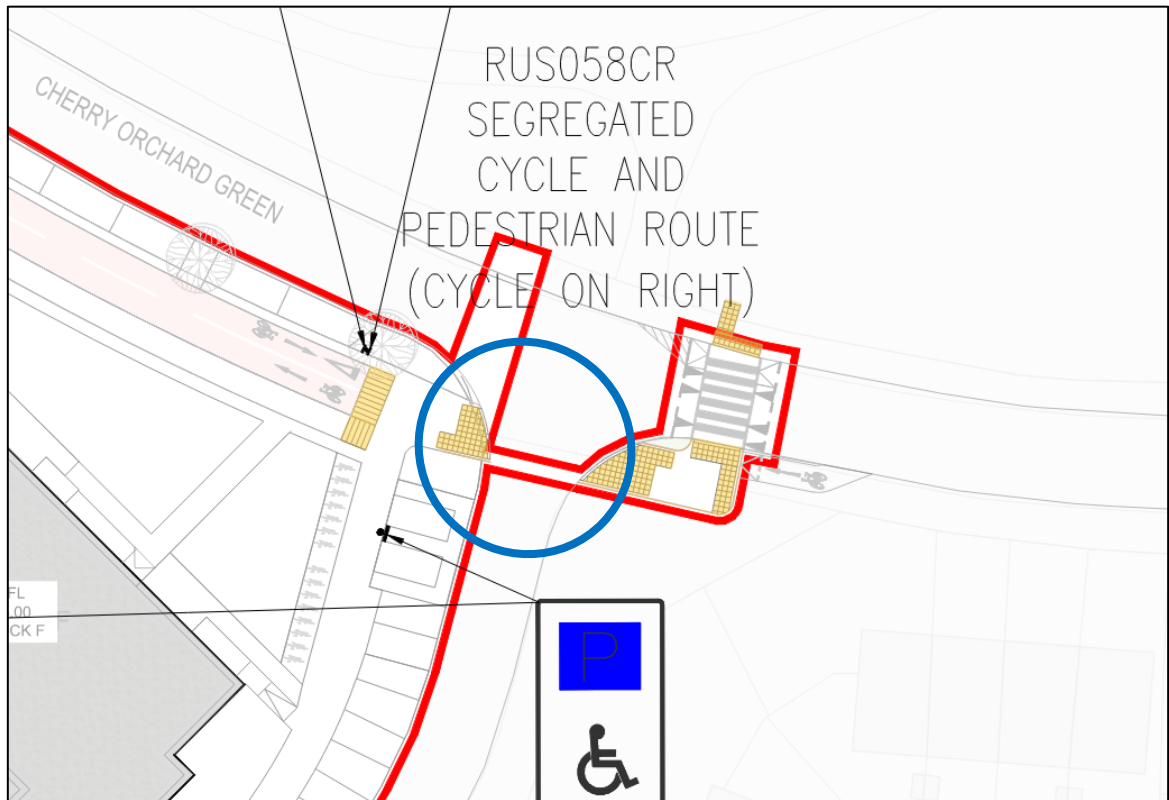


Figure 5.2 – Junction Priority

Recommendation

Provide appropriate road markings at the existing Cherry Orchard Green / Barnville Park junction.

5.3 Problem

The proposed visibility splay extends across parking areas and proposed landscaping/planting. Vehicles parked within the visibility splay, together with the future growth of planting, may obstruct intervisibility between drivers. This could reduce the ability of road users to observe approaching vehicles in sufficient time and may increase the risk of vehicular collisions.



Figure 5.3 – Visibility Splay Across Proposed Parking and Trees

Recommendation

Ensure all visibility splays are adequate, complete and free from obstacles including, but not limited to, parking and planting/trees. Relocate parking and trees as required.

5.4 Problem

The proposed visibility splay does not appear to be correctly superimposed on the drawings. As a result, it is unclear whether the required visibility standards can be achieved. Inadequate visibility splays may compromise intervisibility between drivers, increasing the risk of vehicular collisions.

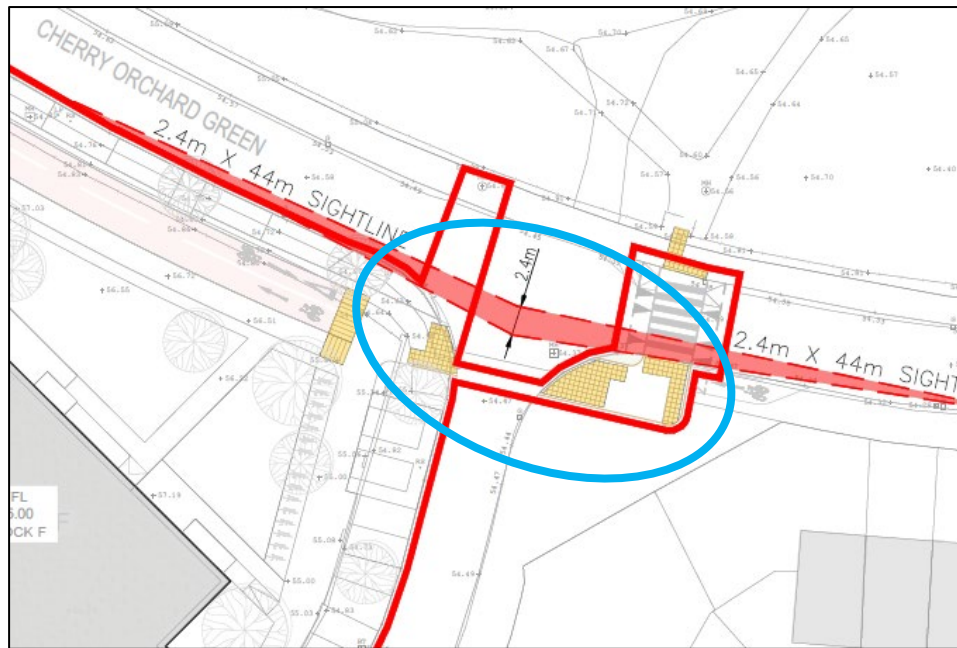


Figure 5.4 – Visibility Splay Incorrectly Superimposed

Recommendation

Review and amend the drawings to clearly demonstrate the correct location and extent of the required visibility splays. Ensure all visibility splays are adequate, complete and free from obstacles including, but not limited to, parking and planting/trees. Relocate parking and trees as required.

5.5 Problem

Intervisibility between pedestrians crossing pedestrian crossings and drivers of vehicles approaching the crossings may be restricted by vehicles parked in the adjacent car parking spaces or landscaping adjacent to the pedestrian crossings. A lack of adequate intervisibility may contribute to a collision at these locations.

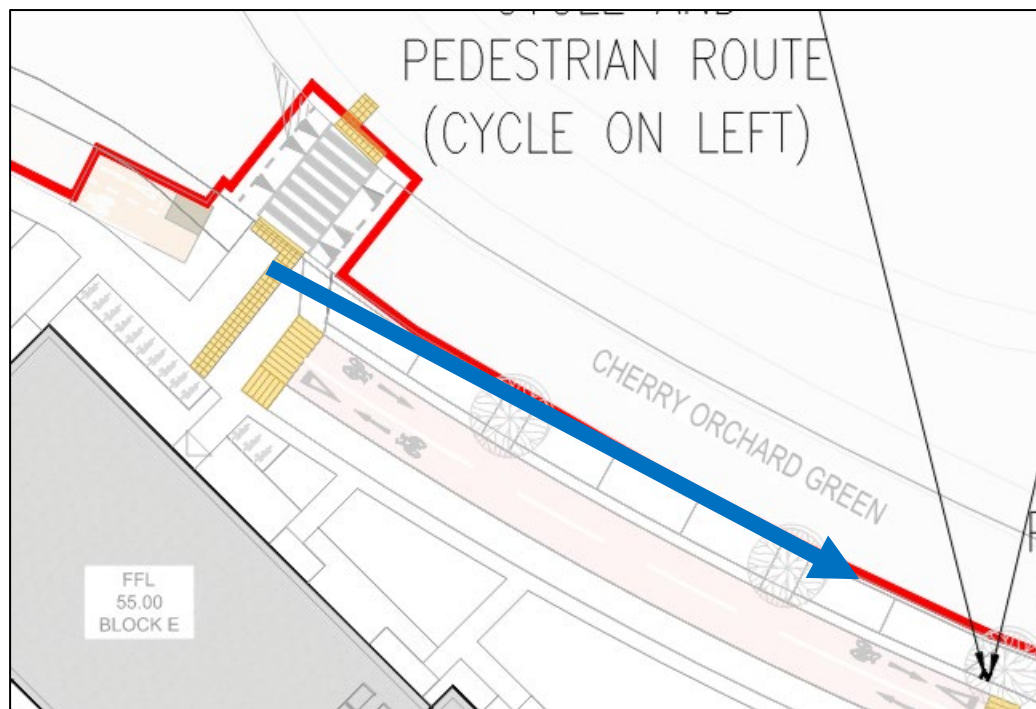


Figure 6.2 – Visibility Compromised at Pedestrian Crossing

Recommendation

Ensure adequate intervisibility between pedestrians and motorists. Relocate parking and landscaping as required.

5.6 Problem

Swept Path Analysis drawings have been provided for certain vehicle movements; however, they do not demonstrate vehicle manoeuvrability throughout the proposed internal car park. As a result, it is unclear whether sufficient space is available for all vehicles to manoeuvre safely within the development. Inadequate manoeuvring space may result in encroaching into opposing traffic lanes or pedestrian areas, or undertaking multi-point turns, increasing the risk of vehicular collisions and injuries to vulnerable road users

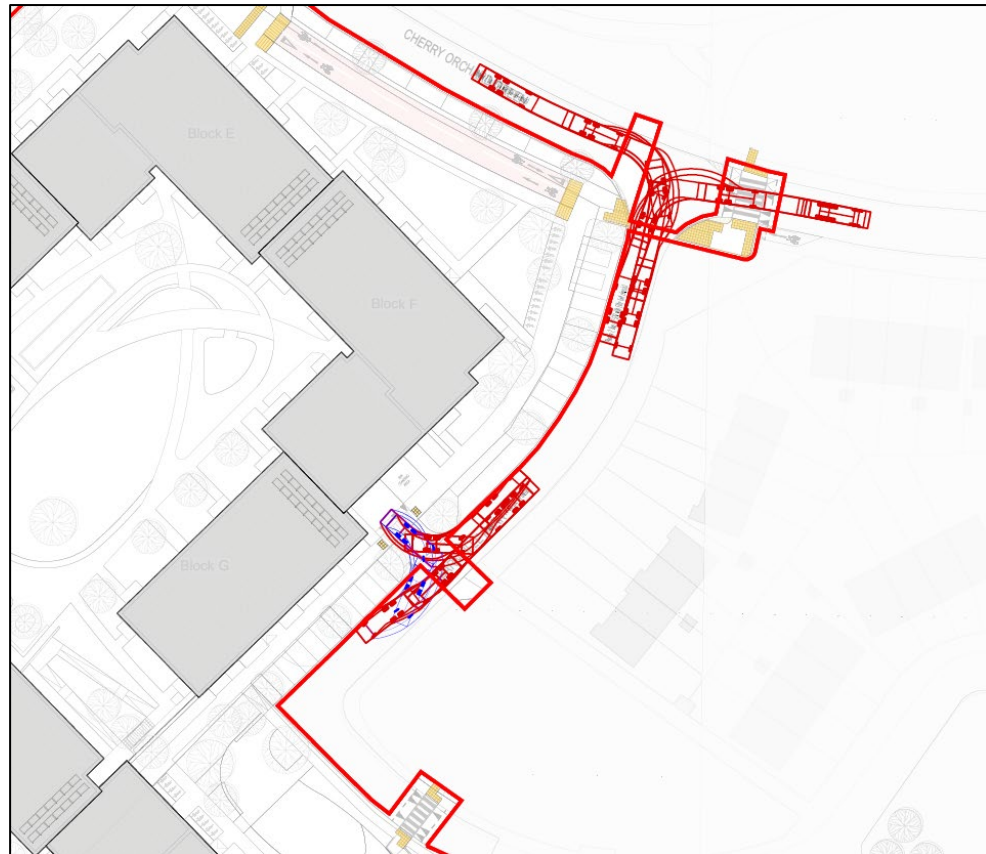


Figure 5.5 – Swept Path Analysis

Recommendation

Ensure adequate manoeuvrability space on all road networks for all vehicle types.

5.7 Problem

A raised pedestrian crossing is proposed on the eastern side of the Cherry Orchard Green / Barnville Park junction. It was noted during the site visit that existing speed ramps are currently located on both the western and eastern approaches to the junction, approximately 15 m to 20 m from the proposed raised crossing. The close proximity of multiple vertical traffic calming features may result in inconsistent driver behaviour, discomfort for vehicle occupants, and increased braking and acceleration manoeuvres. This could lead to driver distraction and an increased risk of vehicle conflicts in the vicinity of the junction and crossing.

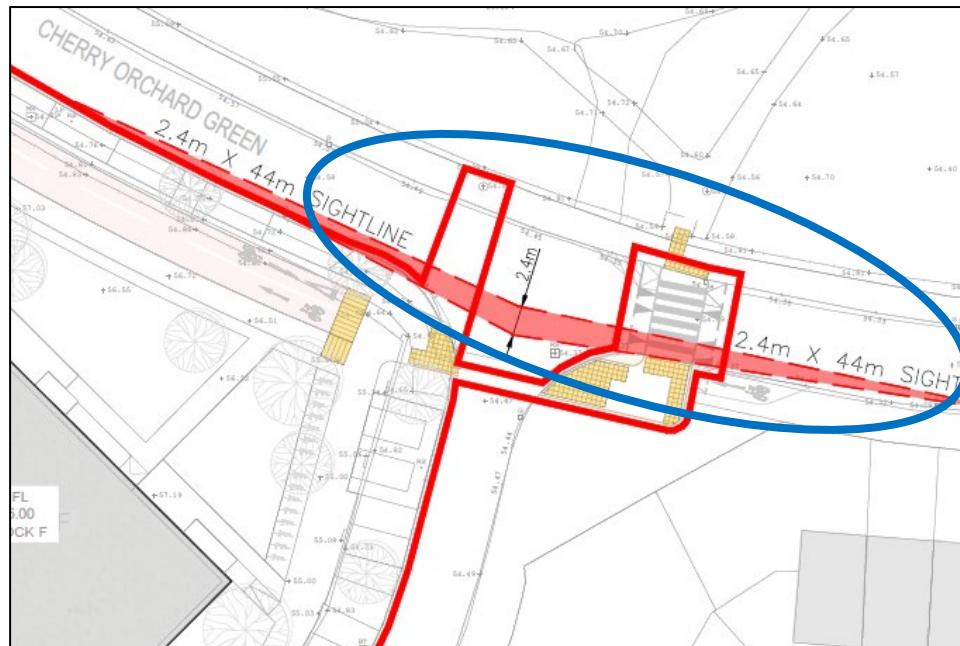


Figure 5.6 – Raised Ramps in close proximity to the Raised Pedestrian Crossing

Recommendation

Review the spacing and interaction between the proposed raised pedestrian crossing and the existing speed ramps to ensure an appropriate and consistent traffic calming strategy is provided. Consider the removal, relocation, or modification of existing traffic calming measures where necessary to reduce the potential for driver confusion and to maintain a safe environment for all road users.

5.8 Problem

Priority arrangements at the internal junctions within the proposed car parking area are not indicated on the drawings. The absence of clearly defined priority may result in uncertainty among drivers regarding right-of-way, leading to hesitation, inappropriate manoeuvres, or conflicting vehicle movements. This could increase the risk of vehicular collisions and may also present a hazard to pedestrians moving through the car parking area.

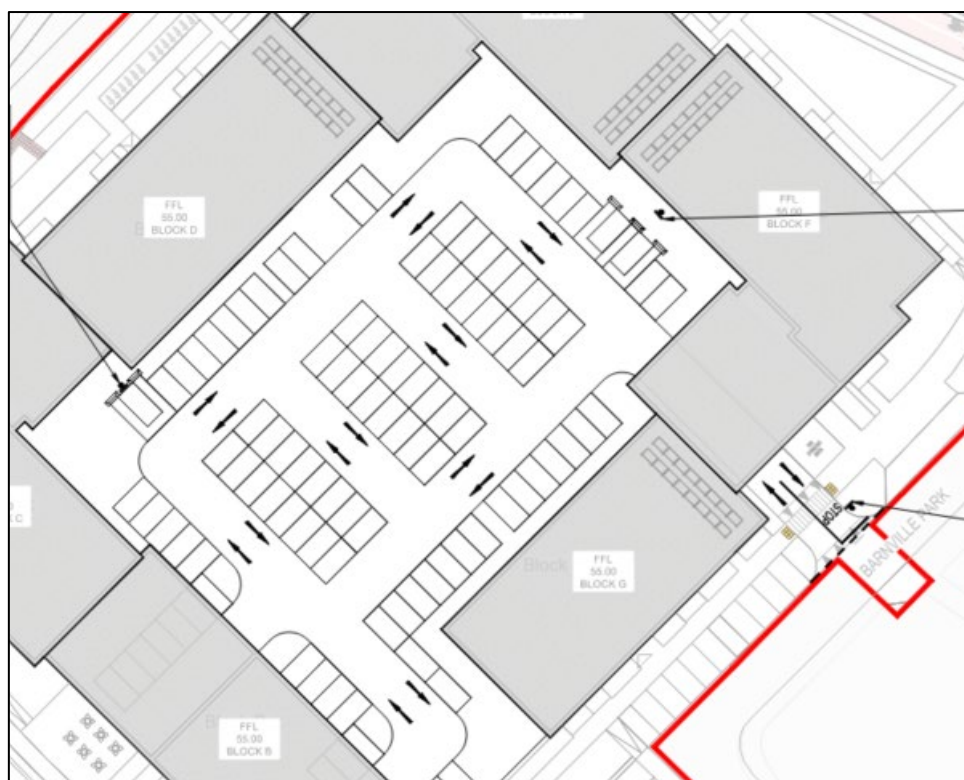


Figure 5.7 – Junction Priority

Recommendation

Provide appropriate road markings at the internal junctions within the car park area.

5.9 Problem

It is unclear if an appropriate tuning is provided at the end of the cul-de-sac within the car parking area at the location shown in the image below. A lack of an appropriate turning area may lead to long reversing manoeuvres along the car park access road increasing collision risk at this location.



Figure 5.8 – Turning Area

Recommendation

Ensure that an appropriate turning area is provided at this location.

5.10 **Problem**

A door serving a bin storage area is proposed to open directly onto the vehicle access to the car parking area. Users exiting the bin storage area may step directly into the path of moving vehicles with limited opportunity to observe approaching traffic. Similarly, drivers may have insufficient time to react to pedestrians emerging from the doorway. This may increase the risk of collisions between vehicles and pedestrians, particularly during periods of servicing and waste collection activity.



Figure 8.9 – Pedestrian Access

Recommendation

Review the layout of the bin storage area and associated access arrangements to ensure that pedestrians are not required to emerge directly into vehicular routes.

6. WALKING AUDIT

6.1 Issue

A proposed shared footway (pedestrians and cyclists) will result the user comfort for both modes, especially in a development with reduced parking levels.

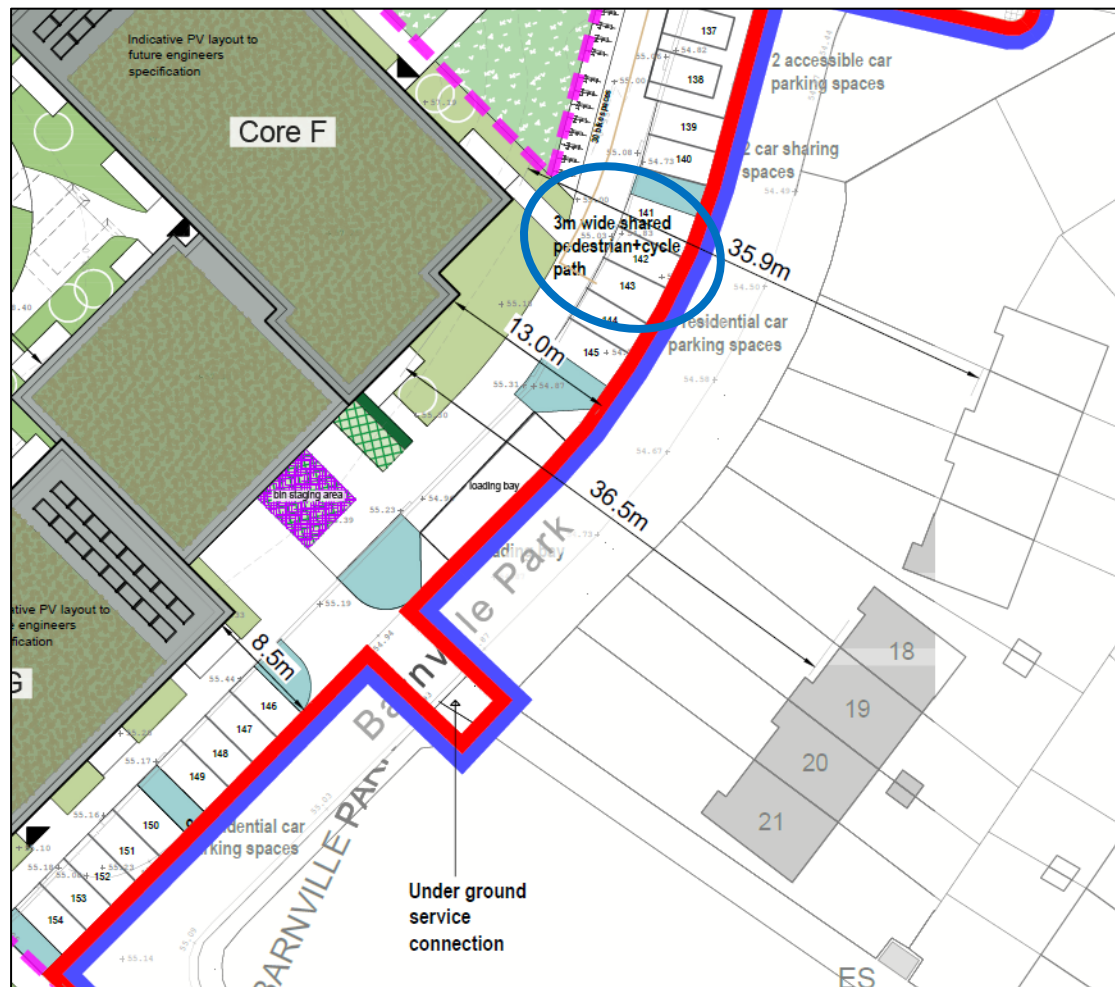


Figure 6.1 – Shared Footpath

Suggestion

Consider segregated footway and cycleway. Ensure adequate cross-sectional width, and thereby level of service, for both modes of transport based on anticipated volumes of users.

6.2 Issue

Infrastructure along pedestrian desire lines is not exhaustive along likely desire lines. This may reduce the attractiveness of walking as a mode of transport.

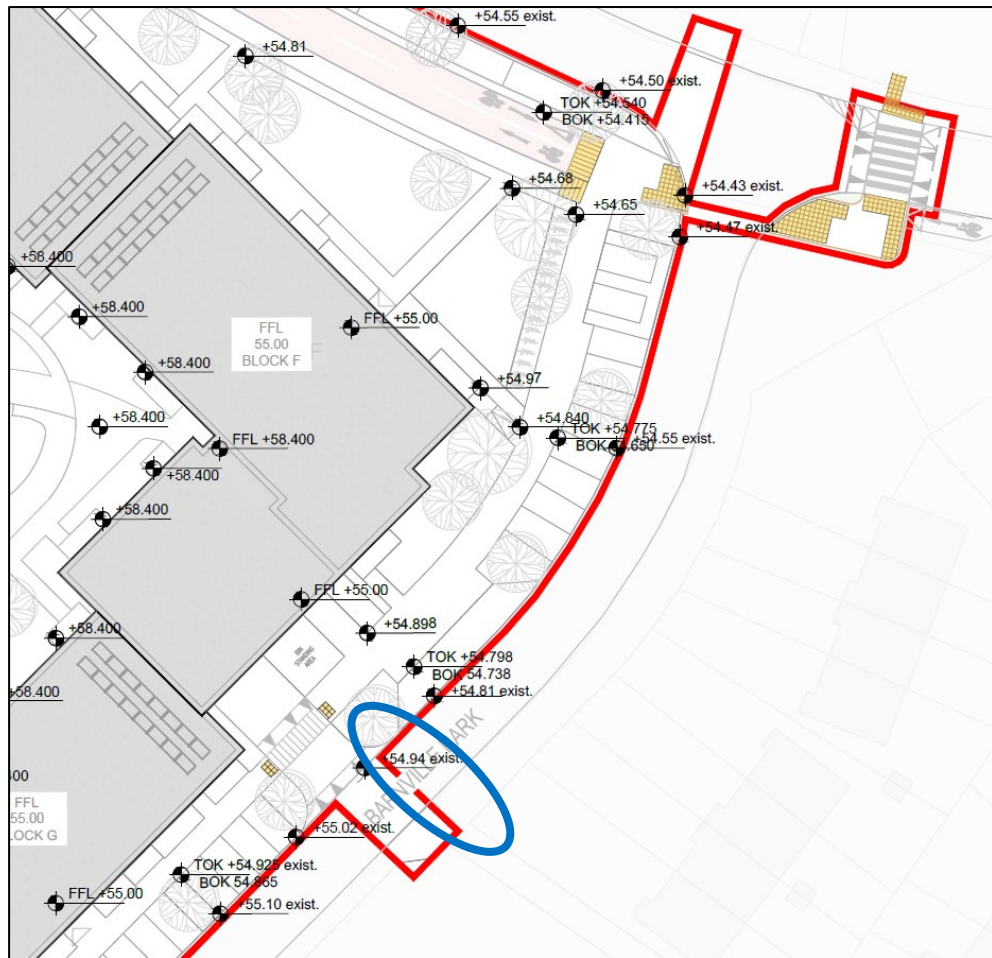


Figure 6.2 – Likely Pedestrian Desire Lines without Crossing

Suggestion

Ensure adequate pedestrian infrastructure along all likely crossing points and desire lines.

6.3 Issue

Sheffield Stands are proposed immediately adjacent to footpaths/shared space/cycletracks in a number of locations including but not limited to the locations shown in the image below. Poorly stored cycles may overhang onto the footpath/shared space area reducing its capacity.

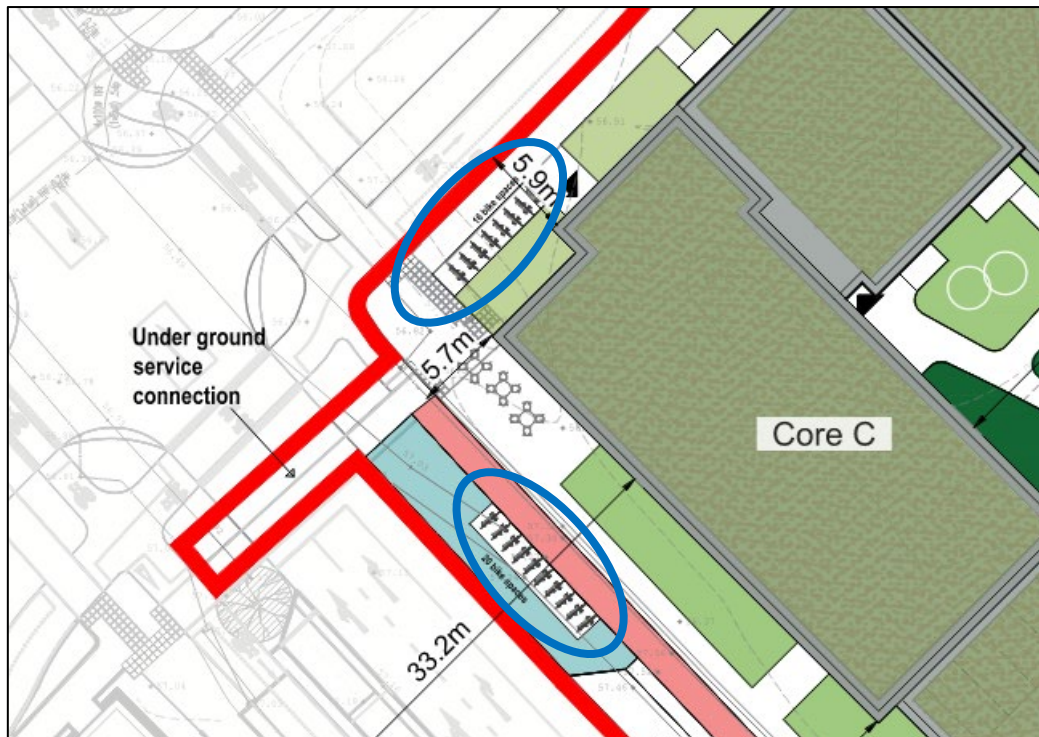


Figure 6.3 – Pedestrian Routes adjacent to Sheffield stands

Suggestion

Ensure adequate separation between the cycle parking areas and the adjacent footpaths/shared space/cycletracks.

6.4 Issue

Adequate pedestrian links have not been provided within the proposed car parking area. As a result, pedestrians may be required to walk within vehicular circulation routes to access parking spaces, building entrances, and other facilities. The absence of dedicated pedestrian routes may lead to increased interaction between pedestrians and vehicles manoeuvring within the car park, thereby increasing the risk of pedestrians being struck by passing or reversing vehicles



Figure 6.4 – Pedestrian Routes within the Car Park

Suggestion

Provide dedicated pedestrian routes within the car parking area to facilitate safe and convenient pedestrian movement between parking spaces and key destinations within the development.

7. CYCLING AUDIT

7.1 Issue

Bi-directional cycleway ends at a congested area including shared space area and pedestrian crossings. It is unclear how cyclists will tie-in to/from this cycleway from surrounding/adjacent cycling routes or desire lines.

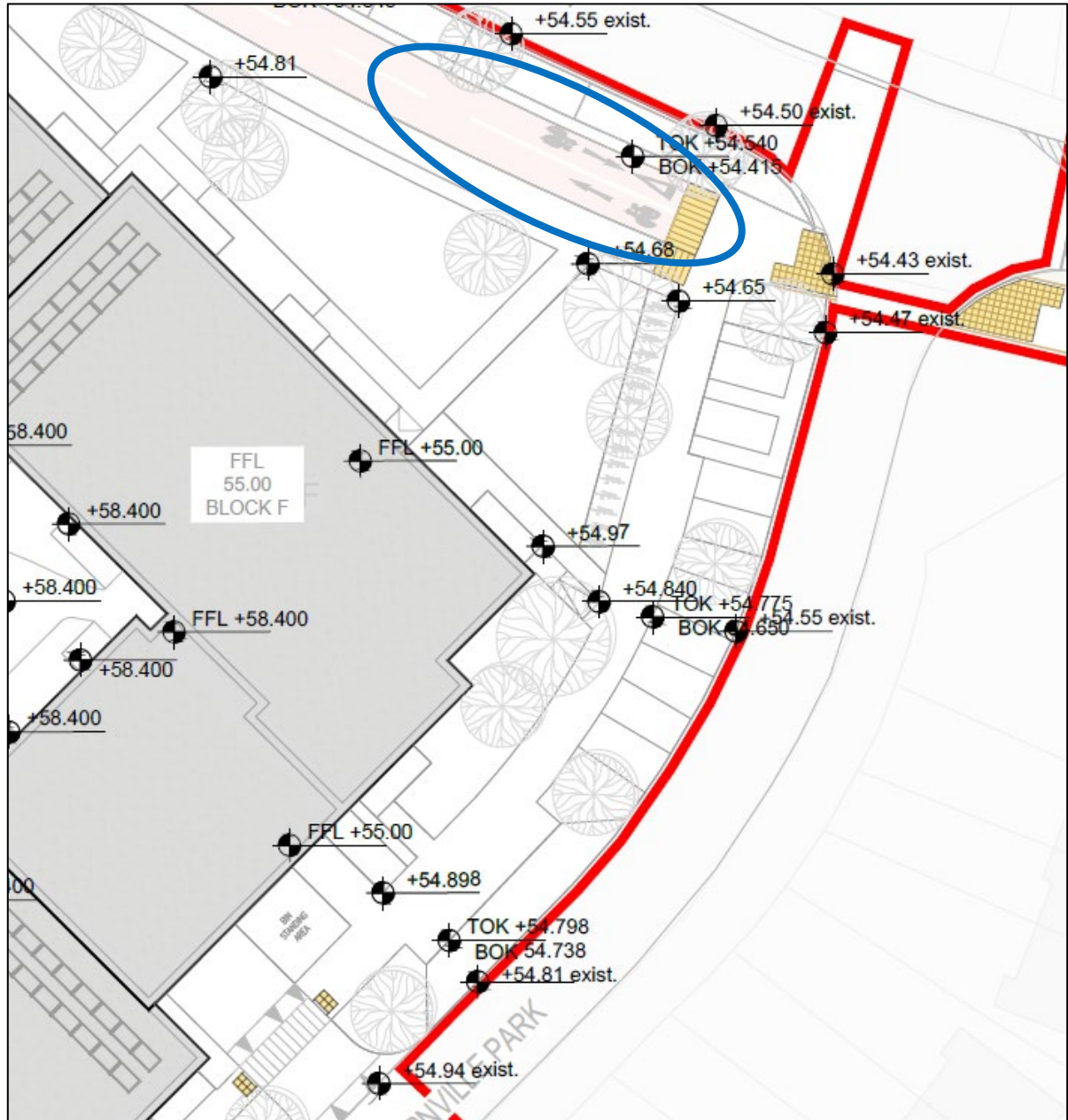


Figure 7.1 – Pedestrian Routes adjacent to Sheffield stands

Suggestion

Ensure infrastructure provides ample opportunity for tie-in to adjacent/future infrastructure.

7.2 Issue

It is unclear if proposed cycleway widths will be adequate for cargo cycles. Inadequate infrastructure may limit the uptake of the mode of transport.

Suggestion

Ensure infrastructure provides ample dimensions for cargo cycles.

7.3 Issue

It is unclear how the proposed Sheffield stands will be fixed to the ground. If these are bolted to the ground, where the bolt is accessible, this can give rise to theft by the removal of the Sheffield stand using a socket set (or similar). Risk of theft or non-secure storage may reduce the attractiveness or uptake of the mode.

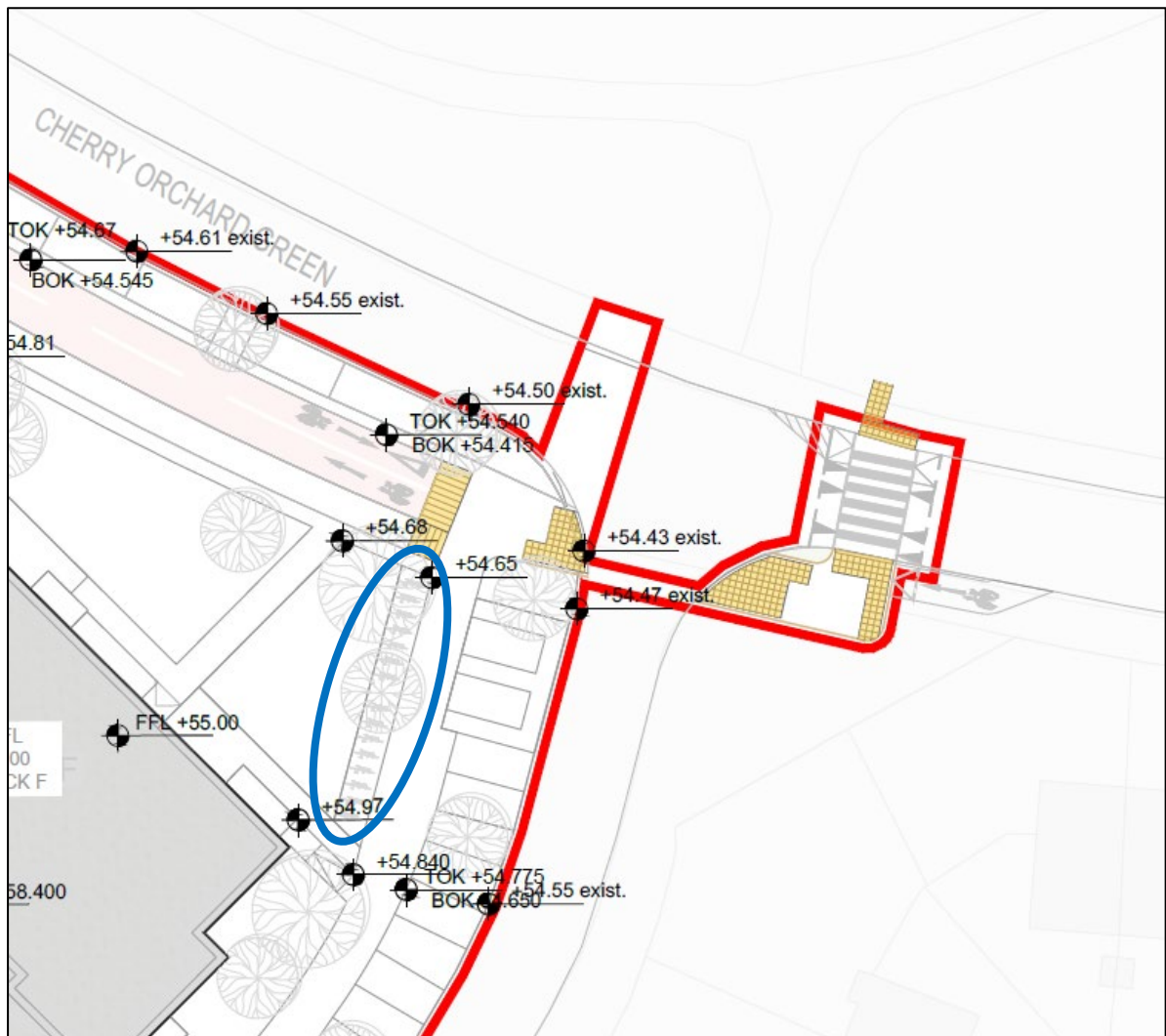


Figure 7.2 – Sheffield stands

Suggestion

Ensure secure storage.

7.4 Issue

It is unclear how cyclists will access some of the cycle parking areas from the proposed cycle facility. A lack of appropriate connections may lead to conflicts with other road users

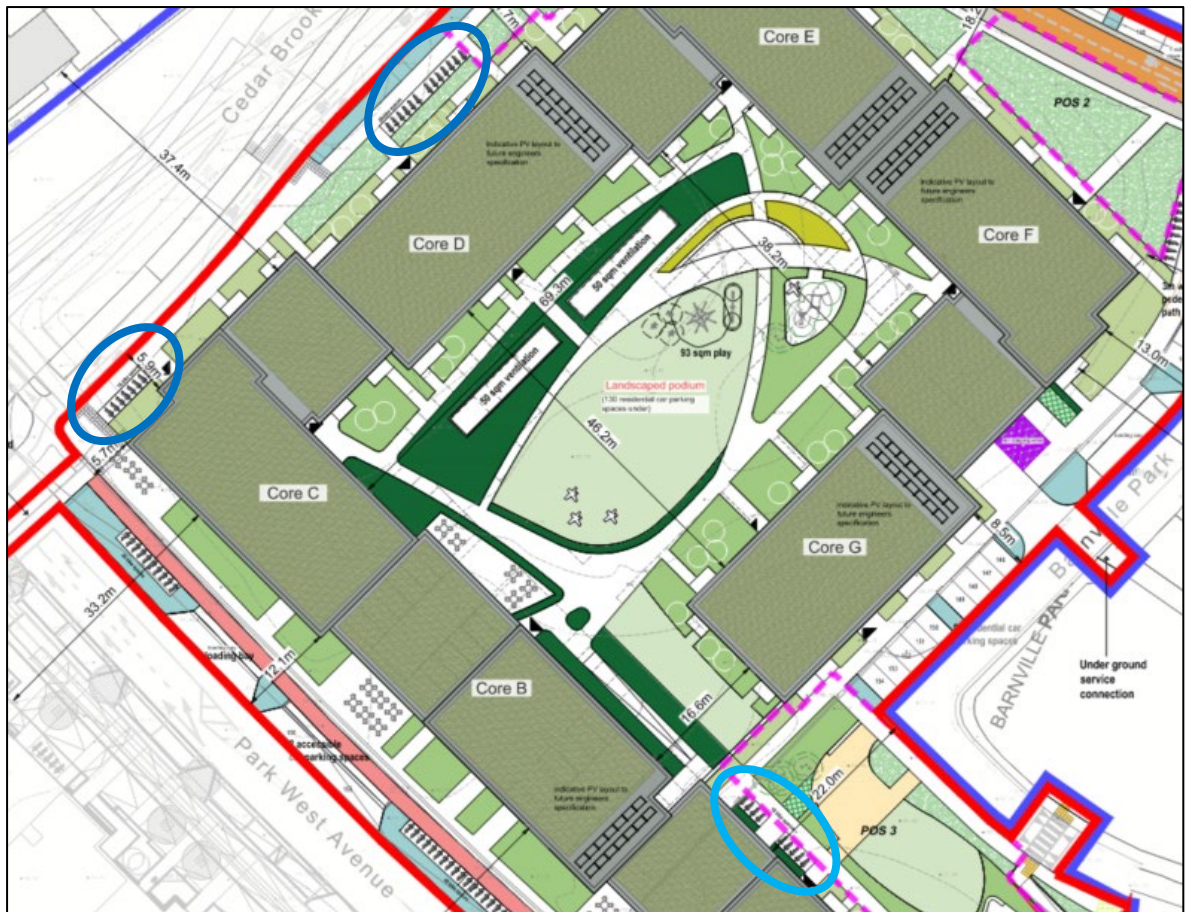


Figure 7.3 –Cycle Access

Suggestion

Ensure appropriate access is provided from the cycle facility to all the cycle parking areas.

7.5 Issue

It is not clear if there is adequate storage facilities in the development for cargo cycles. Due to their larger dimensions standard Sheffield stands are not suitable.

Suggestion

Review the cycle parking proposals to ensure that adequate and appropriately sized parking facilities are provided for cargo cycle

8. ACCESSIBILITY AUDIT

8.1 Issue

Proposed tactile paving appears to be incorrect (Buff coloured with a tail). Incorrect usage of tactile paving may result in confusion, causing disorientation, for vision impaired users.

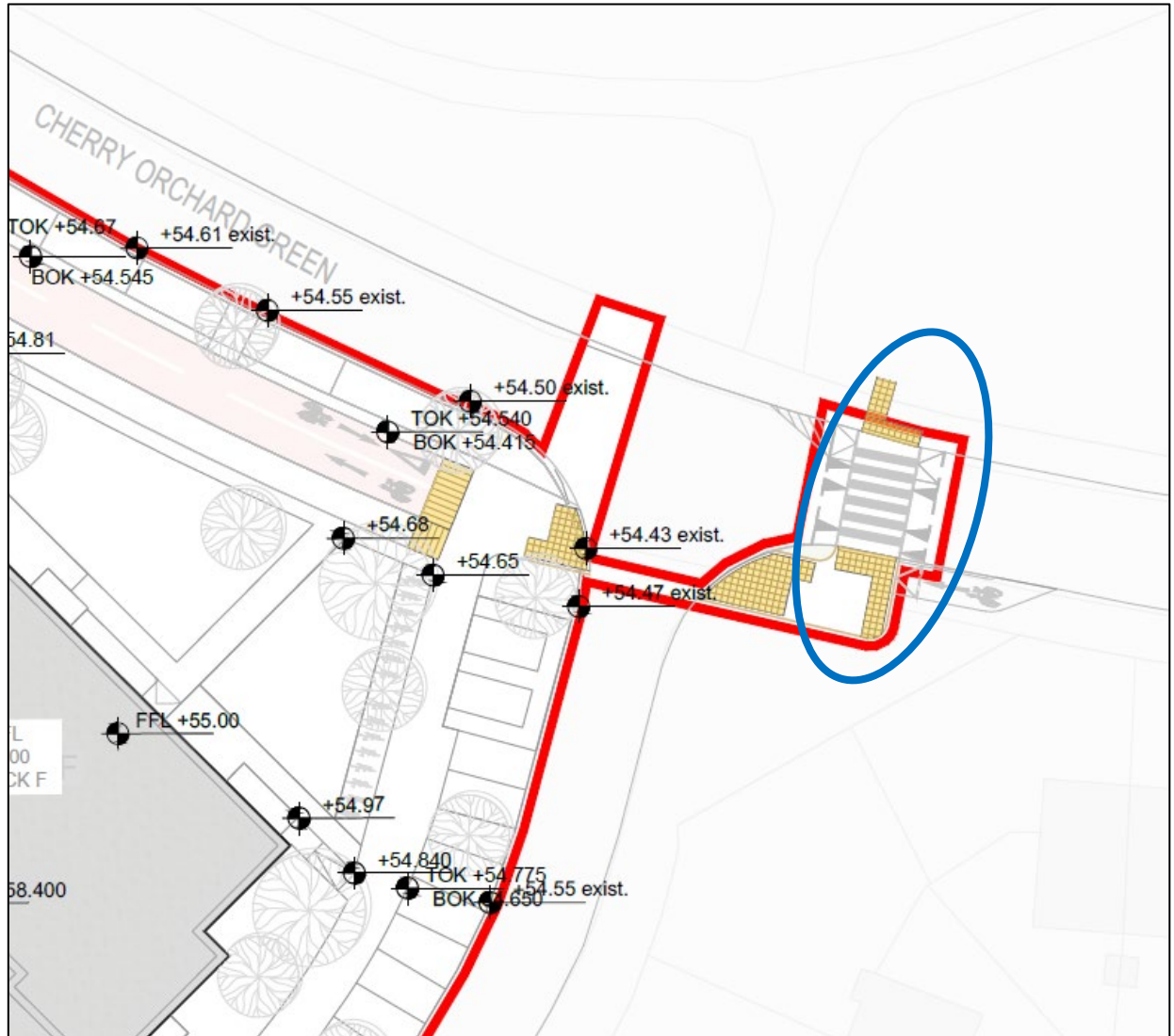


Figure 8.1 – Incorrect Tactile Paving Layout.

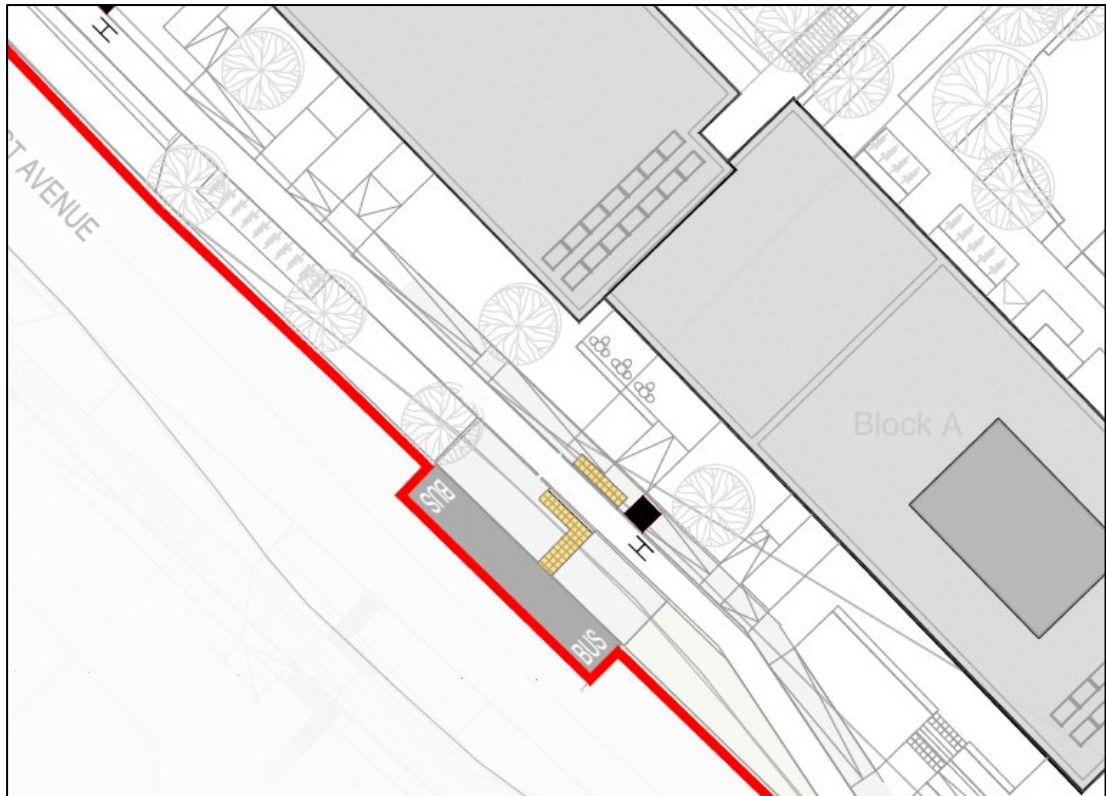


Figure 8.2 – Incorrect Tactile Paving Layout.

Suggestion

Ensure compliance with tactile paving standards to support independent navigation for white cane users.

8.2 Issue

The proposed area of shared space, 3 metres wide, may pose navigation challenges for vision or mobility impaired users due to the increased conflict with cyclists.

Suggestion

Consider full segregation of all modes.

8.3 Issue

It is unclear if there will be any segregation between the footway and cycleway. Where installed at grade without tactile delineation, this arrangement can cause disorientation for vision impaired users who may walk inadvertently onto adjacent cycleways, creating a conflict.

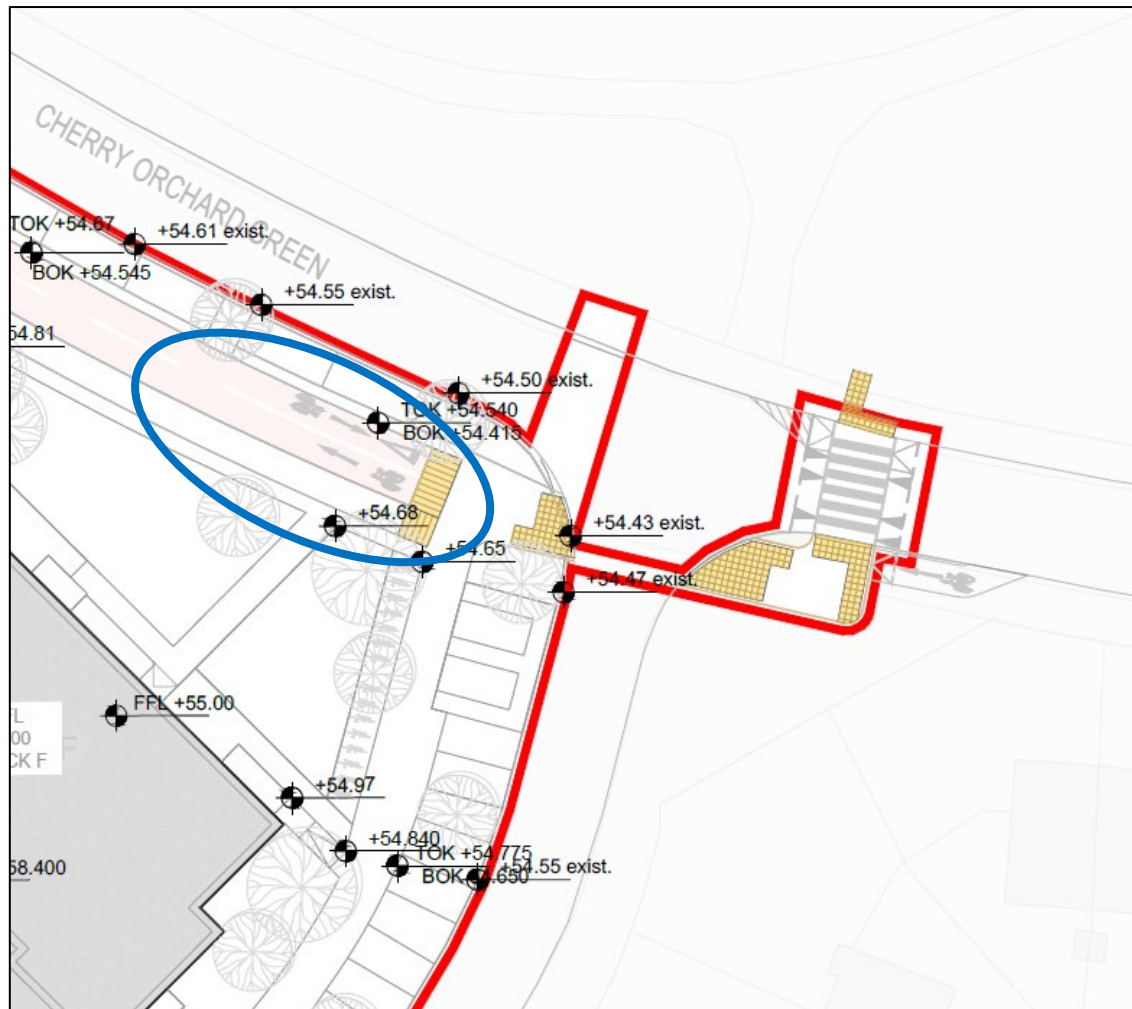


Figure 8.3 – Footway / Cycleway Arrangement

Suggestion

Consider upstand between footway and cycleway or tactile delineation.

8.4 Issue

It is unclear where chamber lids will be installed. Where installed in footways they may result in interruptions to tactile paving, causing a risk of confusion or disorientation for vision impaired users.

Suggestion

Ensure full continuity of tactile paving. Adopt recessed chamber lids as required.

8.5 Issue

Disabled parking spaces are provided within the proposed development. However, no dropped kerbs are shown to be provided to allow a mobility impaired pedestrian to access the footpath adjacent to some of the disabled parking spaces. A lack of a dropped kerb may lead to mobility

impaired pedestrians travelling along the carriageway to access the footpath where they would be at an increased risk of being struck by a passing vehicle.

Suggestion

The proposed kerb layout should be reviewed and modifications implemented to ensure dropped kerbs for pedestrian access is provided at locations where pedestrian access/use is anticipated.

8.6 Issue

Footpaths intersect with shared pedestrian/cycle facilities at a number of locations throughout the proposed development. However, no measures are indicated to warn pedestrians that they are entering an area where cyclists may be present. The absence of appropriate warning measures may result in pedestrians inadvertently entering the path of cyclists, leading to uncertainty and increasing the risk of collisions between cyclists and pedestrians, particularly vulnerable users such as children, older people, and those with visual impairments.

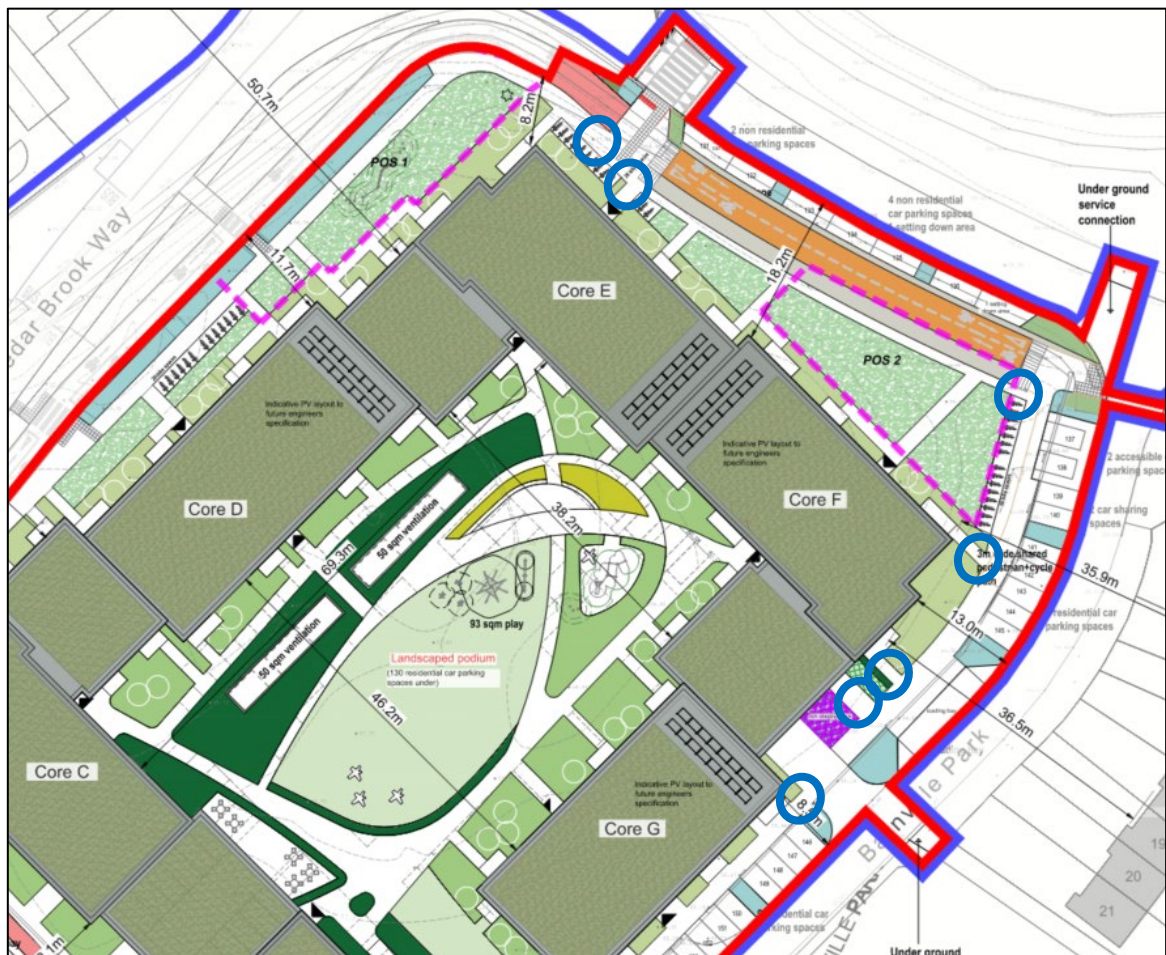


Figure 8.4 – Tactile Paving

Suggestion

Provide appropriate tactile paving at locations where footpaths intersect with shared pedestrian/cycle facilities to alert pedestrians to the potential presence of cyclists.

9. ROAD SAFETY AUDIT FEEDBACK FORM

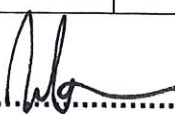
Scheme: Proposed Housing Development at Park West Avenue, Cherry Orchard, Dublin

Document Number: 26176-01-001

Date Audit Completed: 27th August 2026

Paragraph No. in Safety Audit Report	To Be Completed By Designer			To Be Completed by Audit Team
	Problem Accepted (yes/no)	Recommended Measure Accepted (yes/no)	Describe alternative measure(s). Give reasons for not accepting suggested measure. Only complete if suggested measure is not accepted.	Alternative measures or reasons accepted by auditors (yes/no)
5.1	YES	YES	Appropriate drainage facilities such as double gullies on either side of the raised table shall be incorporated into the design to ensure no ponding of surface water at these locations.	-----
5.2	YES	YES	There is currently no stop line at this junction. This can be added if required by Dublin City Council.	-----
5.3	YES	YES	The lack of visibility within the visibility splays at the proposed access location to the undercroft parking is acknowledged. The parking spaces along Barnville Park have been shifted to avoid encroachment into the visibility splay. The updated visibility splays are reflected in the current visibility splay drawings.	-----
5.4	YES	YES	Updated visibility splays are included in the planning application drawing pack and ensure that parking spaces and trees are clear of the visibility splays at this junction location.	-----
5.5	YES	YES	The lack of intervisibility between vehicles and pedestrians at this location is noted. The proposed parking spaces along Cherry Orchard Green have been shifted to facilitate clear visibility between vehicles and pedestrians using the road crossing.	-----
5.6	YES	YES	Swept path analysis for a large vehicle within the undercroft parking area has been included in the planning application drawing pack	-----

			and clearly demonstrates the manoeuvrability of vehicles within the undercroft. Refuse and fire tender vehicles are not proposed to access or utilise the undercroft parking area.	
5.7	YES	YES	Both existing speed ramps will be replaced by the proposed speed ramps at the northeast of the development, at the junction of Cherry Orchard Green and Barnville Park, and at the northwest of the development on Cherry Orchard Green.	-----
5.8	YES	YES	Appropriate road markings and priority junctions have been included in the updated design and are reflected in the roads markings and signage drawings submitted under the planning application.	-----
5.9	YES	YES	The proposed parking bays in this area of the undercroft layout have been adjusted, and appropriate large vehicle autotrack analysis has been undertaken to ensure adequate manoeuvrability within this area.	-----
5.10	YES	YES	The layout and access location of the bin store area in the undercroft parking has been reviewed to ensure pedestrians are not required to emerge directly into the vehicular routes. This detail is shown on the updated Architects Drawing 2539-PA-Car Bicycle Parking Layout submitted as part of Planning.	-----

Safety Audit
Signed off  Design Team Leader

Print Name NICHOLAS MCKEOWN

Date 9/9/26

Safety Audit
Signed off  Employer

Print Name DANIEL LARKIN

Date 9/9/26

Safety Audit
Signed off  Audit Team Leader

Print Name George Frisby

Date 9/9/2026

10. OTHER AUDITS FEEDBACK FORM

Scheme: Proposed Housing Development at Park West Avenue, Cherry Orchard, Dublin

Document Number: 26176-01-001

Date Audits Completed: 27th August 2026

Paragraph No. in Audit Report	To Be Completed By Designer		
	Issue Accepted (yes/no)	Suggested Measure Accepted (yes/no)	Describe alternative measure(s). Give reasons for not accepting suggested measure. Only complete if suggested measure is not accepted.
6.1	YES	PARTIALLY	The recommendation to consider segregated cycle and pedestrian facilities is noted. A segregated cycle track and footpath are provided along the northern and eastern fronts of the development, in line with the primary roads and main cyclist routes.
6.2	YES	YES	
6.3	YES	PARTIALLY	The interface between the proposed cycle parking facilities and adjacent footpaths, shared spaces and cycle tracks is noted. The location and arrangement of the cycle parking facilities will be reassessed where appropriate to ensure suitable integration with the surrounding pedestrian and cyclist facilities.
6.4	YES	PARTIALLY	The provision of dedicated pedestrian routes within the car parking area is noted. Dedicated pedestrian facilities are provided along the perimeter of the undercroft parking area, providing a safe route between the parking spaces and the wider pedestrian network. Given the scale and layout of the undercroft parking area, the provision of additional dedicated pedestrian routes through the parking aisles is not considered necessary.
7.1	YES	PARTIALLY	Appropriate tactile paving is incorporated into the design to indicate to cyclists that the cycle track terminates at this shared-surface location. Future cycle lane facilities are proposed as part of a separate development to the north of Cherry Orchard Green, with cyclists required to cross the street to access and connect with the future cycle lane.
7.2	YES	PARTIALLY	The cycle track is designed at 4.0 m wide, in accordance with the desirable minimum width stipulated in the Cycle Design Manual for a bidirectional cycle track.

7.3	YES	YES	
7.4	YES	YES	
7.5	YES	YES	
8.1	YES	YES	
8.2	YES	PARTIALLY	The cycle track and footpath arrangement adjacent to Cherry Orchard Green, with the shared surface area, has been designed in consultation with Dublin City Council and reflects the Council's preferred approach for this side of the development.
8.3	YES	PARTIALLY	An upstand, where required by the Council, will be incorporated at the relevant locations.
8.4	YES	YES	
8.5	YES	YES	
8.6	YES	YES	

Safety Audit

Signed off



Design Team Leader

Print Name

NICHOLAS McKEOWN

Date

9/9/20

Please complete and return to:

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UK and Ireland Office Locations

