

Vanisland Limited

Confey Phase 1A LRD

Infrastructure Design Report (Planning Submission)

2423-DOB-XX-SI-RP-C-0001

June 2026

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Document Control

Document:		Infrastructure Design Report (Planning Submission)			
Project:		Confey Phase 1A LRD			
Client:		Vanisland Limited.			
Job Number:		DOBA2423			
File Origin:		\\doba-server\projects\Projects\DOB&A Projets\2024 Projects\DOBA 2423 - Ballymore Confey Lands\08 Reports & Specifications\8.1			
Document Checking:					
Author:		Martin James Coffey		Signed:	
Issue	Date	Status	Issued to	Copies	Checked for Issue
S2.P01	08.05.2026	Issue 1	Client, Design Team	1E	
S2.P02	16.06.2026	Issued for Planning	Kildare County Council	1E	

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1 Introduction

Donnachadh O'Brien & Associates Consulting Engineers Ltd. (DOBA) have been instructed by the Client, Vanisland Limited., to prepare an Infrastructure Design Report (IDR) to accompany a planning application submission to Kildare County Council (KCC) for the proposed Large Scale Residential Development (LRD) within the townlands of Newtown and Confey, Leixlip Co. Kildare. This Infrastructure Design Report is structured as follows;

- **Section 2** summarises the attributes of the **Existing Site**,
- **Section 3** provides a description of the **Proposed Development**,
- **Section 4** addresses the proposed responses to the KCC Stage 2 formal Opinion.
- **Section 5** addresses the proposed **Surface Water** & SuDS design demonstrating compliance with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS) and Kildare County Council. This section demonstrates how the proposed development has adopted a Nature Based SuDS (NBS) focused approach to surface water disposal on site through the provision of bioswales, bioretention tree pits, filter drains and permeable paving and finally petrol / oil separator are proposed as proprietary system SuDS in addition to supplementary underground attenuation in the form of proprietary 95% void forming crate systems. The proposed design provides a minimum 2-stage surface water treatment process which intercepts surface water run-off at source and treats the water by filtration and treatment through natural material prior to discharging to the existing surface water network traversing the GAA club to the east before discharging to an existing watercourse.
- **Section 6** addresses existing and proposed **Wastewater Drainage** arrangements,
- **Section 7** addresses the existing and proposed **Water Supply** proposals to the development, and finally,
- **Section 8** outlines the **Roads Infrastructure** arrangements for the proposed development and describes the existing infrastructure, proposed development access and proposed roads infrastructure throughout the site. This section also summarises the Road Safety Audit, Transport Assessment and Mobility Management Plans that will be prepared and submitted with the final Planning Application.

This Planning submission to Kildare County Council (KCC) follows the S247 consultation held in April 2025 and the Stage 2 S32B LRD Process submitted in October 2025 and reflects key changes to civil infrastructure, particularly in relation to proposed drainage and roads. Detailed comments received from KCC arising from the S247 and S32B consultation have been addressed as part of this submission. This Infrastructure Design Report should be read in conjunction with all other relevant information prepared by the Design Team and enclosed with the application Submission.

2 Existing Site

The existing greenfield site as illustrated in **Figure 1** below is bound to the south by the Royal Canal and the Royal Canal Greenway, to the west by agricultural lands, to the north by the L1015 Confey Road and to the east by the R149 Captain's Hill and beyond by Confey GAA Club. The existing site topography slopes from north-west to south-east with existing levels ranging from c. +59.00m along the northern boundary to +57.00m along the eastern boundary. The existing site is illustrated on **Engineering drawings C-0100**. The lands form part of the area designated as the Confey Masterplan lands within the Leixlip Local Area Plan 2020-2023 (as extended). A Masterplan was prepared for the entire Confey lands to ensure that any future development is carried out in a sustainable manner. The LAP was amended to integrate the Masterplan as part of the LAP and this came into effect in May 2024.



Figure 1 Indicative Site location (highlighted in red)

3 Proposed Development Description

Vanisland Limited, intend to apply for planning permission for a Large-scale Residential Development (LRD) on lands within the townlands of Newtown and Confey, Leixlip, Co. Kildare. The application site is bound by the R149 to the east, the L1015 to the north, Paceland and Captains Hill (residential dwellings) to the north-east, greenfield lands to the west, and the Royal Canal to the south.

The proposed development provides for the construction of 272 no. residential units comprising: 101 no. terraced houses (54 no. 3-bed 2 no. storey houses, 28 no. 4-bed 2 storey houses and 19 no. 4-bed 3 no. storey houses); 12 no. own door 1-bed apartment units in an end of terrace (3 storey) arrangement throughout the site; 78 no. duplex apartment units (33 no. 2-bed and 45 no. 3-bed units) provided in terraced and end of terrace (3 storey) arrangements throughout the site; and provision of a mixed use area (referred to as Block A) comprising 81 no. apartments / duplex apartments units (29 no. 1-bed, 36 no. 2-bed, and 16 no. 3-bed units) in 4 no. blocks partially over a podium / undercroft level (Blocks A1 to A4) ranging from 3 no. storeys to 6 no. storeys.

The provision at ground floor and podium / undercroft level of Block A of a childcare facility and associated play area; 3 no. commercial units (for Class 1- Shop, or Class 2- Office / Professional Services, or Class 11 Gym, or Restaurant / Café use, including ancillary takeaway use, or Class 8- Health Centre / Civic, or Cultural Use); a Restaurant / Café unit; bike stores; bin stores; plant areas; 1 no. ESB substation and associated switch rooms; and car parking.

The development provides public open space and communal open space to serve the residential units, and c. 1 ha of the proposed strategic open space comprising a linear park to the north of the Royal Canal.

Provision of 2 no. vehicular and pedestrian / cyclist access from the R149 to the east and the L1015 to the north; and proposed upgrades (horizontal widening and minor vertical road alignment) to the R149 to the east and to the L1015 along the northern boundary of the site.

The development will provide for car parking spaces; bicycle parking spaces; internal roads, pedestrian and cycle paths; and the provision of the proposed infrastructure up to the application site boundary to facilitate future connections to adjoining lands.

Provision of foul, watermain and surface water drainage, including upgrade works to the existing watermain along the R149; public lighting; landscaping and boundary treatment works; PV panels; services; bin and bicycle stores; and all associated infrastructure and site works to facilitate the development.



Figure 2 Proposed development (source: BSLArch)

4 Stage 2 LRD Comments from Kildare County Council

Ref	WCC Opinion	Applicant Response
Landscaping/ Park		
5	Clarification is required regarding the extent of Sustainable Urban Drainage Systems (SuDS), particularly where more than 10% of open space is occupied by SuDS features. On the Taking in Charge map, street trees within public spaces are not clearly identified and it is unclear who will be responsible for their maintenance if they fall outside the Taking in Charge area. This issue is of particular importance where trees form part of SuDS infrastructure	The Proposed SuDS features have been reviewed and Coordinated with the Landscape Architect. A total area of 16% of the Overall POS is being occupied by SuDS features such as Bioretention areas, Swales and Retention basins. SuDS tree pits have been removed from Taken in charge areas and have been coordinated with the Landscape Architect and landscape design.
Water Services - SuDS		
1	The proposed surface water drainage system shall be designed in terms of incorporating appropriate Sustainable Drainage Systems (SuDS). The applicant shall comply with the Kildare County Development Sustainable Drainage Systems (SuDS) Guidance Document and incorporate a sequence of SuDS techniques that work together in a Management Train to control the flow, volume and frequency of run-off as well as preventing or treating pollution as water flows through the development. SuDS design shall maximise nature-based solutions and the sustainable drainage systems shall be designed, inspected, and supervised by a qualified engineer who shall certify the works as compliant with regard planning compliance, design and construction. The sustainable drainage systems shall cater for the 1 in 100 year storm event (or as otherwise agreed in writing) and with an allowance of +30% in order to cater for "climate change" and an additional 10% for Urban creep. The Applicant shall ensure that surface water from the development does not discharge to a point where neighbouring developments would be at risk of flooding	As per Section 5.2 below, The design and management of surface water for the proposed development will comply with the requirements of the Greater Dublin Strategic Drainage Study (GSDSDS). The design of the surface water network and SuDS measures within the application site shall include a 30% climate change factor and an allowance for a 10% factor applied to account for Urban Creep in accordance with the Kildare Co. Co. Water Services requirements.
2	Proposed Surface Water Drainage and Landscaping layouts/details shall correlate in full with each other as part of any planning application. The applicant is required to show details and sizes of the Sewage, Water and Storm network they are connecting to, and the condition they are in. Surface water and Wastewater drainage	The proposed discharge of the surface Water network from the site to the adjacent existing Surface Water sewer to the East of the site is illustrated in the Engineering Drawing DR-C-0200 submitted with this application. The proposed Separate Wastewater discharge from the site to the existing 750mm diameter sewer outlined in section 6.3 of this Infrastructure Design Report is also illustrated

	systems must discharge to separate pipe networks	on Engineering Drawing DR-C-0300 submitted with this application The proposed Watermain connection and associated watermain upgrade works are outlined in section 7 of this report. The associated sizing and layout of the infrastructure has been illustrated on Engineering drawing DR-C-0400, 0401, 0402 and 0403.
3	Underground attenuation systems are not an acceptable nature-based SuDS measure and should only be considered as a last resort, refer to Objective IN 024 of the Kildare County Development Plan 2023-2029. It is the intention of Kildare County Council that the use of underground drainage techniques is to be limited across Kildare as per Objective IN 024. In that vein, the applicant is requested to revise the surface water design to remove the proposed underground Cellular Attenuation System and replace same with a nature based above ground solution such as detention basins	DOBA have reviewed the overall surface water strategy to replace any underground attenuation structures with Nature Based solution. The primary Regional control prior to discharge from the site has been developed in the form of a Retention basin, however, the requirement for supplementary underground attenuation to the north of the MU1 still remains. This solution has been last resort. A complete Nature Based Regional Control at the outfall would result in the removal of a significant portion of the residential units.
4	The applicant shall submit a Sustainable Drainage Systems (SuDS) Maintenance Plan for the written approval of the Planning Authority. The plan shall include a schedule of activities providing details and frequency of maintenance tasks required for all SuDS and surface water drainage elements proposed. This maintenance regime shall have planned preventative and response elements and cover all emergency maintenance and repairs	Section 5.8 of this report highlights the management regime of all Nature Based Solutions and the frequency of maintenance tasks.
5	The applicant is required to submit a surface water drainage catchment drawing delineating each proposed individual surface water catchment for the development.	Engineering drawing 2423-DOB-XX-SI-DR-C-0250 has been submitted with this application and illustrates the proposed surface water catchment for the proposed development.
6	All Sustainable Drainage Systems (SuDS) features within areas proposed for Taking in Charge shall be designed and constructed in accordance with Kildare County Council's Sustainable Drainage Systems (SuDS) Taking in Charge Standard Details. All tree pits shall collect runoff via overland flow and not direct discharge to base of tree pit.	The proposed Surface Water strategy has been developed to allow overland flows from adjacent hardstanding to be conveyed to tree pits. Conveyed flows will discharge to the main Surface water line. No surface water flows will discharge directly to the base of tree pits.
7	Flood risk must be assessed and commented on for all sites. Submissions must comply with OPW Guidelines for Planning Authorities.	As per Section 5.11, A Site-Specific Flood Risk Assessment (SSFRA) has been prepared by JBA Consulting and has been submitted with this application as a separate document. The SSFRA concludes that the proposed

		development complies with the requirements of the Justification Test for development management and that the Flood Risk Assessment and strategic development recommendations were undertaken in accordance with 'The Planning System and Flood Risk Management' guidelines and agrees with the core principles contained within.
Uisce Eireann		
1	All Confirmation of Feasibility (COF) letters are usually valid for a period of c. 12 months from date of issuance. After this period, it may be required for the applicant to submit a new PCE in order to obtain an updated COF letter. The applicant is required, under the Large-Scale Residential Development Regulations to submit a valid Confirmation of Feasibility (COF) when lodging their LRD application	The received Confirmation of Feasibility (CDS25002837) is dated 22 October 2025 and therefore is within 12 months at the time of submission of the LRD application for which this pertains to.
2	Uisce Eireann does not permit build over its assets. Separation distances from public infrastructure, as per Uisce Eireann's Standards Codes and Practices must be achieved. It is the applicants responsibility to submit a diversion enquiry to Uisce Eireann Diversions Section (diversions@water.ie) prior to construction, where a potential build over public assets is in question and/or where the applicants proposals cannot achieve separation distances from public infrastructure as per UE Standards & Codes of Practice	As per Section 6.2.3 of this report, The applicant has liaised with Uisce Eireann regarding existing UE assets which traverse the site, have submitted a diversion application (DIV26011) and have received a Confirmation of Feasibility for the same.
3	Statement of Design Acceptance (SODA) - The applicant is advised that a SODA is recommended to be in place and submitted at full LRD planning application lodgement stage.	Uisce Eireann, through the Statement of Design Acceptance process have reviewed the proposed Wastewater and Watermain arrangement for the development and have approved the arrangements provided. As part of the development for which this application pertains to, the applicant is in possession of a Statement of Design Acceptance (SoDA) and is submitted with this application. The received SoDA has been included in Appendix E of this report.
Transportation		
1	(a) The proposed main access points off the L1015 and R419 for both construction and development traffic. No long straight sections of road >70m as per DMURS	As per Section 8.8 of this report, the Design Statement of Consistency indicates that no lengths of road are >70m in accordance with DMURS.
	(b) Internal access roads to be a minimum of 5.5 metres wide with the main spine road to be a minimum of 6.0 m in width	As per Section 8.8 of this report, the Design Statement of Consistency indicates that access roads are a minimum of 5.5m. However, Homezones have been designed as 4.8m wide

		vehicular access with 1.2m wide step-in zone (6.0m)
	(c) Footpaths to be a minimum of 2.0 m wide	As per Section 8.8 of this report, the Design Statement of Consistency indicates that footpaths are a minimum of 2.0m wide.
	(d) Corner radii and longitudinal gradients to be in accordance with the Design Manual for Urban Roads and Streets DMURS 2019	Corner radii and gradients proposed across the site are in accordance with DMURS, with corner radii proposed to ensure slower speeds and traffic calming.
	(e) Critical Swept Path Analyses for a 3 axle refuse collection vehicle 9.86m by 2.50m in dimension, a private vehicle and a fire tender demonstrating access and egress to and from the site and manoeuvrability on the site	A swept path analysis of a refuse (Length 10.200m), private vehicle, and fire Tender has been completed illustrating manoeuvrability across the site. Please refer to Engineering drawing DR-C-0750, 0751 and 0752 for details.
	(f) The manner in which surface water runoff is collected and disposed of for the application site to comply with SUDS. Storm water runoff attenuation to be located under public open space and not under trafficked area refer to KCC SUDS Guidance Document	Stormwater attenuation has been proposed in Green landscaped areas and is not located in areas of vehicular trafficable areas. Please refer to Engineering drawing DR-C-0200 for details.
	(g) Surface wearing course for the proposed development to be Stone Mastic Asphalt, SMA 14 surf PMB 65/105-60 des 45mm thick, in compliance with clause 942 of NRA/TII specification. All surface water drainage gullies shall be fitted with suitable locking type covers or gratings	Surface wearing course across the site for road is proposed as 40mm PMSA 14 SURF PMB 65/106-60 to Clause 942. All gullies will be fitted with suitable locking type D400 covers/ gratings
	(h) Details of 30 km/h Slow Zones signage and their respective locations in the residential development in accordance with the Department of Transport, Tourism and Sport's (DTTAS) traffic signs advice note TSAN-2016-02	Engineering drawing DR-C-0600 illustrates the Homezone signage and respective locations in accordance with the Department of Transport, Tourism and Sport's (DTTAS) traffic signs advice note TSAN-2016-02
	(i) All signage and road markings to be in accordance with the Department of Transport, Tourism and Sport's (DTTAS) Traffic Signs Manual	Engineering drawing DR-C-0600 illustrates the all-proposed signage and respective locations in accordance with the Department of Transport, Tourism and Sport's (DTTAS) traffic signs advice note TSAN-2016-02
	(j) Lines of sight at the proposed vehicular entrance to be in accordance with the Design Manual for Urban Roads and Streets DMURS (2019) where speed limit is 50kph	As highlighted in the Road Safety Audit in Appendix G, amendments were made to the proposed parallel parking to allow for increased lines of sight at junctions. Reduced sightlines were assessed with 20kph-30kph speeds through the site with the traffic calming of speed tables etc. It is anticipated that speeds at 50kph are not practical or possible through the proposed site as a result of speed and traffic calming measures.

	(k) Permeable paving for the car parking areas if proposed to comply with SUDS	Permeable paving has been proposed to parking bays are comply with SuDS. The proposed buildup of the permeable parking bays is illustrated in Engineering drawing DR-C-1100.
	(l) On street parking spaces to be 2.50 metres by 5.00 metres marked in 100mm white lines of a durable material. Disabled parking spaces are to be in accordance with the Irish Wheelchair Association's Best Practice Access Guidelines, clearly marked with 100mm wide white lines with a durable permanent material and have 1.20 metre wide accessibility aisles cross hatched in yellow. Disabled parking spaces are also to be marked with a white wheelchair symbol in a durable material	On street perpendicular parking bays have been provided with 2.5m widths and 5.0m lengths. Parallel parking bays have been provided with 2.5m widths, and 6.0m lengths. Accessibility spaces have also been provided with a 1.20m wide accessibility aisle.
	(n) Home zones to be a minimum of 4.8m in width with 1.2m footpath access for pedestrians delineated and different pavement finish to be used	Homezones have been designed as 4.8m wide vehicular access with 1.2m wide step-in zone (6.0m). It is proposed that the homezones will have an alternative surface finish to standard carriageways as per Engineering Drawing DR-C-1300
2	The applicant to provide appropriate gateway, signage and road lining entry for the proposed home zone areas.	Engineering drawing DR-C-0600 illustrates the Homezone signage and respective locations in accordance with the Department of Transport, Tourism and Sport's (DTTAS) traffic signs advice note TSAN-2016-02
3	The applicant to submit a detailed design and drawings scale 1:500 for the proposed widening works of L1015 and R149 consisting of a 6.5m wide carriageway with a 1.5m grass verge, 2m wide cycle track and 2m wide footpath at the site frontage. The Applicant to clarify how verge, cycle track and footpath to be provided at the northwest junction of L1015 and R149 along road frontage of 2 bungalows	Engineering drawing DR-C-0500 Site Layout illustrates at 1:500 the proposed road widening works along the L1015 and R149 and all adjacent infrastructure. As part of phase 1A, no cycle path or verge will be provided along the front of the 2 No. existing bungalows. VRU infrastructure along the R149 and the L1015 will be provided to allow future connection following the development of the surrounding Confey masterplan lands.
6	The applicant to Liaise with Traffic Management Section re. provision of Toucan crossing on R149	As per section 8.7 of this report, the applicant has liaised with Annette Keavney of Kildare County Council who is Senior Executive Engineer of Transportation and Public Safety and has advised that the location of the Toucan crossing for the proposed development is acceptable.
14	The Sustainable Urban Drainage Systems (SuDS) features such as swales, drainage blankets, permeable paving in the parking areas are welcomed. The Local Authority has a preference for a bound stone mastic asphalt in the other traffic areas. The Applicant is requested to avoid the use of underground storage tanks that have limited benefits in terms of landscape, ecology and attenuation storage due to silting and maintenance costs.	All road infrastructure outside the illustrated permeable paving will be a bound PMSA 14 SURF PMB 65/106-60 to Clause 942. DOBA have reviewed the overall surface water strategy to replace any underground attenuation structures with Nature Based solution. The primary regional control prior to discharge from the site has been developed in the form of a Retention basin, however, the requirement for supplementary underground attenuation to the north of the MU1 still remains. This solution has

		been last resort. A complete Nature Based Regional Control at the outfall would result in the removal of a significant portion of the residential units.
15	The applicant is requested to submit a Construction Management Plan that is to contain: (a) The duration of the construction phase, including all haul routes to and from the site,	The applicant has submitted an Outline Construction Management Plan 2423-DOB-XX-SI-RP-0002 with this application and which outlines the proposed duration and sequencing of the project
	(b) Mitigation measures to minimize the effects the proposed development would have on the immediate public road network and existing traffic movements. (c) Wheel wash arrangements and locations for the construction phase.	The applicant has submitted an Outline Construction Management Plan 2423-DOB-XX-SI-RP-0002 with this application and which outlines the proposed mitigation measures of immediate impact on the public roads and wheel wash arrangements
	(d) Location of the construction compound, parking, delivery and storage areas during the construction phase. (This is in the interest of the existing residential amenity of properties in the area).	The applicant has submitted an Outline Construction Management Plan 2423-DOB-XX-SI-RP-0002 with this application. As outlined in the report the appointed contractor will provide a full Construction management plan for the construction works.
	(e) Scaffolding and hoarding arrangements for the development.	The applicant has submitted an Outline Construction Management Plan 2423-DOB-XX-SI-RP-0002 with this application where section 4.3.1 provides details on the hoarding arrangements.
	(f) The manner in which the existing public road and footpath network shall be kept clean, (g) A condition and photographic survey of the surrounding footpath and road network.	The applicant has submitted an Outline Construction Management Plan 2423-DOB-XX-SI-RP-0002 with this application where section 5.1.1 outlines the manner in which the existing public road and hard surfaces are kept clean. A photographic condition survey shall be prepared prior to the commencement of the development to retrieve photographic evidence of the infrastructure.
	(h) Relevant construction site warning signs shall be in accordance with the Department of Transport, Tourism and Sport (DTTAS) Traffic Signs Manual.	The applicant has submitted an Outline Construction Management Plan 2423-DOB-XX-SI-RP-0002 with this application where section 4.4 provides information regarding warning/safety signs during the construction phase of the development.
	(i) A Construction Waste Management Plan that is to contain the final destination of each waste stream generated on site	The applicant has submitted an Outline Resource Waste Management Plan 2423-DOB-XX-SI-RP-0003 with this application which provides information regarding the removal and disposal of construction waste and how each waste stream is dealt with.
16	The applicant to carry out a Road Safety Audit by an independent consultant incorporating all RSA recommendations. The RSA is to assess: • The location of the access points to the development. • The internal areas of the proposed	The applicant has commissioned a stage 1-2 Road safety Audit for the proposed development as detailed in section 8.10 of this report. The Road Safety Auditor has advised on several aspects of the proposed development where the applicant has revised the proposals to suit. The Stage 1-2 Road Safety Audit and Response has

	development. • The interface with the existing public road / foot path network. The applicant is requested to make the necessary changes to the design proposals following the Stage 1 and 2 RSA. The applicant is requested to note that if the application is subsequently granted, then the applicant will be required to carry out a Stage 3 audit/assessment.	been submitted with this application and is included in Appendix G.
Environmental		
1	Outline Construction and Demolition Resource Waste Management Plan (RWMP) to be submitted in accordance with Appendix C of the "EPA Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for C&D Projects (2021)" including demonstration of proposals to adhere to best practice and protocols	The applicant has submitted an Outline Resource Waste Management Plan 2423-DOB-XX-SI-RP-0003 with this application which provides information regarding the removal and disposal of construction waste and how each waste stream is dealt with
Building & Development Control		
2	Building and Development Control have concerns regarding the placement of SuDS features (tree pits) in areas that are not intended to be taken in charge. The applicant should ensure that all SuDS elements serving areas which are to be TIC are located within the proposed TIC areas to ensure access for maintenance. Examples shown below (see page 11 of the Opinion Letter)	All proposed SuDS features have been proposed in locations which are intended to be Taken in Charge by Kildare County Council to ensure access for maintenance.
5	The applicant is requested to take into consideration any areas where raised tables are placed directly in front of residential driveways which conflict with access/egress to driveways for vehicles	Raised table and associated ramping section has been located to avoid any conflict with accessing or egressing vehicles from private curtilage. Please refer to Engineering drawing DR-C-0500.

5 Surface Water

The structure of this section of the report is as follows;

- **Section 5.2** summarises the **Existing Surface Water** located on and adjacent to the proposed development,
- **Section 5.3** outlines the **Proposed Surface Water Strategy**,
- **Section 5.3** summarises the **Planning Stage Ground Investigations** carried out to date,
- **Section 5.5** estimates the **Greenfield Run-Off Rate** in accordance with the IH24 method,
- **Section 5.6** describes the proposed surface water outfall to the **existing surface water sewer traversing the eastern GAA lands**
- **Section 5.7** provides the proposed **SuDS Strategy** including SuDS Hierarchy, proposed SuDS elements, SuDS treatment train This section also outlines the rationale for providing or not providing various SuDS measures across the site with a focus on Nature Based SuDS (NBS) measures,
- **Section 5.8** outlines the **Maintenance Regime** for the proposed SuDS features.
- **Section 5.9** demonstrates how the proposed scheme complies with the requirements of the **Greater Dublin Regional Drainage Study** Criterion 1 through 4 namely River Water Quality Protection, River Protection Regime, Level of service (Flooding) for the site and River flood protection,
- **Section 5.10** describes the **Proposed Surface Water Piped Network Design Parameters**, and finally,
- **Section 5.11** summarises the findings of the **Site-Specific Flood Risk Assessment (SSFRA)** prepared by JBA Consulting and submitted separately with this application.

5.2 Existing Surface Water

The Rathleek Stream is present to the west of the site and flows in a north-south direction prior to outfalling to an existing culvert beneath the Royal Canal to the south-west of the subject lands. An open channel exists to the south of the site which drains the southern portion of the lands and also outfalls to the Rathleek Stream to the west. Finally, an open channel located in the centre of the site discharges to the existing 675mm surface water sewer located beneath the Confey GAA grounds to the east of the subject lands. This surface water outfalls to the Oranstown Stream which flows south and discharges to the River Liffey at Castle Park, Leixlip



Figure 3 Extract from ArcGIS map illustrating existing surface water watercourse and existing 675mm dia. SW Sewer on and adjacent to the subject site

5.3 Proposed Surface Water Drainage Strategy

The design and management of surface water for the proposed development will comply with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS). The design of the surface water network and SuDS measures within the application site shall include a 30% climate change factor and an allowance for a 10% factor applied to account for Urban Creep in accordance with the Kildare Co. Co. Water Services requirements.

5.4 Planning Stage Ground Investigations

The Applicant notes that a suite of ground investigations were carried out on site by Ground Investigations (GII) Ireland in February 2025. These investigations included the following:

- Trial Pits

- Soakaways
- CBR Testing
- Percussion Boreholes
- Rotary Boreholes
- Ground Water Monitoring
- Laboratory Testing

In summary,

The interpretive report by GII concluded the following;

- Cohesive deposits were encountered beneath the Topsoil and were described typically as brownish grey or greyish brown slightly sandy slightly gravelly CLAY with low cobble content overlying a stiff grey to dark grey slightly sandy slightly gravelly CLAY with low cobble and boulder content. The strength of the cohesive deposits typically increased with depth and was stiff below 1.00m BGL
- Granular deposits were encountered within the cohesive deposits to a maximum depth of 2.0m BGL. These deposits were described as grey to dark grey clayey sandy angular to subrounded fine to coarse GRAVEL with low cobble and boulder content or Brownish orangish grey clayey gravelly fine to coarse SAND. The secondary sand/gravel and clay constituents varied across the site and with depth while low cobble and boulder content also present where noted on the exploratory hole logs.
- Boreholes recovered moderately weak to strong grey to dark grey fine to medium grained laminated argillaceous limestone interbedded with weak to moderately weak dark grey to black fine grained laminated calcareous Mudstone. The depth to rock varies from 2.30m BGL 8.00m BGL.
- No Ground Water was observed during the onsite testing, & No. Groundwater Standpipes were installed to observe variance of water tables throughout the year.
- BRE365 soakaway testing carried out in at 5 No. locations yielded very poor or no infiltration, concluding that surface water disposal via infiltration was not feasible.

Disposal of surface water run-off to ground via infiltration will be very limited based on the BRE365 soakaway test results and has been **ignored** in the calculation of attenuation requirements for the site. Proposed SuDS measures will be left unsealed to utilise any available infiltration.

5.5 Estimation of Proposed Greenfield Runoff Rate

In accordance with the IH24 method, the greenfield runoff for existing undeveloped sites measuring less than 50Ha can be estimated adopting the following formula. The Qbar discharge rate has been calculated for each in Table 1.

$$Qbar_{rural} (m^3/s) = 0.00108 \times (Area)^{0.89} (SAAR)^{1.17} (SOIL)^{2.17}$$

Table 1 Qbar calculation- outfall

Standard Average Annual Rainfall (SAAR)	800	mm
Soil Index	0.4	
Total Site Area	5.832	Hectares (ha)
Storm Return Period	100	Years
Permissible Outflow per hectare, QBAR	4.0	l/s/ha
* Total Permissible Outflow	22.63	l/s

5.6 Proposed Surface Water Drainage Outfall

The proposed surface water drainage outfall from the site shall be conveyed to an existing Surface Water piped network traversing the Confey GAA Lands and ultimately discharging to the Oranstown Stream located to the west of the Confey GAA Lands as seen in Figure 3 above, Figure 4 below, and as illustrated on **Engineering Drawing C-0200**.

DOBA have liaised with Waterways Ireland Regarding the proposed additional 22.63l/s flows from the site discharging to the Oranstown stream and have received confirmation that Waterways have no objection to the same. Mervyn Hamilton from Waterways Ireland has addressed the proposal with the following:

'No objection was raised by Waterways Ireland in principle to a proposed discharge of surface water from the development to the existing open channel'

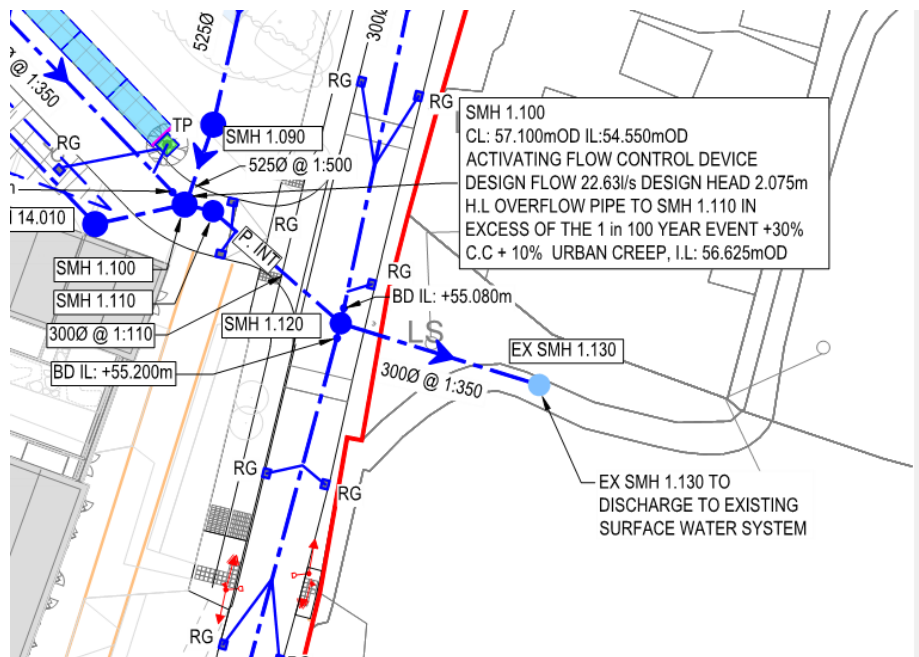


Figure 4 Extract from C-0200 illustrating the proposed discharge to the existing Confey GAA Lands manhole.

5.7 Proposed SuDS Strategy

5.7.1 Proposed SuDS Hierarchy

The SuDS hierarchy outlined in Table 2 below has been considered for this site in accordance with the requirements of KCC WSD and a rationale has been provided for the inclusion or exclusion of each SuDS items;

Table 2: Proposed SuDS Hierarchy

Sustainable Urban Drainage System		Regional Control	Source Control	Site Control	Other	Proposed for the Scheme (Y/N)	Rationale for the provision or otherwise of proposed SuDS measures
#	Nature Based SuDS (NBS)						
1	Constructed Wetlands	●				N	Constructed wetlands are not proposed for this project.
2	Retention Pond	●				Y	Retention ponds are proposed as a regional control NBS SuDS measure for this project
3	Bioretention Areas		●			Y	Bioretention areas are proposed as source control NBS SuDS measures for this project.
4	Bioswales		●			Y	Bioswales areas are proposed as source control NBS SuDS measures for this project.
5	Rain Gardens		●			N	Raingardens are not proposed as source control NBS SuDS measures for this project, unlined permeable pavements are proposed under the private parking spaces in lieu of rain gardens.
6	Blue-Green Roofs		●			N	Blue-Green Roofs are not proposed for this project as these elements are most suited to extensive areas of <u>flat roofs</u> on building under Management control. This project is a residential scheme with the MU1 area to the South West of the site being proposed with <u>pitched roofs</u> which are not suited to blue-green roofs.
7	Green Walls		●			N	Green walls are most suited to Management Controlled multi-unit apartments as opposed to the type of dwelling predominantly being proposed for this development. There are however, other Source Control NBS SuDS features proposed such as Bioretention Areas, Tree Pits.
8	Tree Pits		●			Y	Tree Pits are proposed as source control NBS SuDS measures for this project.
	Infiltration System SuDS						
9	Unlined tree pits-trenches		●			Y	Unlined tree pits-trenches are proposed as source control NBS SuDS measures for this project. The tree pits shall be left unlined in order to provide the required interception storage, however, the infiltration achieved shall be ignored for the purpose of the design calculations.
10	Unlined permeable paving		●			Y	Unlined permeable paving is proposed as source control NBS SuDS measures for this project. The permeable paving shall be left unlined in order to provide the required interception storage, however, the infiltration achieved shall be ignored for the purpose of the design calculations.

11	Infiltration trenches		●			N	Infiltration Trenched are not proposed for this project.
Filtration System SuDS							
12	Filter Drains		●			Y	Filter Drains are proposed as source control SuDS measures for this project and will be located at the bottom of a number of Bioswales.
13	Filter Strips		●			N	It is not proposed to provide filter strips on this development. Filter drains and lined permeable paving has instead been proposed.
14	Lined Permeable Paving		●			N	It is proposed to provide unlined permeable paving on this development to allow for the minimal infiltration available and for interception purposes.
Detention Systems SuDS							
15	Bioswales			●		Y	Bioswales are proposed in the public open spaces to provide storage during extreme rainfall events. The Bioswales are proposed both as on line and off line systems and have been coordinated with the landscape architect.
16	Lined Underground Attenuation Tank	●				Y	It is proposed to provide a supplementary underground attenuation structure to the north of the MU1 area in this development in the storm of a 95% crate system.
17	Hydrobrake	●				Y	Hydro brake or similar Flow restriction device is proposed to discharge Surface Water Runoff from the site at an equivalent greenfield runoff rate of 22.63l/s
18	Over-sized pipes			●		N	It is proposed to provide over-sized pipes within this development.
Proprietary Treatment Systems							
19	Petrol/ oil separators				●	Y	Petrol/ oil interceptors are proposed to be placed prior to the discharge of surface water to the public surface water drainage network.
20	Rainwater Harvesting		●			N	Rainwater Harvesting is not proposed for this project

5.7.2 Proposed Treatment Strategy

Figure 5 below illustrates the minimum 2 stage treatment strategy proposed for the proposed development and associated SuDS hierarchy.

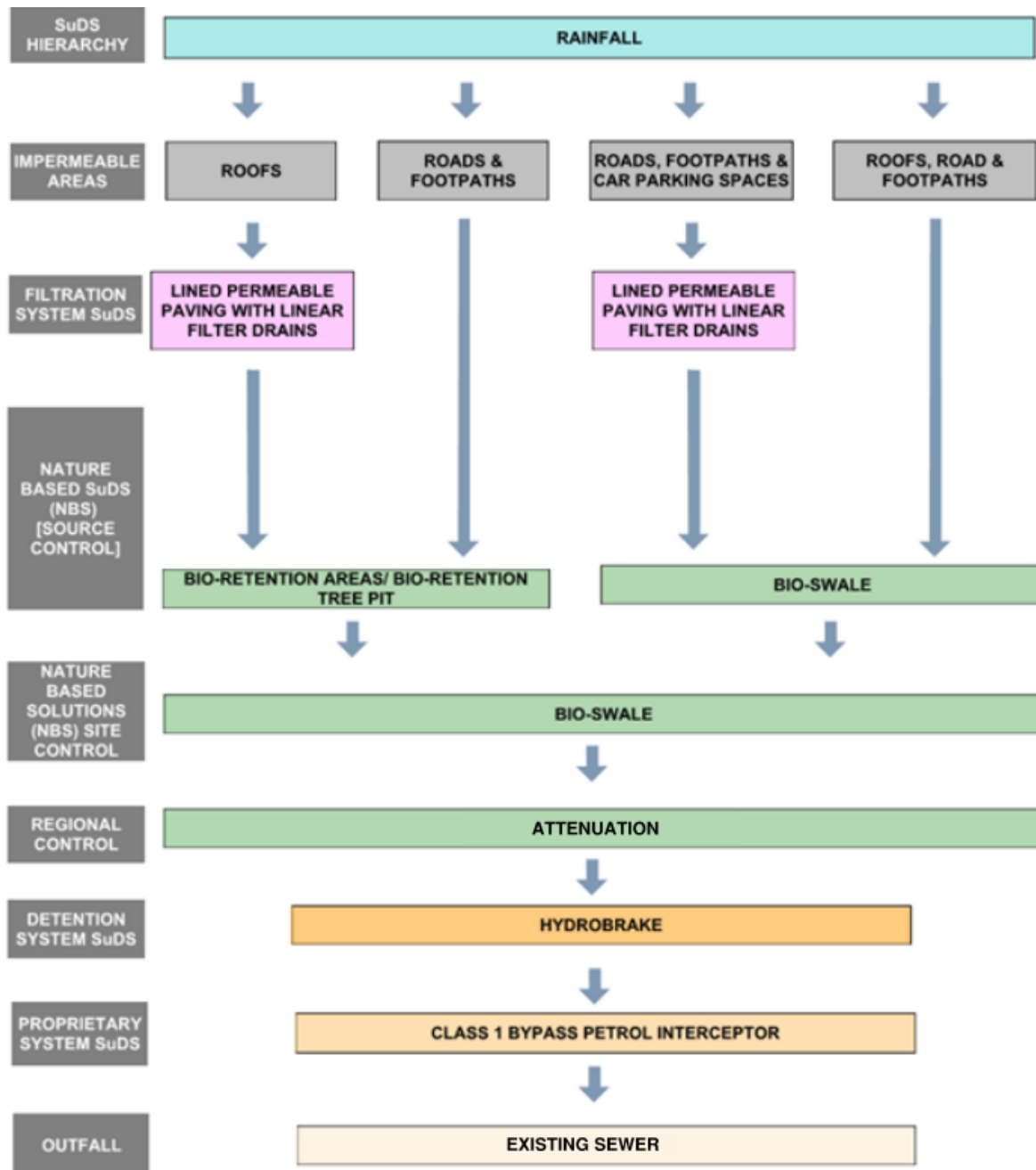


Figure 5 Proposed Typical Sub-Catchment Treatment Train

5.8 Proposed SuDS Features & Associated Management/ Maintenance

The following section of the report addresses the maintenance requirements for the proposed SuDS features in accordance with the CIRIA SuDS Manual.

5.8.1 Nature Based SuDS

5.8.1.1 Constructed Wetlands & Retention Ponds (Regional Control)

TABLE 23.1 Operation and maintenance requirements for ponds and wetlands		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season)
	Cut the meadow grass	Half yearly (spring, before nesting season, and autumn)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options	Half yearly
	Check any mechanical devices, eg penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1 m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1 m above water level	Annually
	Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract)	Annually
	Remove sediment from any forebay.	Every 1–5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays.	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, eg every 25–50 years
Remedial actions	Repair erosion or other damage	As required
	Replant, where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair / rehabilitate inlets, outlets and overflows.	As required

5.8.1.2 Bioretention Areas, Raingardens & Bioswales (Source Control)

TABLE 17.1 Operation and maintenance requirements for swales			
Maintenance schedule	Required action	Typical frequency	
Regular maintenance	Remove litter and debris	Monthly, or as required	
	Cut grass – to retain grass 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 surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required	
	Inspect vegetation 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 maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area	
Remedial actions	Repair erosion or other damage by re-turfing or reseeding	As required	
	Relevel uneven surfaces and reinstate design levels	As required	
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	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 standard practices	As required	

TABLE 18.3 Operation and maintenance requirements for bioretention systems			
Maintenance schedule	Required action	Typical frequency	
Regular inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary	Quarterly	
	Check operation of underdrains by inspection of flows after rain	Annually	
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly	
	Inspect inlets and outlets for blockage	Quarterly	
Regular maintenance	Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)	
	Replace any plants, to maintain planting density	As required	
	Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually	
Occasional maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required	As required	
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required	
Remedial actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years	

5.8.1.3 Tree Pits (Source Control)

TABLE 19.3 Operation and maintenance requirements for trees (after CRWA, 2009)

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets and outlets	Inspect monthly
Occasional maintenance	Check tree health and manage tree appropriately	Annually
	Remove silt build-up from inlets and surface and replace mulch as necessary	Annually, or as required
	Water	As required (in periods of drought)
Monitoring	Inspect silt accumulation rates and establish appropriate removal frequencies	Half yearly

5.8.2 Filtration System SuDS

5.8.2.1 Filter Drains (Source Control)

TABLE 16.1 Operation and maintenance requirements for filter drains

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (eg NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required

5.8.2.2 Permeable Paving (Source Control)

TABLE 20.15 Operation and maintenance requirements for pervious pavements

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

5.8.3 Proprietary Treatment Systems

5.8.3.1 Rainwater Harvesting (Source Control)

TABLE 11.6 Operation and maintenance requirements for RWH systems

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspection of the tank for debris and sediment build-up, inlets/outlets/withdrawal devices, overflow areas, pumps, filters	Annually (and following poor performance)
	Cleaning of tank, inlets, outlets, gutters, withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional maintenance	Cleaning and/or replacement of any filters	Three monthly (or as required)
Remedial actions	Repair of overflow erosion damage or damage to tank	As required
	Pump repairs	As required

5.8.3.2 Petrol/ oil separators

TABLE 14.2 An example of operation and maintenance requirements for a proprietary treatment system

Maintenance schedule	Required action	Typical frequency
Routine maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation	Six monthly
	Change the filter media	As recommended by manufacturer
	Remove sediment, oil, grease and floatables	As necessary – indicated by system inspections or immediately following significant spill
Remedial actions	Replace malfunctioning parts or structures	As required
Monitoring	Inspect for evidence of poor operation	Six monthly
	Inspect filter media and establish appropriate replacement frequencies	Six monthly
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months

5.9 Proposed Design of Sustainable Drainage System

The design of sustainable drainage systems, as per Chapter 6 of the Greater Dublin Strategic Drainage Study (GDSDS), is set out below and describes the performance of the proposed surface water drainage system when measured against the relevant GDSDS drainage criterion, namely

- Criterion 1 – River Quality Protection
- Criterion 2 – River Regime Protection
- Criterion 3 – Level of Service (flooding) for the Site
- Criterion 4 – River Flood Protection

The requirements of SuDS are typically addressed through the provision of

- Interception Storage
- Treatment Storage (*not required if interception storage is provided*)
- Attenuation Storage
- Long Term Storage (*not required if growth factors are not applied to Q_{bar} when designing attenuation storage*)

In accordance with KCC requirements, a Climate Change factor of 30% + 10% Urban Creep will be applied to the design of the surface water system.

5.9.1 River Quality Protection

5.9.1.1 Objective

Interception storage of at least 5mm, and preferably 10mm, of rainfall where run-off to the receiving water can be prevented.

5.9.1.2 Proposal

The 10mm rainfall event on site will be intercepted without discharging to the public system. Table 3 is a summary of the required and provided interception volumes in each of the sub-catchments.

Table 3: Proposed Interception Areas

Area Description	Area (m^3)
Roofs	14,820
Hardstanding (Internal Site)	28,740

The required interception storage to accommodate the 10mm rainfall event is therefore $43,560 \times 0.001 = 435m^3$

A summary of the interception volumes provided is as follows:-

- 200mm of stone buildup beneath the 95% void former attenuation tank
 - $291m^2 \times 0.2 \times 0.4 = 23.28m^3$
- 200mm of stone buildup beneath the permeable paving (below the invert of the distribution pipes)
 - $6825m^2 \times 0.2 \times 0.4 = 546m^3$

The total provided interception storage is $569.28m^3$, while the total required interception storage is $435m^3$, therefore the provision of interception storage volume exceeds the minimum required on site for the 10mm event and complies with the requirements of GSDS and the River Quality Protection objective.

5.9.2 River Regime Protection

5.9.2.1 Objectives

2.1 Discharge rate equal to 1-year Greenfield site peak runoff rate or 2 l/s/Ha, whichever, is the greater. Site critical duration storm to be used to assess attenuation volume.

2. 2 Discharge rate equal to 1 in 100-year Greenfield site peak run off rate. Site critical duration storm to be used to assess attenuation storage volume.

5.9.2.2 Proposals

The surface water network has been designed to comply with the sub-criteria and prior to discharging to the existing public surface water network through the Confey GAA lands, the surface water runoff will be reduced to the existing Greenfield runoff rate, Q_{bar} , of **22.63 l/s**. In order to achieve this, it is proposed to limit the surface water runoff from the site via a proposed hydro brake flow control device fitted to the discharge manholes as illustrated on **Engineering drawing C-0200**.

5.9.3 Level of Service (flooding) for the Site

5.9.3.1 Objectives

- *No flooding on site except where specifically planned flooding is approved. Summer design storm of 15 or 30 minutes are normally critical.*
- *No internal property flooding. Planned flood routing and temporary flood storage accommodation on site for short high intensity storms. Site critical duration events.*
- *No internal property flooding. Floor levels at least 500mm above Maximum River level and adjacent on-site storage retention.*
- *No flooding of adjacent urban areas. Overland flooding managed within the development.*

5.9.3.2 Proposal

Engineering calculations included in **Appendix B** demonstrate that no pluvial out-of-manhole flooding of the proposed surface network occurs for storms up to and including a 1 in 100 Year plus 30% Climate Change + 10% Urban Creep. Therefore, no flooding of the site, internal properties or adjacent urban areas occurs. Pipe sizes and gradients have been designed so as to achieve self-cleansing velocities as per the requirements of the Building Regulations Part 'H'. The lowest proposed floor level is set at a minimum 500mm above the highest water level in the attenuation. A high level overflow has been proposed to facilitate a free-flowing discharge in the event of a storm exceeding a 1:100 Year plus 30% Climate Change and 10% Urban Creep and/ or the outfall becoming blocked. **Engineering Calculations** included in **Appendix B** demonstrate that no pluvial out-of-manhole flooding occurs when the outfall is set to the high level over flow level.

5.9.4 River Flood Protection

5.9.4.1 Objectives

- *Long-term floodwater accommodated on site for development runoff volume is in excess of the Greenfield volume. Temporary flood storage drained by infiltration on a designated flooding area brought into operation by extreme flood events only. 100-year, 6-hour duration storm to be used for assessment of the additional volume of runoff.*
- *Infiltration storage provided equal in volume to long term storage and usually designed to operate for all events.*
- *Maximum discharge rate of Q_{bar} or 2 l/s/Ha, whichever is the greater, for all attenuation storage where separate long-term storage cannot be provided.*

5.9.4.2 Proposals

As noted above, the proposed Q_{bar} for the site is **22.63 l/s**. As the surface water run-off generated on site does not exceed Q_{bar} there is no requirement for long-term storage to limit the impact on the receiving watercourse.

5.10 Proposed Piped Surface Water Network Design Parameters

The surface water piped network and associated attenuation design calculations have been prepared using Microdrainage Network Design Computer software by Innovyze. The proposed surface water drainage system has been designed in accordance with I.S. EN 12056: 2000 'Gravity Drainage Systems inside Buildings', I.S. EN 752: 2017 'Drain & Sewer Systems outside Buildings', 'The Greater Dublin Region Code of Practice for Drainage Works', the recommendations of the 'Greater Dublin Strategic Drainage Study', (GDSDS) and the Building Regulations Technical Guidance Document Part H applying the following parameters.

Surface water drainage design method	Modified Rational Method
Storm Return period (years)	1 in 5-year
Allowable outflow (l/s)	22.63l/s
Flooding Period	Up to and including a 1 in 100 Year + 30% CC - 10% Urban Creep.
Standard Annual Average Rainfall (SAAR) (mm)	800
M5-60 rainfall depth (mm)	16.8
Ratio, r	0.297
Allowance for Climate Change (%)	30%
Allowance for Urban Creep (%)	10%
Minimum self-cleansing velocity (m/s)	0.75
Pipe roughness (mm)	0.6
Run-off coefficients	
Soft landscaped areas	30%
External hardstanding	80%
Roof Areas	95%

Refer to **Engineering drawing C-0200** relating to the proposed development's surface water drainage network. An extract of drawing **C-0200** is included in Figure 6 below:



Figure 6 Extract from DOBA drawing C-0200 indicating the proposed SW layout (Source: DOBA)

5.11 Flood Risk

A Site-Specific Flood Risk Assessment (SSFRA) has been prepared by JBA Consulting and has been submitted with this application as a separate document. The SSFRA concludes that the proposed development complies with the requirements of the Justification Test for development management and that the Flood Risk Assessment and strategic development recommendations were undertaken in accordance with 'The Planning System and Flood Risk Management' guidelines and agrees with the core principles contained within.

A review of available flood information identified the Confey Stream as the primary source of flood risk. Historical data and predictive modelling, including the CFRAM Study, indicate that the development is in Flood Zone C. However, as the Confey Stream flows through the site, it was necessary to confirm this with detailed modelling. To refine the understanding of flood risk, a site-specific 1D-2D hydraulic model was developed, incorporating channel survey data and a Digital Terrain Model (DTM). The modelling results confirmed that the site boundary is partially inundated during the 1% AEP and 0.1%

AEP event. Climate change (MFRS scenario) and residual risks, including the potential blockage structures, were also assessed.

The results from the hydraulic model confirm that all residential areas of the site are located in Flood Zone C. In accordance with the FRA guidelines, it is recommended that all residential areas are retained in areas of the site classified as Flood Zone C. Mitigation measures have been proposed, including setting the finished floor levels above the 0.1% AEP flood level. A minimum freeboard of 1.47m has been provided over the 0.1% AEP flood event.

In summary, the proposed development will be raised above the 0.1% AEP flood levels, and all vulnerable development will be located in Flood Zone C. Additionally, this will protect the site from the predicted impacts of climate change and the identified residual risks.

Regarding pluvial flood risk, review of the available information and site topography does not indicate that the site is at risk of pluvial flooding. Surface water within the site will be managed through the provision of a stormwater system.

Please refer to the SSFRA (OML-JBAI-XX-XX-RP-HO-0002-A3-C01) prepared by JBA Consulting and submitted with this application/

6 Wastewater Drainage

6.1 Existing Wastewater Drainage

Uisce Eireann GIS mapping indicates the presence of an existing 750mm dia. Wastewater sewer located to the south of the subject site. The Applicant commissioned a Ground Penetrating Radar and Topographical Survey to confirm the Location and invert of the existing 750mm dia. Wastewater sewer which will receive flows from the proposed development.

An existing Rising main was also encountered traversing the site following the Ground Penetrating Radar. DOBA have liaised with Uisce Eireann regarding both the rising main and Wastewater. Please refer to section 6.2 below regarding the required diversions to facilitate the proposed development.

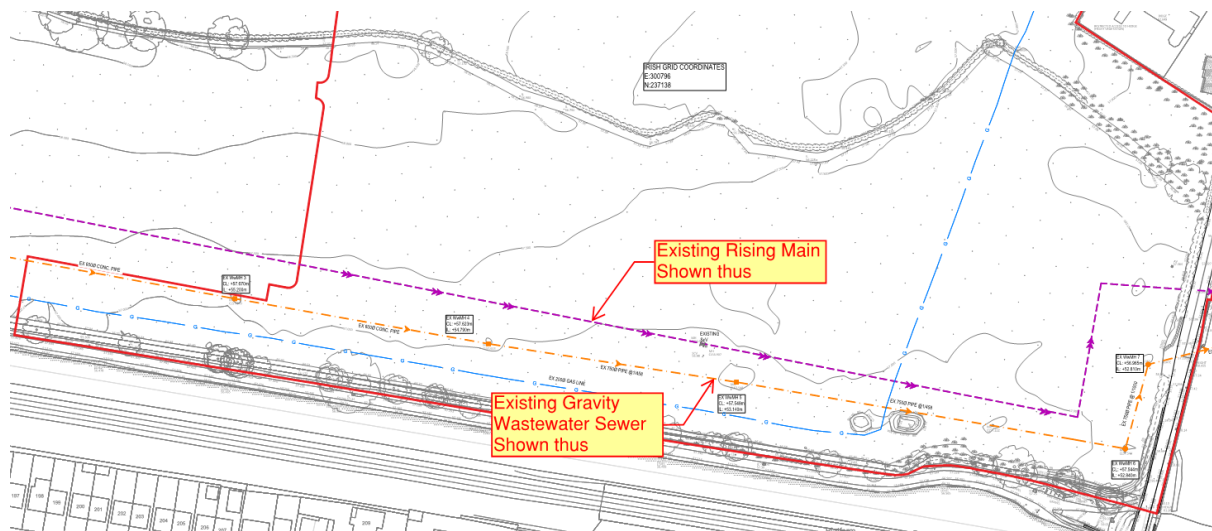


Figure 7 Existing Services illustrating location of existing 750mm dia. concrete wastewater sewer to the south of the subject site in addition to a present existing Rising main running parallel and traversing the subject site.

6.2 Uisce Eireann Consultation

6.2.1 Pre-Connection Enquiry and Confirmation of Feasibility

Uisce Eireann, through the Pre-Connection Enquiry (PCE) process (reference CDS25002837) have confirmed that there is capacity on the site for the developments wastewater. The Applicant has submitted an updated PCE for the proposed Phase 1A development and are in possession of a Confirmation of Feasibility (CoF) which states that a connection to the existing infrastructure is '*Feasible without Infrastructure Upgrade by Uisce Eireann*'. The CoF has been included in **Appendix D** of this report.

6.2.2 Statement of Design Acceptance

Uisce Eireann, through the Statement of Design Acceptance process have reviewed the proposed Wastewater and Watermain arrangement for the development and have approved the arrangements provided. As part of the development for which this application pertains to, the applicant is in possession of a Statement of Design Acceptance (SoDA) and is submitted with this application. The received SoDA has been included in Appendix E

6.2.3 Uisce Eireann Diversion Application

The applicant has consulted Uisce Eireann regarding the diversion of the existing rising main seen in figure 7 and section 6.1 through a diversion application process (DIV26011). The proposed diversion arrangement have been reviewed by Uisce Eireann and the applicant is in possession of a Diversion application Confirmation of Feasibility which has been included in Appendix F. Regarding the existing 750mm Dia Wastewater Gravity sewer seen in figure 7, The proposed development has been developed to provide sufficient and required separation distances to the infrastructure.

6.3 Proposed Wastewater Drainage

The proposed wastewater network will collect effluent from the new development via a main Wastewater drainage network which is located within the road network around the proposed development where it will finally discharge by gravity to the existing 750mm dia. Wastewater sewer to the south of the site. The proposed wastewater sewer network is illustrated on **Engineering drawing C-0300**, have been designed in accordance with the principles and methods set out in Uisce Eireann's Code of Practice for Wastewater Infrastructure IW-CDS-5030-03, IS EN 752 Drain & Sewer Systems outside Buildings, IS EN 12056 Gravity Drainage Systems inside Buildings and the Building Regulations Technical Guidance Document Part H Drainage & Wastewater. See **Figure 8** below for an extract of DOBA drawing **C-0300** illustrating the proposed wastewater drainage layout. The estimated peak Wastewater loading generated by the proposed development's Dry Weather Flow is estimated at 1.42 l/s while the Design Wastewater Flow of 3DWF is **9.0 l/s** based on a peaking factor of 6.0 in accordance with Section 2.2.5 of the IW Wastewater Code of Practice IW-CDS-5030-03 and as illustrated in **Table 4** below. Engineering calculations have been included in **Appendix C**.

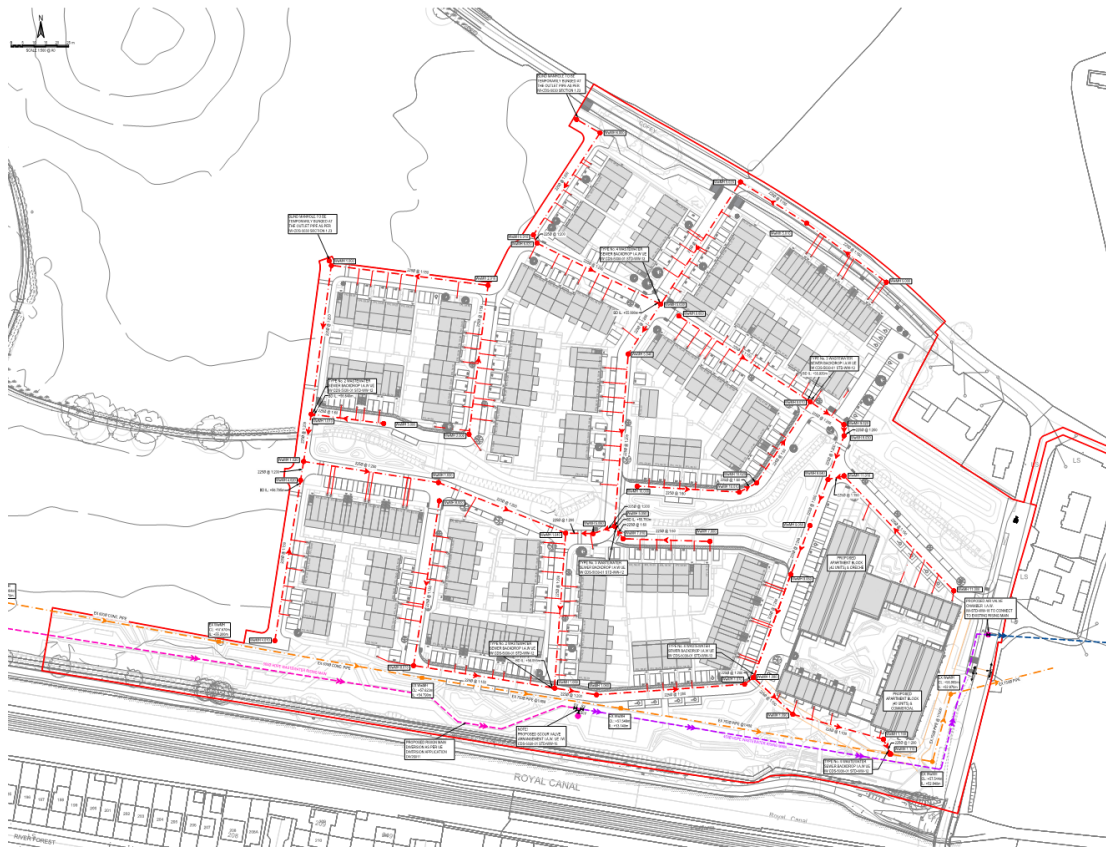


Figure 8 Extract from DOBA drawing C-0300 indicating the proposed wastewater layout (Source: DOBA)

Table 4 Proposed Post-Development Wastewater Flows

RESIDENTIAL						
Predicted Development Wastewater Flows						
Use Type	No. of Units	Occupancy Rate (persons/ dwelling)	Population (P)	Loading (l/ person/ day)	Daily Loading (l/ day)	Daily Loading (l/s)
Residential	272	3	816	150	122400	1.42
Dry Weather Flow (1 DWF)						1.42
Design Wastewater Flow (6 DWF)						8.50
COMMERCIAL						
Predicted Development Wastewater Flows						
Use Type	Floor Area (m ²)	Occupancy Rate (persons/m ²)	Population (P)	Loading (l/ person/ day)	Daily Loading (l/ day)	Daily Loading (l/s)
Creche	555	8	69	60	4163	0.05
Retail Units	705	7.5	94	30	2820	0.03
Dry Weather Flow (1 DWF)						0.08
Design Wastewater Flow (6 DWF)						0.48
Total Design Wastewater Flow (6DWF)						8.98

7 Water Supply

7.1 Existing Water Supply

Uisce Éireann (UE) GIS mapping indicates the presence of existing 75mm dia. and 50mm dia. watermains to the north and east of the subject lands respectively.

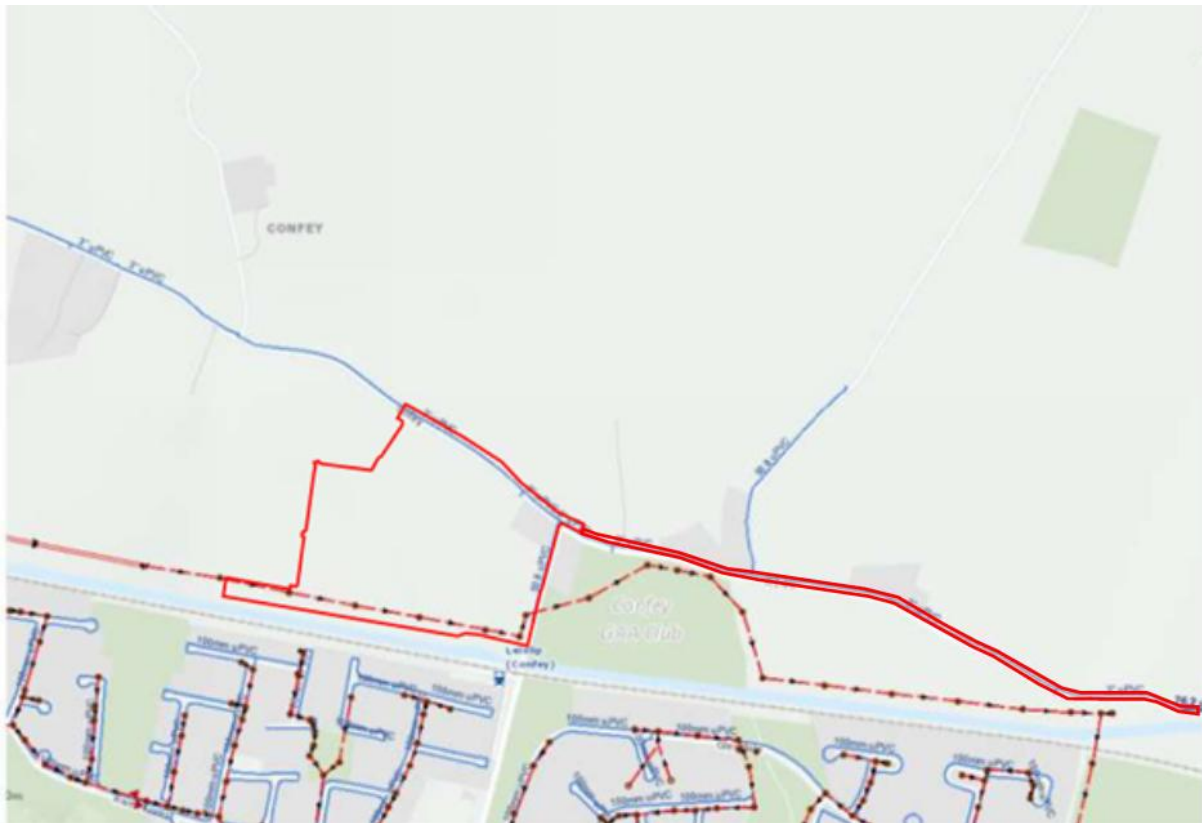


Figure 9 Extract from UE map illustrating location of existing 75mm and 50mm dia. watermains to the north and east of the subject site

7.2 Uisce Eireann Pre-Connection Enquiry

DOBA have liaised with Uisce Eireann (UE) in relation to the proposed development and submitted a pre-connection enquiry to which UE responded with a Confirmation of Feasibility (CoF) (CDS25002837). The Connection & Developer Services (CDS) Response noted that a new water connection is *“Feasible subject to upgrades.”*

The applicant has also submitted a pre-connection enquiry for the Confey Masterplan lands and future development in the area and received a Confirmation of Feasibility (CoF) CDS23001233 stating that a water connection was feasible subject to upgrades as outlined in below as has been included in Appendix H.

The Uisce Éireann CoF CDS23001233 (refer to Appendix H) states the following and is further illustrated in Figure 10 below.

- IN 1 - A new supply main of approximately 2200m of new 250mm ID pipe to be laid to replace existing 75mm uPVC and to connect the site developments to the newly laid 250mm ID main as per IN 2.
- IN 2 - A new supply main of approximately 2250m of new 250mm ID pipe to be laid to replace existing 100mm uPVC main.
- IN 3 - Supply main of approximately 470m of new 300mm ID pipe to be laid from inlet meter of Blackwood Park District Metered Area (DMA).

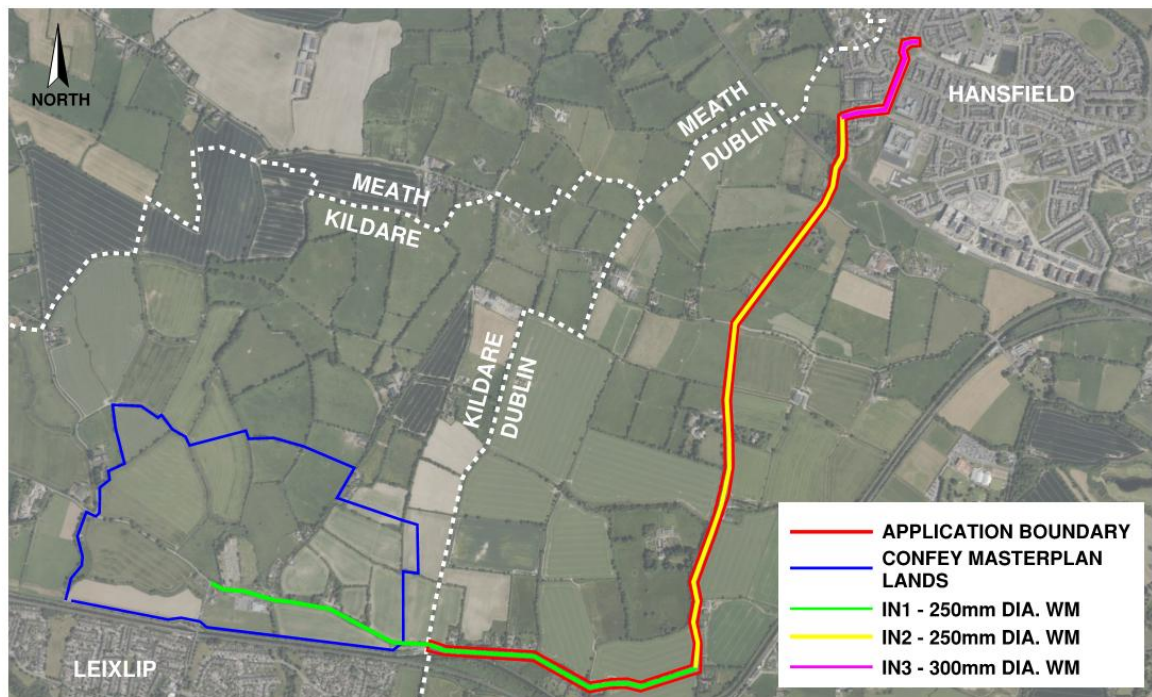


Figure 10 Extent of Watermain Upgrades Prior to the Construction of the Ongar to Barnhill Development

The overall extent of upgrades required to serve the Confey masterplan traverse the administrative areas of both Kildare County Council and Fingal County Council.

The Uisce Eireann Report issued to the applicant as part of the Stage 2 S32B opinion from Kildare County Council refers to upgrades required to increase capacity on the network in the Lexilip area. These upgrades are related to those highlighted in section 7.2 above and Figure 10. Section 7.3 below identifies the required upgrade works be proposed as part of this application to Kildare County Council which satisfies both the UE report and the CoF requirements.

7.3 Proposed Water Supply

Further to the receipt of the CoF CDS25002837 and the Uisce Eireann Report issued to the applicant as part of the LRD opinion, Uisce Éireann have confirmed that watermain upgrades are required to be

provided to serve the subject lands. The development consists of a portion of watermain upgrade works along the R149 to the East of the site, replacing an existing 75mm dia. uPVC watermain with an upgraded 250mm dia. uPVC watermain. The proposed development upgraded watermain shall run from the eastern entrance of the subject site to the Kildare administrative boundary circa 870m to the east of the site along the R149. The proposed watermain upgrade shall connect with an upgraded 250mm watermain constructed within the Fingal County Council administrative area, which planning has been submitted to Fingal County Council as part of a separate application. (FCC Reg. Ref: FE26A/0196E).

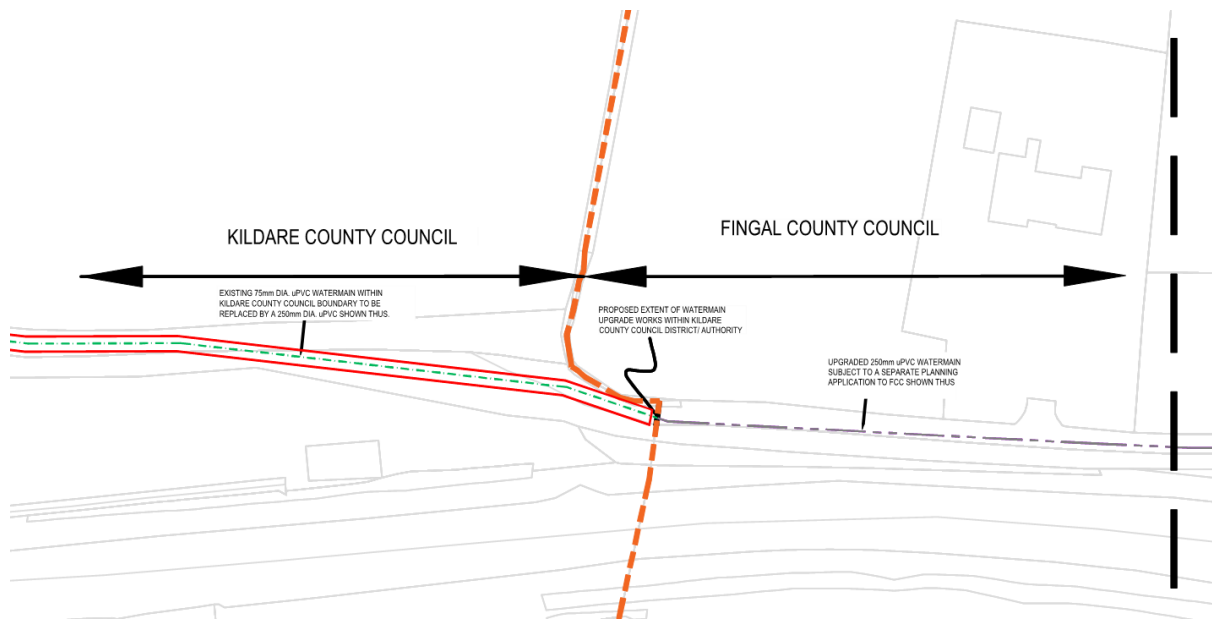


Figure 11 Extract from DOBA drawing C-0453 indicating the extent of watermain upgrade works within the KCC administrative boundary to the east of the subject site.

The proposed watermain upgrade works associated with this application in addition to the extent of watermain upgrades within the Fingal Boundary (FE26A/0196E), will provide future capacity for the wider Confey Masterplan. All works associated with the watermain upgrade shall be undertaken outside of any grass verges and will be contained within the public road and lands in charges of Kildare County Council under licence to Uisce Eireann.

The proposed development watermain layout and connections, valves, hydrants, meters etc. shall be designed in accordance with UÉ's Code of Practice for Water Infrastructure IW-CDS-5020-03 Standard Details and the Department of the Environment's Building Regulations "Technical Guidance Document Part B Fire Safety". The new site watermain network will adequately serve the firefighting requirements with Fire Hydrants provided on the loop main in accordance with Part B of the Building Regulations. The estimated peak hour water demand generated by the proposed development is approximately 8.68l/s.



Figure 12 Extract from DOBA drawing C-0401 illustrating the proposed water supply layout (Source: DOBA)

Table 5 Post-Development Peak Water Demand

RESIDENTIAL								
Proposed Water Demand								
Use Type	No. of Units	Occupancy Rate (persons/dwelling)	Population (P)	Per Capita Consumption (l/person/day)	Average daily domestic demand (l/day)	Average daily domestic demand (sec)	Average day/peak week demand (l/sec)	Peak hour water demand (l/sec)
Residential	272	2.7	734	150	110160	1.28	1.59	7.97
Peak hour water demand (l/s)								7.97
COMMERCIAL								
Proposed Water Demand								
Use Type	Floor Area (m ²)	Occupancy Rate (persons/m ²)	Population (P)	Per Capita Consumption (l/person/day)	Average daily domestic demand (l/day)	Average daily domestic demand (sec)	Average day/peak week demand (l/sec)	Peak hour water demand (l/sec)
Creche	555	8	69	60	4163	0.05	0.06	0.30
Retail	705	7.5	94	60	5640	0.07	0.08	0.41
Peak hour water demand (l/s)								0.71
Total Peak Hour Water Demand								8.68

8 Roads Infrastructure

8.1 Existing Roads Infrastructure

The existing site, as outlined in red in Figure 13 below, is bound to the south by the Royal Canal and the Royal Canal Greenway, to the west and north by agricultural lands, and to the east by Confey GAA Club. The existing site is adjacent to the R149 road to the east of the site and the L1015 along the northern boundary.



Figure 13 Existing roads infrastructure (Source: Google maps)

8.2 Dart + West Electrified Heavy Railway Order (ABP Ref 314323)

The DART+ West project is seeking to significantly increase rail capacity on the Maynooth & M3 Parkway lines. This will be achieved by changing from diesel powered trains to electrified, high-capacity DART trains and increasing the frequency of trains from 6 to 12 trains per hour per direction. The project will involve the electrification of approximately 40km of permanent way (railway line) from the Dublin City centre to west of Maynooth and to M3 Parkway Station and development of all associated supporting infrastructure. The electrification of the rail line is located predominantly within the existing railway corridor within Irish Rail/ CIÉ owned lands. The principal project components can be summarised to include:

- Signalling, Electrification and Telecommunication (SET) works.
- Construction of overhead line equipment (OHLE) along the railway.
- Structural alterations to existing rail overbridge structures.
- Modification works to existing bridge structures.
- Linear railway permanent way works.
- Closure of six existing level crossings and construction of replacement access infrastructure at Ashtown, Coolmine, Porterstown, Clonsilla and Barberstown.
- Station alterations at Connolly Station (RPS) including the provision of a new entrance at Preston Street via Connolly Station vaults (connecting to platforms 6 and 7) and associated public realm works on Preston Street.
- Construction of a new station at Spencer Dock.
- Construction of 12 substations, supporting technical buildings and electricity connections along the line. Construction of temporary construction compounds.
- Construction of permanent maintenance compounds. • Off-line track realignment in the vicinity of Rail overbridge 23 (OBG23/Jackson's Bridge) and associated roadworks.
- Construction of a depot (west of Maynooth), access infrastructure including a new overbridge, roadworks and flood compensation storages areas and all drainage and ancillary works.
- Drainage works and all ancillary works.

The Works proposed above were granted permission by An Bord Pleanála (ABP Ref: 314323) on 18th July 2024.

8.2.1 Cope Bridge Modification/ Upgrade

The granted works outlined above in section 8.2 include for the modification and upgrade of several bridge Structures, including the Cope Bridge, south of the proposed subject site. At present the Cope Bridge is managed through signal-controlled access for vehicles (shuttle system). The granted Railway order works development includes the separation of pedestrian and cycle traffic from motorised traffic by means of two new pedestrian/cycle bridges on either side of the existing bridge which will be utilised by public and passengers travelling from Leixlip Confey Station to the south of the Royal Canal. The granted footbridges travel over lands zoned for F2 Strategic Open Space either side of the Royal Canal. The upgrade works will also provide formal pedestrian and cycle links to the north of the Canal. The granted Cope Bridge upgrade works have been designed and will be delivered by others.

The proposed Confey Phase 1a LRD development has been designed with consideration regarding road and VRU facility alignment following the Railway bridge upgrade works.. The applicant is in regular engagement with Irish Rail to fully coordinate these upgrades with the proposed development. Please refer to the submitted **Engineering Drawing C-0700 C-0710** for details regarding the proposed Interim and Long-Term arrangements prior to, and following the granted Cope Bridge upgrade works.



Figure 14 Existing Location of Railway Bridge Infrastructure (Source: Google maps)

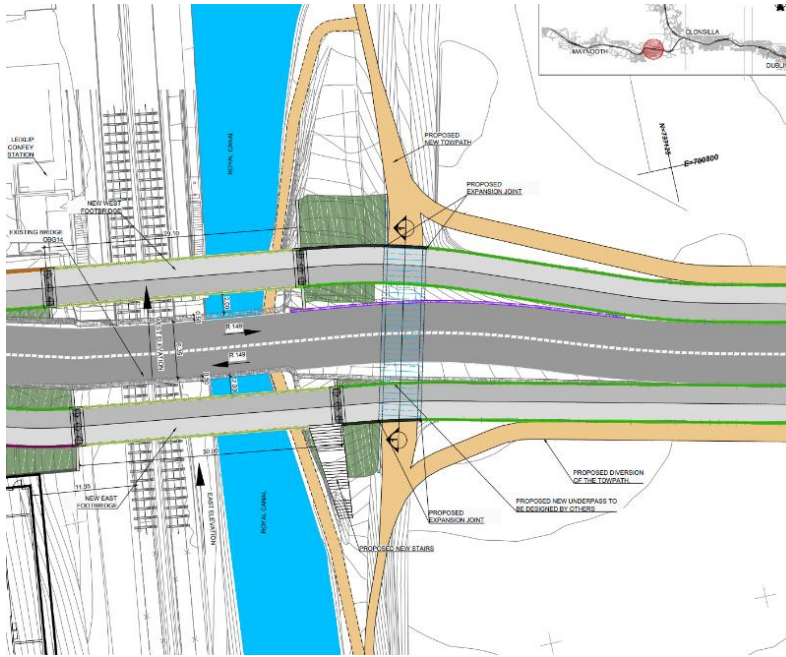


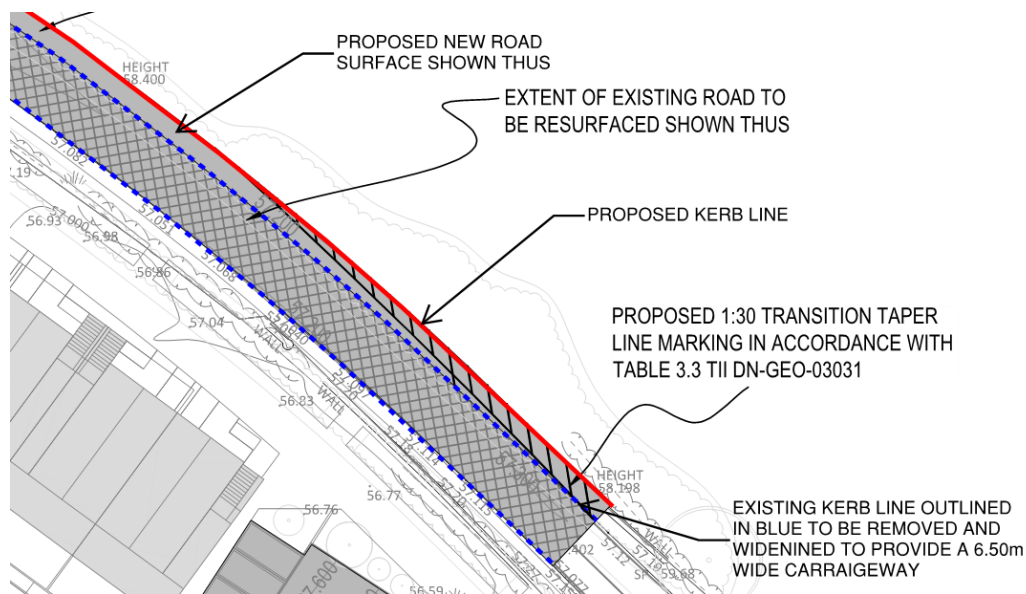
Figure 15 Granted Cope Bridge Ungraded Infrastructure (ABP Ref. 314323) (Source: IDOM/ Roughan O Donovan)

8.3 Proposed Development Access

The proposed development access is via the construction of 2 No. dedicated entrance off the R149 to the east and the L1015 Confey Road to the north of the site as illustrated on **Engineering drawing C-0550**.

8.4 L1015 Confey Road

Horizontal widening and minor vertical road realignment of the L1015 is proposed in order to facilitate the proposed development for Confey Phase 1a LRD lands and the wider Masterplan area and the Masterplan development. The proposed road realignment/ widening shall provide a 6.50m wide road along the north of the proposed development which will tie into the existing alignment of the L1015. The proposed widening shall provide future provision of VRU facilities for the masterplan development. Road hatch Transition Taper markings at 1:30 shall indicate to road users the temporary change of carriageway widths along the north of the site in accordance with Table 3.3 of TII DN-GEO-03031. Figure 16 below indicates the typical road widening along the L1015.



[illegible]

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As part of the short and Interim proposals for the R149 road infrastructure; prior to the delivery of the Cope bridge upgrade works and associated VRU infrastructure upgrade, It is proposed to construct a toucan crossing arrangement on the R149 road to provide permeability for pedestrians from the proposed Confey development to Leixlip town across the eastern side of the bridge where a footpath currently exists as seen in Figure 20 above.

Following the completion of the Cope bridge upgrade, and the construction of the masterplan Bus Stop arrangement, the toucan crossing will be removed as a result of new VRU infrastructure being provided at both sides of the Cope bridge structure which can be seen in Figure 21.

The applicant has consulted with the Senior Executive Engineer of Transportation & Public Safety , Annete Keavney of Kildare County Council regarding the location of the Toucan crossing in the Interim and have received correspondence of acceptance. Annette Keavney of Kildare County Council has responded with the following:

*'We have reviewed the submitted plans for the temporary toucan crossing at Captains Hill. The proposal aligns with KCC standard details for controlled crossings, including provision for tactile paving, shared pedestrian/cyclist areas, and appropriate tie-in to both existing and future infrastructure. The crossing is clearly intended as an interim measure ahead of the Cope Bridge upgrade, with removal and further VRU improvements planned as part of the bridge works. Signal pole locations and guardrailings should be confirmed at detailed design stage, **but overall, the proposal is acceptable from a roads and VRU connectivity perspective.**'*

8.8 DMURS Statement of Consistency

The internal roads infrastructure to serve the subject site have been developed in accordance with the Confey Masterplan of the Leixlip Local Area Plan ('the LAP') 2020-2023 (as extended to 2026). Section 3.9 of 'the LAP' follows a road hierarchy which follows standards set out in the Design Manual for Urban Roads and Streets (DMURS) as follows and is illustrated in Figure 22 and Figure 23 below and on **Engineering drawings C-0500**

- 6.0m wide Link Streets with min. 2.0m raised footpaths and on street parallel and perpendicular car parking,
- 5.5m wide Local streets with min. 2.0m raised footpaths and on street parallel and perpendicular car parking,
- Home Zones (access only) with 6.0m raised shared surfaces (4.8m wide carriageway and 1.2m wide pedestrian step-in zones) have been located primarily on local streets directly adjacent to green open spaces and in cul-de-sacs to promote more liveable streets.



Figure 22 Extract from Confey Masterplan of the Leixlip Local Area Plan ('the LAP') 2020-2023 (as extended to 2026) indicating Road Hierarchy

Psychological and physical traffic calming measures have been adopted within the proposed site layout to balance the functional needs of various carriageway users in particular Vulnerable Roads Users (VRUs) in accordance with Section 3 of the Confey Design Code as follows;

- The creation of a self-regulating street environment through the introduction of shared surfaces, on-street parking, reduced corner radii, reduced visibility splays and staggered junctions,
- The promotion of on street activity internally along streets through the provision of on-street parking,
- Limiting straight sections of roads to a maximum of 70m through the introduction of horizontal deflections coupled with vertical deflections in the form of raised table tops where required,
- The use of minimal signage and line markings along internal streets with such treatments used sensitively throughout and predominately at key nodes and transition areas with adjoining streets,
- The provision of footpath widths no less than 2.0m are proposed throughout the scheme with tie-ins provided to existing external pedestrian routes, in particular along the northern boundary of the subject site,
- Appropriate clear unobstructed visibility splays are provided at all internal nodes which have been fully coordinated with the Architect, Landscape Architect and Public Lighting designer,
- Well designed and frequently provided pedestrian crossing facilities are provided along key travel desire lines throughout the scheme. All uncontrolled crossings are provided with either

dropped kerbs and tactile paving or flat raised table top treatments thereby allowing pedestrians to informally assert a degree of priority,

- The materials used in shared surface areas will be varied to indicate that the carriageway is an extension of the pedestrian domain,
- Vertical deflections in the form of raised tables are strategically placed across the internal road network to promote lower speeds and enable pedestrians to cross at grade. The maximum height of these raised flat top treatments is designed to be 75mm,
- At any flat top pedestrian crossing/ traffic calming traffic table treatments, different surface material treatments are proposed to alert and subsequently influence driver behaviour and associated vehicle speeds,
- Kerb heights will be maintained at 75mm internally within the development,
- Cyclists will either share the carriageway with other road users internally within the development or use dedicated off-road cycle tracks as illustrated on the site plan,
- In accordance with DMURS, perpendicular parking spaces are a minimum of 5.0m long by 2.5m wide, and finally,
- Designed pedestrian & cyclist connectivity to the adjacent lands.

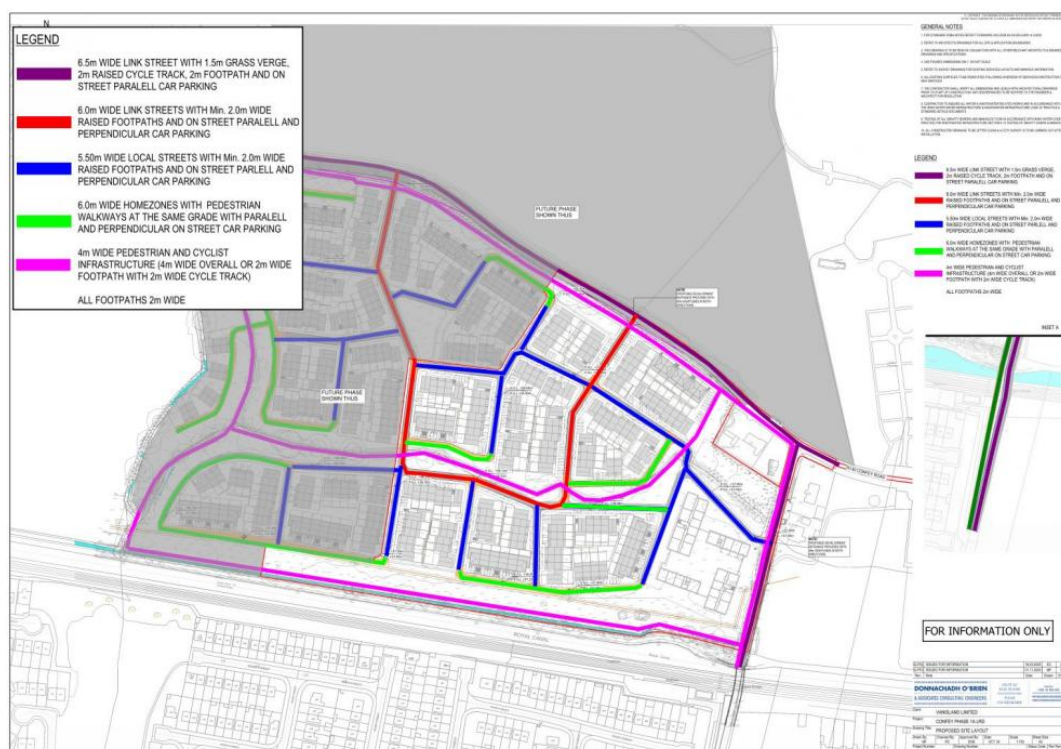


Figure 23 DMURS Roads / Street Hierarchy (Source: DOBA)

8.9 Traffic & Transport Assessment and Mobility Management Plan

A separate Traffic & Transport Assessment (TA) and Mobility Management Plan has been prepared by the transportation consultant and has been submitted with this application.

8.10 Stage 1 Road Safety Audit

A Stage 1-2 Road Safety Audit has been completed by Traffico on behalf of the Applicant and a copy of the audit in addition to the signed Feedback Form has been submitted with the Planning Application. The Stage 1-2 audit and response document outlines the alternations applied to the site layout following the auditors' recommendations. The Road safety audit has been included in Appendix G