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Civil Engineering Infrastructure Report for Planning

Project:

White Heather, South Circular Road

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1. EXECUTIVE SUMMARY

A Large-Scale Residential Development is proposed at the White Heather Site at South Circular Road, Dolphins Barn, Dublin 8. The site is bounded by the Grand Canal to the South and South Circular Road to the North. The site covers an area of 1.13ha and is currently a brownfield site. The current ground level is c22.000m AOD and the new proposed ground level will approximate to the current level. The proposed development will consist of approximately 250 No. residential units over 6 Blocks.

The proposed surface water drainage system has been designed in accordance with the documents mentioned in section 2.2. The overarching objective of the drainage system is to manage runoff as close to the point of rainfall as possible, ensuring that source-control measures are maximised in use before runoff enters the underground network. The proposed system collects runoff from roof areas, hardstanding surfaces, and positively drained landscaped areas, and treats, retains, and attenuates flows prior to controlled discharge.
A variety of SuDS measures were incorporated into the design:

- SuDS features cover 62.16% of all roof area within the site, with 54.25% of this being intensive green roof, a significant portion of this being positioned above blue roof storage. The DCC Development Plan 2022-2028 requires a minimum of 50% of all roof area for developments over 100m^2 being covered in intensive green roof and this has been achieved.
- Permeable paving covers the majority of the external ground floor of the site, excluding only the site entrance tie-in point, to attenuate and treat runoff. Infiltration is not predicted to be feasible within the site leading to a perforated pipe being incorporated within the permeable build-up to convey flows to the main drainage system.
- A buried modular attenuation tank was incorporated into the surface water drainage network due to the scale of the site and high proportion of hard surfaces. The tank was designed to hold up to the 1 in 30-year storm event, with more extreme storm water events surcharging to enter into the permeable paving situated through the development.

The estimated unrestricted flow of the current site was calculated as 141.36l/s in section 2.1 of the report. The new surface water drainage network has been designed to restrict the outflow from the site to 2.1l/s as explained in section 2.3.4.1 of the report. The outflow of the surface water network will enter into the combined manhole C1.6 before flowing into the public combined brick culvert sewer in South Circular Road. A dead leg of 2m will be incorporated into the final surface water manhole to allow for future public infrastructure improvements. All details for watermain and foul will be designed as agreed by the received SODA, located in Appendix 6.3.

Table 1.0: Executive Summary – Breakdown of Areas

Executive Summary			Total Areas	Area Breakdown	Area Breakdown	% of Total Area	% of Section
Total Site Area	**Total Site Area**		**11360**			**100%**	
	Hardstanding			4091.46		36.02%	
	Roof			4896.81		43.11%	
	Soft Landscaping			2771.33		24.40%	
Hardstanding	**Total Hardstanding Area**		**4091.46**			**100%**	
	Permeable Paving			2972.58		72.65%	
	Impermeable Roadway			1118.88		27.35%	
Roof	**Total Roof Area**		**4896.81**			**100%**	
	Intensive Green			2661.43		54.25%	
		Intensive Green on Drainage Board			*790.96*		*16.15%*
		Intensive Green on Blue Roof Storage			*1870.47*		*38.20%*
	Hardstanding on Blue Roof Storage			382.3		7.81%	
	Impermeable Roof			1118.88		22.85%	

2. INTRODUCTION

2.1 PROPOSED DEVELOPMENT

This report has been prepared in support of a planning application for a proposed mixed-use, Large-Scale Residential Development (LRD) at the White Heather site, located off the South Circular Road, Dublin 8, Dublin.

The development will comprise the demolition of all existing commercial and warehouse buildings and structures on the site, and the construction of 250 no. residential units within six blocks (Blocks 01, 02(A/B), 03(A/B), 04(A/B), and two duplex blocks) ranging in height up to seven storeys. The development will include 12 no. studio apartments, 148 no. one-bedroom apartments, 74 no. two-bedroom apartments, 8 no. one-bedroom duplex units, and 8 no. two-bedroom duplex units.

All residential units will include private balconies or terraces, oriented north, south, east, or west.

The proposal also includes the conversion of the existing residential dwelling at 307/307A South Circular Road to a crèche with an associated external play area. A new kiosk/café and adjoining open space will be provided adjacent to 307/307A South Circular Road, along with car and bicycle parking. The development will provide public open spaces between Blocks 03 and 04, as well as to the north and south of the apartment blocks, the latter overlooking the Grand Canal, together with communal open spaces throughout the scheme. Vehicular, pedestrian, and cyclist access will be provided from the northeast of the site via South Circular Road, with additional pedestrian and cyclist access from the west via St James's Terrace.

The proposal also includes landscaping, public and communal open spaces, and all associated site development works required to facilitate the project. These works include boundary treatments, plant and waste management areas, and other service provisions, including ESB infrastructure.

2.2 SCOPE OF THIS REPORT

This report describes the proposed civil engineering infrastructure for the development and connectivity to the public infrastructure serving the area. In particular, foul and surface water drainage and water supply are considered.

This report should be read in conjunction with the drawings listed in Section 1.3 and the following Reports submitted with the application under separate cover:

- Doc No 25.142-RP-02: Basement Impact Report
- Doc No 25.142-RP-03: Site Specific Flood Risk Assessment

2.3 DRAWINGS SUBMITTED

WHH-BMCE-ZZ-ZZ-DR-C-10000 – Civil General Notes
WHH-BMCE-ZZ-ZZ-DR-C-11100 – Proposed Site Layout
WHH-BMCE-ZZ-ZZ-DR-C-11200 – Proposed Drainage, & Watermain Layout
WHH-BMCE-ZZ-ZZ-DR-C-11230 – Proposed Lower Ground Floor Drainage Layout
WHH-BMCE-ZZ-ZZ-DR-C-11300 – Proposed SUDS Strategy
WHH-BMCE-ZZ-ZZ-DR-C-11310 – Overland Flow Drawing
WHH-BMCE-ZZ-ZZ-DR-C-12030 – Site Sections A-A & B-B
WHH-BMCE-ZZ-ZZ-DR-C-12200 – Proposed Surface Water Longitudinal Section
WHH-BMCE-ZZ-ZZ-DR-C-12201 – Proposed Foul Water Longitudinal Sections

WHH-BMCE-ZZ-ZZ-DR-C-12300 – Permeable Paving Standard Details
WHH-BMCE-ZZ-ZZ-DR-C-12310 – Soft and Hard Landscaping on Podium / Roof Areas - Standard Details
WHH-BMCE-ZZ-ZZ-DR-C-12322 – SuDS Details - Filter Drain and Detention Basin Details

2.4 LOCATION

The site is located in the northeastern environs of Dublin South-Central, as shown in Figure 1.1 below. It is immediately bound by

- The Priestfield Cottages road to the east;
- South Circular Road to the northeast;
- Existing residential units and a church to the north;
- St James Terrace residential units to the west;
- The Grand Canal to the south;

Figure 2.1: Location of Site

The site covers an area of 1.13 ha. The existing site is 100% impermeable throughout, being made up of industrial buildings with associated concrete yard / hardstandings. All existing buildings are to be demolished as part of the proposed development.

2.5 TOPOGRAPHY

The existing ground levels across the overall site are typically graded from southwest to northeast, the highest points are approximately +23.0mOD at the access road from St James Terrace at the south-western boundary, and existing levels at the lowest point are circa of +22.1mOD at the access road from South Circular Road at the north-eastern boundary.

The site topographical survey is enclosed in Appendix 1.

2.6 Ground Conditions

An intrusive site investigation will be undertaken to confirm the existing ground conditions. Based on the currently available information it is understood the site is underlain by low permeability clay soils.

2.7 Communications with Local Authority

2.7.1 S247 Pre-Planning Meeting

An S247 pre-planning meeting was held on 02/05/2025. A number of infrastructure-related items were raised in the meeting. These are copied in the table below, alongside an explanation as to how the drainage proposals detailed herein address each of the items raised.

Table 2.1: S247 Meeting: Drained-related items

S247 Meeting Item	**Designer Comment**
Item 2.1. Approach: Strategy to surface water management is generally correct and reflects updated policy. (Note)	The approach remains broadly the same as those submitted ahead of the S247 meeting.
Item 2.2. Discharge: Maximum discharge rate to be confirmed in next submission. Quantum of attenuation proposed to be detailed in subsequent submission. DCC requesting minimum attenuation tank sizing as viable. (BMCE)	The proposed site discharge rate is **2.1 l/s.** The proposed attenuation tank has a capacity of **228m³**. Additional attenuation will be provided within the permeable paving and on the podium blue roof. Refer to Section 2.3.3 of this report for details.
Item 2.3. Duplexes Unit Comments: *2.3.1. Traditional roofs pose challenges for green roof. (Note)* *2.3.2. Include commentary in report and explore reuse or rainwater harvesting. (BMCE)*	The proposals include extensive green roofs on all available flat roofs. Refer to Section 2.3.1 of this report for details.
Item 2.4. Localised Pluvial Flooding: Potential issue at St James Terrace flagged by NF. NF to liaise internally with Gerry O'Connell. NF to share relevant data on same with CK. (BMCE)	The proposed runoff from the site will be significantly lower than the existing flows, helping to reduce the load on the surrounding drainage infrastructure, and reducing the risk of pluvial flooding. Furthermore, the proposals include permeable paving on all road, parking and footpath areas, which could provide temporary capacity for excess flows from neighbouring sites in the event of a localised flooding event.
Item 2.5. Drainage Area Calculations: Discrepancies noted in drainage area calculations (~4000m² missing). (BMCE)	The revised drainage calculations consider a positively drained area totalling 0.968 ha. Circa 0.11 ha of the site is considered to drain directly to the underlying soils.

	Refer to Section 2.2.1 of this report and the Causeway Flow drainage calculations in Appendix 4.
Item 2.6. Basement: Half-level design noted; detail on its extent and drainage impact required by DCC. (BMCE)	BIA enclosed separately.
Item 2.7. Flood Risk Assessment: Preliminary assessment complete; no major concerns at this stage. (Note)	No further comments required.

2.7.1 LRD Opinion

An LRD Opinion and Basement Impact Assessment were received on the 16th of September 2025. The LRD Opinion and response can be found in Appendix 2.

3. SURFACE WATER DRAINAGE

3.1 Existing Surface Water Drainage

At present, surface water from the site discharges to the existing 990x640mm brick combined sewer on South Circular Road at an unattenuated rate. This combined brick culvert sewer is at a depth of approximately 1.9-2m below the existing road level. Uisce Eireann sewer plans are provided in Appendix 1 (extract shown below):

Fig 3.1: Public Sewers in the vicinity of the site

The existing site is 100% impermeable. The peak runoff from the existing site can therefore be estimated using the modified rational method as follows:

Existing Peak Runoff Rate, $Q_{p,Ex}$ = 2.78 x Cv x i x A

Where:
Runoff Coefficient (Cv) = 0.9 (industry standard value for estimating runoff from impermeable surfaces)
Peak rainfall intensity (i) = 50 mm/hr (industry standard value for estimating existing runoff rates)
Impermeable area (A) = 1.13 ha

Hence $Q_{p,Ex}$ = 2.78 x 0.9 x 50mm/hr x 1.13 ha = **141.36 l/s**

3.2 Proposed Surface Water Drainage

The proposed surface water drainage system is designed to comply with the 'Greater Dublin Strategic Drainage Study (GDSDS) Regional Drainage Policies Technical Document – Volume 2, New Developments, 2005', the 'Greater Dublin Regional Code of Practice for Drainage Works, V6.0 2005', DCC 'Sustainable Drainage Design & Evaluation Guide, 2021', DCC 'Development Plan 2022-2028', and DCC 'Green & Blue Roof Guide, 2021'. CIRIA Design Manuals C753, C697 and C609 have also been used to design the surface water drainage system within the site.

It is proposed to construct a new surface water drainage system for the development to collect runoff from roofs, paved areas and any additional runoff from landscaped areas which doesn't percolate to ground. The aim of the drainage design is to treat, retain, and slowly discharge water from source into the underground drainage network. The system can be described as follows:

- Intensive green roofs will be provided on the majority of flat-roof areas. The raised podium garden in the centre of the site as well as all top roof levels will also have a layer of blue roof attenuation underneath the intensive green roof layer, allowing for rainwater falling onto the apartment blocks to be retained and slowly release into the buried drainage system at a controlled outflow.
- Permeable paving will be used for all hard paved roadways, parking bays and footpaths (with the exception of the site entrance road at the interface with the public roadway), providing attenuation and treatment of rainwater flows. Should infiltration rates prove favourable, then these areas will facilitate the direct infiltration of rainwater to ground. Otherwise, perforated collector pipes laid within the permeable buildup will direct flows towards the new buried drainage system. The drainage design did not rely on infiltration in these areas.
- Additional attenuation will be provided via a buried attenuation tank with downstream flow control, to limit the eventual discharge rate from the site.
- Soft landscaping will provide interception of rainfall and promote diffuse infiltration into the underlying soils. However, for the purposes of the drainage calculations, it has been assumed that 50% of the proposed landscaped areas will be positively drained, via the application of an appropriate runoff coefficient. This ensures a conservative approach.
- The site is underlain by clays which are expected to achieve low infiltration rates. The site infiltration rate has therefore been taken as zero in the design of the drainage system, representing 'worst-case' scenario. Once infiltration tests have been carried out on site, the design will be reviewed to determine if the volume of below-ground attenuation can be reduced.
- There is no existing surface water sewer or watercourse in the vicinity of the site. The proposed drainage system will discharge to the existing combined sewer in the South Circular Road to the northeast. The system is designed to accommodate flows for the 1 in 100-year

storm event. A Hydrobrake flow control device will limit offsite flows to **2.1 l/s.** Refer to section 2.3.4.1 for clarification on reasoning behind offsite flows of 2.1l/s.

3.2.1 Catchment Area

The total site area is 1.13 ha, which includes approximately 0.24 ha of soft landscaping. For the purposes of the drainage calculations, it will be conservatively assumed that 50% of this landscape area is positively drained, with the remainder assumed to drain directly to the underlying soils. The equivalent impermeable area calculation for the site is shown in the table below.

Table 3.1: Proposed Drainage Areas

Surfacing Type	Area (m2)	Runoff Coefficient	Equivalent Impermeable Area (m2)
Impermeable Roof	1853.08	0.95	1760.43
Impermeable Hardstanding	1118.88	0.90	1006.99
Intensive Green Roof on Drainage Board	790.96	0.5	395.48
Intensive Green Roof on Blue Roof Storage	1870.47	0.5	935.24
Hardstanding on Blue Roof Storage	382.3	0.95	363.19
Permeable Paving	2972.58	0.8	2378.06
Positively Drained Soft Landscaping	2771.33	0.47	1302.55
Total	**11360**		**8141.94**

3.3 SUDS STRATEGY

3.3.1 Compliance with Dublin City Development Plan 2022-2028

The surface water network for the site has been designed in accordance with the requirements stated within the Dublin City Development Plan 2022-2028. Particular attention was given to Appendix 11, “Technical Summary of Dublin City Council Green & Blue Roof Guide (2021), Appendix 12, “Technical Summary of Dublin City Council Sustainable Drainage Design & Evolution Guide (2021)”, and Appendix 13, “Surface Water Management Guidance”.

All apartment blocks have been designed to meet the requirements specified in Appendix 11. Green blue roofs have been incorporated into the design where possible leading to intensive green roofs, green roofs on blue roof storage, and hardstanding material on blue roof storage covering more than the required 50% of the overall impermeable roof areas, refer to section 3.3.3.1.2. for more information. Emergency overflow systems will be installed atop each roof area to ensure that the risk of flooding is minor, whilst regular maintenance and ease of access will aid in ensuring each green roof continues to work correctly.

A breakdown of the apartment block roof area attenuation measures can be seen in the below table: All intensive green roofs that are not situated above blue roof storage were calculated as providing 10mm of interception storage only. All roof situated on blue roof storage was assumed to be able to store water within attenuation blocks of a depth of 150mm.

Table 3.2: Apartment Block Roof Type Breakdown

Apartment Block	Intensive Green (m^2)	Storage Provided (m^3)	Intensive on Blue (m2)	Storage Provided (m^3)	Hardstanding on Blue (m2)	Storage Provided (m^3)
Block 1	0	0	235.48	35.32	86.76	13.01
Block 2	0	0	611.98	91.80	121.98	18.30
Block 3	588.23	5.88	298.90	44.84	86.78	13.02
Block 4	202.73	2.03	215.43	32.31	86.78	13.02
Podium	0	0	508.68	76.30	0	0
Totals	**790.96**	**7.91**	**1870.47**	**280.57**	**382.3**	**57.35**

The requirements mentioned within Appendix 12 have been met throughout the infrastructure report in sections 3.2, 3.2.1, 3.3.2, and 3.3.4.1.

Controlling surface run-off at source was the desired solution but, due to the size of the site and large percentage of hardstanding area, a buried underground attenuation tank was incorporated within the network to ensure that the outflow would not exceed the specified discharge rate into the public combined sewer running along South Circular Road.

3.3.2 Compliance with the Principles of Sustainable Drainage Systems

The proposed drainage will be designed in accordance with the principles of Sustainable Drainage Systems (SUDS) as embodied in the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS). The GDSDS addresses the issue of sustainability by requiring designs to comply with a set of drainage criteria which aim to minimise the impact of urbanisation by replicating the run-off characteristics of the brownfield site. The criteria provide a consistent approach to addressing the increase in both rate and volume of run-off as well as ensuring the environment is protected from pollution that is washed off roads and buildings. These drainage design criteria and are as follows:

Table 3.3: GDSDS Criteria

GDSDS Criteria	Aims
Criterion 1 – River Water Quality Protection -Provide Interception & treatment Storage	• to prevent pollution • to maintain base flows in streams • to recharge groundwater.
Criterion 2 – River Regime Protection -Provide Attenuation Storage	• to prevent river scour due to flash flooding.
Criterion 3 – Site Flood Risk Mitigation -Provide adequate pipe network & check overland flows	• to prevent site flooding for 30-year storm and manage overland flows if site flooding occurs for 100 year storm.
Criterion 4 – River Flood Protection -Provide Long Term Storage or Extended Attenuation Storage	• to prevent river flooding

The overarching principle of SuDS design is that surface water runoff should be managed for maximum benefit. The types of benefits that can be achieved by SuDS will be dependent on the site but fit broadly into four categories – The Four Pillars of SuDS – and are as follows: water quantity, water quality, amenity, and biodiversity.

Table 3.4: The Four Pillars of SuDS – C753 Ciria SuDS Manual

SuDS Pillar	**Benefit**
Water Quantity	• Maintain & protect the natural water cycle • Support the management of Flood Risk
Water Quality	• Manage the quality of the runoff to prevent pollution
Biodiversity	• Create & Sustain better places for Nature
Amenity	• Create & Sustain better places for people

The proposed SuDS strategy has been developed in coordination with the landscape architect and wider design team to achieve a solution which is compliant with the GDSDS Criteria 1 to 4, DCC 'Green & Blue Roof Guide, 2021', DCC 'Sustainable Drainage Design & Evaluation Guide 2021', DCC 'Development Plan 2022-2028', and the Ciria SuDs Manual 'Pillars of SuDS'. The proposals employ a variety of at-source and site-wide control measures to control water quantity and quality, whilst also providing landscaped amenity spaces to benefit both people and nature.

The proposed SuDS measured are listed in Table 2.4 and shown on drawing WHH-BMCE-ZZ-ZZ-DR-C-11300. The following sections describe how the proposed SuDS management train meets GDSDS criteria 1 to 4.

Refer to drawing WHH-BMCE-ZZ-ZZ-DR-C-11200 for the drainage layout including proposed location of the attenuation tank, drawing WHH-BMCE-ZZ-ZZ-DR-C-11300 for the SuDS Plan and drawings WHH-BMCE-ZZ-ZZ-DR-C-12320 and C-12321 for the proposed SuDS details.

Reference should also be made to the Causeway Flow Software output for attenuation & network simulation calculations given in Appendix 4.

SuDS Measures	Measures to be used on this site (Y/N)	Rationale for selecting / not selecting measure	Area of Feature (m^2)	Relevant GDSDS Criterion	GDSDS Storage Volume Classification (see note 1)	Storage volume size (m^3)	Performance (See Note 2)			
							Quantity	Quality	Biodiversity	Amenity
Source Control										
Swales	N	No suitable locations for open water features		1 & 2	Int, Tre & Att					
Tree Pits	N	Other measures preferred		1 & 2	Int, Tre & Att					
Downpipe Planters	N	Other measures preferred		1	Int					
Rainwater harvesting	N	Other measures preferred		1	Int					
Soakaways	N	Assumed poor infiltration rates (soakaway tests to confirm)		1 &2	Int, Tre & Att					
Infiltration Trenches	N	Assumed poor infiltration rates (soakaway tests to confirm)		1 &2	Int, Tre & Att					
Permeable pavement	Y	Provided on all roads, parking bays and footpaths	2972.58	1 &2	Int, Tre & Att					
Green Roofs	Y	Provided on flat roofs where possible	2661.43	1 &2	Int, Tre & Att					
Green Wall	N	Other measures preferred								
Filter strips	N	Permeable paving is preferred method for draining hardstandings		1 & 2	Int, Tre & Att					
Raingardens/ Bio-retention system	N	Other measures preferred		1 & 2	Int, Tre & Att					
Blue Roofs	Y	Provided on raised external podium and inaccessible roof areas	2252.77	2	Att					
Filter Drain	N	Permeable paving is preferred method for draining hardstandings		1 & 2	Int, Tre & Att					
Site Control										
Detention Basins	N	No suitable locations for open		1	Int & Att &					

		water features			LT					
Bio Retention Systems	N	No suitable locations for bio-retention features		1 &4	Int & LT					
Ponds & Wetlands	N	No suitable locations for open water features		1 &2	Int, Tre & Att					
Petrol/Oil interceptor	N	Permeable paving achieves sufficient pollutant removal		1	Tre					
Attenuation Systems	Y		200	2	Att & Int					

Note 1: Int = Interception storage (can be counted as both treatment & attenuation storage), Tre = Treatment Storage, Att = Attenuation Storage, LT= long term storage.
Note 2: green = good performance, orange = moderate performance, red = poor performance.

Table 3.5 List of Suds Measures Employed, with volumes and performance rating

3.3.3 Criterion 1 GDSDS: River Quality Protection - Interception or Treatment Storage

3.3.3.1 Calculation of Interception Volume

Run-off from natural greenfield areas contributes very little pollution and sediment to rivers since for most rainfall events the rainfall percolates directly to ground. By contrast, piped drainage systems in urban areas generate run-off during virtually every rainfall event, with little of the rainfall percolating to the ground. Much of the runoff generated in urban areas includes high concentrations of pollutants, particularly in the first phase of run-off. To prevent this, Criterion 1 requires that interception storage is provided so that the first 5-10mm of rainfall from developments is intercepted and retained on site to prevent pollution. This approach helps to recharge groundwater and maintain base flows in streams, more closely replicating the run-off characteristics of greenfield sites.

Interception storage volume required @ 5mm across site = 11360 m^2 x 0.005m = 56.80m^3

The proposed SuDS measures comfortably achieve this minimum interception storage requirement, as detailed in the following sections.

3.3.3.1.1 Permeable Paving

Permeable paving will be used for all hard paved roadways, parking bays and footpaths (with the exception of the site entrance road at the interface with the public roadway). The majority of permeable paving used on site comprises paving blocks laid with open joints to allow incident rainfall to percolate down through the surface into a granular subbase layer specifically designed to provide attenuation. The proposed attenuation layer will be **400mm thick**, with a minimum 30% void ratio. A section of modular attenuation will be situated beneath the impermeable hardstanding roads located between blocks 3no. and 4no., this modular attenuation will be **510mm thick**, with a void ratio of 95%.

Permeable paving provides interception storage as a portion of the water captured will be released to atmosphere via evapotranspiration, whilst excess flows will be directed towards the buried drainage system via perforated collector pipes laid 50mm above the base of the granular subbase.

Furthermore, permeable paving helps to improve water quality as pollutants are removed as the water percolates down through the system's permeable build-up. Chapter 20 of C753 Ciria SuDS Manual provides further details on the benefits of permeable paving.

Refer to drawing WHH-BMCE-ZZ-ZZ-DR-C-11300 for the proposed permeable paving extents.

<u>Permeable Paving Interception Storage</u>
Permeable paving area = 2972.58m²
= 2972.58m² x 0.05m x 30% porosity = 44.59m^3

3.3.3.1.2 Green Roofs

Intensive green roofs will be provided on all flat roof areas, providing at-source control of rainwater. Green roofs provide water quantity, amenity, biodiversity and water quality benefits (e.g. filtration of pollutants as water percolates down through the green roof structure). Where PV panels or other roof plant equipment preclude the use of green roof substrate, a gravel ballast will be provided over the drainage board so that interception storage will still be provided.

Intensive green roof systems contain deeper substrate levels to accommodate for a wider range of planting and require more regular maintenance. The green roofs located at the higher apartment

blocks will typically only be accessed for maintenance and will comprise of 200mm – 300mm overall soil depth. The green roofs located at accessible public levels will be designed to allow for easy maintenance access and public usage.

Intensive green roofs provide interception storage, which helps to reduce the rate and volume of water discharging to the below-ground system. A typical intensive green roof system can intercept and retain over 30 litres/m² depending on the build-up. Since these roofs are exposed to the Irish climate, there is a high probability that the roof will not be completely dry, and the storage capacity will be compromised on any given rainfall event. Thus, the more conservative estimate of 10 l/m² interception storage will be assumed.

Intensive green roofs cover 54% of all total roof area. 2,661.43m² of 4896.81m^2 is covered by intensive green roof situated on drainage boards or blue roof storage. All roof area included within Table 3.1 was included within this calculation.

Refer to BMCE drawing WHH-BMCE-ZZ-ZZ-DR-C-11300 for the proposed green roof extents.

Green Roof Interception Storage

Total Green Roof area = 2,661.43m²

= 2,661.43m ² x 10 l/m^2 = 26,614.3 litres = 26.61m^3

3.3.3.1.3 Blue Roofs

The raised podium garden in the centre of the site will be provided with a deeper blue roof storage layer. Blue roofs are similar to green roof systems, but include an additional layer specifically designed for the attenuation of rainwater at high level. The outlets from blue roofs are restricted to ensure the attenuation layer is utilised and achieve controlled discharge of flows to the below-ground system. The proposed attenuation layer will be **150mm thick**, with a minimum 95% void ratio.

To maximise the benefits of the blue roof, it is assumed that approximately 95% of the runoff from the surrounding blocks will cascade onto the podium roof. The exact blue roof catchment will be coordinated and agreed with the MEP engineer, architect and specialist blue roof designer at detailed design stage.

Refer to Appendix 4 for details of how the blue roof is modelled in the hydraulic calculations. Refer to drawing WHH-BMCE-ZZ-ZZ-DR-C-11300 for the proposed blue roof extents.

Blue roofs offer similar SuDS benefits to green roofs. Hence, it can be conservatively assumed that the podium blue roof will provide 10 l/m2 interception storage. The below calculation has only considered areas of hardstanding material above blue roof storage mentioned above in Table 1.0.

Blue Roof Interception Storage

Total Blue Roof area = 382.3m²

= 382.3m² x 10 l/m^2 = 3823.0 litres = 3.82m^3

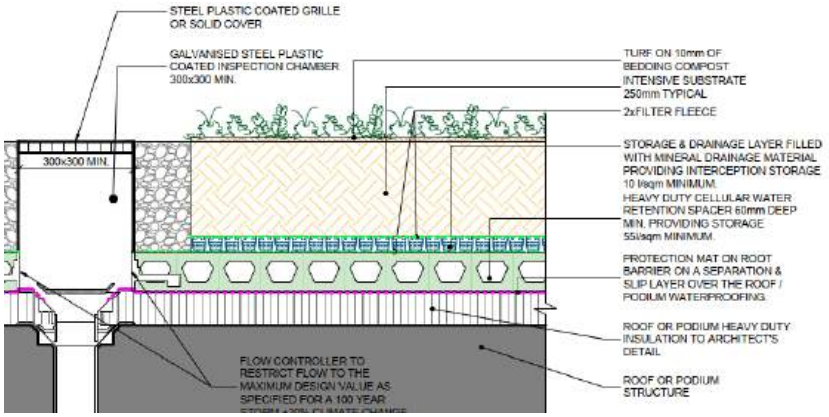


Fig 3.2: Intensive Green Roof over Blue Roof Storage

3.3.4 Criterion 2 GDSDS: River Regime Protection – Attenuation Storage

3.3.4.1 Calculation of QBar

Hard paved developments drained via traditional piped networks will result in significantly higher runoff flows when compared to greenfield rates, potentially leading to scour and erosion in the receiving stream / river network. To prevent this, new developments should aim to reduce runoff rates to equivalent greenfield QBar rates.

In accordance with the IH124 method, the equivalent greenfield QBar runoff for sites measuring less than 50 ha can be estimated using the following formula:

$$QBar\ (in\ m^3/s) = 0.00108 \times (0.01 \times AREA)^{0.89} \times SAAR^{1.17} \times SPR^{2.17}$$

Where:
QBar = mean annual flood flow from a catchment
AREA = Catchment area in ha = 1.13 ha
SAAR = Standard Average Annual Rainfall (754.7mm for the site as sourced directly from Met Eireann)
SPR = Standard Percentage Runoff coefficient for the SOIL category (clay soils on site are assumed to be SOIL type 4, hence an SPR value of 0.47 is applicable for the site).

The HR Wallingford greenfield runoff rate estimation tool has been used to estimate the QBar value from the site in line with the above method (refer to Appendix 3 for details). The resulting QBar value is **5.7 l/s**.

The proposed discharge location is the existing combined sewer in the South Circular Road to the northeast of the site. It is understood Irish Water will only accept connections to this sewer which are limited to 2 l/s/ha. Hence the proposed discharge from the site will be limited to **2.1 l/s**. This is approximately 63% lower than the QBar rate calculated above, meaning the design proposals comfortably achieve the requirement to limit flows to equivalent greenfield rates.

3.3.4.2 Below-Ground Attenuation Tank

Attenuation tanks are used to create below-ground void space for the temporary storage of surface water prior to controlled release to the receiving sewer or watercourse. It is proposed to provide an attenuation tank under the car parking and recreational space in the north of the site. This tank will attenuate all remaining surface water run-off that is excess to the other SuDS attenuation storage.

The site attenuation storage has been designed to accommodate the 1 in 30-year rainfall event, with rainfall events of up to a 1 in 100-year storm (+20% cc) accommodated within the permeable paving and underground attenuation tank. A Hydrobrake flow control device will be provided immediately downstream of the attenuation tank to ensure outflows are limited to 2.1 l/s.

Appendix 4 contains the modelling results, showing the critical storm durations, rainfall depths and corresponding storage volumes required for the 30 and 100-year events, with outflows limited to achieve the above rate.

3.3.4.3 Suds Measures to meet the Attenuation Storage requirement

The GDSDS requires that flood waters be managed within the site for the 1 in 100-year flood event. The proposed scheme ensures that all rainfall up to the 1 in 100-year (+20% climate change) event is attenuated on site and outflows are limited to 2.1 l/s as discussed above.

During the 1 in 100-year storm, 317m^3 is provided within the permeable paving, whilst an additional 228m^3 is provided in the attenuation tank, giving a total of 545m^3. The blue roof storage situated on the podium is used to retain and reduce the flow of water entering the underground drainage system to 3l/s.

3.3.5 Criterion 3 GDSDS – Site Flood Risk Mitigation – Pipe Network Design

3.3.5.1 Network Design

The GDSDS requires that no flooding should occur on site for storms up to and including the 30-year event. The pipe network and the attenuation storage volumes should, therefore, be checked for such storms to ensure that no site flooding occurs.

No flooding of internal areas should occur during the 100-year event. The pipe network can therefore surcharge and cause site flooding during this event but the top water level due to any such flooding must be at least 500mm below any internal floor levels and the flood waters should be contained within the site. In addition, the top water level in the attenuation tank during the 100-year storm must be at least 500mm below any internal floor levels. Consideration should also be given to flooding of the receiving public system or watercourse outside the site during the 100-year event and all internal floor levels should be at least 500mm above the recorded levels for the receiving system for the 100-year event.

The lowest habitable FFLs on site are at 22.200m and are situated to the northwest area of the site, located away from the potential flooding locations. Refer to drawing WHH-BMCE-ZZ-ZZ-DR-C-11310 to see that all potential flooding will be directed to the northern area of the site, which has an FFL of 24.400m. This FFL is over 2m above the maximum water level reached in both the attenuation tank and the permeable paving of 21.806m. The main building in the centre of the site includes a basement/lower-ground floor comprising non-habitable car parking and plant rooms. Based on the guidance provided in Dublin City Council's SFRA, it is deemed acceptable for non-habitable basement areas to be located below the maximum water level of attenuation features.

3.3.5.2 Assessment of Possible Overland Flow Routes

If a storm greater than the 1 in 100-year (+20% climate change) rainfall event were to occur, the proposed site drainage could reach its capacity and flooding could occur. Similarly, this could also occur in the event of a blockage in the receiving sewer system. In either such event, the excess surface water flows would be contained within the site and would gradually enter into the underground drainage network. Refer to drawing WHH-BMCE-ZZ-ZZ-DR-C-11310.

3.3.6 Criterion 4 GDSDS – River Flood Protection– Long Term Storage or Extended Attenuation

3.3.6.1 Calculation of Long -Term Storage Volume

Criterion 4 is intended to prevent flooding of the receiving system/watercourse by either limiting the volume of run-off to the pre-development greenfield volume using “long term storage” (Option 1) or by limiting the rate of run-off for the 100-year storm to QBar without applying growth factors using “extended attenuation storage” (Option 2).

The proposed scheme satisfies Criterion 4 using Option 2 (provision of extended attenuation storage). As can be seen in the Causeway Flow modelling results given in Appendix 4 the rate of outflow from the attenuation tank does not exceed the specified discharge rate of 2.1 l/s during the 100-year storm event.

4. FOUL DRAINAGE SYSTEM

4.1 EXISTING FOUL DRAINAGE SYSTEM

There is an existing 940x620mm diameter brick culvert (combined sewer) running along South Circular Road along the northern boundary of the proposed site. Refer to drawing 25142-BMCE-ZZ-ZZ-DR-C-11210 for details.

4.2 CONSULTATIONS WITH IRISH WATER

A Pre-Connection Enquiry (PCE) was submitted to Uisce Éireann (UÉ) to confirm the feasibility of a new connection to the existing network and a confirmation of feasibility was received on the 22nd of September 2025. The Pre-connection reference number is **CDS25003323.**

The confirmation of feasibility was received with the following conditions given:

- *Feasible without infrastructure upgrade by Uisce Éireann.*
- *The Development has to incorporate Sustainable Drainage Systems/Attenuation measures for stormwater management, in order to reduce the surface water inflow into the receiving combined sewer, ensuring that it does not exceed 2l/s/ha. Full details of these have to be agreed with the LA Drainage Division.*

A Statement of Design Conformity was submitted to Uisce Éireann (UÉ) on the 6th of October. A Statement of Design Acceptance (SODA) was received on the 25th of November from Uisce Éireann (UÉ).

The SODA was received with the following condition:

- *All wastewater from basements shall be pumped to ground level to discharge by gravity to the Uisce Éireann network. The pumped wastewater shall discharge initially to a standoff (rising main discharge) manhole before discharging by gravity to the sewer network. Direct pumping to the gravity network shall not be permitted.*

4.3 PROPOSED FOUL DRAINAGE SYSTEM

4.3.1 Description

New foul drainage will be provided to collect and convey the foul flows from the new buildings. The proposed foul drainage layout and connections to the existing public sewer is designed in accordance with the Irish Water Standard Codes of Practice

A minimum pipe diameter of 225mm will be used at gradients no flatter than 1 in 200.

It is proposed foul flows will combine with the collected surface water flows, prior to connection to the existing combined sewer in the South Circular Road.

4.3.2 Relevant Standards

The foul drainage network for the proposed development has been designed in accordance with the following guidelines:

- Irish Water Code of Practice for Wastewater Infrastructure

- Department of the Environment's Recommendations for Site Development Works for Housing Areas
- Department of the Environment's Building Regulations "Technical Guidance Document Part H- Drainage and Waste -Water Disposal"
- BS EN 752: 2008 Drain and Sewer Systems Outside Buildings
- IS EN 12056: Part 2 (2000) Gravity Drainage Systems Inside Buildings

4.3.3 Design Criteria & Network design

The estimated peak foul flow from the proposed 250 residential units is **7.734 l/s** whilst the estimated peak flow for the creche is **0.229 l/s**– refer to the foul flow calculations in Appendix 5 for details.

Table 4.1 Foul Water Flow Figures.

	Input
Unit type	Residential
Occupancy per unit	2.7
Demand per occupant	150 l/ day
No of Units	250
Total Daily Flow	114,675 l/day
Average Flow	1.327 l/second
Peak Flow	7.963 l/second

4.4 Basement car park Drainage

The proposed for the central block include a basement/lower ground floor housing car parking and plant rooms. A drainage system will be provided at this lower level to collect flows from internal floor gulleys. These flows will pass through a petrol interceptor before being pumped to ground floor level to connect to the main site drainage.

5. WATER SUPPLY

5.1 EXISTING PUBLIC WATERMAINS

Irish Water Record Drawings given in Appendix 1 indicate that there is a selection of water supply pipe in close proximity. It is intended to connect the new drainage from the proposed site via the existing 225mm diameter line along the northern boundary of the site. This is subject to agreement with Uisce Éireann.

5.2 CONSULTATION WITH IRISH WATER

A Pre-Connection Enquiry (PCE) was submitted to Uisce Éireann (UÉ) to confirm the feasibility of a new connection to the existing network and a confirmation of feasibility was received on the 22nd of September 2025. The Pre-connection reference number is **CDS25003323.**

The confirmation of feasibility was received with the following conditions given:

- *Feasible without infrastructure upgrade by Uisce Éireann.*
- *Connection main – Approx. 15m of new 150mm ID pipe to be laid to connect the site development to the existing 100mm CI main (as shown below). Meter to be installed on the connection main.*
- *If connection is required from the same point of connection proposed by developer, connection shall be taken from DMA main, which will require an upgrade of approx. 200m watermain.*
- *The proposed Development indicates that Uisce Éireann assets are present on the site. The developer has to demonstrate that proposed structures and works will not inhibit access for maintenance or endanger structural or functional integrity of the assets during and after the works. Drawings (showing clearance distances, changing to ground levels) and Method Statements should be included in the Detailed Design of the Development. A wayleave in favour of Uisce Éireann will be required over the assets that are not located within the Public Space. For design submissions and queries related to diversion/build near or over, please contact IW Diversion Team via email diversions@water.ie.*

A Statement of Design Conformity was submitted to Uisce Éireann on the 6th of October. A Statement of Design Acceptance was received on the 25th of November, this document did not contain any conditions relating to the watermain network.

5.3 PROPOSED WATERMAIN SYSTEM

5.3.1 Description

The proposed water main layout and connections to existing public water mains have been designed in accordance with Irish Water Standard Codes of Practice. All internal proposed water mains will be HDPE SDR17 in accordance with Irish Water Standards. The proposed watermain connection pipe will be a 200mm OD diameter HDPE SDR19 until the first waterman junction.

Individual houses will have their own connections (25mm O.D. PE pipe MDPE 80 SDR11) to distribution water mains via service connections and meter / boundary boxes.

A 160mm OD diameter watermain will be required to serve the water supply and fire-fighting demand for the proposed development. UÉ code of practice suggests 225mm pipe for 300 – 700 houses (Apartment use noted possibly less as hydrant and road configuration etc. different)

Refer to drawing WHH-BMCE-ZZ-ZZ-DR-C-11220 for details of the proposed watermain layout.

5.3.2 Design Criteria & Network design

The Pre – connection enquiry estimate for Water Demand is set out in Table 5.1 below.

Table 5.1 Water Demand Figures.

	Input
Unit types	Residential & Creche
Occupancy per unit	2.7
Demand per occupant	150 l/ day
No of Units	250
Total Daily Demand	103,950 l/day
Average Demand @ peak factor = 1.25	1.504 l/second
Peak Demand @ peak factor = 6	7.519 l/second

Number of units have been reduced since application was made and calculations have been updated to match proposal as per Appendix 5.

5.3.3 Hydrants

The proposed water main layout is arranged such that all buildings are a maximum of 46.0m from a hydrant in accordance with the Department of the Environment's Building Regulations "Technical Guidance Document Part B Fire Safety". Hydrants shall comply with the requirements of BS 750:2012 and shall be installed in accordance with Irish Water's Code of Practice and Standard Details.

APPENDIX 1

TOPO SURVEY AND SITE UTILITIES

NOTES

1) ALL DIMENSIONS TO BE CHECKED ON SITE AND NOT SCALED FROM THIS DRAWING.
2) HOLLIS SHALL BE INFORMED IN WRITING OF ANY DISCREPANCIES.
3) ALL DIMENSIONS ARE IN METRES ONLY.
4) THE ORIGIN AND ORIENTATION OF THE SURVEY GRID RELATE TO A GPS TIE TO IRISH TRANSVERSE MERCATOR GRID.
5) ALL LEVELS ARE BASED ON A GPS TIE TO THE OSGM15(ROI) GEOID MODEL.

KEY

General		Street Furniture	
A	Alarm	A/C	Air Conditioner
AC	Asphalt Concrete	B	Bollard
Bk	Brick	BB	Bebbo Beacon
Brk	Brick Setts	BS	Bus Stop
BRW	Brick Retaining Wall	CCTV	Closed Circuit Television
BW	Brick Wall	EJB	Electrical Junction Box
Chy	Chimney	EM	Electricity Meter
Conc	Concrete	EP	Electricity Pole
CoW	Cable on Wall	FL	Floodlight
CPS	Concrete Paving Slabs	GM	Gas Meter
FC	Flood Catchlight	GV	Gas Valve
FH	Fire Hydrant	HR	Handrail
FB	Flower Bed	IB	Illuminated Bollard
Mis	Mudbanks	IBS	Illuminated Road Sign
OHI	Overhead	JB	Junction Box
PGM	Permanent Ground Marker	L	Light
PLI	Pavement Light	LB	Litter Bin
PS	Paving Stones	LP	Lamp Post
RSD	Roller Shutter Door	Mkr	Marker
SLB	Shrub Bed	NB	Notice Board
SO	Smoke Outlet	NP	Name Plate
Tac	Tactile Paving	P	Post
Typ	Typical	PB	Pillar Box
V	Vent	PM	Parking Meter
W	Window	RS	Road Sign
		SB	Signal Box
Fence Types		SP	Sign Post
BWF	Barbed Wire Fence	TCB	Telephone Call Box
CBF	Close Boarded Fence	TCP	Traffic Control Post
CIF	Corrugated Iron Fence	TJB	Telephone Junction Box
CLF	Chain Link Fence	TL	Traffic Light
IRF	Iron Railing Fence	TLCB	Traffic Light Control Box
OBF	Open Boarded Fence	TP	Telephone Pole
PBF	Post and Rail Fence	VCP	Vehicle Charging Point
PWF	Post and Wire Fence		
SF	Security Fence	**Levels & Heights**	
		AL	Arch Level
Inspection Covers & Services		ABL	Arch Spring Level
BT	British Telecom IC	BL	Bottom (soffit) Level
BT	British Telecom IC	CL	Cover Level
CTV	Cable Television IC	Col	Column
IC	Dust Cover	d	Depth
DrC	Drainage Chamber	EL	Eave Level
ESB	Electrical Service Box	h	Height
ER	Earthing Rod	IL	Invert Level
FH	Flying Hydrant	Max	Maximum
G	Gully	Min	Minimum
GC	Gas Cock	OSBM	Ordnance Survey Bench Mark
GV	Gas Valve	RL	Ridge Level
IC	Inspection Cover	SBM	Site Bench Mark
ICTL	Traffic Light Inspection Cover	SL	Sump Level
KO	Kerb Outlet	TBM	Temporary Bench Mark
MH	Manhole	TeW	Top Of Wall
PH	Pedestrian Light	WCL	Window Cill Level
RG	Road Gully	WHL	Window Head Level
S	Steer		
SC	Stop Cock	**Pipes**	
SV	Stop Valve	DP	Down Pipe
TelTC	Telephone Inspection Cover	RWP	Rain Water Pipe
TLIC	Traffic Light Inspection Cover	VP	Vent Pipe
UTL	Unable To Lift		
V	Valve (unknown)		
WIC	Water Inspection Cover		
WM	Water Meter		
WV	Water Valve		

SURVEY CONTROL

TOPOGRAPHICAL SYMBOLS

25.50 Spot Level
Soffit Level
Stair/Ramp Arrow (points up)
Structural Overhead Slope (points up)
Roof Slope (points down)
Bank Slope
Gate
Survey Control Station
Tree Symbol
g = Trunk Girth
s = Spread Radius
h = Height

REVISIONS

REV.	DATE	AMENDMENTS	INITIAL

THIS DRAWING IS FOR THE FOLLOWING PURPOSE ONLY:
PRELIMINARY ☐ TENDER ☐ CONSTRUCTION ☐
SKETCH ☐ MEASURED SURVEY ☒ CONTRACT ☐

TITLE
TOPOGRAPHICAL SURVEY

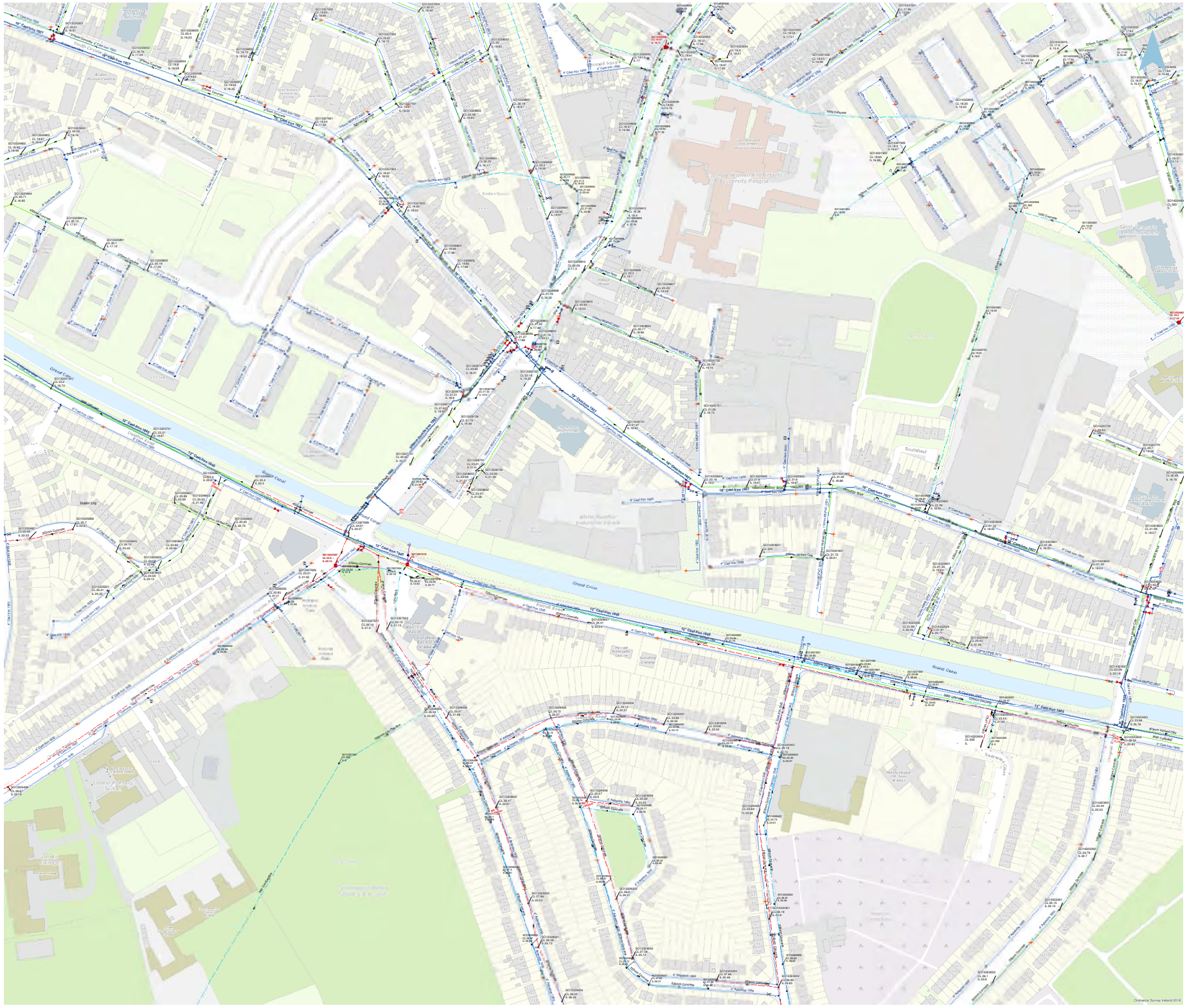
CLIENT
U and I Group
7A Howick Place
London
SW1P 1DZ

PROJECT NAME
White Heather Industrial Estate
South Circular Road
Dublin
D08 K5K0

HOLLIS
115 Lower Baggot Street
Dublin
D02 FN88
T +353 1 447 5130
W hollisglobal.com

DATE	DRAWN BY
13.10.2020	LS
SCALE 1:250 @A0	CHECKED PV

PROJECT	ORIGINATOR	VOLUME/ ZONE/BLOCK	LEVEL	FILE TYPE
91459	HLS	00	ZZ	M2
DISCIPLINE/ ROLE	NUMBER		STATUS	REVISION
G	10100		A7	---



UISCE ÉIREANN : IRISH WATER

Legend

- Boundary Meter
- Unknown Meter ; Other Meter
- Non-Return
- Sluice Valve Open
- Sluice Valve Closed
- Sluice Valve Open
- Sluice Valve Closed

Water Hydrants

Hydrant Function

- Fire Hydrant
- Water Pump Stations
- Water Kiosk
- Cap
- Other Fittings
- Tap

Water Distribution Mains

Owned By

- Irish Water
- Irish Water
- Irish Water

Sewer Manholes

Manhole Type

- Standard
- Other; Unknown
- Sewer Chambers
- Gravity - Combined
- Gravity - Foul
- Gravity - Overflow

Storm Manholes

Manhole Type

- Standard
- Other; Unknown

Storm Discharge Points

Discharge Type

- Outfall
- Surface Gravity Mains

1:1,000 at A0

Last edited: 28/09/2020

Metres

0 25 50 100

APPENDIX 2

DUBLIN CITY COUNCIL LRD OPINION AND RESPONSE

Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council

Planning and Development Act 2000, as amended

Planning and development (Large Scale Residential Developments) Act 2021

Notice of LRD Opinion

Planning Authority Reference No: LRD6086/25-S2

Location; 307/307a, White Heather Industrial Estate SCR, South Circular Road and, 12a St James Terrace, Dublin 8.

Description: Proposed Large Scale Residential Development (LRD) at White Heather Industrial Estate, South Circular Road & 307/307a South Circular Road and 12a St James's Terrace, Dublin 8. The development consists of 250 no. units within. apartment Blocks 01, 02 (A and B), 03 (A and B), 04(A and B), and 05 (a terrace of duplex apartments). These comprise; 12 no. studios; 112 no. 1-beds; 124 no. 2-bed and 2 no. 3-bed units. Included in the proposed development is a creche c.165sqm; communal open space c. 2337.3sqm; public open space c.2441.3sqm; car parking c.82 spaces & cycle parking c.442 no. spaces.

Applicant: Green Urban Logistics 3 White Heather Propco Limited

The Planning Authority refers to your request pursuant to section 32 of the Planning and development (Large Scale Residential Developments) Act 2021. Section 32D of the Act provides that the planning authority shall provide an opinion as to whether or not the documents submitted for the purposes of the meeting constitute a reasonable basis on which to make an application for permission for the proposed LRD.

Following consideration of the issues raised during the LRD meeting the Planning Authority is of the opinion that the documentation submitted constitutes a reasonable basis for an application for permission for the proposed LRD.

Furthermore pursuant to article 16A of the Planning and Development (Large-scale Residential Development) Regulations 2021 the applicant is hereby notified that, in addition to the requirements of section 32D, notify the prospective LRD applicant that specified

information in addition to the requirements of article 23, the following specific information should be submitted with any LRD application for permission for the proposed development:

1. Planning

The applicant is advised that the following points be addressed within the final LRD application documentation:

a) The applicant is required to explore a reduced overall height of the blocks (maximum 6 storey with lower height at edges of site) with regard to the Z1 zoning of the site and Appendix 3 of the City Development Plan 2022 -2028 given that the prevailing residential environment is quite low and given that this site is not within an SDRA. Serious concern with proposed 7 and 8 storey blocks remains – previous refusal reasons need to be overcome.
b) Distances from the proposed duplex units and apartment blocks to existing site boundaries and existing properties should all be clearly shown on the plans & the applicant is requested to explore increased setbacks from common boundaries to ensure protection of residential amenities
c) Trees identified as in good condition in the Tree Survey including 6141/B shall be retained & the proposed kiosk re located /reduced or omitted to ensure these trees at the entrance of the site can be retained and protected through construction phase.
d) The Housing Quality Assessment (HQA) should be split for each proposed Block for ease of assessment.
e) The HQA should include a column which shows which apartments are designed as UD units.
f) The applicant is requested to submit details of any proposed screening of balconies and clearly identify all units on plan which will require screening to unsure no undue overlooking.
g) The Applicant is requested to submit details of the boundary treatments proposed & ensure retention of all adjoining historic boundary walls to the Z1 and Z2 housing
h) It is understood that the An Post Depot site is under a long lease & the masterplan for potential future development could be an indicative layout - provide more in terms of block structure, heights - as opposed to the detailed proposed layout
i) Explore a greater set back of Block 4A & 4B from common boundary with An Post depot – no dimensions given – future potential development of this neighbouring site needs to be considered & siting of block for future residents of this scheme – safety issues – concerning. All dimensions should be clearly shown.
j) Appropriate Assessment pending - NIS may be required.
k) Ecological surveys (have been commissioned) and will need to be submitted for assessment at Stage 3 of the process.
l) Details on areas to be taken in charge (if any) should be considered, noting that the area outlined as public open space does not appear suitable to be taken in charge and therefore should be addressed in the overall management of the site.
m) The Applicant is requested to satisfy themselves that all documents are up to date and that all documents as set out in Section 15-1 Thresholds for Planning Applications are submitted at Stage 3.

The following additions and amendments should be submitted at Stage 3;

- Ensure that all revised drawings and documents correlate with each other
- Dimensions need to be clearly shown on all plans – e.g. distance from proposed blocks to common boundaries & heights proposed

- Ecological surveys

2. Traffic and Transportation Matters

The Transportation Planning Division recommends that the following items be addressed prior to the submission of a planning application:

Access

a) The applicant is required to prepare a response to SMT010 and the sustainable and efficient movement design criteria under Appendix D of the Sustainable and Compact Settlement Guidelines 2024.
b) The applicant should liaise with and seek agreement from the Transportation Planning Division prior to submission of the application to agree the layout of the site access junction layout and all works to the public road. The applicant shall provide further details regarding the safety and suitability of site access junction design, whereby stop line and road markings conflict with raised table crossings, with use of reference examples. A letter of consent to extend the red line boundary to facilitate the proposed works within the public road is required
c) A Stage 1 Road Safety Audit shall be submitted and the recommendations of the audit incorporated into site access junction design, where relevant.
d) The access junction within the site shall be revised to provide priority access to the retained warehousing units (An Post parcel delivery unit) to the east of the site, with a separate priority junction provided for site access at the beginning of the shared surface road.
e) Visibility splays should be provided for the revised site access junction arrangements.
f) The applicant should seek agreement with Dublin City Council Active Travel Division and Transportation Planning Division regarding the interface of the development with the planned Portobello to Blackhorse Active Travel route. Evidence of any such agreement shall be submitted.
g) A speed limit of 10-20 km/h with design elements to reduce vehicle speed should be provided throughout the internal road network, in accordance with the guidance of the Design Manual for Urban Roads and Streets (2019).
h) Swept path analysis for ESB substation servicing vehicle access should be provided.
i) Vehicle drop-off facilities for the childcare facility shall not be provided on South Circular Road and should instead be accommodated within the site in the vicinity of the childcare facility.

Cycle Parking

a) The applicant is required to prepare a Bicycle Design Statement (BDS). The BDS should set out details as to how all bicycles can safely and with ease access the proposed cycle parking from the public road. Detailed drawings of all cycle parking areas should be included. It should be demonstrated that adequate height clearance, separation distance between racks and within internal access corridors is provided for ease of accessibility and functionality of the long-term compounds, in accordance with the provisions of the Cycle Design Manual, 2023.
b) Having regard to the guidance of the NTA Cycle Design Manual, 2023 and to the relevant provision of Section 3 and Table 1 of Appendix 5 of the Dublin City

Development Plan, 2022-2028, the applicant is required to provide details of the following amendments to the scheme with regard to cycle parking:

i. A second means of cyclist access to the basement level cycle parking shall be provided in the form of an enlarged cycle lift with convenient external access.
ii. The large basement-level cycle store shall be sub-divided into 2 or more smaller stores as a means of improving security.
iii. A minimum of 5% of the total residential cycle parking provision shall be of a type capable of accommodating non-standard / larger cycle parking equipment (e.g. cargo bikes, adaptive bikes, e-bikes).
iv. The proportion of double-stack cycle parking shall be reduced in favour of an increased number of secure ground level (e.g. Sheffield) stands.
v. Separate, secure, sheltered, and well-lit staff cycle parking for the childcare facility shall be provided.
vi. E-charging facilities shall be included within the overall cycle parking provision

3. Drainage - Surface Water Management

Dublin City Council's Drainage Division note that at this stage, the proposed surface water (SW) management strategy is not satisfactory, and recommends the following items must be considered prior to any application:

a) The SW strategy does not seem to follow the guidance provided in the DCC SuDS design and evaluation guide and there is no reference to the Development Plan 2022-2028 and the relevant SW policies. There is a concern that the proposal does not comply with the relevant DCC requirements; the Civil Engineering Infrastructure Report does not explain how the design satisfies the Development Plan policies.

b) The applicant should note, in particular, the requirements under the following policies:
- **Managing Surface Water Flood Risk (SI21)**
- **Sustainable Drainage Systems (policy SI22)**
- **Green Blue Roof (policy SI23)**
- **Surface Water Management (policy SI25)**

c) The Civil Engineering Infrastructure Report references the GDSDS however the Report does not demonstrate how all the DCC SuDS requirements, Green-Blue Roof requirements nor the Surface Water Management requirements have been met.

d) It is not clear what volume of attenuation storage is required overall and best practice would break the site into sub-catchments and indicate how the storage is provided in each. The volumes provided by each SuDS element should be shown/stated. It is not clear if attenuation is being "doubled up" on by routing the podium storage to the underground tank. It is expected that attenuation is maximised at roof level, in line with the Green Blue Roof policy, however minimal attenuation seems to be proposed at roof level. Extensive green roofs are now proposed for the apartment blocks, in a change from the S247 meeting (when blue-green roofs were indicated). The provision of the deeper substrate intensive green roof would better support biodiversity goals. Source control should be the objective. DCC guidance also states that attenuation tanks are only considered in exceptional circumstances. Sufficient justification has not been given for the roof design or the proposed underground storage. Sites are required to store the 30 year event; the 100 year event is to be retained within the boundary. The SuDS strategy needs to be explained more clearly with areas, volumes and flow controls clearly defined at each level. Surface water management for the terraced housing, substation and creche should be clarified.

e) Confirmation of discharge rate is required. Proposed discharge rate is limited to 2.1l/s however Qbar is the limiting discharge quoted from the attenuation tank. Finished ground levels should be reviewed; there are some discrepancies between the Landscape drawings and all other drawings. Proposed phasing of the development should be indicated.

f) With respect to the level of service provided, flood risk should be reviewed. The Civil Engineering Infrastructure Report states that Finished Floor Levels (FFL) are 500mm minimum above the attenuation tank and permeable paving levels, however the FFLs in Block 4 are actually 1.2m approx. below the adjacent path/road levels. It is not clear why this block is being sited at a lower level than the rest of the development and if the resultant flood risk here has been assessed. Residential accommodation is proposed at these lowered ground levels. Minimum allowable and proposed FFLs should be stated in the Report. The drawings show the plant room is located in the basement and Engineering reports should address how this essential infrastructure is protected. Any risk of water inundation to basement levels via the access ramps should also be addressed. Overland flow route drawing should be provided. All these points should also be addressed in an updated Site Specific Flood Risk Assessment.

g) The Basement Impact Report has been sent to DPPDCs external consultants for review and comments will be provided to the applicant once received.

h) DPPDC have identified possible issues with both areas proposed for Taking in Charge (TIC). Any such proposals will require (consensus) agreement across various DCC departments. DPPDC note that private drainage is located within the area proposed for TIC along the southern/canal boundary and this is not permitted. Private infrastructure cannot be located within any area intended to be TIC. Proposed surface water management arrangements for the TIC area at the SCR entrance are also required.

i) The applicant is strongly advised that consultation with Drainage Planning is recommended prior to lodgement of any planning application.

4. Archaeology

The City Archaeologist recommends that the following items be addressed within the final application documentation:

i. The site has a net area of 1ha. It is the policy of the Dublin City Development Plan 2022-28 (Section 11.5.5; BHA26.4) that sites over 0.5 hectares size will be subject to consultation with the City Archaeologist and archaeological assessment prior to a planning application being lodged.
ii. The high potential for significant archaeological and industrial heritage features to exist is outlined in the submitted technical note.
The applicant is thus advised to submit an Archaeological Assessment of the new development. The assessment should include *inter alia* a site-specific baseline study of the site, a detailed Industrial Heritage Assessment by a recognised expert and a detailed impact assessment.
iv. Early pre-development testing would help to quantify the extent and location of the archaeological resource. It is noted that there are upstanding buildings across the site and that only limited pre-demolition testing may be possible.
v. Where significant features, such as the canal docks, are expected to survive below ground, these should be carefully evaluated by the design team for preservation in situ.
vi. A Heritage Interpretation Strategy in publicly accessible internal / external spaces would be welcomed (n.b. that this type of public facing interpretation is being created for the Grand Canal Harbour development).

5. Conservation

The applicant should address the following from the Conservation Officer within the final application documentation:

a) The applicant is required to explore a reduced height given the key built heritage concerns regarding the proposed height, scale and massing relating to the impacts of the proposed development on the setting of the Protected Structure, and the impact on the setting and character of the established two-storey residential terraces that adjoin the site on South Circular Road and adjoining streets. The elevations on the South Circular Road illustrate the difference in height between the proposed development and the Protected Structure Church of Our Lady of Dolours and its setting.

b) The applicant is required to explore a 4-storey base + 1 (recessed 'attic') up to 6 storeys as the maximum height considered. (This will still be significantly higher than the established 2-3 storey terraces and other buildings in the immediate receiving environment.

c) All adjoining historic boundary walls to the Z1 and Z2 housing around the subject site should be protected and retained, consolidated and repaired where required to best conservation practice.

d) With regard to the pedestrian and bicycle entrance, adjacent to No. 307 South Circular Road, the CO emphasises the importance of an appropriate buffer zone along the side of this house, in light of the removal of its garden. The proposed adaption and reuse of the house within the proposed development is welcomed in principle. The revision of the proposed development to ensure the retention of the beech tree is acknowledged and welcomed as it is important for the setting of the proposed development in the context of the established built heritage along the South Circular Road. All dimensions for the buffer zone shall be included on the final drawings.

e) The proximity of the proposed development to the 18th century Grand Canal is of concern. The applicant is requested to explore an augmented soft landscape strategy between the landscaping within the site boundary and the remaining canal banks that are within the ownership and control of Waterways Ireland, in order to protect the character of the Conservation Area.

f) The Archaeologist' concerns regarding industrial heritage and archaeology are noted regarding the remains of the former laundry and canal dock and should be addressed in the final submission.

g) Future proofing and masterplan for the adjacent An Post site needs to be considered & any schematic indicated for the adjacent An Post site should ensure that the scheme would not present a 'back-of-house' elevation / arrangement onto the existing streetscape and two-storey terraced houses of Priestfield. The 'back-of-house' should be located within the inner courtyard of the site.

h) Elevation drawings of the receiving environment shall include eaves / parapet / ridge heights in any contextual drawings for comparison with the proposed new development, as the eaves / parapet levels are the most important to reference in new proposals.

Other Documents required as outlined above

The relevant required documentation as set out in Table 15.1 of the Dublin City Development Plan 2022 – 2028 Planning Application Documentation - Planning Thresholds shall be

provided in addition to the specified reports requested above and as outlined in the applicant's Stage 2 Planning Letter.

Please Note:
Under section 32E of the Act of 2021 neither the taking place of an LRD meeting nor the provision of an LRD opinion shall prejudice the performance by the planning authority of its functions under this Act or any regulations under this Act or any other enactment and cannot be relied upon in the formal planning process or in legal proceedings.

Brian Keaney

Brian Keaney

Acting Deputy City Planner

BARRETT MAHONY
CONSULTING ENGINEERS
CIVIL & STRUCTURAL

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LRD Opinion Response

PROJECT NAME:	Large Scale Residential Development at White Heather Industrial Estate, South Circular Road, Dublin 8
BMCE PROJECT NO:	25142
PLANNING Reg Ref #	LRD6086/25-S2
SUBJECT:	LRD Opinion Response
Report Ref	Green Urban Logistics / Planning File
TO:	Dublin City Council
PREPARED BY:	Abigail Harris & Ciaran Kennedy Barrett Mahony Consulting Engineers
DATE / REVISION:	14th November 2025
Page	1 of 8

BARRETT MAHONY
CONSULTING ENGINEERS
CIVIL & STRUCTURAL

1. INTRODUCTION

Barrett Mahony Consulting Engineers (BMCE) has been requested to provide Civil and Structural Engineering input in response to an LRD opinion issued by the Local Authority regarding an application for planning permission for a new Large Scale Residential Housing Development at White Heather Industrial Estate, South Circular Road and 12a St James Terrace, Dublin 8.

2. LRD OPINION RESPONSES

BMCE input is in relation to part 3, concerning Drainage matters on the LRD opinion. This document should be read in conjunction with submissions by other members of the design team addressing other relevant elements.

3. LRD OPINION ITEM NO. 3

3.1. LRD ITEM. 3

Dublin City Council's Drainage Division note that at this stage, the proposed surface water (SW) management strategy is not satisfactory, and recommends the following items must be considered prior to any application:

3.1.1. LRD Item. 3 (a)

1. (a) The SW strategy does not seem to follow the guidance provided in the DCC SuDS design and evaluation guide and there is no reference to the Development Plan 2022-2028 and the relevant SW policies. There is a concern that the proposal does not comply with the relevant DCC requirements; the Civil Engineering Infrastructure Report does not explain how the design satisfies the Development Plan Policies.

Response:

Refer to updated Civil Infrastructure Report for clarification on the relevant documents and policies that were taken into consideration whilst the surface water drainage network was being designed.

BARRETT MAHONY
CONSULTING ENGINEERS
CIVIL & STRUCTURAL

3.1.2. LRD Item. 3 (b)

(b) The applicant should note, in particular, the requirements under the following policies:

- *Managing Surface Water Flood Risk (SI21)*
- *Sustainable Drainage Systems (Policy SI22)*
- *Green Blue Roof (Policy SI23)*
- *Surface Water Management (Policy SI25)*

Response:

Refer to the Civil Infrastructure Report for clarification on how the relevant requirements have been met.

Policies	Description	Response
SI21 – Managing Surface Water Flood Risk	*To minimise flood risk arising from pluvial (surface water) flooding in the City by promoting the use of natural or nature-based flood risk management measures as a priority, by requiring the use of sustainable drainage systems (SuDS) to minimise and limit the extent of hard surfacing and paving, and requiring the use of sustainable drainage techniques, where appropriate, for new development or for extensions to existing developments, in order to reduce the potential impact of existing and predicted flooding risk and to deliver wider environmental and biodiversity benefits, and climate adaption.*	All apartment block roof areas will be covered by either intensive green roofs or intensive blue green roofs to retain and treat surface water at roof level, slowly discharging into the main network. Impermeable hardstanding at ground level will either be permeable paving or impermeable hardstanding positioned above modular storage underneath.
SI22 – Sustainable Drainage Systems	*To require the use of Sustainable Drainage Systems (SuDS) in all new developments, where appropriate, as set out in the Greater Dublin Strategic Drainage Study (Vol 2: New Development) / Greater Dublin*	The surface water network has been designed with the aim of treating and retaining surface runoff at source points within the development. Green roofs

	Regional Code of Practice for Drainage Works and having regard to the guidance set out in Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas, Water Sensitive Urban Design Best Practice Interim Guidance Document (DHLGH, 2021). Sustainable Drainage Systems (SuDS) should incorporate nature-based solutions and be designed in accordance with the Dublin City Council Sustainable Drainage Design & Evaluation Guide (2021) which is summarised in Appendix 12. SuDS should protect and enhance water quality through treatment at source while enhancing biodiversity and amenity.	will cover 55% of all roof areas within the site thus aiding in enhancing biodiversity and amenity. Refer to infrastructure report for explanations on meeting all requirements of Appendix 12.
SI23 – Green Blue Roofs	*To require all new developments with roof areas in excess of 100sq. metres to provide for a green blue roof designed in accordance with the requirements of Dublin City Council's Green & Blue Roof Guide (2021) which is summarised in Appendix 11.*	All apartment block roof areas will be designed with intensive green roofs with a substrate depth of 200mm. Roofs will be designed with intensive green roofs or intensive blue green roofs. This will lead to a reduction in underground attenuation measures.
SI25 – Surface Water Management	*To require the preparation of a Surface Water Management Plan as part of all new developments in accordance with the requirements of Appendix 13 – the Council's Surface Water Management Guidance.*	Refer to the infrastructure report for information on how the requirements within Appendix 13 have been met.

3.1.3. LRD Item. 3 (c)

(c). The Civil Engineering Infrastructure Report references the GDSDS however the Report does not demonstrate how all the DCC SuDS requirements, Green-Blue Roof requirements nor the Surface Water requirements have been met:

Response:

Refer to the updated Civil Infrastructure Report section 3.3.1 for clarification on how compliance with Dublin City Development Plan has been achieved.

3.1.4. LRD Item. 3 (d)

(d). It is not clear what volume of attenuations storage is required overall and best practice would break the site into sub-catchments and indicate how the storage is provided in each. The volumes provided by each SuDS element should be shown/stated. It is not clear if attenuation is being "doubled up" on by routing the podium storage to the underground tank. It is expected that attenuation is maximised at roof level, in line with the Green Blue Roof policy, however minimal attenuation it seems to be proposed at roof level. Extensive green roofs are now proposed for the apartment blocks, in a change from the S247 meeting (where blue-green roofs were indicated). The provision of the deeper substrate intensive green roof would be better to support biodiversity goals. Source control should be the objective. DCC guidance also states that attenuation tanks are only considered in exceptional circumstances. Sufficient justification has not been given for the roof design or the proposed underground storage. Sites are required to store the 30-year event' the 100-year event is to be retained within the boundary. The SuDS strategy needs to be explained more clearly with areas, volumes and flow controls clearly defined at each level. Surface water management for the terraced housing, substation and creche should be clarified.

Response:

Refer to BMCE drainage drawing 11200, SuDS drawing 11300, and Civil Infrastructure Report for clarifications. Green roofs have been updated to intensive roofs with blue roof attenuation storage situated in specified locations. All roof storages have been designed to retain and reduce the flow of water entering the underground surface water network through a series of cascading blue-green storage tanks with a reduced outflow into the nearby surface water network or permeable paving. The buried attenuation tank has been designed to attenuate for storms up to the 1 in 30-year event, storm events up until the 1 in 100-year storm duration will be held within the permeable

paving and buried attenuation tank. The discharge from the buried attenuation tank will remain at 2.1l/s in all storm event durations.

3.1.5. LRD Item. 3 (e)

(e) Confirmation of discharge rate is required. Proposed discharge rate is limited to 2.1l/s however Qbar is the limiting discharge quoted from the attenuation tank. Finished ground levels should be reviewed; there are some discrepancies between the Landscape drawings and all other drawings. Proposed phasing of the development should be indicated.

Response:

Refer to drainage drawing 11200 that has been amended to clearly show the discharge rate from the attenuation tank towards the public drainage network as 2.1l/s. Refer to BMCE Civil Infrastructure Report section 2.3.3.1 for explanation on the usage of a discharge rate of 2.1l/s instead of Qbar. The drainage drawing has been reviewed and updated with correct finished ground levels.

3.1.6. LRD Item. 3 (f)

(f). With respect to the level of service provided, flood risk should be reviewed. The Civil Engineering Infrastructure Report states that Finished Floor Levels (FFL) are 500mm minimum above the attenuation tank and permeable paving levels, however the FFLs in Block 4 are actually 1.2m approx. below the adjacent path/road levels/ It is not clear why this block is being sited at a lower level than the rest of the development and if the resultant flood risk here has been assessed. Residential accommodation is proposed at these lowered ground levels. Minimum allowable and proposed FFLs should be stated in the Report. The drawings show the plant room is located in the basement and Engineering reports should address how this essential infrastructure is protected. Any risk of water inundation to the basement levels via the access ramps should also be addressed. Overland flow route drawing should be provided. All these points should also be addressed in an updated Site Specific Flood Risk Assessment.

Response:

Refer to updated architect drawings showing that the lower basement levels within Block 4 have been removed. An overland flood drawing was created, drawing 11310, to portray the directional flow of water if blockages occur. All water entering the basement

will be collected within the lower ground floor drainage network, refer to drawing 11230.

3.1.7. LRD Item. 3 (g)

(g). The Basement Impact Report has been sent to DPPDCs external consultants for review and comments will be provided to the applicant once received.

Response:

The Cundall Auditor's Report was received September 2025, additional drawings related to the basement design were created to allow for clarification on all queries mentioned, refer to BMC drawing 12030 for site sections.

3.1.8. LRD Item. 3 (h)

(h) DPPDC have identified possible issues with both areas for Taking In Charge (TIC). Any such proposals will require (consensus) agreement across various DCC departments. DPPDC note that private drainage is located within the area proposed for TIC along the southern/canal boundary and this is not permitted. Private infrastructure cannot be located within any area intended to be TIC. Proposed surface water management arrangements for the TIC area at the SCR entrance are also required.

Response:

Refer to BMCE drainage drawing 11200. All private drainage has been adjusted to remain within the private site boundary. After discussions, the taking in charge areas of the site have been adjusted and this is conveyed on the architects Taking In Charge Drawing.

3.1.9. LRD Item. 3 (i)

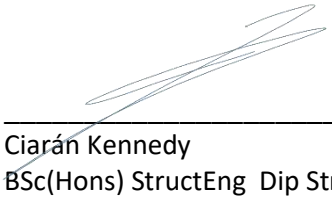
(i) The applicant is strongly advised that consultation with Drainage Planning is recommended prior to lodgement of any planning application.

Response:

A meeting with the Drainage Planning department was requested and took place Monday 3rd November 2025 to ensure that the drainage design would meet all requirements specified for the site.

BARRETT MAHONY
CONSULTING ENGINEERS
CIVIL & STRUCTURAL

We trust that this adequately addresses the Further Information request and can allow the application to be progressed.



Ciarán Kennedy
BSc(Hons) StructEng Dip Struct Eng MIStructE MIEI CEng FConsEI
Chartered Engineer
Managing Director
for Barrett Mahony Consulting Engineers

APPENDIX 3

HR WALLINGFORD GREENFIELD RUNOFF RATE ESTIMATION

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

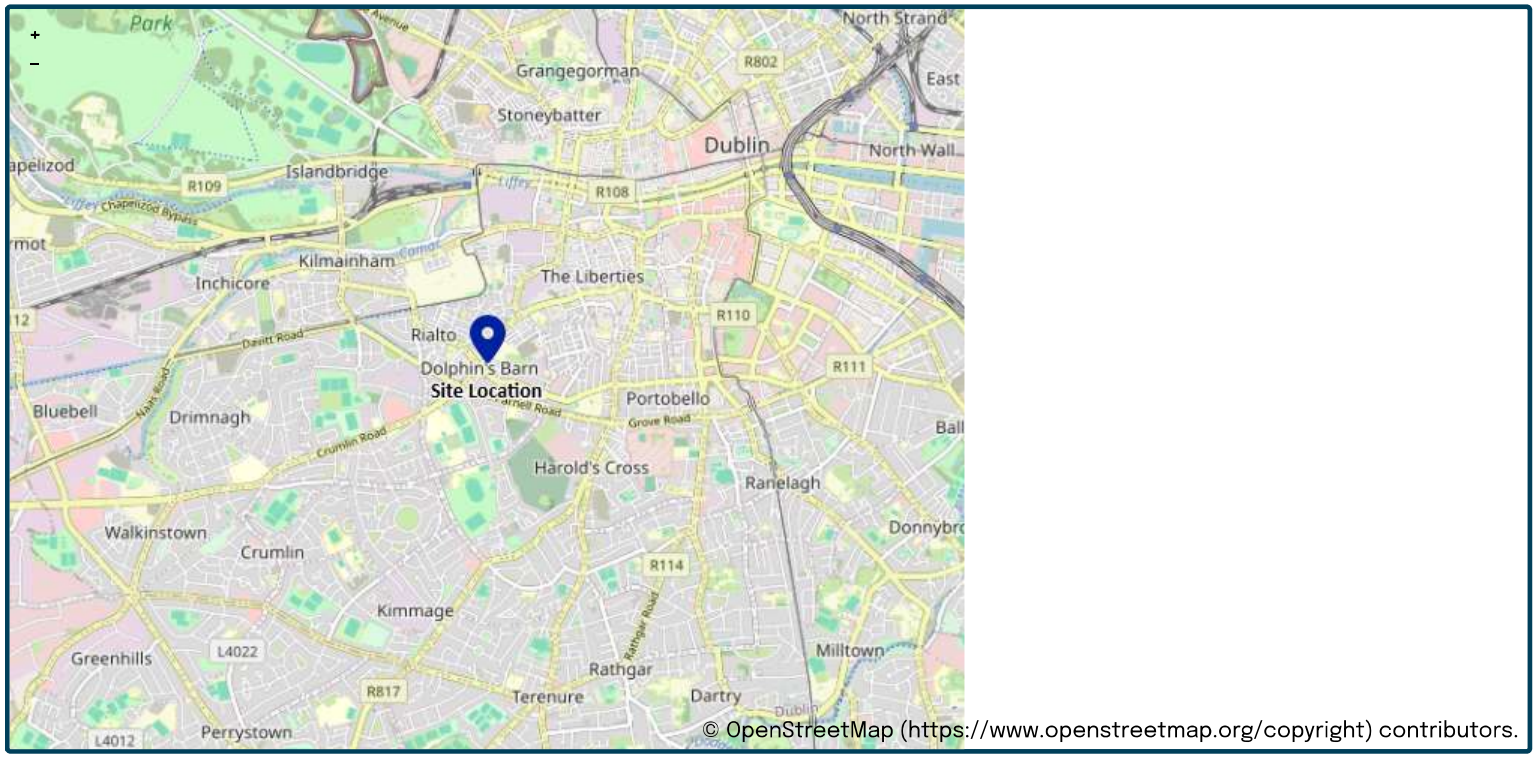
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	02/07/2025
Calculated by	SH
Reference	
Model version	2.0.1

Location

Site name	White Heather
Site location	



Site easting	114441
Site northing	390288

Site details

Total site area (ha)	1.084 ha

Greenfield runoff

Method

Method	IH124

IH124

	My value		Map value
SAAR (mm)	754.7 mm		942
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
QBar (IH124) (l/s)	5.7 l/s		

Growth curve factors

	My value		Map value
Hydrological region	12		12
1 year growth factor	0.85		
2 year growth factor	0.95		
10 year growth factor	1.72		
30 year growth factor	2.13		
100 year growth factor	2.61		
200 year growth factor	2.86		

Results

Method	IH124
Flow rate 1 year (l/s)	4.9 l/s
Flow rate 2 year (l/s)	5.4 l/s
Flow rate 10 years (l/s)	9.8 l/s
Flow rate 30 years (l/s)	12.2 l/s
Flow rate 100 years (l/s)	14.9 l/s
Flow rate 200 years (l/s)	16.3 l/s

Disclaimer

APPENDIX 4

CAUSEWAY FLOW SURFACE WATER DESIGN CALCULATIONS

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)	17.250	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	0.530
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
Roof 1	0.021	10.00	40.000	1200	-5.669	28.887	0.150	39.850
S1.0	0.000	10.00	22.500	450	17.059	24.273	1.575	20.925
S1.1	0.024	5.00	22.250	600	17.471	46.180	1.471	20.779
S1.2	0.046	10.00	22.300	450	17.210	54.450	1.565	20.735
S1.3	0.043	10.00	22.240	450	23.440	76.477	1.645	20.595
S3.2	0.031	10.00	22.200	1200	91.386	76.740	1.295	20.905
S1.4	0.025	10.00	22.200	1350	54.051	76.431	1.741	20.459
S4.0	0.056	5.00	22.400	1200	132.193	90.466	1.200	21.200
Roof 2	0.009	10.00	50.000	150	30.969	60.224	0.150	49.850
Roof 3	0.044	10.00	40.000	150	31.341	31.026	0.202	39.798
S3.0	0.000	10.00	22.200	1200	94.886	39.972	1.150	21.050
S2.0	0.039	10.00	22.750	450	-11.026	46.238	1.750	21.000
Blue roof	0.040	10.00	23.600	150	55.735	38.832	0.300	23.300
S5.0	0.031	10.00	22.200	450	29.928	87.321	1.125	21.075
Tank	0.000	5.00	22.200	1200	58.576	82.119	1.900	20.300
S1.6	0.000		22.200	1200	78.323	81.968	1.900	20.300
S4.1	0.036	5.00	22.200	1200	99.061	79.604	1.232	20.968
S3.1	0.024	10.00	22.200	1200	93.740	55.832	1.214	20.986
Outfall			22.200	1200	134.895	92.585	2.118	20.082
Downpipe			23.600	150	86.095	40.015	2.050	21.550
S1.7	0.000		22.400	1200	102.960	81.925	2.206	20.194
Roof 4	0.031	10.00	40.100	150	66.212	62.363	0.250	39.850
Roof 5	0.034	10.00	50.000	150	71.605	30.096	0.150	49.850
Roof 6	0.045	10.00	40.000	1200	108.320	47.929	0.150	39.850
Downpipe 1			40.000	150	-9.115	38.373	18.000	22.000
Downpipe Roof 2			50.000	150	31.014	51.271	10.000	40.000
Downpipe Roof 3			40.000	150	39.858	31.431	16.450	23.550
Downpipe Roof 5			50.000	150	71.662	51.724	9.900	40.100
Downpipe Roof 4			40.000	150	59.700	55.234	16.400	23.600
Downpipe Roof 6			40.000	150	95.228	51.724	18.300	21.700
1	0.000		22.200	1200	139.005	91.873	2.137	20.063
Dummy 4	0.024	5.00	22.200	1200	95.105	18.148	0.391	21.809
Dummy 3	0.024	5.00	22.200	1200	78.835	17.609	0.300	21.900
Dummy 5	0.024	5.00	22.200	1200	108.748	18.009	0.300	21.900
S1.5	0.017	5.00	22.200	1200	54.097	79.470	1.756	20.444
Dummy 1	0.031	5.00	22.500	1200	26.815	16.932	0.600	21.900
Dummy 2	0.031	5.00	22.500	1200	17.054	17.124	0.665	21.835

Dummy Chambers added to FLOW Model to indicate ACO channels within design

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
7.000	Roof 1	Downpipe 1	10.093	0.600	39.850	39.749	0.101	99.9	150	10.17	49.8
8.002	S1.0	S1.1	21.911	0.600	20.925	20.779	0.146	150.0	225	5.61	50.0
7.003	S1.1	S1.2	8.274	0.600	20.779	20.735	0.044	188.0	225	10.92	48.1
7.004	S1.2	S1.3	22.891	0.600	20.735	20.595	0.140	163.5	225	11.29	47.3
7.005	S1.3	S1.4	30.611	0.600	20.595	20.473	0.122	250.0	300	11.81	46.2
9.000	S5.0	Tank	29.116	0.600	21.075	20.881	0.194	150.0	225	10.46	49.1
1.008	S3.2	S1.4	37.336	0.600	20.905	20.698	0.207	180.0	300	13.02	44.0
7.001	Downpipe 1	S2.0	8.094	0.600	22.000	21.700	0.300	27.0	150	10.24	49.6
2.000	Roof 2	Downpipe Roof 2	8.953	0.600	49.850	49.761	0.089	100.6	150	10.15	49.8
1.006	S3.0	S3.1	15.901	0.600	21.050	20.986	0.064	250.0	300	12.12	45.6
7.002	S2.0	S1.1	28.497	0.600	21.000	20.867	0.133	215.0	225	10.77	48.4
1.004	Blue roof	Downpipe	30.383	0.600	23.400	23.197	0.203	150.0	150	11.60	46.6
1.009	S1.4	S1.5	3.039	0.600	20.459	20.444	0.015	200.0	300	13.06	43.9
1.011	Tank	S1.6	19.748	0.600	20.300	20.300	0.000	0.0	300	13.45	43.2
6.000	S4.0	S4.1	34.867	0.600	21.200	20.968	0.232	150.0	300	5.45	50.0
6.001	S4.1	S3.2	8.192	0.600	20.968	20.913	0.055	150.0	300	5.56	50.0
1.007	S3.1	S3.2	21.040	0.600	20.986	20.905	0.081	259.8	300	12.48	44.9
1.012	S1.6	S1.7	24.637	0.600	20.300	20.194	0.106	233.0	300	13.85	42.6
1.005	Downpipe	S3.0	8.791	0.600	21.550	21.520	0.030	293.0	150	11.85	46.1
1.013	S1.7	Outfall	33.667	0.600	20.194	20.082	0.112	300.0	300	14.47	41.6
2.001	Downpipe Roof 2	Roof 3	20.248	0.600	40.000	39.798	0.202	100.2	150	10.49	49.0
2.002	Roof 3	Downpipe Roof 3	8.527	0.600	39.850	39.765	0.085	100.3	150	10.63	48.7
2.003	Downpipe Roof 3	Blue roof	17.517	0.600	23.550	23.433	0.117	150.0	150	10.98	47.9
1.000	Roof 5	Downpipe Roof 5	21.628	0.600	49.850	49.706	0.144	150.0	150	10.44	49.1

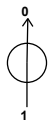
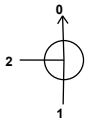
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
7.000	1.005	17.8	3.8	0.000	0.101	0.021	0.0	47	0.802
8.002	1.065	42.3	11.2	1.350	1.246	0.062	0.0	79	0.901
7.003	0.950	37.8	25.4	1.246	1.340	0.146	0.0	135	1.016
7.004	1.020	40.5	32.8	1.340	1.420	0.192	0.0	154	1.132
7.005	0.990	70.0	39.2	1.345	1.427	0.235	0.0	161	1.017
9.000	1.065	42.3	5.5	0.900	1.094	0.031	0.0	55	0.742
1.008	1.168	82.6	67.1	0.995	1.202	0.422	0.0	206	1.297
7.001	1.946	34.4	3.8	17.850	0.900	0.021	0.0	34	1.288
2.000	1.002	17.7	1.6	0.000	0.089	0.009	0.0	31	0.626
1.006	0.990	70.0	37.9	0.850	0.914	0.230	0.0	157	1.009
7.002	0.888	35.3	10.5	1.525	1.158	0.060	0.0	84	0.776
1.004	0.818	14.5	26.6	0.050	0.253	0.158	0.0	150	0.833
1.009	1.108	78.3	108.2	1.441	1.456	0.682	0.0	300	1.122
1.011	1.000	70.7	114.1	1.600	1.600	0.730	0.0	300	0.000
6.000	1.281	90.6	10.1	0.900	0.932	0.056	0.0	67	0.852
6.001	1.281	90.6	16.6	0.932	0.987	0.092	0.0	86	0.982
1.007	0.971	68.6	48.5	0.914	0.995	0.299	0.0	187	1.050
1.012	1.026	72.5	112.3	1.600	1.906	0.730	0.0	300	1.039
1.005	0.582	10.3	26.3	1.900	0.530	0.158	0.0	150	0.593
1.013	0.902	63.8	109.8	1.906	1.818	0.730	0.0	300	0.914
2.001	1.003	17.7	1.6	9.850	0.052	0.009	0.0	30	0.620
2.002	1.003	17.7	9.3	0.000	0.085	0.053	0.0	77	1.014
2.003	0.818	14.5	9.2	16.300	0.017	0.053	0.0	87	0.866
1.000	0.818	14.5	6.0	0.000	0.144	0.034	0.0	68	0.782

Links

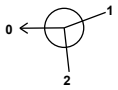
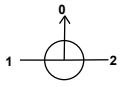
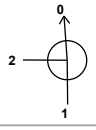
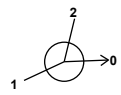
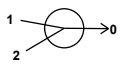
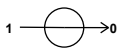
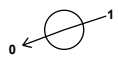
Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.001	Downpipe Roof 5	Roof 4	11.954	0.600	40.100	39.950	0.150	79.7	150	10.62	48.7
1.002	Roof 4	Downpipe Roof 4	9.656	0.600	39.850	39.700	0.150	64.4	150	10.75	48.4
1.003	Downpipe Roof 4	Blue roof	16.874	0.600	23.600	23.300	0.300	56.2	150	10.95	48.0
5.000	Roof 6	Downpipe Roof 6	13.631	0.600	39.850	39.757	0.093	146.6	150	10.27	49.5
5.001	Downpipe Roof 6	S3.1	4.369	0.600	21.700	21.671	0.029	150.0	150	10.36	49.3
1.014	Outfall	1	4.171	0.600	20.082	20.063	0.019	225.0	225	14.55	41.5
3.001	Dummy 4	S3.0	21.825	0.600	21.809	21.592	0.217	100.6	225	5.57	50.0
3.000	Dummy 3	Dummy 4	16.279	0.600	21.900	21.819	0.081	200.0	225	5.29	50.0
4.000	Dummy 5	Dummy 4	13.644	0.600	21.900	21.809	0.091	150.0	225	5.21	50.0
1.010	S1.5	Tank	5.204	0.600	20.444	20.392	0.052	100.0	300	13.12	43.8
8.000	Dummy 1	Dummy 2	9.763	0.600	21.900	21.835	0.065	150.0	225	5.15	50.0
8.001	Dummy 2	S1.0	7.149	0.600	21.835	21.787	0.048	150.0	225	5.26	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.001	1.127	19.9	6.0	9.750	0.000	0.034	0.0	57	0.989
1.002	1.255	22.2	11.4	0.100	0.150	0.065	0.0	76	1.261
1.003	1.344	23.7	11.3	16.250	0.150	0.065	0.0	73	1.328
5.000	0.828	14.6	8.0	0.000	0.093	0.045	0.0	79	0.847
5.001	0.818	14.5	8.0	18.150	0.379	0.045	0.0	80	0.840
1.014	0.867	34.5	109.5	1.893	1.912	0.730	0.0	225	0.883
3.001	1.303	51.8	13.0	0.166	0.383	0.072	0.0	77	1.091
3.000	0.921	36.6	4.3	0.075	0.156	0.024	0.0	52	0.623
4.000	1.065	42.3	4.3	0.075	0.166	0.024	0.0	49	0.693
1.010	1.572	111.1	110.6	1.456	1.508	0.699	0.0	246	1.781
8.000	1.065	42.3	5.6	0.375	0.440	0.031	0.0	55	0.742
8.001	1.065	42.3	11.2	0.440	0.488	0.062	0.0	79	0.901

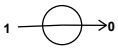
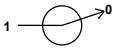
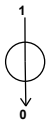
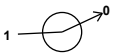
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Roof 1	-5.669	28.887	40.000	0.150	1200				
						0	7.000	39.850	150
S1.0	17.059	24.273	22.500	1.575	450		1	8.001	21.787	225
							0	8.002	20.925	225
S1.1	17.471	46.180	22.250	1.471	600		1	8.002	20.779	225
							2	7.002	20.867	225
							0	7.003	20.779	225
S1.2	17.210	54.450	22.300	1.565	450		1	7.003	20.735	225
							0	7.004	20.735	225
S1.3	23.440	76.477	22.240	1.645	450		1	7.004	20.595	225
							0	7.005	20.595	300

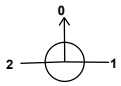
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S3.2	91.386	76.740	22.200	1.295	1200	1	6.001	20.913	300
						 2	1.007	20.905	300
						0	1.008	20.905	300
S1.4	54.051	76.431	22.200	1.741	1350	 1	7.005	20.473	300
						2	1.008	20.698	300
						0	1.009	20.459	300
S4.0	132.193	90.466	22.400	1.200	1200				
						0	6.000	21.200	300
Roof 2	30.969	60.224	50.000	0.150	150				
						0	2.000	49.850	150
Roof 3	31.341	31.026	40.000	0.202	150	 1	2.001	39.798	150
						0	2.002	39.850	150
S3.0	94.886	39.972	22.200	1.150	1200	 1	3.001	21.592	225
						2	1.005	21.520	150
						0	1.006	21.050	300
S2.0	-11.026	46.238	22.750	1.750	450	1	7.001	21.700	150
						 0	7.002	21.000	225
Blue roof	55.735	38.832	23.600	0.300	150	 1	2.003	23.433	150
						2	1.003	23.300	150
						0	1.004	23.400	150
S5.0	29.928	87.321	22.200	1.125	450				
						0	9.000	21.075	225
Tank	58.576	82.119	22.200	1.900	1200	1	9.000	20.881	225
						 2	1.010	20.392	300
						0	1.011	20.300	300
S1.6	78.323	81.968	22.200	1.900	1200	1	1.011	20.300	300
									
						0	1.012	20.300	300
S4.1	99.061	79.604	22.200	1.232	1200	1	6.000	20.968	300
									
						0	6.001	20.968	300
S3.1	93.740	55.832	22.200	1.214	1200	 1	5.001	21.671	150
						2	1.006	20.986	300
						0	1.007	20.986	300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Outfall	134.895	92.585	22.200	2.118	1200	1	1.013	20.082	300
									
						0	1.014	20.082	225
Downpipe	86.095	40.015	23.600	2.050	150	1	1.004	23.197	150
									
						0	1.005	21.550	150
S1.7	102.960	81.925	22.400	2.206	1200	1	1.012	20.194	300
									
						0	1.013	20.194	300
Roof 4	66.212	62.363	40.100	0.250	150	1	1.001	39.950	150
									
						0	1.002	39.850	150
Roof 5	71.605	30.096	50.000	0.150	150				
						0	1.000	49.850	150
Roof 6	108.320	47.929	40.000	0.150	1200				
						0	5.000	39.850	150
Downpipe 1	-9.115	38.373	40.000	18.000	150	1	7.000	39.749	150
									
						0	7.001	22.000	150
Downpipe Roof 2	31.014	51.271	50.000	10.000	150	1	2.000	49.761	150
									
						0	2.001	40.000	150
Downpipe Roof 3	39.858	31.431	40.000	16.450	150	1	2.002	39.765	150
									
						0	2.003	23.550	150
Downpipe Roof 5	71.662	51.724	50.000	9.900	150	1	1.000	49.706	150
									
						0	1.001	40.100	150
Downpipe Roof 4	59.700	55.234	40.000	16.400	150	1	1.002	39.700	150
									
						0	1.003	23.600	150
Downpipe Roof 6	95.228	51.724	40.000	18.300	150	1	5.000	39.757	150
									
						0	5.001	21.700	150
1	139.005	91.873	22.200	2.137	1200	1	1.014	20.063	225
									

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Dummy 4	95.105	18.148	22.200	0.391	1200		1	4.000	21.809	225
							2	3.000	21.819	225
							0	3.001	21.809	225
Dummy 3	78.835	17.609	22.200	0.300	1200		0	3.000	21.900	225
Dummy 5	108.748	18.009	22.200	0.300	1200		0	4.000	21.900	225
S1.5	54.097	79.470	22.200	1.756	1200		1	1.009	20.444	300
							0	1.010	20.444	300
Dummy 1	26.815	16.932	22.500	0.600	1200		0	8.000	21.900	225
Dummy 2	17.054	17.124	22.500	0.665	1200		1	8.000	21.835	225
							0	8.001	21.835	225

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	x
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	Scotland and Ireland	Additional Storage (m³/ha)	0.0
M5-60 (mm)	17.250	Starting Level (m)	
Ratio-R	0.300	Check Discharge Rate(s)	x
Summer CV	1.000	Check Discharge Volume	x
Analysis Speed	Normal		

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 %)
1	0	0	0
10	0	0	0
30	0	0	0
100	20	0	0

Node Blue roof Online Orifice Control

Flap Valve	x	Design Depth (m)	0.150	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	3.0		
Invert Level (m)	23.400	Diameter (m)	0.064		

Node Tank Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	20.300	Product Number	CTL-SHE-0060-2100-1750-2100
Design Depth (m)	1.750	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	2.1	Min Node Diameter (mm)	1200

Node Roof 1 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.100	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.5		
Invert Level (m)	39.850	Diameter (m)	0.028		

Node Roof 2 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.100	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.5		
Invert Level (m)	49.850	Diameter (m)	0.028		

Node Roof 3 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.100	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	2.0		
Invert Level (m)	39.850	Diameter (m)	0.060		

Node Roof 5 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.100	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.1		
Invert Level (m)	49.850	Diameter (m)	0.012		

Node Roof 4 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.150	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	3.0		
Invert Level (m)	39.850	Diameter (m)	0.064		

Node Roof 6 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.100	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.5		
Invert Level (m)	39.850	Diameter (m)	0.028		

Node Blue roof Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	23.450
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	505.4	0.0	0.150	505.4	0.0	0.151	0.0	0.0

Node Tank Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	20.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	205.0	0.0	1.200	205.0	0.0	1.201	0.0	0.0

Node Roof 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	39.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	359.4	0.0	0.150	359.4	0.0	0.151	0.0	0.0

Node S1.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	21.670
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	245.0	0.0	0.400	245.0	0.0	0.401	0.0	0.0

Node S2.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	21.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	260.0	0.0	0.400	260.0	0.0	0.401	0.0	0.0

Node S1.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	21.670
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	100.0	0.0	0.400	100.0	0.0	0.401	0.0	0.0

Node S1.2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	21.670
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	150.0	0.0	0.400	150.0	0.0	0.401	0.0	0.0

Node S1.3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	21.670
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	60

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	180.0	0.0	0.400	180.0	0.0	0.401	0.0	0.0

Node S1.4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	21.670
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	250.0	0.0	0.400	250.0	0.0	0.401	0.0	0.0

Node S5.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	21.670
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	240.0	0.0	0.400	240.0	0.0	0.401	0.0	0.0

Node Roof 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	49.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	132.0	0.0	0.150	132.0	0.0	0.151	0.0	0.0

Node Roof 3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	39.798
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	716.9	0.0	0.150	716.9	0.0	0.151	0.0	0.0

Node S3.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	21.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	230.0	0.0	0.510	230.0	0.0	0.511	0.0	0.0

Node S3.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	21.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	240.0	0.0	0.510	240.0	0.0	0.511	0.0	0.0

Node S3.2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	21.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	215.0	0.0	0.510	215.0	0.0	0.511	0.0	0.0

Node Roof 4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	40.024
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.13	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	620.0	0.0	0.075	620.0	0.0	0.076	0.0	0.0

Node Roof 5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	49.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	426.3	0.0	0.150	426.3	0.0	0.151	0.0	0.0

Node Roof 6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	39.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	562.3	0.0	0.150	562.3	0.0	0.151	0.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.94%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
8640 minute summer	Roof 1	5100	39.866	0.016	0.1	5.6167	0.0000	OK
15 minute summer	S1.0	11	20.997	0.072	9.4	0.0114	0.0000	OK
2160 minute summer	S1.1	1620	20.968	0.189	1.6	0.0535	0.0000	OK
2160 minute summer	S1.2	1620	20.967	0.232	2.1	0.0369	0.0000	SURCHARGED
2160 minute summer	S1.3	1680	20.966	0.371	2.6	0.0589	0.0000	SURCHARGED
15 minute summer	S3.2	12	21.035	0.130	31.2	0.1472	0.0000	OK
2160 minute summer	S1.4	1560	20.966	0.507	6.5	0.7254	0.0000	SURCHARGED
15 minute summer	S4.0	10	21.262	0.062	8.7	0.0698	0.0000	OK
2880 minute summer	Roof 2	1680	49.865	0.015	0.1	1.8629	0.0000	OK
10080 minute summer	Roof 3	6600	39.831	0.033	0.2	22.2951	0.0000	OK
15 minute summer	S3.0	11	21.138	0.088	12.0	0.0996	0.0000	OK
30 minute summer	S2.0	21	21.052	0.052	4.1	0.0083	0.0000	OK
120 minute summer	Blue roof	86	23.459	0.159	5.2	4.6401	0.0000	OK
30 minute summer	S5.0	20	21.118	0.043	3.3	0.0068	0.0000	OK
2160 minute summer	Tank	1620	20.967	0.667	6.9	130.6965	0.0000	SURCHARGED
60 minute summer	S1.6	63	20.330	0.030	1.5	0.0338	0.0000	OK
15 minute summer	S4.1	11	21.057	0.089	14.1	0.1003	0.0000	OK
15 minute summer	S3.1	11	21.078	0.092	14.4	0.1046	0.0000	OK
60 minute summer	Outfall	69	20.115	0.033	1.5	0.0378	0.0000	OK
120 minute summer	Downpipe	86	21.588	0.038	1.4	0.0007	0.0000	OK
60 minute summer	S1.7	66	20.226	0.032	1.5	0.0359	0.0000	OK
30 minute summer	Roof 4	22	40.023	0.173	3.3	0.0100	0.0000	FLOOD RISK
8640 minute summer	Roof 5	5520	49.880	0.030	0.2	12.0820	0.0000	OK
2880 minute summer	Roof 6	1860	39.874	0.024	0.4	12.9363	0.0000	OK
10080 minute summer	Downpipe 1	5820	22.005	0.005	0.1	0.0001	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
8640 minute summer	Roof 1	7.000	Downpipe 1	0.1	0.249	0.004	0.0031	
15 minute summer	S1.0	8.002	S1.1	9.4	0.596	0.222	0.3525	
2160 minute summer	S1.1	7.003	S1.2	1.6	0.440	0.043	0.3119	
2160 minute summer	S1.2	7.004	S1.3	2.1	0.497	0.053	0.9104	
2160 minute summer	S1.3	7.005	S1.4	2.6	0.380	0.037	2.1556	
15 minute summer	S3.2	1.008	S1.4	30.7	1.076	0.372	1.0670	
2160 minute summer	S1.4	1.009	S1.5	6.4	0.632	0.081	0.2140	
15 minute summer	S4.0	6.000	S4.1	8.5	0.623	0.094	0.4829	
2880 minute summer	Roof 2	2.000	Downpipe Roof 2	0.1	0.238	0.004	0.0024	
10080 minute summer	Roof 3	2.002	Downpipe Roof 3	0.0	0.000	0.000	0.0000	
15 minute summer	S3.0	1.006	S3.1	12.1	0.677	0.172	0.2834	
30 minute summer	S2.0	7.002	S1.1	4.1	0.595	0.116	0.1963	
120 minute summer	Blue roof	Orifice	Downpipe	1.4				
30 minute summer	S5.0	9.000	Tank	3.2	0.632	0.077	0.1496	
2160 minute summer	Tank	Hydro-Brake®	S1.6	1.5				
60 minute summer	S1.6	1.012	S1.7	1.5	0.401	0.021	0.0934	
15 minute summer	S4.1	6.001	S3.2	13.9	0.688	0.153	0.1810	
15 minute summer	S3.1	1.007	S3.2	14.3	0.602	0.208	0.5007	
60 minute summer	Outfall	1.014	1	1.5	0.437	0.044	0.0145	24.4
120 minute summer	Downpipe	1.005	S3.0	1.4	0.428	0.132	0.0280	
60 minute summer	S1.7	1.013	Outfall	1.5	0.370	0.024	0.1385	
30 minute summer	Roof 4	1.002	Downpipe Roof 4	3.1	0.869	0.141	0.0348	
8640 minute summer	Roof 5	1.000	Downpipe Roof 5	0.0	0.200	0.003	0.0050	
2880 minute summer	Roof 6	5.000	Downpipe Roof 6	0.1	0.268	0.009	0.0069	
10080 minute summer	Downpipe 1	7.001	S2.0	0.1	0.398	0.002	0.0015	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.94%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute summer	Downpipe Roof 2	1680	40.007	0.007	0.1	0.0001	0.0000	OK
15 minute summer	Downpipe Roof 3	1	23.550	0.000	0.0	0.0000	0.0000	OK
8640 minute summer	Downpipe Roof 5	5520	40.105	0.005	0.0	0.0001	0.0000	OK
30 minute summer	Downpipe Roof 4	22	23.637	0.037	3.1	0.0007	0.0000	OK
2880 minute summer	Downpipe Roof 6	1860	21.711	0.011	0.1	0.0002	0.0000	OK
60 minute summer	1	71	20.094	0.031	1.5	0.0000	0.0000	OK
15 minute summer	Dummy 4	11	21.881	0.072	11.0	0.0817	0.0000	OK
15 minute summer	Dummy 3	10	21.948	0.048	3.7	0.0540	0.0000	OK
15 minute summer	Dummy 5	10	21.945	0.045	3.7	0.0503	0.0000	OK
2160 minute summer	S1.5	1680	20.966	0.522	6.6	0.5907	0.0000	SURCHARGED
15 minute summer	Dummy 1	10	21.951	0.051	4.8	0.0573	0.0000	OK
15 minute summer	Dummy 2	10	21.913	0.078	9.6	0.0877	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute summer	Downpipe Roof 2	2.001	Roof 3	0.1	0.077	0.004	0.0284	
15 minute summer	Downpipe Roof 3	2.003	Blue roof	0.0	0.000	0.000	0.0154	
8640 minute summer	Downpipe Roof 5	1.001	Roof 4	0.0	0.235	0.002	0.0023	
30 minute summer	Downpipe Roof 4	1.003	Blue roof	3.1	0.264	0.132	0.1767	
2880 minute summer	Downpipe Roof 6	5.001	S3.1	0.1	0.266	0.009	0.0022	
15 minute summer	Dummy 4	3.001	S3.0	10.9	1.021	0.211	0.2340	
15 minute summer	Dummy 3	3.000	Dummy 4	3.7	0.504	0.100	0.1223	
15 minute summer	Dummy 5	4.000	Dummy 4	3.7	0.460	0.087	0.1124	
2160 minute summer	S1.5	1.010	Tank	6.5	0.609	0.059	0.3665	
15 minute summer	Dummy 1	8.000	Dummy 2	4.8	0.512	0.112	0.0917	
15 minute summer	Dummy 2	8.001	S1.0	9.4	0.824	0.223	0.0820	

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	Roof 1	960	39.874	0.024	0.5	8.1308	0.0000	OK
2880 minute summer	S1.0	2220	21.409	0.484	1.0	0.0770	0.0000	SURCHARGED
2880 minute summer	S1.1	2220	21.409	0.630	2.1	0.1782	0.0000	SURCHARGED
2880 minute summer	S1.2	2220	21.409	0.674	2.6	0.1071	0.0000	SURCHARGED
2880 minute summer	S1.3	2220	21.408	0.813	3.1	0.1293	0.0000	SURCHARGED
2880 minute summer	S3.2	2220	21.411	0.506	4.6	0.5727	0.0000	SURCHARGED
2880 minute summer	S1.4	2220	21.410	0.951	7.9	1.3605	0.0000	SURCHARGED
2880 minute summer	S4.0	2220	21.412	0.212	0.8	0.2399	0.0000	OK
600 minute summer	Roof 2	390	49.871	0.021	0.4	2.5905	0.0000	OK
4320 minute summer	Roof 3	3900	39.856	0.058	0.6	39.4309	0.0000	OK
2880 minute summer	S3.0	2220	21.412	0.362	2.3	0.4094	0.0000	SURCHARGED
2880 minute summer	S2.0	2220	21.409	0.409	0.7	0.0651	0.0000	SURCHARGED
120 minute summer	Blue roof	90	23.470	0.170	8.1	9.9468	0.0000	OK
2880 minute summer	S5.0	2220	21.409	0.334	0.5	0.0531	0.0000	SURCHARGED
2880 minute summer	Tank	2220	21.409	1.109	8.6	217.1998	0.0000	SURCHARGED
2880 minute summer	S1.6	2220	20.331	0.031	1.7	0.0355	0.0000	OK
2880 minute summer	S4.1	2220	21.411	0.443	1.3	0.5015	0.0000	SURCHARGED
2880 minute summer	S3.1	2220	21.412	0.426	2.8	0.4818	0.0000	SURCHARGED
2880 minute summer	Outfall	2220	20.117	0.035	1.7	0.0398	0.0000	OK
120 minute summer	Downpipe	90	21.592	0.042	1.7	0.0008	0.0000	OK
2880 minute summer	S1.7	2220	20.227	0.033	1.7	0.0378	0.0000	OK
30 minute summer	Roof 4	25	40.037	0.187	5.7	1.0686	0.0000	FLOOD RISK
2880 minute summer	Roof 5	2640	49.899	0.049	0.5	19.8608	0.0000	OK
2880 minute summer	Roof 6	1800	39.886	0.036	0.7	19.0294	0.0000	OK
1440 minute summer	Downpipe 1	960	22.007	0.007	0.1	0.0001	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	Roof 1	7.000	Downpipe 1	0.1	0.296	0.008	0.0046	
2880 minute summer	S1.0	8.002	S1.1	1.0	0.298	0.024	0.8714	
2880 minute summer	S1.1	7.003	S1.2	1.9	0.434	0.051	0.3291	
2880 minute summer	S1.2	7.004	S1.3	2.5	0.445	0.062	0.9104	
2880 minute summer	S1.3	7.005	S1.4	3.0	0.384	0.043	2.1556	
2880 minute summer	S3.2	1.008	S1.4	4.6	0.595	0.055	2.6292	
2880 minute summer	S1.4	1.009	S1.5	7.5	0.573	0.096	0.2140	
2880 minute summer	S4.0	6.000	S4.1	0.8	0.335	0.009	2.1562	
600 minute summer	Roof 2	2.000	Downpipe Roof 2	0.1	0.276	0.006	0.0035	
4320 minute summer	Roof 3	2.002	Downpipe Roof 3	0.0	0.218	0.001	0.0010	
2880 minute summer	S3.0	1.006	S3.1	2.3	0.424	0.032	1.1197	
2880 minute summer	S2.0	7.002	S1.1	0.7	0.356	0.019	1.1334	
120 minute summer	Blue roof	Orifice	Downpipe	1.7				
2880 minute summer	S5.0	9.000	Tank	0.5	0.361	0.012	1.1580	
2880 minute summer	Tank	Hydro-Brake®	S1.6	1.7				
2880 minute summer	S1.6	1.012	S1.7	1.7	0.414	0.023	0.1005	
2880 minute summer	S4.1	6.001	S3.2	1.3	0.332	0.014	0.5769	
2880 minute summer	S3.1	1.007	S3.2	2.8	0.432	0.041	1.4816	
2880 minute summer	Outfall	1.014	1	1.7	0.451	0.049	0.0156	235.0
120 minute summer	Downpipe	1.005	S3.0	1.7	0.454	0.163	0.0324	
2880 minute summer	S1.7	1.013	Outfall	1.7	0.380	0.026	0.1494	
30 minute summer	Roof 4	1.002	Downpipe Roof 4	3.3	0.879	0.147	0.0359	
2880 minute summer	Roof 5	1.000	Downpipe Roof 5	0.1	0.208	0.004	0.0064	
2880 minute summer	Roof 6	5.000	Downpipe Roof 6	0.2	0.310	0.016	0.0106	
1440 minute summer	Downpipe 1	7.001	S2.0	0.1	0.469	0.004	0.0023	

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute summer	Downpipe Roof 2	390	40.009	0.009	0.1	0.0002	0.0000	OK
4320 minute summer	Downpipe Roof 3	3900	23.555	0.005	0.0	0.0001	0.0000	OK
2880 minute summer	Downpipe Roof 5	2640	40.106	0.006	0.1	0.0001	0.0000	OK
30 minute summer	Downpipe Roof 4	26	23.638	0.038	3.3	0.0007	0.0000	OK
2880 minute summer	Downpipe Roof 6	1800	21.714	0.014	0.2	0.0002	0.0000	OK
2880 minute summer	1	2220	20.096	0.033	1.7	0.0000	0.0000	OK
15 minute summer	Dummy 4	11	21.907	0.098	19.4	0.1111	0.0000	OK
15 minute summer	Dummy 3	10	21.963	0.063	6.5	0.0717	0.0000	OK
15 minute summer	Dummy 5	10	21.959	0.059	6.5	0.0666	0.0000	OK
2880 minute summer	S1.5	2220	21.409	0.965	7.8	1.0914	0.0000	SURCHARGED
15 minute summer	Dummy 1	10	21.970	0.070	8.4	0.0787	0.0000	OK
15 minute summer	Dummy 2	10	21.942	0.107	16.7	0.1209	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute summer	Downpipe Roof 2	2.001	Roof 3	0.1	0.114	0.006	0.0290	
4320 minute summer	Downpipe Roof 3	2.003	Blue roof	0.0	0.197	0.002	0.0067	
2880 minute summer	Downpipe Roof 5	1.001	Roof 4	0.1	0.255	0.003	0.0029	
30 minute summer	Downpipe Roof 4	1.003	Blue roof	3.3	0.267	0.138	0.1776	
2880 minute summer	Downpipe Roof 6	5.001	S3.1	0.2	0.304	0.017	0.0035	
15 minute summer	Dummy 4	3.001	S3.0	19.1	1.181	0.368	0.3522	
15 minute summer	Dummy 3	3.000	Dummy 4	6.4	0.552	0.175	0.1917	
15 minute summer	Dummy 5	4.000	Dummy 4	6.4	0.525	0.152	0.1696	
2880 minute summer	S1.5	1.010	Tank	8.1	0.570	0.073	0.3665	
15 minute summer	Dummy 1	8.000	Dummy 2	8.3	0.578	0.197	0.1415	
15 minute summer	Dummy 2	8.001	S1.0	16.6	0.952	0.392	0.1247	

Results for 30 year Critical Storm Duration. Lowest mass balance: 95.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute summer	Roof 1	1320	39.879	0.029	0.5	9.9321	0.0000	OK
2880 minute summer	S1.0	2400	21.575	0.650	1.2	0.1034	0.0000	SURCHARGED
2880 minute summer	S1.1	2400	21.575	0.796	2.3	0.2252	0.0000	SURCHARGED
2880 minute summer	S1.2	2400	21.575	0.840	3.0	0.1335	0.0000	SURCHARGED
2880 minute summer	S1.3	2520	21.575	0.980	3.8	0.1559	0.0000	SURCHARGED
2880 minute summer	S3.2	2460	21.575	0.670	4.8	16.1168	0.0000	SURCHARGED
2880 minute summer	S1.4	2460	21.577	1.118	8.4	1.5994	0.0000	SURCHARGED
2880 minute summer	S4.0	2460	21.575	0.375	1.0	0.4237	0.0000	SURCHARGED
480 minute summer	Roof 2	320	49.875	0.025	0.6	3.1089	0.0000	OK
4320 minute summer	Roof 3	4320	39.862	0.064	0.7	43.8174	0.0000	OK
2880 minute summer	S3.0	2460	21.575	0.525	2.4	17.0300	0.0000	SURCHARGED
2880 minute summer	S2.0	2400	21.575	0.575	0.8	0.0914	0.0000	SURCHARGED
120 minute summer	Blue roof	94	23.478	0.178	9.4	13.6855	0.0000	OK
2880 minute summer	S5.0	2460	21.578	0.503	0.6	0.0800	0.0000	SURCHARGED
2880 minute summer	Tank	2460	21.577	1.277	8.8	235.2417	0.0000	SURCHARGED
2880 minute summer	S1.6	2460	20.332	0.032	1.8	0.0367	0.0000	OK
2880 minute summer	S4.1	2460	21.575	0.607	1.6	0.6862	0.0000	SURCHARGED
2880 minute summer	S3.1	2460	21.575	0.589	2.9	17.8165	0.0000	SURCHARGED
2880 minute summer	Outfall	2460	20.118	0.036	1.8	0.0412	0.0000	OK
120 minute summer	Downpipe	94	21.594	0.044	1.8	0.0008	0.0000	OK
2880 minute summer	S1.7	2460	20.228	0.034	1.8	0.0389	0.0000	OK
30 minute summer	Roof 4	26	40.048	0.198	7.3	1.9605	0.0000	FLOOD RISK
4320 minute summer	Roof 5	3660	49.909	0.059	0.5	24.0689	0.0000	OK
2880 minute summer	Roof 6	1800	39.892	0.042	0.8	22.4573	0.0000	OK
2160 minute summer	Downpipe 1	1320	22.008	0.008	0.2	0.0002	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2160 minute summer	Roof 1	7.000	Downpipe 1	0.2	0.333	0.011	0.0061	
2880 minute summer	S1.0	8.002	S1.1	1.2	0.297	0.027	0.8714	
2880 minute summer	S1.1	7.003	S1.2	2.2	0.434	0.058	0.3291	
2880 minute summer	S1.2	7.004	S1.3	3.0	0.445	0.073	0.9104	
2880 minute summer	S1.3	7.005	S1.4	3.7	0.362	0.053	2.1556	
2880 minute summer	S3.2	1.008	S1.4	4.6	0.565	0.055	2.6292	
2880 minute summer	S1.4	1.009	S1.5	8.9	0.536	0.114	0.2140	
2880 minute summer	S4.0	6.000	S4.1	1.0	0.335	0.011	2.4553	
480 minute summer	Roof 2	2.000	Downpipe Roof 2	0.1	0.301	0.008	0.0043	
4320 minute summer	Roof 3	2.002	Downpipe Roof 3	0.1	0.263	0.005	0.0030	
2880 minute summer	S3.0	1.006	S3.1	2.3	0.426	0.033	1.1197	
2880 minute summer	S2.0	7.002	S1.1	0.8	0.357	0.022	1.1334	
120 minute summer	Blue roof	Orifice	Downpipe	1.8				
2880 minute summer	S5.0	9.000	Tank	0.6	0.361	0.014	1.1580	
2880 minute summer	Tank	Hydro-Brake®	S1.6	1.8				
2880 minute summer	S1.6	1.012	S1.7	1.8	0.422	0.025	0.1051	
2880 minute summer	S4.1	6.001	S3.2	1.3	0.332	0.015	0.5769	
2880 minute summer	S3.1	1.007	S3.2	2.9	0.431	0.042	1.4816	
2880 minute summer	Outfall	1.014	1	1.8	0.459	0.052	0.0164	264.3
120 minute summer	Downpipe	1.005	S3.0	1.8	0.466	0.178	0.0347	
2880 minute summer	S1.7	1.013	Outfall	1.8	0.387	0.028	0.1566	
30 minute summer	Roof 4	1.002	Downpipe Roof 4	3.4	0.887	0.153	0.0368	
4320 minute summer	Roof 5	1.000	Downpipe Roof 5	0.1	0.216	0.005	0.0069	
2880 minute summer	Roof 6	5.000	Downpipe Roof 6	0.3	0.321	0.019	0.0115	
2160 minute summer	Downpipe 1	7.001	S2.0	0.2	0.525	0.006	0.0031	

Results for 30 year Critical Storm Duration. Lowest mass balance: 95.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute summer	Downpipe Roof 2	320	40.010	0.010	0.1	0.0002	0.0000	OK
4320 minute summer	Downpipe Roof 3	4320	23.559	0.009	0.1	0.0002	0.0000	OK
4320 minute summer	Downpipe Roof 5	3660	40.107	0.007	0.1	0.0001	0.0000	OK
30 minute summer	Downpipe Roof 4	26	23.638	0.038	3.4	0.0007	0.0000	OK
2880 minute summer	Downpipe Roof 6	1800	21.715	0.015	0.3	0.0003	0.0000	OK
2880 minute summer	1	2460	20.097	0.034	1.8	0.0000	0.0000	OK
15 minute summer	Dummy 4	10	21.923	0.114	24.7	0.1285	0.0000	OK
15 minute summer	Dummy 3	10	21.972	0.072	8.3	0.0813	0.0000	OK
15 minute summer	Dummy 5	10	21.967	0.067	8.3	0.0754	0.0000	OK
2880 minute summer	S1.5	2520	21.576	1.132	9.2	1.2804	0.0000	SURCHARGED
15 minute summer	Dummy 1	10	21.982	0.082	10.7	0.0926	0.0000	OK
15 minute summer	Dummy 2	10	21.958	0.123	21.3	0.1396	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute summer	Downpipe Roof 2	2.001	Roof 3	0.1	0.135	0.008	0.0364	
4320 minute summer	Downpipe Roof 3	2.003	Blue roof	0.1	0.238	0.006	0.0091	
4320 minute summer	Downpipe Roof 5	1.001	Roof 4	0.1	0.263	0.003	0.0031	
30 minute summer	Downpipe Roof 4	1.003	Blue roof	3.4	0.266	0.143	0.1784	
2880 minute summer	Downpipe Roof 6	5.001	S3.1	0.3	0.315	0.019	0.0038	
15 minute summer	Dummy 4	3.001	S3.0	24.3	1.254	0.469	0.4233	
15 minute summer	Dummy 3	3.000	Dummy 4	8.2	0.577	0.224	0.2340	
15 minute summer	Dummy 5	4.000	Dummy 4	8.2	0.556	0.194	0.2041	
2880 minute summer	S1.5	1.010	Tank	8.3	0.559	0.075	0.3665	
15 minute summer	Dummy 1	8.000	Dummy 2	10.6	0.601	0.250	0.1725	
15 minute summer	Dummy 2	8.001	S1.0	21.1	1.008	0.497	0.1493	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 97.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute summer	Roof 1	1740	39.890	0.040	0.6	13.5853	0.0000	OK
2880 minute summer	S1.0	2880	21.806	0.881	1.6	10.2071	0.0000	SURCHARGED
2880 minute summer	S1.1	2880	21.806	1.027	3.4	4.3996	0.0000	SURCHARGED
2880 minute summer	S1.2	2880	21.806	1.071	4.6	6.3332	0.0000	SURCHARGED
2880 minute summer	S1.3	2880	21.806	1.211	5.6	7.5864	0.0000	SURCHARGED
2880 minute summer	S3.2	2880	21.806	0.901	9.0	63.7163	0.0000	SURCHARGED
2880 minute summer	S1.4	2880	21.806	1.347	12.6	12.1964	0.0000	SURCHARGED
2880 minute summer	S4.0	2880	21.806	0.606	1.5	0.6859	0.0000	SURCHARGED
600 minute summer	Roof 2	390	49.886	0.036	0.7	4.4548	0.0000	OK
7200 minute summer	Roof 3	4380	39.876	0.078	0.7	53.2450	0.0000	OK
2880 minute summer	S3.0	2880	21.806	0.756	4.2	67.9329	0.0000	SURCHARGED
2880 minute summer	S2.0	2880	21.806	0.806	1.2	8.4716	0.0000	SURCHARGED
180 minute summer	Blue roof	140	23.500	0.200	10.7	24.3122	0.0000	OK
2880 minute summer	S5.0	2880	21.806	0.731	0.8	9.9695	0.0000	SURCHARGED
2880 minute summer	Tank	2880	21.806	1.506	13.3	235.5011	0.0000	SURCHARGED
2880 minute summer	S1.6	2880	20.334	0.034	1.9	0.0380	0.0000	OK
2880 minute summer	S4.1	2880	21.806	0.838	2.5	0.9483	0.0000	SURCHARGED
2880 minute summer	S3.1	2880	21.806	0.820	5.7	70.9198	0.0000	SURCHARGED
2880 minute summer	Outfall	2880	20.120	0.038	1.9	0.0428	0.0000	OK
2880 minute summer	Downpipe	2880	21.807	0.257	1.5	0.0046	0.0000	SURCHARGED
2880 minute summer	S1.7	2880	20.230	0.036	1.9	0.0404	0.0000	OK
30 minute summer	Roof 4	28	40.080	0.230	11.4	4.5292	0.0000	FLOOD RISK
5760 minute summer	Roof 5	5460	49.942	0.092	0.6	37.2427	0.0000	OK
2160 minute summer	Roof 6	1500	39.911	0.061	1.4	32.6983	0.0000	OK
2880 minute summer	Downpipe 1	1680	22.010	0.010	0.3	0.0002	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute summer	Roof 1	7.000	Downpipe 1	0.3	0.363	0.015	0.0073	
2880 minute summer	S1.0	8.002	S1.1	1.6	0.296	0.037	0.8714	
2880 minute summer	S1.1	7.003	S1.2	3.4	0.425	0.089	0.3291	
2880 minute summer	S1.2	7.004	S1.3	4.5	0.412	0.111	0.9104	
2880 minute summer	S1.3	7.005	S1.4	5.5	0.360	0.079	2.1556	
2880 minute summer	S3.2	1.008	S1.4	6.5	0.547	0.079	2.6292	
2880 minute summer	S1.4	1.009	S1.5	13.3	0.511	0.170	0.2140	
2880 minute summer	S4.0	6.000	S4.1	1.5	0.335	0.016	2.4553	
600 minute summer	Roof 2	2.000	Downpipe Roof 2	0.2	0.352	0.014	0.0061	
7200 minute summer	Roof 3	2.002	Downpipe Roof 3	0.3	0.380	0.017	0.0069	
2880 minute summer	S3.0	1.006	S3.1	3.0	0.424	0.043	1.1197	
2880 minute summer	S2.0	7.002	S1.1	1.2	0.349	0.035	1.1334	
180 minute summer	Blue roof	Orifice	Downpipe	2.2				
2880 minute summer	S5.0	9.000	Tank	0.8	0.361	0.020	1.1580	
2880 minute summer	Tank	Hydro-Brake®	S1.6	1.9				
2880 minute summer	S1.6	1.012	S1.7	1.9	0.432	0.027	0.1110	
2880 minute summer	S4.1	6.001	S3.2	2.5	0.321	0.027	0.5769	
2880 minute summer	S3.1	1.007	S3.2	-4.8	0.431	-0.070	1.4816	
2880 minute summer	Outfall	1.014	1	1.9	0.468	0.056	0.0174	294.2
2880 minute summer	Downpipe	1.005	S3.0	1.5	0.437	0.148	0.1548	
2880 minute summer	S1.7	1.013	Outfall	1.9	0.396	0.031	0.1656	
30 minute summer	Roof 4	1.002	Downpipe Roof 4	3.7	0.909	0.167	0.0392	
5760 minute summer	Roof 5	1.000	Downpipe Roof 5	0.1	0.233	0.006	0.0081	
2160 minute summer	Roof 6	5.000	Downpipe Roof 6	0.3	0.345	0.024	0.0137	
2880 minute summer	Downpipe 1	7.001	S2.0	0.3	0.569	0.008	0.0552	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 97.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute summer	Downpipe Roof 2	390	40.012	0.012	0.2	0.0002	0.0000	OK
7200 minute summer	Downpipe Roof 3	4380	23.565	0.015	0.3	0.0003	0.0000	OK
5760 minute summer	Downpipe Roof 5	5460	40.107	0.007	0.1	0.0001	0.0000	OK
30 minute summer	Downpipe Roof 4	28	23.640	0.040	3.7	0.0007	0.0000	OK
2880 minute summer	Downpipe Roof 6	2880	21.806	0.106	0.3	0.0019	0.0000	OK
2880 minute summer	1	2880	20.098	0.035	1.9	0.0000	0.0000	OK
15 minute summer	Dummy 4	11	21.961	0.152	38.4	0.1721	0.0000	OK
15 minute summer	Dummy 3	10	21.993	0.093	12.9	0.1057	0.0000	OK
15 minute summer	Dummy 5	10	21.984	0.084	12.9	0.0951	0.0000	OK
2880 minute summer	S1.5	2880	21.806	1.362	13.7	1.5409	0.0000	SURCHARGED
15 minute summer	Dummy 1	10	22.018	0.118	16.7	0.1330	0.0000	OK
15 minute summer	Dummy 2	10	22.002	0.167	33.1	0.1891	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute summer	Downpipe Roof 2	2.001	Roof 3	0.2	0.128	0.014	0.0682	
7200 minute summer	Downpipe Roof 3	2.003	Blue roof	0.3	0.332	0.021	0.0164	
5760 minute summer	Downpipe Roof 5	1.001	Roof 4	0.1	0.281	0.004	0.0037	
30 minute summer	Downpipe Roof 4	1.003	Blue roof	3.7	0.288	0.156	0.1803	
2880 minute summer	Downpipe Roof 6	5.001	S3.1	0.3	0.330	0.023	0.0658	
15 minute summer	Dummy 4	3.001	S3.0	37.9	1.381	0.731	0.5984	
15 minute summer	Dummy 3	3.000	Dummy 4	12.7	0.612	0.348	0.3419	
15 minute summer	Dummy 5	4.000	Dummy 4	12.8	0.613	0.302	0.2872	
2880 minute summer	S1.5	1.010	Tank	12.6	0.568	0.113	0.3665	
15 minute summer	Dummy 1	8.000	Dummy 2	16.5	0.625	0.389	0.2569	
15 minute summer	Dummy 2	8.001	S1.0	32.7	1.110	0.773	0.2107	

APPENDIX 5

FOUL WATER AND WATERMAIN DEMAND CALCULATIONS

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PROJECT TITLE: WHITE HEATHER SCR
CALCULATION: FOUL WATER FLOW
APPENDIX: A

BY: B.O
PAGE: 1
DATE: 03/07/2025

	SUMMARY:	Total Peak Flow	Total Average Flow
A:	Residential	7.734 l/s	1.289 l/s
B:	Creche	0.229 l/s	0.038 l/s
		7.964 l/s	**1.327 l/s**

A: RESIDENTIAL - 688 UNITS

The foul effluent from the proposed dwellings is calculated as per the Irish Water Code of Practice for Wastewater Infrastructure (July 2020 (rev. 2)) assuming dry weather flow of 150 l/head/day plus a 10% infiltration rate and using the Irish Water assumed average occupancy of 2.7 persons/unit.

No. of Units = 250
No. of Occupants = 250 x 2.7 = 675.0

Daily Flow = No. of Occupants x Dry Weather Flow
Daily Flow = 675.0 x 150 x 1.1 = 111,375 l/day

$$\text{Average Flow} = \frac{\text{Daily Flow}}{\text{Flow Duration}} = \frac{111{,}375 \text{ l/day}}{24 \times 60 \times 60} = \mathbf{1.289 \text{ l/s}}$$

Peak Flow = Average Flow x 6
Peak Flow = 1.289 l/s x 6 = **7.734 l/s**

B: CRÈCHE

Assume conservatively 50no. children catered for. Assume staff:child ratio of 1:5 on average (based on Schedule 6 Part 1 of Child Care Act 1991 (Early Years Services) Regulations 2016.). Thus assume total of 10no. staff + 50no. children = 60no. persons. As per Irish Water CoP for WW Infrastructure Appendix D, assume flow rate for "Schools - non-residential without a canteen" = 50litres/person/day.

No. of Children = 50
Staff:Child Ratio = 1:5
Total Population = 50 + 10 = 60

Daily Flow = Population x Dry Weather Flow
Daily Flow = 60 x 50 x 1.1 = 3,300 l/day

$$\text{Average Flow} = \frac{\text{Daily Flow}}{\text{Flow Duration}} = \frac{3{,}300 \text{ l/day}}{24 \times 60 \times 60} = \mathbf{0.038 \text{ l/s}}$$

Peak Flow = Average Flow x 6
Peak Flow = 0.038 l/s x 6 = **0.229 l/s**

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	SUMMARY:	Total Peak Demand	Total Average Demand
A:	Residential	7.324 l/s	1.465 l/s
B:	Creche	0.195 l/s	0.039 l/s
		7.520 l/s	**1.504 l/s**

A: RESIDENTIAL -250 UNITS

The water demand for the proposed development has been calculated using the guidelines given in the Irish Water Code of Practice for Water Infrastructure July 2020 Rev 2) Section 3.7.2 assuming a per-capita consumption of 150 l/head/day and using the Irish Water assumed average occupancy of 2.7 persons/unit. The average day/peak week demand is taken as 1.25 times the average daily domestic demand. The peak demand factor is taken as 5 times the average day/peak week demand.

No. of Units = 250
No. of Occupants = 250 x 2.7 = 675

Avg. Daily Demand = No. of Occupants x Allowance per head
Avg. Daily Demand = 675 x 150 = 101,250 l/day

$$\text{Average Flow} = \frac{\text{Daily Flow}}{\text{Flow Duration}} \times 1.25 = \frac{101{,}250 \text{ l/day}}{24 \times 60 \times 60} \times 1.25 = \mathbf{1.465 \text{ l/s}}$$

Peak Demand = Average Flow x 5
Peak Demand = 1.465 l/s x 5 = **7.324 l/s**

B: CRÈCHE

Assume conservatively 50no. children catered for. Assume staff:child ratio of 1:5 on average (based on Schedule 6 Part 1 of Child Care Act 1991 (Early Years Services) Regulations 2016.). Thus assume total of 10no. staff + 50no. children = 60no. persons. As per Irish Water CoP for WW Infrastructure Appendix D, assume flow rate for "Schools - non-residential without a canteen" = 50litres/person/day. The average day/peak week demand is taken as 1.25 times the average daily domestic demand. The peak demand factor is taken as 5 times the average day/peak week demand.

No. of Children = 50
Staff:Child Ratio = 1:5
Total Population = 50 + 10 = 60

Daily Flow = No. of Workers x Dry Weather Flow
Daily Flow = 60 x 45 = 2,700 l/day

$$\text{Average Flow} = \frac{\text{Daily Flow}}{\text{Flow Duration}} \times 1.25 = \frac{2{,}700 \text{ l/day}}{24 \times 60 \times 60} \times 1.25 = 0.039 \text{ l/s}$$

Peak Flow = Average Flow x 5
Peak Flow = 0.039 l/s x 5 = 0.195 l/s

APPENDIX 6

IRISH WATER CORRESPONDENCE

Mark Killian

9 Prussia Street
Stoneybatter
Dublin 7
D07KT57

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

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

www.water.ie

7 April 2021

Re: CDS20006559 pre-connection enquiry - Subject to contract | Contract denied

Connection for Multi/Mixed Use Development of 376 units at White Heather Industrial Estate, Dolphins Barn, Dublin 8, Co. Dublin

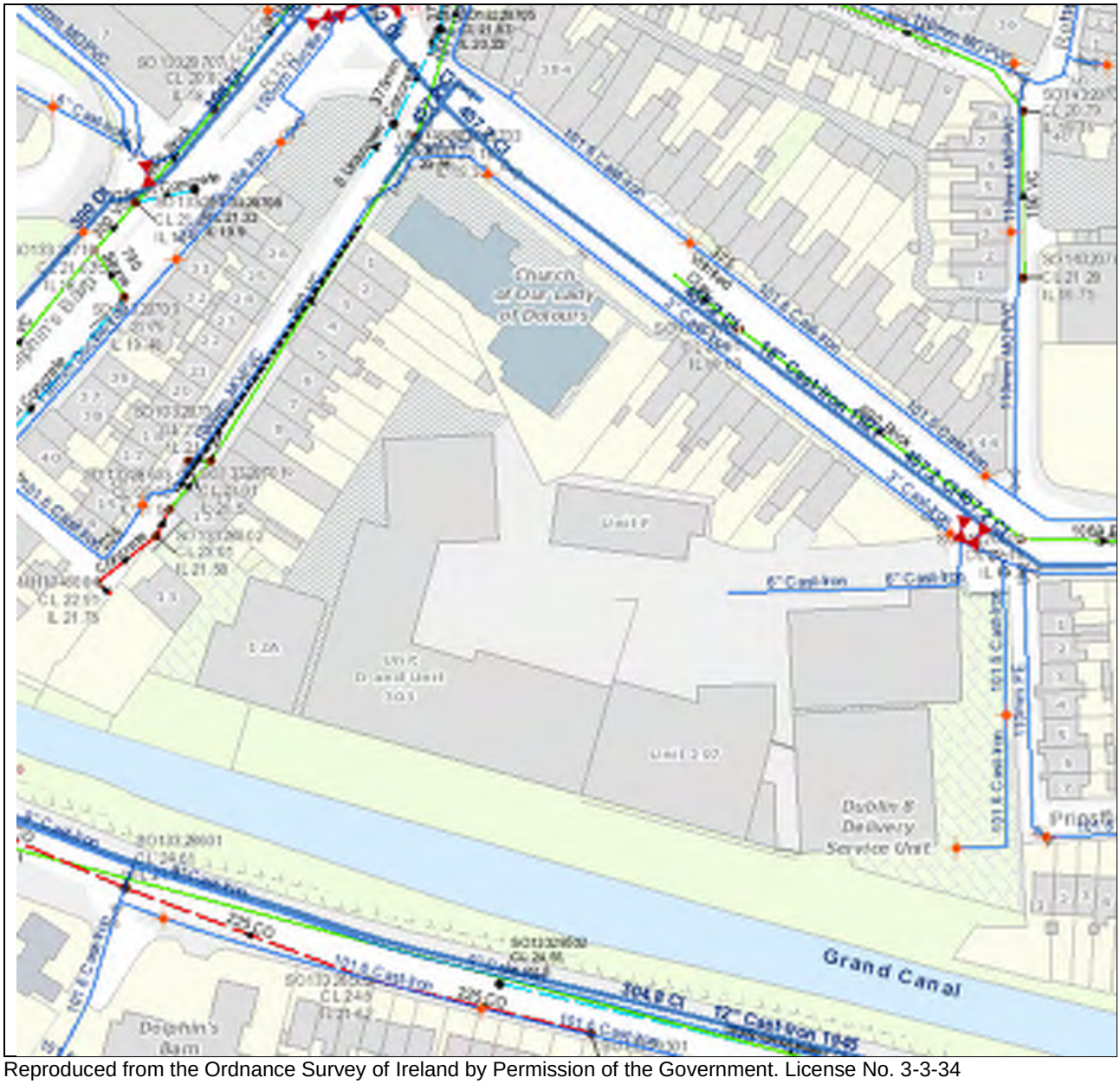
Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at White Heather Industrial Estate, Dolphins Barn, Dublin 8, Co. Dublin (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	**OUTCOME OF PRE-CONNECTION ENQUIRY** **THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.**
Water Connection	Feasible Subject to upgrades
Wastewater Connection	Feasible Subject to following conditions
SITE SPECIFIC COMMENTS	
Water Connection	The connection should be made to the existing 150mm DI main in Dolphin's Barn Street. Approximately 50m of a new 200mm ID pipe has to be laid for the connection (see green line in figure below) with installation of a bulk meter and associated telemetry system. The Applicant will be required to fund the upgrade works and be responsible for any 3rd party consents related to the connection.

	On site water storage will be required for the average day peak week demand rate of the commercial section for 24-hour period with a re-fill time of 12 hours. 
Wastewater Connection	The Development has to incorporate Sustainable Drainage Systems/ Attenuation in the management of stormwater and to reduce surface and storm water inflow into the receiving combined sewer. Storm water discharge is limited to 2l/s/ha for a 1 in 100-year storm event. A report regarding the current storm connection and contributing surface water area, verified by independent surveys, should be provided at a connection application stage and before any existing infrastructure is demolished.
The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.	

The map included below outlines the current Irish Water infrastructure adjacent to your site:



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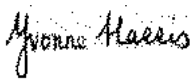
Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

General Notes:

1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at https://www.water.ie/connections/get-connected/
5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
6) Irish Water Connection Policy/ Charges can be found at https://www.water.ie/connections/information/connection-charges/
7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
9) To access Irish Water Maps email datarequests@water.ie
10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Marina Byrne from the design team via email mzbyrne@water.ie For further information, visit **www.water.ie/connections.**

Yours sincerely,



Yvonne Harris

Head of Customer Operations

APPENDIX 6.1

PRE-CONNECTION ENQUIRY

Pre-connection enquiry form

Business developments, mixed use developments, housing developments

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

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

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

Section A | Applicant details

1 *Applicant details:

Registered company name (if applicable): Green Urban Logist

ics 3 White Heather Propco Ltd

Trading name (if applicable):

Company registration number (if applicable): 769306

Parent company registered company name (if applicable):

Parent company registration number (if applicable):

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

*Contact name: Jason Lee & Clara Doyle

*Postal address: 32 Molesworth Street Dubl

in 2

*Eircode: D02Y512

Please provide either a landline or a mobile number

Landline:

*Mobile: +353 1 697 3304

*Email: bollero@bmce.ie

2 Agent details (if applicable):

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

*Contact name: ciaran kennedy

Company name (if applicable): Barrett Mahony C Eng

*Postal address: Sandwith House,

52/54 Lwr Sandwith Street

Dublin 2

*Eircode: D02WR26

Please provide either a landline or a mobile number

Landline: 0167732200

*Mobile 0868222199

*Email: ckennedy@bmce.ie

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

Applicant ○ Agent ◉

Section B | Site details

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

White Heather Site

***Address 2** South Circular Road

***Address 3** Dolphins Barn

***City/Town** Dublin 2

***County** Dublin **Eircode** D08WR9T

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

Eastings (X) 313917 Northings (Y) 232671

Note: Values for Eastings must be between 015,900 and 340,000. Northings, between 029,000 and 362,000

Eg. co-ordinates of GPO, O'Connell St., Dublin: E(X) 315,878 N(Y) 234,619

6 *Local Authority where proposed development is located:

DUBLIN CITY COUNCIL

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

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

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

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

Eg. IDA, HSE, LDA, etc.

Section C | Development details

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

Domestic:

Property type	Number of units	Property type	Number of units
House		Apartments	252
Duplex	16	Number of Apartment Blocks	3

Industry/business:

Property type	Number of units	Property type	Number of units
Agricultural	0	Brewery / Distillery	0
Restaurant / Café / Pub		Car Wash / Valeting	0
Creche	150m2	Data Centre	0
Fire Hydrant	0	Fire Station	0
Food Processing	0	Hotel Accommodation	0
Industrial / Manufacturing	0	Laundry / Laundrette	0
Office	1 X 40m2	Primary Care Centre	0
Residential / Nursing Care Home	0	Retail	1 X 125m2
School	0	Sports Facility	0
Student Accommodation	0	Warehouse	0

Other (please specify type)		No. of Units	

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

n i l

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

See Calculation Sheets, number shown separate to housing, for commercial only

5

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

0 1 / 0 8 / 2 0 2 5

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

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

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

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

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

Water only ○ Please go to Section D

Wastewater only ○ Please go to Section E

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

Section D | Water connection and demand details

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

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

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

14 **Approximate date water connection is required:** 0 1 / 1 0 / 2 0 2 5

15 ***What diameter of water connection is required to service the development?** 1 5 0 mm

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

If 'Yes', how many? ☐☐

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

Post-development peak hour water demand	3.0	**l/s**
Post-development average hour water demand	0.5	**l/s**

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

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

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

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

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

2 2 ☐☐☐ m

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

3 2 ☐☐☐ m

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

Please include calculations on the attached sheet provided.

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

Additional fire flow requirements over and above those identified in Q17-18	35 L/S (2,100L/MIN)	**l/s**

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

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

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

Section E | Wastewater connection and discharge details

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

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

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

New connection into existing Public Sewer outside site

25 ***Approximate date that wastewater connection is required:** 01 / 09 / 2025

26 ***What diameter of wastewater connection is required to service the development?** 225 mm

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

If 'Yes', how many?

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

Post-development peak discharge	3.0	**l/s**
Post-development average discharge	0.5	**l/s**

Please include calculations on the attached sheet provided.

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

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

Please include calculations on the attached sheet provided.

30 Wastewater organic load:

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

Temperature range	
pH range	

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

Yes ☑ No ☐

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

Existing Paved and hardstanding drains to combined, proposed to reduce with suDs and Attenu

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

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

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

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

22 m

34 What is the lowest finished floor level on site above Malin Head Ordnance Datum? 22 m

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

19.1 m

Section F | Supporting documentation

Please provide the following additional information (all mandatory):

> Site location map: A site location map to a scale of 1:1000, which clearly identifies the land or structure to which the enquiry relates. The map shall include the following details: ☑

i. The scale shall be clearly indicated on the map.

ii. The boundaries shall be delineated in red.

iii. The site co-ordinates shall be marked on the site location map.

> Details of planning and development exemptions (if applicable). ☑

> Calculations (calculation sheets provided below). ☑

> Site layout map to a scale of 1:500 showing layout of proposed development, water network and wastewater network layouts, additional water/wastewater infrastructure if proposed, connection points to Irish Water infrastructure. ☑

> Conceptual design of the connection asset from the proposed development to the existing Irish Water infrastructure, including service conflicts, gradients, pipe sizes and invert levels. ☑

> Any other information that might help Irish Water assess this pre-connection enquiry. ☑

Section G | Declaration

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

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

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

I/We have enclosed all the necessary supporting documentation.

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

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

Signature: Ciaran Kennedy

Digitally signed by Ciaran Kennedy
DN: cn=Ciaran Kennedy, c=IE, o=Barrett Mahony Consulting Engineers, ou=Managing Director, email=ciaran.kennedy@bmce.ie
Date: 2023.09.04 17:55:03 +01'00'

Date: 0 8 / 0 5 / 2 0 2 5

Your full name (in BLOCK CAPITALS):

C i a r a n K e n n e d y

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

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

Irish Water
PO Box 860
South City Delivery Office
Cork City

Please note that if you are sending us your application form and any associated documentation by email, the maximum file size that we can receive in any one email is 35MB.

Please note, if mandatory fields are not completed the application will be returned.

Irish Water is subject to the provisions of the Freedom of Information Act 2014 ("FOIA") and the codes of practice issued under FOIA as may be amended, updated or replaced from time to time. The FOIA enables members of the public to obtain access to records held by public bodies subject to certain exemptions such as where the requested records may not be released, for example to protect another individual's privacy rights or to protect commercially sensitive information. Please clearly label any document or part thereof which contains commercially sensitive information. Irish Water accepts no responsibility for any loss or damage arising as a result of its processing of freedom of information requests.

Calculations

Water demand

Category	No	Rate (IW UÉ) l/day	Contributing Vol	Comment
Staff Full Time Staff	10	90	900	Split over shifts

Total Commercial / retail Volume 900 L / day

Plus allowance for housing

2.7 x 150 x 270 units = 109,350 l/day

Grand Total 110,250 l/day

1.27 l/s Average Flow over 24 Hrs
7.66 l/s Peak Flow based on 6XDWF(24 hr)

150mmØ Watermain pipe size is adequate and complies with uisce Éireann guidance for <300 units = 150mmØ

On-site storage

Water Storage,
Min 24hour storage to be provided in line with requirements, design by M&E Engineer

Fire flow requirements

Hydrants already provided on public area close to site and new hydrants proposed inside site / housing estate roads ,

Additional new hydrants to be added inside site boundary

Fire fighting already provided in public realm, allow for 2100 L/minute = 35 l/s flow

Category	No	Rate (IW UÉ) l/day	Contributing Vol	Comment
Staff Full Time Staff	10	90	900	Split over shifts

Total Commercial / retail Volume 900 L / day

Plus allowance for housing

2.7 x 150 x 270 units = 109,350 l/day

Grand Total 110,250 l/day

1.27 l/s Average Flow over 24 Hrs
7.66 l/s Peak Flow based on 6XDWF(24 hr)

Capacity of 150mmØ pipe at say 1:80 fall approx, 17.67 l/s therefore more than adequate .
150 adequate for flow, to be increased to 225 to meet UÉ requirements TBC

Not relevant

Local break tank will be provided as per the later mechanical design, not relied upon here in this initial design.

Regular domestic cold water storage to be provided in each house.

Guide to completing the pre-connection enquiry form

This form should be completed by applicants enquiring about the feasibility of a water and/or wastewater connection to Irish Water infrastructure.

The Irish Water Codes of Practice are available at **www.water.ie** for reference.

Section A | Applicant Details

Question 1: This question requires the applicant or company enquiring about the feasibility of a connection to identify themselves, their postal address, and to provide their contact details.

Question 2: If the applicant has employed a consulting engineer or an agent to manage the enquiry on their behalf, the agent's address and contact details should be recorded here.

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

Section B | Site details

Question 4: This is the address of the site requiring the water/wastewater service connection and for which this enquiry is being made.

Question 5: Please provide the Irish Grid co-ordinates of the proposed site. Irish grid positions on maps are expressed in two dimensions as Eastings (E or X) and Northings (N or Y) relative to an origin. You will find these coordinates on your Ordnance Survey map which is required to be submitted with an application.

Question 6: Please identify the Local Authority that is or will be dealing with your planning application, for example Cork City Council.

Question 7: Please indicate if planning permission has been granted for this application, and if so, please provide the planning permission reference number.

Question 8: Please indicate if this development is affiliated with a government body/agency, and if so, specify

Section C | Development details

Question 9: Please specify the number of different property/premises types by filling in the tables provided.

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

Question 9.2: Please indicate the maximum expected occupancy in numbers of people according to the proposed development you selected.

Question 10: Please indicate the approximate commencement date of works on the development.

Question 11: Please indicate if a phased building approach is to be adopted when developing the site. If so, please provide details of the phase master-plan and the proposed variation in water demand/wastewater discharge as a result of the phasing of the development.

Question 12: Please indicate the type of connection required by ticking the appropriate box and proceed to complete the appropriate section or sections.

Section D | Water connection and demand details

Question 13: Please indicate if a water connection already exists for this site.

Question 13.1: Please indicate if this enquiry concerns an additional connection to one already installed on the site.

Question 13.2: Please indicate if you are proposing to upgrade the water connection to facilitate an increase in water demand. Irish Water will determine what impact this will have on our infrastructure.

Question 14: Please indicate the approximate date that the proposed connection to the water infrastructure will be required.

Question 15: Please indicate what diameter of water connection is required to service this development.

Question 16: Please indicate if more than one connection is required to service this development. Please note that the connection size provided may be used to determine the connection charge.

Question 17: If this connection enquiry concerns a business premises, please provide calculations for the water demand and include your calculations on the calculation sheet provided. Business premises include shops, offices, hotels, schools, etc. Demand rates (peak and average) are site specific. Average demand is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). For design purposes, please refer to the Irish Water Codes of Practice for Water Infrastructure.

Question 18: If this connection enquiry is for an industrial premises, please calculate the water demand and include your calculations on the calculation sheet provided. Demand rates (peak and average) are site specific. Average demand is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). The peak demand for sizing of the pipe network will be as per the specific business production requirements. For design purposes, please refer to the Irish Water Codes of Practice for Water Infrastructure.

Question 19: Please specify the ground level at the location where connection to the public water mains will be made. This is required in order to determine if there is sufficient pressure in the existing water infrastructure to serve your proposed development. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 20: Please specify the highest finished floor level on site. This is required in order to determine if there is sufficient pressure in the existing water infrastructure to serve your proposed development. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 21: If storage is required, water storage capacity of 24-hour water demand must usually be provided at the proposed site. In some cases, 24-hour storage capacity may not be required, for example 24-hour storage for a domestic house would be provided in an attic storage tank. Please calculate the 24-hour water storage requirements and include your calculations on the attached sheet provided. Please also confirm that on-site storage is being provided by ticking the appropriate box.

Question 22: The water supply system shall be designed and constructed to reliably convey the water flows that are required of the development including fire flow requirements by the Fire Authority. The Fire Authority will provide the requirement for fire flow rates that the water supply system will have to carry. Please note that while flows in excess of your required demand may be achieved in the Irish Water network and could be utilised in the event of a fire, Irish Water cannot guarantee a flow rate to meet your fire flow requirement. To guarantee a flow to meet the Fire Authority requirements, you should provide adequate fire storage capacity within your development. Please include your calculations on the attached sheet provided, and further provide confirmation of the Fire Authority requirements.

Question 23: Please identify proposed additional water supply sources, that is, do you intend to connect to the public water mains or the public mains and supplement from other sources? If supplementing public water supply with a supply from another source, please provide details as to how the potable water supply is to be protected from cross contamination at the premises.

Section E | Wastewater connection and discharge details

Question 24: Please indicate if a wastewater connection to a public sewer already exists for this site.

Question 24.1: Please indicate if this enquiry relates to an additional wastewater connection to one already installed.

Question 24.2: Please indicate if you are proposing to upgrade the wastewater connection to facilitate an increased discharge. Irish Water will determine what impact this will have on our infrastructure.

Question 25: Please specify the approximate date that the proposed connection to the wastewater infrastructure will be required.

Question 26: Please indicate what diameter of wastewater connection is required to service this development.

Question 27: Please indicate if more than one connection is required to service this development. Please indicate number required.

Question 28: If this enquiry relates to a business premises, please provide calculations for the wastewater discharge and include your calculations on the attached sheet provided. Business premises include shops, offices, hotels, schools, etc. Discharge rates (peak and average) are site specific. Average discharge is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). For design purposes, please refer to the Irish Water Codes of Practice for Wastewater Infrastructure.

Question 29: If this enquiry relates to an industrial premises, please provide calculations for the wastewater discharge and include your calculations on the calculation sheet provided. Discharge rates (peak and average) are site specific. Average discharge is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). The peak discharge for sizing of the pipe network will be as per the specific business production requirements. For design purposes, please refer to the Irish Water Codes of Practice for Wastewater Infrastructure.

Question 30: Please specify the maximum and average concentrations and the maximum daily load of each of the wastewater characteristics listed in the wastewater organic load table (if not domestic effluent), and also specify if any other significant concentrations are expected in the effluent. Please complete the table and provide additional supporting documentation if relevant. Note that the concentration shall be in mg/l and the load shall be in kg/day. Note that for business premises (shops, offices, schools, hotels, etc.) for which only domestic effluent will be discharged (excluding discharge from canteens/ restaurants which would require a Trade Effluent Discharge licence), there is no need to complete this question.

Question 31: In exceptional circumstances, such as brownfield sites, where the only practical outlet for storm/ surface water is to a combined sewer, Irish Water will consider permitting a restricted attenuated flow to the combined sewer. Storm/surface water will only be accepted from brownfield sites that already have a storm/surface water connection to a combined sewer and the applicant must demonstrate how the storm/surface water flow from the proposed site is minimised using sustainable urban drainage system (SUDS). This type of connection will only be considered on a case by case basis. Please advise if the proposed development intends discharging surface water to the combined wastewater collection system.

Question 32: Please specify if the development needs to pump its wastewater discharge to gain access to Irish Water infrastructure.

Question 33: Please specify the ground level at the location where connection to the public sewer will be made. This is required to determine if the development can be connected to the public sewer via gravity discharge. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 34: Please specify the lowest floor level of the proposed development. This is required in order to determine if the development can be connected to the public sewer via gravity discharge. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 35: Please specify the proposed invert level of the pipe exiting the property to the public road.

Section F | Supporting documentation

Please provide additional information as listed.

Section G | Declaration

Please review the declaration, sign, and return the completed application form to Irish Water by email or by post using the contact details provided in Section G.

Notes

Notes

APPENDIX 6.2

CONFIRMATION OF FEASIBILITY – CDS25003323

CONFIRMATION OF FEASIBILITY

Ciaran Kennedy

Barrett Mahony
Sandwith House
52-54 Lower Sandwith Street
Dublin 2

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

22 September 2025

Our Ref: CDS25003323 Pre-Connection Enquiry
White Heather site, South Circular Road, Dublin 2

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 271 unit(s) at White Heather site, South Circular road, Dublin 2 (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
  - Connection main – Approx. 15m of new 150mm ID pipe to be laid to connect the site development to the existing 100mm CI main (as shown below). Meter to be installed on the connection main.
  - If connection is required from the same point of connection proposed by developer, connection shall be taken from DMA main, which will require an upgrade of approx. 200m watermain.
  - The proposed Development indicates that Uisce Éireann assets are present on the

site. The Developer has to demonstrate that proposed structures and works will not inhibit access for maintenance or endanger structural or functional integrity of the assets during and after the works. Drawings (showing clearance distances, changing to ground levels) and Method Statements should be included in the Detailed Design of the Development. A wayleave in favour of Uisce Éireann will be required over the assets that are not located within the Public Space. For design submissions and queries related to diversion/build near or over, please contact IW Diversion Team via email address diversions@water.ie

- **Wastewater Connection**
  - Feasible without infrastructure upgrade by Uisce Éireann
  - The Development has to incorporate Sustainable Drainage Systems/ Attenuation measures for stormwater management, in order to reduce surface water inflow into the receiving combined sewer, ensuring that it does not exceed 2 l/s/ha. Full details of these have to be agreed with the LA Drainage Division.

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

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

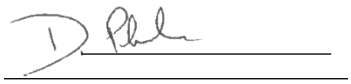
Where can you find more information?

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

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

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

Yours sincerely,



Dermot Phelan
Connections Delivery Manager

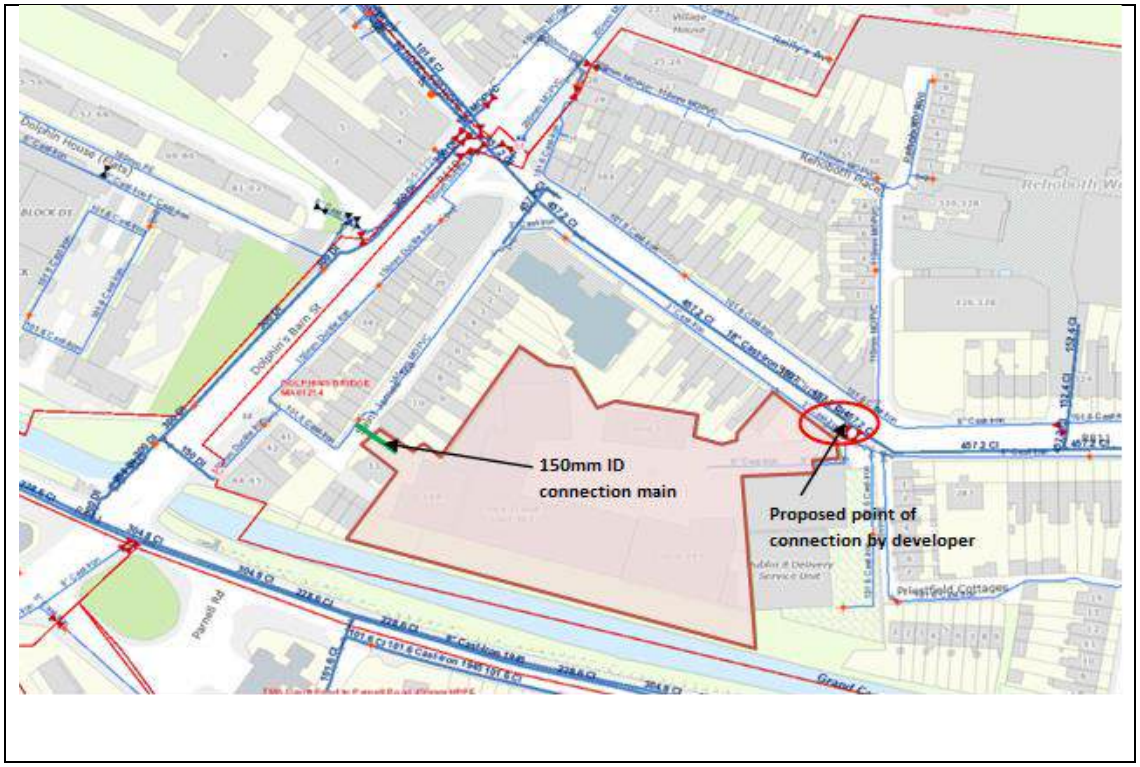
Section A - What is important to know?

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

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

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

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



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.

APPENDIX 6.3

STATEMENT OF DESIGN ACCEPTANCE – CDS25003323

Ciaran Kennedy
Barret Mahony
Sandwith House
52-54 Lower Sandwith Street
Dublin 2

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

25 November 2025

Re: Design Submission for White Heather site, South Circular road, Dublin 2, Dublin (the "Development")
(the "Design Submission") / Connection Reference No: CDS25003323

Dear Ciaran Kennedy,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Uisce Éireann has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before you can connect to our network you must sign a connection agreement with Uisce Éireann. This can be applied for by completing the connection application form at www.water.ie/connections. Uisce Éireann's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Uisce Éireann's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Uisce Éireann does not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Uisce Éireann representative:
Name: Antonio Garzón Mielgo
Email: antonio.garzonmielgo@water.ie

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

Appendix A

Document Title & Revision

- WHH-BMD-ZZ-ZZ-DR-C-11210 PL4
- WHH-BMD-ZZ-ZZ-DR-C-11220 PL3
- WHH-BMD-ZZ-ZZ-DR-C-12201 PL1

Standard Details/Code of Practice Exemption:

1. All wastewater from basements shall be pumped to ground level to discharge by gravity to the Uisce Éireann network. The pumped wastewater shall discharge initially to a standoff (rising main discharge) manhole before discharging by gravity to the sewer network. Direct pumping to the gravity network shall not be permitted.

Additional Comments

The design submission will be subject to further technical review at connection application stage.

Uisce Éireann cannot guarantee that its Network in any location will have the capacity to deliver a particular flow rate and associated residual pressure to meet the requirements of the relevant Fire Authority, see Section 1.17 of Water Code of Practice.

*For further information, visit **www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Uisce Éireann will not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT - `ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.
3. FOR CIVIL GENERAL NOTES AND LEGENDS REFER TO DRAWING CE-10000.
4. THRUST BLOCKS ARE TO BE LOCATED AND INSTALLED AS PER UISCE ÉIREANN DETAILS.

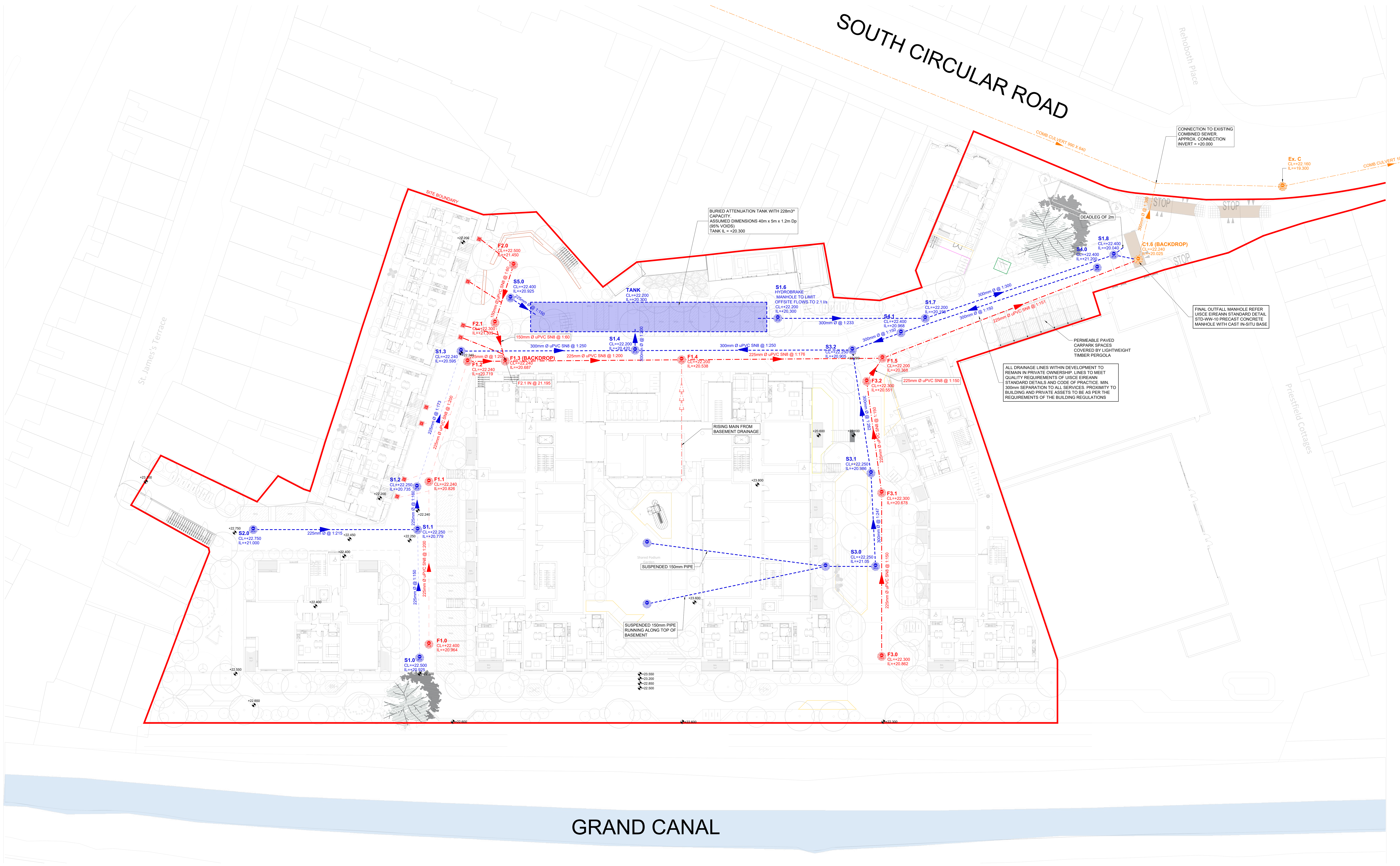
NOTES:

1. ALL CONNECTIONS TO BE MADE SOFFIT TO SOFFIT.
2. CONNECTIONS FROM INTERNAL RWP'S AND SVP'S NOT SHOWN - POSITIONS TO BE AGREED WITH ARCHITECT & MEP ENGINEER.
3. ALL HARDSTANDING TO BE PERMEABLE PAVING WITH 400mm Dp. GRANULAR STORAGE LAYER AND PEFRFORATED COLLECTOR PIPES (COLLECTOR PIPES NOT YET SHOWN).
4. SURFACE WATER AND FOUL DRAINAGE NETWORK DESIGNED USING uPVC SN8 PIPES

DRAWING ISSUED AS PART OF APPLICATION FOR STATEMENT OF DESIGN ACCEPTANCE (SODA)
REFER TO UISCE ÉIREANN CDS REF
PCE CDS25003323 - WHITE HEATHER SITE, SOUTH CIRCULAR ROAD, DUBLIN

ALL NEW WORKS IN RED LINE TO REMAIN IN PRIVATE OWNERSHIP. ALL WORKS TO BE CARRIED OUT TO MEET THE REQUIREMENTS OF UISCE ÉIREANN IN TERMS OF QUALITY AND SPECIFICATION,
MIN 300MM SEPARATION TO BE PROVIDED BETWEEN ALL SERVICES.
PROXIMITY TO BUILDINGS TO MEET THE REQUIREMENTS OF THE BUILDING REGULATIONS.

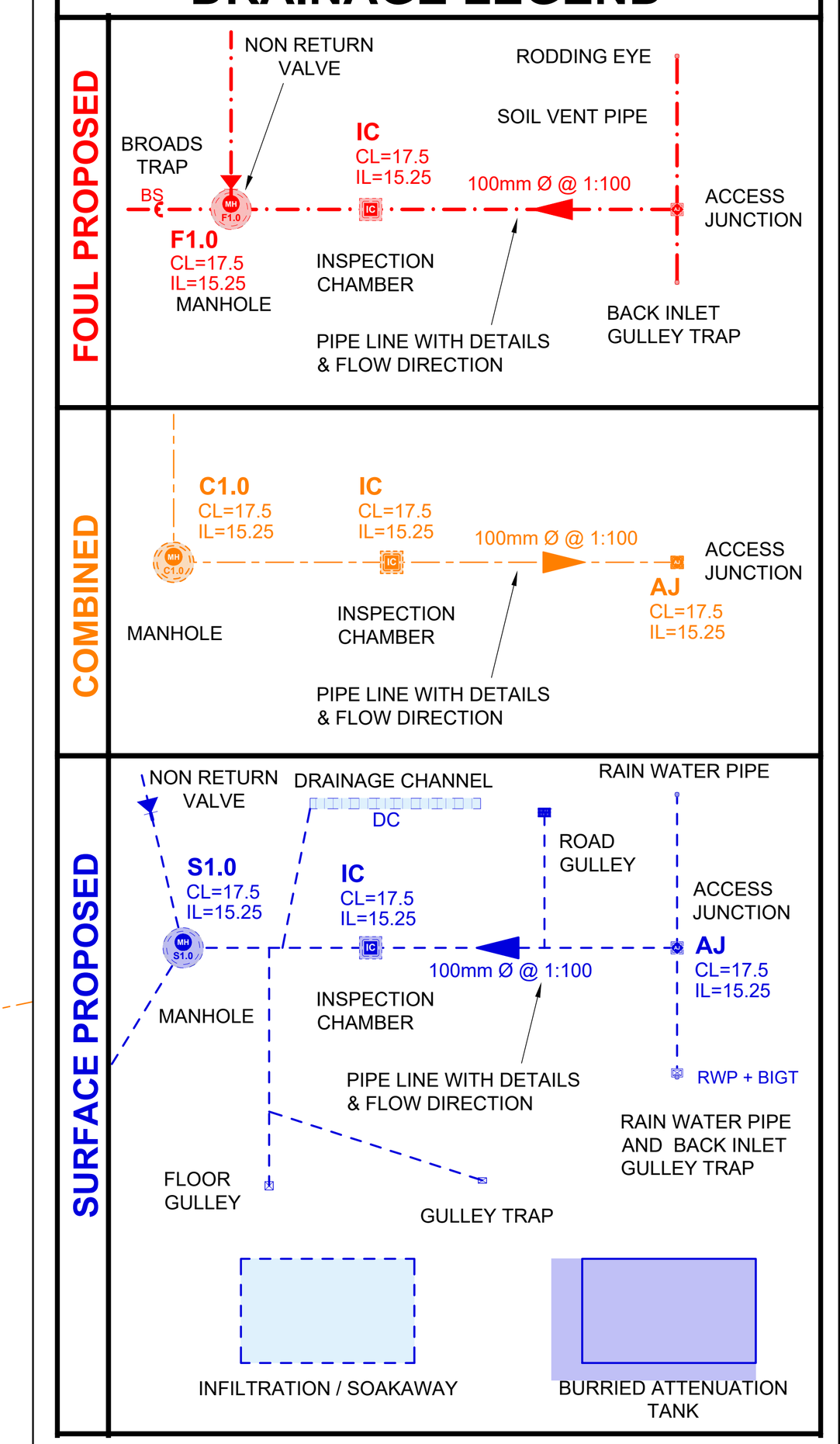
ALL WORKS TO BE CARRIED OUT TO LATEST UÉ REQUIRMENTS
CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE
CONNECTIONS AND DEVELOPER SERVICES
DESIGN AND CONSTRUCTION REQUIREMENTS FOR SELF-LAY DEVELOPMENTS
AUGUST 2025 (REVISION 3)



PROPOSED FOUL & SURFACE WATER DRAINAGE LAYOUT

SCALE @ A0: 1:250
SCALE @ A2: 1:500

DRAINAGE LEGEND



ISSUE	DATE	DESCRIPTION	BY
PL4	11.11.25	SODA UPDATE	MA
PL3	13.10.25	ISSUED FOR LRD OPINION	AT
PL2	30.09.25	ISSUED FOR SODA	AT
PL1	18.07.25	ISSUED FOR PLANNING	AT

Project Engineer: - | Project Director: CIARAN KENNEDY

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Consulting Engineers, Civil . Structural . Project Management.E-mail: bmce@bmce.ie Web: www.bmce.ie

QAS INTERNATIONAL ISO 9001:2008 REGISTERED COMPANY
The Institution of Structural Engineers
ACEI
FIDIC International Federation of Consulting Engineers

CLIENT
GREEN URBAN LOGISTICS 3 WHITE HEATHER PROPCO LIMITED CAPITAL

PROJECT TITLE
WHITE HEATHER, SOUTH CIRCULAR ROAD

BM PROJECT No.
25.142

MODEL
REFERENCE: - | SUITABILITY: - | REVISION: -

DRAWING TITLE
PROPOSED FOUL & SURFACE WATER DRAINAGE LAYOUT - KEY PLAN

DWG
DRAWING REFERENCE: **WHH-BMD-ZZ-ZZ-DR-C-11210** | STATUS: - | REVISION: **PL4**

DRAWING ISSUED AS PART OF APPLICATION FOR STATEMENT OF DESIGN ACCEPTANCE (SODA)
REFER TO UISCE ÉIREANN CDS REF.
PCE CDS25003325 - WHITE HEATHER SITE, SOUTH CIRCULAR ROAD, DUBLIN

ALL NEW WORKS IN RED LINE TO REMAIN IN PRIVATE OWNERSHIP. ALL WORKS TO BE CARRIED OUT TO MEET THE REQUIREMENTS OF UISCE ÉIREANN IN TERMS OF QUALITY AND SPECIFICATION.
MIN 300MM SEPARATION TO BE PROVIDED BETWEEN ALL SERVICES.
PROXIMITY TO BUILDINGS TO MEET THE REQUIREMENTS OF THE BUILDING REGULATIONS.

ALL WORKS TO BE CARRIED OUT TO LATEST UÉ REQUIRMENTS
CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE
CONNECTIONS AND DEVELOPER SERVICES
DESIGN AND CONSTRUCTION REQUIREMENTS FOR SELF-LAY DEVELOPMENTS
AUGUST 2025 (REVISION 3)

PROPOSED WATERMAIN LAYOUT

SCALE @ A0: 1:250
SCALE @ A2: 1:500

NOTES

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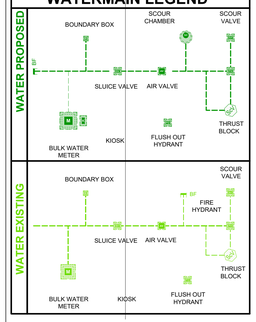
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.
3. FOR CIVIL GENERAL NOTES AND LEGENDS REFER TO DRAWING CE-10000.
4. THRUST BLOCKS ARE TO BE LOCATED AND INSTALLED AS PER UISCE ÉIREANN DETAILS.

NOTES:
1. REFER TO THE UISCE EIREANN WATERMAIN CODE OF PRACTICE FOR STANDARD DETAILS.
2. ALL PIPE DIAMETER TO BE 100mmØ UNLESS NOTED OTHERWISE.
3. BULK METERS LOCATIONS INDICATIVE ONLY.

WATERMAIN LEGEND



ISSUE	DATE	DESCRIPTION	BY
PL3	11.11.25	SODA UPDATE	MA
PL2	30.09.25	ISSUED FOR SODA	AT
PL1	18.07.25	ISSUED FOR PLANNING	AT

Project Engineer: -
Project Director: CIARAN KENNEDY

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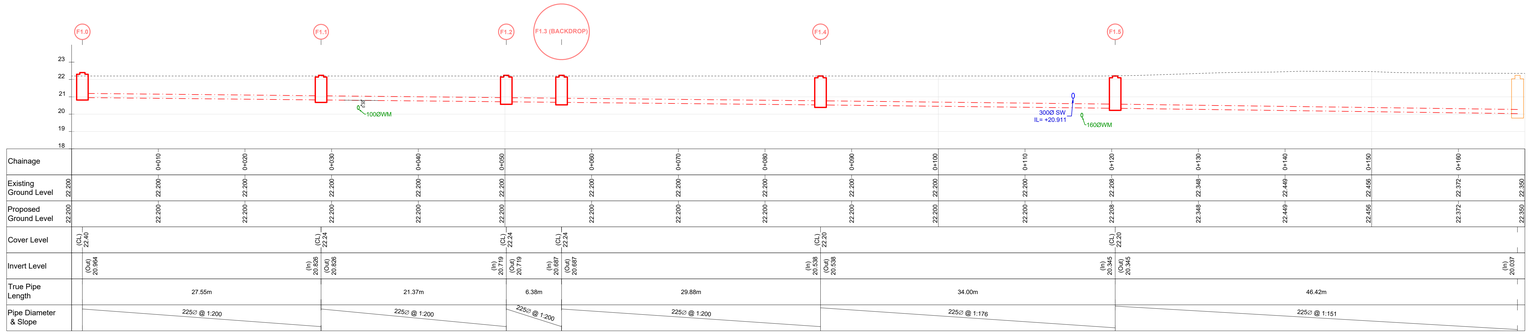
CLIENT
GREEN URBAN LOGISTICS 3 WHITE HEATHER PROPCO LIMITED CAPITAL

PROJECT TITLE: **WHITE HEATHER, SOUTH CIRCULAR ROAD**
BM PROJECT No. **25.142**

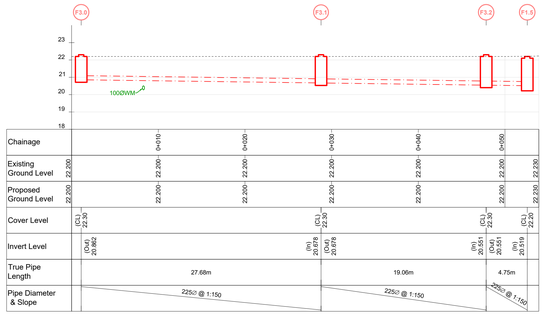
REFERENCE	SUITABILITY	REVISION
-	-	-

DRAWING TITLE: **PROPOSED WATERMAIN LAYOUT - KEY PLAN**

DRAWING REFERENCE	STATUS	REVISION
WHH-BMD-ZZ-ZZ-DR-C-11220	-	PL3



SECTION F1.0 TO OUTFALL MANHOLE
H=1:250,V=1:125



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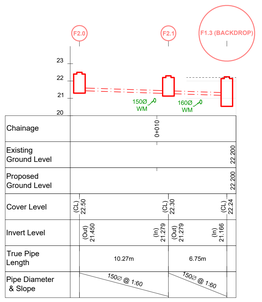

SECTION F2.0 TO F1.3
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NOTES

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PROPOSED FOUL WATER LONGITUDINAL SECTIONS

SCALE @ A0: 1:250
SCALE @ A2: 1:500

ISSUE	DATE	DESCRIPTION	BY
PL1	11.11.25	SODA UPDATE	GN

Project Engineer: | Project Director: CIARAN KENNEDY

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CLIENT:
GREEN URBAN LOGISTICS 3 WHITE HEATHER PROPCO LIMITED CAPITAL

PROJECT TITLE:
WHITE HEATHER, SOUTH CIRCULAR ROAD

BM PROJECT No.
25.142

STATUS	REFERENCE	SUITABILITY	REVISION
-	-	-	-

DRAWING TITLE:
PROPOSED FOUL WATER LONGITUDINAL SECTIONS

STATUS	DRAWING REFERENCE	STATUS	REVISION
-	WHH-BMD-ZZ-ZZ-DR-C-12201	-	PL1

Barrett Mahony Consulting Engineers

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