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Dublin City Council
Civic Offices
Dublin 8

Attention: Planning Department - Drainage Division -
Re: Proposed LRD Student Accommodation at Blackpitts, Dublin 8

Our ref: 2419-10-Drainage
Date: 10th July 2025

Please see attached J.J. Campbell and Associates planning / drainage drawings for the above proposed project, together with Engineering Service Report.

Drawing List:

- C1 Basement Plan – Foul and Storm
- C2 Ground Floor - Foul and Storm
- C3 Watermain
- C4 1st 2nd 3rd 4th Floors
- C5 5th 6th Roof Plan
- C6 Details
- C7 Longitudinal Sections – Foul and Storm

Yours faithfully

Marcus Wallace
Director

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Engineering Service Report

Student Accommodation Development at Blackpitts

Dublin 8

JJ Campbell & Associates
Consulting Civil & Structural Engineers

CONTENTS:

Document Information	
Project	Blackpitts LRD
Project No.	2419-10
Document Title	Engineering Services Report
Prepared by	Marcus Wallace
Checked by	John Campbell
Date	10th July 2025

1. Site Description. Existing Buildings and Proposed Development.

Planning permission is sought for a Large-Scale Residential Development delivering 217 student bed spaces (209 single rooms and 4 twin rooms, 213no. rooms in total), within one block. The blocks ranges in height up to 6 storeys with a basement below. All associated internal and external amenity space, including the provision of restaurant/café, on street carparking, cycle parking, landscaping, bin stores, service provision and all other associated site development works.

Figure 01 – Existing Site Location

2. Existing Foul Effluent

Drainage records received from Irish Water indicate that there is an existing 300Ø Combined sewer to the north of the development in Donovan Lane, the sewer travels west east towards Blackpitts where it connects to a 1050Ø combined sewer which then flows from south to north along the front of the proposed development.

A 550Ø combined cast iron sewer is located in Clanbrassil Street to the east, the sewer flows south to north.

There is no dedicated foul sewer in the immediate vicinity of the development.

Foul drainage network within the site is unknown.

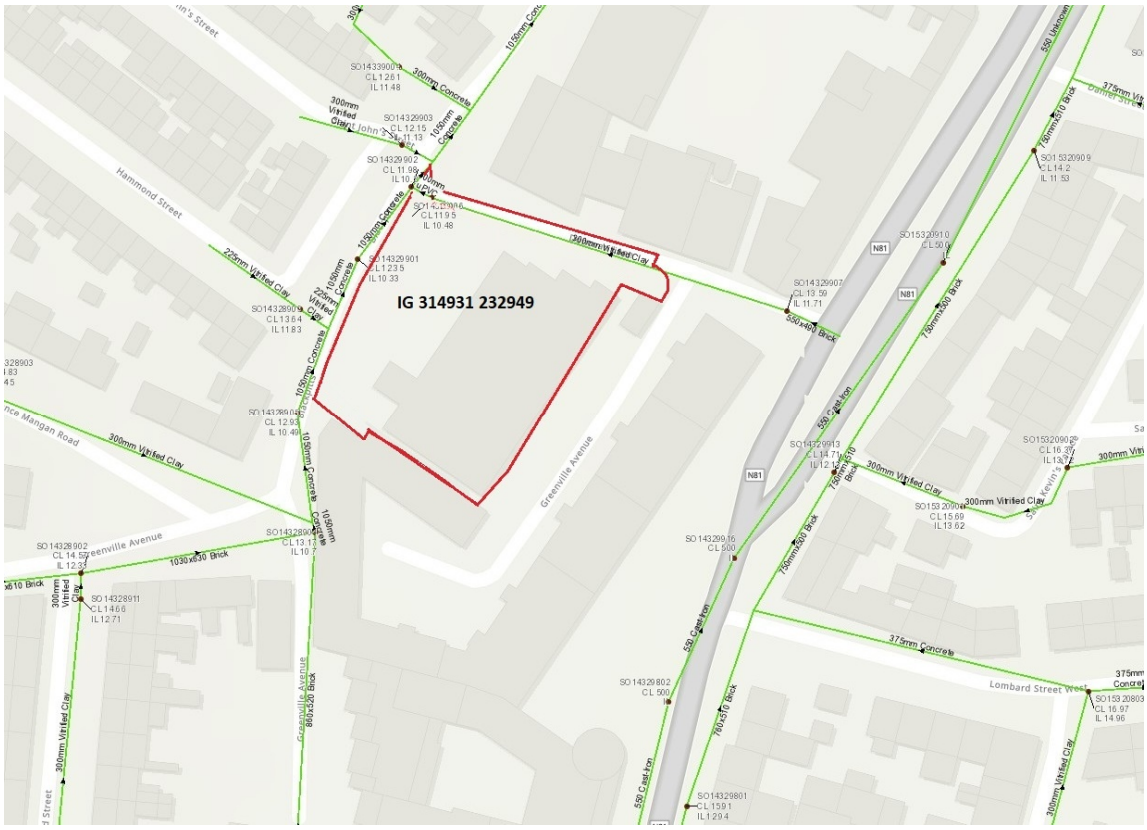

Figure 02 – Existing Foul

3. Proposed Foul Effluent

Foul water from the proposed development will drain by gravity and will be designed to take discharges from the LRD student accommodation.

Foul in the basement will be pumped from the basement up to a decompression manhole FMH02 before discharging by gravity to FMH01.

The foul system will connect to the existing 300Ø combined sewer north west of the proposed development at the corner of Blackpitts and Donovan Lane, into existing manhole SO14329906. Discharge rates shall be calculated using Uisce Eireann Code of Practice.

A Pre-connection enquiry was submitted to Uisce Eireann to confirm capacity in the receiving network. A confirmation of feasibility was received from Uisce Eireann confirming the existing Watermain and Foul/combined network has capacity for the proposed development, CDS24009260, see Appendix 5.

A Statement of Design Acceptance for the scheme was received from Uisce Eireann on the 2nd April 2025, CDS24009260, see Appendix 5.

3.1 Discharge

Student Accommodation:

213 Student rooms (217 bed spaces) x 1 person	
per bed space x 150 l/h/d:	32,550 l/day
Additional 10% Unit consumption allowance:	35,805 l/day
Peak flow:	
35,805 x 6 /24 x 60 x 60:	2.49 l/s

3.2 Self-Cleansing Velocity

See ISEN *7524 (1998) Part 4. - Drain and sewer systems outside buildings*

Hydraulic Design Clause 8 Self Cleansing Velocity.

For small diameter drains and sewers less than DN 300, self-cleansing can generally be achieved by ensuring that a velocity of at least 0.7 m/s occurs daily or that a gradient of 1:DN is specified. The internal drainage will have minimum fall of 1:60 and higher flows can be expected at least once daily and the self-cleansing velocity will be achieved.

3.3 Grease Traps

Kitchen / common area will be situated at ground floor for student use only. The small restaurant / café at ground floor is for student use only. A "Grease Guardian" under sink grease trap shall be installed in the kitchen of the small restaurant / café.

4. Existing Surface Water

Drainage records show there is a 600Ø storm sewer east of the proposed development on Clanbrassil Street. The storm network flows north west towards Christchurch.

The nearest manhole on Clanbrassil Street is SO14329909, CL 14.848m and with an invert level of 13.038m. The road level around the perimeter of the site varies from 12.0m to 12.91m. The storm sewer in Clanbrassil Street is too high to allow storm to discharge by gravity to Clanbrassil Street.

Storm water within the site is unattenuated and has no flow control to the public combined network.

Figure 03 – Existing surface Water

5. Proposed Surface Water

Surface water runoff from the proposed development will all drain by gravity and will be attenuated prior to discharge into the existing 300Ø combined sewer on Donovan Lane. Peak surface water runoff will be restricted to 2 litres per second for the whole development.

DCC drainage construction standards will be applied to all external spaces which are to be taken in charge by DCC in accordance with the Greater Dublin Regional Code of Practice for Drainage Works.

Attenuation for the proposed development will be via the Green and Blue Roof, Tree Pits and Wavin Aquacells or similar approved system at ground level.

5.1 SuDS Strategy

Sustainable urban drainage is a concept that incorporates long term environmental and social factors into drainage design. It takes account of both the quantity and quality of runoff as well as the amenity value of surface water in the urban environment. The overcharging principles of SuDS design is that surface water runoff should be managed for maximum benefit. The four categories that benefits can be achieved are:

- Water Quantity
- Water Quality
- Amenity
- Biodiversity

All storm drainage work within the proposed development lands shall be designed as constructed in accordance with the following:

GDSDS

CIRIA SuDS Manual (C753)

The criteria set out in the above will help confirm the surface water strategy and SuDS management train of the development.

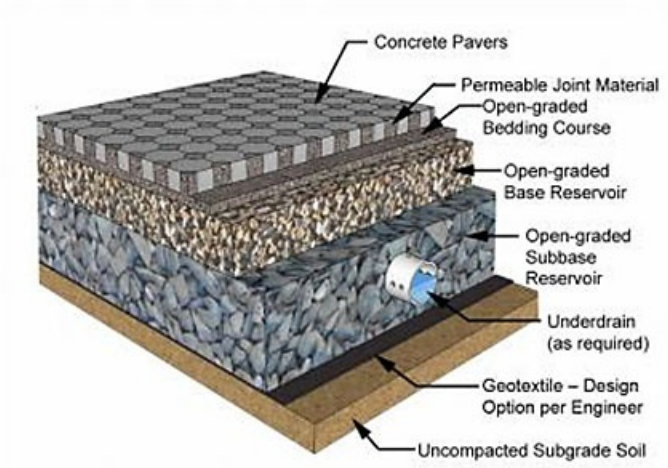

Figure 04 – Typical permeable paving at ground level.

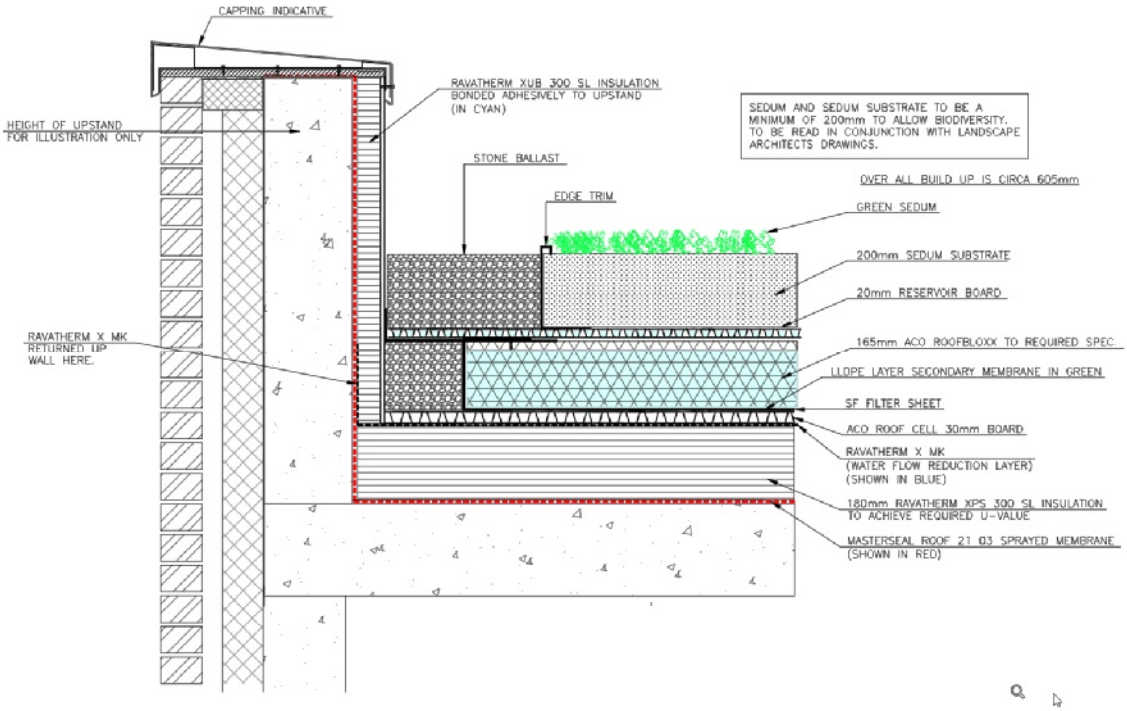

Figure 05 – Green and Blue Roof (Minimum 200mm substrate)

Figure 06 – Tree Pits

5.2 SuDS Management Train

An important concept when designing SuDS is the management train. By passing water through several stages of treatment, sediment and other pollutants will be removed and maintenance costs are reduced.

Taking into account the location of this difficult infill site, the proposed development shall incorporate a number of different SuDS components adapted to the local context ensuring that runoff is manged at source:

- The top most roof and lower terraces shall be a minimum of 70% Green and 100% Blue roofs, intercepting / treating the first 5mm of rainfall and also attenuating storm water. If the 70% green roof cannot be achieved on the top most roof due to plant, it shall be compensated by the Green and Blue Terrace 01 and 02 at fifth floor.

- All paving in the central courtyard shall be permeable paving, intercepting / treating the first 5mm of rainfall. Even if the soil has poor infiltration some infiltration will take place in the stone below the areas and the overflow pipe will retain flow which will slowly infiltrate or evaporate. See landscape architects drawing for layouts.

- Soft landscaping shall allow interception / treatment. Soft landscaping shall also incorporate tree pits which provide long term SuDS benefits such as attenuating surface water and filtering out pollutants. See landscape architects drawing for layouts.

- 3 No SuDS tree pits are proposed for the development.

- Rainwater harvesting tank for irrigation of ground floor landscaping.

5.3 Green and Blue Roofs Areas and Ground Level Areas

The total attenuation required is 96.21m³, say 97m³, see attenuation calculations in Appendix 2. Storm water discharging to the Green and Blues roofs shall be attenuated on the roofs. Storm water discharging to the ground and other surfaces shall be attenuated in Wavin Aquacells at ground level and the 3 no Tree Pits.

Description	Total Area	% Site Coverage
Green and Blue Roof 01:	46m²	2.38%
Green and Blue Roof 02:	907m²	46.87%
Green and Blue Terrace 01:	204m²	10.54%
Green and Blue Terrace 02:	61.5m²	3.18%
Ground Level:		
Soft Landscaping:	154m²	7.96%
Permeable paving at GF:	271m²	14%
Other Hard Areas:	291.5²	15.06%
Total:	1935m²	100%

5.4 Storage and discharge rates from the Green and Blue Roofs

Volume and discharge from the Green and Blue roofs are to be proportional to site coverage and overall volume required to be attenuated (97m³) and overall discharge of 2 l/s for the site:

Description	% Site Coverage	Volume	Discharge
Green and Blue Roof 01:	2.38%	2.31m³	0.048 l/s
Green and Blue Roof 02:	46.84%	45.46m³	0.94 l/s
Green and Blue Terrace 01:	10.54%	10.22m³	0.21 l/s
Green and Blue Terrace 02:	3.18%	3.08m³	0.06 l/s
Total:		61.07m³	1.26 l/s

The remaining (97m³ – 61.07m³) 35.93m³ attenuation will be provided at ground level by 3 No tree pits and Wavin Aquacell.

5.5 Interception and treatment

Interception and treatment storage will be provided by the Green and Blue roofs, soft landscaping and permeable paving at ground level.

5.6 SuDS Tree Pits

3 no SuDS tree pits are proposed, see also Landscape Architects drawing. It is proposed to install "GreenBlue" tree pits which have 20% voids by volume which reduces the size of the attenuation tank required. Tree pits minimum of 2m x 2m x 1.0Dp x 20% voids = 0.8m³ Storage each

SuDS Tree Pit 01:	0.8m³
SuDS Tree Pit 02:	0.8m³
SuDS Tree Pit 03:	0.8m³
Total:	2.4m³

5.6 Rainwater Harvesting

Due to the complexity of the project, roof types, roof setbacks, podium suspended slab and complexity of the plumbing for a dual system, rainwater harvesting is not suitable for internal use in toilets.

But rainwater harvesting tank is suitable for irrigation and watering the planting within the central courtyard. It is proposed to install a 6m³ KJingspan Aqua Harvest or similar rain water harvesting tank with overflow to the attenuation tank at ground level, see Appendix 9.

5.7 GDSDS Table 6.3 Criterion

In accordance with the GDSDS the criterion requirements as set out in Table 6.3 are to be complied with in the following manner;

- Criterion 1 – River Water Quality Protection

  Interception Storage of 5mm of rainfall will be achieved through the use of the green & blue roofs, permeable parking, permeable gravel path and porous access road at ground level:

Green and Blue Roofs:

Total storage:		61.07m³

Tree Pits:

Total storage:		2.4m³

Permeable Paving:

Total area:		271m²
Stone (30% voids)		0.25m
Volume provided:	271m² x 0.25m x 30% voids:	20.3m³

Total interception storage provided: 61.07m³ + 2.4m³ + 20.3m³: 83.77m³
Interception volume is required to cater for 5mm rainfall on paved (impervious) surfaces. We have conservatively included the whole site, 1935m²

Interception volume required = 1935 * 0.005 = 9.7m³

Interception volume provided is 83.77m³ and interception volume required is 9.7m³.

As the interception volume is provided, no further treatment volume is necessary for this development (ref. GDSDS volume 2, chapter 6, table 6.3).

Criterion 2 – River Regime Protection
Surface water discharge from the proposed development will be restricted to an equivalent rate of 2.0l/s. This will be achieved with the provision of a flow control device at the outfall manhole and Green & Blue Roofs outlets.

Criterion 3 – Level of Service (Flooding) Site
Development located at Flood Zone C
See separate JBA Flood Risk Assessment.

Criterion 4 – River Flood Protection

As outlined above, the runoff from the site will be limited to a maximum of 2.0l/s for the proposed development. This in accordance with guidelines set out in the GDSDS Volume 2.

Also, the site is 100% hard standing and not attenuated.

The current discharge to the combined sewer, if we use the 1 hour 100 year storm event: 0.0386m/h x 1935m² x 1000/60x60 = 20.4l/s

A reduction of 20.4 l/s – 2 l/s = 18.4 l/s

5.8 Attenuation Storage

DCC require that attenuation storage is provided to store the storm water from the GDSDS Design Storm – 30yr, 1-hr flood. In addition, because the whole site is taken up with the development, the 100yr 6-hr flood will also be attenuated which equates to 97m³ total storage, see Appendix 2.

61.07m³ will be attenuated on the Green and Blue roofs,

2.4m³ will be stored in the 3 No tree pits.

20.3m³ of additional storage is available in the permeable paving, which is ignored.

Remaining (97m³ - 61.07m³ - 2.4m³) 33.53m³ will be attenuated at ground level in the Wavin Aquacell:

Required:		33.53m³
Provided:	7m x 7m x 0.8m deep x 95% voids =	37.24m³

5.9 Landscaping

See Landscape Architects drawings.

5.10 Hydrobrake / Connection to Uisce Eireann 300Ø Combined Sewer

A hydro-brake will be fitted to the outfall manhole SMH01.

A HDR Hydrobrake Optimum Flow Control limiting outflow to 2.0 l/s (limited to 2l/s for operational purposes) will be fitted to the outfall surface water manhole, located on the east side of the site which then discharges to the 300Ø public combined sewer in Donovan Lane.

5.11 Petrol Interceptor

No car parking, no petrol interceptor required.

6. Water Supply

6.1 Existing Water Supply

Records obtained from Uisce Eireann indicate a number of public mains in the vicinity of the proposed development:

- 150Ø DI watermains to the west of the proposed development on Blackpitts
- 110Ø MOPVC watermains to the west of the proposed development Hammond Street.
- 100Ø DI watermains to the north east of the proposed development in Donovan Lane.

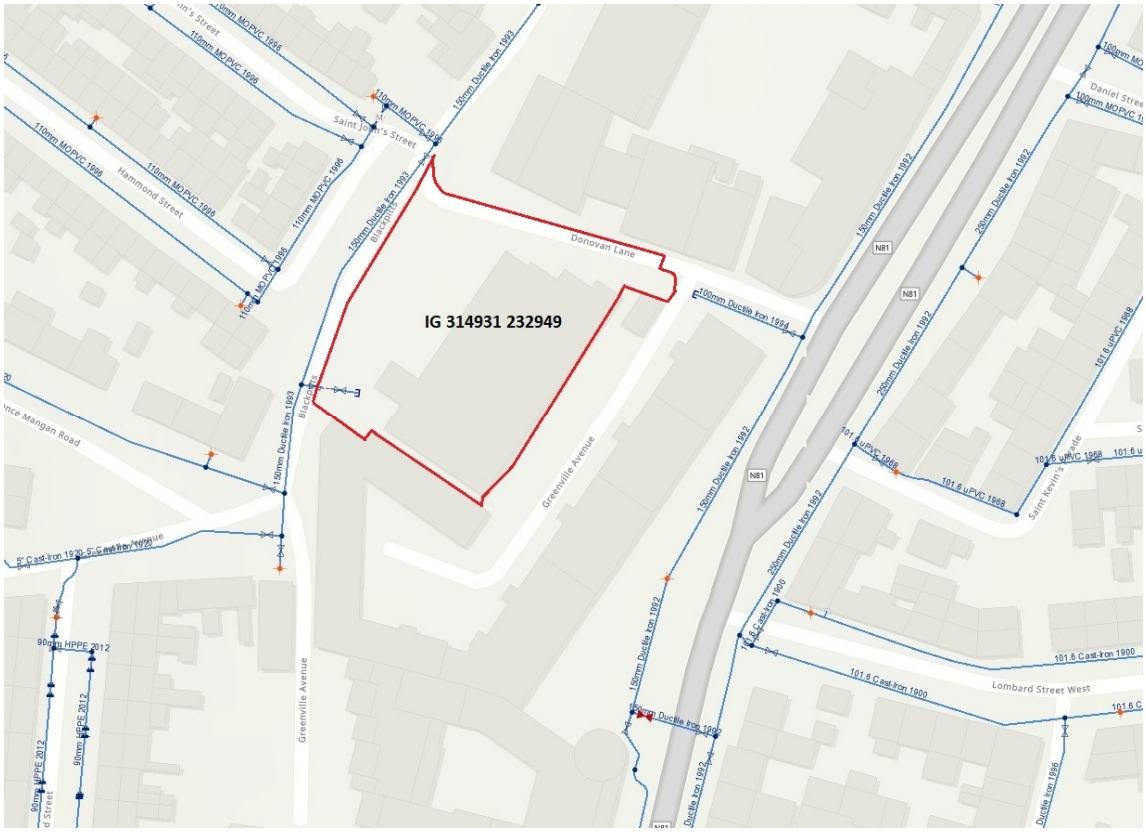

Figure 07 – Existing Watermain

6.2 Proposed Water Supply

Student Accommodation:
Average Daily Demand (213 Rooms, 217 Bed spaces)
150 ltr/person/day x 1.0 student per 217 bed spaces =
32,550 ltr/ day

Average day / Peak Week
32,550 / (60x60x24) = 0.38 ltr/ sec
0.38 X 1.25 = 0.48 ltr/sec IW Factor for Peak: 1.25

Peak Demand
0.48 X 5 = 2.4 ltr/sec

It is proposed to upgrade the existing connection to a new 100Ø connection from the existing 150Ø DI public mains in Blackpitts.

Water metering will be in accordance with the requirements of Uisce Eireann.

Pressure boosting and storage will be to the requirements of Dublin City Council / Uisce Eireann. Design Details for pressure boosting and storage will be agreed with Dublin City Council Water Services Division/Uisce Eireann prior to development commencing on site.

7. Flood Risk Assessment

Flood Risk Assessment for the proposed development has been prepared by JBA.

8. Response to Stage 2 LRD Opinion (Surface Water Management)

2a. Engineering Report notes that the development is unable to connect to 600mm dia public surface water sewer in Clanbrassil Street, which would be the preferred option. Invert of the sewer at Clanbrassil Street is too high to facilitate a gravity connection from the site. Only other option is to connect to the combined sewer network.

Connection to combined sewer will be used.

2b. Overall attenuation volume required is 97m3. Some of this will be stored in blue roofs.

As per calculation attached.

2c. Indicated surface water discharge rate from the site is 2l/s.

As per calculation attached.

2.d Possibility of incorporating rainwater harvesting for the blue roof areas should be investigated.

Rainwater harvesting has been included, see section 5.6 above.

2.e Flow control manhole should include a penstock valve as per detail included in the Greater Dublin Regional COP for Drainage works.

Manhole S02 has been amended to include a penstock, see revised drawings C2 and C6.

2.f An extra manhole will be required at the SW outfall connection to the combined sewer to accommodate an intercepting trap to stop foul odour coming back up the line.

Extra manhole has been added, hydro-brake and broads-traps are in sperate manholes, see updated drawing C2 and C6.

2.g Detail should be provided on the green / blue roof flow restrictor.

See Appendix 6 for ACO blue roof flow restrictor.

Appendix 1 - Rainfall Data

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 313931, Northing: 232993,

	Interval		Years											
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.4,	3.5,	4.1,	5.0,	5.6,	6.1,	7.7,	9.6,	10.8,	12.6,	14.2,	15.4,	17.3,	18.8,	20.1,	N/A ,
10 mins	3.4,	4.9,	5.7,	7.0,	7.9,	8.5,	10.8,	13.4,	15.1,	17.5,	19.8,	21.5,	24.2,	26.3,	28.0,	N/A ,
15 mins	4.0,	5.8,	6.7,	8.2,	9.3,	10.0,	12.7,	15.7,	17.8,	20.6,	23.2,	25.3,	28.4,	30.9,	32.9,	N/A ,
30 mins	5.3,	7.5,	8.7,	10.6,	11.9,	12.8,	16.1,	19.8,	22.2,	25.7,	28.8,	31.2,	35.0,	37.9,	40.3,	N/A ,
1 hours	7.0,	9.8,	11.3,	13.6,	15.2,	16.4,	20.4,	24.9,	27.8,	32.0,	35.7,	38.6,	43.1,	46.5,	49.4,	N/A ,
2 hours	9.2,	12.8,	14.7,	17.6,	19.5,	21.0,	25.8,	31.3,	34.9,	39.9,	44.3,	47.8,	53.0,	57.1,	60.5,	N/A ,
3 hours	10.8,	14.9,	17.1,	20.4,	22.5,	24.2,	29.7,	35.8,	39.8,	45.3,	50.3,	54.1,	59.9,	64.4,	68.1,	N/A ,
4 hours	12.2,	16.7,	19.1,	22.6,	25.0,	26.8,	32.7,	39.4,	43.7,	49.7,	55.0,	59.0,	65.3,	70.1,	74.1,	N/A ,
6 hours	14.3,	19.5,	22.2,	26.2,	28.9,	31.0,	37.6,	45.0,	49.8,	56.5,	62.3,	66.8,	73.7,	79.0,	83.4,	N/A ,
9 hours	16.9,	22.8,	25.9,	30.4,	33.4,	35.8,	43.2,	51.5,	56.8,	64.2,	70.7,	75.7,	83.3,	89.1,	93.9,	N/A ,
12 hours	18.9,	25.4,	28.8,	33.8,	37.1,	39.6,	47.7,	56.6,	62.4,	70.3,	77.3,	82.6,	90.8,	97.0,	102.1,	N/A ,
18 hours	22.3,	29.7,	33.5,	39.2,	42.9,	45.7,	54.8,	64.7,	71.1,	80.0,	87.7,	93.6,	102.5,	109.4,	115.0,	N/A ,
24 hours	25.0,	33.2,	37.4,	43.5,	47.5,	50.6,	60.4,	71.2,	78.1,	87.6,	95.9,	102.2,	111.8,	119.1,	125.1,	145.6,
2 days	30.7,	39.9,	44.6,	51.4,	55.8,	59.2,	69.9,	81.4,	88.7,	98.7,	107.4,	113.9,	123.8,	131.4,	137.5,	158.4,
3 days	35.3,	45.4,	50.5,	57.8,	62.6,	66.2,	77.6,	89.7,	97.4,	107.9,	117.0,	123.8,	134.1,	141.9,	148.2,	169.7,
4 days	39.4,	50.2,	55.6,	63.4,	68.5,	72.3,	84.2,	97.0,	105.1,	116.0,	125.4,	132.5,	143.1,	151.2,	157.7,	179.8,
6 days	46.4,	58.5,	64.5,	73.1,	78.7,	82.8,	95.9,	109.7,	118.3,	130.0,	140.1,	147.6,	158.9,	167.4,	174.2,	197.5,
8 days	52.6,	65.8,	72.3,	81.6,	87.6,	92.0,	106.0,	120.7,	129.9,	142.2,	152.8,	160.7,	172.6,	181.5,	188.7,	212.9,
10 days	58.3,	72.4,	79.4,	89.3,	95.6,	100.4,	115.1,	130.6,	140.3,	153.3,	164.3,	172.6,	184.9,	194.2,	201.7,	226.8,
12 days	63.6,	78.6,	86.0,	96.4,	103.1,	108.1,	123.6,	139.8,	149.9,	163.4,	174.9,	183.5,	196.3,	205.9,	213.7,	239.6,
16 days	73.4,	90.0,	98.1,	109.5,	116.8,	122.2,	139.0,	156.5,	167.4,	181.9,	194.2,	203.4,	217.0,	227.2,	235.4,	262.9,
20 days	82.4,	100.4,	109.2,	121.5,	129.3,	135.1,	153.1,	171.7,	183.3,	198.7,	211.7,	221.4,	235.7,	246.5,	255.1,	283.9,
25 days	92.9,	112.6,	122.1,	135.3,	143.8,	150.1,	169.3,	189.3,	201.6,	217.9,	231.7,	242.0,	257.2,	268.5,	277.7,	307.9,

NOTES:
N/A Data not available
These values are derived from a Depth Duration Frequency (DDF) Model
For details refer to:
'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

Appendix 2 - Attenuation Calculations

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Project : **Blackpitts**
Job No : **2419-10**

Return Period: 100 Yrs

Site Area: 1935 m² **0.1935 Ha**

Qbar: 2.0 l/s
(Qbar minimum set to 2 l/s for operational purposes)

Surface Water Attenuation Design:

Contribution Areas	**m²**	**% imperv**	**Equivalent Area**
Green and Blue Roof 01 + 02	**953**	**95**	**905 m²**
Green and Blue Terrace 01 + 02	**266**	**95**	**252 m²**
Permeable Paving at Ground Floor	**271**	**90**	**244 m²**
Soft Landscaping	**154**	**30**	**46 m²**
Other Hard Areas	**292**	**100**	**292 m²**
Total:	**1935 m²**		**1739 m²**

Duration (minutes)	Runoff Area (m²)	Rainfall (mm)	Rainfall + 20% for climate Change	Total surface Water	Allowable Outflow (m³)	Storage required m³
10	1739	21.50	25.80	44.87	1.20	43.67
15	1739	21.60	25.30	44.00	1.80	42.20
30	1739	31.20	37.44	65.11	3.60	61.51
60	1739	38.60	46.32	80.56	7.20	73.36
120	1739	47.80	57.36	99.76	14.40	85.36
240	1739	59.00	70.80	123.13	28.80	94.33
360	1739	66.80	80.16	139.41	43.20	96.21
720	1739	82.60	99.12	172.39	86.40	85.99
1440	1739	102.20	122.64	213.29	172.80	40.49
2880	1739	113.90	136.68	237.71	345.60	-107.89
Max Storage Capacity Required incl 20% climate change						**96.21**

Appendix 3 - Storm Water Management Plan

1.1 General

The extent of the SWMP shall be kept simple due to the relatively small nature of the infill site / development. SWMP to be read in conjunction with JJ Campbell and Associates civil drawings and drainage report.

1.2 Flood Risk Assessment (FRA):

The site is a brown field site with no history of previous flooding. Review of the available sources of flooding indicates there are no instances of historic flooding on site.

Review of the fluvial flood maps confirm that the site is in Flood Zone C and is considered to be low risk of inundation from fluvial flooding.

See separate JBA FRA for the development.

1.3 Overview of Storm Water Management:

1.3.1 Existing Storm Water

Storm water from the existing site is currently not attenuated and discharges directly to the combined sewer in Blackpitts. The proposed development and storm water management will greatly reduce storm water discharge to the public sewers.

1.3.2 Proposed Storm water

1.3.2.1 Proposed Roof

The roof design incorporates a Beton / ACO Green and Blue roof. All storm water falling on the roofs, including parapets and lift pits projections etc shall be attenuated on the Green and Blue Roof. The Green and Blue roof also allow for interception of the first 5mm of rainfall. The minimum area of Green and Blue is 70% with a discharge at an overall rate of 1.07 l/s for the roofs. A full design of the Green and Blue roof shall be carried out by the specialist designer / installer, Beton/ACO.

1.3.2.2 Ground Level

The use of soft landscaping and concrete paving ensures that all storm water falling at ground level is intercepted at source.

Wavin Aquacell attenuation and 3 no Tree Pits shall attenuate storm water falling at ground level.

1.3.2.3 Discharge to the Public Storm Network

All proposed storm water shall be separate to the foul within the development and shall discharge to the 300Ø combined sewer in Donovan Lane.

1.4 SuDS

Requirement of section 7.3, SuDS of the of the Sustainable Drainage Design and Evaluation Guide (2021) have been considered. The site is a small infill site with limited scope for extensive SuDS.

At roof levels, interception of rainfall is catered for through the use of a Green and Blue Roof. Storm water is intercepted and attenuated at roof level and the discharge limited to 1.07 l/s.

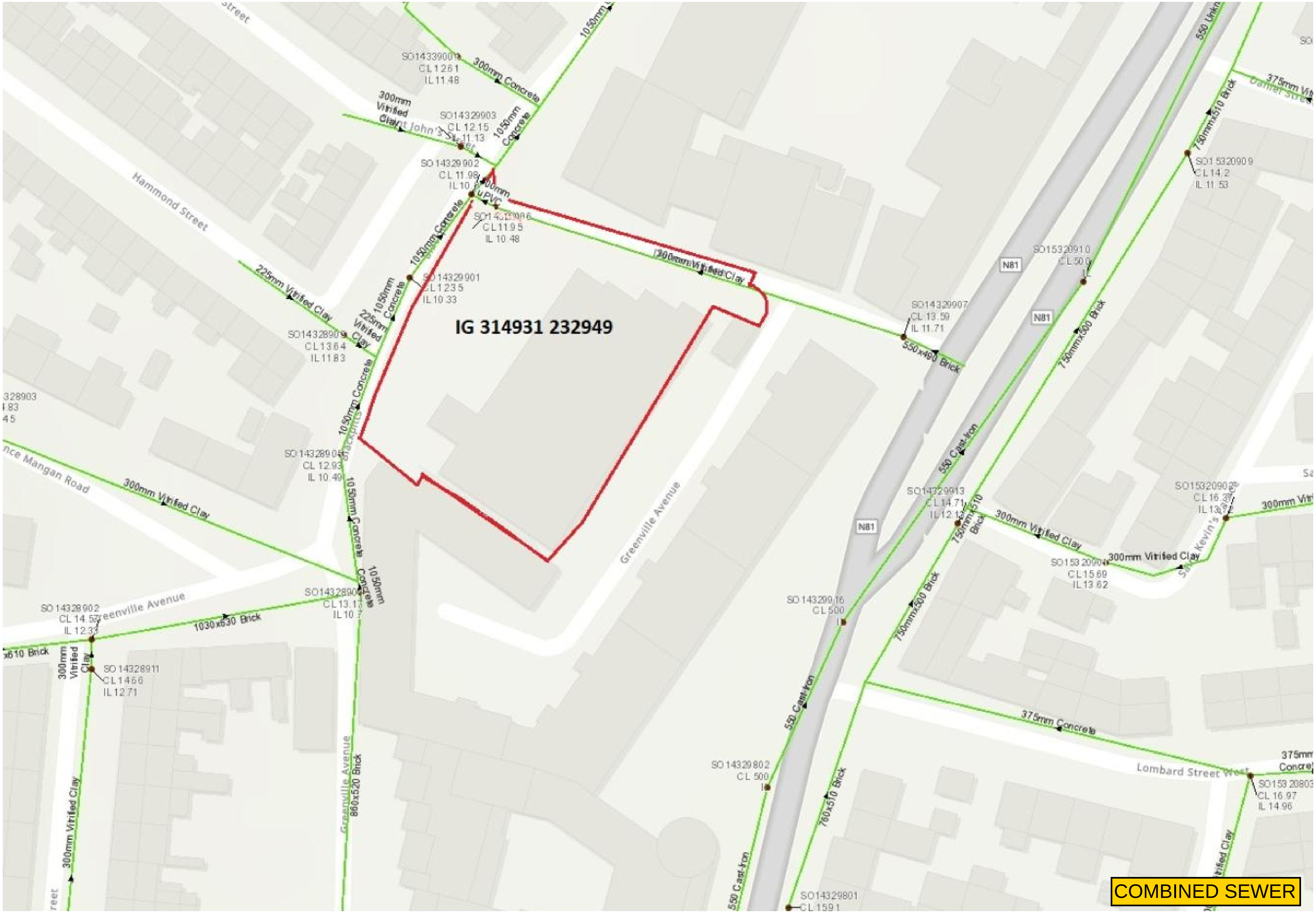
At ground level interception and treatment of rainfall is catered for by planting / soft landscaping and tee pits as shown on Landscaping drawings.

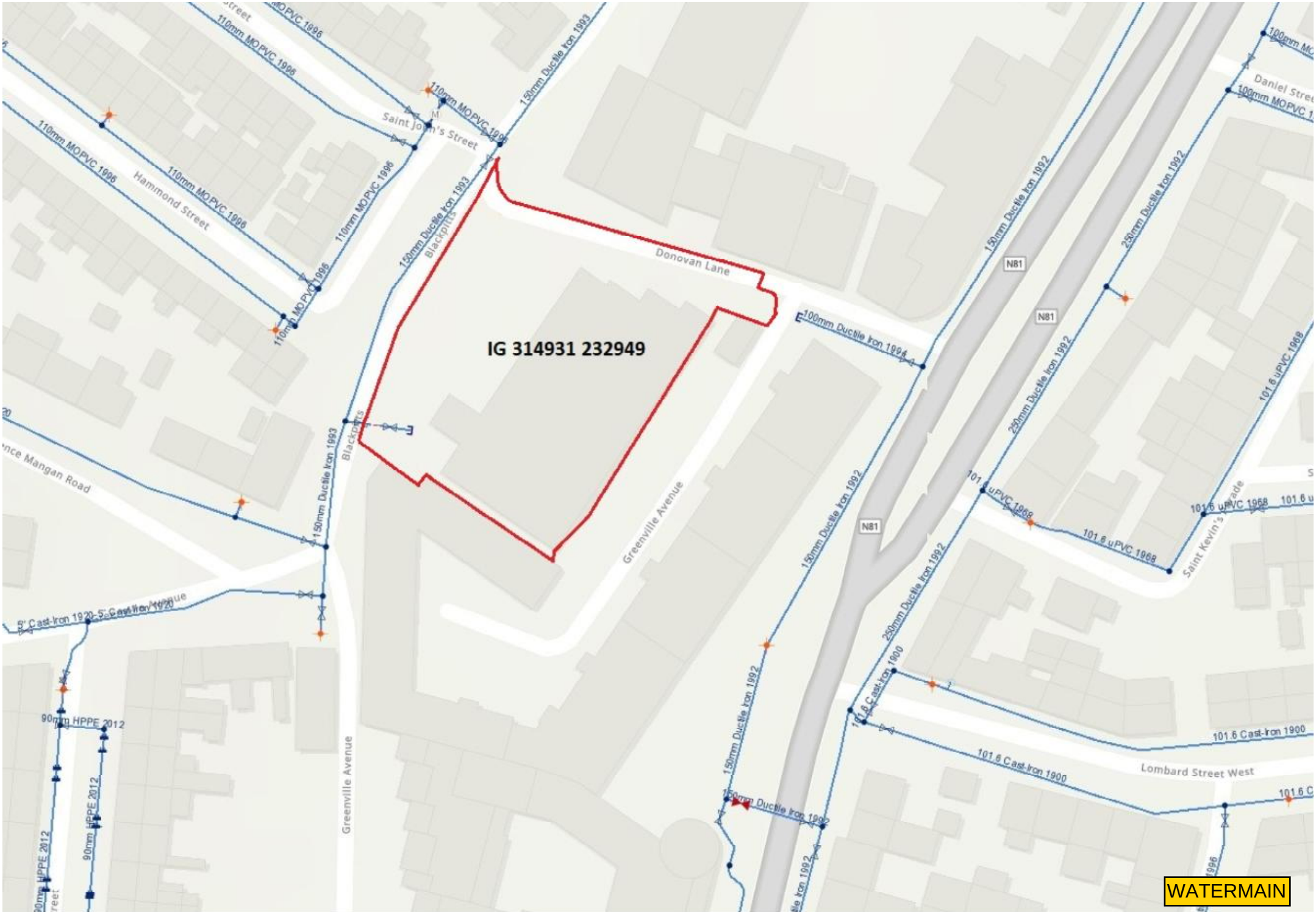
Control of runoff is through the Green and Blue roofs, 3 No Tree Pits and Wavin Aquacell attenuation, discharge for the whole site is limited to 2l/s in Hydro-Brake at manhole SMH01.

1.5 Conclusion

Having regard to GGSDS, DCC Sustainable Drainage Design and Evaluation Guide 2021 and CIRIA design guides on SuDS, a wide range of measures have been considered for the design and management of storm water for the proposed development. These measures will ensure that best practice for the management of storm water can be achieved for the proposed development.

Appendix 4 - Uisce Eireann Maps


IG 314931 232949
COMBINED SEWER
Hammond Street
Greenville Avenue
Lombard Street West
Mangan Road
N81
300mm Concrete
1050mm Concrete
300mm Vitrified Clay
225mm Vitrified Clay
300mm uPVC
1030x630 Brick
860x520 Brick
550x490 Brick
550 Cast-Iron
750mmx500 Brick
750mmx510 Brick
760x510 Brick
375mm Concrete
SO14339001
CL 12.61
IL 11.48
SO14329903
CL 12.15
IL 11.13
SO14329902
CL 11.98
SO14329901
CL 12.35
IL 10.33
CL 11.95
IL 10.48
SO14328909
CL 13.64
IL 11.83
SO14328905
CL 12.93
IL 10.49
SO14328902
CL 14.57
IL 12.33
SO14328911
CL 14.66
IL 12.71
SO14329907
CL 13.59
IL 11.71
SO15320910
CL 5.00
SO15320909
CL 14.2
IL 11.53
SO14329913
CL 14.71
SO15320904
CL 15.69
IL 13.62
SO14329916
CL 5.00
SO14329802
CL 5.00
SO14329801
CL 15.91
SO15320803
CL 16.97
IL 14.96


IG 314931 232949
Donovan Lane
Greenville Avenue
Blackpitts
Hammond Street
Saint John's Street
Daniel Street
Saint Kevin's Parade
Lombard Street West
Nance Mangan Road
N81
110mm MOPVC 1996
150mm Ductile Iron 1993
150mm Ductile Iron 1992
100mm Ductile Iron 1994
250mm Ductile Iron 1992
101.6 uPVC 1968
101.6 Cast-Iron 1900
90mm HPPE 2012
WATERMAIN


IG 314931 232949
Saint John's Street
Hammond Street
Blackpitts
Donovan Lane
Greenville Avenue
Greenville Avenue
Greenville Avenue
Lombard Street West
Saint Kevin's Parade
Daniel Stree
N81
N81
N81
SD15330002
CL 13.874
IL 11.864
225mm Concrete
600mm Concrete
SD15320908
CL 14.096
IL 12.096
600mm Concrete
150mm Vitrified Clay
SD14329909
CL 14.848
IL 13.038
600mm Concrete
SD14329803
CL 15.46
IL 13.46
STORM WATER

Appendix 5 – Uisce Eireann
Confirmation of Feasibility
Statement of Design Acceptance

CONFIRMATION OF FEASIBILITY

Marcus Wallace

JJ Campbell & Assoc.
F1 Nutgrove Office Park
Rathfarnham
Dublin 14
D14 A895

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

20 November 2024

Our Ref: CDS24009260 Pre-Connection Enquiry
Warehouse Site, Blackpitts, Dublin 8

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 Student Accommodation at Warehouse Site, Blackpitts, Dublin 8, (the **Development)**.

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

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

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

- The Development has to incorporate Sustainable Drainage Systems/ Attenuation in the management of storm water and to reduce surface water inflow into the receiving combined sewer. 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/

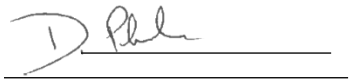
Where can you find more information?

- **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

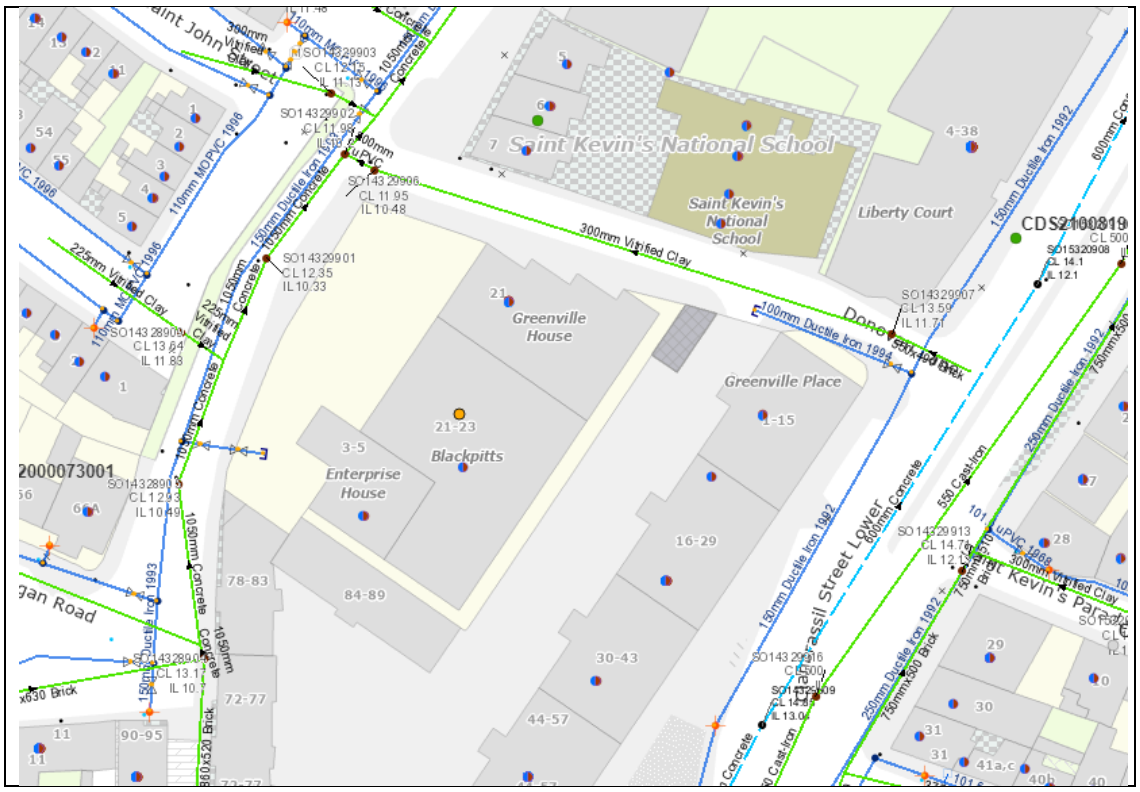
Section A - What is important to know?

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.

Marcus Wallace
JJ Campbell & Assoc
F1 Nutgrove Office Park
Rathfarnham
Dublin 14
D14 A895

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

2 April 2025

Re: Design Submission for Warehouse Site, Blackpitts, Dublin 8, Dublin (the "Development")
(the "Design Submission") / Connection Reference No: CDS24009260

Dear Marcus Wallace,

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: Alicia Ros Bernal
Email: ailciarosbernal.bernal@water.ie

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

Appendix A

Document Title & Revision

- C1 - Basement Plan
- C2 - GF Plan - Foul and Storm
- C3 - GF Plan – Watermain
- C7 - Sections

Additional Comments

Foul sewer pipe materials shall be specified at the Connection Application stage, in accordance with Section 3.13 of the Wastewater Code of Practice.

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.

Appendix 6 - Green and Blue Roof Details
Roof Outlet Flow Control

ACO. creating
the future of drainage

ACO Blue Roof Flow Restrictor and Overflow

ACO offers a Blue Roof Flow Restrictor and Overflow as a means of safely controlling the rate of runoff from a blue roof, without overloading the roof structure.

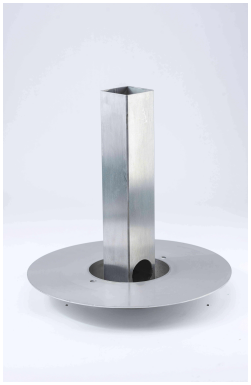
The restrictor and overflow have been primarily designed for use with the ACO range of HP vertical spigot and screw, 45- and 90-degree roof outlets and accessories, however other types and make of roof outlet can be accommodated – please consult with ACO Design Services for further information.

The design of the restrictor is individually tailored to suit the site-specific requirements for each blue or blue green roof allowing the SuDS design to be optimised. The design of the flow restrictor(s) can be carried out with tailored roofs designed to BSEN12056-3:2000 and /or to attenuation sizing principles. The number and size of flow restrictors required is project specific, and Individual overflows should be provided to all roof outlets not fitted with a flow restrictor.

System Overview

Product Type	Nominal Size (mm)	Diameter (mm)	Overflow
50/75 Blue Roof Flow Restrictor	50 & 75	300	Height to suit max storage Depth
100/150 Blue Roof Flow Restrictor	100 & 150	380	Height to suit max storage Depth
50/75 Blue Roof Flow Overflow	50 & 75	300	Height to suit max storage Depth
75/150 Blue Roof Flow Overflow	100 & 150	380	Height to suit max storage Depth

Blue Roof Overflow



Blue Roof Restrictor 100/150

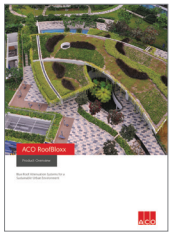
Blue Roof Restrictor 50/75

ACO Blue Flow Restrictor and Overflow Key Features

- Manufactured from corrosion-resistant 304 grade stainless.
- Built-in overflow– provides a failsafe drainage solution.
- The orifice height can be positioned so water can be retained on the roof for passive irrigation of a green roof.
- Larger single orifice is less prone to blockages - if the system is designed using attenuation principles using the ACO Patent Pending Blue Roof Attenuation System.
- Wide flange and Clamping Ring allows the secondary membrane to be dressed and sealed and clamped around the outlet without disturbing the roofing membrane seal.
- The position of the orifice ensures that the roof membrane clamp ring seal is not subjected to prolonged periods of hydrostatic pressure when surcharged.
- Coded solid cover (with vent) ensures the restrictor position is easily identified and prevents debris from entering and potentially blocking the outlet.
- Can be used with the ACO RoofBloxx Diffuser unit to provide great access for maintenance.

Note

Provided the Blue Roof attenuation and drainage system is designed using the ACO RoofBloxx Patent Pending system the roof drainage will comply with both the requirements of BS12056-3:2000 and will also meet the site discharge parameters required under planning conditions.

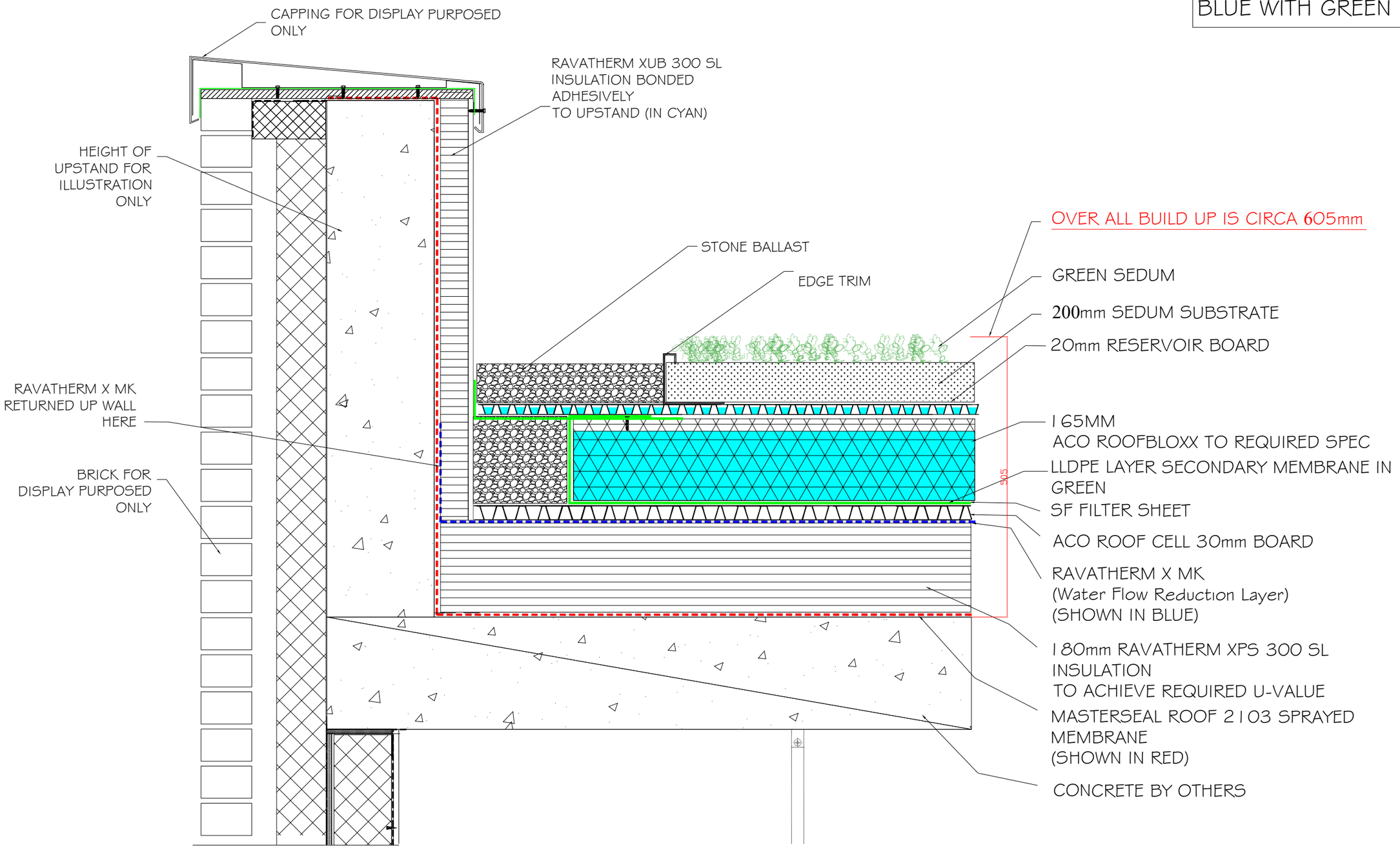


To download a copy of the ACO RoofBloxx Product Overview brochure visit **www.aco.co.uk/ products/roofbloxx**

ACO Building Drainage Contacts:
e-mail Customer Enquiries: abdcommercial@aco.co.uk
e-mail Technical: abdtechnical@aco.co.uk
Tel: 01462 810411
www.aco.co.uk

ACO. creating the future of drainage

TYPICAL PARAPET
BLUE WITH GREEN ROOF DETAIL;



TYPICAL PARAPET BLUE WITH GREEN ROOF DETAIL

Cork
Beton Construction Services Ltd
Heron Court, Market Quay,
Bandon,
Co.Cork
Phone: +353 23 88 542 31

Dublin
Beton Construction Services Ltd
Unit B14, Aerodrome Business Park
Rathcoole
D24 NW93.
Phone: +353 1 401 6402

TITLE:
TYPICAL PARAPET BLUE WITH GREEN ROOF DETAIL;

Project : Blackpitts

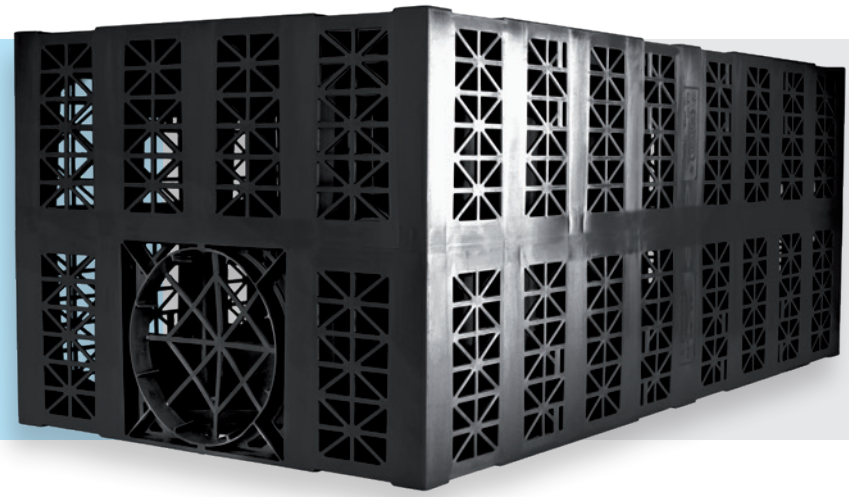
Scale: NTS	Drawn No: DB-2024-01-01	
Drawn by: AM	Date: 15-07-2024	REV: 1

Note: This Drawing is for illustration purposed only and not considered a working drawing.

Appendix 7 – Wavin AquaceII

Product Datasheet

AquaCell Core-R



Product description

AquaCell Core-R has been designed for use in deep applications, subject to regular and heavy traffic loadings, e.g. cars and HGV's. AquaCell Core-R can also be used in both landscaped and deep soakaway applications.

Technical specification

Product code / SAP code	6LB150 / 4064830	**Void ratio**	95%
Colour	Black	**Material**	Recycled PP
Dimensions	1m x 0.5m x 0.4m	**Vertical loading**	66.9 tonnes/m^2 (669 kN/m^2)
Weight	11.5kg	**Lateral loading**	12.3 tonnes/m^2 (123 kN/m^2)
Storage volume	190 litres	**BBA approval**	Certificate 03/4018

Maximum installation depths

Typical soil type	**Maximum depth of installation – to base of units (m)[1]**				
	Soil weight kN/m^3	**Angle of internal friction φ (degrees)[2, 3]**	**Landscaped areas**	**Vehicle mass <9 tonnes[4, 5]**	**Vehicle mass <44 tonnes**
Over consolidated stiff clay	20	24	3.85	3.61	3.36
Silty sandy clay	19	26	4.35	4.09	3.83
Loose sand and gravel	18	30	5.34	5.06	4.78
Medium dense sand and gravel	19	34	5.94	5.68	5.41
Dense sand and gravel	20	38	6.68	6.43	6.18

Minimum cover depths

	Landscaped areas	**Car parks with vehicle mass <3 tonnes[5]**	**Car parks with vehicle mass <9 tonnes**	**Car parks with vehicle mass <12 tonnes**	**Low speed roads with vehicle mass <60 tonnes**
Minimum cover depth (m)	0.30	0.50	0.60	0.70	1.11

1. Without groundwater present below base of units – AquaCell Core-R may be used where groundwater is present, contact Wavin for technical advice.
2. Loosening of dense sand or softening of clay by water can occur during installation. The designer should allow for any such likely effects when choosing an appropriate value of φ.
3. The design is very sensitive to small changes in the assumed value of φ, therefore, it should be confirmed by a chartered geotechnical engineer. In clay soils, it may be possible to utilise cohesion in some cases.
4. Applicable for car parks or other areas trafficked only by cars or occasional refuse collection trucks or similar vehicles (typically one per week).
5. This category should be used when considering landscaped areas that may be trafficked by ride on mowers.

Assumptions made:

- Ground surface is horizontal
- Shear planes or other weaknesses are not present within the structure of the soil

Source: BBA

Wavin Ireland Ltd | Balbriggan | Co Dublin | K32 K840
Tel 01 8020200 | **Email** info.ie@wavin.com | **Website** www.wavin.ie

June 2021

Appendix 8 – Hydro-Brake

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	0.800	2.000
Flush-Flo™	0.200	1.996
Kick-Flo®	0.463	1.568
Mean Flow		1.728

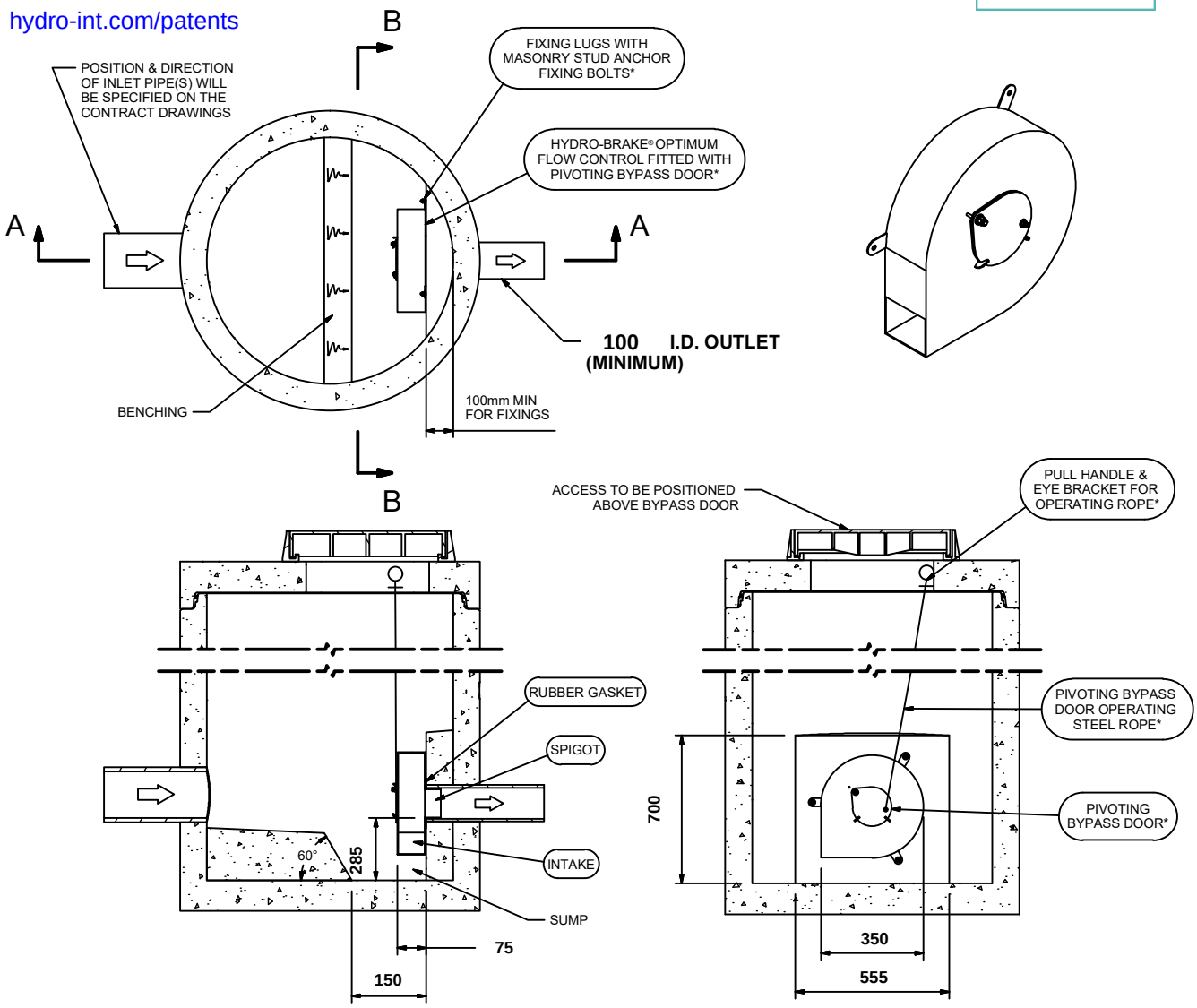
Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Indicative Weight: 10 kg

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 08/4596

wrc approved PT/503/0422 Valid: 01/04/2022 - 31/03/2027

hydro-int.com/patents



SECTION A-A

SECTION B-B

IMPORTANT: ⬭ LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SCL-0066-2000-0800-2000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International A CRH COMPANY

DATE	21/11/2024 09:10
SITE	Blackpitts
DESIGNER	Marcus Wallace
REF	Blackpitts

SCL-0066-2000-0800-2000
Hydro-Brake® Optimum

Hydro International Ltd • Unit 2, Rivermead Court • Kenn Business Park • Windmill Road • Kenn • Clevedon • BS21 6FT • Tel: 01275 878371 • www.hydro-int.com • Email: Enquiries@hydro-int.com

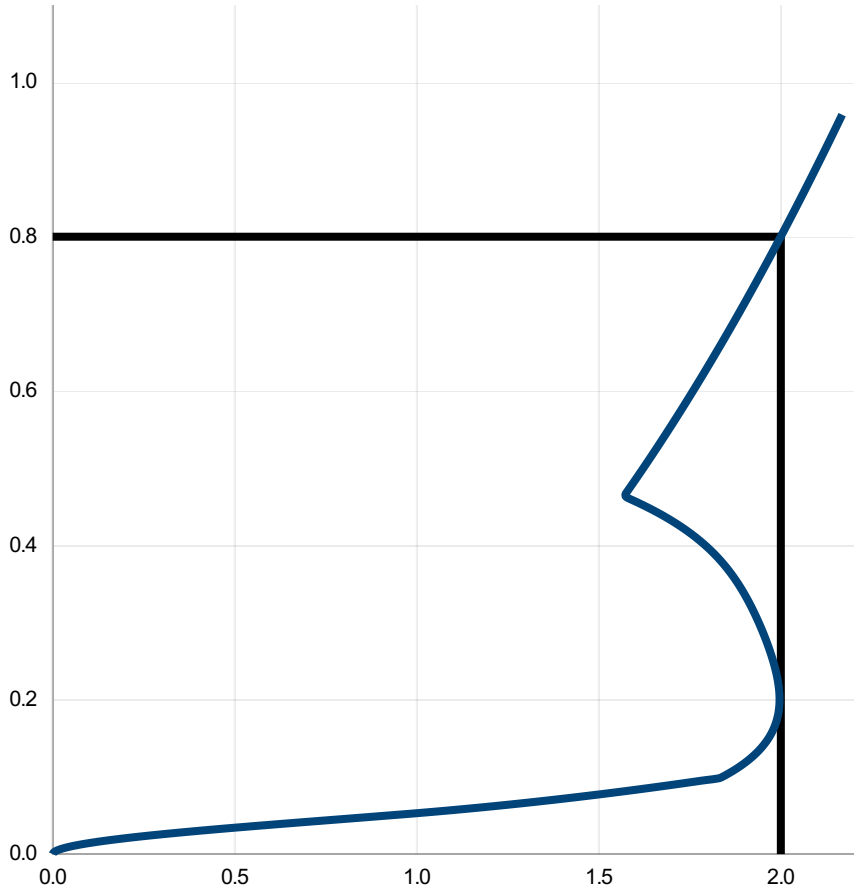
marcus.wallace@jjc.ie

Technical Specification		
Control Point	Head (m)	Flow (l/s)
Primary Design	0.800	2.000
Flush-Flo™	0.200	1.996
Kick-Flo®	0.463	1.568
Mean Flow		1.728

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE No 08/4596

wrc approved™
PT/503/0422
Valid: 01/04/2022 - 31/03/2027

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.028	0.341
0.055	1.054
0.083	1.591
0.110	1.877
0.138	1.947
0.166	1.983
0.193	1.996
0.221	1.993
0.248	1.980
0.276	1.960
0.303	1.936
0.331	1.907
0.359	1.871
0.386	1.823
0.414	1.757
0.441	1.666
0.469	1.577
0.497	1.617
0.524	1.656
0.552	1.694
0.579	1.731
0.607	1.768
0.634	1.803
0.662	1.837
0.690	1.871
0.717	1.904
0.745	1.937
0.772	1.968
0.800	2.000

DESIGN ADVICE

The head/flow characteristics of this SCL-0066-2000-0800-2000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

Hydro International
A CRH COMPANY

DATE	21/11/2024 09:10
Site	Blackpitts
DESIGNER	Marcus Wallace
Ref	Blackpitts

SCL-0066-2000-0800-2000

Hydro-Brake® Optimum

Appendix 9 – Rainwater Harvesting Tank

Water Management Solutions

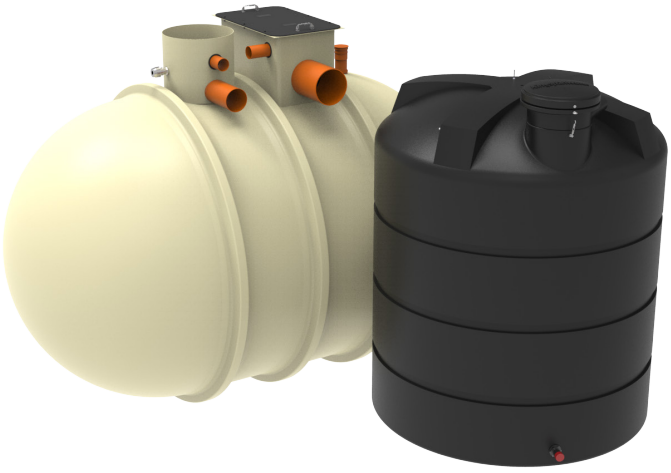
Klargester

AquaHarvest Commercial Rainwater Harvesting Range

Our new Klargester AquaHarvest products provides a fully integrated solution suitable for commercial buildings, vehicle washing facilities amongst other domestic and commercial settings. Made from durable materials you can future-proof your project against water shortages with this sophisticated rainwater harvesting system.

Why choose an AquaHarvest solution?

- 1 year warranty (terms apply)*
- Fully compliant against EN 16941-1:2018
- Features intelligent Grundfos pump for total reliability
- 3 stage filtration (leaf, pump and in line filters)
- Smart design featuring a calmed inlet at the bottom of the tank
- Service support with commissioning (subject to additional cost)



As part of our Planet Passionate programme, Kingspan are dedicated to delivering innovative surface water management technologies, developed on the back of 65 years' experience.

*Terms and conditions apply. View online at https://www.kingspan.com/gb/en-gb/products/wastewater-management/warranty-terms

WE ARE PLANET PASSIONATE

Klargester AquaHarvest
Commercial Rainwater Harvesting Range

How it works

Rainwater directed to the system is firstly filtered by an integral leaf filter, before furthering filtering on the pump inlet. Final fine filtration is catered for by the inline filter supplied as part of the kit. The Grundfos 'intelligent' pump has the necessary sensors to allow automatic operation when demand is called for by drop of pressure in the system. If the storage tank has a low level of rainwater, there is a small automatic charge of mains water into the tank to ensure the system never runs dry (not applicable to Above Ground Solutions). The main advantage of this system is that rainwater is delivered to the appliances at mains pressure or higher.

Typical Applications:

- Self Build
- Commercial Buildings
- Vehicle Washing Facilities
- Plant /Tool Hire Washing Facilities
- Garden Centres
- Golf Courses
  (Green and Equipment Maintenance)

AquaHarvest Commerical Rainwater Harvesting Range	
Product	**Capacity (ltrs)**
Below Ground	6,000-79,000
Above Ground	6,000
Above Ground	8,450

For more information on any of our products: **T:** +44 (0)1296 633 033
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