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**Proposed Apartment Development
Rathdown Motors
Terenure
Dublin**

**PLANNING SUBMISSION
DRAINAGE DESIGN REPORT**

Prepared by ONCE, Consulting Engineers

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1. INTRODUCTION

ONCE Consultant Engineers have been appointed to undertake a detailed assessment of proposed drainage infrastructure, associated with the proposed development of i) *demolition of commercial buildings at Nos. 1-7 Templeogue Road (Eircode No. D6WW611) and unnamed commercial building fronting Templeogue Road (Eircode No. D6WX688); (ii) demolition of the party boundary wall and non-original single-storey rear returns to the residential buildings at Nos. 16-18 Terenure Road West and provision of new party/ boundary walls to the rear of these properties; (iii) construction of a part-four part-five storey mixed-use block with frontage to Terenure Road West and Templeogue Road comprising 36 no. apartments (13 no. one-bedroom & 23 no. two-bedroom units) and 165sq.m of commercial floor space; (iv) construction of a three storey residential block within the centre of the site comprising 9 no. apartments (2 no. one-bedroom & 7 no. two-bedroom units); (v) provision of an ESB substation accessible via Terenure Road West and provision of service/loading bay and new footpath on Terenure Road West; (vi) provision of surface level carparking areas (20 no. car spaces, 3 no. motorcycle spaces & 1 no. service bay) accessible via Templeogue Road; (vii) all ancillary works necessary to facilitate the development including boundary treatments, landscaping, SuDS drainage works, construction of pedestrian infrastructure, provision of bin/bicycle storage. All residential apartments will be served by private amenity space in the form of a balcony/terrace and will have shared access to an area of communal amenity space at surface level between the proposed blocks at the existing Rathdown Motors site, Terenure, Dublin.*

The site currently contains a single storey commercial unit with car park.

The site is adjacent to and will drain to existing drainage services on the public road.

2. SITE LOCATION

The site is located on the junction of the Templeogue Road and Terenure Road West.

The site is outlined in red on fig 1.

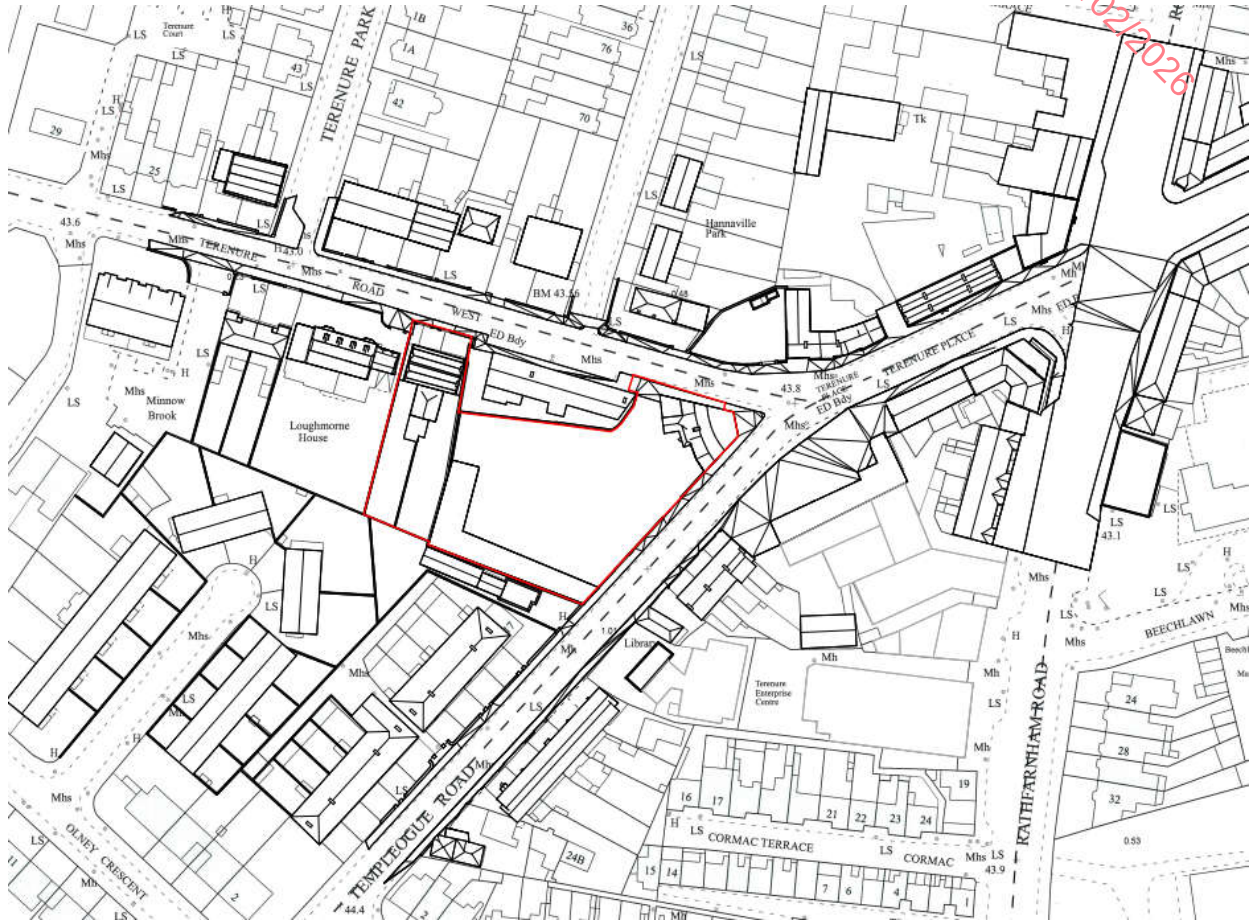


Fig 1 Site location

3. DRAINAGE PROPOSALS

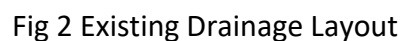
- To collect and discharge the foul sewer to the existing 375mm Clay Uisce Eireann Sewer.
- To intercept all additional surface run-off into a green infrastructure with an overflow to the existing Dublin City Council Surface Drainage Sewer.
- A new connection for a main water supply from Uisce Eireann.

4. EXISTING SITE SERVICES LOCAL AUTHORITY NETWORKS

The existing Foul drainage is connected to the 375mm diameter Vitrified Clay pipes on Templeogue Road and Terenure Road West.

The existing Water main is a 150mm Cast Iron Uisce Eireann pipe on Templeogue Road and Terenure Road West.

The existing service layout is indicated in fig 2.



5. FOUL DESIGN

FOUL SEWER DESIGN

The foul drainage layout is indicated on Site Layout Drawing 7107-PL01a. The proposed sewer discharges by gravity via an onsite 150mm diameter drain to a new final manhole on the existing site prior to discharge to the public sewer in a 225mm pipe.

Proposed gravity drainage system will be constructed with uPVC pipes and laid in accordance with the building regulations (section H) and in accordance with the selected pipe manufacturer's recommendations. All proposed works affecting the public drainage system will be subject to detailed agreement with the water and drainage department of Dublin City Council and with Uisce Eireann. The individual pipe materials and gradients are chosen to ensure self-cleaning velocities (i.e. between approximately 0.75 and 1.8 m/sec) at flows greater than approximately 1/8 of the pipe bore.

The onsite network will utilise 150mm diameter uPVC pipes at a minimum fall of 1:80 to satisfy level constraints. Chosen diameter allowable pipe flows are as follows:

- No of Units 45
- PE 45 x 2.7 = 121.50
- DWF 45x 446 L/Day = 20,070L/day
- Peaking Factor Domestic <750PE = 6 =>20,070 x 6 = 120,420L/day
- 1.41L/sec (over 24hr)

The Foul drainage layout has been designed for flow at 75 % of proportional depth to maintain a self cleaning velocity > 0.75m/sec

Pipe sizes, gradients, invert and cover levels and connection to public sewers are shown on drawing 7107-PL01 Site Drainage Layout.

All connections will be in accordance with the requirements of Uisce Eireann and the recommendations of IW Code of Practice for wastewater infrastructure.

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6. SURFACE WATER DESIGN

1. The surface water pipe network is designed for a rainfall intensity of 50mm/hr, BS8301 8.8.2 or 1 in 2 year return period
2. The storm water management limits are achieved utilisation of SuDS in accordance with HR Wallingford guidelines.

The surface water pipe network is designed for a rainfall intensity taken from Met Eireann's Rainfall return tables,

The storm water management limits are achieved by implementation of source control Best Management Practices & utilisation of SuDS in accordance with the Greater Dublin Strategic Drainage Study.

Site Drainage Layout Drawing No. 7107-PL01 shows the proposed surface water layout.

The surface water design methodology is in accordance with the criteria below:

- The pipe network is designed for a rainfall intensity of 50mm/hr, BS8301 8.8.2 or 1 in 2 year return period;
- Allowance for 20% Climate change;
- Storage in accordance with SUDS & GDRCoP for Drainage Works requirements;
- Design for interception of the first 5mm of all rainfall events;
- Designed based on Wallingford method outlined in the CIRIA Report R156 (1996) and SuDS Manual C753

The proposed surface water drainage from the development will comply with the Sustainable Drainage Explanatory Design and Evaluation Guide.

A review of the development was under taken to comply with the provision of Sustainable Urban Drainage Systems (SUDS) in the County and maximise the amenity and biodiversity value of these systems.

The objectives of the design are;

- To limit surface water run-off from new developments through the use of Sustainable Urban Drainage, Systems (SuDS) using surface water and nature-based solutions and ensure that SuDS is integrated into all new development in the County and designed in accordance with The County Council Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide.
- To incorporate a SuDS management train during the design stage whereby surface water is managed locally in small sub-catchments rather than being conveyed to and managed in large systems further down the catchment.

- To require multifunctional open space provision within new developments to include provision for ecology and sustainable water management.
- To promote SuDS features as part of the greening of urban and rural streets to restrict or delay runoff from streets entering the storm drainage network.
- To maintain and enhance existing surface water drainage systems in the County and promote and facilitate the development of Sustainable Urban Drainage Systems (SuDS), including integrated constructed wetlands, at a local, district and County level, to control surface water outfall and protect water quality.

Existing site services local authority networks

The proposal complied with the DCC policy by addressing the criteria in three ways,

1. Runoff destination

- a. The reuse of the surface water as a resource was reviewed and considered not feasible in a high density residential development where the storage of the water supply to service the WC's was considered and would result an unmanageable control.
- b. In compliance with Dublin City Council Green Roof / Blue Roof Guide the roof areas is greater than 100sq.m and
- c. A green roof is proposed from the building roof of the structure to provide a nature based feature that will promote interception loss by evaporation and infiltration.
- d. The hard landscaping area to be used for parking to the side of the site will be a permeable paving that will infiltrate runoff into the ground.
- e. The landscaping will be permeable.
- f. The overflow runoff from the building will be attenuated though a swale within the public Open Space prior to discharge to the Local Authority Surface water sewer.

2. The Hydraulic requirements of the site were assessed and as the development has the potential to impact upon property or infrastructure,

- a. The site does not pose a pollution risk to the environment rising from overflow from a combined sewer to a receiving water course.
- b. The site is not at risk from a 1:100 year flood / rainfall event.

The Hydraulic requirements for the site were assessed and comply with the requirements of section 5.3. fig 3

Criterion	Sub-criterion	Return Period (Years)	Design Objective
Criterion 1 River Water Quality Protection	1.1	<1	Interception storage of at least 5mm, and preferably 10mm, of rainfall where run-off to the receiving water can be prevented.
Criterion 2 River Regime Protection	2.1	1	Discharge rate equal to 1-year greenfield site peak runoff rate or 2 l/s/ha, whichever is the greater. Site critical duration storm to be used to assess attenuation storage volume.
	2.2	100	Discharge rate equal to 1 in 100-year greenfield site peak run-off rate. Site critical duration storm to be used to assess attenuation storage volume.
Criterion 3 Level of Service (Flooding) for the Site.	3.1	30	No flooding on site except where specifically planned flooding is approved. Summer design storm of 15 or 30 minutes are normally critical.
	3.2	100	No internal property flooding. Planned flood routing and temporary flood storage accommodated on site for short high intensity storms (critical duration events).
	3.3	100	No internal property flooding. Floor levels at least 500mm above maximum river level and adjacent on-site storage retention.
	3.4	100	No flooding of adjacent urban areas. Overland flooding managed within the development.

Criterion	Sub-criterion	Return Period (Years)	Design Objective
Criterion 4 River Flood Protection (Criterion 4.1, or 4.2 or 4.3 to be applied)	4.1	100	"Long-term" floodwater accommodated on site for development run-off volume which is in excess of the greenfield run-off volume.
			Temporary flood storage drained by infiltration on a designated flooding area brought into operation by extreme events only.
	4.2	100	100-year, 6 hour duration storm to be used for assessment of the additional volume of run-off.
			Infiltration storage provided equal in volume to "long term" storage.
			Usually designed to operate for all events.
			100-year, 6-hour duration storm to be used for assessment of the additional volume of run-off.
	4.3	100	Maximum discharge rate of Qbar or 2 l/s/ha, whichever is the greater, for all attenuation storage where separate "long term" storage cannot be provided.

Fig 3 SuDS Criteria - The County Council Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide

The site was assessed and complies with the following Criteria

Criterion	Sub Catchment	Return Period (Years)	Design Objectives Proposal
Criterion 1 River Water Quality Protection	1.1	<1	The site has three catchment areas. The roof, car parking and garden. The Road and parking will discharge to water table. The roof will be intercepted with a green roof. This will accommodate the 5-10 mm interception storage
Criterion 2 River Regime Protection	2.1	1	The discharge from the site is restricted by the interception at the green roof and permeable pavement features. The excess surface water discharge from the roof will be discharged to an Infiltration trench in the Public Open Space to ground water recharge. The excess flow from the site not accommodated in the SuDS features is requested with a flow rate of 2L/s/Ha .
	2.2	100	The surface drainage will incorporate an overflow to retain a 1:100 event within the site landscaping features.
Criterion 3 Level of Service (Flooding) for the site	3.1	30	No internal flooding is planned for 30 year return periods of rainfall events, with all surface water runoff intercepted and discharged by evaporation, infiltration.
	3.2	100	No internal flooding is planned for 100 year return periods of rainfall events, with all surface water runoff intercepted and discharged by evaporation, infiltration.
	3.3	100	No internal flooding is planned for 100 year return periods of rainfall events, with all floor levels greater than 500mm above retention storage.

	3.4	100	No flooding is predicted or designed of adjacent urban areas. No over land flooding is predicted in the site.
Criterion 4 River Flood Protection (Criterion 4.1,or 4.2 or 4.3 to be applied)	4.1	100	The site is designed with a long term flood water accommodation on site for the surface water runoff volume. The runoff is intercepted and discharged by evaporation and infiltration for a 100 year 6 hour duration.

Fig 4 SuDS Criteria Compliance Table

3. Water Quality

- a. The site complies with the SuDS Requirement of Water Quality.
- b. The surface water runoff is intercepted at the roof and permeable pavement levels.
- c. The catchment is sized to capture for a 100 year rainfall event with no planning overland flooding.
- d. The rainfall runoff will be intercepted by a green roof and stone paving providing a protection of any discharge from pollution acting as a source control of the flow.

4. Amenity and Biodiversity

- a. The proposed site has an open space to the East with potential for integration of the drainage into biodiversity drainage features.



Figure 17.10 School children in a shallow swale designed for play, Worcestershire (courtesy Robert Bray Associates)

- b. The car parking area and access road will be a permeable pavement with infiltration.

5. Drainage design concept

- a. The drainage is designed to capture rainfall runoff at source.
 - i. The rainfall collected on the roof is retained in an Extensive vegetation.
 - ii. The parking rainfall is intercepted by a permeable pavement design.
- b. Rainfall runoff is controlled at source by these features.
- c. The rainfall runoff is conveyed between the features this increases interception losses, treats pollution, promotes an ease of maintenance with an operational legibility.

6. Managing pollution

- a. The requirements from the Policy document are.

Contributing Surface Type	Pollution Hazard Level	SuDS Components
Residential roofs	Very low	Discharge to any SuDS components
Normal commercial roofs	Low	Discharge to any SuDS components
Leachable metal roofs	Low but polluting	Bioretention or source control with one or two further SuDS components.
Driveways, residential, car parks, low traffic roads, low use car parks (schools and offices)	Low	Permeable pavement or source control with one SuDS component
Commercial yards, delivery areas, busy car parks, other low traffic roads (except trunk roads and motorways)	Medium	Permeable pavement or source control with one or two further SuDS components.
Haulage yard, lorry parks, waste sites, sites handling chemicals and fuels, industrial sites	High	Carry out detailed risk assessment and consult with the appropriate licencing authority.

Fig 5 Polution Hazard Table The County Council Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide

- b. The roof is a residential development with a Very low Pollution Hazard.
- c. The roof rainfall is intercepted by a green roof design.

- d. The car park is an Access road, residential car park with low traffic. This has a Low Pollution Hazard. The overflow from the paving area will be routed through a petrol Interceptor.
- e. The initial run off from the parking areas are protected by a permeable pavement design

The proposed drainage design is based on Approach 2 for the calculation of flow rates and storage.

7. Detail drainage design

- a. The drainage runoff is assessed in two catchments

Site Area 3,182 sq.m

- i. Building roof 1,169 m²
- ii. Carparking 607 m²

- b. Rainfall Data;

Average annual rainfall data obtained from Met Eireann for the area.

Met Eireann Return Period Rainfall Depths for sliding Durations Irish Grid: Easting: 314316, Northing: 230137,														
DURATION	Interval		Years											
	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,
5 mins	2.6,	3.7,	4.3,	5.3,	5.9,	6.4,	8.1,	10.0,	11.3,	13.1,	14.8,	16.1,	18.1,	19.6,
10 mins	3.6,	5.2,	6.0,	7.3,	8.2,	8.9,	11.3,	14.0,	15.8,	18.3,	20.6,	22.4,	25.2,	27.3,
15 mins	4.2,	6.1,	7.1,	8.6,	9.7,	10.5,	13.3,	16.4,	18.5,	21.5,	24.2,	26.3,	29.6,	32.2,
30 mins	5.5,	7.9,	9.2,	11.1,	12.4,	13.5,	16.8,	20.7,	23.2,	26.8,	30.1,	32.6,	36.5,	39.5,
1 hours	7.3,	10.3,	11.9,	14.3,	15.9,	17.2,	21.3,	26.0,	29.1,	33.4,	37.3,	40.3,	44.9,	48.5,
2 hours	9.7,	13.4,	15.4,	18.4,	20.4,	22.0,	27.0,	32.7,	36.4,	41.6,	46.2,	49.8,	55.2,	59.5,
3 hours	11.4,	15.7,	18.0,	21.4,	23.6,	25.4,	31.0,	37.4,	41.5,	47.3,	52.4,	56.4,	62.4,	67.0,
4 hours	12.8,	17.5,	20.0,	23.7,	26.2,	28.1,	34.3,	41.1,	45.6,	51.8,	57.3,	61.5,	68.0,	73.0,
6 hours	15.1,	20.5,	23.3,	27.5,	30.3,	32.4,	39.4,	47.0,	52.0,	58.9,	65.0,	69.7,	76.8,	82.3,
9 hours	17.7,	23.9,	27.1,	31.9,	35.0,	37.5,	45.2,	53.8,	59.3,	67.0,	73.7,	78.9,	86.7,	92.8,
12 hours	19.9,	26.7,	30.2,	35.4,	38.8,	41.5,	49.9,	59.1,	65.1,	73.4,	80.6,	86.1,	94.6,	101.0,
18 hours	23.4,	31.2,	35.2,	41.1,	44.9,	47.9,	57.3,	67.6,	74.3,	83.4,	91.4,	97.5,	106.8,	113.9,
24 hours	26.3,	34.8,	39.2,	45.6,	49.8,	53.0,	63.2,	74.4,	81.5,	91.4,	100.0,	106.5,	116.4,	124.0,
2 days	32.5,	42.2,	47.1,	54.2,	58.9,	62.4,	73.6,	85.6,	93.3,	103.7,	112.8,	119.6,	130.0,	137.9,
3 days	37.5,	48.1,	53.5,	61.2,	66.2,	70.0,	82.0,	94.8,	102.9,	113.9,	123.4,	130.6,	141.4,	149.6,
4 days	41.8,	53.3,	59.0,	67.3,	72.6,	76.6,	89.3,	102.8,	111.3,	122.8,	132.7,	140.2,	151.4,	159.9,
6 days	49.4,	62.3,	68.7,	77.8,	83.7,	88.1,	102.0,	116.6,	125.8,	138.3,	148.9,	156.9,	168.9,	177.9,
8 days	56.1,	70.2,	77.2,	87.0,	93.4,	98.2,	113.0,	128.7,	138.5,	151.7,	163.0,	171.4,	184.0,	193.5,
10 days	62.3,	77.4,	84.9,	95.4,	102.2,	107.3,	123.1,	139.6,	150.0,	163.9,	175.7,	184.5,	197.7,	207.6,
12 days	68.0,	84.1,	92.1,	103.2,	110.4,	115.7,	132.3,	149.7,	160.5,	175.1,	187.4,	196.6,	210.3,	220.6,
16 days	78.6,	96.5,	105.3,	117.5,	125.3,	131.2,	149.3,	168.1,	179.8,	195.5,	208.7,	218.6,	233.3,	244.3,
20 days	88.4,	107.9,	117.4,	130.6,	139.0,	145.4,	164.7,	184.9,	197.4,	214.0,	228.1,	238.6,	254.1,	265.7,
25 days	99.9,	121.1,	131.4,	145.8,	154.9,	161.7,	182.6,	204.2,	217.6,	235.3,	250.3,	261.5,	278.0,	290.3,

Fig 6 Met Eireann Rain Fall Duration Table for the site

The SuDS management will utilise a number of measures.

1. Green Infiltration and retention
2. Biotention at ground level in swale.
3. Tree pit infiltration

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4. Trapped road gulley
5. Permeable paving to parking
6. Petrol Interceptor

Drainage Particulars

- a. The green roof is designed as extensive 100% coverage in a 200mm soil depth filtration layer.
- b. The vegetation will be drought resilient grass.
- c. The rainfall will be intercepted by the soil and discharge over a permeable layer.
- d. The discharge to the Green Roof is controlled with an orifice control prior to discharge to the ground level filter drain.
- e. The car park and access road is 607m² of part permeable pavement with 100mm of permeable stone.
- f. The Qbar calculations for the site are.
 - i. Soil type 2
 - ii. SAAR 900mm
- g. The 1:1 Return Period rainfall is collected and held within the green roof infrastructure

The volume of storage required
 = 1169 x 10.3mm
 = 12m³

20% climate change allowance
 = 14.4m³

- h. The surface water runoff volume for a 1:100 Return 6hr period is 81.40 m³.

The attenuation volume is held within an Open Green Space depression and cellular storage basin.

Cellular attenuation / infiltration 67m³
 Basin overflow 20m³
 = 87m³

- i. The pipe network is designed for a rainfall intensity of 50mm/hr, BS8301 8.8.2 or 1in 2 year return period;
- j. Allowance for 20% Climate change;
- k. The green roof and permeable paving will intercept the first 5mm of all rainfall events;
- l. Designed based on Wallingford method outlined in the CIRIA Report R156 (1996) and SuDS Manual C753

The green roof construction build up will constitute;

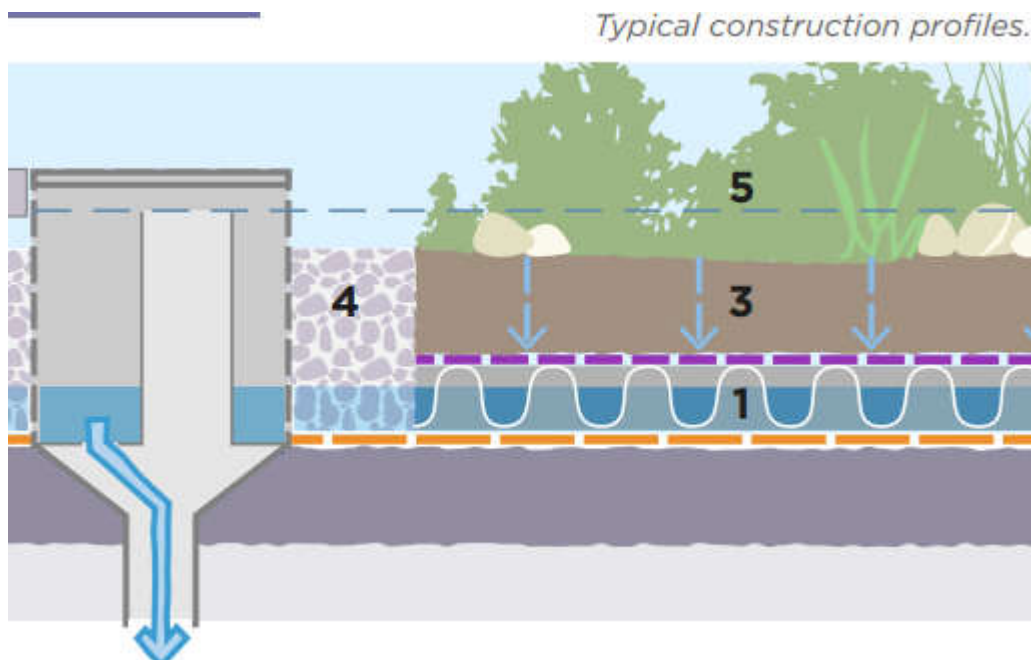


Fig 7 Typical Green Roof Construction Details

Building 2

5: Storage above vegetation area = 0

4: Perimeter drainage $68\text{m} \times 0.3 \times 0.2 = 4.0\text{m}^3$

3: Growing medium layer $250\text{m}^2 \times 0.2\text{m} \times 0.15 = 7.5\text{m}^3$

1: Stone layer with a 30% void ratio, $250\text{m}^2 \times 0.1\text{m} \times 0.3 = 7.5\text{m}^3$.

The volume of surface water stored can be estimate as

$$V_{\text{roof}} = 4.0 + 7.5 + 7.5 = 19.0 \text{ m}^3$$

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Building 1

5: Storage above vegetation area = 0

4: Perimeter drainage $100\text{m} \times 0.3 \times 0.2 = 6.0\text{m}^3$

3: Growing medium layer $500\text{m}^2 \times 0.2\text{m} \times 0.15 = 15\text{m}^3$

1: Stone layer with a 30% void ratio, $500\text{m}^2 \times 0.1\text{m} \times 0.3 = 15\text{m}^3$.

The volumn of surface water stored can be estimate as

$$V_{\text{roof}} = 6.0 + 15 + 15 = 36.0 \text{ m}^3$$

The total attenuation volumn on the green roof is 55m^3 .

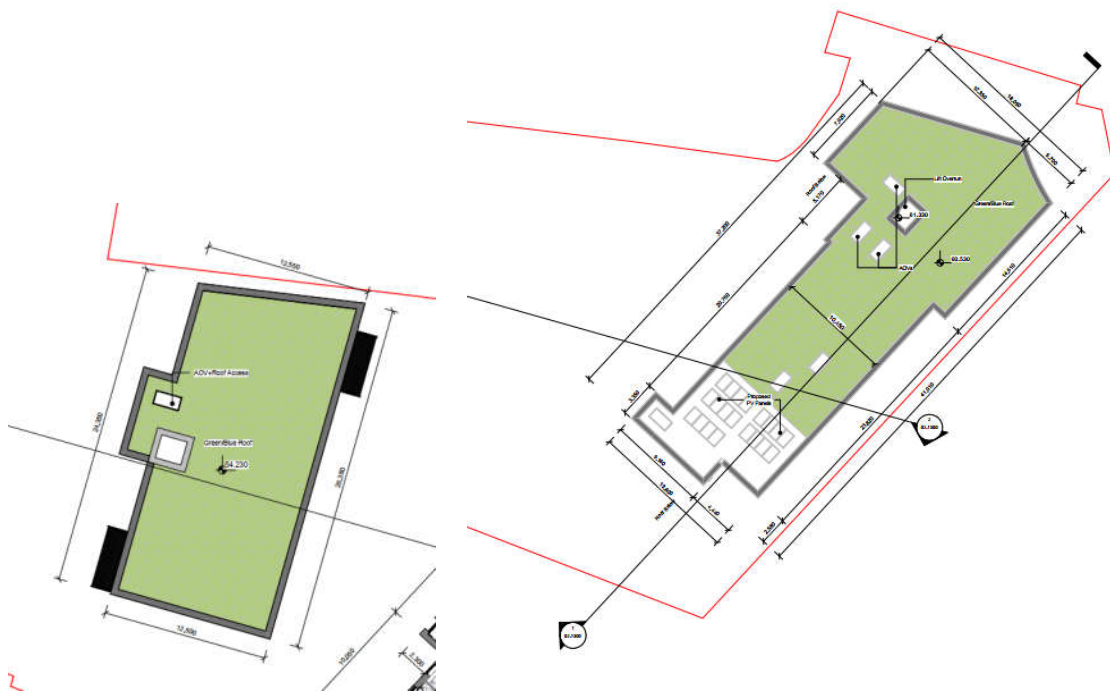


Fig 8 Extent of Green Roof

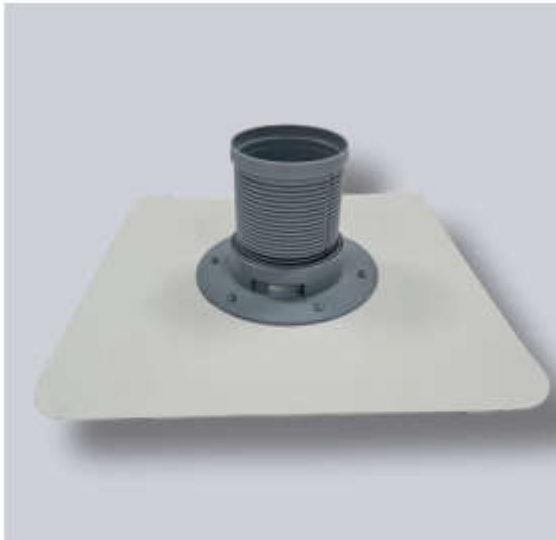
Flow control.

The attenuated water on each roof will be discharged by a controlled orifice outlet.

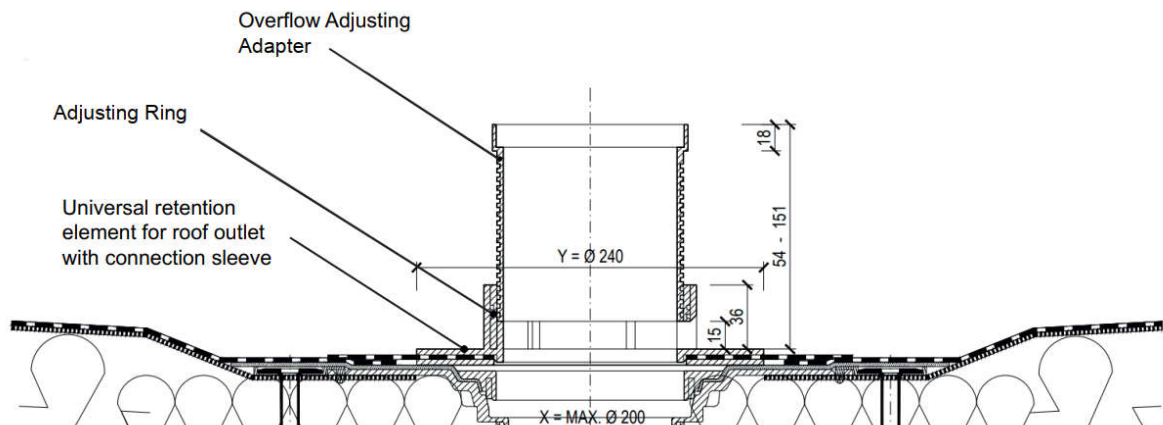
The ND AFC-100 is installed in combination with the ND WSE lte/lt/hd Water Retention Elements for extensive, intensive and trafficable water retention roof installations. It is installed to support the temporarily storage of water on the roof by restricting the discharge values in line with the hydraulic calculation and modelling. Depending on the chosen water

storage level (50mm, 65mm, 80mm, 100mm and 150mm) and chosen slider position of the ND AFC-100 can discharge values be reduced down to even 0,09 l/s.

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ND AFC-100 Adjustable Flow Control



- a. An overflow height level with the top of growing medium with a leaf guard will be provided to control unexpected rainfalls.
- b. Each roof area will be provided with a minimum two outlets.

ELEMENTS OF ND AFC-100 ADJUSTABLE FLOW CONTROL

Overview of flowrate in l/s depending on the position of the slider

Position of AFC-100 slider	Flowrate of ND AFC-100 [l/s]				
	50	65	80	100	150
	Pp(50) [mm]	Pp(65) [mm]	Pp(80) [mm]	Pp(100) [mm]	Pp(150) [mm]
1	0,092650	0,106277	0,118345	0,132740	0,163266
2	0,156252	0,179234	0,199586	0,223863	0,275344
3	0,219855	0,252191	0,280828	0,314986	0,387422
4	0,283457	0,325147	0,362069	0,406109	0,499501
5	0,347059	0,398104	0,443310	0,497232	0,611579
6	0,410661	0,471061	0,524551	0,588355	0,723657
7	0,474263	0,544017	0,605792	0,679477	0,835735
8	0,537865	0,616974	0,687033	0,770600	0,947813
9	0,601468	0,689931	0,768274	0,861723	1,059892
10	0,665070	0,762887	0,849515	0,952846	1,171970
11	0,728672	0,835844	0,930757	1,043969	1,284048
12	0,792274	0,908801	1,011998	1,135092	1,396126
13	0,855876	0,981757	1,093239	1,226215	1,508204
14	0,919478	1,054714	1,174480	1,317337	1,620282
15	0,983081	1,127671	1,255721	1,408460	1,732361
16	1,046683	1,200627	1,336962	1,499583	1,844439
17	1,110285	1,273584	1,418203	1,590706	1,956517
18	1,173887	1,346541	1,499444	1,681829	2,068595
19	1,237489	1,419497	1,580685	1,772952	2,180673
20	1,301091	1,492454	1,661927	1,864075	2,292752
21	1,364694	1,565411	1,743168	1,955198	2,404830
22	1,428296	1,638368	1,824409	2,046320	2,516908
23	1,491898	1,711324	1,905650	2,137443	2,628986
24	1,555500	1,784281	1,986891	2,228566	2,741064
25	1,619102	1,857238	2,068132	2,319689	2,853142
26	1,682704	1,930194	2,149373	2,410812	2,965221
27	1,746306	2,003151	2,230614	2,501935	3,077299

c.

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WATER MAIN

In order to facilitate the development, it is proposed to construct a new 100mm HDPE primary watermain from the existing public main on the Templeogue Road to service the development. The water supply to each dwelling will be provided with a 21mm Hydro supply pipe.

The supply arrangements will be carried out to the requirements of and under the directions of Irish Water and Dublin City Council Water Services Department.

Watermains shall be laid in non-trafficked areas to maximum possible extent.

- The location of valves, hydrants, air valves etc. in trafficked areas shall be avoided wherever practical.
- Watermains shall not pass under any structure
- A minimum cover of 1.0m shall be provided in non-trafficked areas
- A minimum cover of 1.2m shall be provided in trafficked areas
- Proper designed concrete thrust blocks shall be provided at all bends and tees located along the watermain
- Marker tape, in blue PVC and incorporating a corrosion resistant tracing system and printed with the words 'WATERMAIN' throughout shall be laid directly over the centre line of the pipe, at least 300mm above the pipe. The tracer system shall be continuous and adequately secured to valves and fittings
- No common connections shall be provided. Each dwelling shall have its own individual connection.
- Meter chambers shall be located in public access areas
- All pipe laying shall be carried out by experienced pipe layers
- All internal connections, including service connections to each unit, shall be carried out by qualified personnel approved by Irish Water
- A separate service connection certificate shall be completed and signed by the installer for each internal connection made and retained on the safety file
- All watermains to be laid in strict accordance with Irish Water Requirements.
- Minimum 150mm of bedding and surround to be provided to watermains
- All connections onto existing public watermains shall be carried out by Dublin City Council personnel as agents of Irish Water
- Only personnel who have received certified training in electro-fusion shall carry out jointing of polyethylene pipe.

5.1 Hydraulic Testing of Watermains

All new watermains should be tested, swabbed and sterilised before becoming operational in accordance with the following principles:

- The watermains shall be tested in accordance with 'A guide to testing of Water Supply Pipelines and Sewer Rising' issued by the Water Research Centre (WRC) or to the specific requirements of Dublin City Council.

- All pressure testing shall be monitored by Dublin County Council personnel.
- Testing shall be carried out on as short lengths of pipelines as practical.
- Pipelines which fail test shall not be accepted. Defects shall be located and remedied and pipeline re-tested as often as necessary until testing requirements are complied with
- All hydraulic testing of watermains shall be certified by an engineer and records retained on safety file.

WATER CONSERVATION

Conservation measures are aimed at reducing water usage throughout the development.

The development will provide a number of water reduction devices. These devices would include:

- Water Saver Shower heads
- 'Push down' Taps
- Reduced flush Toilets
- Dual Flush Toilets

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Design Criteria

Site Area 3,141 sq.m

Impermeable Area 1250 sq.m

Landscaping Area 340 sq.m

Attenuation Design

1. SITE DETAILS

Site Area (m2):	3141	m2	
Public open space	340	m2	Not draining to system
Site Area (HA):	0.2801	HA	Site area minus POS
SAAR (mm):	800	mm	Source: www.met.ie/climate/services
Soil Type:	2	-	Reference: Flood Studies Report (NERC,1975)
SPR:	0.3	-	Reference: Flood Studies Report (NERC,1975)

2. IH124 METHOD (WALLINGFORD)

Is Qbar < 50 HA? Yes Use Method 1 Below

1. QBAR BASED ON AREA RATIO (AREA<50 HA)

Area Ratio:	0.0056	
Qbar (50 HA):	0.1065 m3/s	Calculation: $Qbar = 0.00108 * ((0.01 * \text{Site Area})^{0.89}) * (SAAR^{1.17}) * SPR^{2.17}$
Qbar (Actual):	0.0006 m3/s	Calculation: $Qbar(50HA) * \text{Area Ratio}$
Qbar (Actual):	0.5968 l/s	Calculation: $Qbar \text{ Actual (m3/s)} * 1000$

2. QBAR ON FULL AREA (AREA > 50HA)

Qbar:	0.0011 m3/s	Calculation: $Qbar = 0.00108 * ((0.01 * \text{Site Area})^{0.89}) * (SAAR^{1.17}) * SPR^{2.17}$
Qbar:	1.0556 l/s	Calculation: $Qbar \text{ Actual (m3/s)} * 1000$

Applicable Qbar 0.5968 l/s Source: Based on applicable method above

3. GROWTH REDUCTION CURVE

Method 1 (AREA<50HA)

Return Period	Factor	Qbar	Unit	
10 Years	1.7	1.01	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$
30 Years	2.13	1.27	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$
100 Years	2.61	1.56	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$
200 Years	2.86	1.71	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$

Method 2 (AREA>50 HA)

Return Period	Factor	Qbar	Unit	
10 Years	1.7	1.79	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$
30 Years	2.13	2.25	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$
100 Years	2.61	2.76	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$
200 Years	2.86	3.02	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$

2. RUN-OFF AREAS

Surface Run-off zones (m2)
Impermeable Area
Landscaping and or green area
Partially permeable area

Area (m2)	Coefficient of	Effective Area (m2)
1250	1	1250.00
340	0.3	102.00
730	0.8	584.00

Total Area 1936.00

Use Qbar from Method 1 (Area<50 HA) or Method 2 (Area>50 HA)?

Method 1	
Qbar	0.60 l/s
Minimum flow rate	2.00 l/s
Interception rainfall depth	5.00 mm
Climate Change allowance	20 %

30 YEAR RETURN PERIOD									
Time	Mins	Secs	Max Rainfall for 30 Year Storm (m)	Climate change Factored rainfall (m)	Area (m2)	Flow (l/s)	Volume (m3)	QBAR vol.(m3)	Attenuation volume required (m3)
5 min	5	300	0.0112	0.01344	1936	54.47	16.34	0.60	15.74
10 min	10	600	0.0156	0.01872	1936	44.27	26.56	1.20	25.36
15 min	15	900	0.0184	0.02208	1936	36.74	33.07	1.80	31.27
30 min	30	1800	0.023	0.0276	1936	24.31	43.75	3.60	40.15
60 min	60	3600	0.0288	0.03456	1936	15.90	57.23	7.20	50.03
2 hour	120	7200	0.0361	0.04332	1936	10.30	74.19	14.40	59.79
3 hour	180	10800	0.0412	0.04944	1936	7.97	86.04	21.60	64.44
4 hour	240	14400	0.0452	0.05424	1936	6.62	95.33	28.80	66.53
6 hour	360	21600	0.0516	0.06192	1936	5.10	110.20	43.20	67.00
9 hour	540	32400	0.0588	0.07056	1936	3.92	126.92	64.80	62.12
12 hour	720	43200	0.0646	0.07752	1936	3.25	140.40	86.40	54.00
18 hour	1080	64800	0.0737	0.08844	1936	2.49	161.54	129.60	31.94
24 hour	1440	86400	0.0809	0.09708	1936	2.06	178.27	172.80	5.47
48 hour	2880	172800	0.092	0.1104	1936	1.18	204.05	345.60	-141.55
100 YEAR RETURN PERIOD									
Time	Mins	Secs	Max Rainfall for 100 Year Storm (m)	Climate change Factored rainfall (m)	Area (m2)	Flow (l/s)	Volume (m3)	QBAR vol.(m3)	Attenuation volume required (m3)
5 min	5	300	0.0136	0.01632	1936	73.05	21.92	0.60	21.32
10 min	10	600	0.0186	0.02232	1936	55.89	33.53	1.20	32.33
15 min	15	900	0.0218	0.02616	1936	45.52	40.97	1.80	39.17
30 min	30	1800	0.027	0.0324	1936	29.47	53.05	3.60	49.45
60 min	60	3600	0.0334	0.04008	1936	18.87	67.91	7.20	60.71
2 hour	120	7200	0.0413	0.04956	1936	11.98	86.27	14.40	71.87
3 hour	180	10800	0.0467	0.05604	1936	9.15	98.81	21.60	77.21
4 hour	240	14400	0.051	0.0612	1936	7.56	108.80	28.80	80.00
6 hour	360	21600	0.0578	0.06936	1936	5.77	124.60	43.20	81.40
9 hour	540	32400	0.0654	0.07848	1936	4.39	142.26	64.80	77.46
12 hour	720	43200	0.0714	0.08568	1936	3.62	156.20	86.40	69.80
18 hour	1080	64800	0.0909	0.10908	1936	3.11	201.50	129.60	71.90
24 hour	1440	86400	0.0883	0.10596	1936	2.26	195.46	172.80	22.66
48 hour	2880	172800	0.0984	0.11808	1936	1.27	218.92	345.60	-126.68
Design Attenuation Volume			81.4	m3					

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Surface Water Design Summary

Qbar 0.598l/sec

30 year Attenuation Volume 67cu.m

100 year Attenuation Volume required 81.40u.m

Green Roof Interception volume 55.00 cu.m

Swale attenuation volume provided 67 cu.m (below ground level cellarer tank storage)

Detention basin volume provided 20 cu.m

Total Storage 87cu.m

SURFACE WATER PIPE NETWORK DESIGN

The system is designed in accordance with BS8301: 1985 British Standard Code of Practice for Building Drainage. The Wallingford Rational Methods is used for the design.

METHOD 1 - BS8301 8.8.3 (Wallingford Rational Method)

Time of concentration = time of entry + (length of drain / full bore velocity of flow)

BS8301 8.8.4 (c)

Time of entry for a two-year return period is 4 to 7 mins

For a flat catchments we take the longer time of 7 mins = 420 s

Taking an average velocity = 0.75m/s

Total length of drain picking up the development catchment = 70m approx

$t = 420 + (70 / 0.75) = 513s$ $t = 8.5$ mins

Referring to published Met office rainfall depth data table on the previous page:

Closest data is for storm duration of 10 mins with a two-year return period,

Rainfall = 4.3mm per 10min period = 25.8 mm per hour

$Q = A_p \times i \times C_v \times C_r \times 2.78$ (area drained by section of network 1,250m²)

$Q = (1,250) \times 25.8 \times 1.3 \times .8 \times 2.78 = 93.24m^3 /hr$

$Q = 93.24 / 60 \times 60 = 25.9L/sec$ L/sec

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Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 314316, Northing: 230137,

DURATION	Interval		Years													
	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.6,	3.7,	4.3,	5.3,	5.9,	6.4,	8.1,	10.0,	11.3,	13.1,	14.8,	16.1,	18.1,	19.6,	20.9,	N/A ,
10 mins	3.6,	5.2,	6.0,	7.3,	8.2,	8.9,	11.3,	14.0,	15.8,	18.3,	20.6,	22.4,	25.2,	27.3,	29.1,	N/A ,
15 mins	4.2,	6.1,	7.1,	8.6,	9.7,	10.5,	13.3,	16.4,	18.5,	21.5,	24.2,	26.3,	29.6,	32.2,	34.3,	N/A ,
30 mins	5.5,	7.9,	9.2,	11.1,	12.4,	13.5,	16.8,	20.7,	23.2,	26.8,	30.1,	32.6,	36.5,	39.5,	42.0,	N/A ,
1 hours	7.3,	10.3,	11.9,	14.3,	15.9,	17.2,	21.3,	26.0,	29.1,	33.4,	37.3,	40.3,	44.9,	48.5,	51.4,	N/A ,
2 hours	9.7,	13.4,	15.4,	18.4,	20.4,	22.0,	27.0,	32.7,	36.4,	41.6,	46.2,	49.8,	55.2,	59.5,	63.0,	N/A ,
3 hours	11.4,	15.7,	18.0,	21.4,	23.6,	25.4,	31.0,	37.4,	41.5,	47.3,	52.4,	56.4,	62.4,	67.0,	70.9,	N/A ,
4 hours	12.8,	17.5,	20.0,	23.7,	26.2,	28.1,	34.3,	41.1,	45.6,	51.8,	57.3,	61.5,	68.0,	73.0,	77.1,	N/A ,
6 hours	15.1,	20.5,	23.3,	27.5,	30.3,	32.4,	39.4,	47.0,	52.0,	58.9,	65.0,	69.7,	76.8,	82.3,	86.8,	N/A ,
9 hours	17.7,	23.9,	27.1,	31.9,	35.0,	37.5,	45.2,	53.8,	59.3,	67.0,	73.7,	78.9,	86.7,	92.8,	97.7,	N/A ,
12 hours	19.9,	26.7,	30.2,	35.4,	38.8,	41.5,	49.9,	59.1,	65.1,	73.4,	80.6,	86.1,	94.6,	101.0,	106.3,	N/A ,
18 hours	23.4,	31.2,	35.2,	41.1,	44.9,	47.9,	57.3,	67.6,	74.3,	83.4,	91.4,	97.5,	106.8,	113.9,	119.7,	N/A ,
24 hours	26.3,	34.8,	39.2,	45.6,	49.8,	53.0,	63.2,	74.4,	81.5,	91.4,	100.0,	106.5,	116.4,	124.0,	130.2,	151.4,
2 days	32.5,	42.2,	47.1,	54.2,	58.9,	62.4,	73.6,	85.6,	93.3,	103.7,	112.8,	119.6,	130.0,	137.9,	144.3,	166.1,
3 days	37.5,	48.1,	53.5,	61.2,	66.2,	70.0,	82.0,	94.8,	102.9,	113.9,	123.4,	130.6,	141.4,	149.6,	156.2,	178.8,
4 days	41.8,	53.3,	59.0,	67.3,	72.6,	76.6,	89.3,	102.8,	111.3,	122.8,	132.7,	140.2,	151.4,	159.9,	166.8,	190.1,
6 days	49.4,	62.3,	68.7,	77.8,	83.7,	88.1,	102.0,	116.6,	125.8,	138.3,	148.9,	156.9,	168.9,	177.9,	185.2,	209.8,
8 days	56.1,	70.2,	77.2,	87.0,	93.4,	98.2,	113.0,	128.7,	138.5,	151.7,	163.0,	171.4,	184.0,	193.5,	201.2,	227.0,
10 days	62.3,	77.4,	84.9,	95.4,	102.2,	107.3,	123.1,	139.6,	150.0,	163.9,	175.7,	184.5,	197.7,	207.6,	215.6,	242.5,
12 days	68.0,	84.1,	92.1,	103.2,	110.4,	115.7,	132.3,	149.7,	160.5,	175.1,	187.4,	196.6,	210.3,	220.6,	229.0,	256.8,
16 days	78.6,	96.5,	105.3,	117.5,	125.3,	131.2,	149.3,	168.1,	179.8,	195.5,	208.7,	218.6,	233.3,	244.3,	253.2,	282.8,
20 days	88.4,	107.9,	117.4,	130.6,	139.0,	145.4,	164.7,	184.9,	197.4,	214.0,	228.1,	238.6,	254.1,	265.7,	275.1,	306.2,
25 days	99.9,	121.1,	131.4,	145.8,	154.9,	161.7,	182.6,	204.2,	217.6,	235.3,	250.3,	261.5,	278.0,	290.3,	300.2,	333.1,

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

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CALCULATION SHEET	Project RATHDOWN MOTORS				Job. Ref 7107	
	Section Greenfield Qbar Calculation				Sheet No. 1	
	Calcs by TON	Date 07/04/2025	Chkd by	Date	DWG No.	Calc. Rev

1. SITE DETAILS

Site Area (m2):	3141	m2	
Public open space	340	m2	Not draining to system
Site Area (HA):	0.2801	HA	Site area minus POS
SAAR (mm):	800	mm	Source: www.met.ie/climate/services
Soil Type:	2	-	Reference: Flood Studies Report (NERC,1975)
SPR:	0.3	-	Reference: Flood Studies Report (NERC,1975)

2. IH124 METHOD (WALLINGFORD)

Is Qbar < 50 HA? Yes Use Method 1 Below

1. QBAR BASED ON AREA RATIO (AREA<50 HA)

Area Ratio:	0.0056	
Qbar (50 HA):	0.1065 m3/s	Calculation: $Qbar = 0.00108 * ((0.01 * \text{Site Area})^{0.89}) * (SAAR^{1.17}) * SPR^{2.17}$
Qbar (Actual):	0.0006 m3/s	Calculation: $Qbar(50HA) * \text{Area Ratio}$
Qbar (Actual):	0.5968 l/s	Calculation: $Qbar \text{ Actual (m3/s)} * 1000$

2. QBAR ON FULL AREA (AREA > 50HA)

Qbar:	0.0011 m3/s	Calculation: $Qbar = 0.00108 * ((0.01 * \text{Site Area})^{0.89}) * (SAAR^{1.17}) * SPR^{2.17}$
Qbar:	1.0556 l/s	Calculation: $Qbar \text{ Actual (m3/s)} * 1000$

Applicable Qbar 0.5968 l/s Source: Based on applicable method above

3. GROWTH REDUCTION CURVE

Method 1 (AREA<50HA)

Return Period	Factor	Qbar	Unit	
10 Years	1.7	1.01	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$
30 Years	2.13	1.27	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$
100 Years	2.61	1.56	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$
200 Years	2.86	1.71	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$

Method 2 (AREA>50 HA)

Return Period	Factor	Qbar	Unit	
10 Years	1.7	1.79	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$
30 Years	2.13	2.25	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$
100 Years	2.61	2.76	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$
200 Years	2.86	3.02	l/s	Calculation: $\text{Applicable Qbar} * \text{Factor}$

CALCULATION SHEET	Project RATHDOWN MOTORS					Job. Ref 7107	
	Section Attenuation Volume					Sheet No 1	
	Calcs by TON		Date 07/04/2023	Chkd by	Date	DWG No	Calc. Rev

1. SITE DETAILS

Site Area (m2): 3141 m2
 Public Open Space 340
 Site Area (HA): 0.1353 HA
 SAAR (mm): 800 mm
 Soil Type: 2 -
 SPR: 0.3 -

Source: www.met.ie/climate/services

Reference: Flood Studies Report (NERC,1975)

Reference: Flood Studies Report (NERC,1975)

2. RUN-OFF AREAS

Surface Run-off zones (m2)	Area (m2)	Coefficient of	Effective Area (m2)
Impermeable Area	1250	1	1250.00
Landscaping and or green area	340	0.3	102.00
Partially permeable area	730	0.8	584.00
Total Area			1936.00

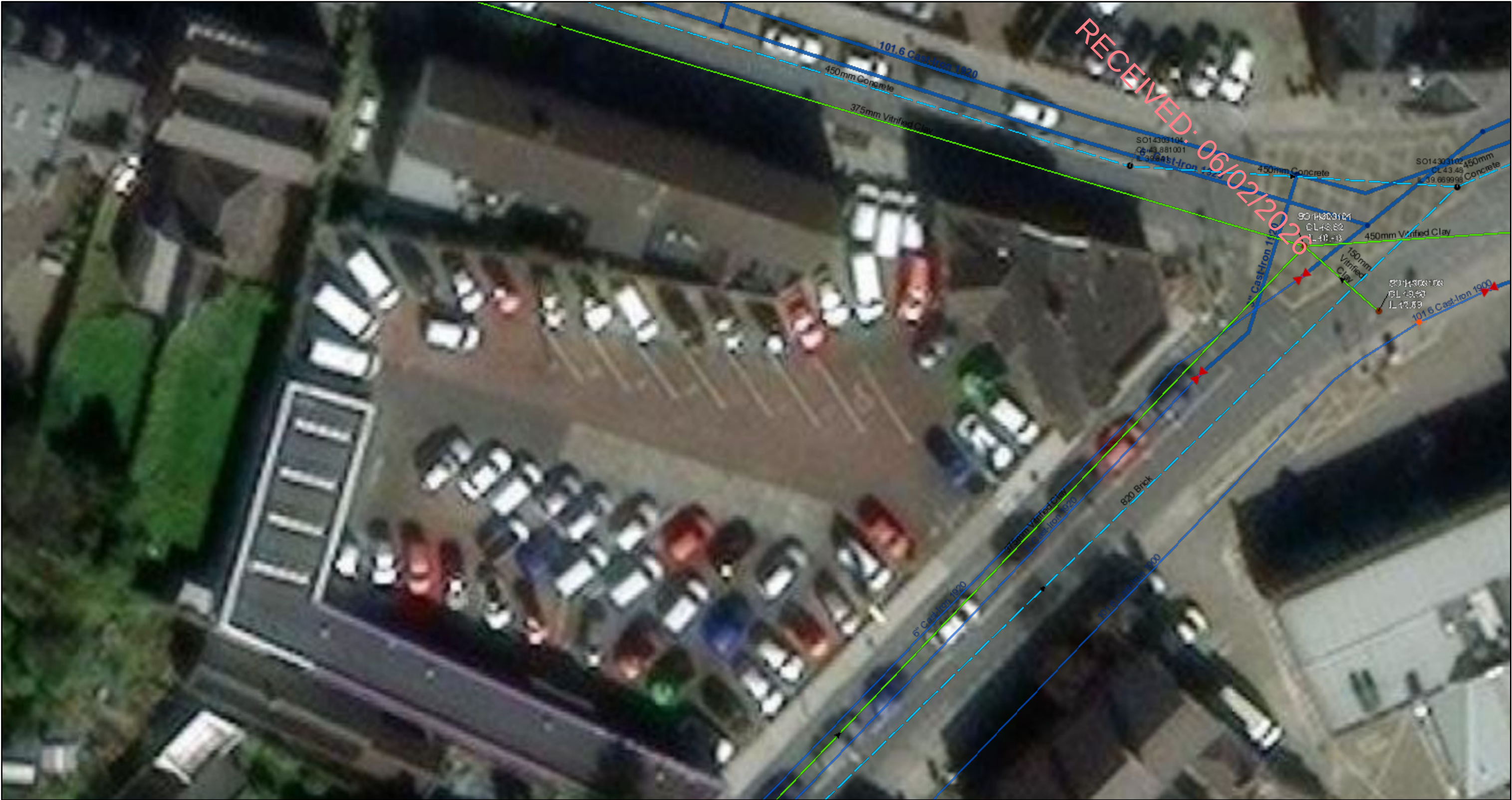
Use Qbar from Method 1 (Area<50 HA) or Method 2 (Area>50 HA)?

Method 1	
Qbar	0.60 l/s
Minimum flow rate	2.00 l/s
Interception rainfall depth	5.00 mm
Climate Change allowance	20 %

30 YEAR RETURN PERIOD									
Time	Mins	Secs	Max Rainfall for 30 Year Storm (m)	Climate change Factored rainfall (m)	Area (m2)	Flow (l/s)	Volume (m3)	QBAR vol.(m3)	Attenuation volume required (m3)
5 min	5	300	0.0112	0.01344	1936	54.47	16.34	0.60	15.74
10 min	10	600	0.0156	0.01872	1936	44.27	26.56	1.20	25.36
15 min	15	900	0.0184	0.02208	1936	36.74	33.07	1.80	31.27
30 min	30	1800	0.023	0.0276	1936	24.31	43.75	3.60	40.15
60 min	60	3600	0.0288	0.03456	1936	15.90	57.23	7.20	50.03
2 hour	120	7200	0.0361	0.04332	1936	10.30	74.19	14.40	59.79
3 hour	180	10800	0.0412	0.04944	1936	7.97	86.04	21.60	64.44
4 hour	240	14400	0.0452	0.05424	1936	6.62	95.33	28.80	66.53
6 hour	360	21600	0.0516	0.06192	1936	5.10	110.20	43.20	67.00
9 hour	540	32400	0.0588	0.07056	1936	3.92	126.92	64.80	62.12
12 hour	720	43200	0.0646	0.07752	1936	3.25	140.40	86.40	54.00
18 hour	1080	64800	0.0737	0.08844	1936	2.49	161.54	129.60	31.94
24 hour	1440	86400	0.0809	0.09708	1936	2.06	178.27	172.80	5.47
48 hour	2880	172800	0.092	0.1104	1936	1.18	204.05	345.60	-141.55
100 YEAR RETURN PERIOD									
Time	Mins	Secs	Max Rainfall for 100 Year Storm (m)	Climate change Factored rainfall (m)	Area (m2)	Flow (l/s)	Volume (m3)	QBAR vol.(m3)	Attenuation volume required (m3)
5 min	5	300	0.0136	0.01632	1936	73.05	21.92	0.60	21.32
10 min	10	600	0.0186	0.02232	1936	55.89	33.53	1.20	32.33
15 min	15	900	0.0218	0.02616	1936	45.52	40.97	1.80	39.17
30 min	30	1800	0.027	0.0324	1936	29.47	53.05	3.60	49.45
60 min	60	3600	0.0334	0.04008	1936	18.87	67.91	7.20	60.71
2 hour	120	7200	0.0413	0.04956	1936	11.98	86.27	14.40	71.87
3 hour	180	10800	0.0467	0.05604	1936	9.15	98.81	21.60	77.21
4 hour	240	14400	0.051	0.0612	1936	7.56	108.80	28.80	80.00
6 hour	360	21600	0.0578	0.06936	1936	5.77	124.60	43.20	81.40
9 hour	540	32400	0.0654	0.07848	1936	4.39	142.26	64.80	77.46
12 hour	720	43200	0.0714	0.08568	1936	3.62	156.20	86.40	69.80
18 hour	1080	64800	0.0909	0.10908	1936	3.11	201.50	129.60	71.90
24 hour	1440	86400	0.0883	0.10596	1936	2.26	195.46	172.80	22.66
48 hour	2880	172800	0.0984	0.11808	1936	1.27	218.92	345.60	-126.68

Design Attenuation Volume	81.4	m3
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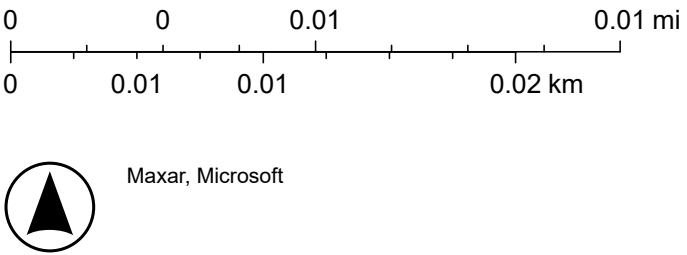
UE Water Mains & Sewer-Copy



12/04/2025

1:500

Storm Manholes - Standard - Backdrop - Cascade - Catchpit - Bifurcation - Hatchbox - Lamphole - Hydrobrake - Other; Unknown	Surface Water Mains - Surface Gravity Mains - Surface Gravity Mains Private - Surface Water Pressurised Mains - Surface Water Pressurised Mains Private	Sewer Manholes - Standard - Backdrop - Cascade - Catchpit - Bifurcation - Hatchbox - Lamphole - Hydrobrake - Other; Unknown	Sewer Clean Outs - Rodding Eye - Flushing Structure - Other; Unknown - Waste Water Treatment plant - Waste Water Pump station	Sewer Inlets - Standard - Catchpit - Gully - Other; Unknown	Sewer Discharge Points - Outfall - Overflow - Soakaway - Other; Unknown	Sewer Fittings - Vent/Col - Other; Unknown - Sewer Chambers	Sewer Mains - Gravity - Combined - Gravity - Foul - Gravity - Unknown - Pumping - Combined - Pumping - Foul - Pumping - Unknown - Syphon - Combined - Syphon - Foul - Syphon - Unknown - Syphon - Overflow - Overflow - Sewer Lateral Lines - Sewer Virtual Network lines - Waste Features Not in Service - Proposed Sewer	Sewer Mains (Private) Gravity - Combined	Wastewater Discharge Authorisation Boundary	Network Meters - Boundary Meter - Bulk Meter - Check Meter - Group Scheme - Source Meter - Waste Meter - Unknown Meter; Other Meter - Flow Control Valves - Non-Return - PRV - PSV - Line Valves - Sluice Valve Open - Sluice Valve Part Open	Sluice Valve Closed - Butterfly Valve Open - Butterfly Valve Part Open - Butterfly Valve Closed - Butterfly Valve Closed - Butterfly Valve Closed - Scour Valves - Air Control Valves - Single Air Control Valve - Double Air Control Valve - Water Stop Valves - Water Hydrants - Fire Hydrant	Fire Hydrant/Washout - Washout - Water Treatment Plant - Abstraction Point - Reservoir - Reservoir (Potable Water) - Reservoir (Raw Water) - Water Pump Stations - Water Network Structures - Storage Cell - Storage Tower - Dosing Point - Meter Station - Water Pump - Other; Unknown - Boundary Box - Water Fittings - Cap - Other Fittings - Reducer - Tap - Water Distribution Mains - Irish Water	Private Water Network Structures - Storage Cell - Storage Tower - Dosing Point - Meter Station - Water Pump - Other; Unknown - Boundary Box - Water Fittings - Cap - Other Fittings - Reducer - Tap - Water Distribution Mains - Irish Water	Private - Trunk Water Mains - Irish Water - Private - Water Lateral Lines - Irish Water - Non IW - Water Abandoned Lines - Water Abandoned Points - Water Distribution Chambers - World Imagery - Low Resolution 15m Imagery - High Resolution 60cm Imagery - High Resolution 30cm Imagery - Citations
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UE Water Mains & Sewer

StormWaterNetwork wms

Storm Manholes

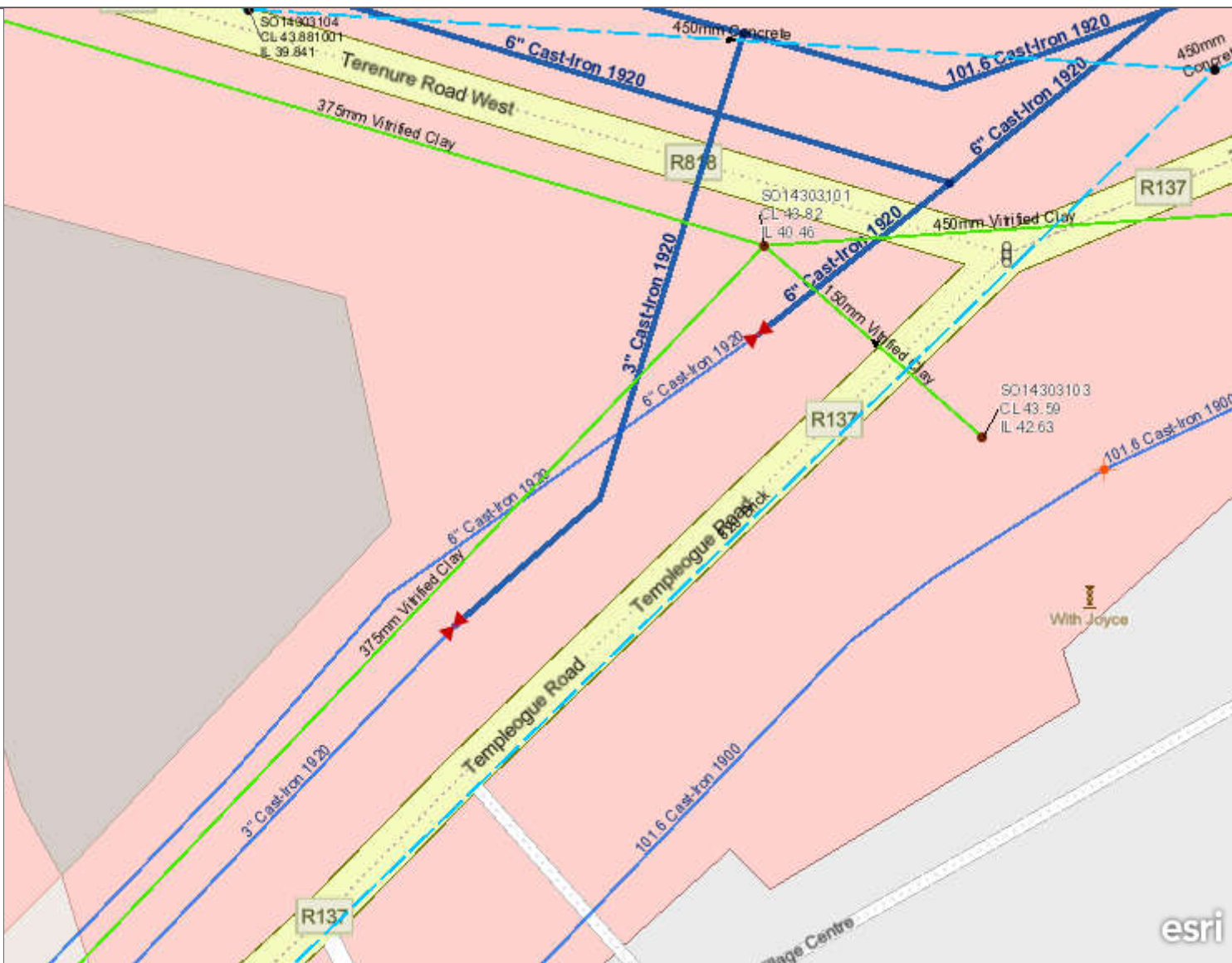
- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake
- Other; Unknown

Storm Discharge Points

- Outfall
- Overflow
- Soakaway
- Other; Unknown

Surface Water Mains

- Surface Gravity Mains
- Surface Gravity Mains Private
- Surface Water Pressurised Mains
- Surface Water Pressurised Mains Private



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RECEIVED: 06/02/2026

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Product Details

AquaCell Eco

Application

AquaCell Eco is manufactured from specially reformulated, recycled material and has been specifically designed for shallow, non-trafficked, landscaped applications. AquaCell Eco is **NOT** suitable for locations subject to high water tables.

AquaCell Eco is typically suitable for installations to a maximum depth of 1.5 metres, to the base of the units from ground level, with a minimum cover depth of 0.3 metres, (Wavin's recommendation, is to allow a cover depth of 0.5 metres).

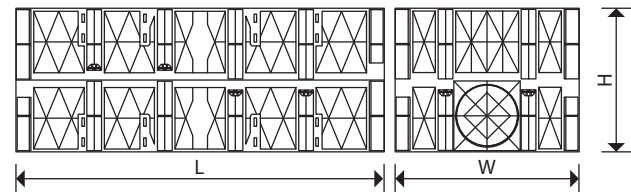
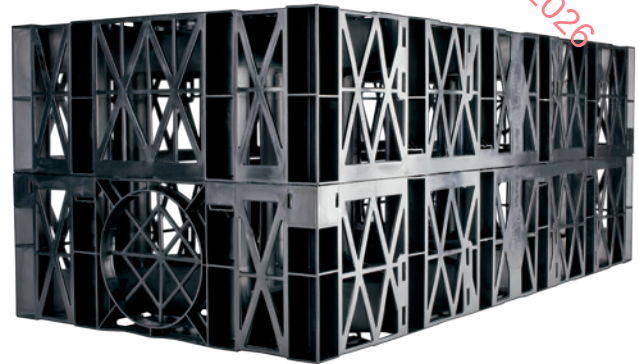
Any installation using AquaCell Eco must **NOT** be subjected to additional loading at any time. Trafficking by construction plant on site, including mechanical equipment, must be avoided.

If trafficking of the buried tank by construction plant or, other vehicles is unavoidable, the installation should be constructed using AquaCell Core units (see page 11).

The width of an AquaCell Eco installation should not exceed 12 metres to allow for mechanical backfilling without loading. There is no limit to the length of the installation.

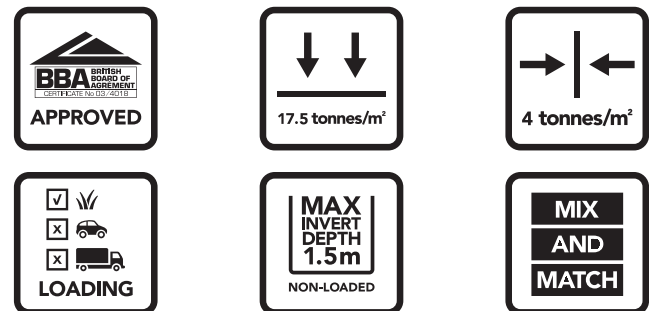
Features and benefits

- Manufactured from specially reformulated, recycled material
- Suitable for both soakaway and attenuation applications
- Proven vertical loading capacity of: 17.5 tonnes/m²
- Proven lateral loading capacity of: 4.0 tonnes/m²
- Integral "hand holds" for ease of carrying/handling
- Black in colour, for ease of identification
- BBA approved – Certificate No 03/4018



Material: Reformulated polypropylene

Nominal Size (mm)	Part Number	Dimensions (mm)		
		W	H	L
160	6LB025	500	400	1000



Maximum installation depths (to base units) and minimum cover depths ⁽¹⁾

Typical soil type	Typical angle of shearing	Maximum depth of installation (m)	Minimum cover depth (m)
Stiff over-consolidated clay (e.g. London clay)	24°	0.95	0.30
Normally consolidated silty, sandy clay (e.g. alluvium, made ground)	26°	1.05	0.30
Loose sand and gravel	29°	1.2	0.30
Medium dense sand and gravel	33°	1.5	0.30
Dense sand and gravel	38°	1.9	0.30

(1) These values relate to installations where the groundwater is a minimum of one metre below the base of the excavation. AquaCell Eco units should not be used where groundwater is present.

Source: BBA