



**HAYES HIGGINS PARTNERSHIP**  
**CHARTERED ENGINEERS • PROJECT MANAGERS**

## **Civil Engineering Services Report**

For

## **Proposed Traveller-Specific Group Housing, Stockhole Lane**

Co. Dublin

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## DOCUMENT CONTROL SHEET

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## 1. Introduction

Hayes Higgins Partnership has been commissioned to prepare a Civil Engineering Services Report for the proposed development at Stockhole Lane, Co. Dublin.

This report was compiled after reviewing the available information on drainage and water supply, reviewing the OPW flood maps and other available information from public bodies. It contains information on the design of the surface water and foul drainage systems to be constructed for the proposed development.

The design of both the surface water and foul drainage systems has been carried out in accordance with the following:

- The Greater Dublin Regional Code of Practice for Drainage Works
- Technical Guidance Document H of the Building Regulations
- The Greater Dublin Strategic Drainage Study (GDSDS)
- DOE Recommendations for Site Development Works for Housing Areas
- BS 8301:1985, Code of practice for Building Drainage
- BS EN 752 External building drainage
- OPW The Planning System and Flood Risk Management

The proposed surface water drainage system is a gravity feed drainage system discharging to a modular attenuation system in the south of the site. The surface water system is designed to take the runoff generated by a 1 in 100 year storm event (+20% climate change). The modular attenuation system will be connected to the existing surface water system which discharges into an existing water stream that discharges to the Sluice River at a point north of Baskin Lane (the L2055), to the west of the Malahide Road (the R107). A petrol interceptor tank will be provided between manhole S03 and S06. One existing manhole (downstream manhole S07) and the existing pipe need to be modified in order to discharge at the existing level of the headwall invert level. A hydrobrake is to be used to limit max discharge to 3.11 l/s (Q<sub>bar</sub>), which is the maximum allowable site discharge.

The foul drainage system for the proposed development is a gravity feed system within the site falling to the existing public foul drainage system, Cloghran Sewer. Also, the existing 10 dwellings at Baskin Park & Court will be connected to this sewer by modifying the existing pump chamber to become outfall manhole, installing a new foul sewer and manhole. The existing waste water treatment plant will be decommissioned.

## 2. Proposed Site

The site in question is a green field site which measures approximately 1.22ha in area. Originally, it was used for agriculture. It is located to the east of Stockhole Lane. An existing residential development Baskin Court and Baskin Park is situated to the north, and agricultural fields to the east and south. The site is bounded by a palisade fence. A series of earth mounds are present on the land. The site also contains a waste water treatment plant and percolation for 10 existing dwellings at Baskin Court and Baskin Park.

Proposed on the site are seven dwellings as Traveller-Specific Group Housing and associated site development works. The dwellings will back onto the east boundary and face the proposed public open space and Stockhole Lane to the west. The houses are bungalows. There is a high point in the south-east corner of the road and a low point in the north. Each car parking and footpath falls away from the finish floor levels by 2% to eastern side of the new road where new gullies are to be installed. The road crossfall goes from the western side of the road to the eastern by 2%. The houses will be accessed directly from the proposed road to the front.

### 3. Surface Water Drainage

Local Authorities require that all developments must include a sustainable urban drainage system, SuDS.

The conditions on site are not favourable to infiltration as stated in Stockhole Lane –Ground Investigation Interpretative Report (18-1309) carried out by CausewayGeotech. Soakaways tests were carried out (trial pit SA01–SA03) according to the Building Research Establishment (2007), BRE Digest 365: Soakaways. As a result, the absence of outflow from the pits indicated very low infiltration coefficients. The low-permeability fine-grained soils are therefore considered to have limited infiltration and would be deemed unsuitable for the implementation of infiltration drainage systems. The ground has no capacity (no infiltration) to accept water discharge because of its low permeability, which will cause water retention instead of promoting water flow for recharging. For these reasons, the use of swales, infiltration trenches, permeable paving and soakaways are ineffective. A retention basin was proposed at an early stage, however, it was considered hazardous due to its depth (2-2.5m), and also there is a risk it would be used as a landfill site.

Taking into account this, a surface water attenuation system connected to the existing surface drainage network, via a hydrobrake limiting discharge to 3.11 l/s (Qbar), is to be used to dispose of the surface water from the developed site to an existing water stream.

The gravity feed surface water system will serve the hardstanding on site. The main surface sewers in the proposed development are to consist of 225mm diameter uPVC pipes with fall 1/200, with the exceptions of two pipelines that need to be 300mm diameter. One pipeline from surface manhole S03 to the Petrol Interceptor Tank, and another new pipeline from the existing manhole to be modified to the existing headwall, which will also receive discharge from the existing 10 dwellings at Baskin Park & Court. Given the levels on site the simplest approach is to use one attenuation system. The total impermeable surface area is the sum of roofs, footpaths, paving and road areas, which results in 2301 m<sup>2</sup>. Surface water sewers will fall by gravity to the proposed attenuation system located in the south. The attenuation system will connect via hydrobrake to the existing surface water sewer, which has to be modified to comply with the new invert levels required.

The existing surface water sewer to be modified is located within a 10m wide and it falls downslope away from the site. It is proposed to upsize the pipe from the existing 225mm diameter pipe to a 300mm diameter pipe due to capacity requirements taking into account the increased loading due to collection of surface water from 2301sqm of impermeable surface that was previously greenfield. Also, it is being taken into account the surface water discharge from 10 dwellings Baskin Park & Court by a 100mm diameter rising main into an existing manhole to be modified (S08) just downstream the new surface manhole S07.

The required storage volume to retain the on-site runoff for the group of houses is noted on drainage drawing 01. To alleviate any possible risk of flood the storage is designed for a 1 in 100 year storm (+20%). A 20% increase in runoff due to global warming is included as per "Greater Dublin Regional Code of Practice for Drainage Works" and the "GDSDS".

The surface water drains have been designed in accordance with BS EN 752, Code of Practice for Drainage Outside Buildings. Details of the proposed surface water drainage system are shown in Hayes Higgins Partnership drawing 01 and calculations within Appendix A.



#### **4. Foul Water Drainage**

The foul drainage system has been designed in accordance with BS 8301:1985, Code of Practice for Building Drainage and the current Building Regulations.

The foul drainage system for the development is a gravity feed system falling to an existing 225mm diameter foul sewer located to the west of the site, on Stockhole Lane (the Cloghran Sewer). Foul sewers from the development will be connected to this foul sewer via new pipe infrastructure and will eventually discharge to the Ringsend Wastewater Treatment Plant (WWTP) for treatment and ultimate disposal. The development will not result in a significant increase in foul discharge (peak flow of 0.294 l/s) from the site on the public sewer and we do not anticipate any capacity problems.

Average flow = 600 l/day per dwelling = 0.007 l/s

7 no. dwellings = 0.049 l/s

Peak flow = 6xDry weather flow (average flow) = 6 x 0.049 = 0.294 l/s

The main foul sewers in the proposed development are to consist of 225mm diameter concrete pipes with fall 1/200 chosen throughout to minimise the risk of blockages and to aid maintenance. Based on the 225mm diameter pipes with a 1:200 fall, the design flow is calculated as 32.18 l/s. The achieved velocity is 0.81 m/s, which is higher than the minimum self-cleansing velocity of 0.75 m/s for pipes less than 300mm diameter. A roughness coefficient (ks) of 1.5mm is applied to the design of all pipes.

The drawings included with the planning application show the proposed foul drainage layout. Details of the proposed foul sewer are shown in Hayes Higgins Partnership drawing 01 and calculations within Appendix B.

#### **5. Water Supply System**

There is an existing watermain located in Baskin Court. It is proposed to extend the watermain with a 100mm diameter HDPE watermain pipe through the site to serve the proposed houses.

In accordance with requirements air valves and scour valves will be provided around the site as necessary. Hydrants will be provided as directed by the Fire Safety Certificate and Technical Guidance Document B of the Building Regulations 2006. Water saving devices including aerated taps and low water usage appliances will be used in the proposed development in accordance with best practice. The proposed watermain layout and details are shown on Hayes Higgins Partnership drawing 03.

#### **6. Stage 1 Flood Risk Assessment**

A stage 1 desktop flood risk assessment was undertaken to identify possible sources of flooding and the risk posed to the development, and separately the risk posed to surrounding areas as a result of the development. The Guidelines for Planning Authorities – The Planning System and Flood Risk Management was referenced during design.

## **Tidal**

The site is situated far enough away from the sea not to be subjected to coastal or tidal flooding.

## **Fluvial, Pluvial (urban drainage), and pluvial (overland flow)**

### External Sources

The OPW flood mapping website, [www.floodmaps.ie](http://www.floodmaps.ie) and [www.floodinfo.ie](http://www.floodinfo.ie) have been reviewed and included in Appendix E. Both websites show some flooding downstream the water stream mentioned, however, the site is located at a higher level than the water stream and the surrounding land slopes away from the site. Also, from the information contained in this report it is evident that the site has not been subjected to flooding during previously reported flooding events as consulted the websites above. As such it is reasonable to assume there is no risk to the proposed development resulting from flooding off-site.

### Internal sources

It is intended that all surface water run off generated by the 1in100 year storm will be dealt with via the attenuation tank. An allowance has been made for a 20% increase in runoff due to global warming, as per the "Greater Dublin Strategic Drainage Study" recommendations.

## **Blockages**

All dwellings have a 2% downhill gradient towards the road where the surface water is taken and discharge into an existing water stream. The site also has a downhill gradient south towards the existing water stream mentioned above. The adjacent public sewers are running down the slope away from the site.

## **Groundwater**

Groundwater was encountered deeply in 4 tests of 12. The site also has a downhill gradient south towards the existing water stream apart the proposed dwellings.

Due to all of these factors the risk of flooding is minimal.

A Stage 2 FRA is currently being complete by IE Consulting.

## **7. Site Access**

Vehicular access to the houses will be provided from the extension of the existing road, Stockhole Lane. There will be a raised table for pedestrian crossing and speed control. The housing development will also be reachable by foot from existing footpath in the north which will be connected to a new footpath between green area and the new road. This new footpath will lead to the dwellings. At all pedestrian crossing points tactile paving will be provided. Sufficient corner radii bends, site distances at junctions, road widths (6m width) and footpaths widths (2m width) will be provided throughout. Road layout complies with Design Manual for Urban Roads. Each dwelling is going to have 2 parking spaces. Sufficient sightlines are provided at the exit from the site onto Stockhole Lane as shown in Hayes Higgins Partnership drawing 04.

## **8. Services Design Summary**

The proposed Surface water drainage system has been set up so as to ensure that adequate self-cleansing velocities are obtained, in accordance with the Building Regulations, and to comply in full with the Greater Dublin Regional Code of Practice for Drainage Works. Similarly, the proposed Foul drainage system has been set up to ensure that adequate self-cleansing velocities are obtained for partial flows under design loading, in accordance with the Building Regulations.

## **Appendix A**



**Job Number:** 18D073  
**Date:** 03.08.19

Q																					
Manhole Ref Number	Sewer Ref Number	Cover Level	Invert Level	Depth To Manhole	Cover	Length	Gradient	Pipe Diameter	Velocity flowing full	Pipe Capacity	Time Of Flow	Time Of Concentration	Rate Of Rainfall	IMPERMEABLE AREA						Required Rate Of Flow	Pipe Capacity
														Roof	Road	Footpath	Paving	Total	Cumulative		
		(m)	(m)	(m)	(m)	(m)	(1 in)	(mm)	(m/s)	(l/s)	(min)	(min)	(mm/hr)	(m^2)	(m^2)	(m^2)	(m^2)	(m^2)	(m^2)	(l/s)	(l/s)
S01	S01	46.30	45.13	1.17				225													
S02	S01-S02	46.53	45.04	1.49	1.26	18.6	200	225	0.92	36.55	0.34	5.34	76.8	377	235	51	50	688	688	14.7	36.5
S03	S02-S03	46.93	44.83	2.10	1.88	41.2	200	225	0.92	36.55	0.75	6.09	71.0	120	169	56	50	370	1058	20.9	36.5
S04	S04	47.09	45.06	2.03	1.81			225													
S05	S04-S05	47.07	44.97	2.10	1.87	18.3	200	225	0.92	36.55	0.33	5.33	76.8	258	248	50	50	581	581	12.4	36.5
S03	S05-S03	46.93	44.83	2.10	1.88	28.2	200	225	0.92	36.55	0.51	5.84	72.7	119	451	80	25	662	1242	25.1	36.5
S03	S03	46.93	44.83	2.10	1.88			225													
S06	S03-S06	46.32	44.50	1.82	1.52	47.4	200	300	1.11	78.21	0.71	5.71	73.7	874	1103	237	175	2301	2301	47.1	78.2
S07	S07	46.70	44.39	2.31	2.09			225	FLOW CONTROL = 3.11 l/s												
S08	S07-S08	47.90	44.35	3.55	3.33	35.6	200	225													

## **Appendix B**

**Job Title:** STOCKHOLE LANE  
**Calculation by:** JGC  
**Checked by:**

**Job Number:** 18D073  
**Date:** 13.12.18

**Proposed Foul Drainage Design**

Manhole Ref Number	Sewer Ref Number	Cover Level (m)	Invert Level (m)	Depth To Manhole (m)	Length (m)	Gradient (1 in)	Pipe Diameter (mm)	Velocity flowing full (m/s)	Pipe Capacity (l/s)
F01		47.00	44.70	2.31					
F02	<i>F01-F02</i>	47.04	44.58	2.47	23.8	200	225	0.81	32.18
F03	<i>F02-F03</i>	46.93	44.41	2.52	32.7	200	225	0.81	32.18
F04		46.19	44.73						
F03	<i>F04-F03</i>	46.93	44.41	2.52	63.0	200	225	0.81	32.18
F03		46.93	44.41	2.52					
F05	<i>F03-F05</i>	47.15	44.21	6.66	39.8	200	225	0.81	32.18
Ex.F.MH		44.30	41.95	2.35					
F06	<i>Ex.F.MH-F06</i>	44.60	40.50	4.10	10.0	200.00	225	0.81	32.18

## **Appendix C**

Calculated by: Jacob Granados  
Site name: Stockhole Lane  
Site location: Stockhole Lane, Co. Dublin

Site coordinates  
Latitude: 53.42312° N  
Longitude: 6.21231° W

This is an estimation of the greenfield runoff rate limits that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments", W5-074/A/TR1/1 rev. E (2012) and the SuDS Manual, C753 (Ciria, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Reference: 6519204  
Date: 2019-01-24T12:03:58

## Methodology

IH124

### Site characteristics

Total site area (ha)	1.22
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### Methodology

Qbar estimation method	Calculate from SPR and SAAR
SPR estimation method	Calculate from SOIL type

	Default	Edited
SOIL type	2	2
HOST class	---	---
SPR/SPRHOST	0.3	0.3

### Hydrological characteristics

	Default	Edited
SAAR (mm)	933	933
Hydrological region	12	12
Growth curve factor: 1 year	0.85	0.85
Growth curve factor: 30 year	2.13	2.13
Growth curve factor: 100 year	2.61	2.61

### Notes:

(1) Is  $Q_{BAR} < 2.0$  l/s/ha?

(2) Are flow rates  $< 5.0$  l/s?

Where flow rates are less than 5.0 l/s consents are usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set in which case blockage work must be addressed by using appropriate drainage elements

(3) Is  $SPR/SPRHOST \leq 0.3$ ?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite may be a requirement for disposal of surface water runoff.

### Greenfield runoff rates

	Default	Edited
Qbar (l/s)	3.11	3.11
1 in 1 year (l/s)	2.65	2.65
1 in 30 years (l/s)	6.63	6.63
1 in 100 years (l/s)	8.12	8.12

## **Appendix D**

Met Eireann  
Return Period Rainfall Depths for sliding Durations  
Irish Grid: Easting: 318618, Northing: 243851,

DURATION	Interval		Years													
	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.5,	3.5,	4.0,	4.8,	5.3,	5.7,	7.1,	8.7,	9.7,	11.1,	12.4,	13.4,	14.9,	16.1,	17.1,	N/A ,
10 mins	3.4,	4.8,	5.6,	6.7,	7.4,	8.0,	9.9,	12.1,	13.5,	15.5,	17.3,	18.7,	20.8,	22.4,	23.8,	N/A ,
15 mins	4.0,	5.7,	6.5,	7.8,	8.7,	9.4,	11.7,	14.2,	15.9,	18.2,	20.3,	22.0,	24.5,	26.4,	28.0,	N/A ,
30 mins	5.3,	7.4,	8.5,	10.1,	11.2,	12.0,	14.8,	17.9,	19.9,	22.7,	25.2,	27.1,	30.1,	32.4,	34.3,	N/A ,
1 hours	7.0,	9.6,	11.0,	13.0,	14.4,	15.4,	18.7,	22.5,	24.9,	28.3,	31.3,	33.6,	37.1,	39.8,	42.0,	N/A ,
2 hours	9.3,	12.6,	14.3,	16.7,	18.4,	19.7,	23.8,	28.3,	31.2,	35.2,	38.8,	41.5,	45.6,	48.8,	51.4,	N/A ,
3 hours	11.0,	14.7,	16.6,	19.4,	21.3,	22.7,	27.3,	32.3,	35.6,	40.1,	44.0,	47.0,	51.5,	55.0,	57.9,	N/A ,
4 hours	12.3,	16.4,	18.5,	21.6,	23.6,	25.2,	30.1,	35.6,	39.1,	43.9,	48.1,	51.3,	56.2,	59.9,	63.0,	N/A ,
6 hours	14.5,	19.1,	21.5,	25.0,	27.3,	29.0,	34.6,	40.7,	44.5,	49.9,	54.5,	58.1,	63.4,	67.5,	70.9,	N/A ,
9 hours	17.1,	22.3,	25.1,	29.0,	31.6,	33.5,	39.7,	46.5,	50.8,	56.7,	61.9,	65.8,	71.6,	76.1,	79.8,	N/A ,
12 hours	19.1,	24.9,	27.9,	32.2,	35.0,	37.1,	43.8,	51.1,	55.8,	62.1,	67.6,	71.8,	78.1,	82.9,	86.8,	N/A ,
18 hours	22.5,	29.1,	32.5,	37.3,	40.5,	42.8,	50.4,	58.5,	63.6,	70.6,	76.7,	81.3,	88.2,	93.4,	97.7,	N/A ,
24 hours	25.3,	32.5,	36.2,	41.4,	44.9,	47.4,	55.6,	64.3,	69.8,	77.4,	83.9,	88.8,	96.1,	101.7,	106.3,	121.7,
2 days	31.4,	39.6,	43.7,	49.5,	53.3,	56.1,	65.0,	74.4,	80.3,	88.2,	95.1,	100.2,	107.9,	113.6,	118.3,	134.2,
3 days	36.3,	45.3,	49.7,	56.0,	60.1,	63.1,	72.6,	82.5,	88.7,	97.1,	104.3,	109.6,	117.6,	123.6,	128.5,	144.8,
4 days	40.6,	50.2,	55.0,	61.7,	66.0,	69.2,	79.2,	89.6,	96.1,	104.9,	112.3,	117.8,	126.1,	132.3,	137.3,	154.1,
6 days	48.1,	58.8,	64.1,	71.5,	76.2,	79.7,	90.6,	101.9,	108.9,	118.2,	126.2,	132.1,	140.8,	147.4,	152.7,	170.3,
8 days	54.7,	66.4,	72.1,	80.1,	85.1,	88.9,	100.5,	112.5,	120.0,	129.9,	138.2,	144.4,	153.6,	160.5,	166.0,	184.4,
10 days	60.7,	73.3,	79.4,	87.9,	93.2,	97.2,	109.5,	122.2,	130.0,	140.3,	149.1,	155.6,	165.2,	172.3,	178.1,	197.1,
12 days	66.3,	79.7,	86.1,	95.1,	100.7,	105.0,	117.8,	131.1,	139.2,	150.0,	159.1,	165.8,	175.8,	183.2,	189.1,	208.8,
16 days	76.7,	91.5,	98.5,	108.3,	114.5,	119.1,	133.0,	147.3,	156.0,	167.6,	177.3,	184.5,	195.1,	202.9,	209.2,	230.1,
20 days	86.3,	102.3,	109.9,	120.4,	127.0,	132.0,	146.8,	162.0,	171.3,	183.6,	193.8,	201.4,	212.5,	220.8,	227.4,	249.2,
25 days	97.6,	114.9,	123.2,	134.5,	141.6,	146.9,	162.8,	179.0,	188.9,	201.9,	212.7,	220.7,	232.5,	241.2,	248.2,	271.1,

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](http://www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf)

### 15D086 - Surface Water Attenuation Calculation 1-30

	1	2	3	4	5	6
Time	<i>Storm Frequency &amp; Duration</i>	<i>Rainfall</i>	<i>Rainfall Intensity</i>	<i>Potential Run-off From Developed Site</i>	<i>Allowable Run- off From Developed Site</i>	<i>Storage Requirement</i>
(mins)		(mm)	(mm/hr)	(l/s)	(l/s)	(m3)
5	M30-5 min	9.70	116.40	74.40	3.11	21.4
10	M30-10 min	13.50	81.00	51.77	3.11	29.2
15	M30-15 min	15.90	63.60	40.65	3.11	33.8
30	M30-30 min	19.90	39.80	25.44	3.11	40.2
60	M30-60 min	24.90	24.90	15.92	3.11	46.1
<b>120</b>	<b>M30-2 hr</b>	<b>31.20</b>	<b>15.60</b>	<b>9.97</b>	<b>3.11</b>	<b>49.4</b>
180	M30-3 hr	35.60	11.87	7.58	3.11	48.3
240	M30 - 4hr	39.10	9.78	6.25	3.11	45.2
360	M30-6 hr	44.50	7.42	4.74	3.11	35.2
540	M30-9 hr	50.80	5.64	3.61	3.11	16.1
<u>720</u>	<u>M30-12 hr</u>	<u>55.80</u>	<u>4.65</u>	<u>2.97</u>	<u>3.11</u>	<u>-6.0</u>
1080	M30-18 hr	63.60	3.53	2.26	3.11	-55.2
1440	M30-24 hr	69.80	2.91	1.86	3.11	-108.1
2880	M30-2day	80.30	1.67	1.07	3.11	-352.6



## 17D004 - Surface Water Attenuation Calculation 1-100 + 20%

1	2	3	4	5	6
<i>Storm Frequency &amp; Duration</i>	<i>Rainfall</i>	<i>Rainfall Intensity</i>	<i>Potential Run-off From Developed Site</i>	<i>Allowable Run- off From Developed Site</i>	<i>Storage Requirement</i>
	<i>(mm)</i>	<i>(mm/hr)</i>	<i>(l/s)</i>	<i>(l/s)</i>	<i>(m3)</i>
M100-5 min	16.08	192.96	123.33	3.1	36.1
M100-10 min	22.44	134.64	86.06	3.1	49.8
M100-15 min	26.40	105.60	67.50	3.1	57.9
M100-30 min	32.52	65.04	41.57	3.1	69.2
M100-60 min	40.32	40.32	25.77	3.1	81.6
M100-2 hr	49.80	24.90	15.92	3.1	92.2
M100-3 hr	56.40	18.80	12.02	3.1	96.2
<b>M100 - 4hr</b>	<b>61.56</b>	<b>15.39</b>	<b>9.84</b>	<b>3.1</b>	<b>96.9</b>
M100-6 hr	69.72	11.62	7.43	3.1	93.2
M100-9 hr	78.96	8.77	5.61	3.1	80.9
M100-12 hr	86.16	7.18	4.59	3.1	63.9
M100-18 hr	97.56	5.42	3.46	3.1	23.0
<b><u>M100-24 hr</u></b>	<b><u>106.56</u></b>	<b><u>4.44</u></b>	<b><u>2.84</u></b>	<b><u>3.1</u></b>	<b><u>-23.5</u></b>
M100-2day	120.24	2.51	1.60	3.1	-260.7

Allowable Run-off  
Total Area

3.11  
**2301**

l/s  
**m<sup>2</sup>**



## User Inputs

Chamber Model	SC-740
Outlet Control Structure	Yes (Outlet)
Project Name	Proposed Housing, Stockhole Lane, Co. Dublin
Engineer	Jacob Granados
Project Location	Stockhole Lane, Co. Dublin
Project Date	01/24/2019
Measurement Type	Metric
Required Storage Volume	97 cubic meters
Stone Porosity	40%
Stone Foundation Depth	152 mm.
Stone Above Chambers	152 mm.
Average Cover Over Chambers	460 mm.
Design Constraint	Width
Design Constraint Dimension	10 meters

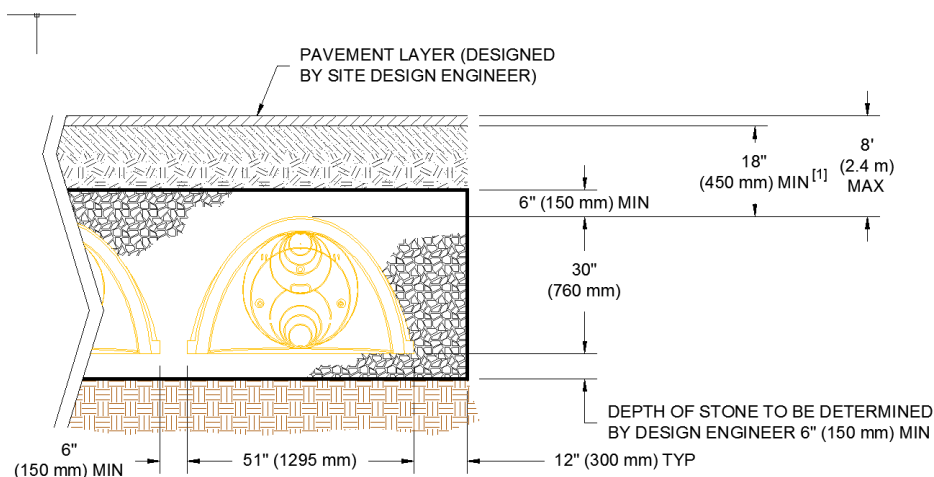
## Results

### System Volume and Bed Size

Installed Storage Volume	99 cubic meters
Storage Volume Per Chamber	2.12 cubic meters
Number Of Chambers Required	40 each
Number Of End Caps Required	12 each
Rows/Chambers	4 row(s) of 7 chamber(s)
Leftover Rows/Chambers	2 row(s) of 6 chamber(s)
Maximum Length	17.38 meters
Maximum Width	9.33 meters
Approx. Bed Size Required	158 square meters

### System Components

Amount Of Stone Required	116 cubic meters
Volume Of Excavation (Not Including Fill)	168 cubic meters
Non-woven Filter Fabric Required	370 square meters
Length Of Isolator Row	15.67 meters
Non-Woven Isolator Row Fabric	36 square meters
Woven Isolator Row Fabric	46 square meters



[1] - TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24\" (600 mm).

© ADS Stormtech 2016

## **Appendix E**

## Summary Local Area Report

This Flood Report summarises all flood events within 2.5 kilometres of the map centre.

The map centre is in:

County: Dublin

NGR: O 188 428

This Flood Report has been downloaded from the Web site [www.floodmaps.ie](http://www.floodmaps.ie). The users should take account of the restrictions and limitations relating to the content and use of this Web site that are explained in the Disclaimer box when entering the site. It is a condition of use of the Web site that you accept the User Declaration and the Disclaimer.



Map Scale 1:9,884

### Map Legend

	Flood Points
	Multiple / Recurring Flood Points
	Areas Flooded
	Hydrometric Stations
	Rivers
	Lakes
	River Catchment Areas
	Land Commission *
	Drainage Districts *
	Benefiting Lands *

\* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained in the Glossary.

## 4 Results



1. North of M50 (N1 road) old Airport Road Nov 2002

County: Dublin

Start Date: 13/Nov/2002

Flood Quality Code: 3

Additional Information: Reports (4) More Mapped Information



2. Mayne M50 flyover old Airport Road Nov 2000

County: Dublin

Start Date: 05/Nov/2000

Flood Quality Code: 3

Additional Information: Reports (4) More Mapped Information



3. Mayne M50 flyover old Airport Road Recurring

County: Dublin

Start Date:

Flood Quality Code: 4

Additional Information: Reports (4) More Mapped Information



4. Stockhole Lane (near Airport) Recurring

County: Dublin

Start Date:

Flood Quality Code: 4

Additional Information: Reports (1) More Mapped Information

# Flood Maps

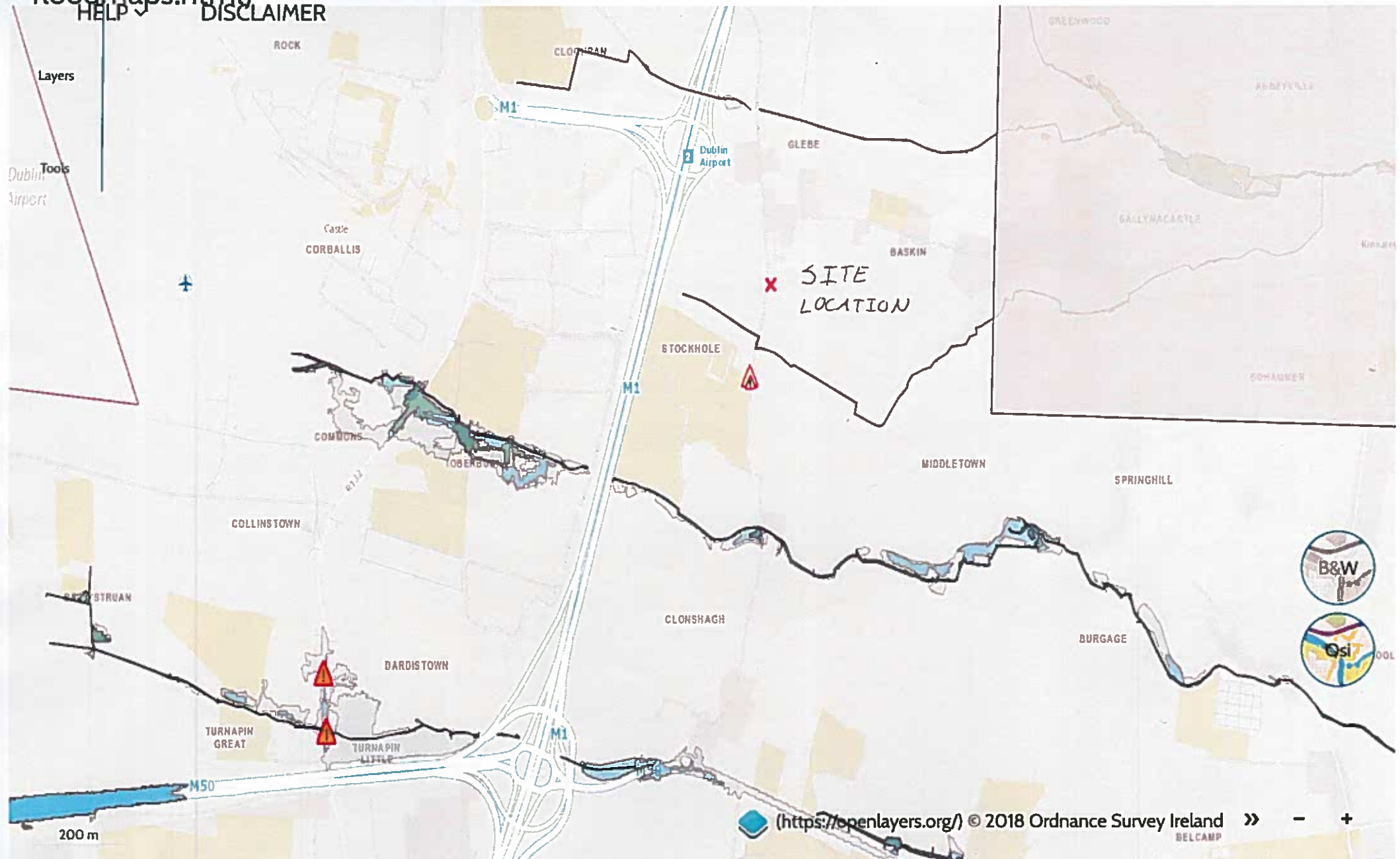
(disclaimer.html)  
floodmaps.html

PUBLICATIONS (/PUBLICATIONS/)

RESOURCES ▾

REPORT PAST FLOOD

FEEDBACK



## **Appendix F**

**SUDS/Green Infrastructure measures selected for this site**

Suds Measures	Measures to be used on this site	Rationale for selecting/not selecting measure
Source Control		
Swales	N	<p>Swales were ruled out due to adverse site topography; ground is rising from the lowest dwelling (no 1) and associated road, at the north of the site, whilst surface water drainage needs to fall in a southerly direction.</p> <p>Last but not least the conditions on site are not favourable to infiltration as stated in Stockhole Lane –Ground Investigation Interpretative Report (18-1309). Soakaways tests were carried out (trial pit SA01–SA03) according to the Building Research Establishment (2007), BRE Digest 365: Soakaways. As a result, the absence of outflow from the pits indicated very low infiltration coefficients. The low-permeability fine-grained soils are therefore considered to have limited infiltration and would be deemed unsuitable for the implementation of infiltration drainage systems. The ground has no capacity (no infiltration) to accept water discharge because of its low permeability, which will cause water retention instead of promoting water flow for recharging. For these reasons, the use of swales are ineffective.</p> <p>Refer to section 3 Surface Water Drainage of the Civil Engineering Services Report.</p>
Tree Pits	N	<p>Tree pits were ruled out due to adverse topography; open space and trees are located on ground which is higher than the lowest dwelling no 1 and associated road at the north of the site.</p> <p>Last but not least firm/stiff glacial till at 1.5/2m depth means tree pits are not suitable. The ground has no capacity (no infiltration) to accept water discharge because of its low permeability, which will cause water retention instead of promoting water flow for recharging. For these reasons, the use of tree pits is ineffective.</p> <p>Refer to section 3 Surface Water Drainage of the Civil Engineering Services Report.</p>
Rainwater Butts	N	Client Decision
Rainwater harvesting	N	Development is residential and too small to consider use of rainwater harvesting
Soakaways	N	Firm/Stiff glacial till at 1.5/2m depth means Soakaways are not suitable. 3 No. Infiltration tests indicated that the proposed site lies within the extremely low permeability range.
Infiltration trenches	N	Firm/Stiff glacial till at 1.5/2m depth means Infiltration trenches are not suitable. 3 No. Infiltration tests indicated that the proposed site lies within the extremely low permeability range.
Permeable pavement	N	Firm/Stiff glacial till at 1.5/2m depth means Permeable pavement are not suitable. 3 No. Infiltration tests indicated that the proposed site lies within the extremely low permeability range.
- Grasscrete	N	Firm/Stiff glacial till at 1.5/2m depth means Grasscrete are not suitable. 3 No. Infiltration tests indicated that the proposed site lies within the extremely low permeability range.
- Block paving	N	Firm/Stiff glacial till at 1.5/2m depth means Block paving are not suitable. 3 No. Infiltration tests indicated that the proposed site lies within the extremely low permeability range.
- Porous Asphalt	N	Firm/Stiff glacial till at 1.5/2m depth means Porous Asphalt are not suitable. 3 No. Infiltration tests indicated that the proposed site lies within the extremely low permeability range.

Green Roofs	N	Housing unit design does not allow for green roofs
Filter strips	N	Firm/Stiff glacial till at 1.5/2m depth means Filter strips are not suitable. 3 No. Infiltration tests indicated that the proposed site lies within the extremely low permeability range.
Bioretention systems	N	Firm/Stiff glacial till at 1.5/2m depth means Bioretention systems are not suitable. 3 No. Infiltration tests indicated that the proposed site lies within the extremely low permeability range.
Blue Roofs	N	Housing unit design does not allow for blue roofs
Filter Drain	N	Firm/Stiff glacial till at 1.5/2m depth means Filter Drain are not suitable. 3 No. Infiltration tests indicated that the proposed site lies within the extremely low permeability range.
<b>Site Control</b>		
Detention Basins	N	An attenuation basin was considered and designed in the southern part of the site but this was ruled out due to excessive depth and associated risks of becoming a site for illegal dumping. Refer to HHP drawing number 01_Proposed Drainage Layout. Sheet 1 of 2_Rev P.
Retentions basins	N	An attenuation basin was considered and designed in the southern part of the site but this was ruled out due to excessive depth and associated risks of becoming a site for illegal dumping. Refer to HHP drawing number 01_Proposed Drainage Layout. Sheet 1 of 2_Rev P.
<b>Regional Control</b>		
Ponds	N	Green spaces are too small to facilitate ponds
Wetlands	N	Green spaces are too small to facilitate wetlands
<b>Other</b>		
Petrol/Oil interceptor	Y	Suitable for proposed development
Attenuation tank – only as a last resort where other measures are not feasible	Y	A StormTech attenuation system is used which allows for infiltration of stormwater where possible.
Oversized pipes– only as a last resort where other measures are not feasible	N	Not required

**Note:**

1. Fingal has a preference for above ground Green Infrastructure rather than tanks or over sized pipes . Above ground flows through swales, basins etc are encouraged.
2. Demonstrate SUDS system will have sufficient Pollutant removal efficiency in accordance with Ciria Suds Manual C753
3. Basins sides should be no steeper than 1:4 and no deeper than 1.2m in the 1%AEP
4. Culverting shall be avoided where possible
5. De-culverting is encouraged.
6. Examples of Suds systems throughout Fingal available at <https://pin.it/yvwrkb3hrekcdue>



**Flood risk to be assessed**

Flood risk	Applicable to subject site	Measures to reduce risk	Residual risk
Fluvial		Refer to Stage 2 Flood Risk Assessment	
Pluvial		Refer to Stage 2 Flood Risk Assessment	
Coastal		Refer to Stage 2 Flood Risk Assessment	
Groundwater		Refer to Stage 2 Flood Risk Assessment	
Dam/Embankment/Canal bank breach		Refer to Stage 2 Flood Risk Assessment	
Network drainage		Refer to Stage 2 Flood Risk Assessment	
Snow melt		Refer to Stage 2 Flood Risk Assessment	
Watermain burst		Refer to Stage 2 Flood Risk Assessment	

**Note:**

Models should consider the risk when outlets are surcharged

## **Appendix G**



Uisce Éireann  
Bosca OP 6000  
Baile Átha Cliath 1  
Éire

Irish Water  
PO Box 6000  
Dublin 1  
Ireland

T: +353 1 89 25000  
F: +353 1 89 25001  
[www.water.ie](http://www.water.ie)

Jacob Granados Castro  
The Glass House  
11 Coke Lane  
Smithfield  
Dublin 7, Dublin D07WNP2

18 February 2019

Dear Jacob Granados Castro,

**Re: Connection Reference No CDS19000036 pre-connection enquiry - Subject to contract | Contract denied**

**Connection for Housing Development of 10 unit(s) at Stokhole Lane, Dublin, Dublin.**

Irish Water has reviewed your pre-connection enquiry in relation to a water connection at Stokhole Lane, Dublin.

Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the network(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated.

Please be advised that at connection application stage you have to demonstrate that wastewater infrastructure within the Estate is in adequate condition and in compliance with requirements of Irish Water Code of Practice and Standard Details.

You are advised that this correspondence does not constitute an offer in whole or in part to provide a connection to any Irish Water infrastructure and is provided subject to a connection agreement being signed at a later date.

A connection agreement can be applied for by completing the connection application form available at **[www.water.ie/connections](http://www.water.ie/connections)**. Irish Water'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.

If you have any further questions, please contact Marina Zivanovic Byrne from the design team on 01 89 25991 or email [mzbyrne@water.ie](mailto:mzbyrne@water.ie). For further information, visit [www.water.ie/connections](http://www.water.ie/connections).

Yours sincerely,

**Maria O'Dwyer**

**Connections and Developer Services**

**Stiúrthóirí / Directors:** Mike Quinn (Chairman), Eamon Gallen, Cathal Marley, Brendan Murphy, Michael G. O'Sullivan

**Oifig Chláraithe / Registered Office:** Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin 1, D01 NP86

Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Irish Water is a designated activity company, limited by shares.

**Uimhir Chláraithe in Éirinn / Registered in Ireland No.:** 530363

Jacob Granados Castro  
The Glass House  
11 Coke Lane  
Smithfield  
Dublin 7, Dublin D07WNP2

12 February 2019

Dear Jacob Granados Castro,

**Re: Connection Reference No CDS19000030 pre-connection enquiry - Subject to contract | Contract denied**

**Connection for Housing Development of 7 unit(s) at Stokhole Lane, Dublin, Dublin.**

Irish Water has reviewed your pre-connection enquiry in relation to a water connection at Stokhole Lane, Dublin, Dublin.

Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the network(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated.

Proposed water connection is via Baskin Estate of 10 no. houses which hasn't been taken in charge. The Estate has water connection from 24' trunk main in Stochole Lane and waste water discharges into a private WWTP which is situated within the proposed site boundaries.

At connection application stage and prior to commencement of any Self-Lay Works:

- The Baskin Estate has to be connected into the gravity sewer in Stochole Lane and existing WWTP with associated pump station and rising main have to be decommissioned and the land decontaminated.
- you should identify and procure transfer to Irish Water of the arterial water Infrastructure within any Third Party Infrastructure
- you should demonstrate that the arterial infrastructure are in compliance with requirements of Irish Water Code of Practice and Standard Details and in adequate condition and capacity to cater for additional load from the Development.

All infrastructure should be designed and installed in accordance with the Irish Water Codes of Practice and Standard Details. A design proposal for the water and/or wastewater infrastructure should be submitted to Irish Water for assessment. Prior to submitting your planning application, you are required to submit these detailed design proposals to Irish Water for review.

You are advised that this correspondence does not constitute an offer in whole or in part to provide a connection to any Irish Water infrastructure and is provided subject to a connection agreement being signed at a later date.

**Stiúrthóirí / Directors:** Mike Quinn (Chairman), Eamon Gallen, Cathal Marley, Brendan Murphy, Michael G. O'Sullivan

**Oifig Chláraithe / Registered Office:** Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin 1, D01 NP86

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If you have any further questions, please contact Marina Zivanovic Byrne from the design team on 01 89 25991 or email [mzbyrne@water.ie](mailto:mzbyrne@water.ie). For further information, visit [www.water.ie/connections](http://www.water.ie/connections).

Yours sincerely,



**Maria O'Dwyer**

**Connections and Developer Services**