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OBA | CONSULTING
CIVIL & STRUCTURAL
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Senior Planning Officer
Land Use
Planning and Transportation Department
South Dublin County Council,

25/05/2022

Dear Sir/Madam,

**Further Information: Lissadell, Whitechurch Road, Rathfarnham, Dublin 16. Demolition of existing single storey structures: porch to front, bay window and store to rear; construction of single storey flat roof extension to front, part single storey flat roof extension and part two storey extension with pitch roof to match existing dwelling to rear and internal modifications with associated siteworks.**

**Planning ref: SD21B/0585**

Enclosed:

- 126-03-C01 Revision B Foul & SW Drainage Layout Plan – Main Dwelling;
- Flood Risk Assessment;
- Infiltration tests; and
- SW Attenuation calculations.

Please find attached responses to engineering related items of the request for further information, dated 24th January 2022.

Responses to Additional Information Request Item No.1 and 3:

1. *The proposed extension to the south of the existing dwelling is located in an area that is at risk of 1 in 100 year flood risk event. The applicant is requested to carry out a site-specific Flood Risk Assessment to an appropriate level of detail, addressing all potential sources of flood risk. The FRA should demonstrate compliance with the Flood Risk Guidelines, paying particular attention to residual flood risks and any proposed site specific flood management measures. The applicant is requested to submit a report to outline what mitigation measures are proposed for the development to ensure flood risk is mitigated against on site as well as downstream/upstream of the site.*

**Response**

1. Please refer to the included Flood Risk Assessment.

3. *There are no soil percolation test results, design calculations or dimensions submitted for the proposed soakaway. The applicant is required to submit a report showing site specific soil percolation test results and design calculations for the proposed soakaway in accordance with BRE Digest 365 – Soakaway Design.*

a. *The applicant is requested to submit a revised drawing showing plan & cross-sectional views, dimensions, and location of proposed soakaway. Any proposed soakaway shall be located fully within the curtilage of the property and shall be:*
   i. *At least 5m from any building, public sewer, road boundary or structure.*
   ii. *Generally, not within 3m of the boundary of the adjoining property.*
   iii. *Not in such a position that the ground below foundations is likely to be adversely affected.*
   iv. *10m from any sewage treatment percolation area and from any watercourse / floodplain.*
   v. *Where possible soakaways must include an overflow connection to the surface water drainage network.*

b. *The applicant should include Water Buts as a SuDs measure (Sustainable urban Drainage).*

**Response**

**3.**

a. On-site infiltration tests failed. Please refer to photo documents in the Addendum.
Currently the SW from the main house discharges unattenuated flow directly to the stream.
Since the soil infiltration tests failed, it is proposed to provide a SW attenuation tank with restricted discharge to the stream.
The tank has been kept as shallow as possible to avoid the water table and also to keep the outfall above the stream level (at 1.2m above the current stream level. Outfall from the SW attenuation tank discharges at maximum 2 l/s to the stream.
Comparison of Peak Flow Post Development to Existing Flow
Peak flow after the development is completed:
SW = 2.0 l/s (Hydrobrake discharge rate)
Total = 2.0 l/s
Comparing this with existing un-attenuated surface water flow from the existing (152 $m^2$) roof during say 50mm/hr. storm
Surface Water Flow = $\frac{0.05 \times 152 \times 1,000}{60^2}$ = 2.1 l/s
As demonstrated, the proposed discharge will not exceed the current discharge, due to the SUDS measures proposed (interception and attenuation) which ensure that the current status quo is never exceeded.
Please refer to the enclosed drawing 126-03-01 Revision B, showing plans, sections and dimensions of the proposed attenuation.

b. SUDS measures include water butts and sedum roof to the main extension. The SW Attenuation ensures storage for the 100-year +20% event with a limited discharge of 2 l/s.

We trust that these items satisfy the request for additional information.

Yours faithfully

**Ciaran O'Brien**

**BEng CEng MIEI EurIng FConsEI**

# Addendum

Attenuation Volume Calculations

Site Area = 2225 $m^2$ (Red Boundary east of the stream)

Areas contributing to SW Run-off:

| Description | Finish | Area ($m^2$) | Percentage run-off (%) | Equivalent run-off area ($m^2$) |
|---|---|---|---|---|
| Roof | roof tile/concrete | 240 | 90 | 216.0 |
| Equivalent impermeable area: | | | | **216.0** |

Greenfield runoff rate ($Q_{bar}$) = 0.29 l/s HR Wallingford "Greenfiled runoff estimation for sites"

However, guidance is that where the permissible outflow based on $Q_{bar}$ and site area is less than 2 l/s, the maximum outflow is to be limited to 2 l/s. Therefore,

Permissible outflow = **2.0 l/s**

**100 year storm**

Permissible Volume (l)= Actual Achievable Outflow (l/s) x time (s)

Actual Volume (l)= (Equivalent Impermeable Area x depth of rainfall)

Storage capacity (l)= Actual - Permissible Volumes

| Duration | Rainfall | Permissible | Actual | Store |
|---|---|---|---|---|
| min | mm | l | l | l |
| 5 | 19 | 600.00 | 4104.00 | 3504.00 |
| 10 | 26.5 | 1200.00 | 5724.00 | 4524.00 |
| 15 | 31.1 | 1800.00 | 6717.60 | 4917.60 |
| 30 | 39 | 3600.00 | 8424.00 | 4824.00 |
| 60 | 48.9 | 7200.00 | 10562.40 | 3362.40 |
| 120 | 61.3 | 14400.00 | 13240.80 | -1159.20 |
| 240 | 76.8 | 28800.00 | 16588.80 | -12211.20 |
| 360 | 87.6 | 43200.00 | 18921.60 | -24278.40 |
| 720 | 109.8 | 86400.00 | 23716.80 | -62683.20 |
| 1440 | 137.6 | 172800.00 | 29721.60 | -143078.40 |

Site specific rainfall - Met Eireann

From table above, required storage volume is 4.9 $m^3$
Allow 20% for climate change, volume required = 5.9 $m^3$

Hydrobrake discharge = 2.0 l/s

Print Close Report

HR Wallingford
Working with water

# Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by: Alan Manthe

Site name: Lissadell

Site location: Whitechurch Road

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

**Site Details**

| | |
|---|---|
| Latitude: | 53.27432° N |
| Longitude: | 6.28226° W |
| Reference: | 2279912589 |
| Date: | May 25 2022 11:12 |

**Runoff estimation approach** IH124

**Site characteristics**

Total site area (ha): 0.1

**Methodology**

$Q_{BAR}$ estimation method: Calculate from SPR and SAAR

SPR estimation method: Calculate from SOIL type

| **Soil characteristics** | Default | Edited |
|---|---|---|
| SOIL type: | 2 | 2 |
| HOST class: | N/A | N/A |
| SPR/SPRHOST: | 0.3 | 0.3 |

| **Hydrological characteristics** | Default | Edited |
|---|---|---|
| SAAR (mm): | 1034 | 1034 |
| Hydrological region: | 12 | 12 |
| Growth curve factor 1 year: | 0.85 | 0.85 |
| Growth curve factor 30 years: | 2.13 | 2.13 |
| Growth curve factor 100 years: | 2.61 | 2.61 |
| Growth curve factor 200 years: | 2.86 | 2.86 |

| **Greenfield runoff rates** | Default | Edited |
|---|---|---|
| $Q_{BAR}$ (l/s): | 0.29 | 0.29 |
| 1 in 1 year (l/s): | 0.24 | 0.24 |
| 1 in 30 years (l/s): | 0.61 | 0.61 |
| 1 in 100 year (l/s): | 0.75 | 0.75 |
| 1 in 200 years (l/s): | 0.82 | 0.82 |

**Notes**

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

When $Q_{BAR}$ is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

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

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

**(3) Is SPR/SPRHOST ≤ 0.3?**

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 314619, Northing: 226249,

| | Interval | | Years | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DURATION | 6months, | 1year, | 2, | 3, | 4, | 5, | 10, | 20, | 30, | 50, | 75, | 100, | 150, | 200, | 250, | 500, |
| 5 mins | 2.7, | 4.0, | 4.7, | 5.8, | 6.6, | 7.2, | 9.2, | 11.5, | 13.1, | 15.4, | 17.4, | 19.0, | 21.5, | 23.5, | 25.1, | N/A , |
| 10 mins | 3.8, | 5.6, | 6.6, | 8.1, | 9.2, | 10.0, | 12.8, | 16.1, | 18.3, | 21.4, | 24.2, | 26.5, | 29.9, | 32.7, | 35.0, | N/A , |
| 15 mins | 4.5, | 6.6, | 7.8, | 9.6, | 10.8, | 11.8, | 15.1, | 18.9, | 21.5, | 25.2, | 28.5, | 31.1, | 35.2, | 38.5, | 41.1, | N/A , |
| 30 mins | 5.9, | 8.6, | 10.1, | 12.3, | 13.9, | 15.1, | 19.2, | 24.0, | 27.2, | 31.7, | 35.8, | 39.0, | 44.0, | 47.9, | 51.2, | N/A , |
| 1 hours | 7.7, | 11.2, | 13.0, | 15.9, | 17.9, | 19.4, | 24.5, | 30.4, | 34.4, | 39.9, | 45.0, | 48.9, | 55.0, | 59.8, | 63.7, | N/A , |
| 2 hours | 10.1, | 14.5, | 16.9, | 20.5, | 23.0, | 24.9, | 31.3, | 38.6, | 43.4, | 50.3, | 56.5, | 61.3, | 68.7, | 74.5, | 79.3, | N/A , |
| 3 hours | 11.9, | 17.0, | 19.7, | 23.8, | 26.7, | 28.9, | 36.1, | 44.4, | 49.8, | 57.6, | 64.5, | 69.9, | 78.3, | 84.8, | 90.2, | N/A , |
| 4 hours | 13.3, | 18.9, | 21.9, | 26.5, | 29.6, | 32.0, | 39.9, | 49.0, | 54.9, | 63.4, | 70.9, | 76.8, | 85.8, | 92.9, | 98.7, | N/A , |
| 6 hours | 15.6, | 22.1, | 25.5, | 30.8, | 34.3, | 37.1, | 46.1, | 56.3, | 63.0, | 72.6, | 81.0, | 87.6, | 97.8, | 105.7, | 112.2, | N/A , |
| 9 hours | 18.3, | 25.8, | 29.7, | 35.7, | 39.7, | 42.9, | 53.1, | 64.7, | 72.3, | 83.0, | 92.6, | 100.0, | 111.4, | 120.2, | 127.5, | N/A , |
| 12 hours | 20.5, | 28.7, | 33.1, | 39.7, | 44.1, | 47.6, | 58.8, | 71.4, | 79.7, | 91.4, | 101.8, | 109.8, | 122.1, | 131.7, | 139.6, | N/A , |
| 18 hours | 24.1, | 33.5, | 38.6, | 46.1, | 51.1, | 55.0, | 67.8, | 82.1, | 91.5, | 104.6, | 116.3, | 125.3, | 139.1, | 149.8, | 158.7, | N/A , |
| 24 hours | 27.0, | 37.4, | 43.0, | 51.2, | 56.8, | 61.0, | 75.0, | 90.6, | 100.8, | 115.1, | 127.8, | 137.6, | 152.6, | 164.2, | 173.8, | 207.3, |
| 2 days | 33.9, | 45.9, | 52.1, | 61.3, | 67.4, | 72.1, | 87.2, | 103.9, | 114.8, | 129.8, | 142.9, | 153.0, | 168.4, | 180.2, | 190.0, | 223.6, |
| 3 days | 39.5, | 52.7, | 59.5, | 69.5, | 76.1, | 81.1, | 97.2, | 114.9, | 126.3, | 142.0, | 155.7, | 166.1, | 182.0, | 194.1, | 204.1, | 238.4, |
| 4 days | 44.5, | 58.7, | 66.0, | 76.6, | 83.6, | 89.0, | 106.0, | 124.5, | 136.3, | 152.6, | 166.8, | 177.6, | 194.0, | 206.4, | 216.6, | 251.6, |
| 6 days | 53.1, | 69.1, | 77.3, | 89.0, | 96.7, | 102.6, | 121.1, | 141.0, | 153.8, | 171.2, | 186.2, | 197.6, | 214.8, | 227.9, | 238.6, | 275.0, |
| 8 days | 60.8, | 78.3, | 87.2, | 99.9, | 108.2, | 114.5, | 134.2, | 155.5, | 168.9, | 187.3, | 203.1, | 215.0, | 233.0, | 246.7, | 257.8, | 295.5, |
| 10 days | 67.9, | 86.7, | 96.2, | 109.8, | 118.6, | 125.3, | 146.2, | 168.5, | 182.7, | 201.9, | 218.3, | 230.8, | 249.5, | 263.6, | 275.1, | 314.0, |
| 12 days | 74.5, | 94.6, | 104.6, | 119.0, | 128.3, | 135.3, | 157.2, | 180.6, | 195.3, | 215.3, | 232.4, | 245.3, | 264.6, | 279.2, | 291.0, | 331.1, |
| 16 days | 86.8, | 109.1, | 120.1, | 135.9, | 146.0, | 153.7, | 177.5, | 202.6, | 218.4, | 239.8, | 258.0, | 271.7, | 292.1, | 307.5, | 320.0, | 362.1, |
| 20 days | 98.2, | 122.4, | 134.4, | 151.4, | 162.3, | 170.5, | 195.9, | 222.7, | 239.4, | 262.0, | 281.2, | 295.6, | 317.0, | 333.1, | 346.2, | 390.0, |
| 25 days | 111.5, | 138.0, | 151.0, | 169.4, | 181.1, | 190.0, | 217.2, | 245.8, | 263.6, | 287.5, | 307.8, | 323.0, | 345.6, | 362.5, | 376.2, | 422.0, |

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