JODA ENGINEERING CONSULTANTS

BELLMOUNT DEVELOPMENTS

STORM WATER MANAGEMENT AND SUDS ASSESSMENT

RESIDENTIAL DEVELOPMENT, REDFORGE ROAD, BLACKPOOL

ENGINEERS IRELAND
cpd ACCREDITED COMPANY

Prepared By:
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4507/RM/05-21

1. Introduction.

1.1. General Description

JODA Engineering Consultants were commissioned to undertake a SUDS ssessment report for a residential development at Redforge Road, Blackpool, Cork City.

The development will consist of:

- *The demolition of existing structures on site including a single storey building, pump island canopy, 4 no. fuel pumps and the decommissioning/removal of 4 no. underground fuel tanks; and*
- *The construction of 114 no. Build to Rent apartments (comprising a mix of 1 and 2 bed apartments) in 2 no. blocks, ranging in height from 4 to 9 storeys;*
- *1 no. retail unit;*
- *Residential amenity facilities including a reception, residents' gym, lounge area and shared workspace;*
- *The provision of landscaping and amenity areas including an enclosed courtyard and 1 no. rooftop garden;*
- *The provision of public realm improvements on Redforge Road including widened footpaths and pavement improvements, pedestrian crossing, tree planting, raised tables/planters and seating areas; and*
- *All associated ancillary development including pedestrian/cyclist facilities, lighting, drainage, boundary treatments, bin and bicycle storage, ESB Sub-station and plant at ground floor level.*

1.2. Stormwater Management/SUDS Assessment

Design Parameter	Audit Result
Topography	A Topographical survey information for the proposed development site has been undertaken. The survey confirm that the existing topographical levels within the proposed development site range from 14.1m OD to 13.9m OD. The existing ground profile is generally flat.  **Figure 1.1 – Site Location**
Relevant Studies/References	• *G*reater Dublin Strategic Drainage Strategy (GDSDS) • Greater Dublin Regional Code of Practice for Drainage Works; • The SUDs Manual (CIRIA C753).
Key Considerations & Benefits of SUDS	The key benefits and objectives of SUDs considered as part of this SWM and listed below include: • Reduction of run-off rates; • Provision of volume storage; • Volume treatment provided; • Reduction in volume run-off; • Water quality improvement; • Biodiversity.

HR Wallingford Report for Soil and Hydrological characteristics

HR Wallingford
Working with water

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Roberto Mione
Site name:	Redforge Road
Site location:	Blackpool, Cork

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:	51.91677° N
Longitude:	8.47126° W
Reference:	2817280694
Date:	May 12 2021 15:05

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.3

Methodology

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

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	1141	1141
Hydrological region:	13	13
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	1.65	1.65
Growth curve factor 100 years:	1.95	1.95
Growth curve factor 200 years:	2.15	2.15

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.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	2.57	2.57
1 in 1 year (l/s):	2.18	2.18
1 in 30 years (l/s):	4.23	4.23
1 in 100 year (l/s):	5	5
1 in 200 years (l/s):	5.52	5.52

<table>
<tr><td>SUDS Measures Considered</td><td>JODA Engineering Consultants have given due consideration to the SUDS measures most applicable for this site. Measures include;
<table>
<tr><th>SUDS Technology</th><th>Comments</th></tr>
<tr><td>Petrol Interceptor</td><td>Petrol Interceptor have not been proposed as part of development</td></tr>
<tr><td>Green/Blue Roofs</td><td>Green roofs have been included as part of this development.
An intensive green roof is planned for the development which will cover approximately 70% of the proposed roof area. This layer will facilitate interception of the first 10mm of rainfall falling on the green roof surface. In line with the SuDS manual CIRIA C753 Table 24.6, Green Roofs are assumed to be compliant for zero run-off from the first 5.0mm rainfall.</td></tr>
<tr><td>Swale/Filter Drain/ Infiltration trench</td><td>Swale, Filter Drain and Infiltration trench have not been proposed as part of the development.</td></tr>
<tr><td>Permeable Paving</td><td>Permeable paving has been not proposed as hard standing areas are minor</td></tr>
<tr><td>Soakaways</td><td>Soakaways have not been proposed as part of the development.</td></tr>
<tr><td>Surface Water Attenuation</td><td>Surface Water Attenuation has been proposed as part of development.</td></tr>
<tr><td>Site Run-off Rates</td><td>SuDS requires that post development run-off rates be maintained at the equivalent to, or lower than, the pre-development run-off levels. The proposed discharge rate from the site will be below the pre-development run-off levels in line with the SUDS requirement</td></tr>
<tr><td>Rainwater Harvesting</td><td>RWH has not been proposed within the development</td></tr>
<tr><td>Detention Basins, Retention Ponds, Stormwater Wetlands</td><td>Detention basins, retention ponds etc. have been deemed unsuitable due to space constraints</td></tr>
<tr><td>Tree Root Structural Cell Systems, Bio-retention, rain garden</td><td>Tree Pits, Bio-retention, rain gardens have been deemed unsuitable for the proposed development.</td></tr>
</table></td></tr>
<tr><td>Surface Water Drainage Design</td><td>The surface water drainage system will collect storm-water run-off generated from the proposed residential development, collecting run-off from impermeable road surfaces via gullies and adjoining areas.</td></tr>
<tr><td>Climate Change</td><td>Rainfall values for the proposed development are sourced from Met Eireann to calculate the input hydrograph for the drainage design. The design rainfall intensities were increased by a factor of 10% to take account of climate change.</td></tr>
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Discharge Rate/Flow Control	Is provided to restrict the discharge Rate to 8 l/s with an Hydrobrake flow control.
Volume Storage	The storm water will drain to an on-site, below ground level attenuation facility. Attenuation capacity is designed for a 1 in 100 year storm event + 10% allowance for climate change. The attenuation tank capacity required is 43.2m3.
Biodiversity	Refer to the landscape design for Biodiversity scheme
Return Period	A 100-year return period plus 10% for climate change has been used in the design for the attenuation Systems.
Health & Safety and Maintenance Issues	The proposed drainage system comprises SuDS devices, traditional gullies, manholes, attenuation systems, and underground pipes. These elements are considered acceptable from a Health & Safety perspective once supplier/manufacturers guides are followed and complied with during the detailed design, construction and operation.
Conclusion	JODA Engineering Consultants considers that the surface water drainage design for the proposed development is acceptable and meets all the requirements of the Stage 1 Stormwater Management and SUDS Assessment.