

Client	Eldhose Varghese	Document No.	22021-DSR-07
Project	32 Liffey Park, Liffey Valley Park, Lucan	Revision	A
Project No.	22021	Date	July 22
Title	Drainage Summary Report	By	GC

CUNNINGHAM CONSULTING CIVIL & STRUCTURAL ENGINEERS LTD.
3 PRIORY GROVE
BLACKROCK
Co. DUBLIN
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DOCUMENT	SITE DRAINAGE SUMMARY REPORT
DOCUMENT NO:	10144 / 20-DW – DSR – 01
PROJECT REFERENCE:	
- Project No:	22021
- Project Location:	32 Liffey Park, Liffey Valley Park, Lucan
- Project Title:	Proposed Extension.
ARCHITECT:	Colin Carroll
CLIENT:	Eldhouse Varghese

				APPROVALS		
Issue	Date	Pages	Issue Description	By	Check	Approve
A	2022-08-11	All	Issued for Planning Compliance	CCCS	G.C	G.C
<input type="checkbox"/> Entire Document Issued this Revision			Remarks:			
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1 INTRODUCTION:

1.1 Eldhose Varghese has recently been granted planning permission for a rear, ground floor level extension, and a dormer attic conversion to his home at 32 Liffey Park, Liffey Valley Park, Lucan, Dublin.

The planning register reference is as follows:

Final Grant Order No.:	0906	Date of Final Grant:	26-Jul-2022
Decision Order No.:	0749	Date of Decision:	14-Jun-2022
Register Reference:	SD22B/0168	Date:	20-Apr-2022

1.2 A scheme for the proposed development was prepared by Colin Carroll Architecture.

1.3 Mr Varghese is the current owner and occupier of the house and has lived there since December 2021.

1.4 Mr Varghese has appointed Cunningham Consulting Civil & Structural Engineers to act as Civil & Structural Engineers on the proposed development.

1.5 Condition number 2 & 3 of the final planning grant requires that prior to the commencement of development that details of the foul & surface water drainage are submitted to the planning authority for written agreement.

1.6 This report outlines the design of the following proposed site services

- Foul Water drainage
- Surface Water Drainage & Sustainable Urban Drainage System (SuDS) provision.

2 SITE LOCATION & DESCRIPTION:

2.1 The proposed development is located at 32 Liffey Park, Liffey Park Valley, Lucan, Co. Dublin. This is an existing semi-detached two-storey house in a well-established residential area.

2.2 The site area is approx. 0.023 hectares (230 m²).

2.3 The proposed location is towards the end of a cul-de-sac.

2.4 The development consists of a ground floor level extension to the side and rear of the existing house and includes an attic conversion with dormer window to the rear of the roof.

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Title	Drainage Summary Report	By	GC

- 2.5 This report deals with the proposed Civil Engineering infrastructure for the development, specifically the foul and surface drainage. This report should be read in conjunction with the following drawings that are included with this report.

22021 - 10	Existing Foul & Surface Water Drainage Layout.
22021 - 11	Proposed Foul & Surface water Drainage Layout & SuDS Provision
22021 - 12	Typical Drainage Details

3 EXISTING DRAINAGE

- 3.1 A CCTV survey of the drainage within the site was commissioned for the use purpose of this report. Drainco Ltd conducted the CCTV survey.
- 3.2 The CCTV survey confirmed that the existing foul & surface water drainage for the dwelling is a separate system.
- 3.3 The existing foul & surface water drainage is outlined in Drawing No. 22021-10
- 3.4 Existing Foul Drainage:
- 3.5 The existing foul system, from this dwelling, discharges to a shared/common foul drain that runs Westward along the rear gardens of the adjoining houses. It appears that the last (downstream) manhole on the line is at No. 31 Liffey Park and that the line then travels Northwards alongside No. 31 towards the main public sewer in Liffey Park, at the front of the houses. No. 31 is the adjoining semi-detached house to No. 32.
- 3.6 The Irish Water drainage maps indicate that there is an existing 225mm Diameter foul sewer that runs along Liffey Park in a Northwest direction
- 3.7 Existing Stormwater Drainage:
- 3.8 The existing surface water is collected within the site and discharges towards the front of the house to an existing common line running North-westerly along the end of the driveways before discharging to the public storm sewer in Liffey Park.
- 3.9 The Irish Water drainage maps indicate that there is an existing 225mm Diameter UPVC stormwater sewer that runs along Liffey Park in a Northwest direction
- 3.10 The existing site area is approximately 230 m².

Client	Eldhose Varghese	Document No.	22021-DSR-07
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Title	Drainage Summary Report	By	GC

3.11 There is an existing 49.1 m² soft landscaped / grass lawn garden to the rear of the site. The remainder of the site is hard surfaced with concrete roof tiles to the buildings and a concrete yard slab to the ground paving.

3.12 The total existing impervious run-off area is approximately 180.9 m².

3.13 There is currently no apparent SuDS provision.

4 PROPOSED DRAINAGE:

4.1 The proposed foul & Surface water drainage system layout for the development is outlined in drawings 22021 - 11.

4.2 Proposed Foul Drainage

4.3 The foul drainage system discharging to the rear common sewer will be maintained as a separate system with gravity falls.

4.4 The extension is required to be constructed over the common drain to the rear of the dwelling. Foundations for the extension will be detailed to be taken to below the level of the common sewer to avoid any surcharge to the line. All pipework running through rising walls will be detailed with bridging lintels and appropriate deflection gaps provided.

4.5 It is proposed to provide a new manhole within the side passageway to the side of the rear extension to provide better access for maintenance and to facilitate better connections.

4.6 The proposed additional outfall from the development is small consisting of an additional bathroom to the front of the extension and the relocation of the existing kitchen to the rear.

4.7 The hydraulic design of the foul sewers is in accordance with the recommendations of EN 752, Drainage and sewer systems outside of buildings, and Irish Water Publications IW-CDS-5020-01, IW-CDS-5020-02 and IW-CDS-5020-03.

4.8 Velocities are in the range 0.75 to 3.0 m/s when flowing.

4.9 All foul sewers to be fully sealed Unplasticised PVC pipes in accordance with BS 4660 and BS EN 1401-part 1.

4.10 Hydraulic roughness Ks = 1.5

Client	Eldhose Varghese	Document No.	22021-DSR-07
Project	32 Liffey Park, Liffey Valley Park, Lucan	Revision	A
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Title	Drainage Summary Report	By	GC

4.11 Pipe sizes, velocities, gradients etc. are checked by reference to 'Tables for the hydraulic design of pipes, sewers, and channels' by H.R. Wallingford & D.I.H. Barr.

4.12 Proposed Surface Water

4.13 The proposed surface water system is proposed to maintain its current line and discharge point and will remain a separate system.

4.14 The hydraulic design of the surface water drainage is in accordance with the recommendations of EN 752, Drainage and sewer systems outside of buildings.

4.15 Velocities are in the range 0.75 to 3.0 m/s when flowing.

4.16 All Surface sewers to be fully sealed Unplasticised PVC pipes in accordance with BS 4660 and BS EN 1401-part 1.

4.17 Hydraulic roughness $K_s = 0.6$

4.18 Design based on uniform rate of rainfall of 50mm / hour, since max. length of any pipe run is less than 200m.

4.19 Pipe sizes, velocities, gradients etc. are checked by reference to 'Tables for the hydraulic design of pipes, sewers, and channels' by H.R. Wallingford & D.I.H. Barr.

4.20 **SUSTAINABLE URBAN DRAINAGE SYSTEM (SuDS) PROVISION**

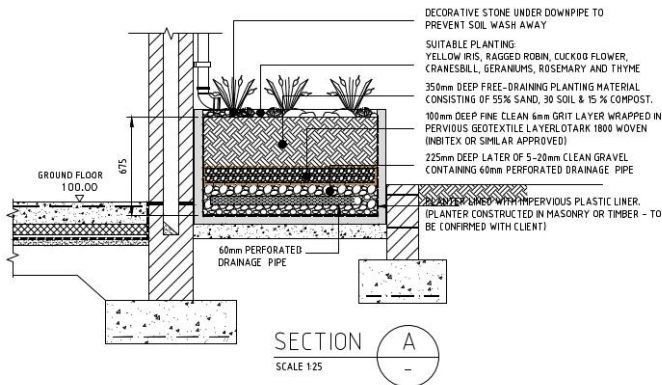
4.21 The original planning application detailed a soakaway within the rear garden of the dwelling. However, it is considered that there is insufficient space within the rear garden to locate a soakaway. It is not possible to provide a minimum dimension of 5 metres from buildings and 3 metres from any boundary. It is also not feasible to site a soakaway to the front of the dwelling.

4.22 It is proposed to provide an alternative SuDS provision for the development in the form of two flow-through rainwater downpipe garden planters.

One to the rear, serving the existing kitchen roof, and the other to the side of the new extension serving 65% of the proposed extension roof run-off.

Details for the flow-through planters are included on Drawing 22021/11 and extracted below.

Client	Eldhose Varghese	Document No.	22021-DSR-07
Project	32 Liffey Park, Liffey Valley Park, Lucan	Revision	A
Project No.	22021	Date	July 22
Title	Drainage Summary Report	By	GC



RAIN GARDEN FLOW-THROUGH PLANTER BOX DETAIL

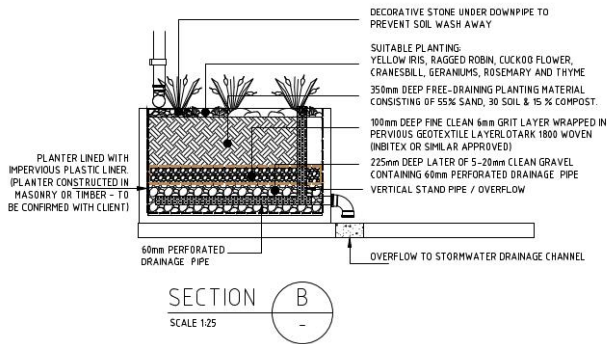


IMAGE EXAMPLE OF RAIN GARDEN PLANTER BOX DETAIL

(FROM SOUTH DUBLIN COUNTY COUNCIL PUBLICATION, A HOUSEHOLDERS GUIDE TO SUDS)

- 4.23 The roof rainwater downpipes, noted above, will discharge directly to the rainwater planters. Typically, water will soak into the soil in the planter and be taken up into the planting. During heavy rainfall, excess water will pond in the planter, which is then proposed to overflow to surface water gullies.
- 4.24 The Rainwater planters proposed will slow the flow of rainfall from the roof to the drainage system. The stone, sand & soils, and the vegetation in the planter will provide infiltration and treatment of the run-off by removing pollutants and reduce the need of offsite conveyance.
- 4.25 A summary of the pre-development and the proposed impermeable run-off areas of the building and immediate pathing is detailed in the table below.

Client	Eldhose Varghese	Document No.	22021-DSR-07
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Project No.	22021	Date	July 22
Title	Drainage Summary Report	By	GC

Element	(M ²)
Existing Total Site Area	230
Existing soft landscaped / grassed Area	49.1
Existing impermeable area (untreated - direct discharge)	180.9
Proposed reduction in Ex. Landscaped / grassed area due to extension	5.9
Impermeable Area after proposed development	186.8
SuDS Provision	
Roof Run-off Area to Rainwater Planters	
	Planter 1 22.3
	Planter 2 19.65
	Net reduction in untreated run-off = 41.95
Net untreated impermeable area	144.85
Net reduction in untreated surface water run-off. (Relative to pre-development levels)	
	20%

In summary, it is proposed to treat 20% of the surface water run-off from the site, relative to pre-development levels, via attenuation and filtration within the flow-through planters.

- 4.26 The GDSD address sustainability by requiring designers to comply with criteria aimed to minimise the urbanization by replicating the runoff characteristics of the greenfield site.

The criteria are:

- Criteria 1 - River Water Quality
- Criteria 2 - River Regime Protection
- Criteria 3 - Flood Risk Assessment
- Criteria 4 - River Flood Protection

4.27 CRITERIA 1 & 2 – RIVER WATER QUALITY PROTECTION AND RIVER REGIME PROTECTION

- 4.28 Run off from natural green field areas contribute very little pollution and sediment to rivers for most rainfall events. Direct run off from greenfield sites to rivers takes place with rainwater percolating into the ground. By contrast, urban runoff, when

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drained, by piped systems, results in run off from virtually every rainfall event with high levels of pollution, particularly in the first phase of runoff.

4.29 By discharging 20% of the surface water run-off through a rainwater planter, compliance with Criteria 1 and Criteria 2 is achieved. There is a net improvement to the run-off water quality from the site compared to pre-development values.

4.30 CRITERIA 3 – SITE FLOODING

4.31 This states that no flooding should occur on the site for the 30-year storm and that no flooding of internal areas should occur during the 100-year return storm.

4.32 There are no past flood events noted in on the OPW flood maps within 1km of the site. Pluvial or Fluvial flood maps available for the area do not indicate any risk.

The client has no knowledge of any history of flooding on the site.

4.33 The rainwater planter will be a trough-flow system with a high-level overflow. The reduced runoff is proposed to discharge to the existing system.

4.34 CRITERIA 4 – RIVER FLOODING

4.35 This criterion is intended to prevent river flooding by limiting the volume of run off to predevelopment greenfield volumes. By virtue of slowing the flow of rainfall through these planters and reducing the runoff to a lower value than the pre-development levels, this criterion is complied with.