McCloy Consulting

Drainage Design Statement

Ballyroan Community and Youth Centre, Dublin

M02138-05_DG01 | February 2025

WATER & ENVIRONMENTAL CONSULTANTS

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DISTRIBUTION

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	00	1	2	3	4	5	6	7	8
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1 INTRODUCTION

1.1 Terms of Reference

This drainage design statement was commissioned by South Dublin County Council to support a planning application for a site located at Ballyroan Community and Youth Centre, Dublin.

The objective of this report is to inform South Dublin County Council of the intended approach for the site drainage, attenuation, flow control and discharge locations and demonstrate compliance with the requirements of South Dublin County Council as the relevant Planning Authority.

This report and the preliminary design referred to is developed for planning and informative purposes only and the level of detail presented reflects this. Layouts and details provided, unless noted otherwise, will be subject to detailed design at a later stage prior to commencement of any works.

1.2 Statement of Authority

McCloy Consulting is an independent environmental and water engineering consultancy specialising in drainage and SuDS design, surface water management plans and flood risk assessment. The practice has extensive experience in design and implementation of surface water management across the UK and Ireland.

The key staff members involved in the drainage design and drafting of this report are as follows:

- Iain Black MSc BEng (Hons) – Project Engineer with experience in the fields of flood risk and drainage and surface water management design.
- Jill Dick MEng (Hons) – Senior Engineer specialising in drainage and surface water management design, and wastewater.

1.3 Approach to the Assessment

This report details the SuDS design associated with the proposals for extension and upgrade works to Ballyroan Community and Youth Centre, Marian Road, Rathfarham, Dublin 14. The proposals are adaption to an existing developed site but the drainage design where possible adopts a SuDS approach for the proposed alterations.

For the purposes of this study, the following resources have been referred to:

- South Dublin County Council Development Plan (2022 – 2028).
- South Dublin County Council: Sustainable Drainage Explanatory Design and Evaluation Guide 2022.
- South Dublin County Council: A Householders Guide to Sustainable Drainage.
- CIRIA C753: The SuDS Manual

2 DESIGN FOR PLANNING APPLICATION

2.1 Design Drivers

The key aspects driving the design are as detailed in Policy GI4: Sustainable Drainage Systems of South Dublin County Council's Local Development Plans. The requirements apply to all developments reviewed by South Dublin County Council as part of the planning process. Summary of policy is as follows:

Policy GI4: Sustainable Drainage Systems Objectives	Description of Objective
Objective 1	To limit surface water from new developments through SuDS / nature based solutions.
Objective 2:	To incorporate a SuDS management train which manages surface water in small catchments
Objective 3	Open space provision to include for ecology / sustainable water management
Objective 4	SuDS measures are completed to taking in charge standard.
Objective 5	Promotion of SuDS in greening of urban areas to restrict / delay run-off entering drainage networks
Objective 6	Maintain and enhance existing drainage in the County; promote SuDS to control surface water outfall and protect water quality.

Hydraulic calculation software has been utilised to provide estimated attenuation storage volumes for a rainfall event of magnitude 1% AEP +20% climate change.

The area of surface runoff being attenuated is the building extension and adjacent paved area where works are proposed.

Hydraulic calculation results are included in Appendix B.

2.2 Surface Water Management Approach

The drainage from the area to undergo alteration / development shall comprise of drainage from proposed roofing and paved areas. Roof drainage is expected to be collected within a raingarden planter via rainwater downpipe; and paved areas shall be collected via permeable paving. The planter outlet will flow onto the permeable paving.

The site has existing storm drainage in place. It is intended to connect outflows from the development into the existing site storm network. Permeable paving outlet shall feature 20mm orifice plate to provide flow control.

The proposed concept drainage layout is included in Appendix A.

2.3 Hydraulic Design Calculations

2.3.1 Design parameters

The following was adopted in the analysis of the proposed SuDS elements at the site:

- 100-year return period / 1% AEP event plus climate change allowance of 20%.
- Assumption that all roof and hardstanding areas are 95% impermeable.
- A 20mm orifice plate shall be used to limit flow out of the permeable paving.

2.4 Design Outcome

Analysis within hydraulic calculation software indicates that permeable paving depth and area is sufficient to contain surface water flows generated from the roof area and permeable paved area up to the 100 year +20% climate change rainfall event. The analysis also demonstrates that the use of a 20mm orifice plate will limit flows to a maximum of 0.5lps for the 100 year +20% climate change rainfall event.

Permeable paving modelled particulars are as shown in Table 2-1.

Table 2-1 Permeable paving design characteristics

Surface Area (m^2)	20.5
Permeable storage depth (m)	0.38
Porosity (%)	33
Orifice plate opening (mm)	20

2.5 Peak Flow

Based on a peak run-off for 150Lps/Ha, the calculated run-off rate for the developed area is 1.43lps (based on 95.5m^2 of hardstanding). Orifices have been sized by hydraulic modelling to limit flows; it is noted that a minimum size of 20mm is recommended size to prevent blockage. Hydraulic analysis demonstrates that the use of a 20mm orifice plate will limit flows to a maximum of 0.5lps for the 100 year +20% climate change rainfall event.

2.6 Pollution Control

The proposed development consists of roofing and pedestrian areas with only occasional trafficking for maintenance purposes and is assessed as low pollution hazard per CIRIA C753 SuDS Manual, Table 26.2. The SuDS manual indicates source hazard indices per Table 2-2.

The proposed SuDS drainage features include use of raingarden planters and permeable paving.

The paved area is at highest risk of pollution and therefore is assessed. Runoff from the paved area will not pass through the rain-planter, therefore this has been omitted from the assessment.

Table 2-2 Pollution Control Hazard and Treatment Indices

Pollutant	**Source Hazard Index (Risk score)**	**Permeable pavement/ surface (Mitigation score)**	**Total Mitigation Index >=0 deemed compliant**	**Compliant?**
TSS	0.5	0.7	-0.2	Yes
Metals	0.4	0.6	-0.2	Yes
Hydrocarbons	0.4	0.7	-0.3	Yes

Per CIRIA C753, Table 26.3, the mitigation indices of a permeable paving system alone would exceed the respective pollution hazard indices shown above. Therefore, the proposed features are suitable for the nature of the development in terms of pollution risk mitigation. The total mitigation index is also displayed in Table 2-2.

2.7 Amenity and Biodiversity

The design considers the required orientation, aspect, and proximity to other features (such as amenity space for users and site access) and appropriate scale and form to suit the surrounding area. Plant species will be selected to suit the existing landscape and the site's visual and design intent, as per the recommendations of The SuDS Manual (CIRIA C753). Extracts from the SuDS manual in relation to the implementation of the raingarden planters as follows:

"Bioretention systems can deliver significant aesthetic benefits by incorporating vegetation into streetscape and general landscape features. As raingardens they can take small areas of roof water and can be located in any green space or can be hard features such as raised planters on patios."

"They can provide quality habitat conditions for wildlife, contributing positively to biodiversity enhancement in urban areas."

2.8 Maintenance Requirements

The developer is to ensure that maintenance of the drainage system is provided for as part of the overall management plan for the site.

Maintenance plans for drainage features are detailed on the following table.

Table 2-3 Drainage System Maintenance Requirements

Flow Controls, Inspection Chambers and Sediment Traps		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly
	Remove debris and sediment from chambers	Monthly for first six months, then quarterly or after significant storm
Remedial actions	Repair/rehabilitate where required	As required
Monitoring	Check all structures to ensure all is in good condition and operating as designed.	Annually
	(Flow controls) check for evidence of blockage	Monthly or after significant storm.
	(Flow controls) check for damage to components	Annually or after significant storm.

Permeable paving		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Brushing (standard cosmetic sweep over whole surface)	Once per year, after autumn leaf fall, or reduced frequency as required, based on site- specific observations of clogging or manufacturers recommendation- pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely

		to collect most sediment
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required once per year on less frequently used pavements
Remedial Action	Remediation of any landscaping which, through vegetation maintenance, causes soil to spill from the rain planter to the permeable pavement.	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth- if required, take remedial action	Three- monthly, 48hours after large storms for first six months
	Inspect silt accumulation rates and establish appropriate brushing frequency	Annually
	Monitor inspection chambers	Annually

Rain planter		
Maintenance Schedule	Required Action	Typical Frequency
Regular inspections	Inspect filtration surfaces for silting / ponding. Record dewatering time and assess standing water levels in any underdrain to determine if maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly
	Inspect inlets and outlets for blockage	Quarterly

Rain planter		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter, surface debris and weeds	Quarterly
	Replace any plants to maintain density	As required
Occasional Maintenance	Infill any holes / scour in filter medium. Improve erosion protection if required.	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch.	As required
Remedial actions	Remove and replace filter medium and vegetation above	As required but likely to be >20 years.

2.9 Summary / Demonstration of Compliance

The proposed development is resilient to surface water flooding. Site drainage design shall ensure the site is drained and flood resilient. Drainage design shall be as per the requirements of South Dublin County Council Policy GI4 – Sustainable Drainage Systems.

Table 2-4 Demonstration of Compliance with South Dublin County Council Planning Policy

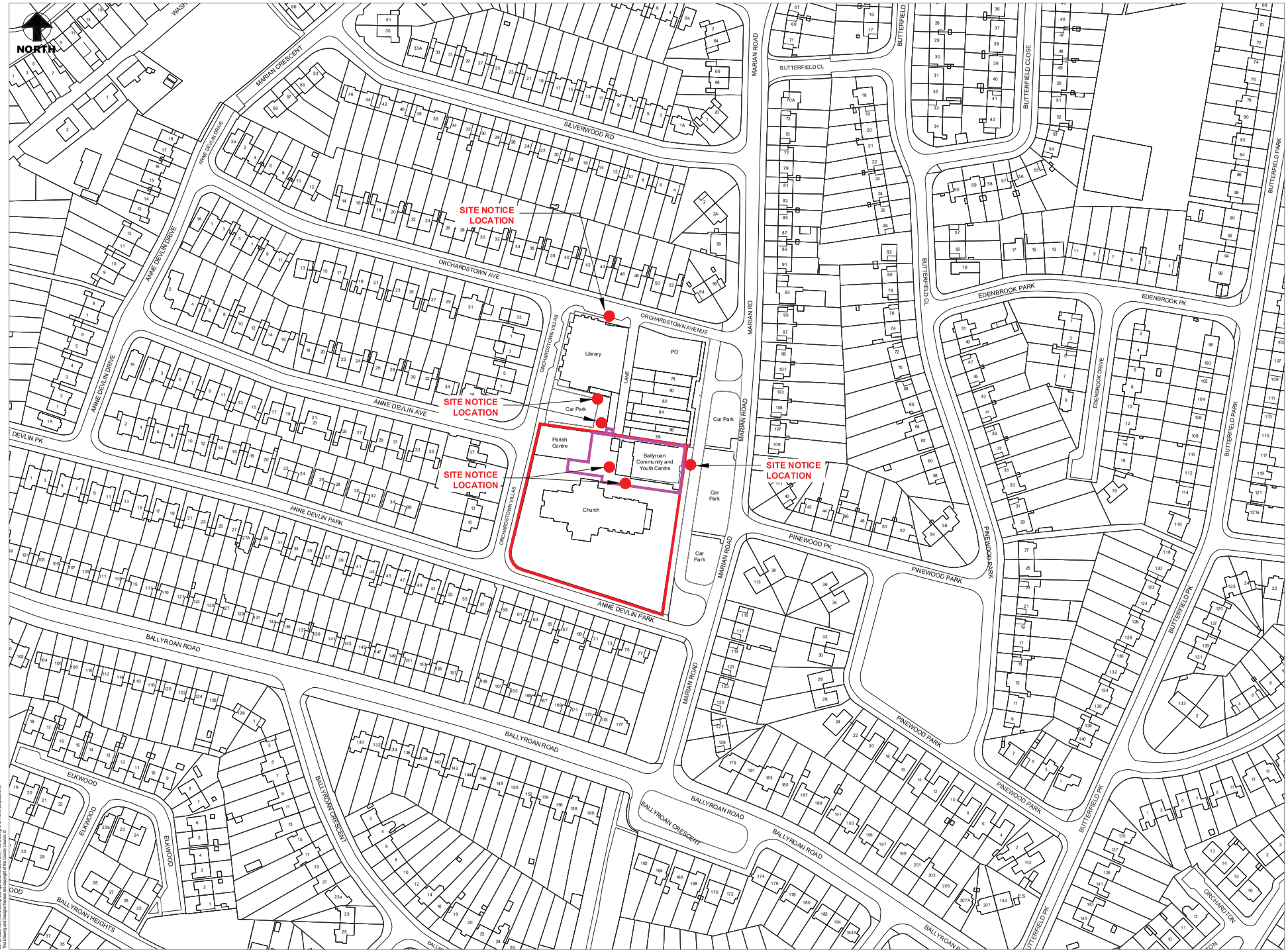
Policy GI4: SuDS Objectives	Description of Objective	Demonstration of compliance	Complies?
Objective 1	To limit surface water from new developments through SuDS / nature-based solutions.	The proposals involve the use of a new raingarden planter and permeable paved area.	✓
Objective 2:	To incorporate a SuDS management train which manages surface water in small catchments	The SuDS features shall apply to a small section of roof and paved area and shall contain at or close to source.	✓
Objective 3	Open space provision to include for ecology / sustainable water management	The raingarden planter shall undergo appropriate planting and ongoing maintenance to ensure contribution to ecology and biodiversity.	✓
Objective 4	SuDS measures are completed to taking in charge standard.	Construction detail has been supplied; construction detail is in accordance with best practice per CIRIA C753 – The SuDS Manual.	✓

Policy GI4: SuDS Objectives	Description of Objective	Demonstration of compliance	Complies?
Objective 5	Promotion of SuDS in greening of urban areas to restrict / delay run-off entering drainage networks	The proposals involve the introduction of a raingarden planter to an existing area of hardstanding.	✓
Objective 6	Maintain and enhance existing drainage in the County; promote SuDS to control surface water outfall and protect water quality.	Water quality pollution risk for the drained area is low (roofing; areas occasionally trafficked); however raingarden planters and permeable paving offer removal of pollutants. Proposal includes orifice plate flow control to reduce run-off from the development area.	✓

Attenuation for surface run off will be provided by raingarden planters and permeable paving. The implementation of flow control to an area previously allowed free discharge to existing storm pipe networks demonstrates that the development provides a reduced rate of run-off compared to the existing scenario.

Appendix A

Existing and Proposed Site



01 P01 **SITE LOCATION PLAN**
SCALE 1:1000 @ A1

OWNERSHIP /SITE BOUNDARY
DEVELOPMENT AREA /SITE BOUNDARY (PART 8)
SITE NOTICE LOCATION

BALLYROAN COMMUNITY & YOUTH CENTRE

SHEET P01

SITE LOCATION PLAN

PART 8
2025

Comhairle Contae Átha Cliath Theas
South Dublin County Council

The existing Ballyroan Community & Youth Centre provides essential community services for the Ballyroan community and includes a community hall; community café; meeting rooms; childcare facilities including external play area; staff office; sanitary facilities and a meals-on-wheels kitchen.

Due to a growing demand for these community services, the existing building requires upgrade works, with additional space needed for additional staff offices, meeting rooms and childcare accommodation.

The objective of the proposed works is to improve universal access to the community centre and to maximise the potential of the centre for staff and the public through internal reordering and extension works, allowing the centre to meet the growing need for community services in the area and to continue to serve the widest possible number of users.

Works to comprise of:

i. Rearrangement /upgrade of the community centre interior.

ii. New single-storey flat roof extension.

iii. Accessibility enhancement works to the existing community centre entrance, and new accessible entrance to the rear of the centre (subject to landowner consent).

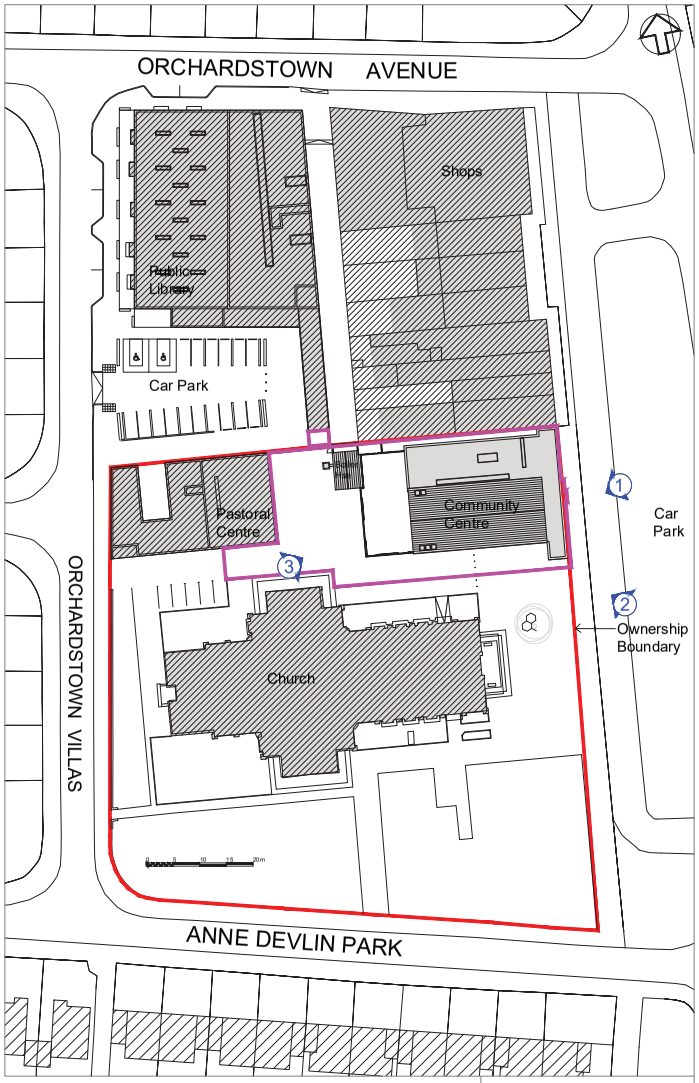
iv. Minor alterations to existing parish boiler house.

v. New external screened community centre bin store.

vi. New solar panels to south facing pitched roof.

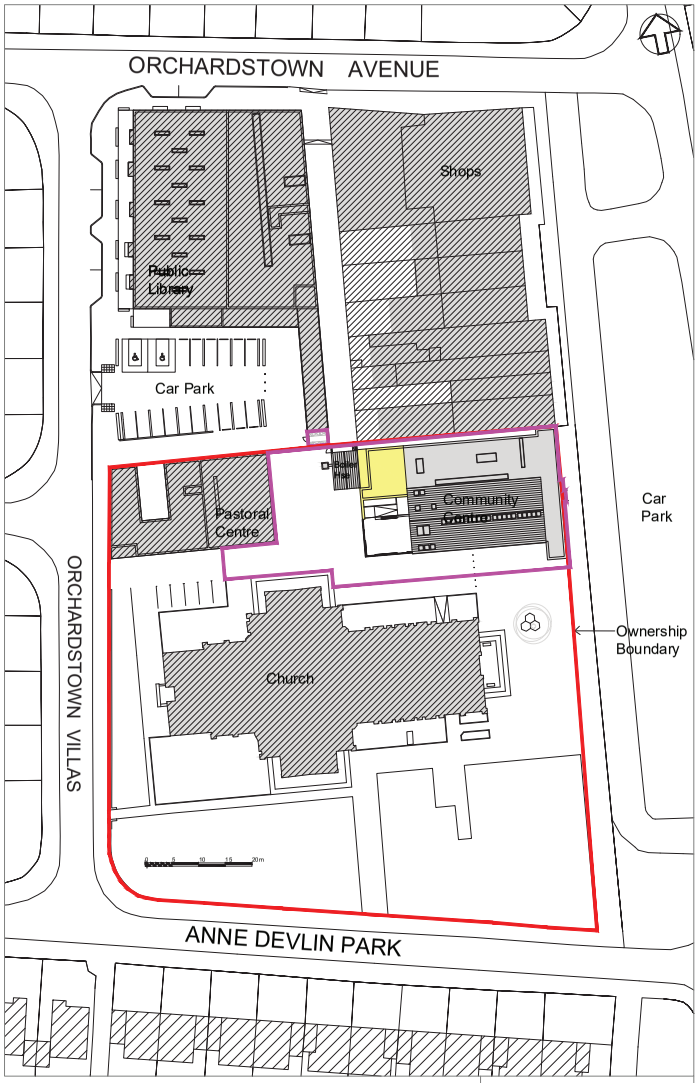
vii. Refurbishment /upgrade of the existing concrete pavers to the south and west of the community centre building (subject to landowner consent and final details to be agreed with the relevant SDCC internal departments).

viii. All associated ancillary site works as may be required in adjacent lands but not limited to foul and surface water drainage and utility supplies.



01 P02 **SITE PLAN - EXISTING**
SCALE 1:500 @ A1

OWNERSHIP /SITE BOUNDARY
DEVELOPMENT AREA /SITE BOUNDARY (PART 8)
VIEW LOCATION POINT



02 P02 **SITE PLAN - PROPOSED**
SCALE 1:500 @ A1

OWNERSHIP /SITE BOUNDARY
DEVELOPMENT AREA /SITE BOUNDARY (PART 8)
PROPOSED EXTENSION

View 01: Community Centre building entrance (east facing)

View 02: Community Centre south facing elevation

View 03: Parish boiler house and screened play area to rear of community centre (west facing elevation)

BALLYROAN COMMUNITY & YOUTH CENTRE

SHEET P02

SITE LAYOUT PLANS

PART 8
2025

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Appendix B

Hydraulic Calculations

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Iain Black
Site name:	M02138-05
Site location:	Ballyroan

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:	53.29022° N
Longitude:	6.29888° W
Reference:	942274552
Date:	Feb 26 2025 15:09

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 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):	915	915
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

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):	2.49	2.49
1 in 1 year (l/s):	2.12	2.12
1 in 30 years (l/s):	5.31	5.31
1 in 100 year (l/s):	6.51	6.51
1 in 200 years (l/s):	7.13	7.13

CRM Stormflow Stormwater Management Software

Client:	South Dublin City Council
Project:	M02138-05
Location:	Dublin
Catchment:	Ballyroan Community Centre

Catchment Details:

Buildings	75	m^2	x 95 %
Dense surfacing	20.5	m^2	x 95 %
Effective Area	90.725	m^2	

Storage Details:

Length	6.4	m
Width	3.5	m
Depth	0.35	m
Porosity	33	%
Area Increase	0	%

Rainfall Details - FSR Method:

Return Period	100	years
Climate Change Factor	20	%
r value	0.27	
M5-60	16	mm
Summer Storm Profile		

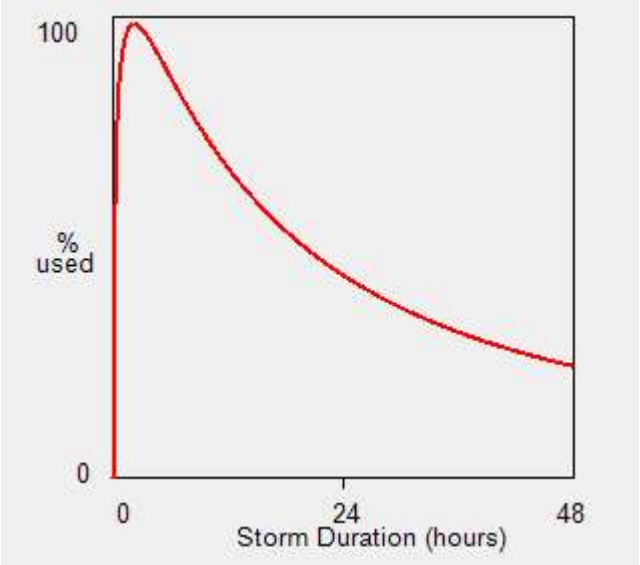
Duration	Intensity		Required
	mm	mm/h	storage (m^3)
5 min	9.0	128.9	0.924
10 min	13.9	99.8	1.379
15 min	17.3	83.1	1.666
30 min	24.1	57.8	2.111
45 min	28.4	45.4	2.298
60 min	31.5	37.8	2.403
2 hours	40.0	24.0	2.547
6 hours	56.4	11.3	2.248
24 hours	85.4	4.3	1.136

Outflow Details:

Infiltration rate	0	m/hr
Attenuation Control	Orifice Plate	
Control Diameter	20	mm
Discharge rate	0.5	l/s

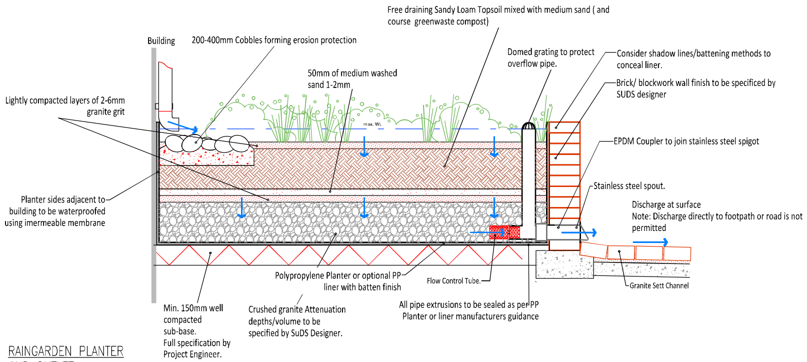
Results:

Outcome:	Pass
Critical Storm Duration	2.2 hrs
Hmax	0.345 m
Time to half empty	42.5 min

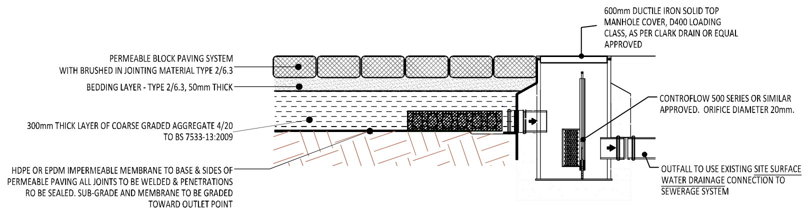


Appendix C

Proposed Concept Drainage Plan and Details



RAINGARDEN PLANTER AND OUTLET
SCALE 1:10



PERMEABLE PAVING AND OUTLET
SCALE 1:10

NOTES

GENERAL
1. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION PURPOSES.

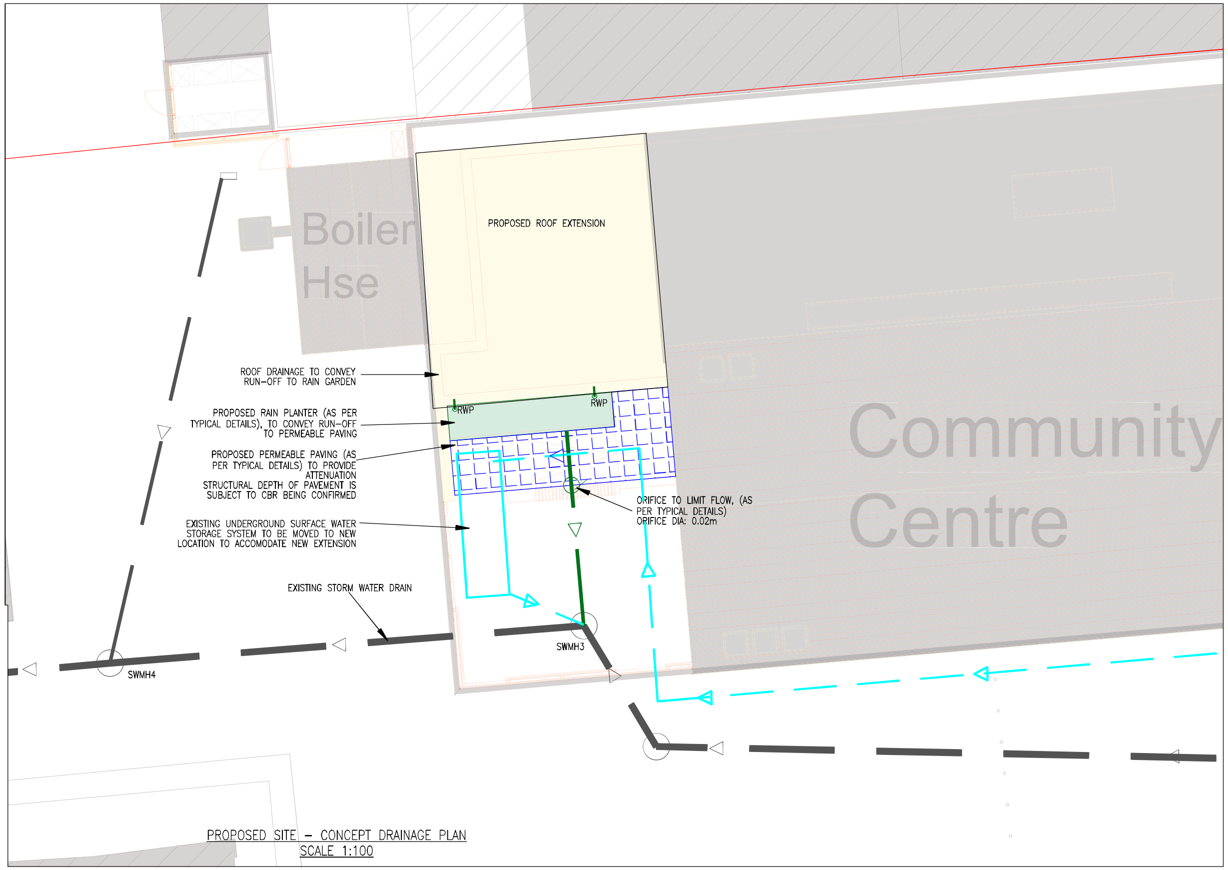
2. THIS DRAWING SHALL BE REVIEWED IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL DRAWINGS.

3. THIS DRAWING IS NOT TO BE SCALED FROM.

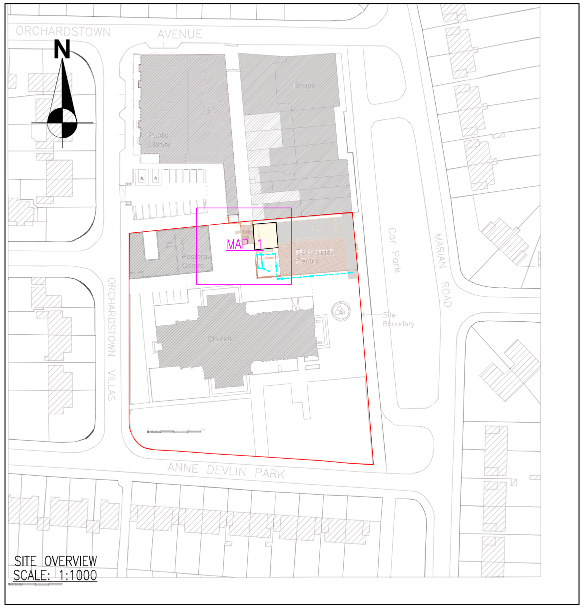
4. THE CONTRACTOR IS TO LIAISE WITH ALL STATUTORY UNDERTAKERS IN REGARD TO LOCATING ALL EXISTING SERVICES WITHIN AND ADJACENT TO THE SITE OF THE WORK

LEGEND

- SITE BOUNDARY
- PROPOSED RAIN GARDEN
- PROPOSED CARRIER PIPE
- PROPOSED PERMEABLE PAVING
- EXISTING RAIN HARVESTING NETWORK
- EXISTING SURFACE WATER SEWER



PROPOSED SITE – CONCEPT DRAINAGE PLAN
SCALE 1:100



SITE OVERVIEW
SCALE: 1:1000

ISSUE	DRN	APP	DATE	NOTES / DESCRIPTION
1	IB	JD	27.02.25	FOR REVIEW

STATUS: FOR REVIEW

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Co. Antrim, BT36 5QA

PROJECT: BALLYROAN COMMUNITY & YOUTH CENTRE

CLIENT: SOUTH DUBLIN CITY COUNCIL

DRAWING TITLE: CONCEPT DRAINAGE LAYOUT GENERAL ARRANGEMENT

SCALE	ORIGINAL SIZE	
AS SHOWN	A1	
DRAWN: IB	CHECKED: JD	DATE: 27/02/2025
PROJECT No.: M02138-05	DRAWING No.: DWG_100	ISSUE NO.: 1

Appendix D D

Drainage Records

Produced Under OSI License No. EN0026708

KEY

- INDICATES EXTG. BUILDING TO BE DEMOLISDED.
- INDICATES NEW BUILD
- INDICATES EXTG BUILDING TO BE REFURBISHED.
- INDICATES NEW PAVING

LEGEND

- NEW SURFACE WATER LINE
- NEW FOUL WATER LINE
- SWMH01 NEW SURFACE WATER MANHOLE
- FMH01 NEW FOUL WATER MANHOLE
- EXTG. SURFACE WATER LINE
- EXTG. FOUL WATER LINE
- AJ CHAMBER
- RG ROAD GULLY
- EXTG. DRAINAGE GRUBBED UP

NEW SURFACE WATER MANHOLES

REF No.	TYPE	COVER LEVEL	INVERT LEVEL
SWMH01	–	58.900	58.100
SWMH02	–	58.900	57.640
SWMH03	–	58.900	57.550
SWMH04	–	58.900	57.370
SWMH05	–	58.900	57.150
SWMH06	–	58.900	57.120
SWMH07	–	58.900	56.990
SWMH08	–	58.900	56.950 approx

NEW FOUL WATER MANHOLES

REF No.	TYPE	COVER LEVEL	INVERT LEVEL
FMH02	–	58.900	57.560
FMH03	–	58.900	57.300
FMH04	–	58.900	57.000
FMH05	–	58.900	56.840

NOTE:
ALL NEW uPVC DRAIN PIPES TO BE BEDDED AND SURROUNDED IN 100mm MIN. LEAN MIX CONCRETE TO DETAIL.

COVER LEVELS TO BE CONFIRMED ON SITE.

NOTES

This drawing is to be read in conjunction with all relevent Architect's, Services Engineer's and HL drawings and details.

All dimensions to be checked on site and any discrepancies to be reported to the Engineer.

Figured dimensions only to be used: drawings not to be scaled.

All levels are structural unless otherwise noted.

Architects
box Architecture

NOTE:
THIS IS AN AIR TIGHT BUILDING PENETRATIONS TO THE EXTERNAL ENVELOPE WILL BE KEPT AT A MINIMUM.

Rev	By	Chk	Date	Description
C	T.R.	MS	03-12-08	TENDER ISSUE.
B	T.R.	MS	28-11-08	DRAFT TENDER ISSUE.
A	T.R.	TK/MS	10-11-08	Progress Print

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JOB TITLE
BALLYROAN PASTORAL AND COMMUNITY CENTRE RATHFARNHAM DUBLIN 14.

DRG. TITLE
PROPOSED ROUTE FOR NEW SURFACE WATER AND FOUL WATER DRAINAGE.

Scales 1:200 | A1
Date NOV. 2008 | Drawn T.R.
DRAWING NUMBER DE88-002 | REV. C