

STORMWATER AUDIT (STAGE 1)

JBA Project Code 2026s0294
Contract Caheranardish, Mungret LRD – Stage 1 Stormwater Audit
Client OSL Butler Consulting Engineers Ltd.
Prepared by Jack Shanahan & Aneeqe Ahmed
Subject Stormwater Audit Stage 1 Report



Revision History

Issue	Date	Status	Issued to
S3-P01	18/03/2026	First issue	OSL
A3-C01	31/03/2026	Final Issue	OSL

1 Introduction

JBA Consulting have been contracted by OSL Butler Consulting Engineers on behalf of Homeland Projects Ltd., to undertake a Stage 1 Stormwater Audit of the surface water drainage for the proposed development at Mungret, Co. Limerick. In the absence of a Limerick City & County Council stormwater audit procedure this audit has been completed in accordance with Dún Laoghaire Rathdown County Council's (DLRCC) Stormwater Audit Procedure (DLR CDP 2022-2028, Appendix 7) as set out below.

Stage 1 – Pre Planning Stage: A Stage 1 Audit shall be carried out of the applicant's proposed Stormwater drainage proposals based on the drawings submitted for planning approval.

The Stage 1 Audit report must be submitted to DLRCC for approval prior to lodging the planning application. All recommendations shall be complied with, unless otherwise agreed in writing with DLRCC.

In certain circumstances, where there has been a constructive engagement with Municipal Services on SuDS proposals from an early stage of the design process, consideration may be given for waiving the requirement of a Stage 1 Audit.

The subject of this Stage 1 Stormwater audit is to review the proposed surface water drainage design and sustainable urban drainage system (SuDS) proposals for the proposed development.

1.1 Report Structure

The Feedback Form in Appendix A identifies queries raised in this report which are to be answered by the Design Engineers. Once an 'Acceptable' status is achieved for each query the audit is deemed to be closed out.

The results of the audit are set out hereunder, where items raised in the feedback form are shown in bold within this report.

1.2 Relevant Studies and Documents

The following documents were considered as part of this surface water audit:

- Greater Dublin Strategic Drainage Strategy (GDSDS)
- Greater Dublin Regional Code of Practice for Drainage Works
- The SuDS Manual (CIRIA C753)
- LCCC Development Plan 2022-2028
- BRE Digest 365

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The following documentation was provided by OSL on 06/03/2026:

- 24051-OSL-00-RP-C-0011 Surface Water Design Report Rev P01
- 24051-OSL-11-DR-C-1120 Proposed Surface Water Layout RevP04
- 24051-OSL-11-DR-C-1121 Proposed Surface Water Longitudinal Sections - Sheet 1 RevP03
- 24051-OSL-11-DR-C-1122 Proposed Surface Water Longitudinal Sections - Sheet 2 RevP03
- 24051-OSL-11-DR-C-1123 Proposed Surface Water Longitudinal Sections - Sheet 3 RevP03
- 24051-OSL-11-DR-C-1124 Proposed Surface Water Longitudinal Sections - Sheet 4 RevP03
- 24051-OSL-11-DR-C-1126 Catchment Characteristics Layout RevP01
- 24051-OSL-11-DR-C-1127 Surface Water Exceedance Routes RevP01
- 24051-OSL-90-DR-C-9020 Proposed Surface Water Details - Sheet 1 RevP03
- 24051-OSL-90-DR-C-9021 Proposed Surface Water Details - Sheet 2 RevP03
- 24051-OSL-90-DR-C-9022 Proposed Surface Water Details - Sheet 3 RevP03
- 24051-OSL-90-DR-C-9023 Proposed Surface Water Details - Sheet 4 RevP03
- 24051-OSL-90-DR-C-9024 Proposed Surface Water Details - Sheet 5 RevP03
- 24051-OSL-90-DR-C-9025 Proposed Surface Water Details - Sheet 6 RevP03

1.3 Key Considerations and Benefits of SuDS

The key benefits and objectives of SuDS considered as part of this audit and listed below include:

- Water Quantity
- Water Quality
- Amenity
- Biodiversity

Which can be achieved by;

- Storing runoff and releasing it slowly (attenuation)
- Harvesting and using the rain close to where it falls
- Allowing water to soak into the ground (infiltration)
- Slowly transporting (conveying) water on the surface
- Filtering out pollutants
- Allowing sediments to settle out by controlling the flow of the water

1.3.1 SuDS Management Train

A SuDS Management Train is a robust pollutant removal strategy. The treatment train can comprise four stages:

1. *Prevention*
2. *Source Control*
3. *Site Control*
4. *Regional control*

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2 Proposed Development Caheranardish, Mungret, Co. Limerick

2.1 Site Characteristics

The total site area is stated to be approx. 6 ha in the Surface Water Report with 5.6ha considered as part of the storm water design before the use of runoff reduction factors. The site is currently undeveloped green field. The Flood Risk Assessment indicates that the site is generally sloping from north to south with some low points towards the centre of the site.

The development will consist of a Largescale Residential Development (LRD), comprising of 182no. residential dwellings as follows: 141no. houses consisting of 104no. detached/semi-detached dwellings (24no. 4-beds, 78no. 3-beds and 2no. 2-beds), 37no. townhouses (18no. 3-beds and 19no. 2-beds) and 41no. apartment units across 1no. triplex unit (2no. 2 beds and 1no. 1-bed) and a five-storey apartment building (13no. 2-beds and 25no. 1-beds) with a crèche with capacity to accommodate 70no. children at ground floor level. The proposed development will include the provision for car parking, including EV charging points and bicycle parking. The proposed development will also include the provision of private, communal, and public open spaces; internal roads and pathways; pedestrian and cyclist routes; hard and soft landscaping and boundary treatments; waste storage; plant; signage; a new vehicular and pedestrian access onto the Mungret Park Road; public lighting; substations; all associated site development works; and all drainage and foul sewer infrastructure and network works including a pumping station and connections to the existing networks and nature-based suds measures. It is proposed to discharge from the site via an existing 300mm diameter surface water pipe to the east of the site.

This audit is being prepared in advance of a submission for planning permission to LCCC.

The location of the site is shown in Figure 1 below.

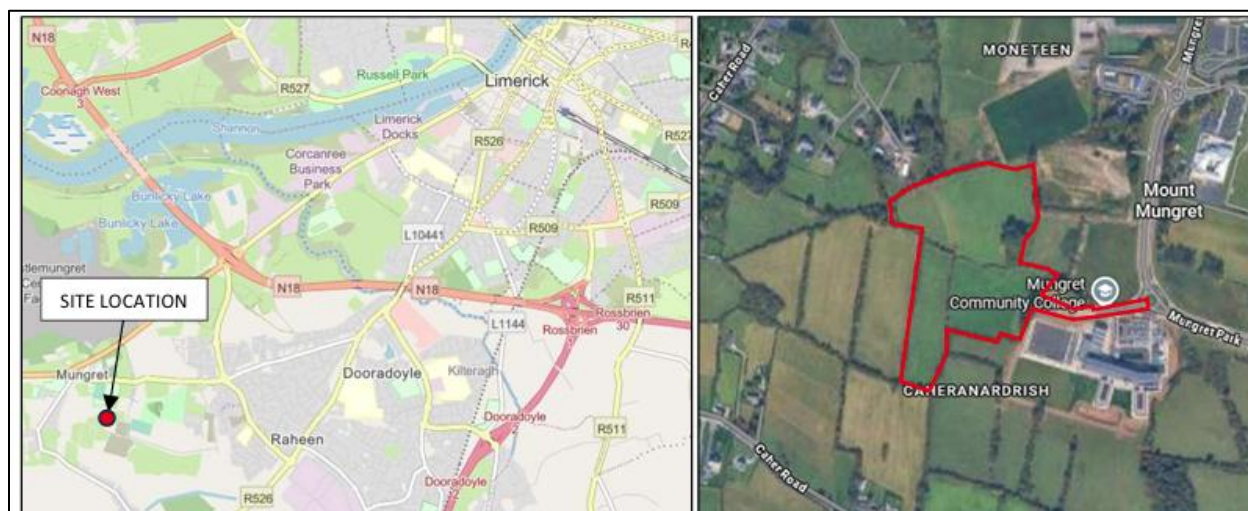


Figure 1- Site Location (extract from Surface Water Report)

2.2 Review of SW Drainage Proposals

2.2.1 Ground Investigation

The Surface Water Report details infiltration testing that was carried out. Four trial pits were dug and infiltration testing carried out with infiltration rates obtained between 8.048×10^{-6} m/s and 7.844×10^{-5} m/s. No groundwater strikes were mentioned however it is unclear when the testing took place as if done during the summer then it would not represent the highest groundwater levels possible on site.

OSL to confirm timing of infiltration testing and provide SI report.

OSL to confirm whether groundwater monitoring was carried out.

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2.2.2 Design Parameters

Rainfall parameters can be estimated using Met Éireann data, using the Flood Studies Report (FSR) values or the values in the GDSDS. The Met Éireann method can be more representative of a site if selected correctly. The design values used by BMCE and considered by JBA are shown below:

Rainfall parameters	Designer values	JBA Comment
M5 60 (mm)	16.9	16.8 – Met Éireann 2023 DDF
Ratio R	0.318	0.317 – Met Éireann 2023 DDF
SAAR (mm)	990	OK
Qbar l/s	11.2l/s	OK – It is noted that the lesser of the two values has been chosen. JBA's interpretation of the spec. is that the greater of the values can still be used.
Climate Change	30%	OK – As per LCCC SuDS Document
Urban Creep	10%	OK – As per LCCC SuDS Document

2.3 Surface Water Drainage Strategy

2.3.1 Site Drainage Strategy

The proposed surface water drainage network comprises five sub-catchments across the site. Infiltration systems have been incorporated within the stormwater strategy based on the infiltration testing undertaken, which indicates a reasonable infiltration capacity across the site. The surface water network generally consists of a gravity pipe system with Sustainable Drainage Systems (SuDS) measures including green roofs, permeable paving, swales, bioretention areas, detention basins, attenuation tanks and tree pits integrated where practicable.

Five attenuation tanks are proposed across the development. These include one located to the north of the site with a storage capacity of 277.5 m³, one to the south with a capacity of 157 m³, one to the east with a capacity of 256 m³, one to the west with a capacity of 260 m³, and one centrally located with a capacity of 473 m³. All attenuation structures are proposed as underground cellular storage tanks.

Discharge from the development will be regulated by a series of flow control devices located throughout the site, with the final flow control positioned downstream of the southern attenuation tank and upstream of the pumping station. The final discharge rate is restricted to 11.2 l/s to comply with the allowable discharge rate for the development.

It is not clearly stated which areas drain to each detention basin, nor whether runoff entering these basins is intended to infiltrate prior to entering the downstream attenuation tanks.

A surface water pumping system has been proposed despite good capacity for infiltration within the site. The possibility of infiltrating all runoff from the site should be fully investigated before proposing a pump solution

The drainage network has been modelled

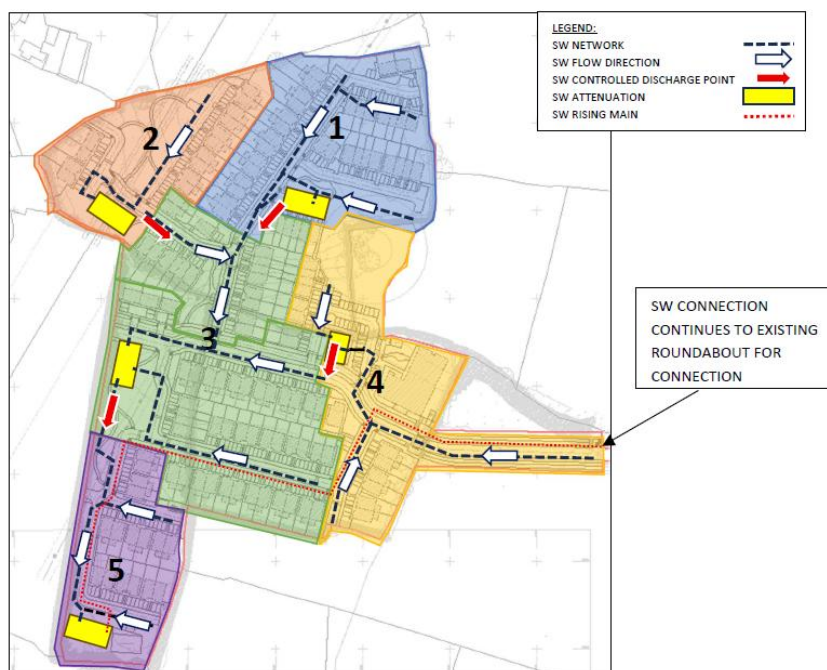


Figure 2 Surface Water Sub-Catchments (extract from Surface Water Report)

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using InfoDrainage hydraulic modelling software, which applies the Wallingford Procedure / Modified Rational Method rainfall-runoff approach with hydrodynamic network routing to simulate storm events and assess pipe capacities, storage requirements and discharge controls. It is further discussed in 2.2.4

OSL to confirm what areas enter each detention basin and whether it is intended for them to infiltrate into the attenuation tanks.

OSL to confirm that it is not feasible to infiltrate all runoff from the site.

2.3.2 SuDS Measures Considered

SuDS Technology	Comments
Green/Blue Roofs	A green roof has been proposed on the apartment block proposed in the development
Swale, Filter Drain, Infiltration Trench	Five swales have been proposed to convey and treat some of the road runoff within the site
Tree Pits, Bioretention Areas, Rain Gardens	A number of tree pits and bioretention areas have been proposed to intercept runoff from roads before discharging to the main stormwater network.
Permeable Paving	Permeable paving is proposed within car parking areas to provide water quality treatment and conveyance of surface runoff to the main stormwater network. A limited portion of the permeable paving is designed to allow infiltration, while the remainder is designed as non-infiltrating permeable paving, acting primarily as a conveyance and storage layer. OSL to clarify why the majority of permeable paving areas are designed as non-infiltrating systems despite the reported favourable infiltration conditions across the site.
Soakaways	None proposed.
Detention Basins, Retention Ponds, Stormwater Wetlands	Five detention basins have been proposed each at least partially above one of the attenuation tanks. Each detention basin has a depth of 500mm with varying areas.
Rainwater Harvesting	An option exists for each dwelling to have a rainwater butt however this is not included in the surface water design. OSL to confirm that rainwater butts are not proposed as part of the surface water drainage design.
Petrol Interceptor	A class 1 bypass interceptor has been proposed upstream of each attenuation tank.
Attenuation	Five online geocellular attenuation tanks have been proposed with the first having a volume of 277.5m ³ , the second having a volume of 256m ³ , the third having a volume of 473m ³ , the fourth having a volume of 260m ³ and the fifth having a volume of 157m ³ . All attenuation tanks are proposed as geocellular storage systems with a permeable liner, as indicated in the typical construction detail. OSL to confirm whether the attenuation tanks are intended to provide infiltration or whether they are lined storage systems only.
Other	N/A

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2.3.3 Review of drainage design and drawings

The hatching used in the Catchment Characteristics drawing does not match the legend which could cause confusion.

The details used should be reviewed to ensure they are entirely relevant to the stormwater design.

There appears to be a discrepancy between the manholes levels quoted on the storm water layout and the longsection drawings for manhole S3-7. These should be reviewed to ensure that they match to avoid confusion. Manhole S1-3 does not appear on the surface water layout and manhole S1-5.1 is listed twice.

The overland flow routes drawings illustrate two low points, one to the east of S3-7.3 and the other at S3-12, for potential pooling. Have any measures been proposed to avoid excessive overland flow pooling.

OSL to review Catchment Characteristics drawing.

OSL to review longsection and surface water layout manhole levels for manhole S3-7.

OSL to confirm the locations of manholes S1-3 and S1-5.1

OSL to clarify if any measures are proposed to prevent excessive pooling at low points

2.3.4 Review of Network and Attenuation Calculations

The network modelling has been carried out using the Infodrainage software.

The network has been designed for the 1 in 100 year return period and has been simulated for all storm durations up to 10080 minutes (7 days).

The simulation results show no flooding up to the 1 in 100-year event plus 30% Climate Change and 10% Urban Creep

The site has been modelled as a single catchment with the final discharge point downstream of Attenuation Tank 5.

A breakdown of the areas assigned to each of the nodes in the Infodrainage model is included in the Surface Water Report however, these cannot be fully checked as the areas in the model are numbered differently to the manholes and no drawing showing them has been provided.

Runoff reduction factors have been averaged across the site with the averaged value applied to the entire site. This is typically not done as it may overestimate runoff from green areas and underestimate the runoff from hardstanding areas. Additionally, the CV value has not been set to 0.1 despite there being runoff factors applied to the areas entering the network. This will lead to a double reduction in area entering the network and possibly an undersized network.

OSL to confirm with runoff factors applied.

OSL to rerun infodrainage model with summer and winter CV values set to 1.

2.3.5 Interception/Treatment

Interception of runoff is intended to prevent any runoff for small rainfall events which are less than 5mm (and up to 10mm if possible). Treatment of 15mm is required if interception is not provided.

Table 24.6 of the CIRIA manual provides indication of deemed to satisfy criteria and it is considered that this should be complied with. All sources of runoff should also be intercepted where possible. A high level of Interception provided for some parts of the site is not to be considered as adequate compensation for a low degree of interception provision for other locations. Compliance is required for the whole site, or at least for road/paved areas, for it to be considered effective. Interception mechanisms are based on runoff retention. This can be achieved using rainwater harvesting or using soil storage and evaporation. Either infiltration or transpiration rates can dispose of the runoff from minor events to enable the next event to be captured.

SuDS have been proposed throughout the site. The infrastructure report discusses the SuDS measures proposed for the site, however compliance with Table 24.6 of the CIRIA SuDS Manual has not been

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demonstrated. The interception has been shown as a volume instead of an area.

OSL to additionally clarify how compliance with CIRIA SuDS Manual Table 24.6 has been demonstrated.

2.3.6 Exceedance Flows

A drawing showing the overland flood route has been provided. Overland flow generally flows towards the watercourse running through the site to the west of the development aside from a southern section which runs off the site to an existing road.

2.4 Health & Safety and Maintenance Issues

The proposed drainage system comprises SuDS devices, road gullies, manholes, Aquacell attenuation tank 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.

Optimum performance of the SUDs treatment train is subject to the frequency of maintenance provided. SuDS maintenance plan has been proposed.

Particular consideration is required at detailed design stage to the design, maintenance requirements and whole life plan (and replacement) of the SuDS system as a whole.

Regular maintenance of the hydrobrakes will be required to remove any blockages, particularly in the wake of heavy rainfall events or local floods.

While the drainage report provides general commentary on maintenance requirements, it is recommended that a detailed maintenance and management plan be prepared and agreed with the Local Authority prior to the commencement of construction. This plan should clearly define inspection frequencies, access requirements, maintenance procedures, and the party responsible for long-term operation and maintenance of each drainage and SuDS element.

OSL to provide detailed Maintenance Plan

2.5 Design Review Process and Audit Conclusions

This report outlines the review of the initial submission by the OSL Butler Consulting Engineers and JBA comments are also included in the Audit Feedback Form in Appendix A. This feedback form shows the audit trail and the responses from the designer. When answers to queries have been considered "Acceptable" then the audit is considered to be closed out. Some queries may be considered acceptable subject to Local Authority agreement.

2.5.1 Items to be considered at Detailed Design Stage

Proper detail design and construction of SuDS devices is paramount to ensure long term optimum hydraulic performance as well as maximisation of biodiversity opportunity. It is recommended that a collaborative, multidisciplinary approach to detailed design is adopted, involving engineers, architects, ecologists and landscape architects, to ensure that SuDS measures are fully integrated into the overall site layout and function as intended throughout the lifecycle of the development.

A full site investigation is to be undertaken at detailed design stage.

Groundwater monitoring is to be carried out at detailed design stage before construction commences.

A sensitivity test of the Infodrainage model is to be carried out by setting the CV value for the model to 1.

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2.6 Audit Report sign off

Audit Report Prepared by:

Jack Shanahan Meng MIEI
Graduate Engineer

Approved by:

Aneeqe Ahmed
Senior Engineer

Audit Report Findings are accepted by the Design Engineer

Representative:	Ben Mong
Name of Company:	OSL Butler & Co Consulting Engineers
Date:	31/03/2026

Note:

JBA Consulting Engineers & Scientists Ltd. role on this project is as an independent reviewer/auditor. JBA Consulting Engineers & Scientists hold no design responsibility on this project. All issues raised and comments made by JBA are for the consideration of the Design Engineer. Final design, construction supervision, with sign-off and/or commissioning of the surface water system so that the final product is fit for purpose with a suitable design, capacity and lifespan, remains the responsibility of the Design Engineers.

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Appendix A – Audit Feedback Form



JBA Consulting Stormwater Audit - Stage 1 Feedback Form

Project:

Stage 1 SWA - Caheranardish, Mungret, Co. Limerick

Date:

31/03/2026 (C01)

JBA Reviewer:

Jack Shanahan & Aneeque Ahmed

Project Number:

2025s0294

Item No.	JBA Review Comment	Comment/Clarification Request/Suggested Mitigation	Response from Client/Client Representative	Acceptable / Not Acceptable
	18/03/2026	18/03/2026		
Ref Docs	24051-OSL-00-RP-C-0011 Surface Water Design Report Rev P01 24051-OSL-11-DR-C-1120 Proposed Surface Water Layout RevP04 24051-OSL-11-DR-C-1121 Proposed Surface Water Longitudinal Sections - Sheet 1 RevP03 24051-OSL-11-DR-C-1122 Proposed Surface Water Longitudinal Sections - Sheet 2 RevP03 24051-OSL-11-DR-C-1123 Proposed Surface Water Longitudinal Sections - Sheet 3 RevP03 24051-OSL-11-DR-C-1124 Proposed Surface Water Longitudinal Sections - Sheet 4 RevP03 24051-OSL-11-DR-C-1126 Catchment Characteristics Layout RevP01 24051-OSL-11-DR-C-1127 Surface Water Exceedance Routes RevP01 24051-OSL-90-DR-C-9020 Proposed Surface Water Details - Sheet 1 RevP03 24051-OSL-90-DR-C-9021 Proposed Surface Water Details - Sheet 2 RevP03 24051-OSL-90-DR-C-9022 Proposed Surface Water Details - Sheet 3 RevP03 24051-OSL-90-DR-C-9023 Proposed Surface Water Details - Sheet 4 RevP03 24051-OSL-90-DR-C-9024 Proposed Surface Water Details - Sheet 5 RevP03			
P01				
1	The run off coefficient used is the average of the green area and hardstanding area value in LCCC's SuDS document and has been applied universally across the site. This runs the risk of overestimating runoff from green areas and underestimating runoff from hardstanding areas, and doesn't account for proportionality of surfaces.	OSL to review runoff coefficient to ensure there is no underestimation of flows.	OSL has reviewed and is confident that the run off coefficients as applied are representative. The associated risks with over and underestimation of runoff in the context of the surface water design has been assessed and deemed appropriate. Please note, back gardens of dwellings and units are drained positively through backgarden gullies, linear drains and connected to the main surface water network for conveyance. The entirety of the site has the potential of draining to the surface water network, thus applied and included within the Infodrainage and designs accordingly.	Acceptable
2	The Surface Water Design Report provides only a high-level maintenance table.	OSL to provide full maintenance plan	A high-level maintenance table is appropriate for the detail required as part of the planning application.	Acceptable
3	The interception calculation has been carried out in terms of volume and not in area as per table 24.6 of CIRIA report C753	OSL to update interception calculations	Compliance with Table 24.6 of the CIRIA report C753 is not required by LCCC.	Acceptable
4	A CV of 1 does not appear to have been applied to the network model despite run off factors being applied to catchment areas which leads to a double reduction in areas in the model	OSL to confirm the Cv values adopted within the model and verify (with model output) that no double reduction of runoff has occurred.	The applied impervious percentage within each catchment represents the actual proportion of hardstanding surfaces (e.g., roofs, pavements, and other impermeable areas) derived directly from the proposed site layout drawings. This parameter defines the physical land cover within the model and is not used as a calibration factor. Impervious areas are assumed to contribute near-total runoff, while the remaining pervious areas are modelled separately. Seasonal Capture Values (CV) are applied to the pervious portion of the catchment to represent the hydrologic response of soils under varying seasonal conditions. The summer CV reflects typical unsaturated conditions with higher infiltration and evapotranspiration, whereas the winter CV represents saturated ground conditions, which are characteristic of the critical design season in Ireland. As a result, the winter CV governs peak runoff rates and attenuation requirements, ensuring a conservative assessment of drainage performance. Accordingly, impervious percentage and CV values perform distinct but complementary roles within the model: the former defines the extent of runoff-generating surfaces based on site geometry, while the latter controls the runoff response of pervious areas in accordance with seasonal soil conditions. These parameters are not interchangeable and have been applied consistently to maintain a physically representative and transparent hydrologic model. Setting the Seasonal Capture Value (CV) to 1.0 effectively assumes that all rainfall on the pervious portion of the catchment is converted directly to runoff, with no losses to infiltration, storage, or evapotranspiration. In practical terms, this causes pervious areas to behave identically to impervious surfaces, removing the distinction between soil and hardstanding in the model. While this may provide a highly conservative upper-bound scenario, it is not representative of real site conditions in Ireland, where even saturated soils retain some infiltration capacity. Consequently, applying CV = 1 across the catchment would overestimate runoff volumes and peak flows, leading to an unrealistic representation of the drainage system and potentially oversized infrastructure. This methodology aligns with established hydrologic practice and relevant guidance, including the CIRIA C753 SuDS Manual (CIRIA), the Greater Dublin Strategic Drainage Study (GSDSDS) (Greater Dublin Strategic Drainage Study), and guidance from the Office of Public Works, all of which require that land cover characteristics and seasonal soil conditions are represented separately to ensure robust estimation of runoff and appropriate drainage design.	See Note 23
5	The M5-60 and Ratio r used are slightly higher then the Met Eireann values for the site.	OSL to review	Using values derived from the Met Eireann Depth Duration Frequency (DDF) Model Update 2023. M5-60 = 16.9, M5-2d=53.1, this r=0.318. We believe these values to be correct. Co-ordinates (Irish Grid) Easting: 153316, Northing: 153488 (ITM X 553270, Y 653519)	Acceptable
6	A limited portion of the permeable paving is designed to allow infiltration, while the remainder is designed as non-infiltrating permeable paving, acting primarily as a conveyance and storage layer.	OSL to clarify why the majority of permeable paving areas are designed as non-infiltrating systems.	As per LCCC Opinion issued under Section32D of the Planning and Development Act (as amended), LCCC has specified that permeable paving driveways are designed as sealed systems.	Acceptable
7	An option exists for each dwelling to have a rainwater butt however this is not included in the surface water design.	OSL to confirm that rainwater butts are not proposed	As noted within Section 3.5.7 of the Surface Water Design Report, 24051-OSL-00-RP-C-0011, It is not proposed to provide rainwater butts as part of the development and thus does not currently form part of this surface water design. The intention would be that these are provided retrospectively by the homeowner.	Acceptable

Item No.	JBA Review Comment	Comment/Clarification Request/Suggested Mitigation	Response from Client/Client Representative	Acceptable / Not Acceptable
8	It is unclear whether it is intended for the runoff caught by the detention basins to infiltrate into the below attenuation tanks. If so has this been accounted for in the infodrainage model?	OSL to Clarify	As noted within Section 3.5.7 and 3.5.9 of the Surface Water Design Report, 24051-OSL-00-RP-C-0011. The detention basins proposed will be located in green areas and will cater for some runoff from adjacent roadways and roofs, but primarily the open space areas where they are situated. Any run off collected within these detention basins will infiltrate to ground and into the below ground attenuation tanks. This has been accounted for within the Infodrainage model.	See Note 21
9	It is unclear what areas are intended to be draining to the detention basins	OSL to Clarify	As per our response in 8 above, the detention basins will primarily drain the open space areas where they are situated. Please refer to the SuDS and SuDS Interception Layout Plan, 24051-OSL-11-DR-C-1128, showing areas drained/intercepted by SuDS features.	Acceptable
10	A surface water pump has been proposed as part of this design despite the capacity for infiltration within the site. Has it been determined as unfeasible to infiltrate all runoff within the site? The need for pumping isn't justified in the documentation given this infiltration potential.	OSL to review need for pump	As per LCCC Opinion issued under Section32D of the Planning and Development Act (as amended), LCCC has specified the requirement of a pumped solution (surface water). The pumped solution originated from a request by Central Services in order to provide contingency in the event of infiltration failure.	Acceptable
11	A full Site Investigation Report has not been provided	OSL to Provide SI report	A full Site Investigation will be commissioned at detailed design stage, subsequent to receiving a grant of planning.	Acceptable
12	It is unclear when the infiltration testing was carried out. If this was not during winter then the groundwater levels may be underestimated	OSL to confirm when infiltration testing carried out	The infiltration Tests were carried out in June of 2025.	See Note 22
13	Groundwater monitoring over a winter period may be necessary to confirm there is sufficient separation from permeable SuDS elements	OSL to carry out groundwater monitoring before construction	Further Site Investigation, as per our response in 11 above, will ensure groundwater monitoring is carried out and considered as part of the SuDS design at detailed design stage.	Acceptable
14	The hatching used in the Catchment Characteristics drawing differs from that in the legend which could cause confusion	OSL to update Catchment Characteristics drawing	Please refer to the revised Catchment Characteristics Layout, 24051-OSL-11-DR-C-1126, with colour/legend correction.	Acceptable
15	There appears to be inconsistencies between the levels quoted on the surface water layout and those in the longitudinal section drawings for manhole S3-7	OSL to review levels in both drawings	Please refer to the revised Surface Water Layout, 24051-OSL-11-DR-C-1120, and Surface Water Longitudinal Section Sheet 2, 24051-OSL-11-DR-C-1122. The levels quoted have now been corrected.	Acceptable
16	On the Exceedance Routes drawing (1127), flow arrows in the vicinity of Attenuation Tank 4 circulate internally and the final escape route is not clearly defined	OSL to revise the drawing so all green (escape) and blue arrows provide continuous off-site routes without internal loops or trapped flow and confirm no risk of localised ponding	Please refer to the revised Surface Water Exceedance Route Layout, 24051-OSL-11-DR-C-1127, as well as the Exceedance Event Report as analysed in Infodrainage. Reviewing the catchments and areas that could potentially have exceedance flows spilling overland to the 'internal low point', the following surface water features were identified; Manholes S3-7.3, S3-7.2, S3-7.1, S4-9, S4-5, S4-6, S4-4, BP4.1, BP4.2, S4-2 and Tank 4. The volume of exceedance equates to 293m3. The roads within that location can contain 1.25m3. The remainder exceedance volumes will be contained within 3 no. interconnected soakaways below ground. Roadside Exceedance Swales (with overland flow drop kerb entry) has been introduced to capture any exceedance flows and allow them to enter the soakaways below.	Acceptable
17	Section 3.6 states that long-term storage (LTS) is not proposed. No pre/post-development 100-year 6-hour volume calculations are provided	OSL to confirm whether the assessment of the 100-year, 6-hour storm runoff volumes for pre- and post-development conditions has been undertaken in accordance with GDSuDS guidance, and to demonstrate that the proposed drainage strategy will not result in an increase in downstream runoff volumes compared with the greenfield condition	Sub-criterion 4.3 of the GDSuDS is satisfied through the proposed design.	Acceptable, See Note 24
18	Site discharge relies on a surface water pumping station	OSL to confirm that pump failure scenarios have been modelled (1 in 100-year event) and demonstrate sufficient upstream storage to prevent flooding of properties during power failure	As per LCCC Opinion issued under Section32D of the Planning and Development Act (as amended), LCCC has specified the requirement of a pumped solution (surface water). The pumped solution originated from a request by Central Services in order to provide contingency in the event of infiltration failure. Site discharge does not rely on the surface water pumping station, infiltration to ground is the main discharge method, with the surface water pumping station considered only as an emergency measure should infiltration fail.	Acceptable
19	Finished floor levels and predicted exceedance water levels are not shown.	OSL to confirm that exceedance water levels (1 in 100-year + 30% CC) remain below finished floor levels of all properties and that overland flows are safely routed through roads and open spaces.	Please refer to Table 4 of the Surface Water Design Report, 24051-OSL-00-RP-C-0011. Max water level during critical storm events for each tank including adjacent Property FFLs/Freeboard available has been noted within this table. The Surface water Exceedance Routes Layout, 24051-OSL-11-DR-C-1127 has been revised to include proposed House FFLs.	Acceptable
20	Manhole S1-3 does not appear on the surface water layout and manhole S1-5.1 is listed twice	OSL to confirm locations of manholes	Please refer to the revised Surface Water Layout, 24051-OSL-11-DR-C-1120. The numbering of these 2 manholes has now been corrected.	Acceptable
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21	It is unclear from the provided drawings that how any of the roof areas would enter the detention basin and not the attenuation tanks	OSL to clarify how roof areas would enter detention basins	The detention basins will primarily be taking the open space areas in which they are situated.	Acceptable
22	Groundwater monitoring over a winter period should be carried out prior to construction given the reliance on infiltration-based SuDS measures and the summer levels are likely to not be representative of the highest levels on site	OSL to carry out groundwater monitoring before construction	OSL will undertake groundwater monitoring prior to construction.	Acceptable

Item No.	JBA Review Comment	Comment/Clarification Request/Suggested Mitigation	Response from Client/Client Representative	Acceptable / Not Acceptable
23	Where reduced runoff contribution is represented within the model (e.g. through impervious area definition or pervious runoff assumptions), the continued use of default Cv values may result in an additional reduction of runoff. It is noted that similar guidance (e.g. DLRCC Appendix 7) advises against combining reduced runoff assumptions with default Cv values, as this may underestimate flows. Therefore, a model run with CV = 1 should be carried out to assess the impact that it would have on the design for completeness	OSL to undertake a sensitivity test (e.g. Cv = 1.0 scenario) to demonstrate that the adopted approach does not result in underestimation of runoff or undersizing of the pipework catering for primarily hard surface run off.	OSL will undertake a sensitivity test as part of the detailed design stage, prior to construction.	Acceptable
24	It is acknowledged that the design is unique in that there is a full contingency parallel system being installed via a pump should infiltration be insufficient, and that the primary means of discharge is to ground. Given that the pump will potentially not be operational for long periods of time, is there intention to operate it periodically as part of a maintenance strategy?	OSL to confirm.	Yes, to mitigate this risk, the drainage network has been deliberately configured to maintain a continuous, low-rate discharge to the pump station under normal operating conditions. This ensures regular operation of the pumping infrastructure, thereby maintaining system functionality, verifying operational readiness, and providing resilience in advance of any exceedance or failure scenarios.	Acceptable