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Planning Department,
South Dublin County Council,
County Hall,
Tallaght,
Dublin 24.

21st April 2022

Re: Register Ref. SD21A/0327
Request for Additional Information
Location: Site at Gordon Park, Old Naas Road, Kingswood, Dublin 22
Applicant: Greenwalk Development Ltd.

Dear Sir / Madam,

We refer to the request for additional information on Planning Submission Reg. Ref. SD21A/0327. We enclose the following documents and drawings as part of the response to this request for Additional Information.

Document No.:	Title	Revision
21003-TJOC-ZZ-ZZ-RP-C-3702	Surface Water Management Plan	C01

Drawing No.:	Title	Revision
21003-TJOC-ZZ-ZZ-DR-C-0064	Proposed Surface Water Layout Overall Plan	C02
21003-TJOC-ZZ-ZZ-DR-C-0065	Proposed Surface Water Layout Sheet 1	C02
21003-TJOC-ZZ-ZZ-DR-C-0066	Proposed Surface Water Layout Sheet 2	C02
21003-TJOC-ZZ-ZZ-DR-C-0067	Proposed Permeable/Imperm. Sub Catchment Areas	C02
21003-TJOC-ZZ-ZZ-DR-C-0080	Overview of Proposed SuDS Features	C01
21003-TJOC-ZZ-ZZ-DR-C-0081	SuDS Features Cross Sections/Details – Sheet 1	C01
21003-TJOC-ZZ-ZZ-DR-C-0082	SuDS Features Cross Sections/Details – Sheet 2	C01

In addition to the above drawings, we set out below our response to the engineering related aspects of the Additional Information (AI) Request under each heading. This response should be read in conjunction with all other information submitted as part of the AI response.

Item 8 (a) Based on limited information provided the surface water attenuation of 984m3 is undersized by approximately 10%. The applicant is requested to submit a report showing revised details of different surface types such as buildings, permeable paving, green areas and their respective run off coefficients.

Response:
We refer to drawing 21003-TJOC-ZZ-ZZ-DR-C-0067 which accompanies this submission. The drawing includes a full breakdown of the surface types on the site. We also refer to Table 1 below which shows the respective run-off rate for all surface types. We note that these run-off rates are based on the Rational Method design for surface water networks. As set out in the Engineering Report that accompanied the planning application, the surface water design for this site was carried out using Microdrainage software which is based on the Modified Rational Method. When using the modified rational method of design, it is recommended to apply a run-off factor of 100% to all impermeable

areas and a run-off factor of 0% to all permeable areas (such as private open spaces and public open spaces).

The modified rational calculation method contains volumetric and routing factors which modifies the contributing areas applied to impermeable areas to take account of the surface water run-off from permeable areas. For comparison purposes, we include Table 2 below which shows the run-off factors applied for the Modified Rational Method. The equivalent contribution area for each method is exactly the same i.e. 1.29Ha.

Equivalent Impermeable Area Based on Rational Method			
Surface Type	Area (Ha)	Run-Off Coefficient (%)	Equiv. Imp. Area (Ha)
Roads	0.2834	95%	0.27
Footpath	0.1137	80%	0.09
On Curtilage Parking (Permeable Paving)	0.2707	60%	0.16
Roof Areas	0.6268	95%	0.60
Private Open space	0.422	20%	0.08
Public Open Space	0.4885	15%	0.07
Footpaths Draining onto Public Open Space	0.0769	15%	0.01
Total Site Area	2.282	Total Equivalent Impermeable Area (Ha)	1.29

Table 1 – Surface Types and Run-Off Coefficients based on Rational Method of Surface Water Design

Equivalent Impermeable Area Based on Modified Rational Method (Used in Microdrainage Software Design)			
Surface Type	Area (Ha)	Run-Off Coefficient (%)	Equiv. Imp. Area (Ha)
Roads	0.2834	100%	0.28
Footpath	0.1137	100%	0.11
On Curtilage Parking (Permeable Paving)	0.2707	100%	0.27
Roof Areas	0.6268	100%	0.63
Private Open space	0.422	0%	0.00
Public Open Space	0.4885	0%	0.00
Footpaths Draining onto Public Open Space	0.0769	0%	0.00
Total Site Area	2.282	Total Equivalent Impermeable Area (Ha)	1.29

Table 2 – Surface Types and Run-Off Coefficients based on the Modified Rational Method of Surface Water Design

With reference to the surface water attenuation volume of 984m3, this figure does not include the surface water storage that is generated in the subbase of the permeable paved driveways of the houses or the permeable paved car park for the Duplex Units during peak storm events. The driveways for the houses and the car park for the duplex units are provided with permeable paving which contains a subbase build-up of 350mm of clean crushed permeable stone to EN 13242.

A detail of the permeable paved build-up was shown on Drg. No. 21003-TJOC-ZZ-ZZ-DR-C-0075 which accompanied the original planning application. A copy of the detail is provided in Figure 1 below for reference also. The permeable stone subbase has a voids ratio of circa 30-40% which provides surface water storage during peak storm events. The depth of subbase is generally determined based on the load applied to the surface of paving (i.e. vehicle loading) and the subsoil strength. In this instance, the depth of subbase has been determined to be 350mm.

The proposed permeable paving to the driveways and car park areas and their associated subbase storage were included in the Microdrainage Surface Water design/calculations that accompanied the original planning application. The depth of water stored in the subbase of each driveway/car park during the 1% AEP surface water storm event varies across the site, as the shape and size of each driveway varies across the site. However, on review of the surface water calculations submitted with the original application, the average depth of water levels in the subbases of driveways/car park is approximately 145mm in the peak 1% AEP storm event. This equates to 41.4% of the storage volume available in the driveway and excludes any water that infiltrates into the ground below the driveways/car parks. Based on the above, we include Table 3 below which sets out the overall surface water storage/attenuation provided across the site in the original application. The total figure of 1,102m3 is greater than 984m3 + 10% (1,085m3).

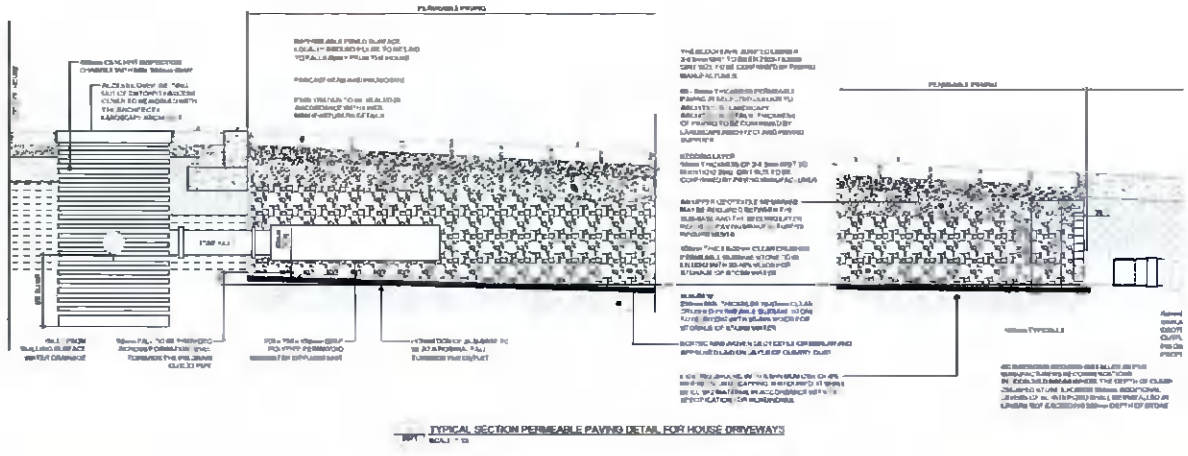

Figure 1 – Detail of Permeable Paved Car Park/Driveway

Surface Water Storage/Attenuation in Original Application		
Feature	Volume (M3)	Comments
Stormtech Attenuation MC3500	757	Located at east of site
Stormtech Attenuation SC740	136	Located at northwest of site
Piped Network and Manholes	84	
Bioretention Swale	7	Located at southwest of site
Subbase Storage in Permeable Paved Driveways and Car Park	118	Calculated based on 2707m2 of permeable paving across the site, average depth of water in subbase of 145mm and 30% Voids Ratio (2707m2 x 0.145m x 30% = 118 m3
Total Volume	1102	M3

Table 3 – Summary of Surface Water Storage/Attenuation Volumes in Original Application

Item 8 (b) The applicant is requested to submit a revised drawing showing the proposed surface water attenuation. Any additional attenuation required should be provided by means of SuDS (Sustainable Drainage). Examples of SuDS include, green roofs, permeable paving, filter drains, swales, green area detention basins, tree pits and other such SuDS.

Response:
Following consultation between the applicant and SDCC's Parks/Public Realm Department, it is proposed to reduce of the below ground surface water attenuation tank in the main open space area and to introduce additional SuDS and Surface Water storage features to the overall site plan including Tree Pits, Bio-retention Area and Filter Strips. These additional features will complement the SuDS features which were previously designed and detailed for the scheme, including Infiltration Trenches and the Permeable Paved driveways/car park areas.

In summary, the surface water run-off from the front roofs of houses will be filtered and stored in permeable paved driveways. The surface water run-off from the rear roofs of houses and any hard standing areas to the rear of houses will be directed to infiltration trenches in the rear gardens of the houses. The surface water in the infiltration trenches and permeable paved subbase will infiltrate into the ground where possible, otherwise it will discharge into the site surface water network via perforated outlet pipes within the SuDS feature.

For the site roads and footpaths, surface water run-off will be collected in road gullies or diverted to dropped kerbs and subsequently discharged into a number of SuDS features such as tree pits, bioretention areas and filter strips. The SuDS features will be provided with subsurface storage media with a minimum voids ratio of 30% to generate surface water storage within the SuDS feature.

The additional SuDS features have been incorporated into the Surface Water design and the revised Surface Water drawings and calculations are included in this Additional Information submission. The revised surface water storage volumes are summarised in Table 4 below. The revised surface water calculations are included in the Surface Water Management Plan that accompanies this Additional Information Response appended to demonstrate that there is no flooding in the surface water system for storm events up to and including the 1% AEP peak storm event.

Revised Surface Water Storage/Attenuation Volumes		
Feature	Volume (M3)	Comments
Stormtech Attenuation MC3500	577	Located at east of site
Stormtech Attenuation SC740	136	Located at northwest of site
Piped Network and Manholes	96	
Tree Pits	18	Calculated based on 66.7m3 of sub-surface storage medium with a minimum voids ratio of 30%. Volume excludes water that may infiltrate to ground if infiltration is available or water that is lost due to evapotranspiration
Filter Strips and Infiltration Trenches	62.7	Calculated based on 459 linear metres of Filter Strips and Infiltration Trenches. Volume excludes water that may infiltrate to ground if infiltration is available
Bioretention Area	11.8	Calculated based on 37m2 of Bioretention area
Subbase Storage in Permeable Paved Driveways and Car Park	211	Calculated based on 2707m2 of permeable paving across the site, average depth of water in subbase of 272mm and 30% Voids Ratio (2707m2 x 0.260m x 30% = 211 m3
Total Volume	1112.5	M3

Table 4 – Summary of Revised Surface Water Storage/Attenuation Volumes

Item 8 (c) The applicant is requested to clarify and illustrate on a drawing if a petrol interceptor is proposed prior to entry of surface water to arched type proposed attenuation systems. A suitable sized petrol/oil interceptor should be proposed.

Response:

A petrol/oil interceptor was shown on Drg 21003-TJOC-ZZ-ZZ-DR-C-0065 which was included in the original planning submission. This drawing has been updated as set out above and the revised drawing is included in the response to the Additional Information request. An extract from the drawing is enclosed below for reference also. A Klargestor NSBE025 Petrol/Oil interceptor is proposed to be installed at the upstream end of the arched type attenuation system. The interceptor has been sized based on the contributing surface area of the site and the flow rate in the surface water system.

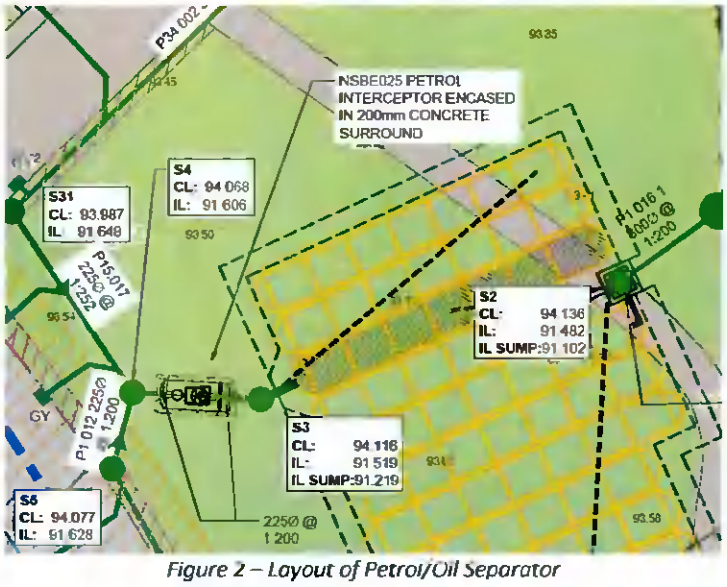

Figure 2 – Layout of Petrol/Oil Separator

Item 8 (d) Water Services of SDCC estimate that surface water discharge should be limited to 5.1 litres/ second and not 6.5 litres/second as proposed on drawing number 21003-TJOC-ZZ-DR-C-0065. The applicant is requested to submit a report and drawing to explain this difference and adjust where necessary.

Response:

A flow control device with a surface water discharge rate of 5.4 l/sec was shown on Drg 21003-TJOC-ZZ-ZZ-DR-C-0065 which was included in the original planning submission. A second flow control device was also indicated on this drawing. The purpose of the second flow control device was to hold back and control surface water flow in the surface water network within the site. The limit set for the second flow control device is 6.5l/sec. However, there is only one surface water discharge point from the site and the flow control device at this point is set at 5.4l/sec.

The discharge rate of 5.4l/sec was determined using the HR Wallingford Greenfield run-off rate calculator. This calculation was included in the Engineering services report in the original planning submission and is appended to this letter also. The site parameters used to determine the greenfield run-off rate are set out overleaf.

- Site area of 2.282 hectares,
- Soil type 2
- SAAR of 873mm.

We refer to the extract below which shows the location of the flow control device that limits the surface water discharge from the site to 5.4l/sec.

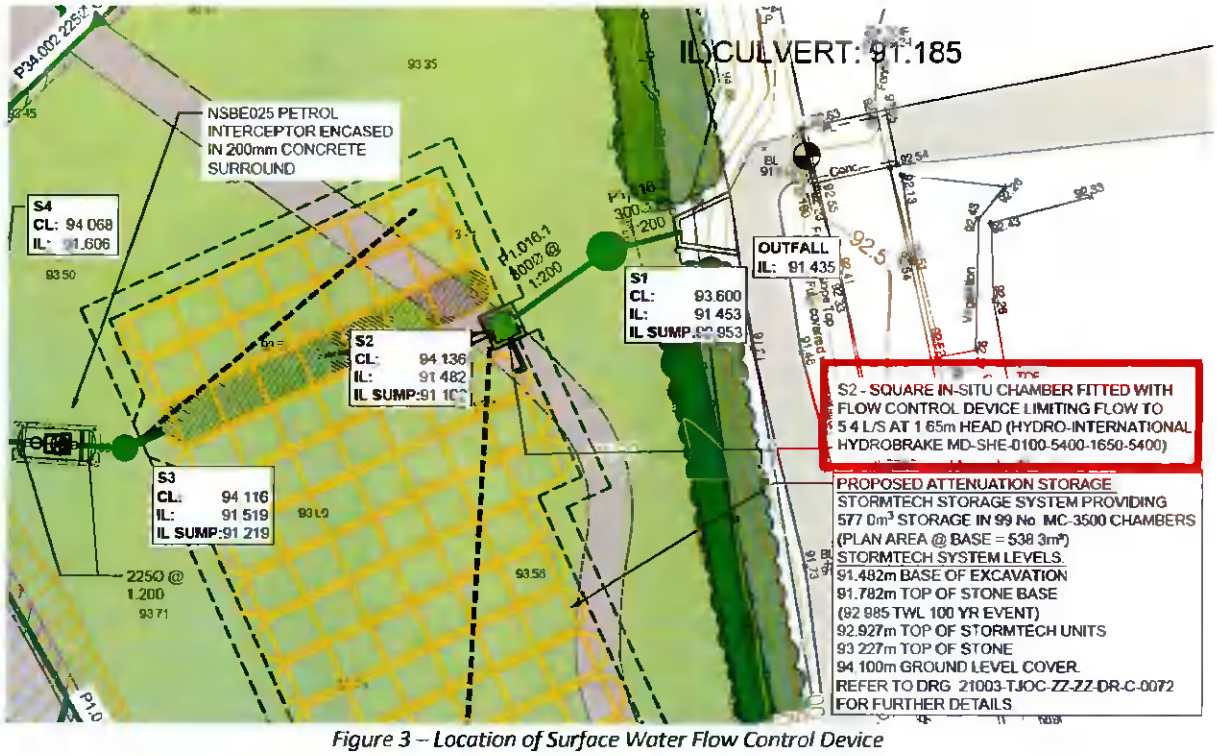

Figure 3 – Location of Surface Water Flow Control Device

We trust the above provides a comprehensive response to the comments raised in relation to the Surface Water design for this proposed development.

Yours sincerely

John Meade

T.J. O'Connor & Associates

Encl.

Appendix A Greenfield run-off rate Calculation

APPENDIX A

HR Wallingford Greenfield Runoff Report

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Niall Scollard
Site name:	Kingswood Lands
Site location:	Old Naas 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 (Cina, 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:	53.29909° N
Longitude:	6.41783° W
Reference:	3419991023
Date:	Oct 05 2021 09:33

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 2.282

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):	873	873
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):	5.39	5.39
1 in 1 year (l/s):	4.58	4.58
1 in 30 years (l/s):	11.47	11.47
1 in 100 year (l/s):	14.06	14.06
1 in 200 years (l/s):	15.4	15.4