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

13 December 2021

RE: PLANNING REF SD 21A/0214 ADDITIONAL INFORMATION RESPONSE

Dear Sir / Madam,

In response to the Decision Order Number: 1317 for Planning Reference No. SD 21A/0214 dated 5th October 2021 we hereby submit our responses to the requests for additional information on the Water Services related items only:-

1) There is no drawing showing the surface water layout of proposed development. There is no report showing surface water attenuation calculations for proposed development.

-Submit a drawing showing the surface water layout for proposed development.

-Submit a report showing surface water attenuation calculation for the proposed new development. The calculations shall include, SAAR value, Qbar, Soil factor, areas of buildings, roads, pathways permeable paving and green areas in m2 and their respective run off coefficients. Include the area of site in Hectares. Provide details of the site area being developed in m2 or Ha (Hectares).

Response:

The current application relates to an extension of the permitted warehouse building constructed under approved parent planning ref SD15A/0254 and approved extension granted planning under SD16A/0456. Given that the site footprint remains unchanged at 0.77 hectares as well impermeable areas remain largely unchanged, it is proposed to retain the existing surface water network and related attenuation facility (currently providing 430m^3 storage) constructed under parent planning ref SD15A/0254.

Please see attached P1507-C-100 Site Services Layout indicating the surface water network.

As the site footprint will remain unchanged, the Qbar from the parent approved parent planning ref SD15A/0254 is applicable. An extract of the Qbar and impermeable details relating to parent planning ref SD15A/0254 are included below (a full set of these calculation are appended to this submission).

JOB NAME: Site Ballymount Industrial Estate		JOB NO: U041	DATE: 20/07/15
TITLE: 1 in 100 Attenuation		CALCS BY: RFM	CHECK'D:
RCD.		ISSUE. 1	REV. 1

Design Storm Return Period	100 years		
Nearest Rainfall Gauge	Dublin City		
Total Site Area	0.77 ha		
Roof Area.	0.00 ha	@	100% Impervious
Hard Surface	0.66 ha	@	100% Impervious
Open Area	0.11 ha	@	0% Impervious
Effective Impermeable Area	0.66 ha		

Allowable Outflow	Calculate	
IH124 QBAR = $0.00108 \times AREA^{0.89} \times SAAR^{1.17} \times SOIL^{2.17}$		
SAAR	710 mm	
Soil Type:	2	
SOIL	0.3	
QBAR/ha	1.85 l/s/ha	
Specified Allowable Outflow	2 l/s/ha	(County Council Requirments or Q-Bar)
Allowable Outflow	2.0 l/s	

An extract of the attenuation calculations relating to parent planning ref SD15A/0254 are included below (a full set of these calculation are appended to this submission).

Cronin & Sutton Consulting		Page 2
31a Westland Square Pearse Street Dublin 2	Job No. U041 Ballymount Source Control	Micro Drainage
Date Aug/2015 File	Designed by RFM Checked by	
Micro Drainage	Source Control W.12.6	

Summary of Results for 100 year Return Period (+10%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
180 min Winter	66.684	0.584	2.0	262.6	O K
240 min Winter	66.730	0.630	2.0	283.6	O K
360 min Winter	66.796	0.696	2.0	313.1	O K
480 min Winter	66.842	0.742	2.0	333.9	O K
600 min Winter	66.876	0.776	2.0	349.0	O K
720 min Winter	66.901	0.801	2.0	360.6	O K
960 min Winter	66.937	0.837	2.0	376.6	O K
1440 min Winter	66.972	0.872	2.0	392.4	O K
2160 min Winter	66.979	0.879	2.0	395.7	O K
2880 min Winter	66.974	0.874	2.0	393.5	O K
4320 min Winter	66.936	0.836	2.0	376.4	O K
5760 min Winter	66.883	0.780	2.0	351.2	O K
7200 min Winter	66.818	0.718	2.0	323.1	O K
8640 min Winter	66.754	0.654	2.0	294.5	O K
10080 min Winter	66.692	0.592	2.0	266.3	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)

A breakdown of the new site characteristics, inclusive of the proposed extension and undercroft area has been provided below.

Catchment Characteristics			
Ballymount Self Store Extension	**Area (m^2)**	**Runoff Coeff.**	**Effective Area (m^2)**
Roofs - Type 1 (Draining to gullies)	4,710	1.00	4710.0
Roofs - Type 2 (Draining to SUDS features)	-	0.70	0.0
Roofs - Type 3 (Draining to Back Gardens)	-	0.00	0.0
Green Roofs		0.70	0.0
Grass over Basements/Podiums	-	0.70	0.0
Roads and Footpaths - Type 1 (Draining to gullies)	2,370	0.80	1896.0
Roads and Footpaths - Type 2 (Draining to Suds features)	-	0.70	0.0
Permeable Paving		0.50	0.0
Gardens	-	0.15	0.0
Verges/Planting	313	0.30	93.9
Parks	-	0.30	0.0
Public Open Space		0.30	0.0

Impermeable Contributing Area	**0.670**	Hectares
Overall Site Area	**0.767**	Hectares
Effective Catchment Runoff Coefficient	**0.87**	

The is a marginal increase from an impermeable contributing area of 0.66 hectares (as per parent planning ref SD15A/0254) to 0.67 hectares (as per current submission) which would be sufficiently accommodated in the existing attenuation tank volume constructed (430m^3) as part parent planning ref SD15A/0254.

Notwithstanding, a revised set of attenuation calculations have been provided demonstrating capacity of the existing attenuation facility and the marginally increased impermeable area.

2) SUDS

(i) The applicant is requested to submit proposals for the use of SUDS on and throughout the site, in line with relevant County Development Plan policies on green infrastructure and surface water drainage in new developments as laid out in Chapters 7 and 8 of the plan.

(ii) Submit a drawing to show what SuDS (Sustainable Drainage Systems) is proposed for the development. Examples of SuDS include Green Roofs, permeable paving, filter drains, channel rills and other such SuDS.

Response:

The current application relates to an extension of the permitted warehouse building constructed under approved parent planning ref SD15A/0254. The site footprint remains unchanged at 0.77 hectares and the current submission proposes to 'swap' out 2140m^2 of existing road area for 2140m^2 of proposed roof area. As stated previously, this leads to a marginal increase from 0.66 hectares of impermeable area (as per parent planning ref SD15A/0254) to 0.67 hectares (as per current submission).

(i) SuDs provisions constructed under approved parent planning ref SD15A/0254 include the following:

Petrol Interceptor: A proprietary oil/water separator which prevents hazardous chemical and petroleum products from entering watercourses and public sewers. This is proposed at the outfall from the site.

Cellular Attenuation System (Stormtech MC3500): A proprietary modular block or arch structure with a maintenance/inspection tunnel for providing underground surface water attenuation storage and can infiltrate runoff to the ground where the subgrade is suitable. The attenuation facility is located within the open carparking footprint, below the car parking area of the current and proposed development.

Rainwater Harvesting System: The rainwater harvesting system will allow for the collection of rainwater for local maintenance and landscaping.

(ii) SuDs provisions constructed under approved parent planning ref SD15A/0254 overlaid on the current proposals are indicated on P1507-C-100 Site Services Layout.

Petrol Interceptor: A proprietary oil/water separator which prevents hazardous chemical and petroleum products from entering watercourses and public sewers. This is proposed at the outfall from the site.

Cellular Attenuation System (Stormtech MC3500): A proprietary modular block or arch structure with a maintenance/inspection tunnel for providing underground surface water attenuation storage and can infiltrate runoff to the ground where the subgrade is suitable. The attenuation facility is located within the open carparking footprint, below the car parking area of the current and proposed development.

Rainwater Harvesting System: The rainwater harvesting system will allow for the collection of rainwater for local maintenance and landscaping.

Yours Sincerely,

Greg Daly
FConsEI BScEng CEng MIEI MIStructE MCIArb MBA
Chartered Engineer-Registered Consulting Engineer
Managing Director

Appendix A *Qbar & Attenuation Calcs - Parent Planning Ref SD15A/0254*

JOB NAME: Site Ballymount Industrial Estate	JOB NO: U041	DATE: 20/07/15
TITLE: 1 in 100 Attenuation	CALCS BY: RFM	CHECK'D:
RCD. 46	ISSUE. 1	REV. 1

Design Storm Return Period	100 years	
Nearest Rainfall Gauge:	Dublin City	
Total Site Area	0.77 ha	
Roof Area:	0.00 ha	@ 100% Impervious
Hard Surface	0.66 ha	@ 100% Impervious
Open Area:	0.11 ha	@ 0% Impervious
Effective Impermeable Area:	0.66 ha	

Allowable Outflow	Calculate	
IH124: $QBAR = 0.00108 \times AREA^{0.89} \times SAAR^{1.17} \times SOIL^{2.17}$		
SAAR	710 mm	
Soil Type	2	
SOIL	0.3	
QBAR/ha	1.85 l/s/ha	
Specified Allowable Outflow	2 l/s/ha	(County Council Requirments or Q-Bar)
Allowable Outflow	2.0 l/s	

Duration (min)	Rainfall 100 Year (mm)	Intensity (mm/hr)	Discharge Q (= 2.71AI) (l/s)	Proposed Runoff (m^3)	Contiguous Land Runoff (m^3)	Total Runoff (m^3)	Allowable Outflow (m^3)	Storage Req'd (m^3)
2	8.3	247.5	443	53	0	53	0	53
5	14.3	171.6	307	92	0	92	1	91
10	21.6	128.7	230	138	0	138	1	137
15	25.9	103.4	185	166	0	166	2	165
30	34.1	68.2	122	220	0	220	4	216
60	41.3	41.3	74	266	0	266	7	258
120	49.5	24.8	44	319	0	319	14	304
240	59.4	14.9	27	382	0	382	29	354
360	70.4	11.7	21	453	0	453	43	410
720	84.7	7.1	13	545	0	545	86	459
1440	98.5	4.1	7	634	0	634	173	461
2880	118.8	2.5	4	765	0	765	346	419
4320	126.5	1.8	3	815	0	815	518	296

Storage required =	461	m^3

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31a Westland Square Pearse Street Dublin 2	Job No. U041 Ballymount Source Control	Micro Drainage
Date Aug/2015 File	Designed by RFM Checked by	
Micro Drainage	Source Control W.12.6	

Summary of Results for 100 year Return Period (+10%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	66.307	0.207	2.0	93.0	O K
30 min Summer	66.386	0.286	2.0	128.7	O K
60 min Summer	66.471	0.371	2.0	166.7	O K
120 min Summer	66.562	0.462	2.0	207.9	O K
180 min Summer	66.618	0.518	2.0	233.2	O K
240 min Summer	66.659	0.559	2.0	251.6	O K
360 min Summer	66.716	0.616	2.0	277.2	O K
480 min Summer	66.755	0.655	2.0	294.5	O K
600 min Summer	66.782	0.682	2.0	307.0	O K
720 min Summer	66.803	0.703	2.0	316.3	O K
960 min Summer	66.830	0.730	2.0	328.4	O K
1440 min Summer	66.853	0.753	2.0	338.8	O K
2160 min Summer	66.865	0.765	2.0	344.5	O K
2880 min Summer	66.864	0.764	2.0	344.0	O K
4320 min Summer	66.843	0.743	2.0	334.2	O K
5760 min Summer	66.809	0.709	2.0	319.2	O K
7200 min Summer	66.772	0.672	2.0	302.4	O K
8640 min Summer	66.733	0.633	2.0	285.0	O K
10080 min Summer	66.695	0.595	2.0	267.7	O K
15 min Winter	66.332	0.232	2.0	104.2	O K
30 min Winter	66.421	0.321	2.0	144.3	O K
60 min Winter	66.516	0.416	2.0	187.1	O K
120 min Winter	66.619	0.519	2.0	233.8	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	76.092	19
30 min Summer	52.951	34
60 min Summer	34.650	64
120 min Summer	21.987	124
180 min Summer	16.705	182
240 min Summer	13.719	242
360 min Summer	10.363	362
480 min Summer	8.481	482
600 min Summer	7.256	602
720 min Summer	6.385	722
960 min Summer	5.217	960
1440 min Summer	3.923	1286
2160 min Summer	2.948	1668
2880 min Summer	2.405	2072
4320 min Summer	1.802	2896
5760 min Summer	1.467	3696
7200 min Summer	1.251	4544
8640 min Summer	1.097	5360
10080 min Summer	0.983	6152
15 min Winter	76.092	19
30 min Winter	52.951	33
60 min Winter	34.650	62
120 min Winter	21.987	122

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31a Westland Square Pearse Street Dublin 2	Job No. U041 Ballymount Source Control	
Date Aug/2015 File	Designed by RFM Checked by	
Micro Drainage	Source Control W.12.6	

Summary of Results for 100 year Return Period (+10%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
180 min Winter	66.684	0.584	2.0	262.6	O K
240 min Winter	66.730	0.630	2.0	283.6	O K
360 min Winter	66.796	0.696	2.0	313.3	O K
480 min Winter	66.842	0.742	2.0	333.9	O K
600 min Winter	66.876	0.776	2.0	349.0	O K
720 min Winter	66.901	0.801	2.0	360.6	O K
960 min Winter	66.937	0.837	2.0	376.6	O K
1440 min Winter	66.972	0.872	2.0	392.4	O K
2160 min Winter	66.979	0.879	2.0	395.7	O K
2880 min Winter	66.974	0.874	2.0	393.5	O K
4320 min Winter	66.936	0.836	2.0	376.4	O K
5760 min Winter	66.880	0.780	2.0	351.2	O K
7200 min Winter	66.818	0.718	2.0	323.1	O K
8640 min Winter	66.754	0.654	2.0	294.5	O K
10080 min Winter	66.692	0.592	2.0	266.3	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
180 min Winter	16.705	180
240 min Winter	13.719	240
360 min Winter	10.363	356
480 min Winter	8.481	474
600 min Winter	7.256	590
720 min Winter	6.385	704
960 min Winter	5.217	932
1440 min Winter	3.923	1372
2160 min Winter	2.948	1948
2880 min Winter	2.405	2224
4320 min Winter	1.802	3156
5760 min Winter	1.467	4040
7200 min Winter	1.251	4904
8640 min Winter	1.097	5792
10080 min Winter	0.983	6560

Appendix B *Attenuation Calcs – Updated Impermeable Areas*

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File Ballymount Attenuation C...	Checked by	
Innovyze	Source Control 2020.1	

Summary of Results for 100 year Return Period (+10%)

Half Drain Time : 1874 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	65.968	0.348	0.1	1.6	1.8	105.4	O K
30 min Summer	66.098	0.478	0.1	1.6	1.8	144.6	O K
60 min Summer	66.233	0.613	0.1	1.6	1.8	185.5	O K
120 min Summer	66.380	0.760	0.1	1.6	1.8	230.0	O K
180 min Summer	66.470	0.850	0.1	1.6	1.8	257.2	O K
240 min Summer	66.535	0.915	0.1	1.7	1.8	276.7	O K
360 min Summer	66.624	1.004	0.2	1.7	1.9	303.9	O K
480 min Summer	66.685	1.065	0.2	1.8	1.9	322.2	O K
600 min Summer	66.728	1.108	0.2	1.8	2.0	335.1	O K
720 min Summer	66.759	1.139	0.2	1.8	2.0	344.6	O K
960 min Summer	66.799	1.179	0.2	1.9	2.0	356.8	O K
1440 min Summer	66.828	1.208	0.2	1.9	2.0	365.6	O K
2160 min Summer	66.836	1.216	0.2	1.9	2.0	367.8	O K
2880 min Summer	66.827	1.207	0.2	1.9	2.0	365.2	O K
4320 min Summer	66.793	1.173	0.2	1.9	2.0	355.0	O K
5760 min Summer	66.751	1.131	0.2	1.8	2.0	342.2	O K
7200 min Summer	66.706	1.086	0.2	1.8	1.9	328.7	O K
8640 min Summer	66.660	1.040	0.2	1.8	1.9	314.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	84.953	0.0	102.2	19
30 min Summer	58.551	0.0	135.8	34
60 min Summer	37.860	0.0	188.1	64
120 min Summer	23.869	0.0	235.7	124
180 min Summer	18.081	0.0	264.4	184
240 min Summer	14.813	0.0	280.2	242
360 min Summer	11.159	0.0	286.4	362
480 min Summer	9.115	0.0	287.4	482
600 min Summer	7.788	0.0	288.0	602
720 min Summer	6.846	0.0	288.7	722
960 min Summer	5.585	0.0	291.4	960
1440 min Summer	4.192	0.0	297.5	1368
2160 min Summer	3.141	0.0	560.4	1708
2880 min Summer	2.557	0.0	572.2	2104
4320 min Summer	1.911	0.0	540.9	2940
5760 min Summer	1.554	0.0	749.1	3752
7200 min Summer	1.323	0.0	797.0	4608
8640 min Summer	1.160	0.0	837.8	5448

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Innovyze	Source Control 2020.1

Summary of Results for 100 year Return Period (+10%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	66.614	0.994	0.2	1.7	1.9	300.8	O K
15 min Winter	66.011	0.391	0.1	1.6	1.8	118.2	O K
30 min Winter	66.156	0.536	0.1	1.6	1.8	162.3	O K
60 min Winter	66.308	0.688	0.1	1.6	1.8	208.1	O K
120 min Winter	66.474	0.854	0.1	1.6	1.8	258.5	O K
180 min Winter	66.577	0.957	0.2	1.7	1.8	289.5	O K
240 min Winter	66.651	1.031	0.2	1.8	1.9	312.0	O K
360 min Winter	66.756	1.136	0.2	1.8	2.0	343.7	O K
480 min Winter	66.827	1.207	0.2	1.9	2.0	365.3	O K
600 min Winter	66.880	1.260	0.2	1.9	2.1	381.2	O K
720 min Winter	66.919	1.299	0.2	1.9	2.1	393.1	O K
960 min Winter	66.973	1.353	0.2	2.0	2.1	409.4	O K
1440 min Winter	67.023	1.403	0.2	2.0	2.2	424.5	O K
2160 min Winter	67.028	1.408	0.2	2.0	2.2	425.8	O K
2880 min Winter	67.017	1.397	0.2	2.0	2.2	422.8	O K
4320 min Winter	66.964	1.344	0.2	2.0	2.1	406.6	O K
5760 min Winter	66.894	1.274	0.2	1.9	2.1	385.4	O K
7200 min Winter	66.819	1.199	0.2	1.9	2.0	362.9	O K
8640 min Winter	66.745	1.125	0.2	1.8	2.0	340.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	1.038	0.0	872.6	6256
15 min Winter	84.953	0.0	113.9	19
30 min Winter	58.551	0.0	143.2	34
60 min Winter	37.860	0.0	210.3	64
120 min Winter	23.869	0.0	261.4	122
180 min Winter	18.081	0.0	284.0	180
240 min Winter	14.813	0.0	288.5	240
360 min Winter	11.159	0.0	291.4	358
480 min Winter	9.115	0.0	293.9	474
600 min Winter	7.788	0.0	296.7	590
720 min Winter	6.846	0.0	300.5	706
960 min Winter	5.585	0.0	308.4	932
1440 min Winter	4.192	0.0	314.2	1372
2160 min Winter	3.141	0.0	601.4	1928
2880 min Winter	2.557	0.0	595.5	2220
4320 min Winter	1.911	0.0	578.4	3156
5760 min Winter	1.554	0.0	838.9	4088
7200 min Winter	1.323	0.0	892.4	4976
8640 min Winter	1.160	0.0	937.8	5872

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Innovyze	Source Control 2020.1	

Summary of Results for 100 year Return Period (+10%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	66.671	1.051	0.2	1.8	1.9	318.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	1.038	0.0	971.1	6752

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	17.600	Shortest Storm (mins)	15
Ratio R	0.275	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+10

Time Area Diagram

Total Area (ha) 0.670

Time (mins) From:	To:	Area (ha)
0	4	0.670

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Model Details

Storage is Offline Dividing Weir Level (m) 65.620
Cover Level (m) 67.500

Cellular Storage Structure

Invert Level (m) 65.620 Safety Factor 1.0
Infiltration Coefficient Base (m/hr) 0.00100 Porosity 0.70
Infiltration Coefficient Side (m/hr) 0.00100

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	432.3	432.3	1.500	0.0	590.7
1.400	432.3	590.7			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0062-2000-1375-2000
Design Head (m)	1.375
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	62
Invert Level (m)	65.620
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.375	2.0	Kick-Flo®	0.553	1.3
Flush-Flo™	0.272	1.6	Mean Flow over Head Range	-	1.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.4	1.200	1.9	3.000	2.9	7.000	4.2
0.200	1.6	1.400	2.0	3.500	3.1	7.500	4.4
0.300	1.6	1.600	2.1	4.000	3.3	8.000	4.5
0.400	1.6	1.800	2.3	4.500	3.4	8.500	4.6
0.500	1.5	2.000	2.4	5.000	3.6	9.000	4.8
0.600	1.4	2.200	2.5	5.500	3.8	9.500	4.9
0.800	1.6	2.400	2.6	6.000	3.9		
1.000	1.7	2.600	2.7	6.500	4.1		