A1ARCHITECTS
ARCHITECTS DESIGNERS PROJECT MANAGERS

SOUTH DUBLIN COUNTY COUNCIL
Planning Department,
County Hall, Town Centre,
Tallaght,
Dublin 24
D24 A3XC

2128 PL/03/AB

11th July 2022

Dear Sir/ Madam,

Re: Development at No. 56 Ballyroan Road, Dublin 16, D16 R8W6, Plannig Reg Ref No SD22B/0027

Please find enclosed the following by way of Compliance to planning permission for the above development;

2(c) Drainage - Irish Water.

(i). It unclear why there is a need for both an attenuation tank and soakaway to manage surface water run-off from the proposed development as shown on drawing number P-02 submitted as part of the response to further information request. Prior to commencement of development the applicant shall submit the following information for written agreement from the planning authority:
A revised surface water layout clarifying the location and volumes of the proposed soakaway and attenuation tanks on site. The drawing shall show the location of all 3 proposed flow control devices and the discharge rates of same. Include water butts on the revised drawing as part of additional SuDS (Sustainable Drainage Systems) features for the proposed development. A revised report showing attenuation system sizing calculations which allows for the proposed discharge rates from attenuation system to the surface water drainage network.

Please find enclosed 6 copies of the following documents:

- letter from Garland Consulting Engineers with information on the proposed system
- Revised Site layout plan with drainage layout
- calculations and specification for attenuation tank/flow control device.
- calculations and specification for Soakaway

If you have any queries regarding the above, please do not hesitate to contact undersigned.

Yours sincerely,

Wojciech Kordyl MSc Arch MRIAI

Land Use Planning & Transportation
12 JUN 2022
South Dublin County Council

A1Architects
The Avila, 125 Drimnagh Road, Walkinstown, Dublin 12A8XC
e-mail: :info@a1architects.com T: +353 872956157 +353 871320994
www.a1architects.com

CONSULTING ENGINEERS | ASSIGNED CERTIFIERS
SAFETY MANAGEMENT | ECONOMIC DEVELOPMENT
WWW.GARLANDCONSULTANCY.COM

GARLAND
Concepts Realised

Our Ref: Mc678-Misc-001

Date: **23 June 2022**

Wojciech Kordyl,
A1 Architects,
The Avila,
125 Drimnagh Road,
Dublin 12.

Re: 56 Ballyroan Road, Dublin 16 – Planning Ref: SD22B/0027
Condition 2 (c) (i)

Dear Wojciech,

We wish to respond to Condition 2 (c) (i) of the above reference Grant of Planning Permission.

The storm water drainage system for the property has been designed to accommodate the maximum volume of storm water runoff generated by the proposed development, to be managed within the confines of the site, prior to discharge to the public system network.

Infiltration tests, undertaken in accordance with the requirement of BRE 365, were carried out at the site and a copy of said report was included with the planning application. The results of the infiltration tests identified subsoils with a poor infiltration rate and, as such, a soakaway system would not be appropriate for the management of storm water runoff without additional measures being adopted. The approach taken in the design allows for all storm water runoff to discharge to a soakaway, allowing for the maximum volume of storm water to infiltrate to the subsoil as possible before overflowing into an attenuation tank, sized to accommodate 100% of the storm water generated, and from there discharged at a controlled rate of 2l/s to the public system.

We enclose calculations for both the soakaway system and attenuation tank for your information.

We trust that the above is in order. Should you have any further queries, please don't hesitate to contact the undersigned.

Yours Sincerely,

Cathal Rigney
Chartered Engineer

DUBLIN
Garland House,
28-30 Rathmines Park, Rathmines,
Dublin 6, D06 F8Y1, Ireland
T +353 1 496 4322
E dublin@garlandconsultancy.com

WATERFORD
Suite 11B, The Atrium,
Maritana Gate, Canada Street,
Waterford, X91 WR40, Ireland
T +353 51 876511
E waterford@garlandconsultancy.com

LIMERICK
Riverfront, Howley's Quay,
Limerick, 94 WTK7
Ireland
T +353 61 319708
E limerick@garlandconsultancy.com

INTERNATIONAL
Jeddah, Saudi Arabia
London, UK
E international@garlandconsultancy.com

Garland House
28-30 Rathmines Park
Rathmines, Dublin 6

Date 07/07/2022 12:28 | Designed by aliya.syeda
File Mc678 - Soakaway 2.SRCX | Checked by
Innovyze | Source Control 2020.1.3

Summary of Results for 100 year Return Period (+20%)

Half Drain Time : 5 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	9.255	0.905	0.0	2.0	2.0	1.0	O K
30 min Summer	9.296	0.946	0.0	2.0	2.0	1.0	O K
60 min Summer	9.116	0.766	0.0	2.0	2.0	0.8	O K
120 min Summer	8.690	0.340	0.0	2.0	2.0	0.4	O K
180 min Summer	8.566	0.216	0.0	1.8	1.8	0.2	O K
240 min Summer	8.532	0.182	0.0	1.5	1.5	0.2	O K
360 min Summer	8.512	0.162	0.0	1.2	1.2	0.2	O K
480 min Summer	8.503	0.153	0.0	0.9	0.9	0.2	O K
600 min Summer	8.498	0.148	0.0	0.8	0.8	0.1	O K
720 min Summer	8.494	0.144	0.0	0.7	0.7	0.1	O K
960 min Summer	8.489	0.139	0.0	0.6	0.6	0.1	O K
1440 min Summer	8.483	0.133	0.0	0.4	0.4	0.1	O K
2160 min Summer	8.478	0.128	0.0	0.3	0.3	0.1	O K
2880 min Summer	8.475	0.125	0.0	0.3	0.3	0.1	O K
4320 min Summer	8.472	0.122	0.0	0.2	0.2	0.1	O K
5760 min Summer	8.470	0.120	0.0	0.2	0.2	0.1	O K
7200 min Summer	8.468	0.118	0.0	0.1	0.1	0.1	O K
8640 min Summer	8.467	0.117	0.0	0.1	0.1	0.1	O K
10080 min Summer	8.466	0.116	0.0	0.1	0.1	0.1	O K
15 min Winter	9.372	1.022	0.0	2.0	2.0	1.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	83.737	0.0	1.9	13
30 min Summer	57.656	0.0	2.7	21
60 min Summer	37.358	0.0	3.5	38
120 min Summer	23.474	0.0	4.5	66
180 min Summer	17.739	0.0	5.1	94
240 min Summer	14.508	0.0	5.6	124
360 min Summer	10.898	0.0	6.3	184
480 min Summer	8.883	0.0	6.8	242
600 min Summer	7.576	0.0	7.3	304
720 min Summer	6.650	0.0	7.7	364
960 min Summer	5.411	0.0	8.3	482
1440 min Summer	4.045	0.0	9.4	710
2160 min Summer	3.023	0.0	10.5	1068
2880 min Summer	2.457	0.0	11.4	1420
4320 min Summer	1.832	0.0	12.8	2144
5760 min Summer	1.486	0.0	13.8	2872
7200 min Summer	1.263	0.0	14.7	3616
8640 min Summer	1.106	0.0	15.4	4248
10080 min Summer	0.988	0.0	16.1	5056
15 min Winter	83.737	0.0	2.2	13

Garland House
28-30 Rathmines Park
Rathmines, Dublin 6

Date 07/07/2022 12:28 | Designed by aliya.syeda
File Mc678 - Soakaway 2.SRCX | Checked by
Innovyze | Source Control 2020.1.3

Summary of Results for 100 year Return Period (+20%)

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
30 min Winter	9.352	1.002	0.0	2.0	2.0	1.1	O K
60 min Winter	8.980	0.630	0.0	2.0	2.0	0.7	O K
120 min Winter	8.561	0.211	0.0	1.7	1.7	0.2	O K
180 min Winter	8.523	0.173	0.0	1.4	1.4	0.2	O K
240 min Winter	8.510	0.160	0.0	1.1	1.1	0.2	O K
360 min Winter	8.499	0.149	0.0	0.8	0.8	0.2	O K
480 min Winter	8.493	0.143	0.0	0.7	0.7	0.1	O K
600 min Winter	8.489	0.139	0.0	0.6	0.6	0.1	O K
720 min Winter	8.486	0.136	0.0	0.5	0.5	0.1	O K
960 min Winter	8.482	0.132	0.0	0.4	0.4	0.1	O K
1440 min Winter	8.478	0.128	0.0	0.3	0.3	0.1	O K
2160 min Winter	8.474	0.124	0.0	0.2	0.2	0.1	O K
2880 min Winter	8.471	0.121	0.0	0.2	0.2	0.1	O K
4320 min Winter	8.468	0.118	0.0	0.1	0.1	0.1	O K
5760 min Winter	8.466	0.116	0.0	0.1	0.1	0.1	O K
7200 min Winter	8.465	0.115	0.0	0.1	0.1	0.1	O K
8640 min Winter	8.464	0.114	0.0	0.1	0.1	0.1	O K
10080 min Winter	8.463	0.113	0.0	0.1	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	57.656	0.0	3.1	22
60 min Winter	37.358	0.0	4.0	40
120 min Winter	23.474	0.0	5.0	64
180 min Winter	17.739	0.0	5.7	94
240 min Winter	14.508	0.0	6.2	124
360 min Winter	10.898	0.0	7.0	182
480 min Winter	8.883	0.0	7.7	248
600 min Winter	7.576	0.0	8.2	300
720 min Winter	6.650	0.0	8.6	366
960 min Winter	5.411	0.0	9.4	488
1440 min Winter	4.045	0.0	10.5	720
2160 min Winter	3.023	0.0	11.8	1096
2880 min Winter	2.457	0.0	12.8	1412
4320 min Winter	1.832	0.0	14.3	2204
5760 min Winter	1.486	0.0	15.5	2856
7200 min Winter	1.263	0.0	16.5	3504
8640 min Winter	1.106	0.0	17.3	4320
10080 min Winter	0.988	0.0	18.0	4952

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)	15.800	Shortest Storm (mins)	15
Ratio R	0.287	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.013

Time (mins) From:	To:	Area (ha)
0	4	0.013

Model Details

Storage is Online Cover Level (m) 9.550

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	2.0
Safety Factor	2.0	Slope (1:X)	100.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	8.350	Cap Infiltration Depth (m)	0.000

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0069-2000-0900-2000
Design Head (m)	0.900
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	69
Invert Level (m)	8.450
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	2.0
Flush-Flo™	0.278	2.0
Kick-Flo®	0.568	1.6
Mean Flow over Head Range	-	1.8

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	1.7	1.200	2.3	3.000	3.5	7.000	5.2
0.200	2.0	1.400	2.4	3.500	3.7	7.500	5.3
0.300	2.0	1.600	2.6	4.000	4.0	8.000	5.5
0.400	1.9	1.800	2.7	4.500	4.2	8.500	5.7
0.500	1.8	2.000	2.9	5.000	4.4	9.000	5.8
0.600	1.7	2.200	3.0	5.500	4.6	9.500	6.0
0.800	1.9	2.400	3.1	6.000	4.8		
1.000	2.1	2.600	3.2	6.500	5.0		

Garland House
28-30 Rathmines Park
Rathmines, Dublin 6

Date 23/06/2022 14:21 | Designed by aliya.syeda
File MC678 -ATTENUATION TAN... | Checked by
Innovyze | Source Control 2020.1.3

Summary of Results for 100 year Return Period (+20%)

Half Drain Time : 17 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	8.842	0.392	0.0	2.0	2.0	3.0	O K
30 min Summer	8.906	0.456	0.0	2.0	2.0	3.5	O K
60 min Summer	8.910	0.460	0.0	2.0	2.0	3.5	O K
120 min Summer	8.847	0.397	0.0	2.0	2.0	3.0	O K
180 min Summer	8.755	0.305	0.0	2.0	2.0	2.3	O K
240 min Summer	8.676	0.226	0.0	2.0	2.0	1.7	O K
360 min Summer	8.578	0.128	0.0	2.0	2.0	1.0	O K
480 min Summer	8.540	0.090	0.0	1.9	1.9	0.7	O K
600 min Summer	8.528	0.078	0.0	1.6	1.6	0.6	O K
720 min Summer	8.519	0.069	0.0	1.5	1.5	0.5	O K
960 min Summer	8.509	0.059	0.0	1.2	1.2	0.4	O K
1440 min Summer	8.499	0.049	0.0	0.9	0.9	0.4	O K
2160 min Summer	8.491	0.041	0.0	0.7	0.7	0.3	O K
2880 min Summer	8.486	0.036	0.0	0.5	0.5	0.3	O K
4320 min Summer	8.481	0.031	0.0	0.4	0.4	0.2	O K
5760 min Summer	8.478	0.028	0.0	0.3	0.3	0.2	O K
7200 min Summer	8.475	0.025	0.0	0.3	0.3	0.2	O K
8640 min Summer	8.474	0.024	0.0	0.3	0.3	0.2	O K
10080 min Summer	8.472	0.022	0.0	0.2	0.2	0.2	O K
15 min Winter	8.898	0.448	0.0	2.0	2.0	3.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	83.737	0.0	4.2	15
30 min Summer	57.656	0.0	5.8	24
60 min Summer	37.358	0.0	7.6	42
120 min Summer	23.474	0.0	9.5	76
180 min Summer	17.739	0.0	10.8	108
240 min Summer	14.508	0.0	11.7	136
360 min Summer	10.898	0.0	13.2	192
480 min Summer	8.883	0.0	14.4	246
600 min Summer	7.576	0.0	15.3	306
720 min Summer	6.650	0.0	16.2	368
960 min Summer	5.411	0.0	17.5	488
1440 min Summer	4.045	0.0	19.7	734
2160 min Summer	3.023	0.0	22.0	1088
2880 min Summer	2.457	0.0	23.9	1428
4320 min Summer	1.832	0.0	26.7	2200
5760 min Summer	1.486	0.0	28.9	2864
7200 min Summer	1.263	0.0	30.7	3672
8640 min Summer	1.106	0.0	32.3	4304
10080 min Summer	0.988	0.0	33.6	5080
15 min Winter	83.737	0.0	4.7	15

Summary of Results for 100 year Return Period (+20%)

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
30 min Winter	9.082	0.632	0.0	2.2	2.2	3.9	O K
60 min Winter	9.018	0.568	0.0	2.1	2.1	3.9	O K
120 min Winter	8.848	0.398	0.0	2.0	2.0	3.0	O K
180 min Winter	8.695	0.245	0.0	2.0	2.0	1.9	O K
240 min Winter	8.591	0.141	0.0	2.0	2.0	1.1	O K
360 min Winter	8.532	0.082	0.0	1.7	1.7	0.6	O K
480 min Winter	8.517	0.067	0.0	1.4	1.4	0.5	O K
600 min Winter	8.509	0.059	0.0	1.2	1.2	0.5	O K
720 min Winter	8.504	0.054	0.0	1.1	1.1	0.4	O K
960 min Winter	8.498	0.048	0.0	0.9	0.9	0.4	O K
1440 min Winter	8.490	0.040	0.0	0.7	0.7	0.3	O K
2160 min Winter	8.484	0.034	0.0	0.5	0.5	0.3	O K
2880 min Winter	8.480	0.030	0.0	0.4	0.4	0.2	O K
4320 min Winter	8.476	0.026	0.0	0.3	0.3	0.2	O K
5760 min Winter	8.473	0.023	0.0	0.2	0.2	0.2	O K
7200 min Winter	8.471	0.021	0.0	0.2	0.2	0.2	O K
8640 min Winter	8.470	0.020	0.0	0.2	0.2	0.1	O K
10080 min Winter	8.469	0.019	0.0	0.2	0.2	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	57.656	0.0	6.5	25
60 min Winter	37.358	0.0	8.5	44
120 min Winter	23.474	0.0	10.6	82
180 min Winter	17.739	0.0	12.1	112
240 min Winter	14.508	0.0	13.2	138
360 min Winter	10.898	0.0	14.8	186
480 min Winter	8.883	0.0	16.1	246
600 min Winter	7.576	0.0	17.2	308
720 min Winter	6.650	0.0	18.1	366
960 min Winter	5.411	0.0	19.6	484
1440 min Winter	4.045	0.0	22.0	730
2160 min Winter	3.023	0.0	24.7	1100
2880 min Winter	2.457	0.0	26.7	1424
4320 min Winter	1.832	0.0	29.9	2200
5760 min Winter	1.486	0.0	32.4	2920
7200 min Winter	1.263	0.0	34.4	3600
8640 min Winter	1.106	0.0	36.1	4360
10080 min Winter	0.988	0.0	37.7	4992

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)	15.800	Shortest Storm (mins)	15
Ratio R	0.287	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.027

Time (mins) From:	To:	Area (ha)
0	4	0.027

Model Details

Storage is Online Cover Level (m) 9.550

Cellular Storage Structure

Invert Level (m) 8.450 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	8.0	0.0	0.501	0.0	0.0
0.500	8.0	0.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0074-2000-0500-2000
Design Head (m)	0.500
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	74
Invert Level (m)	8.450
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.500	2.0
Flush-Flo™	0.149	2.0
Kick-Flo®	0.342	1.7
Mean Flow over Head Range	-	1.7

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	1.9	1.200	3.0	3.000	4.6	7.000	6.8
0.200	2.0	1.400	3.2	3.500	4.9	7.500	7.1
0.300	1.8	1.600	3.4	4.000	5.2	8.000	7.3
0.400	1.8	1.800	3.6	4.500	5.5	8.500	7.5
0.500	2.0	2.000	3.8	5.000	5.8	9.000	7.8
0.600	2.2	2.200	3.9	5.500	6.1	9.500	8.0
0.800	2.5	2.400	4.1	6.000	6.3		
1.000	2.7	2.600	4.3	6.500	6.6		