

**Project: PROPOSED RESIDENTIAL DEVELOPMENT**

**Project No.:** A034 (CATCHMENT A - REFER TO DRAWINGS FOR CATCHMENT EXTENTS)

**Calculation:** Attenuation 100-year - Total Site

**Calcs By:** JF

**Checked By:** RFM

**Date:** 14.07.2022



Site Location:	TINAKILLY	
Design Storm Return Period:	100 years	
Climate Change Factor:	20 %	
Soil Type:	2	
Total Site Area:	5.930 ha	REFER TO DRAWINGS FOR AREAS BREAKDOWN
Hardstanding	3.950 ha	.....@ 80% Impervious
Softstanding	1.980 ha	.....@ 20% Impervious
	ha	.....@ 0% Impervious
	ha	.....@ 0% Impervious
Effective Impermeable Area:	3.556 ha	

<b>Allowable Outflow</b>	<b>Calculate</b>	0.144
IH124: QBAR = 0.00108 x AREA <sup>0.89</sup> x SAAR <sup>1.17</sup> x SOIL <sup>2.17</sup>		
AREA:	0.0593 km <sup>2</sup>	
SAAR:	986 mm	
SOIL:	0.45	
QBAR/ha	6.56 l/s/ha	
<b>Allowable Outflow</b>	<b>38.9 l/s</b>	Minimum Allowable Discharge = 2l/s/ha

<b>Storage required =</b>	<b>1708 m<sup>3</sup></b>	STORAGE ESTIMATE ONLY - REFER TO MICRODRAINAGE CALCS FOR NETWORK SIMULATION AND ACTUAL VOLUMES PROVIDED
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Duration (min)	Rainfall 100-Year (mm)	Rainfall 100-Year with CCF (mm)	Intensity (mm/hr)	Discharge (Q = 2.71iA) (l/s)	Proposed Runoff (m <sup>3</sup> )	Contiguous Land Runoff (m <sup>3</sup> )	Total Runoff (m <sup>3</sup> )	Allowable Outflow (m <sup>3</sup> )	Storage Required (m <sup>3</sup> )
5	14.1	16.9	203.0	1957	587	0	587	12	575
10	19.7	23.6	141.8	1367	820	0	820	23	797
15	23.1	27.7	110.9	1069	962	0	962	35	927
30	28.6	34.3	68.6	661	1191	0	1191	70	1121
60	35.4	42.5	42.5	409	1474	0	1474	140	1334
120	43.7	52.4	26.2	253	1819	0	1819	280	1539
180	49.5	59.4	19.8	191	2061	0	2061	420	1641
240	54.1	64.9	16.2	156	2252	0	2252	560	1692
360	61.2	73.4	12.2	118	2548	0	2548	840	1708
540	69.3	83.2	9.2	89	2885	0	2885	1260	1625
720	75.7	90.8	7.6	73	3151	0	3151	1680	1471
1080	85.7	102.8	5.7	55	3568	0	3568	2520	1047
1440	93.6	112.3	4.7	45	3897	0	3897	3361	536
2880	106.2	127.4	2.7	26	4421	0	4421	6721	-2300
4320	116.6	139.9	1.9	19	4854	0	4854	10082	-5228
5760	125.8	151.0	1.6	15	5237	0	5237	13442	-8205
8640	141.7	170.0	1.2	11	5899	0	5899	20163	-14264
11520	155.6	186.7	1.0	9	6478	0	6478	26885	-20407
14400	168.1	201.7	0.8	8	6998	0	6998	33606	-26608
17280	179.8	215.8	0.7	7	7485	0	7485	40327	-32842
23040	200.9	241.1	0.6	6	8364	0	8364	53769	-45405
28800	220.2	264.2	0.6	5	9167	0	9167	67211	-58044
36000	242.4	290.9	0.5	5	10091	0	10091	84014	-73923

**Project: PROPOSED RESIDENTIAL DEVELOPMENT**

**Project No.: A034** (CATCHMENT B - REFER TO DRAWINGS FOR CATCHMENT EXTENTS)

**Calculation:** Attenuation 100-year - Total Site

**Calcs By:** JF

**Checked By:** RFM

**Date:** 14.07.2022



CSC CONSULTING  
GROUP  
DUBLIN - LONDON - LIMERICK

RECEIVED: 14/08/2023

Site Location:	TINAKILLY	
Design Storm Return Period:	100 years	
Climate Change Factor:	20 %	
Soil Type:	2	
Total Site Area:	3.160 ha	REFER TO DRAWINGS FOR AREAS BREAKDOWN
Hardstanding	2.250 ha	.....@ 80% Impervious
Softstanding	0.910 ha	.....@ 20% Impervious
	ha	.....@ 0% Impervious
	ha	.....@ 0% Impervious
Effective Impermeable Area:	1.982 ha	

<b>Allowable Outflow</b>	<b>Calculate</b>	0.144
IH124: $QBAR = 0.00108 \times AREA^{0.89} \times SAAR^{1.17} \times SOIL^{2.17}$		
AREA:	0.0316 km <sup>2</sup>	
SAAR:	986 mm	
SOIL:	0.45	
QBAR/ha	6.56 l/s/ha	
<b>Allowable Outflow</b>	<b>20.7 l/s</b>	Minimum Allowable Discharge = 2l/s/ha

<b>Storage required =</b>	<b>972 m<sup>3</sup></b>	STORAGE ESTIMATE ONLY - REFER TO MICRODRAINAGE CALCS FOR NETWORK SIMULATION AND ACTUAL VOLUMES PROVIDED
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Duration (min)	Rainfall 100-Year (mm)	Rainfall 100-Year with CCF (mm)	Intensity (mm/hr)	Discharge (Q = 2.71iA) (l/s)	Proposed Runoff (m <sup>3</sup> )	Contiguous Land Runoff (m <sup>3</sup> )	Total Runoff (m <sup>3</sup> )	Allowable Outflow (m <sup>3</sup> )	Storage Required (m <sup>3</sup> )
5	14.1	16.9	203.0	1091	327	0	327	6	321
10	19.7	23.6	141.8	762	457	0	457	12	445
15	23.1	27.7	110.9	596	536	0	536	19	517
30	28.6	34.3	68.6	369	664	0	664	37	626
60	35.4	42.5	42.5	228	821	0	821	75	747
120	43.7	52.4	26.2	141	1014	0	1014	149	865
180	49.5	59.4	19.8	106	1149	0	1149	224	925
240	54.1	64.9	16.2	87	1255	0	1255	298	957
360	61.2	73.4	12.2	66	1420	0	1420	448	972
540	69.3	83.2	9.2	50	1608	0	1608	672	936
720	75.7	90.8	7.6	41	1757	0	1757	895	861
1080	85.7	102.8	5.7	31	1989	0	1989	1343	645
1440	93.6	112.3	4.7	25	2172	0	2172	1791	381
2880	106.2	127.4	2.7	14	2464	0	2464	3582	-1117
4320	116.6	139.9	1.9	10	2706	0	2706	5372	-2667
5760	125.8	151.0	1.6	8	2919	0	2919	7163	-4244
8640	141.7	170.0	1.2	6	3288	0	3288	10745	-7457
11520	155.6	186.7	1.0	5	3610	0	3610	14326	-10716
14400	168.1	201.7	0.8	5	3901	0	3901	17908	-14007
17280	179.8	215.8	0.7	4	4172	0	4172	21489	-17317
23040	200.9	241.1	0.6	3	4662	0	4662	28653	-23991
28800	220.2	264.2	0.6	3	5109	0	5109	35816	-30706
36000	242.4	290.9	0.5	3	5625	0	5625	44770	-39145

**Project: PROPOSED RESIDENTIAL DEVELOPMENT**

**Project No.:** A034 (CATCHMENT C - REFER TO DRAWINGS FOR CATCHMENT EXTENTS)

**Calculation:** Attenuation 100-year - Total Site

**Calcs By:** JF

**Checked By:** RFM

**Date:** 14.07.2022



Site Location:	TINAKILLY	
Design Storm Return Period:	100 years	
Climate Change Factor:	20 %	
Soil Type:	2	
Total Site Area:	1.300 ha	REFER TO DRAWINGS FOR AREAS BREAKDOWN
Hardstanding	0.680 ha	.....@ 80% Impervious
Softstanding	0.620 ha	.....@ 20% Impervious
	ha	.....@ 0% Impervious
	ha	.....@ 0% Impervious
Effective Impermeable Area:	0.668 ha	

<b>Allowable Outflow</b>	<b>Calculate</b>	0.144
IH124: $QBAR = 0.00108 \times AREA^{0.89} \times SAAR^{1.17} \times SOIL^{2.17}$		
AREA:	0.0130 km <sup>2</sup>	
SAAR:	986 mm	
SOIL:	0.45	
QBAR/ha	6.56 l/s/ha	
<b>Allowable Outflow</b>	<b>8.5 l/s</b>	Minimum Allowable Discharge = 2l/s/ha

<b>Storage required =</b>	<b>300 m<sup>3</sup></b>	STORAGE ESTIMATE ONLY - REFER TO MICRODRAINAGE CALCS FOR NETWORK SIMULATION AND ACTUAL VOLUMES PROVIDED
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Duration (min)	Rainfall 100-Year (mm)	Rainfall 100-Year with CCF (mm)	Intensity (mm/hr)	Discharge (Q = 2.71iA) (l/s)	Proposed Runoff (m <sup>3</sup> )	Contiguous Land Runoff (m <sup>3</sup> )	Total Runoff (m <sup>3</sup> )	Allowable Outflow (m <sup>3</sup> )	Storage Required (m <sup>3</sup> )
5	14.1	16.9	203.0	368	110	0	110	3	108
10	19.7	23.6	141.8	257	154	0	154	5	149
15	23.1	27.7	110.9	201	181	0	181	8	173
30	28.6	34.3	68.6	124	224	0	224	15	208
60	35.4	42.5	42.5	77	277	0	277	31	246
120	43.7	52.4	26.2	47	342	0	342	61	280
180	49.5	59.4	19.8	36	387	0	387	92	295
240	54.1	64.9	16.2	29	423	0	423	123	300
360	61.2	73.4	12.2	22	479	0	479	184	294
540	69.3	83.2	9.2	17	542	0	542	276	266
720	75.7	90.8	7.6	14	592	0	592	368	224
1080	85.7	102.8	5.7	10	670	0	670	553	118
1440	93.6	112.3	4.7	8	732	0	732	737	-5
2880	106.2	127.4	2.7	5	831	0	831	1473	-643
4320	116.6	139.9	1.9	4	912	0	912	2210	-1298
5760	125.8	151.0	1.6	3	984	0	984	2947	-1963
8640	141.7	170.0	1.2	2	1108	0	1108	4420	-3312
11520	155.6	186.7	1.0	2	1217	0	1217	5894	-4677
14400	168.1	201.7	0.8	2	1315	0	1315	7367	-6053
17280	179.8	215.8	0.7	1	1406	0	1406	8841	-7435
23040	200.9	241.1	0.6	1	1571	0	1571	11787	-10216
28800	220.2	264.2	0.6	1	1722	0	1722	14734	-13012
36000	242.4	290.9	0.5	1	1896	0	1896	18418	-16522

**Project: PROPOSED RESIDENTIAL DEVELOPMENT**

**Project No.: A034** (CATCHMENT D - REFER TO DRAWINGS FOR CATCHMENT EXTENTS)

**Calculation:** Attenuation 100-year - Total Site

**Calcs By:** JF

**Checked By:** RFM

**Date:** 14.07.2022



**CSC CONSULTING GROUP**  
DUBLIN - LONDON - LIMERICK

RECEIVED: 14/08/2023

Site Location:	TINAKILLY	
Design Storm Return Period:	100 years	
Climate Change Factor:	20 %	
Soil Type:	2	
Total Site Area:	0.443 ha	REFER TO DRAWINGS FOR AREAS BREAKDOWN
Hardstanding	0.370 ha	.....@ 80% Impervious
Softstanding	0.073 ha	.....@ 20% Impervious
	ha	.....@ 0% Impervious
	ha	.....@ 0% Impervious
Effective Impermeable Area:	0.311 ha	

<b>Allowable Outflow</b>	<b>Calculate</b>	0.144
IH124: QBAR = 0.00108 x AREA <sup>0.89</sup> x SAAR <sup>1.17</sup> x SOIL <sup>2.17</sup>		
AREA:	0.0044 km <sup>2</sup>	
SAAR:	986 mm	
SOIL:	0.45	
QBAR/ha	6.56 l/s/ha	
<b>Allowable Outflow</b>	<b>2.9 l/s</b>	Minimum Allowable Discharge = 2l/s/ha

<b>Storage required =</b>	<b>160 m<sup>3</sup></b>	STORAGE ESTIMATE ONLY - REFER TO MICRODRAINAGE CALCS FOR NETWORK SIMULATION AND ACTUAL VOLUMES PROVIDED
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Duration (min)	Rainfall 100-Year (mm)	Rainfall 100-Year with CCF (mm)	Intensity (mm/hr)	Discharge (Q = 2.71iA) (l/s)	Proposed Runoff (m <sup>3</sup> )	Contiguous Land Runoff (m <sup>3</sup> )	Total Runoff (m <sup>3</sup> )	Allowable Outflow (m <sup>3</sup> )	Storage Required (m <sup>3</sup> )
5	14.1	16.9	203.0	171	51	0	51	1	50
10	19.7	23.6	141.8	119	72	0	72	2	70
15	23.1	27.7	110.9	93	84	0	84	3	81
30	28.6	34.3	68.6	58	104	0	104	5	99
60	35.4	42.5	42.5	36	129	0	129	10	118
120	43.7	52.4	26.2	22	159	0	159	21	138
180	49.5	59.4	19.8	17	180	0	180	31	149
240	54.1	64.9	16.2	14	197	0	197	42	155
360	61.2	73.4	12.2	10	223	0	223	63	160
540	69.3	83.2	9.2	8	252	0	252	94	158
720	75.7	90.8	7.6	6	275	0	275	126	150
1080	85.7	102.8	5.7	5	312	0	312	188	123
1440	93.6	112.3	4.7	4	340	0	340	251	89
2880	106.2	127.4	2.7	2	386	0	386	502	-116
4320	116.6	139.9	1.9	2	424	0	424	753	-329
5760	125.8	151.0	1.6	1	457	0	457	1004	-547
8640	141.7	170.0	1.2	1	515	0	515	1506	-991
11520	155.6	186.7	1.0	1	566	0	566	2008	-1443
14400	168.1	201.7	0.8	1	611	0	611	2511	-1899
17280	179.8	215.8	0.7	1	654	0	654	3013	-2359
23040	200.9	241.1	0.6	1	731	0	731	4017	-3286
28800	220.2	264.2	0.6	0	801	0	801	5021	-4220
36000	242.4	290.9	0.5	0	881	0	881	6276	-5395

**Project: PROPOSED RESIDENTIAL DEVELOPMENT**

**Project No.:** A034 (CATCHMENT D - REFER TO DRAWINGS FOR CATCHMENT EXTENTS)

**Calculation:** Attenuation 100-year - Total Site

**Calcs By:** JF

**Checked By:** RFM

**Date:** 14.07.2022



RECEIVED: 14/08/2023

Site Location:	TINAKILLY	
Design Storm Return Period:	100 years	
Climate Change Factor:	20 %	
Soil Type:	2	
Total Site Area:	0.617 ha	REFER TO DRAWINGS FOR AREAS BREAKDOWN
Hardstanding	0.530 ha	.....@ 80% Impervious
Softstanding	0.087 ha	.....@ 20% Impervious
	ha	.....@ 0% Impervious
	ha	.....@ 0% Impervious
Effective Impermeable Area:	0.441 ha	

<b>Allowable Outflow</b>	<b>Calculate</b>	0.144
IH124: QBAR = 0.00108 x AREA <sup>0.89</sup> x SAAR <sup>1.17</sup> x SOIL <sup>2.17</sup>		
AREA:	0.0062 km <sup>2</sup>	
SAAR:	986 mm	
SOIL:	0.45	
QBAR/ha	6.56 l/s/ha	
<b>Allowable Outflow</b>	<b>4.0 l/s</b>	Minimum Allowable Discharge = 2l/s/ha

<b>Storage required =</b>	<b>229 m<sup>3</sup></b>	STORAGE ESTIMATE ONLY - REFER TO MICRODRAINAGE CALCS FOR NETWORK SIMULATION AND ACTUAL VOLUMES PROVIDED
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Duration (min)	Rainfall 100-Year (mm)	Rainfall 100-Year with CCF (mm)	Intensity (mm/hr)	Discharge (Q = 2.71iA) (l/s)	Proposed Runoff (m <sup>3</sup> )	Contiguous Land Runoff (m <sup>3</sup> )	Total Runoff (m <sup>3</sup> )	Allowable Outflow (m <sup>3</sup> )	Storage Required (m <sup>3</sup> )
5	14.1	16.9	203.0	243	73	0	73	1	72
10	19.7	23.6	141.8	170	102	0	102	2	99
15	23.1	27.7	110.9	133	119	0	119	4	116
30	28.6	34.3	68.6	82	148	0	148	7	141
60	35.4	42.5	42.5	51	183	0	183	15	168
120	43.7	52.4	26.2	31	226	0	226	29	197
180	49.5	59.4	19.8	24	256	0	256	44	212
240	54.1	64.9	16.2	19	280	0	280	58	221
360	61.2	73.4	12.2	15	316	0	316	87	229
540	69.3	83.2	9.2	11	358	0	358	131	227
720	75.7	90.8	7.6	9	391	0	391	175	216
1080	85.7	102.8	5.7	7	443	0	443	262	181
1440	93.6	112.3	4.7	6	484	0	484	350	134
2880	106.2	127.4	2.7	3	549	0	549	699	-151
4320	116.6	139.9	1.9	2	603	0	603	1049	-446
5760	125.8	151.0	1.6	2	650	0	650	1399	-749
8640	141.7	170.0	1.2	1	732	0	732	2098	-1366
11520	155.6	186.7	1.0	1	804	0	804	2797	-1993
14400	168.1	201.7	0.8	1	869	0	869	3497	-2628
17280	179.8	215.8	0.7	1	929	0	929	4196	-3267
23040	200.9	241.1	0.6	1	1038	0	1038	5595	-4556
28800	220.2	264.2	0.6	1	1138	0	1138	6993	-5855
36000	242.4	290.9	0.5	1	1253	0	1253	8741	-7489

RECEIVED: 14/08/2023