Appendix A – Proposed Drainage & Watermain Layout

Appendix B – Site Survey

Appendix C – Surface Water Calculations (Attenuation, Greenfield run-off, MET Eireann rainfall)

Job Title: Cherry Orchard Job Number: 20D018
Calculation by: LM Date: 17.11.21
Checked by:

	1	2	3	5	5	6
	Storm Frequency & Duration	***Rainfall***	***Rainfall intensity***	***Potential Run-off From Developed Site***	***Allowable Run-off From Developed Site***	***Storage Requirement***
		mm	***mm/hr***	***m3***	***m3***	***m3***
5	M100-5	19.80	237.60	7.17	0.60	6.57
10	M100-10	27.60	165.60	9.99	1.20	8.79
15	M100-15	32.40	129.60	11.73	1.80	9.93
30	M100-30	40.08	80.16	14.51	3.60	10.91
60	M100-60	49.56	49.56	17.94	7.20	10.74
120	M100-120	61.32	30.66	22.20	14.40	7.80
240	M100 - 4hr	75.72	18.93	27.41	28.80	-1.39
360	M100-6 hr	85.80	14.30	31.06	43.20	-12.14
720	M100-12 hr	106.08	8.84	38.40	86.40	-48.00

Run-off Area 2 362 l/s m^2 Qbar block A

M30-1	1
M30-2	2
M30-5	5
M30-10	10
M30-15	15
M30-30	30
M30-60	60
M30-120	120
M30-4 hr	240
M30-6 hr	360
M30-12 hr	720
M30-1day	1440
M30-2day	2880

5	M100-5	16.5	19.8
10	M100-10	23.0	27.6
15	M100-15	27.0	32.4
30	M100-30	33.4	40.1
60	M100-60	41.3	49.6
120	M100-120	51.1	61.3
240	M100 - 4hr	63	75.7
360	M100-6 hr	71.5	85.8
720	M100-12 hr	88.4	106.1

Job Title: Cherry Orchard Job Number: 20D018

Calculation by: LM Date: 17.11.21

Checked by:

	1	2	3	5	5	6
	Storm Frequency & Duration	***Rainfall***	***Rainfall intensity***	***Potential Run-off From Developed Site***	***Allowable Run-off From Developed Site***	***Storage Requirement***
		mm	***mm/hr***	***m3***	***m3***	***m3***
5	M100-5	19.80	237.60	7.58	0.60	6.98
10	M100-10	27.60	165.60	10.57	1.20	9.37
15	M100-15	32.40	129.60	12.41	1.80	10.61
30	M100-30	40.08	80.16	15.35	3.60	11.75
60	M100-60	49.56	49.56	18.98	7.20	11.78
120	M100-120	61.32	30.66	23.49	14.40	9.09
240	M100 - 4hr	75.72	18.93	29.00	28.80	0.20
360	M100-6 hr	85.80	14.30	32.86	43.20	-10.34
720	M100-12 hr	106.08	8.84	40.63	86.40	-45.77

Run-off Area 2 383 l/s m^2 Qbar block B

M30-1 1
M30-2 2
M30-5 5
M30-10 10
M30-15 15
M30-30 30
M30-60 60
M30-120 120
M30-4 hr 240
M30-6 hr 360
M30-12 hr 720
M30-1day 1440
M30-2day 2880

5	M100-5	16.5	19.8
10	M100-10	23.0	27.6
15	M100-15	27.0	32.4
30	M100-30	33.4	40.1
60	M100-60	41.3	49.6
120	M100-120	51.1	61.3
240	M100 - 4hr	63	75.7
360	M100-6 hr	71.5	85.8
720	M100-12 hr	88.4	106.1

Job Title: Cherry Orchard Job Number: 20D018
Calculation by: LM Date: 17.11.21
Checked by:

	1	2	3	5	5	6
	Storm Frequency & Duration	***Rainfall***	***Rainfall intensity***	***Potential Run-off From Developed Site***	***Allowable Run-off From Developed Site***	***Storage Requirement***
		mm	***mm/hr***	***m3***	***m3***	***m3***
5	M100-5	19.80	237.60	9.21	0.60	8.61
10	M100-10	27.60	165.60	12.83	1.20	11.63
15	M100-15	32.40	129.60	15.07	1.80	13.27
30	M100-30	40.08	80.16	18.64	3.60	15.04
60	M100-60	49.56	49.56	23.05	7.20	15.85
120	M100-120	61.32	30.66	28.51	14.40	14.11
240	M100 - 4hr	75.72	18.93	35.21	28.80	6.41
360	M100-6 hr	85.80	14.30	39.90	43.20	-3.30
720	M100-12 hr	106.08	8.84	49.33	86.40	-37.07

Run-off Area	2	l/s	Qbar		
	465	m^2		block C	

M30-1	1	
M30-2	2	
M30-5	5	
M30-10	10	
M30-15	15	
M30-30	30	
M30-60	60	
M30-120	120	
M30-4 hr	240	
M30-6 hr	360	
M30-12 hr	720	
M30-1day	1440	
M30-2day	2880	

5	M100-5	16.5	19.8	
10	M100-10	23.0	27.6	
15	M100-15	27.0	32.4	
30	M100-30	33.4	40.1	
60	M100-60	41.3	49.6	
120	M100-120	51.1	61.3	
240	M100 - 4hr	63	75.7	
360	M100-6 hr	71.5	85.8	
720	M100-12 hr	88.4	106.1	

Job Title: Cherry Orchard Job Number: 20D018
Calculation by: LM Date: 17.11.21
Checked by:

	1	2	3	5	5	6
	Storm Frequency & Duration	***Rainfall***	***Rainfall intensity***	***Potential Run-off From Developed Site***	***Allowable Run-off From Developed Site***	***Storage Requirement***
		mm	***mm/hr***	***m3***	***m3***	***m3***
5	M100-5	19.80	237.60	13.96	0.60	13.36
10	M100-10	27.60	165.60	19.46	1.20	18.26
15	M100-15	32.40	129.60	22.84	1.80	21.04
30	M100-30	40.08	80.16	28.26	3.60	24.66
60	M100-60	49.56	49.56	34.94	7.20	27.74
120	M100-120	61.32	30.66	43.23	14.40	28.83
240	M100 - 4hr	75.72	18.93	53.38	28.80	24.58
360	M100-6 hr	85.80	14.30	60.49	43.20	17.29
720	M100-12 hr	106.08	8.84	74.79	86.40	-11.61

Run-off Area	2	l/s	Qbar		
	705	m^2		block D	
M30-1	1				
M30-2	2				
M30-5	5				
M30-10	10				
M30-15	15				
M30-30	30				
M30-60	60				
M30-120	120				
M30-4 hr	240				
M30-6 hr	360				
M30-12 hr	720				
M30-1day	1440				
M30-2day	2880				

5	M100-5	16.5	19.8	
10	M100-10	23.0	27.6	
15	M100-15	27.0	32.4	
30	M100-30	33.4	40.1	
60	M100-60	41.3	49.6	
120	M100-120	51.1	61.3	
240	M100 - 4hr	63	75.7	
360	M100-6 hr	71.5	85.8	
720	M100-12 hr	88.4	106.1	

Job Title: Cherry Orchard Job Number: 20D018
Calculation by: LM Date: 17.11.21
Checked by:

	1	2	3	5	5	6
	Storm Frequency & Duration	***Rainfall***	***Rainfall intensity***	***Potential Run-off From Developed Site***	***Allowable Run-off From Developed Site***	***Storage Requirement***
		mm	***mm/hr***	***m3***	***m3***	***m3***
5	M100-5	19.80	237.60	17.29	0.60	16.69
10	M100-10	27.60	165.60	24.09	1.20	22.89
15	M100-15	32.40	129.60	28.29	1.80	26.49
30	M100-30	40.08	80.16	34.99	3.60	31.39
60	M100-60	49.56	49.56	43.27	7.20	36.07
120	M100-120	61.32	30.66	53.53	14.40	39.13
240	M100 - 4hr	75.72	18.93	66.10	28.80	37.30
360	M100-6 hr	85.80	14.30	74.90	43.20	31.70
720	M100-12 hr	106.08	8.84	92.61	86.40	6.21

Run-off Area 2 l/s Qbar
873 m^2 PODIUM HARDSTANDING

M30-1	1
M30-2	2
M30-5	5
M30-10	10
M30-15	15
M30-30	30
M30-60	60
M30-120	120
M30-4 hr	240
M30-6 hr	360
M30-12 hr	720
M30-1day	1440
M30-2day	2880

5	M100-5	16.5	19.8
10	M100-10	23.0	27.6
15	M100-15	27.0	32.4
30	M100-30	33.4	40.1
60	M100-60	41.3	49.6
120	M100-120	51.1	61.3
240	M100 - 4hr	63	75.7
360	M100-6 hr	71.5	85.8
720	M100-12 hr	88.4	106.1

Job Title: Cherry Orchard Job Number: 20D018
Calculation by: LM Date: 17.11.21
Checked by:

	1	2	3	5	5	6
	Storm Frequency & Duration	***Rainfall***	***Rainfall intensity***	***Potential Run-off From Developed Site***	***Allowable Run-off From Developed Site***	***Storage Requirement***
		mm	***mm/hr***	***m3***	***m3***	***m3***
5	M100-5	19.80	237.60	17.29	0.60	16.69
10	M100-10	27.60	165.60	24.09	1.20	22.89
15	M100-15	32.40	129.60	28.29	1.80	26.49
30	M100-30	40.08	80.16	34.99	3.60	31.39
60	M100-60	49.56	49.56	43.27	7.20	36.07
120	M100-120	61.32	30.66	53.53	14.40	39.13
240	M100 - 4hr	75.72	18.93	66.10	28.80	37.30
360	M100-6 hr	85.80	14.30	74.90	43.20	31.70
720	M100-12 hr	106.08	8.84	92.61	86.40	6.21

Run-off Area 2 l/s Qbar
873 m^2 PODIUM HARDSTANDING

M30-1	1
M30-2	2
M30-5	5
M30-10	10
M30-15	15
M30-30	30
M30-60	60
M30-120	120
M30-4 hr	240
M30-6 hr	360
M30-12 hr	720
M30-1day	1440
M30-2day	2880

5	M100-5	16.5	19.8
10	M100-10	23.0	27.6
15	M100-15	27.0	32.4
30	M100-30	33.4	40.1
60	M100-60	41.3	49.6
120	M100-120	51.1	61.3
240	M100 - 4hr	63	75.7
360	M100-6 hr	71.5	85.8
720	M100-12 hr	88.4	106.1

Job Title: Cherry Orchard Job Number: 20D018
Calculation by: LM Date: 17.11.21
Checked by:

1	2	3	5	5	6
Storm Frequency & Duration	***Rainfall***	***Rainfall intensity***	***Potential Run-off From Developed Site***	***Allowable Run-off From Developed Site***	***Storage Requirement***
	mm	***mm/hr***	***m3***	***m3***	***m3***
5 M100-5	19.80	237.60	23.46	0.60	22.86
10 M100-10	27.60	165.60	32.71	1.20	31.51
15 M100-15	32.40	129.60	38.39	1.80	36.59
30 M100-30	40.08	80.16	47.49	3.60	43.89
60 M100-60	49.56	49.56	58.73	7.20	51.53
120 M100-120	61.32	30.66	72.66	14.40	58.26
240 M100 - 4hr	75.72	18.93	89.73	28.80	60.93
360 M100-6 hr	85.80	14.30	101.67	43.20	58.47
720 M100-12 hr	106.08	8.84	125.70	86.40	39.30

Run-off Area	2	l/s	Qbar	
	1185	m^2	PERIMETER HARDSTANDING	

M30-1	1	
M30-2	2	
M30-5	5	
M30-10	10	
M30-15	15	
M30-30	30	
M30-60	60	
M30-120	120	
M30-4 hr	240	
M30-6 hr	360	
M30-12 hr	720	
M30-1day	1440	
M30-2day	2880	

5	M100-5	16.5	19.8	
10	M100-10	23.0	27.6	
15	M100-15	27.0	32.4	
30	M100-30	33.4	40.1	
60	M100-60	41.3	49.6	
120	M100-120	51.1	61.3	
240	M100 - 4hr	63	75.7	
360	M100-6 hr	71.5	85.8	
720	M100-12 hr	88.4	106.1	

Job Title: Cherry Orchard Job Number: 20D018

Calculation by: LM Date: 17.11.21

Checked by:

	1	2	3	5	5	6
	Storm Frequency & Duration	***Rainfall***	***Rainfall intensity***	***Potential Run-off From Developed Site***	***Allowable Run-off From Developed Site***	***Storage Requirement***
		mm	***mm/hr***	***m3***	***m3***	***m3***
5	M100-5	19.80	237.60	39.70	0.60	39.10
10	M100-10	27.60	165.60	55.34	1.20	54.14
15	M100-15	32.40	129.60	64.96	1.80	63.16
30	M100-30	40.08	80.16	80.36	3.60	76.76
60	M100-60	49.56	49.56	99.37	7.20	92.17
120	M100-120	61.32	30.66	122.95	14.40	108.55
240	M100 - 4hr	75.72	18.93	151.82	28.80	123.02
360	M100-6 hr	85.80	14.30	172.03	43.20	128.83
720	M100-12 hr	106.08	8.84	212.69	86.40	126.29

Run-off Area	2 2005	l/s m^2	Qbar CAR PARK
M30-1	1		
M30-2	2		
M30-5	5		
M30-10	10		
M30-15	15		
M30-30	30		
M30-60	60		
M30-120	120		
M30-4 hr	240		
M30-6 hr	360		
M30-12 hr	720		
M30-1day	1440		
M30-2day	2880		

5	M100-5	16.5	19.8
10	M100-10	23.0	27.6
15	M100-15	27.0	32.4
30	M100-30	33.4	40.1
60	M100-60	41.3	49.6
120	M100-120	51.1	61.3
240	M100 - 4hr	63	75.7
360	M100-6 hr	71.5	85.8
720	M100-12 hr	88.4	106.1

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Louise Mahony
Site name:	Cherry Orchard
Site location:	Cherry Orchard

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 (Ciria, 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:	53.34742° N
Longitude:	6.37811° W
Reference:	2617695896
Date:	Apr 29 2020 15:18

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.7631

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):	968	968
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):	2.03	2.03
1 in 1 year (l/s):	1.73	1.73
1 in 30 years (l/s):	4.33	4.33
1 in 100 year (l/s):	5.3	5.3
1 in 200 years (l/s):	5.81	5.81

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 308038, Northing: 234228,

	Interval		Years											
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.4,	3.5,	4.1,	5.1,	5.7,	6.3,	8.0,	10.0,	11.4,	13.3,	15.1,	16.5,	18.7,	20.4,	21.8,	N/A ,
10 mins	3.3,	4.9,	5.7,	7.1,	8.0,	8.7,	11.1,	13.9,	15.9,	18.6,	21.0,	23.0,	26.0,	28.4,	30.4,	N/A ,
15 mins	3.9,	5.7,	6.7,	8.3,	9.4,	10.2,	13.1,	16.4,	18.6,	21.9,	24.7,	27.0,	30.6,	33.4,	35.7,	N/A ,
30 mins	5.1,	7.5,	8.7,	10.7,	12.0,	13.1,	16.6,	20.6,	23.4,	27.2,	30.7,	33.4,	37.6,	41.0,	43.7,	N/A ,
1 hours	6.8,	9.7,	11.3,	13.8,	15.4,	16.7,	21.0,	26.0,	29.2,	33.9,	38.1,	41.3,	46.3,	50.3,	53.6,	N/A ,
2 hours	8.9,	12.7,	14.7,	17.7,	19.8,	21.4,	26.7,	32.7,	36.6,	42.2,	47.2,	51.1,	57.1,	61.7,	65.6,	N/A ,
3 hours	10.5,	14.8,	17.1,	20.6,	22.9,	24.7,	30.6,	37.3,	41.8,	48.0,	53.5,	57.8,	64.4,	69.6,	73.8,	N/A ,
4 hours	11.8,	16.5,	19.1,	22.8,	25.4,	27.4,	33.8,	41.1,	45.9,	52.6,	58.5,	63.1,	70.2,	75.7,	80.3,	N/A ,
6 hours	13.9,	19.3,	22.2,	26.5,	29.4,	31.6,	38.8,	47.0,	52.3,	59.8,	66.4,	71.5,	79.3,	85.4,	90.4,	N/A ,
9 hours	16.4,	22.6,	25.8,	30.7,	34.0,	36.5,	44.6,	53.7,	59.7,	68.0,	75.3,	80.9,	89.6,	96.3,	101.8,	N/A ,
12 hours	18.4,	25.2,	28.8,	34.1,	37.6,	40.4,	49.2,	59.1,	65.5,	74.4,	82.3,	88.4,	97.7,	104.8,	110.7,	N/A ,
18 hours	21.7,	29.4,	33.5,	39.5,	43.5,	46.6,	56.5,	67.5,	74.7,	84.6,	93.4,	100.1,	110.3,	118.1,	124.6,	N/A ,
24 hours	24.3,	32.9,	37.3,	43.9,	48.3,	51.6,	62.4,	74.3,	82.0,	92.7,	102.1,	109.3,	120.2,	128.6,	135.6,	159.5,
2 days	30.2,	39.8,	44.8,	52.0,	56.8,	60.4,	72.0,	84.6,	92.7,	103.8,	113.4,	120.8,	131.9,	140.4,	147.3,	171.2,
3 days	34.9,	45.5,	50.8,	58.6,	63.7,	67.6,	79.8,	93.0,	101.5,	113.0,	123.0,	130.6,	142.0,	150.7,	157.8,	182.0,
4 days	39.1,	50.4,	56.1,	64.4,	69.7,	73.8,	86.6,	100.4,	109.2,	121.1,	131.4,	139.2,	150.9,	159.8,	167.1,	191.7,
6 days	46.3,	58.9,	65.3,	74.3,	80.2,	84.6,	98.5,	113.3,	122.6,	135.2,	146.1,	154.3,	166.6,	175.8,	183.4,	208.8,
8 days	52.7,	66.5,	73.3,	83.0,	89.3,	94.0,	108.8,	124.4,	134.3,	147.5,	158.9,	167.4,	180.2,	189.8,	197.6,	223.9,
10 days	58.6,	73.3,	80.6,	90.9,	97.6,	102.6,	118.1,	134.5,	144.8,	158.6,	170.4,	179.3,	192.5,	202.4,	210.5,	237.5,
12 days	64.1,	79.7,	87.4,	98.3,	105.2,	110.5,	126.7,	143.8,	154.5,	168.8,	181.0,	190.2,	203.8,	214.0,	222.3,	250.1,
16 days	74.3,	91.5,	99.9,	111.7,	119.3,	125.0,	142.5,	160.8,	172.2,	187.4,	200.4,	210.0,	224.4,	235.1,	243.8,	272.8,
20 days	83.7,	102.3,	111.3,	124.0,	132.1,	138.2,	156.8,	176.2,	188.2,	204.3,	217.9,	228.0,	243.0,	254.2,	263.2,	293.4,
25 days	94.7,	114.9,	124.7,	138.3,	147.0,	153.5,	173.4,	194.0,	206.7,	223.6,	237.9,	248.5,	264.3,	276.0,	285.5,	316.9,

NOTES:
N/A Data not available
These values are derived from a Depth Duration Frequency (DDF) Model
For details refer to:
'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

Appendix D – Foul Water Calculations

Job Title:	Cherry Orchard	**Job Number:**	20D018
Calculation by:	LM	**Date:**	13.12.11
Checked by:	DH		

Proposed Foul Drainage: BS 8301 1985

RESIDENTIAL

SITE COMPRISES

No. of Apartments/houses = 144

DETERMINE AVERAGE DAILY FLOW

Assume foul discharge for each dwelling = 650 litres/day

Average Residential Daily Flow = 1.083 l/s

DESIGN FOR PEAK FOUL FLOW

Assume 26 Discharge Units/Apartment/house - Table 4 BS 8301

Therefore, No. of Discharge Units = 3744

PEAK FLOW = 17.74012 l/s - Fig.2 BS 8301

COLEBROOK - WHITE FORMULA

Q = 17.74 **l/s**

ks = 1.5 **mm**

Kinematic viscosity @ 15 degrees Celsius = 1.141×10^{-6} m^2/s

Self Cleansing Velocity= 0.75 m/s

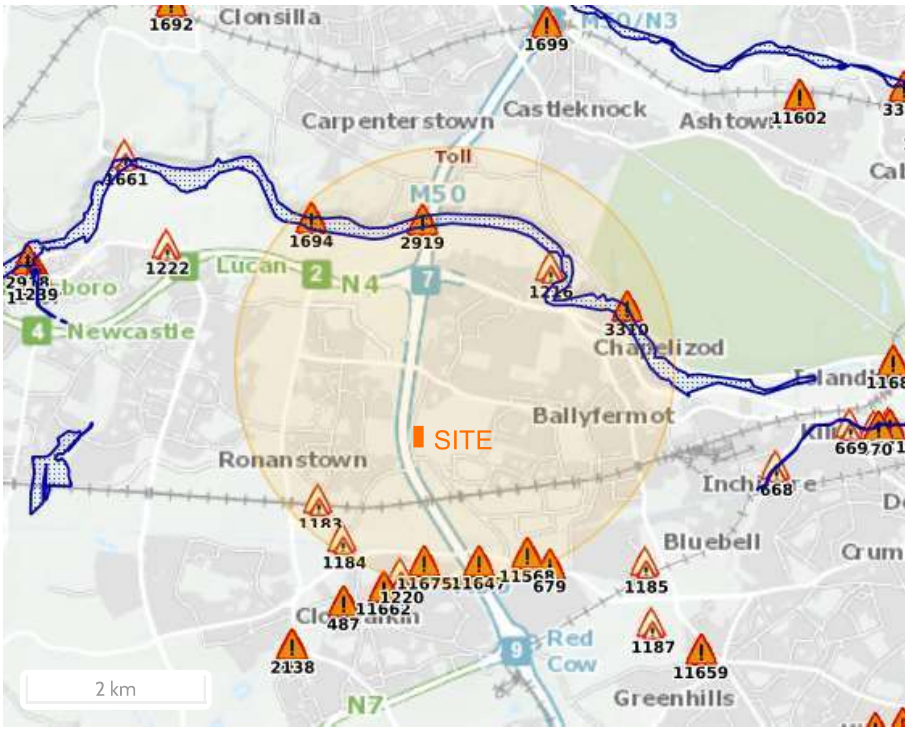
Use	225	**mm Pipe**	
@ 1 in	170	**Gradient**	
Q =	34.94	**l/s**	-
v =	0.879	**m/s**	-

Appendix E – Flood Map Report

Past Flood Event Local Area Summary Report

Report Produced: **20/4/2021 17:13**

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

14 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Camac November 2000 (ID-679)	05/11/2000	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
2.	Beech Row Ronanstown Recurring (ID-1183)	n/a	Approximate Point
	Additional Information: Reports (3) Press Archive (0)		
3.	Cappaghmore Ronanstown Recurring (ID-1184)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
4.	Palmerston Mill Lane Recurring (ID-1216)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
5.	Camac Watery Lane Clondalkin Recurring (ID-1220)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (1)		
6.	Liffey R109 at the Strawberry Beds Nov 2002 (ID-1694)	13/11/2002	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		

	Name (Flood_ID)	Start Date	Event Location
7.	Liffey Sommerton Rd Luttrellstown Golf C Oct 2004 (ID-2190) **Additional Information:** Reports (1) Press Archive (0)	26/10/2004	Approximate Point
8.	Liffey Chapelizod St Martins Row Nov 2000 (ID-3310) **Additional Information:** Reports (1) Press Archive (0)	05/11/2000	Approximate Point
9.	Liffey Lower - Dec 1954 (ID-241) **Additional Information:** Reports (5) Press Archive (2)	08/12/1954	Area
10.	Flooding at Yellow Meadow Apartments, Off Nangor/Yellow Meadows Road, Dublin 22 on 24th Oct 2011 (ID-11675) **Additional Information:** Reports (1) Press Archive (0)	24/10/2011	Exact Point
11.	Liffey Strawberry Beds June 1993 (ID-2919) **Additional Information:** Reports (2) Press Archive (1)	10/06/1993	Approximate Point
12.	Flooding at Diageo, Nangor Road, Dublin 12 on 24th Oct 2011 (ID-11568) **Additional Information:** Reports (1) Press Archive (0)	24/10/2011	Approximate Point
13.	Flooding at Riverview Business Centre, New Nangor Road, Dublin 12 on 24th Oct 2011 (ID-11647) **Additional Information:** Reports (1) Press Archive (0)	24/10/2011	Exact Point
14.	Flooding at Robinhood Industrial Estate, Clondalkin, Dublin 12 on 24th Oct 2011 (ID-11654) **Additional Information:** Reports (1) Press Archive (0)	24/10/2011	Exact Point

Appendix F – Irish Water Confirmation of Feasibility & Statement of Design Acceptance

Louise Mahony

The Glass House
11 Coke Lane
Smithfield
Dublin 7
Co. Dublin
D07 WNP2

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

7 January 2021

Re: CDS20002792 pre-connection enquiry - Subject to contract | Contract denied

Connection for Housing Development of 148 unit(s) at Units 64 & 65, Cherry Orchard Industrial Estate, Co. Dublin

Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Units 64 & 65, Cherry Orchard Industrial Estate, Co. Dublin (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	**OUTCOME OF PRE-CONNECTION ENQUIRY** **THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.**
Water Connection	Feasible Subject to connection to the existing 6” main
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
SITE SPECIFIC COMMENTS	
Water Connection	Feasible Subject to connection to the existing 6” main
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.	

The map included below outlines the current Irish Water infrastructure adjacent to your site:

Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

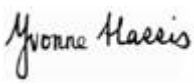
General Notes:

1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at https://www.water.ie/connections/get-connected/
5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.

6) Irish Water Connection Policy/ Charges can be found at https://www.water.ie/connections/information/connection-charges/
7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
9) To access Irish Water Maps email datarequests@water.ie
10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Paul Lowry from the design team on 018230377 or email paullowr@water.ie For further information, visit **www.water.ie/connections.**

Yours sincerely,



Yvonne Harris

Head of Customer Operations

Louise Mahony
The Glass House
11 Coke Lane
Smithfield
Dublin 7, Co. Dublin D07 WNP2

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

14 December 2021

Re: Design Submission for Units 64 & 65, Cherry Orchard Industrial Estate, Co. Dublin (the "Development")
(the "Design Submission") / Connection Reference No: CDS20002792

Dear Louise Mahony,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Irish Water has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before you can connect to our network you must sign a connection agreement with Irish Water. This can be applied for by completing the connection application form at www.water.ie/connections. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Irish Water's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Irish Water does not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Irish Water representative:
Name: Paul Lowry
Phone: 018230377
Email: paullowr@water.ie

Yours sincerely,

Yvonne Harris

Yvonne Harris
Head of Customer Operations

Appendix A

Document Title & Revision

- 20D018_03_Rev P1 - Proposed Drainage Layout
- 20D018_06_Rev P - Foul Sewer Longitudinal Sections

While Irish Water notes that the water and wastewater services infrastructure will remain private and not be vested, we have the following comments:

- Service connections for each apartment block for water and wastewater has not been shown on the layout drawings.

For further information, visit ***www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Irish Water will not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

Appendix G – SuDs Matrix Document

SUDS/Green Infrastructure feasibility checklist – 20D018 – November 2021

Suds Measures	Measures to be used on this site	Rationale for selecting/not selecting measure
Source Control		
Swales	N	There is no viable infiltration via the soil on site – see site investigation report for more details.
Tree Pits	Y	Tree pits to be used in the landscaped areas.
Rainwater Butts	N	Not a viable option given the apartment nature of the development.
Rainwater harvesting	N	This can be reviewed with the architect and client to see if it is a viable option – currently not allowed for.
Soakaways	N	There is no viable infiltration via the soil on site – see site investigation report for more details.
Infiltration trenches	N	There is no viable infiltration via the soil on site – see site investigation report for more details.
Permeable pavement		All footpaths / hardstanding on the site will consist of permeable surfacing. Breakdown of type below. No viable infiltration on the site and so stone buildup to be used as storage.
- Grasscrete	N	There is no viable infiltration via the soil on site – see site investigation report for more details.
- Block paving	Y	To be used on footpaths
- Porous Asphalt	Y	To be used on new entrance road to site
Green Roofs	Y	To be provided on roof of each block
Filter strips	N	Space on site is highly constrained and this element does not provide any sort of attenuation. The benefits would not outweigh the required space and maintenance.
Bio-retention systems/Raingardens	Y	Raingardens included in landscape design. We have not included these in the SuDs calculations, but they will contribute.
Blue Roofs	N	Not cost effective over the lifespan due to maintenance.
Filter Drain	N	There is no viable infiltration via the soil on site – see site investigation report for more details.
Site Control		
Detention Basins	N	No available room on site for large bodies of water and poses a potential drowning hazard.
Retentions basins	N	No available room on site for large bodies of water and poses a potential drowning hazard.
Regional Control		
Ponds	N	No available room on site for large bodies of water and poses a potential drowning hazard
Wetlands	N	No available room on site for large bodies of water and poses a potential drowning hazard.
Other		
Petrol/Oil interceptor	Y	Included in overall drainage design.
Attenuation tank – only as a last resort where other measures are not feasible	N	Not necessary for this site. Site storage for 1/100 storm + 20% climate change is allowed for in stone buildup as attenuation with hydrobrake connection to mains
Oversized pipes– only as a last resort where other measures are not feasible	N	Not necessary for this site.

Appendix H – Site Investigation

Appendix I – Response to Report of the Planning Authority (SDCC Drainage Comments)

HAYES HIGGINS PARTNERSHIP
CHARTERED ENGINEERS · PROJECT MANAGERS

Attn. Brian Harkin
South Dublin County Council.
Drainage Section,
County Hall,
Tallaght,
Dublin 24

Our Ref: 20D018/01

Project Ref: Orchard Gate SHD (Units 64 and 65 Cherry Orchard Industrial Estate, Palmerstown, Dublin 10)

Re: Planning Application Drainage Submission – response to queries raised in Report of the Planning Authority (Planning Authority's Opinion on Proposed Development)
An Bord Pleanála Ref: ABP-310483-21
South Dublin County Council Preplanning Ref: SHD1SPP007/20

Date: 17th November 2021

Dear Brian,

With reference to report dated 9th July 2021 regarding the drainage submission pertaining to proposed housing at Orchard Gate SHD (Units 64 and 65 Cherry Orchard Industrial Estate, Palmerstown, Dublin 10) Hayes Higgins Partnership (2HP) have reviewed and respond to each item as outlined below. 2HP will include the updated design and below comments in the planning submission to be made.

1. 2HP have updated the surface water drainage design and include all relevant design information including details of the calculation for run-off and attenuation calculations. As part of the services report submitted for planning 2HP will include the below. 2HP note the following;
   - Refer to "Greenfield runoff rate" document included in the appendix to this letter indicating Qbar run off rate calculations which includes SAAR and SOIL values for the site.
   - Below see table outlining a breakdown of all proposed surface types, surface areas and corresponding surface run off coefficients for the site.

Area	m^2	Impermeability factor	Run-off area (m^2)	Attenuation needed for 1/100 + 20%	Depth of stone (based on 37% voids)
Roof general – impermeable area	709	1.0	709	All roofs $67m^3$	243mm
Green roof	2409	0.5	1205		
Permeable paving podium	873	0 – take stone as storage no infiltration	873	$36m^3$	111mm
Porous asphalt entrance road	744	1.0 – take stone as storage no infiltration	744	$30m^3$	109mm
Site perimeter hardstanding	1185	1.0 – take stone as storage no infiltration	1185	$61m^3$	139mm
Car park - impermeable	2005	Take as 0.33 carpark is covered with only one vehicle entrance	668	$27m^3$	98mm

- Site specific MET Eireann Rainfall data has been used in the updated surface water drainage and attenuation design.
- 2HP have reviewed the SuDs strategy and note it will be a combination of green roofs, porous surfacing with stone storage tree pits and planters. Based on the combined approach below an attenuation tank is not required. Refer to below table for buildup depth requirements. Design allows for site specific rainfall and a 20% allowance for climate change.

Area	Area m2	Attenuation volume m3	Volume of stone needed (baes on 37% voids)	Area of stone storage	Depth of stone m
Apartment roof A,B,C,D	1914	67	181	744	243
Permeable paving podium	873	36	97	873	111
Porous asphalt entrance road	744	30	81	744	109
Site perimeter hardstanding	1185	61	165	1185	139
Car park - impermeable	668	27	73	744	98

  - The stone storage on the podium will be used to deal with the surface water in this area
  - The external perimeter path will be dealt with via permeable paving and the tree pits / planters

- The entrance road surfacing will take the form of porous asphalt and will provide storage for the run-off from the road, car park area and the roof area (450mm depth)
- The surface run-off from the car park will be connected to the stone buildup in the porous asphalt entrance road via a petrol interceptor.
- A connection to the public system via a hydrobrake (2l/s) will be provided

2. The bike shelter is no longer located in this area. Refer to updated site layout included in the appendix to this letter. In general, where feasible a minimum clear setback distance of 3m will be provided between all structures and trees and the centreline of the surface water sewer as requested.

3. 2HP confirm a wayleave will be registered with the Property Registration Authority in favour of South Dublin County Council in relation to the existing 225mm public surface water sewer where such sewer traverses the site to the west. The extents of the wayleave will be agreed with South Dublin County Council.

4. 2HP have reviewed the surface water drainage strategy for site and as advised in point 1 above note the surface run – off will be dealt with via green roof, permeable surfacing, and tree pits. The attenuation tank system is not required on this site.

5. 2HP have liaised with the project landscape architect and developed further the SuDS features in the open space at ground level for proposed development. This takes the form of tree planters and tree pits in addition to the permeable surfacing. All possible SuDs mechanisms have been explored, refer to attached justification matrix for SuDs. Given the nature of the site with a large hard standing area and limited open space the SuDs mechanisms available are limited.

6. All surface water from car parking will pass through a Kingspan NSBP003 petrol interceptor before entry to the stone buildup under porous asphalt entrance road. As part of the planning application package the location of petrol interceptor will be indicated on the updated drainage layout and a drawing showing the proposed car park drainage layout for proposed development will be included. The car park drainage will be consist of a standard concrete finish car park slab laid to falls to surface water gullies and below slab 150mm diameter pipes falling to petrol interceptor manhole and external stone buildup.

7. 2HP confirm all Water and Drainage Drawings to be submitted at planning application stage will be in A1 size.
   2HP confirm as designed there will be a complete separation of the foul and surface water drainage systems within the site, both in respect of installation and use. Refer to drawing 03 which was submitted for preplanning and will be submitted as part of planning.
   2HP confirm that where precast manholes are used for surface water manholes a minimum thickness surround of 150mm Concrete Class B will be provided. Refer to drawing 05 sheet 2 of 4 which was submitted for preplanning and will be submitted as part of planning.
   2HP confirm all works for this development will comply with the requirements of the Greater Dublin Regional Code of Practice for Drainage Works.

We trust the above is to your satisfaction and should you have any further queries, please do not hesitate to contact the undersigned.

Yours Sincerely,

Louise Mahony
B Eng, C Eng, MIEI

Encls.
Attenuation Calculations
Greenfield Run-off rate calculation
MET Eireann Rainfall document
SuDs Matrix Document
Ground Floor Layout