Thor Design & Management
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Proposed 6No. Additional Dwellings @ St. Finian's Way, Newcastle, Co. Dublin.

Sewer Design

Date: 8th February 2022

The proposed foul sewer design calculations have been designed in accordance with Irish Water Standards

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 299902, Northing: 228811,

	Interval		Years												
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.5,	3.6,	4.3,	5.2,	5.9,	6.5,	8.2,	10.3,	11.7,	13.7,	15.5,	17.0,	19.2,	20.9,	22.4,	N/A ,
10 mins	3.4,	5.0,	5.9,	7.3,	8.3,	9.0,	11.5,	14.4,	16.3,	19.1,	21.7,	23.6,	26.7,	29.2,	31.2,	N/A ,
15 mins	4.0,	5.9,	7.0,	8.6,	9.7,	10.6,	13.5,	16.9,	19.2,	22.5,	25.5,	27.8,	31.5,	34.3,	36.7,	N/A ,
30 mins	5.3,	7.7,	9.0,	11.1,	12.5,	13.6,	17.2,	21.5,	24.3,	28.3,	32.0,	34.8,	39.3,	42.8,	45.7,	N/A ,
1 hours	6.9,	10.0,	11.7,	14.3,	16.1,	17.4,	22.0,	27.2,	30.7,	35.7,	40.2,	43.7,	49.1,	53.3,	56.8,	N/A ,
2 hours	9.1,	13.1,	15.2,	18.4,	20.7,	22.4,	28.0,	34.5,	38.9,	45.0,	50.4,	54.7,	61.3,	66.4,	70.7,	N/A ,
3 hours	10.7,	15.3,	17.7,	21.4,	23.9,	25.9,	32.3,	39.7,	44.6,	51.5,	57.6,	62.4,	69.8,	75.6,	80.4,	N/A ,
4 hours	12.0,	17.0,	19.7,	23.8,	26.6,	28.7,	35.8,	43.8,	49.1,	56.6,	63.3,	68.6,	76.6,	82.8,	88.0,	N/A ,
6 hours	14.1,	19.9,	23.0,	27.6,	30.8,	33.2,	41.3,	50.4,	56.4,	64.8,	72.4,	78.2,	87.2,	94.2,	100.0,	N/A ,
9 hours	16.5,	23.2,	26.7,	32.1,	35.7,	38.5,	47.6,	57.9,	64.7,	74.2,	82.7,	89.2,	99.3,	107.1,	113.6,	N/A ,
12 hours	18.5,	25.9,	29.8,	35.6,	39.6,	42.7,	52.6,	63.9,	71.3,	81.6,	90.9,	98.0,	108.9,	117.4,	124.4,	N/A ,
18 hours	21.7,	30.2,	34.7,	41.4,	45.9,	49.4,	60.7,	73.4,	81.8,	93.4,	103.8,	111.8,	124.1,	133.5,	141.4,	N/A ,
24 hours	24.4,	33.7,	38.6,	46.0,	50.9,	54.7,	67.1,	81.0,	90.1,	102.8,	114.1,	122.7,	136.0,	146.3,	154.8,	184.4,
2 days	30.5,	41.0,	46.5,	54.5,	59.8,	63.9,	77.0,	91.4,	100.7,	113.6,	124.9,	133.5,	146.6,	156.7,	165.0,	193.5,
3 days	35.6,	47.1,	53.0,	61.6,	67.2,	71.5,	85.3,	100.3,	109.9,	123.1,	134.6,	143.3,	156.6,	166.7,	175.0,	203.5,
4 days	40.1,	52.4,	58.7,	67.8,	73.7,	78.2,	92.6,	108.1,	118.0,	131.6,	143.3,	152.2,	165.7,	175.9,	184.3,	212.9,
6 days	48.1,	61.8,	68.7,	78.7,	85.1,	90.0,	105.4,	121.9,	132.3,	146.5,	158.8,	168.0,	181.9,	192.4,	201.0,	230.1,
8 days	55.3,	70.2,	77.7,	88.3,	95.2,	100.4,	116.7,	134.0,	144.9,	159.7,	172.4,	182.0,	196.3,	207.1,	215.9,	245.5,
10 days	61.9,	77.9,	85.8,	97.1,	104.4,	109.9,	127.0,	145.1,	156.4,	171.7,	184.8,	194.6,	209.4,	220.4,	229.4,	259.7,
12 days	68.2,	85.2,	93.5,	105.4,	113.0,	118.7,	136.6,	155.3,	167.1,	182.9,	196.3,	206.4,	221.5,	232.8,	242.0,	272.8,
16 days	79.9,	98.6,	107.7,	120.6,	128.9,	135.1,	154.2,	174.2,	186.6,	203.3,	217.4,	228.0,	243.7,	255.5,	265.0,	296.8,
20 days	90.8,	111.1,	120.9,	134.7,	143.5,	150.1,	170.3,	191.4,	204.5,	221.9,	236.6,	247.6,	263.9,	276.1,	286.0,	318.7,
25 days	103.8,	125.7,	136.4,	151.2,	160.6,	167.6,	189.1,	211.4,	225.1,	243.4,	258.8,	270.3,	287.3,	299.9,	310.1,	343.9,

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

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Date 7th Feb 2021

Development: Additional 6No. Dwellings @ St. Fiaian's Way, Newcastle, Co. Dublin
Developer: Pavement Homes Ltd
PROPOSED HOUSING DEVELOPMENT

Surface Water Design

Pipe Coefficient k=0.06 (new PVC Pipe), Vmin=0.8m/s, Vmax=4.0m/s, V(ideal)=1.8m/s

Area for Road Section from L - M - N - P
Manholes: from S0 to S1

Distance between Manholes = 50.215 m

Road	=	434.68	m	x	1.0	m	=	434.68	m2	x	95.00% (impermeability)	= 412.946 m2
Footpath	=	53.52	m	x	2.0	m	=	107.04	m2	x	95.00% (impermeability)	= 101.688 m2
Front paved areas	=	345.77	m2	x	1.0	No	=	345.77	m2	x	100.00% (impermeability)	= 345.77 m2
Driveway	=	0.00	m2	x	0.0	No	=	0.00	m2	x	100.00% (impermeability)	= 0 m2
Area of Roofs 1		57.87	m2	x	6.0	No	=	347.22	m2	x	100.00% (impermeability)	= 347.22 m2
Area of Roofs 2	0	0.00	m2	x	8.0	No	=	0.00	m2	x	100.00% (impermeability)	= 0 m2
Green Area	0	213.54	m2	x	1.0	No	=	213.54	m2	x	10.00% (impermeability)	= 21.354 m2
											Total	1228.98 m2

Taking Rain Intensity of 50 mm per Hour

Vol of Water = 1228.98 m2 x 0.05 m = 61.45 m3/hr = 17.07 l/s
try 225 diameter pipe at fall 1 160 Therefore v= 1.15 m/s

Total Area = 1228.98 m2 = 0.30 Acres

Q = 60.5 x Ap x R
Where Ap = Impermeable Area (Acres)
R = Rate of Discharge (inches).

Time Taken for Surface Water to travel between Manholes = $\frac{50.215}{1.15}$ = 43.67 = 0.73 mins

Time of Concentration (T) = 0.73 + 3.0 = 3.73 min

$R = \frac{30}{10 + T} = \frac{30}{10 + 3.72775362} = 2.19$

Q(actual) = 60.5 x 0.30368 acres x 2.19 inches = 40.15 ft3/min = **18.95 l/s**

Therefore use 225 diameter @ fall 1 120 = 0.833% OK

Pipe Coefficient k=0.06 (new PVC Pipe), Vmin=0.8m/s, Vmax=4.0m/s, V(ideal)=1.8m/s

Area for Road Section from J - K - L - M
Manholes: from S1 to S2

Distance between Manholes = 43.865 m

Road	=	336.48	m	x	1.0	m	=	336.48	m2	x	95.00% (impermeability)	= 319.656 m2
Footpath	=	55.56	m	x	2.0	m	=	111.12	m2	x	95.00% (impermeability)	= 105.564 m2
Front paved areas	=	553.00	m2	x	1.0	No	=	553.00	m2	x	100.00% (impermeability)	= 553 m2
Driveway	=	0.00	m2	x	0.0	No	=	0.00	m2	x	100.00% (impermeability)	= 0 m2
Area of Roofs 1		83.99	m2	x	1.0	No	=	83.99	m2	x	100.00% (impermeability)	= 83.99 m2
Area of Roofs 2	0	57.90	m2	x	8.0	No	=	463.20	m2	x	100.00% (impermeability)	= 463.2 m2
Green Area	0	456.30	m2	x	1.0	No	=	456.30	m2	x	10.00% (impermeability)	= 45.63 m2
											Total	1571.04 m2

Taking Rain Intensity of 50 mm per Hour

Vol of Water = 1571.04 m2 x 0.05 m = 78.55 m3/hr = 21.82 l/s

try 225 diameter pipe at fall 1 120 Therefore v= 1.33 m/s

Total Area = 1571.04 m2 = 0.39 Acres

Q = 60.5 x Ap x R

Where Ap = Impermeable Area (Acres)
R = Rate of Discharge (inches).

Time Taken for Surface Water to travel between Manholes $= \frac{43.865}{1.33} = 32.98 = 0.55$ mins

Time of Concentration (T) = 0.55 + 3.0 = 3.55 min

$R = \frac{30}{10 + T} = \frac{30}{10 + 3.54968672} = \mathbf{2.21}$

Q(actual) = 60.5 x 0.3882 acres x 2.21 inches = 52.00 ft3/min = 24.54 l/s + 18.95

Therefore use 225 diameter @ fall 1 120 = 0.833% OK = **43.49L/s**

Surface Water Design

Pipe Coefficient k=0.06 (new PVC Pipe), Vmin=0.8m/s, Vmax=4.0m/s, V(ideal)=1.8m/s

Area for Road Section: from G - H - J
Manholes: from S2 to S3

Distance between Manholes = 43.931 m

Road	=	199.64	m	x	1.0	m	=	199.64	m2	x	95.00% (impermeability)	=	189.658	m2
Footpath	=	36.52	m	x	2.0	m	=	73.04	m2	x	95.00% (impermeability)	=	69.388	m2
Front Paved Area	=	311.74	m2	x	1.0	No	=	311.74	m2	x	100.00% (impermeability)	=	311.74	m2
Area of Roofs	=	57.90	m2	x	4.0	No	=	231.60	m2	x	100.00% (impermeability)	=	231.6	m2
Grass Verge		14.40	m2	x	1.0	No	=	14.40	m2	x	10.00% (impermeability)	=	1.44	m2
Area of Roofs		72.87	m2	x	1.0	No	=	72.87	m2	x	100.00% (impermeability)	=	72.87	m2
Green Area		519.23	m2	x	1.0	No	=	519.23	m2	x	10.00% (impermeability)	=	51.923	m2
											Total		928.62	m2

Taking Rain Intensity of 50 mm per Hour

Vol of Water = 928.62 m2 x 0.05 m = 46.43 m3/hr = 12.90 l/s + 43.49l/s = 56.39l/s
try 225 diameter pipe at fall 1: 160 Therefore v= 1.3 m/s

Total Area = 928.62 m2 = 0.23 Acres

Q = 60.5 x Ap x R
Where Ap = Impermeable Area (Acres)
R = Rate of Discharge (inches).

Time Taken for Surface Water to travel between Manholes = $\frac{43.931}{1.3}$ = 33.79 = 0.56 mins

Time of Concentration (T) = 0.56 + 3.0 = 3.56 min

$$R = \frac{30}{10 + T} = \frac{30}{10 + 3.56321795} = 2.21$$

Q(actual) = 60.5 x 0.22946 acres x 2.21 inches = 30.71 ft3/min = 14.49 l/s + 43.49l/s
= 57.98l/s

Therefore use 225 diameter @ fall 1: 160 = 0.625% OK

TOTAL IMPERMEABLE AREA = 3786.64Sq.m

Surface Water Design

Pipe Coefficient k=0.06 (new PVC Pipe), Vmin=0.8m/s, Vmax=4.0m/s, V(ideal)=1.8m/s

Area for Road Section: from G to E
Manholes from S3 to S4

Distance between Manholes = 34.7 m

Road	=	190.24	m	x	1.0	m	=	190.24	m2	x	95.00% (impermeability)	=	180.728	m2
Footpath & Paving	=	48.90	m	x	1.0	m	=	48.90	m2	x	95.00% (impermeability)	=	46.455	m2
Grass Verge	=	49.10	m2	x	1.0	No	=	49.10	m2	x	10.00% (impermeability)	=	4.91	m2
Car Park spaces	=	0.00	m2	x	1.0	No	=	0.00	m2	x	100.00% (impermeability)	=	0	m2
Area of Roofs		0.00	m2	x	1.0	No	=	0.00	m2	x	100.00% (impermeability)	=	0	m2
Area of Roofs		0.00	m2	x	0.0	No	=	0.00	m2	x	100.00% (impermeability)	=	0	m2
Green Area		195.60	m2	x	1.0	No	=	195.60	m2	x	10.00% (impermeability)	=	19.56	m2
											Total		251.65	m2

Taking Rain Intensity of 50 mm per Hour

Vol of Water = 251.65 m2 x 0.05 m = 12.58 m3/hr = 3.50 l/s + 7.0 L/s ATTENUATED
try 225 diameter pipe at fall 1: 160 Therefore v= 0.85 m/s = 10.5l/s

Total Area = 251.65 m2 = 0.06 Acres

Q = 60.5 x Ap x R
Where Ap = Impermeable Area (Acres)
R = Rate of Discharge (inches).

Time Taken for Surface Water to travel between Manholes = $\frac{34.7}{0.85}$ = 40.82 = 0.68 mins

Time of Concentration (T) = 0.68 + 3.0 = 3.68 min

$$R = \frac{30}{10 + T} = \frac{30}{10 + 3.68039216} = 2.19$$

Q(actual) = 60.5 x 0.06218 acres x 2.19 inches = 8.25 ft3/min = 3.89 l/s + 7.0L/S
= **10.89l/s**

Therefore use 225 diameter @ fall 1: 160 = 0.625% OK

Surface Water Design

Pipe Coefficient k=0.06 (new PVC Pipe), Vmin=0.8m/s, Vmax=4.0m/s, V(ideal)=1.8m/s

Area for Road Section from B to C
Manholes from S7 to S8

Distance between Manholes = 21.159 m

Road	=	143.11	m	x	1.0	m	=	143.11	m2	x	100.00% (impermeability)	= 143.11 m2
Footpath & Paving	=	41.20	m	x	1.0	m	=	41.20	m2	x	100.00% (impermeability)	= 41.2 m2
Car Park Spaces	=	0.00	m2	x	1.0	No	=	0.00	m2	x	100.00% (impermeability)	= 0 m2
Driveway	=	0.00	m2	x	0.0	No	=	0.00	m2	x	100.00% (impermeability)	= 0 m2
Area of Roofs	A	0.00	m2	x	1.0	No	=	0.00	m2	x	100.00% (impermeability)	= 0 m2
Area of Roofs		0.00	m2	x	0.0	No	=	0.00	m2	x	100.00% (impermeability)	= 0 m2
Green Area		0.00	m2	x	1.0	No	=	0.00	m2	x	10.00% (impermeability)	= 0 m2
Grass Verge	0	56.25	m2	x	1.0	No	=	56.25	m2	x	10.00% (impermeability)	= 5.625 m2
											Total	184.31 m2

Taking Rain Intensity of 50 mm per Hour

Vol of Water = 184.31 m2 x 0.05 m = 9.22 m3/hr = 2.56 l/s = 0
try 225 diameter pipe at fall 1: 100 Therefore v= 0.76 m/s = 2.56L/S

Total Area = 184.31 m2 = 0.05 Acres

Q = 60.5 x Ap x R

Where Ap = Impermeable Area (Acres)
R = Rate of Discharge (inches).

Time Taken for Surface Water to travel between Manholes = $\frac{21.159}{0.76}$ = 27.84 = 0.46 mins

Time of Concentration (T) = 0.46 + 3.0 = 3.46 min

$$R = \frac{30}{10 + T} = \frac{30}{10 + 3.46401316} = 2.23$$

Q(actual) = 60.5 x 0.04554 acres x 2.23 inches = 6.14 ft3/min = 2.90 l/s
= 2.90L/S

Therefore use 225 diameter @ fall 1: 100 = 1.000% OK

Surface Water Design

Pipe Coefficient k=0.06 (new PVC Pipe), Vmin=0.8m/s, Vmax=4.0m/s, V(ideal)=1.8m/s

Area for Road Section: from C to D to E
Manholes from S8 to S9 to S4

Distance between Manholes = MAX 27.009 m

Road	=	290.38	m	x	1.0	m	=	290.38	m2	x	95.00% (impermeability)	=	275.861	m2
Footpath	=	45.20	m	x	2.0	m	=	90.40	m2	x	95.00% (impermeability)	=	85.88	m2
Car park	=	0.00	m2	x	1.0	No	=	0.00	m2	x	100.00% (impermeability)	=	0	m2
Driveway	=	0.00	m2	x	0.0	No	=	0.00	m2	x	100.00% (impermeability)	=	0	m2
Area of Roofs		58.54	m2	x	4.0	No	=	234.16	m2	x	100.00% (impermeability)	=	234.16	m2
Area of Roofs		0.00	m2	x	0.0	No	=	0.00	m2	x	100.00% (impermeability)	=	0	m2
Grass Verge		19.90	m2	x	1.0	No	=	19.90	m2	x	10.00% (impermeability)	=	1.99	m2
Green Area		102.58	m2	x	1.0	No	=	102.58	m2	x	10.00% (impermeability)	=	10.258	m2
											Total		608.15	m2

Taking Rain Intensity of 50 mm per Hour

Vol of Water = 608.15 m2 x 0.05 m = 30.41 m3/hr = 8.45 l/s "+" 2.90l/s = 11.35L/s
try 225 diameter pipe at fall 1 160 Therefore v= 0.9 m/s

Total Area = 608.15 m2 = 0.15 Acres

Q = 60.5 x Ap x R
Where Ap = Impermeable Area (Acres)
R = Rate of Discharge (inches).

Time Taken for Surface Water to travel between Manholes = $\frac{27.009}{0.9}$ = 30.01 = 0.50 mins (0)

Time of Concentration (T) = 0.50 + 3.0 = 3.50 min

$R = \frac{30}{10 + T} = \frac{30}{10 + 3.50016667} =$ **2.22**

Q(actual) = 60.5 x 0.15027 acres x 2.22 inches = 20.20 ft3/min = 9.53 l/s + 2.90l/s

Therefore use 225 diameter @ fall 1 160 = 0.625% OK = **12.43L/s**

TOTAL IMPERMEABLE AREA = 792.46 Sq.m

STORMTECH Stormwater Management System Design Tool

PROJECT REF:	St. Finian's Way Newcastle, Co. Dublin
LOCATION:	Tank 1
DATE:	1st April 2019
CREATED BY:	HOR

SYSTEM PARAMETERS

Required Total Storage	234.42	m^3
Stormtech chamber model	MC3500	
Filtration Permeable Geo or Impermeable Geo	Filter geo	
Number of Isolator Rows (IR)	1	

SITE PARAMETERS

Stone Porosity	40%		
Excavation Batter Angle (degrees)	60	°	*Minimum Requirement*
Stone Above Chambers	0.3	m	*0.30*
Stone Below Chambers	0.23	m	*0.23*
In-between Row Spacing	0.23	m	*0.23*
Additional Storage outside Excavation. E.g manholes, Header Pipe	0	m^3	

HEADER PIPE

Is Header pipe required within excavation	No	
Orientation of Header Pipe	Parrallel to IR	
Diameter of Header Pipe	0.6	m
Length of Header Pipe	0	m

CHAMBER SYSTEM DIMENSIONS

	Calculated	Adopted	
Number of Rows		4	ea
Number of units per Row		10	ea
System Installed Storage Depth (effective storage depth)	1.675		m
Tank overall installed Width at base	9.11	9.11	m
Tank overall installed Length at Base	23.54	23.6	m
Total Effective System Storage	**243.6**	**244.0**	m^3

STORMTECH SYSTEM D

StormTech Chamber Mod	
Unit Width	
Unit Length	
Unit Height	
Min Cover Over System	
Max Cover Over Chamber	
Chamber Internal Storage	
Header Pipe Internal Storage	

STONE AND EXCAVATIC

Volume of Dig for System	
Width at base	
Width at top	
Length at base	
Length at top	
Depth Of System	
Area of Dig at Base of Sys	
Area of Dig at Top of Syste	
Void Ratio	
Stone Requirement - m3	
Stone Requirement - tonn	

STORMTECH Stormwater Management System Design Tool

PROJECT REF:	St. Finian's Way Newcastle, Co. Dublin
LOCATION:	Attenuation Tank
DATE:	7th February 2022
CREATED BY:	HOR

SYSTEM PARAMETERS

Required Total Storage	102	m^3
Stormtech chamber model	SC740	
Filtration Permeable Geo or Impermeable Geo	Filter geo	
Number of Isolator Rows (IR)	1	

SITE PARAMETERS

Stone Porosity	40%		
Excavation Batter Angle (degrees)	60	°	*Minimum Requirement*
Stone Above Chambers	0.15	m	*0.15*
Stone Below Chambers	0.15	m	*0.15*
In-between Row Spacing	0.15	m	*0.15*
Additional Storage outside Excavation. E.g manholes. Header Pipe	0	m^3	

HEADER PIPE

Is Header pipe required within excavation	No	
Orientation of Header Pipe	Parrallel to IR	
Diameter of Header Pipe	0.6	m
Length of Header Pipe	0	m

CHAMBER SYSTEM DIMENSIONS	**Calculated**	**Adopted**	
Number of Rows		3	ea
Number of units per Row		14	ea
System Installed Storage Depth (effective storage depth)	1.060		m
Tank overall installed Width at base	4.79	4.8	m
Tank overall installed Length at Base	31.08	31.1	m
Total Effective System Storage	**105.7**	**105.9**	m^3

STORMTECH SYSTEM D

StormTech Chamber Mod
Unit Width
Unit Length
Unit Height
Min Cover Over System
Max Cover Over Chamber
Chamber Internal Storage
Header Pipe Internal Storage

STONE AND EXCAVATIC

Volume of Dig for System
Width at base
Width at top
Length at base
Length at top
Depth Of System
Area of Dig at Base of Sys
Area of Dig at Top of Syst
Void Ratio
Stone Requirement - m3
Stone Requirement - tonn

Thor Design & Management.
Structural, Mechanical, Surveying
& Building Services Engineering Consultancy

Attenuation Tank 1

Attenuation Calculations - Overflow

Development - Additional 6No. Dwellings @ St. Finian's Way, Newcastle, Co. Dublin

Calculation of storage volumes at surface water outfall

Area of Development (acres)	**1.771**	Acres
Area of Development: (hectares)	0.72	Ha
Impermiable Area (hectares) =	**0.3786**	Ha
Total Allowable Outflow	7.00	litres/second

Storm Duration (mins)	*Rainfall (mm)*
15	**27.8**
30	**34.8**
60	**43.7**
120	**54.7**
240	**68.5**
360	**78.2**
720	**98**

Storm return peroid of 1 in 100 years

Storm Duration (mins)	*Rainfall (mm)*	*Rainfall Intensity (mm/hr)*	*Flow Rate (l/s)*	*Excess Flow Above Outflo*
15	33.36	133.44	153.20	146.20
30	41.76	83.52	95.89	88.89
60	52.44	52.44	60.20	53.20
120	65.64	32.82	37.68	30.68
240	82.2	20.55	23.59	16.59
360	93.84	15.64	17.96	10.96
720	117.6	9.80	11.25	4.25

Therefore, storage volume required = **238.94 m3**

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& Building Services Engineering Consultancy

Attenuation Tank 2

Attenuation Calculations - Overflow

Development - Additional 6 No. Dwelling @ St. Finian's Way, Newcastle, Co. Dublin

Calculation of storage volumes at surface water outfall

Area of Development (acres)	**1.771**	Acres
Area of Development. (hectares)	0.72	Ha
Impermiable Area (hectares) =	**0.0792**	Ha
Total Allowable Outflow	7.00	litres/second

Storm Duration (mins)	*Rainfall (mm)*
15	**27.8**
30	**34.8**
60	**43.7**
120	**54.7**
240	**68.5**
360	**78.2**
720	**98**

Storm return peroid of 1 in 100 years

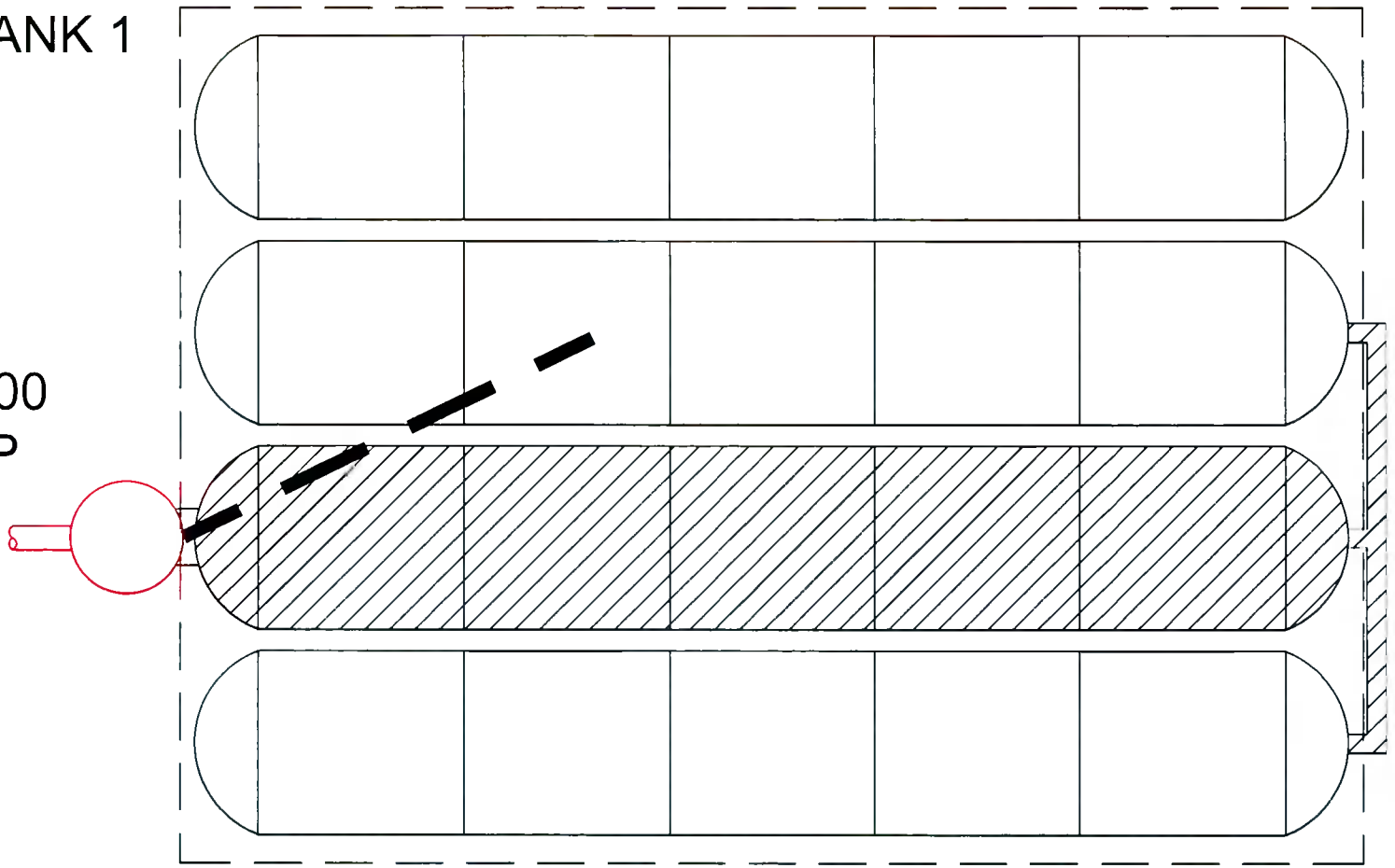
7L/s Included from Attenuation Tan

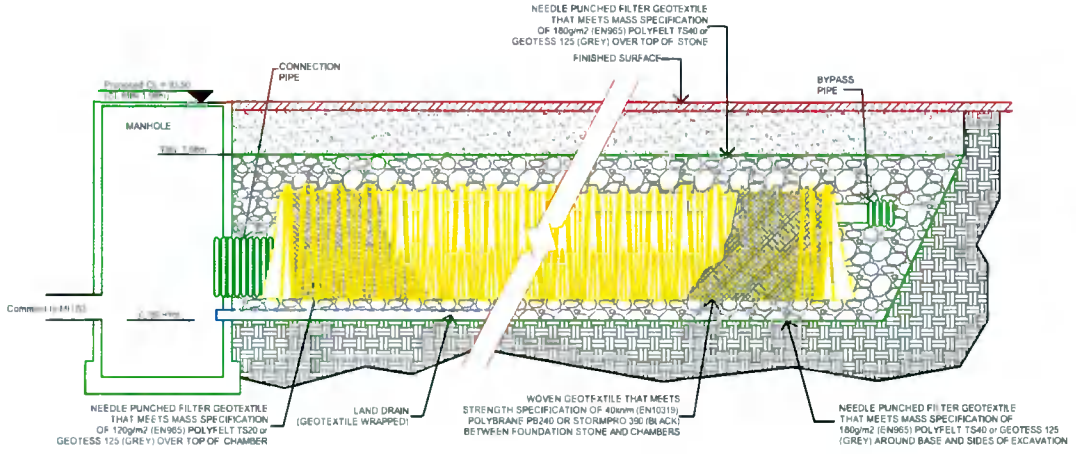
Storm Duration (mins)	*Rainfall (mm)*	*Rainfall Intensity (mm/hr)*	*Flow Rate (l/s)*	*Excess Flow Above Outflo*
15	33.36	133.44	39.05	32.05
30	41.76	83.52	27.06	20.06
60	52.44	52.44	19.59	12.59
120	65.64	32.82	14.88	7.88
240	82.2	20.55	11.94	4.94
360	93.84	15.64	10.76	3.76
720	117.6	9.80	9.35	2.35

Therefore, storage volume required = **101.68 m3**

ATTENUATION TANK 1

OFFLINE MC3500 SYSTEM SETUP





Thor Design & Management

Proposed Additional 6No. Dwellings @ St. Finian's Way, Newcastle, Co. Dublin

Pavement Homes Ltd

Site Drainage

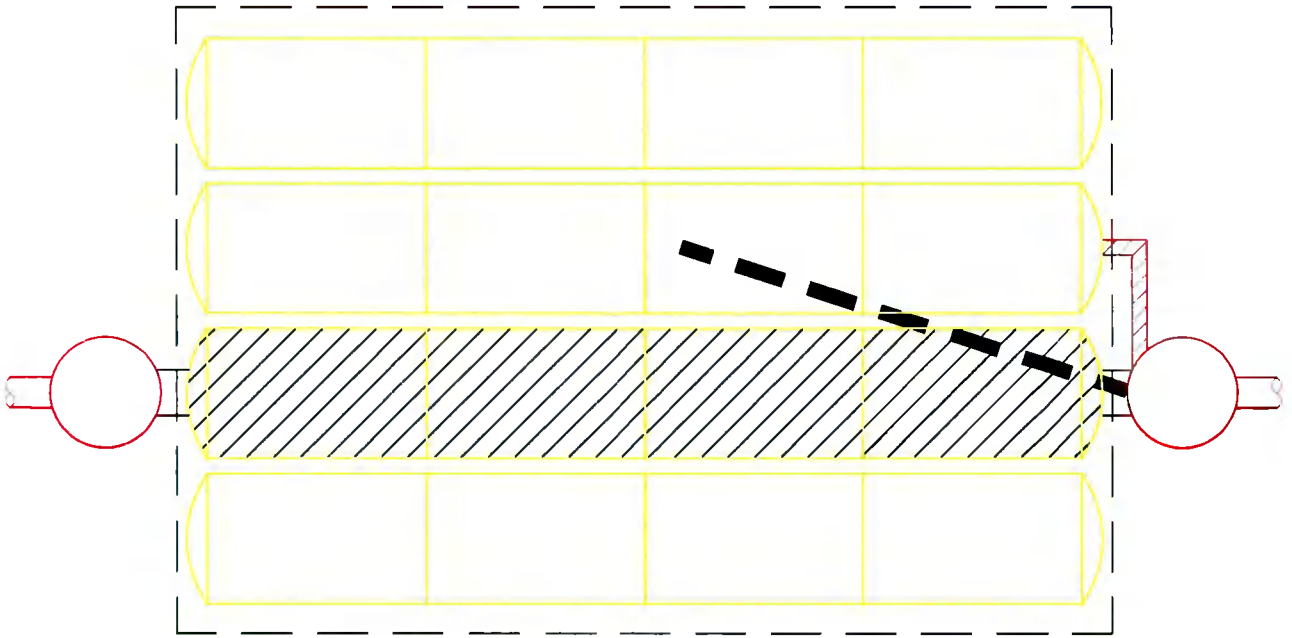
EXISTING STORMTECH ATTENUATION SYSTEM

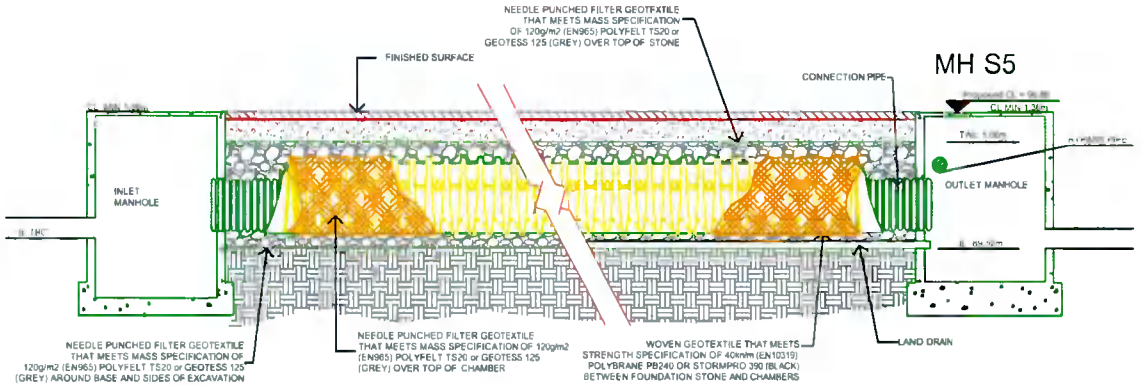
PHL-22S-05 | PL1

7th Feb. 2022 | 1:20

ATTENUATION TANK 2

ONLINE SC740
SYSTEM SETUP





Thor Design & Management

Proposed Additional 6No. Dwellings @ St. Finian's Way, Newcastle, Co. Dublin

Pavement Homes Ltd

Site Drainage

EXISTING STORMTECH ATTENUATION SYSTEM

PHL-22S-06 | PL1

7th Feb. 2022

NS PLASTIC BYPASS SEPARATORS
DECLARATION OF PERFORMANCE

No. KEL-CPR-010

1. Unique identification code of the product-type:

Separator Systems for Light Liquids, Plastic Construction
NSBP003, NSBP004 & NSBP006

2. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4) of the CPR:

Serial Number/Works Order Number printed on the Product Information Label & affixed to product

3. Intended use or uses of the construction product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

Collection & Separation of Light Liquids from Waste Water by means of gravity and/or coalescence

4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11(5):

Kingspan Environmental Ltd
College Rd North
Aston Clinton, Aylesbury, Buckinghamshire
HP22 5EW

5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):

N/A

6. System or systems of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V:

System 3

7. In case of the declaration of performance concerning a construction product covered by a harmonized standard:

EN 858-1:2002
BSI, Maylands Avenue, Hemel Hempstead, Herts HP2 4SQ
Has executed initial type testing according to system 3 and delivered the test report

KINGSPAN ENVIRONMENTAL LTD
180 Gilford Road, Portadown
Co. Armagh, BT63 5LF

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+44 (0) 28 3836 4445
enquiry@kingspanenv.com
www.kingspanenv.com

8. Declared performance:

Essential Characteristics		Performance			Harmonised technical specification
Crushing Resistance (vertical load test)		Pass (also wet conditions)			EN 858-1:2002
Structural Behaviour		Pass			
Resistance to fire		Class E			
Water Tightness (water test)		Pass			
Material Durability		MFR (190/2,16) = 3.0± 1g/10 min (ISO 1133)			
		Density ≥ 939 kg/m³ (ISO 1872)			
		Yield Stress ≥ 19 Mpa (ISO 527-2)			
		Pressure A1 = 1 (EN1778)			
		Pressure A2K = 1 (EN1778)			
Treatment Efficiency	Sample	Specified Maximum Light Liquid (mg/l)	Actual Light Liquid (mg/l)		
	1	≤10	0.37	Pass	
	2	≤10	0.22	Pass	
	3	≤10	0.35	Pass	
	4	≤10	0.23	Pass	
	5	≤10	0.35	Pass	
	Average	≤5	0.30	Pass	
Electrical Consumption		n/a			

Signed for and on behalf of the manufacturer by:

Paul Copping – Technical Director

.....

(Name and function)

Aylesbury – 13th May 2013

.....

(Place and date of issue)

.....

(Signature)

KINGSPAN ENVIRONMENTAL LTD
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Company Reg. No. NI17631