MCD

MCD CIVIL ENGINEERING CONSULTANTS LTD.

Stanhope St., Athy, Co. Kildare T/F (059) 8640013/(059) 8640012

Mr. Mel McLoughlin,
McLoughlin Architecture,
Unit 4B, Elm House,
Millennium Park,
Naas,
Co. Kildare.

Date: 17 May 2021

Your Ref:

Our Ref: P20/027

Re Extension to existing Gaelscoil Naomh Padraig at Glebe, Lucan, Co. Dublin.

Drainage Report

Introduction

The existing Gaelscoil Naomh Padraig National School is to be extended to the rear with a new two storey extension.

The footprint of the proposed extension measures 107m^2 and the extension is to be located on an existing garden area.

SUDS

Since the works involve an extension to an existing building on a brownfield site and not a major redevelopment of the SUDS strategy provides for 100 year stormwater storage for the area of the site being redeveloped with an allowance of 20% for climate change.

Stormwater Storage Calculation

Rainfall data from Met Eireann has been obtained for the site. Stormwater storage calculations have been made for a 75% Winter Profile Storm for storm durations from 5mins to 25 days for 30 year and 100-year return periods. The critical storm volume for this range of storms and return periods is the 24 hours 100-year storm event. The volume of this event is further factored by 20% to allow for climate change giving a storage volume requirement of 16.2.m^3.

Cormac Dooley, BE MSc MIEI
info@mcdcivil.ie

It is proposed to install 8no. Stormtech SC740 storage modules with associated end caps and filter stone surround. The system will be fitted with a row wrapped in geotextile to act as an isolator row to allow for periodic silt removal. The details of the storage modules and surround filter stone are attached to this report.

A high-level emergency overflow shall be provided to the existing system to cater for storm events in excess of the M100 design storm. The storage volume shall act as a soakaway.

Foul Drainage

It is proposed to connect the proposed foul drainage to the existing foul drainage network on site. No surface water from the propose extension shall be connected to the foul sewer and the drainage networks shall remain separate.

Conclusion

The proposed stormwater storage volume will act as a soakaway capable of storing the 100-year storm event from the extension. A high-level overflow allows high volume / extreme events to discharge to the existing surface water drainage network without damage to the site. There is no increase in discharge from the site during extreme design events factored for climate change. The storage volume will reduce discharge rates for smaller events.

The proposed drainage design is considered to be an appropriate engineering response to this developed site and represents a sustainable drainage solution.

I trust the above is in order
Yours faithfully,

Cormac Dooley, BE MSc MIEI
MCD Civil Engineering Consultants Ltd.

MCD Civil Engineering Consultants Ltd.
Stanhope St., Athy, Co. Kildare
059 8640013

Stormwater Storage Design

1.0 **Project Details** — Extension to Scoil Naomh Padraig, Lucan, Co. Dublin — ***Issue*** *19/05/2021* ***Rev*** *0*

Client Details — Scoil Naomh Padraig BOM, Lucan, Co. Dublin

Designer Details — Cormac Dooley, BE MSc MIEI, MCD Civil Engineering Consultants Ltd., Stanhope St., Athy, Co. Kildare — **PREP** CD — **CHK'D** CD

2.0 Site Specific Data

$$Q_{bar} = 0.00108 x AREA^{0.89} \times SAAR^{1.17} \times SOIL^{2.17}$$

Impervious Area	*AREA*	107 *m2*
Annual Rainfall	*SAAR*	954 *mm*
Soil Factor	*SOIL*	0.2
Greenfield Run-off	*Qbar*	0.01 *l/s*
Climate Change	*CCF*	20%

3.0 Design Storage Volume

(See storage volume calculations below)

30 Year Event	9.8 *m3*
Adjusted for Climate Change	11.7 *m3*
100 Year Event	13.5 *m3*
Adjusted for Climate Change	16.2 *m3*

4.0 Soakaway Design

Storage Module	8 Storm Tech SC740		16.96 m3
Storage Ancillaries	0 Storm Tech SC740		0 m3
Design Volume	*Return Period*	*M100*	16.2 m3
Total Storage Volume Provided			**16.96 m3**

5.0 Storage Volume Calculations

Rainfall Depth and Duration Information from Met Eireann for specific for Site Location.
75% Winter Storm Profile as per Flood Estimation FSR Cunnane-Lynn - 1975.

Storage Volumes are calculated based on the maximum difference between inflow less greenfield outflow over the 75% Winter Storm Profile taken in 10 percentile segments.

Duration	*Return Period (min)*	*30 Years (mm)*	*100 Years (mm)*	*30 Year Storage (m3)*	*100 Year Storage (m3)*
5 mins	5	11.5	16.8	1.359	1.987
10 mins	10	16	23.4	1.889	2.766
15 mins	15	18.9	27.5	2.230	3.249
30 mins	30	23.6	34	2.778	4.010
1 hour	60	29.6	42.1	3.472	4.953
2 hours	120	37	52	4.315	6.092
3 hours	180	42.2	58.9	4.898	6.876
4 hours	240	46.4	64.3	5.362	7.482
6 hours	360	52.9	72.8	6.065	8.422
9 hours	540	60.3	82.5	6.841	9.470
12 hours	720	66.2	90.1	7.439	10.270
18 hours	1080	75.5	102	8.340	11.478
24 hours	1440	82.9	111.3	9.015	12.379
2 days	2880	93.4	122.2	9.456	12.867
3 days	4320	102.1	131.7	9.683	13.189
4 days	5760	109.7	140	**9.780**	13.369
6 days	8640	122.9	154.6	9.737	**13.492**
8 days	11520	134.4	167.3	9.493	13.389
10 days	14400	144.7	178.7	9.106	13.133
12 days	17280	154.3	189.3	8.637	12.782
16 days	23040	171.7	208.5	7.744	11.843
20 days	28800	187.5	225.8	6.680	10.916
25 days	36000	205.7	245.7	5.179	9.603

STORMTECH SC-740 CHAMBER

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.

STORMTECH SC-740 CHAMBER
(not to scale)

Nominal Chamber Specifications

Size (L x W x H)
85.4" x 51" x 30"
2,170 mm x 1,295 mm x 762 mm

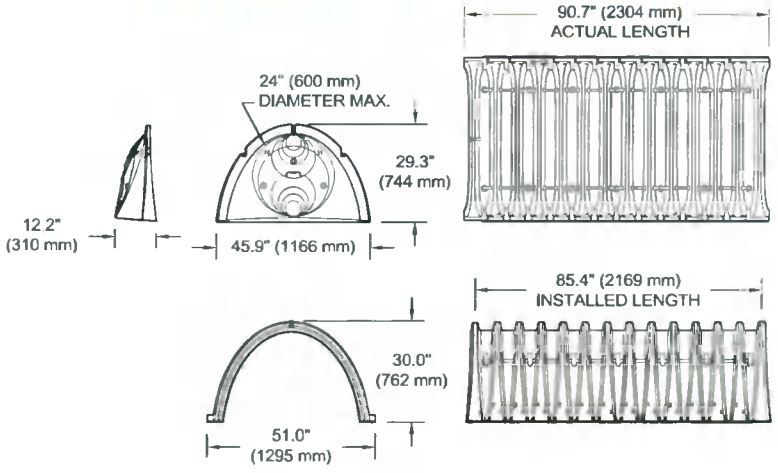
Chamber Storage
45.9 ft³ (1.30 m³)

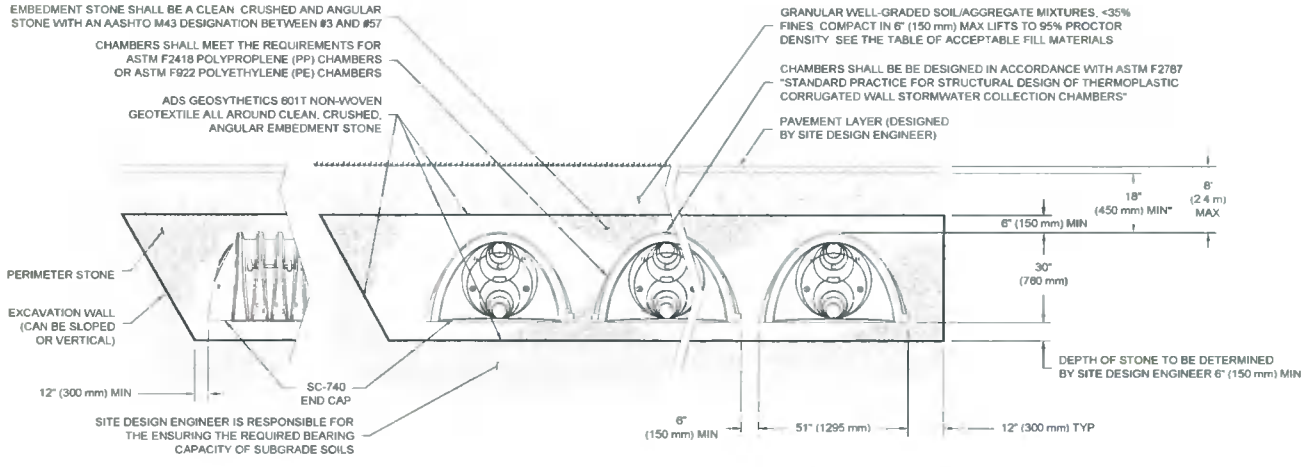
Min. Installed Storage*
74.9 ft³ (2.12 m³)

Weight
74.0 lbs (33.6 kg)

Shipping
30 chambers/pallet
60 end caps/pallet
12 pallets/truck

*Assumes 6" (150 mm) stone above, below and between chambers and 40% stone porosity.





*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24" (600 mm)

StormTech®

ADS®

SC-740 CUMULATIVE STORAGE VOLUMES PER CHAMBER

Assumes 40% Stone Porosity. Calculations are Based Upon a 6" (150 mm) Stone Base Under Chambers.

Depth of Water in System Inches (mm)		Cumulative Chamber Storage ft³ (m³)	Total System Cumulative Storage ft³ (m³)
42 (1067)	↑	45.90 (1.300)	74.90 (2.121)
41 (1041)		45.90 (1.300)	73.77 (2.089)
40 (1016)	Stone	45.90 (1.300)	72.64 (2.057)
39 (991)	Cover	45.90 (1.300)	71.52 (2.025)
38 (965)		45.90 (1.300)	70.39 (1.993)
37 (940)	↓	45.90 (1.300)	69.26 (1.961)
36 (914)		45.90 (1.300)	68.14 (1.929)
35 (889)		45.85 (1.298)	66.98 (1.897)
34 (864)		45.69 (1.294)	65.75 (1.862)
33 (838)		45.41 (1.286)	64.46 (1.825)
32 (813)		44.81 (1.269)	62.97 (1.783)
31 (787)		44.01 (1.246)	61.36 (1.737)
30 (762)		43.06 (1.219)	59.66 (1.689)
29 (737)		41.98 (1.189)	57.89 (1.639)
28 (711)		40.80 (1.155)	56.05 (1.587)
27 (686)		39.54 (1.120)	54.17 (1.534)
26 (660)		38.18 (1.081)	52.23 (1.479)
25 (635)		36.74 (1.040)	50.23 (1.422)
24 (610)		35.22 (0.977)	48.19 (1.365)
23 (584)		33.64 (0.953)	46.11 (1.306)
22 (559)		31.99 (0.906)	44.00 (1.246)
21 (533)		30.29 (0.858)	1.85 (1.185)
20 (508)		28.54 (0.808)	39.67 (1.123)
19 (483)		26.74 (0.757)	37.47 (1.061)
18 (457)		24.89 (0.705)	35.23 (0.997)
17 (432)		23.00 (0.651)	32.96 (0.939)
16 (406)		21.06 (0.596)	30.68 (0.869)
15 (381)		19.09 (0.541)	28.36 (0.803)
14 (356)		17.08 (0.484)	26.03 (0.737)
13 (330)		15.04 (0.426)	23.68 (0.670)
12 (305)		12.97 (0.367)	21.31 (0.608)
11 (279)		10.87 (0.309)	18.92 (0.535)
10 (254)		8.74 (0.247)	16.51 (0.468)
9 (229)		6.58 (0.186)	14.09 (0.399)
8 (203)		4.41 (0.125)	11.66 (0.330)
7 (178)		2.21 (0.063)	9.21 (0.264)
6 (152)	↑	0 (0)	6.76 (0.191)
5 (127)		0 (0)	5.63 (0.160)
4 (102)	Stone	0 (0)	4.51 (0.128)
3 (76)	Foundation	0 (0)	3.38 (0.096)
2 (51)		0 (0)	2.25 (0.064)
1 (25)	↓	0 (0)	1.13 (0.032)

Note: Add 1.13 ft³ (0.032 m³) of storage for each additional inch (25 mm) of stone foundation.

STORAGE VOLUME PER CHAMBER FT³ (M³)

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Foundation Depth in. (mm)		
		6 (150)	12 (300)	18 (450)
SC-740 Chamber	45.9 (1.3)	74.9 (2.1)	81.7 (2.3)	88.4 (2.5)

Note: Assumes 6" (150 mm) stone above chambers, 6" (150 mm) row spacing and 40% stone porosity.

AMOUNT OF STONE PER CHAMBER

ENGLISH TONS (yds³)	Stone Foundation Depth		
	6"	12"	18"
SC-740	3.8 (2.8)	4.6 (3.3)	5.5 (3.9)
METRIC KILOGRAMS (m³)	**150 mm**	**300 mm**	**450 mm**
SC-740	3,450 (2.1)	4,170 (2.5)	4,490 (3.0)

Note: Assumes 6" (150 mm) of stone above and between chambers.

VOLUME EXCAVATION PER CHAMBER YD³ (M³)

	Stone Foundation Depth		
	6 (150)	12 (300)	18 (450)
SC-740	5.5 (4.2)	6.2 (4.7)	6.8 (5.2)

Note: Assumes 6" (150 mm) of row separation and 18" (450 mm) of cover. The volume of excavation will vary as depth of cover increases.

Working on a project?
Visit us at www.stormtech.com
and utilize the StormTech Design Tool

For more information on the StormTech SC-740 Chamber and other ADS products, please contact our Customer Service Representatives at 1-800-821-6710

THE MOST ADVANCED NAME IN WATER MANAGEMENT SOLUTIONS™

Advanced Drainage Systems, Inc.
4640 Trueman Blvd., Hilliard, OH 43026
1-800-821-6710 www.ads-pipe.com