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STORMWATER DRAINAGE – Revised 23/1/2018

Job Number 17.5206

Site Address Senior School Building - St Philips Christian College,  
Salamander Way Port Stephens

Water Quality Measures – Port Stephens DCP 2014 Section B4 - C

All water is collected from the metal roof of the building and discharged through a sealed pipe system to an on-site infiltration tank. No water leaves the site.

The collected water is not contaminated and does not have any additional nutrients or particles added above those already existing in the rain water.

It is proposed to provide detention and infiltration for Major Storm Events up to a 1 in 100 year Storm using Infiltration in a Concrete Tank with No Base.

All water is collected and infiltrated on site. Discharge is sufficiently removed from the existing wetlands to not impact on the water quality of the wetlands.

Hence the water quality and water quantity does not adversely impact the adjoining wetlands and no specific water quality treatments are required to the storm water.

Detention Requirements – 1 in 100 year Storm Event all durations

It is proposed to provide detention and infiltration for Major Storm Events using Infiltration in a Concrete Tank with No Base

Site Infiltration Design Criteria

Geotechnical Investigation determined Site Foundation was Sand with the following Infiltration Parameters from 5QS Consulting Group Geotechnical Engineers Report 5QS Ref No 7209 dated 15/1/2018.

This report is site specific and updated from previous report from Barker Harle Consulting Geotechnical Engineers Report 5QS Ref No 7031 dated 10/3/2017

- Sand Infiltration Rate -  $I = 150 \text{ mm/hr}$  @ 600mm below existing ground level

Use Open Base Concrete Tank 16.4m long x 7.2m wide x 1100mm deep – note site is raised 600mm so depth of testing is relevant to 1.1m deep tank

Infiltration Area =  $16.4 \times 7.2 = 118 \text{ sqm}$

$Q = IA = 150 \times 118 / 3600 = 4.92 \text{ l/s}$

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Total Site Area

Building Area = 1260 sqm

Site Infiltration / Detention Requirements

Stormwater Designed for 1 in 100 Year Storm Events only – other storm events not critical.

Stormwater Design Rainfall Intensities upgraded to ARR 2016 values – see attached chart.

1) Inflow – 1 in 100 year,

Time of Concentration of Flow - paved and piped = 6 minutes

Rainwater Inflow 1 in 100 year storm - Various durations

C = 0.95 for Total Site Area

$Q = C \times I \times A / 3600$

2) Outflow

– 1 in 100 year Storm Event – Infiltration only

– Infiltration in Tank

Detention Volume Required =  $(Q_{in} - Q_{out}) \times t \times 60$  for Various Events

Storm	Intensity	Inflow	Outflow	C	Volume
5 min	340 mm/hr	113 l/s	4.92 l/s	0.95	33 cum
10min	271 mm/hr	91 l/s	4.92 l/s	0.95	52 cum
15min	227 mm/hr	76 l/s	4.92 l/s	0.95	64 cum
30 min	157 mm/hr	52 l/s	4.92 l/s	0.95	85 cum
60 min	102 mm/hr	34 l/s	4.92 l/s	0.95	105 cum
120min	65 mm/hr	22 l/s	4.92 l/s	0.95	121 cum
3hr	49 mm/hr	16 l/s	4.92 l/s	0.95	123 cum Critical
6hr	31 mm/hr	10 l/s	4.92 l/s	0.95	117 cum
12hr	20 mm/hr	7 l/s	4.92 l/s	0.95	75 cum
24hr	13 mm/hr	4.3 l/s	4.92 l/s	0.95	-
48hr	8 mm/hr	2.3 l/s	4.92 l/s	0.95	-
72hr	6 mm/hr	2.0 l/s	4.92 l/s	0.95	-

Detention Volume Provided in Detention / Infiltration Tank

Detention Volume Provided in Concrete Detention Tank – 16.4 x 7.2 x 1.1D

Volume = 16.4 x 7.2 x 1.1 = 130 cum

Detention Volume Provided = 130 cum Detention Volume Required = 123 cum

Acceptable

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Ground Water Level

From 5QS Consulting Group Geotechnical Engineers Report 5QS Ref No 7209 dated 15/1/2018.

Ground Water Level is 1.8 below Existing Ground Level

Existing Ground Surface Level = 6.6 AHD

Ground Water level = 4.8 AHD

Infiltration Tank Levels

Surface Level of Tank Lid = 7.1 AHD


Top Water Level – Detention = 6.8 AHD

Base of Infiltration Tank = 5.7 AHD

Depth of Infiltration above Water Table = 900mm - Acceptable

Infiltration Level below existing Ground Level = 900mm – meets geotechnical req'ts

Designed By:-



Michael Fitzgerald  
MIEAust CPEng





## Location

**Label:** Salamander

**Latitude:** -32.77 [Nearest grid cell: 32.7625 (S)]

**Longitude:** 152.10 [Nearest grid cell: 152.1125 (E)]

## IFD Design Rainfall Intensity (mm/h)

Issued: 22 January 2018

Rainfall intensity for Durations, Exceedance per Year (EY), and Annual Exceedance Probabilities (AEP).

[FAQ for New ARR probability terminology](#)

Duration	Annual Exceedance Probability (AEP)						
	63.2%	50%#	20%*	10%	5%	2%	1%
<b>1 min</b>	139	161	235	290	346	427	492
<b>2 min</b>	117	137	201	248	295	361	413
<b>3 min</b>	108	126	185	228	272	333	382
<b>4 min</b>	102	118	174	214	255	312	359
<b>5 min</b>	96.3	112	164	201	240	295	340
<b>10 min</b>	76.5	88.6	129	159	190	234	271
<b>15 min</b>	64.0	74.2	108	133	159	197	227
<b>30 min</b>	44.2	51.3	75.1	92.5	111	136	157
<b>1 hour</b>	28.8	33.5	49.1	60.5	72.3	88.8	102
<b>2 hour</b>	18.3	21.3	31.2	38.3	45.7	56.0	64.4
<b>3 hour</b>	14.0	16.3	23.7	29.2	34.8	42.6	48.9
<b>6 hour</b>	8.96	10.3	15.0	18.3	21.8	26.8	30.8
<b>12 hour</b>	5.80	6.65	9.50	11.6	13.8	17.0	19.6
<b>24 hour</b>	3.76	4.29	6.06	7.38	8.77	10.8	12.6
<b>48 hour</b>	2.39	2.72	3.82	4.64	5.49	6.78	7.86
<b>72 hour</b>	1.80	2.05	2.87	3.47	4.10	5.05	5.84
<b>96 hour</b>	1.46	1.66	2.32	2.80	3.30	4.05	4.67
<b>120 hour</b>	1.23	1.40	1.95	2.35	2.76	3.38	3.88
<b>144 hour</b>	1.07	1.22	1.69	2.02	2.37	2.89	3.32
<b>168 hour</b>	0.949	1.07	1.48	1.78	2.07	2.52	2.89

Note:

# The 50% AEP IFD **does not** correspond to the 2 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 1.44 ARI.

\* The 20% AEP IFD **does not** correspond to the 5 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 4.48 ARI.

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