

On-Site Detention Calculation Sheet for Upper Parramatta River Catchment
Non-HED Secondary Outlet
(Due to Elevated Downstream 100 yr ARI Flood Level)

Project:	COCA COLA AMATIL HIGH BAY WAREHOUSE - WESTERN OSD			
Site Address	BRIENS ROAD, NORTHMEAD			
Job No:	6220			
Designer:	JRH			
Telephone:	(02) 9221 6611			

Site Data				
OSD Area:	Upper Parramatta River Catchment			
L.G.A	Parramatta City Council			
Site Area	1.096	ha	10,960	m ²
Total Roof Area	0.1105	ha	1,105	m ²
Area of Site draining to OSD Storage	1.096	ha	10,960	m ² Satisfactory
Residual Site Area (Lot Area - Roof Area)	0.986	ha		
Area Bypassing Storage	0	ha		
Area Bypassing / Residual Site Area	0.0%			Satisfactory 30% Max
No. of Dwellings on Site	1			Satisfactory
Site Area per Dwelling	1.096	ha		
Roof Area per Dwelling	0.111	ha		

Basic OSD Parameters				
		Extended Detention		Detention
Basic SSR Vols	Ext Detention Storage	300	m ³ /ha	Total Storage 520 m ³ /ha
Basic SRDs	Primary Outlet	40	L/s/ha	Secondary Outlet 150 L/s/ha

OSD Tank Bypass				
Residual Lot Capture in OSD Tank	100%			
Adjusted SRDs	40	L/s/ha	150	L/s/ha

OSD Calculations				
		Extended Detention		Detention
Basic SSR Volume	Ext Detention Storage	328.80	m ³	Total Storage 569.92 m ³
Total Rainwater Tank Credits		0.00	m ³	0.00 m ³
Storage Volume				Total 569.92 m ³
Storage Volume	Ext Detention Storage	328.80	m ³	Flood Detention Storage 241.12 m ³
OSD Discharges	Primary Outlet	43.84	L/s	Secondary Outlet 164.40 L/s
RL of Top Water Level of Storage	13.500	m		14.500 m
RL of Orifice Centre-line	12.000	m		13.500 m
Number of Orifices	1			1
Estimated Downstream Flood Level	11.70	1.5 yr ARI		14.35 100 yr ARI
Downstream FL - RL of Orifice Centre-line	-0.30	Satisfactory	Adopt non-HED Outlet	0.85
Design Head to Orifice Centre	1.500	m	TWL Detn Storage - RL Orifice	1.000 m
Calculated Orifice Diameter	131	mm	Satisfactory	Satisfactory 281 mm

Overflow Weir & Freeboard Calculation				
RL of Minimum Habitable Floor Level	15.000	m		
RL of Minimum Garage Floor Level	14.700	m		
Length of Overflow Weir	13.50	m		
Site Runoff Coefficient	Parramatta City Council		1.00	
Storm Intensity (5 min 100 yr ARI)			225	mm/h
Peak Flow over Weir			685.0	L/s
Depth of Flow over Weir			98	mm
Freeboard to Habitable Floor		Satisfactory	402	mm
Freeboard to Garage Floor		Satisfactory	102	mm

On-Site Detention Calculation Sheet for Upper Parramatta River Catchment HED Secondary Outlet

Project:	COCA COLA AMATIL HIGH BAY WAREHOUSE - EASTERN OSD				
Site Address	BRIENS ROAD, NORTHMEAD				
Job No:	6220				
Designer:	JRH				
Telephone:	(02) 9221 6611				
Site Data					
OSD Area:	Upper Parramatta River Catchment				
L.G.A	Parramatta City Council				
Site Area	2.85	ha	28,500	m ²	
Total Roof Area	1.675	ha	16,750	m ²	
Area of Site draining to OSD Storage	2.85	ha	28,500	m ²	Satisfactory
Residual Site Area (Lot Area - Roof Area)	1.175	ha			
Area Bypassing Storage	0	ha			
Area Bypassing / Residual Site Area	0.0%				Satisfactory 30% Max
No. of Dwellings on Site	1				Satisfactory
Site Area per Dwelling	2.850	ha			
Roof Area per Dwelling	1.675	ha			
Basic OSD Parameters					
		Extended Detention		Detention	
Basic SSR Vols	Ext Detention Storage	300	m ³ /ha	Total Storage	455 m ³ /ha
Basic SRDs	Primary Outlet	40	L/s/ha	Secondary Outlet	150 L/s/ha
OSD Tank Bypass					
Residual Lot Capture in OSD Tank	100%				
Adjusted SRDs	40	L/s/ha		150	L/s/ha
OSD Calculations					
		Extended Detention		Detention	
Basic SSR Volume	Ext Detention Storage	855.00	m ³	Total Storage	1296.75 m ³
Total Rainwater Tank Credits		0.00	m ³		0.00 m ³
Storage Volume				Total	1296.75 m ³
Storage Volume	Ext Detention Storage	855.00	m ³	Flood Detention Storage	441.75 m ³
OSD Discharges	Primary Outlet	114.00	L/s	Secondary Outlet	427.50 L/s
RL of Top Water Level of Storage	13.250	m		13.900	m
RL of Orifice Centre-line	12.000	m		13.000	m
Number of Orifices	1			1	
Estimated Downstream Flood Level	10.48	1.5 yr ARI		13.00	100 yr ARI
Downstream FL - RL of Orifice Centre-line	-1.52	Satisfactory		0.00	m
Design Head to Orifice Centre	1.250	m		0.250	m
Calculated Orifice Diameter	221	mm	Satisfactory	640	mm
Overflow Weir & Freeboard Calculation					
RL of Minimum Habitable Floor Level				15.300	m
RL of Minimum Garage Floor Level				15.300	m
Length of Overflow Weir				5.00	m
Site Runoff Coefficient	Parramatta City Council			1.00	
Storm Intensity (5 min 100 yr ARI)				225	mm/h
Peak Flow over Weir				1781.3	L/s
Depth of Flow over Weir				363	mm
Freeboard to Habitable Floor			Satisfactory	1037	mm
Freeboard to Garage Floor			Satisfactory	1037	mm

GPT Sizing

GPT on external Catchment Drainage

Catchment = 14.5 ha

$t_c = 16.2$ mins

ARI	INTENSITY (mm/h)	C _i MULTIPLIER	Q _{tc} (m ³ /s)
100	146.4 (AR&R)	1.20	5.28
50	132.8 (AR&R)	1.15	4.59
20	114.7 (AR&R)	1.05	3.62
10	100.7 (AR&R)	1.00	3.03
5	92.6 (AR&R)	0.95	2.64
2	71.9 (AR&R)	0.85	1.84
1	56.3 (AR&R)	0.8	1.35
0.5 (6 month)	42.5 (extrapolated)	0.74 (extrapolated)	0.95
0.25 (3 month)	28.2 (extrapolated)	0.68 (extrapolated)	0.58

$$Q = C I A / 360$$

Where I = Intensity (mm/h)

A = Area (ha)

$$\begin{aligned} Q_{0.5} &= (C_{0.5} * I_{16.2}^{0.5} * A) / 360 \\ &= (0.74 * 0.746 * 42.5 * 14.5) / 360 \\ &= 0.95 \text{ m}^3/\text{s} \quad (950 \text{ l/s}) \end{aligned}$$

$$\begin{aligned} Q_{0.25} &= (C_{0.25} * I_{16.2}^{0.25} * A) / 360 \\ &= (0.68 * 0.746 * 28.2 * 14.5) / 360 \\ &= 0.580 \text{ m}^3/\text{s} \quad (580 \text{ l/s}) \end{aligned}$$

Thus use CDS Offline unit P1512 (selected due to pipe diameter), can treat up to 1 year flow.