Stormwater Drainage PA Submission

Project: 45-47 Macquarie Street and 134-140 Marsden Street, Parramatta

Client: CROWN INTERNATIONAL LEVEL 11 68 ALFRED STREET MILSONS POINT NSW 2061

Architects: JOSHUA INTERNATIONAL ARCHITECTS LEVEL 11 68 ALFRED STREET MILSONS POINT NSW 2061

Planning Consultant: JBA URBAN PLANNING CONSULTANTS LEVEL 7 77 BERRY STREET NORTH SYDNEY NSW 2060

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1.0 INTRODUCTION

1.1 DESCRIPTION

The site incorporates six (6) levels of basement car parking, retail outlets, commercial offices and residential units.

The site is bounded by Hunter Street, Marsden Street and Macquarie Streets, Parramatta. The Macquarie Street frontage incorporates an area which has archaeological significance (Refer to Section 2.6).

1.2 STORMWATER DRAINAGE DESCRIPTION

The project incorporates an internal gravity stormwater drainage system sized in accordance with Parramatta City Council's guidelines for a 1:100 year frequency rainfall event over a 5 minute period (217mm/hr based upon Parramatta City Council's input data).

The system incorporates two (2) detention tanks, rainwater tank / rainwater reuse system all as shown on the stormwater drainage concept plans.

2.0 STORMWATER DRAINAGE

2.1 FLOOD LEVELS

The site is partly within the 1:100 year flood levels as nominated by Parramatta City Council records and information.

In accordance with Parramatta City Council Stormwater Code, the relative levels of the structure including floor levels, entry areas and access driveways have been established to provide the required freeboard. Refer to Architectural floor plan of Level 00 for nominated levels.

2.2 DESCRIPTION OF STORMWATER DRAINAGE

The stormwater drainage incorporates two (2) separate systems:

- A gravity system collecting roof rainwater extending to the rainwater re-use tank.
- A gravity system collecting all balcony outlets, grated drains, planter beds extending to the detention tank.

Pipework throughout will be generally be UPVC materials and sized for a 1:100 year event in accordance with AS 3500.

The discharge from the site is to the existing kerb entry pit, in Macquarie Street.

2.3 STORMWATER DETENTION

The stormwater detention tank will be constructed in accordance with Parramatta City Councils' Stormwater Codes and the Upper Parramatta Catchment Trust requirements, incorporating access, orifice plate, overflow provisions, fall in base of tank and high early discharge pit.

The discharge from the detention tank and overflow will extend to the existing stormwater kerb entry pit located in Macquarie Street.

2.4 RAINWATER RE-USE TANK

The rainwater re-use tank (350,000 litre) will collect rainwater from the residential roof areas. An overflow provision will extend to the stormwater detention tank. The rainwater will be used to supply the irrigation system and to nominated water closets in accordance with the BASIX requirements.

A first flush device is incorporated into the inlet side of the rainwater tank, a water filtration system and rainwater pump provide rainwater re-use to water closets and irrigation system with lilac pipework.

2.5 BASEMENT DRAINAGE

The lower basement levels of the development (namely P5 and P6) are below the water table. The building structure is tanked to accommodate the water table (refer to structural documentation).

An internal spoon drain is located around the perimeter of the basement levels to collect any seeping through vertical walls. A gravity stormwater drainage system connects to a stormwater pump-out pit. The rising main extends to the discharge side of the detention tank.

2.6 MINIMISING THE IMPACT ON THE ARCHAEOLOGICAL ZONE

The frontage to Macquarie Street incorporates a heritage area of the foundation to the original stone buildings.

Given the sensitive nature of the area, services within this area will be minimised where possible.

The stormwater connection in Macquarie Street will be located as far west as possible to reduce the impact on the area.

The archaeological area is moisture controlled by a designated irrigation system and associated sub-soil drainage. This is to be documented by a Heritage Consultant. On-site Stormwater Detention Handbook

I.1 OSD Stormwater Concept Plan Submission – Short Form

This form is to be completed by the stormwater designer and submitted to Council together with the plan(s), any necessary attachments and a completed OSD Calculation Sheet.

PF	OJECT ADDRESS:		K arnus de la c ings
Co	SD DESIGNER DETAILS: Sompany Name: HARRIS PAGE & ASSOCIATES / HENRY & HY	IMAS	
	ldress:		
Te	lephone No.: <u>9262-1660 / 9417 84</u> 00 Fax No:		-
Ac	creditation Organisation: Accreditation Reference: _		
Na	me of designer: DARREN RITCHIE Date: 18.02.1 (Print Name)	0	-
Co	uncil Reviewer's Name: Date:		
1.	CHECKLIST Flooding:	Complies to Handbook Yes No	Council Agrees
	Is the site (whole or partly) below the 100 year ARI flood level?	N D	Yes No
	If yes, does the OSD system reflect the flood affectation?	D'D	
	Have floodplain issues been addressed (eg storage, obstructed flow etc)?		
2.	External catchment: (refer Section 4.1.3)	[₽́ □	
	Is there an external catchment draining into the site?	~	
	If Yes, have calculations of 100 year ARI flow been submitted & full area of catchment shown?		
3.	OSD Storage: (refer Sections 4.1.4, 4.1.5 & 6.5)	N D	
	Was the storage volume calculated using the UPRCT Calculation Sheet?		
	Is the area bypassing the OSD storage less than 30% of the residual area?	N/N	
	Is there free discharge at the outlet or provision made for a drowned outlet?		
	Has the storage been located at the lowest point of the site to collect surface and roof gutter overflow		
4.	Site information:		
	Has the following information has been shown on the plans:	\mathbf{V}	
	- scaled site layout showing all buildings, roadways and landscaped areas	,	
	 spot levels and contours (including adjoining properties) 		
	 location, dimensions and extent of detention storages 		
	 location of any floodways or flowpaths through the site 		
	 location of any other constraints, e.g. easements, sewer and other services or Water Sensitive Urban Design (WSUD) features 		
5.	OSD Calculation Sheet is attached		

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

I								
Project:	UPRCT Handbook	< Demonst	tration E	xample				
Site Address	140 Marsden Stre	et, Parram	atta					
Job No:	a09477							
Designer:	TR							
°	(02) 9417 8400							
	(Si	ite Data			Auran Alla	C. Sang M
OSD Area:		Upper Parr			nent			
L.G.A		Parramatta			none			
Site Area		0.0258	ha	258	m ²			
Total Roof Area		0	ha	0	m ²			
Area of Site draining to O	SD Storage	0.0258	ha	258	m ²	Satisfactory		
Residual Site Area (Lot Ar	Ū	0.026	ha	100		outoriotory		
Area Bypassing Storage		0	ha					
Area Bypassing / Residua	al Site Area	0.0%	na			Satisfactory		30% Ma
No. of Dwellings on Site	il olici Alca	1				Satisfactory		50 70 1014
Site Area per Dwelling		0.026	ha			outistactory		
Roof Area per Dwelling		0.000	ha					
Roor Area per Dwennig		0.000	na					
		Ba	asic OS	SD Paran	neter	S	Sector States	
		Extended I	Detention	ı			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 T	ank Byp	ass	and an address of the second		
Residual Lot Capture in O	SD Tank	100%						
Residual Lot Capture in O Adjusted SRDs	ISD Tank		L/s/ha				150	L/s/ha
	SD Tank	100% 40		`alquiati			150	L/s/ha
	ISD Tank	100% 40	OSD C	alculatio	ons			L/s/ha
Adjusted SRDs		100% 40 Extended I	OSD C	a state of the second second second	ons	Tulou	Detention	
Adjusted SRDs Basic SSR Volume	Ext Detention Storage	100% 40 Extended I 7.74	OSD C Detention m ³	a state of the second second second	ons	Total Storage	Detention 11.74	m ³
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree	Ext Detention Storage	100% 40 Extended I	OSD C	a state of the second second second	ons		Detention 11.74 0.00	m ³ m ³
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume	Ext Detention Storage dits	100% 40 Extended I 7.74 0.00	OSD C Detention m ³ m ³	a state of the second second second	ons	Total	Detention 11.74 0.00 11.74	m ³ m ³ m ³
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume Storage Volume	Ext Detention Storage dits Ext Detention Storage	100% 40 Extended I 7.74 0.00 7.74	OSD C Detention m ³ m ³	a state of the second second second	ons	Total Flood Detention Storage	Detention 11.74 0.00 11.74 4.00	m ³ m ³ m ³ m ³
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume	Ext Detention Storage dits	100% 40 Extended I 7.74 0.00 7.74	OSD C Detention m ³ m ³	a state of the second second second	ons	Total	Detention 11.74 0.00 11.74	m ³ m ³ m ³
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume Storage Volume OSD Discharges	Ext Detention Storage dits Ext Detention Storage Primary Outlet	100% 40 Extended I 7.74 0.00 7.74 1.03	OSD C Detention m ³ m ³ L/s	a state of the second second second	ons	Total Flood Detention Storage	Detention 11.74 0.00 11.74 4.00 3.87	m ³ m ³ m ³ L/s
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume Storage Volume OSD Discharges RL of Top Water Level of	Ext Detention Storage dits Ext Detention Storage Primary Outlet	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720	OSD C Detention m ³ m ³ L/s m	a state of the second second second	ons	Total Flood Detention Storage	Detention 11.74 0.00 11.74 4.00 3.87 9.720	m ³ m ³ m ³ L/s m
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Crea Storage Volume Storage Volume OSD Discharges RL of Top Water Level of E RL of Orifice Centre-line	Ext Detention Storage dits Ext Detention Storage Primary Outlet	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950	OSD C Detention m ³ m ³ L/s m m	a state of the second second second	ons	Total Flood Detention Storage	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220	m ³ m ³ m ³ L/s m
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume OSD Discharges RL of Top Water Level of 3 RL of Orifice Centre-line Number of Orifices	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1	OSD C Detention m ³ m ³ L/s m m	1	ons	Total Flood Detention Storage	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1	m ³ m ³ m ³ L/s m m
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume Storage Volume OSD Discharges RL of Top Water Level of S RL of Orifice Centre-line Number of Orifices Estimated Downstream File	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1 7.95	OSD C Detention m ³ m ³ L/s m m 1.5 yr AF	। २।	ons	Total Flood Detention Storage Secondary Outlet	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1 9.22	m ³ m ³ m ³ L/s m m 100 yr ARI
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume Storage Volume OSD Discharges RL of Top Water Level of F RL of Orifice Centre-line Number of Orifices Estimated Downstream Fle Downstream FL - RL of Orifice	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1 7.95 0.00	OSD C Detention m ³ m ³ L/s m m 1.5 yr AF Satisfac	। २।		Total Flood Detention Storage Secondary Outlet Satisfactory	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1 9.222 0.00	m ³ m ³ m ³ L/s m m 100 yr ARI m
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume Storage Volume OSD Discharges RL of Top Water Level of F RL of Orifice Centre-line Number of Orifices Estimated Downstream Fle Downstream FL - RL of Or Design Head to Orifice Ce	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1 7.95 0.00 1.770	OSD C Detention m ³ m ³ L/s m m 1.5 yr AF Satisfac m	। २। ctory	τv	Total Flood Detention Storage Secondary Outlet Satisfactory VL Ext Detn Storage - RL Orifice	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1 9.222 0.00 0.500	m ³ m ³ m ³ L/s m m ▼ 100 yr ARI m m
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume Storage Volume OSD Discharges RL of Top Water Level of F RL of Orifice Centre-line Number of Orifices Estimated Downstream Fle Downstream FL - RL of Orifice	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1 7.95 0.00	OSD C Detention m ³ m ³ L/s m m 1.5 yr AF Satisfac	। २।	τv	Total Flood Detention Storage Secondary Outlet Satisfactory	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1 9.222 0.00	m ³ m ³ m ³ L/s m m 100 yr ARI m
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume Storage Volume OSD Discharges RL of Top Water Level of F RL of Orifice Centre-line Number of Orifices Estimated Downstream Fle Downstream FL - RL of Or Design Head to Orifice Ce	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage cood Level rifice Cente-line entre er	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1 7.95 0.00 1.770 19	OSD C Detention m ³ m ³ L/s m m 1.5 yr AF Satisfac m mm	र। ctory Satisfacto	τν ry	Total Flood Detention Storage Secondary Outlet Satisfactory VL Ext Detn Storage - RL Orifice	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1 9.222 0.00 0.500	m ³ m ³ m ³ L/s m m ▼ 100 yr ARI m m
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume Storage Volume OSD Discharges RL of Top Water Level of F RL of Orifice Centre-line Number of Orifices Estimated Downstream Fle Downstream FL - RL of Or Design Head to Orifice Ce	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage ood Level rifice Cente-line entre er	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1 7.95 0.00 1.770 19	OSD C Detention m ³ m ³ L/s m m 1.5 yr AF Satisfac m mm	र। ctory Satisfacto	τν ry	Total Flood Detention Storage Secondary Outlet Satisfactory VL Ext Detn Storage - RL Orifice Min Diam 25 mm	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1 9.222 0.00 0.500	m ³ m ³ m ³ L/s m m ▼ 100 yr ARI m m
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume OSD Discharges RL of Top Water Level of 3 RL of Orifice Centre-line Number of Orifices Estimated Downstream Flu Downstream FL - RL of Or Design Head to Orifice Ce Calculated Orifice Diameter	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage ood Level rifice Cente-line entre er Extre Floor Level	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1 7.95 0.00 1.770 19	OSD C Detention m ³ m ³ L/s m m 1.5 yr AF Satisfac m mm	र। ctory Satisfacto	τν ry	Total Flood Detention Storage Secondary Outlet Satisfactory VL Ext Detn Storage - RL Orifice Min Diam 25 mm	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1 9.22 0.00 0.500 51	m ³ m ³ m ³ L/s m m 100 yr ARI m m mm
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume Storage Volume OSD Discharges RL of Top Water Level of F RL of Orifice Centre-line Number of Orifices Estimated Downstream Fle Downstream FL - RL of Or Design Head to Orifice Ce Calculated Orifice Diameter	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage ood Level rifice Cente-line entre er Extre Floor Level	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1 7.95 0.00 1.770 19	OSD C Detention m ³ m ³ L/s m m 1.5 yr AF Satisfac m mm	र। ctory Satisfacto	τν ry	Total Flood Detention Storage Secondary Outlet Satisfactory VL Ext Detn Storage - RL Orifice Min Diam 25 mm	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1 9.220 1 9.22 0.00 0.500 51 19.100	m ³ m ³ m ³ L/s m m 100 yr ARI m m mm
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume Storage Volume OSD Discharges RL of Top Water Level of F RL of Orifice Centre-line Number of Orifices Estimated Downstream Fle Downstream FL - RL of Or Design Head to Orifice Ce Calculated Orifice Diameter RL of Minimum Habitable I RL of Minimum Garage Fle	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage ood Level rifice Cente-line entre er Extre Floor Level	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1 7.95 0.00 1.770 19	OSD C Detention m ³ m ³ L/s m m 1.5 yr AF Satisfac m mm	र। ctory Satisfacto	τν ry	Total Flood Detention Storage Secondary Outlet Satisfactory VL Ext Detn Storage - RL Orifice Min Diam 25 mm	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1 9.22 0.00 0.500 51 19.100 19.100	m ³ m ³ m ³ L/s m ▼ 100 yr ARI m m m m m m
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Crea Storage Volume Storage Volume OSD Discharges RL of Top Water Level of S RL of Orifice Centre-line Number of Orifices Estimated Downstream Fla Downstream FL - RL of Or Design Head to Orifice Ce Calculated Orifice Diameter RL of Minimum Habitable I RL of Minimum Garage Fla Length of Overflow Weir	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage ood Level rifice Cente-line entre er Ov Floor Level oor Level	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1 7.95 0.00 1.770 19	OSD C Detention m ³ m ³ L/s m m 1.5 yr AF Satisfac m mm	र। ctory Satisfacto	τν ry	Total Flood Detention Storage Secondary Outlet Satisfactory VL Ext Detn Storage - RL Orifice Min Diam 25 mm	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1 9.22 0.00 0.500 51 19.100 19.100 1.80	m ³ m ³ m ³ L/s m ▼ 100 yr ARI m m m m m m
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Cree Storage Volume Storage Volume OSD Discharges RL of Top Water Level of F RL of Orifice Centre-line Number of Orifices Estimated Downstream Fle Downstream FL - RL of Or Design Head to Orifice Ce Calculated Orifice Diameter RL of Minimum Habitable I RL of Minimum Garage Fle Length of Overflow Weir Site Runoff Coefficient	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage ood Level rifice Cente-line entre er Ov Floor Level oor Level	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1 7.95 0.00 1.770 19	OSD C Detention m ³ m ³ L/s m m 1.5 yr AF Satisfac m mm	र। ctory Satisfacto	τν ry	Total Flood Detention Storage Secondary Outlet Satisfactory VL Ext Detn Storage - RL Orifice Min Diam 25 mm	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1 9.220 1 9.222 0.00 0.500 51 19.100 19.100 19.100 1.80 0.75	m ³ m ³ m ³ L/s m ▼ 100 yr ARI m m m m m m
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Crea Storage Volume Storage Volume OSD Discharges RL of Top Water Level of S RL of Orifice Centre-line Number of Orifices Estimated Downstream Fla Downstream FL - RL of Or Design Head to Orifice Ce Calculated Orifice Diameter RL of Minimum Habitable I RL of Minimum Habitable I RL of Minimum Garage Fla Length of Overflow Weir Site Runoff Coefficient Storm Intensity (5 min 100	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage ood Level rifice Cente-line entre er Ov Floor Level oor Level	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1 7.95 0.00 1.770 19	OSD C Detention m ³ m ³ L/s m m 1.5 yr AF Satisfac m mm	र। ctory Satisfacto	τν ry	Total Flood Detention Storage Secondary Outlet Satisfactory VL Ext Detn Storage - RL Orifice Min Diam 25 mm	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1 9.222 0.00 0.500 51 9.22 0.00 0.500 51	m ³ m ³ m ³ L/s m ▼ 100 yr ARI m m m m m m m m m
Adjusted SRDs Basic SSR Volume Total Rainwater Tank Crea Storage Volume OSD Discharges RL of Top Water Level of 3 RL of Orifice Centre-line Number of Orifices Estimated Downstream Flu Downstream FL - RL of Or Design Head to Orifice Ce Calculated Orifice Diameter RL of Minimum Habitable I RL of Minimum Garage Flo Length of Overflow Weir Site Runoff Coefficient Storm Intensity (5 min 100 Peak Flow over Weir	Ext Detention Storage dits Ext Detention Storage Primary Outlet Storage ood Level rifice Cente-line entre er Ov Floor Level oor Level	100% 40 Extended I 7.74 0.00 7.74 1.03 9.720 7.950 1 7.95 0.00 1.770 19	OSD C Detention m ³ m ³ L/s m m 1.5 yr AF Satisfac m mm	र। ctory Satisfacto	τν ry	Total Flood Detention Storage Secondary Outlet Satisfactory VL Ext Detn Storage - RL Orifice Min Diam 25 mm	Detention 11.74 0.00 11.74 4.00 3.87 9.720 9.220 1 9.22 0.00 0.500 51 9.22 0.00 0.500 51 19.100 19.100 19.100 1.80 0.75 227 12.2	m ³ m ³ m ³ L/s m m ▼ 100 yr ARI m m m m m m m m m

DARRON RITCHE

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18/02/10

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

Project: Site Address Job No:	UPRCT Handbook							
		Demonst	ration E	xample				
Job No:	140 Marsden Stree	t, Parram	atta					
	a09477							
Designer:	TR							
Telephone:	(02) 9417 8400							
		New Print	S	ite Data				
OSD Area:		Upper Parr	amatta F	River Catchm	ent			
L.G.A		Parramatta						
Site Area		0.4642	ha	4,642	m ²			
Total Roof Area		0.4558	ha	4,558	m ²			
Area of Site draining to	o OSD Storage	0.4642	ha	4,642	m ²	Satisfactory		
Residual Site Area (Lot Area - Roof Area) Area Bypassing Storage		0.008	ha					
		0	ha					
Area Bypassing / Resi	dual Site Area	0.0%				Satisfactory		30% Ma
No. of Dwellings on Si						Satisfactory		
Site Area per Dwelling		0.464	ha					
Roof Area per Dwelling	g	0.456	ha					
				SD Param	eters			
		Extended [ı			Detention	2
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
				ank Bypa	ee			
Regidual Let Capture i	n OSD Tank	100%	0301	апк Бура	33			
Residual Lot Capture i Adjusted SRDs	II OSD Talik	40	L/s/ha				150	L/s/ha
Aujusted SNDS		40	L/3/11a				150	L/S/IId
Law Strategies	and the second second		OSD C	Calculatio	ns	A CONTRACTOR OF THE OWNER	Salar and	and the second
		Extended [Detentior	1			Detention	
Basic SSR Volume	Ext Detention Storage	139.26	m ³			Total Storage	211.21	m ³
Total Rainwater Tank	Credits	0.00	m ³				0.00	m ³
Storage Volume						Total	211.21	m ³
Storage Volume	Ext Detention Storage	139.26	m ³			Flood Detention Storage	71.95	m ³
		10	L/s					
OSD Discharges	Primary Outlet	18.57	L/S			Secondary Outlet	69.63	L/s
OSD Discharges	Primary Outlet	18.57	L/S			Secondary Outlet	69.63	L/s
OSD Discharges RL of Top Water Level		18.57	m			Secondary Outlet	69.63 17.300	L/s m
-	of Storage		m			Secondary Outlet	17.300 15.900	
RL of Top Water Level	of Storage	16.870	m			Secondary Outlet	17.300	m
RL of Top Water Level RL of Orifice Centre-Iir	of Storage	16.870 15.900	m	RI		Secondary Outlet	17.300 15.900	m
RL of Top Water Level RL of Orifice Centre-lin Number of Orifices	of Storage ne	16.870 15.900 1	m m ▼			Secondary Outlet	17.300 15.900 1	m m v
RL of Top Water Level RL of Orifice Centre-lir Number of Orifices Estimated Downstrean	l of Storage ne n Flood Level f Orifice Cente-line	16.870 15.900 1 7.95	m T.5 yr Al		TWL	Г	17.300 15.900 1 9.22	m w 100 yr ARI
RL of Top Water Level RL of Orifice Centre-lir Number of Orifices Estimated Downstrean Downstream FL - RL o	of Storage ne n Flood Level f Orifice Cente-line c Centre	16.870 15.900 1 7.95 -7.95	m ▼ 1.5 yr Al Satisfa			Satisfactory	17.300 15.900 1 9.22 -6.68	m m Joo yr ARI m
RL of Top Water Level RL of Orifice Centre-lin Number of Orifices Estimated Downstrean Downstream FL - RL o Design Head to Orifice	of Storage ne n Flood Level f Orifice Cente-line Centre meter	16.870 15.900 1 7.95 -7.95 0.970 95	m ▼ 1.5 yr Al Satisfa m mm	ctory Satisfactor	/	Satisfactory Ext Detn Storage - RL Orifice Satisfactory	17.300 15.900 1 9.22 -6.68 0.970	m m 100 yr ARI m m
RL of Top Water Level RL of Orifice Centre-lin Number of Orifices Estimated Downstrean Downstream FL - RL o Design Head to Orifice Calculated Orifice Diar	l of Storage ne n Flood Level f Orifice Cente-line Centre meter	16.870 15.900 1 7.95 -7.95 0.970 95	m ▼ 1.5 yr Al Satisfa m mm	ctory	/	Satisfactory Ext Detn Storage - RL Orifice Satisfactory	17.300 15.900 1 9.22 -6.68 0.970 184	m m 100 yr ARI m m mm
RL of Top Water Level RL of Orifice Centre-lin Number of Orifices Estimated Downstream Downstream FL - RL o Design Head to Orifice Calculated Orifice Diar	l of Storage ne n Flood Level f Orifice Cente-line Centre meter Ov ble Floor Level	16.870 15.900 1 7.95 -7.95 0.970 95	m ▼ 1.5 yr Al Satisfa m mm	ctory Satisfactor	/	Satisfactory Ext Detn Storage - RL Orifice Satisfactory	17.300 15.900 1 9.22 -6.68 0.970 184 19.100	m m 100 yr ARI m m mm
RL of Top Water Level RL of Orifice Centre-lin Number of Orifices Estimated Downstrean Downstream FL - RL o Design Head to Orifice Calculated Orifice Diar	of Storage ne n Flood Level f Orifice Cente-line c Centre neter Ov ble Floor Level a Floor Level	16.870 15.900 1 7.95 -7.95 0.970 95	m ▼ 1.5 yr Al Satisfa m mm	ctory Satisfactor	/	Satisfactory Ext Detn Storage - RL Orifice Satisfactory	17.300 15.900 1 9.22 -6.68 0.970 184	m m 100 yr ARI m m mm
RL of Top Water Level RL of Orifice Centre-lin Number of Orifices Estimated Downstream Downstream FL - RL o Design Head to Orifice Calculated Orifice Diar RL of Minimum Habital RL of Minimum Garage	l of Storage ne n Flood Level f Orifice Cente-line c Centre meter Ov ble Floor Level e Floor Level eir	16.870 15.900 1 7.95 -7.95 0.970 95	m ▼ 1.5 yr Al Satisfa m mm	ctory Satisfactor	/	Satisfactory Ext Detn Storage - RL Orifice Satisfactory	17.300 15.900 1 9.22 -6.68 0.970 184 19.100 19.100	m m 100 yr ARI m m mm
RL of Top Water Level RL of Orifice Centre-lin Number of Orifices Estimated Downstream Downstream FL - RL o Design Head to Orifice Calculated Orifice Diar RL of Minimum Habitat RL of Minimum Garage Length of Overflow We	l of Storage he n Flood Level f Orifice Cente-line c Centre neter Ov ble Floor Level e Floor Level e Floor Level eir	16.870 15.900 1 7.95 -7.95 0.970 95	m ▼ 1.5 yr Al Satisfa m mm	ctory Satisfactor	/	Satisfactory Ext Detn Storage - RL Orifice Satisfactory Culation	17.300 15.900 1 9.22 -6.68 0.970 184 19.100 19.100 1.80	m m 100 yr ARI m m mm
RL of Top Water Level RL of Orifice Centre-lin Number of Orifices Estimated Downstream Downstream FL - RL o Design Head to Orifice Calculated Orifice Diar RL of Minimum Habital RL of Minimum Garage Length of Overflow We Site Runoff Coefficient	l of Storage he n Flood Level f Orifice Cente-line c Centre neter Ov ble Floor Level e Floor Level e Floor Level eir	16.870 15.900 1 7.95 -7.95 0.970 95	m ▼ 1.5 yr Al Satisfa m mm	ctory Satisfactor	/	Satisfactory Ext Detn Storage - RL Orifice Satisfactory Culation	17.300 15.900 1 9.22 -6.68 0.970 184 19.100 19.100 1.80 0.75	m m 100 yr ARI m m mm
RL of Top Water Level RL of Orifice Centre-lin Number of Orifices Estimated Downstream Downstream FL - RL o Design Head to Orifice Calculated Orifice Diar RL of Minimum Habitat RL of Minimum Garage Length of Overflow We Site Runoff Coefficient Storm Intensity (5 min	l of Storage ne n Flood Level f Orifice Cente-line c Centre meter Ov ble Floor Level e Floor Level e Floor Level eir 100 yr ARI)	16.870 15.900 1 7.95 -7.95 0.970 95	m ▼ 1.5 yr Al Satisfa m mm	ctory Satisfactor	/	Satisfactory Ext Detn Storage - RL Orifice Satisfactory Culation	17.300 15.900 1 9.22 -6.68 0.970 184 19.100 19.100 1.80 0.75 227	m m 100 yr ARI m m mm m m m
RL of Top Water Level RL of Orifice Centre-lin Number of Orifices Estimated Downstream Downstream FL - RL o Design Head to Orifice Calculated Orifice Diar RL of Minimum Habital RL of Minimum Garage Length of Overflow We Site Runoff Coefficient Storm Intensity (5 min Peak Flow over Weir	l of Storage ne n Flood Level f Orifice Cente-line Centre meter Ov ble Floor Level e Floor Level e Floor Level eir 100 yr ARI)	16.870 15.900 1 7.95 -7.95 0.970 95	m ▼ 1.5 yr Al Satisfa m mm	ctory Satisfactor	/	Satisfactory Ext Detn Storage - RL Orifice Satisfactory Culation	17.300 15.900 1 9.22 -6.68 0.970 184 19.100 19.100 19.100 1.80 0.75 227 219.5	m m 100 yr ARI m m m m m m m L/s
RL of Top Water Level RL of Orifice Centre-lin Number of Orifices Estimated Downstream Downstream FL - RL o Design Head to Orifice Calculated Orifice Diar RL of Minimum Habitat RL of Minimum Garage Length of Overflow We Site Runoff Coefficient Storm Intensity (5 min Peak Flow over Weir Depth of Flow over We	l of Storage ne n Flood Level f Orifice Cente-line c Centre meter Ov ble Floor Level e Floor Level e Floor Level e Floor Level e Floor ARI)	16.870 15.900 1 7.95 -7.95 0.970 95	m ▼ 1.5 yr Al Satisfa m mm	ctory Satisfactor	/	Satisfactory Ext Detn Storage - RL Orifice Satisfactory Culation	17.300 15.900 1 9.22 -6.68 0.970 184 19.100 19.100 19.100 1.80 0.75 227 219.5 177	m m 100 yr ARI m m m m m m m m j j j j j j j j j j j
RL of Top Water Level RL of Orifice Centre-lin Number of Orifices Estimated Downstream Downstream FL - RL o Design Head to Orifice Calculated Orifice Diar RL of Minimum Habitat RL of Minimum Garage Length of Overflow We Site Runoff Coefficient Storm Intensity (5 min Peak Flow over Wei Freeboard to Habitable	l of Storage ne n Flood Level f Orifice Cente-line c Centre meter Ov ble Floor Level e Floor Level e Floor Level e Floor Level e Floor ARI)	16.870 15.900 1 7.95 -7.95 0.970 95	m ▼ 1.5 yr Al Satisfa m mm	ctory Satisfactor	/	Satisfactory Ext Detn Storage - RL Orifice Satisfactory Culation Parramatta City Council Satisfactory	17.300 15.900 1 9.22 -6.68 0.970 184 19.100 19.100 19.100 1.80 0.75 227 219.5 177 1623	m m 100 yr ARI m m m m m m m m t/s mm m m
RL of Top Water Level RL of Orifice Centre-lin Number of Orifices Estimated Downstream Downstream FL - RL o Design Head to Orifice Calculated Orifice Diar RL of Minimum Habital RL of Minimum Garage Length of Overflow We Site Runoff Coefficient Storm Intensity (5 min Peak Flow over Weir Depth of Flow over We Freeboard to Habitable Freeboard to Garage F	l of Storage ne n Flood Level f Orifice Cente-line c Centre meter Ov ble Floor Level e Floor Level e Floor Level e Floor Level e Floor ARI)	16.870 15.900 1 7.95 -7.95 0.970 95	m ▼ 1.5 yr Al Satisfa m mm	ctory Satisfactor	/	Satisfactory Ext Detn Storage - RL Orifice Satisfactory Culation Parramatta City Council Satisfactory	17.300 15.900 1 9.22 -6.68 0.970 184 19.100 19.100 19.100 1.80 0.75 227 219.5 177 1623	m m 100 yr ARI m m m m m m m m m m m m m m m m m m m

DAREEN RITCHIE

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UPRCT Calculation Sheet V9 Web Option 3 FL1890 Rev 4.xls