STORMWATER MANAGEMENT PLAN (FOR DA) PROPOSED RESIDENCE LOT 42, No.7 BRIGHTON STREET, CURL CURL

GENERAL NOTES

- 1. FINAL LOCATION OF NEW DOWNPIPES TO BE DETERMINED BY BUILDER/ARCHITECT AT TIME OF CONSTRUCTION.
- 2. THESE DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTS AND OTHER CONSULTANTS DRAWINGS. ANY DISCREPANCIES TO BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH WORK
- 3. ALL MATERIALS AND WORKMANSHIP TO BE IN ACCORDANCE WITH AS/NZS 3500.3:2003 STORMWATER DRAINAGE, BCA AND LOCAL COUNCIL POLICY/CONSENT/REQUIREMENTS.
- 4. ALL DIMENSIONS AND LEVELS TO BE VERIFIED BY BUILDER ON-SITE PRIOR TO COMMENCEMENT OF WORKS. THESE DRAWINGS ARE NOT TO BE SCALED FOR DIMENSIONS NOR TO BE USED FOR SETOUT PURPOSES.
- 5. ALL SURVEY INFORMATION AND PROPOSED BUILDING AND FINISHED SURFACE LEVELS SHOWN IN THESE DRAWINGS ARE BASED ON LEVELS OBTAINED FROM DRAWINGS BY OTHERS

- 6. ALL STORMWATER DRAINAGE PIPES ARE TO BE uPVC AT MINIMUM 1% GRADE UNLESS NOTED OTHERWISE.
- 7. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND LEVEL ALL EXISTING SERVICES OR OTHER STRUCTURES WHICH MAY AFFECT/BE AFFECTED BY THIS DESIGN PRIOR TO COMMENCEMENT
- 8. ALL PITS WITHIN DRIVEWAYS TO BE 150mm THICK CONCRETE OR EQUAL
- 9. THIS PLAN IS THE PROPERTY OF DONOVAN ASSOCIATES AND MAY NOT BE USED OR REPRODUCED WITHOUT WRITTEN PERMISSION FROM DONOVAN ASSOCIATES

PLAN SPECIFIC NOTES

- 1. ROOF DRAINAGE NOTE: AS 3500 ROOF DRAINAGE REQUIRES EAVES GUTTERS TO BE SIZED FOR 20 YEAR 5 MIN. STORM = 205mm/hr. FOR EAVES GUTTERS, AS 3500.3:2003 THEN HAS THE FOLLOWING REQUIREMENTS:
- i) FOR TYPICAL STANDARD QUAD GUTTER WITH Ae = 6000mm² AND GUTTER SLOPE 1:500 AND STEEPER, THIS REQUIRES ONE DOWNPIPE PER 30m² ROOF AREA
- ii) DOWNPIPES TO BE MINIMUM 90mm DIA. OR 100 x 50mm FOR GUTTERS SLOPE 1:500 AND STEPPER.
- iii) OVERFLOW METHOD TO FIGURE G1 OF AS 3500.3:2003 IT IS THE RESPONSIBILITY OF THE PLUMBER AND / OR BUILDER TO COMPLY WITH THIS THIS DRAWING SHOWS PRELIMINARY LOCATIONS / NUMBERS OF DOWNPIPES ONLY WHICH ARE TO BE VERIFIED BY BUILDER / PLUMBER
- 2. TREE PRESERVATION: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ANY PRIOR APPROVAL REQUIRED FROM COUNCIL WITH RESPECT TO POTENTIAL IMPACT ON TREES FOR ANY WORKS SHOWN ON THIS DRAWING PRIOR TO THE COMMENCEMENT OF THOSE WORKS
- 3. ALL ROOF GUTTERS TO HAVE OVERFLOW PROVISION IN ACCORDANCE WITH AS 3500.3:2003 AND SECTIONS 3.5.3, 3.7.5 AND APPENDIX G OF AS
- 4. THIS DRAWING IS NOT TO BE USED FOR SET-OUT PURPOSES REFER TO ARCHITECTURAL DRAWINGS
- 5. LOCATION OF SURFACE STORMWATER GRATED INLET PITS MAY BE VARIED OR NEW PITS INSTALLED AT THE CONSTRUCTION STAGE PROVIDED DESIGN INTENT OF THIS DRAWING IS MAINTAINED

(GRATED TRENCH DRAIN	LEGEND		SURFACE INLET PIT
	ABSORPTION TRENCH			SURFACE INLET PIT (WITH ENVIROPOD 200 MICRON)
─	PROPOSED ROOF GUTTER FALL		00	ACCESS GRATE
⊢● SP	PROPOSED DOWNPIPE SPREADER			(WITH ENVIROPOD 200 MICRON)
	IWATER PIPE 100mm DIA. MIN. UNO	STORM	450 X 450	450 SQUARE INTERVAL
—_a—_a—_	SUBSOIL PIPE		SL 75.50	GRATE LEVEL = 75.50
_ _ sw	EXISTING STORMWATER PIPE		IL 75.20	INVERT LEVEL = RL 75.20
• IR	INSPECTION RISER		DP 90	PROPOSED DOWNPIPE 90mm DIA. OR 100mm x 50mm MIN.
RWH	RAINWATER HEAD		× 10.00	NATURAL GROUND FINISHED

DRAINAGE NOTES

PIPE SIZE:

THE MINIMUM PIPE SIZE SHALL BE-

- 90mm DIA WHERE THE LINE ONLY RECEIVES ROOFWATER RUNOFF; OR 100mm DIA WHERE THE LINE RECEIVES RUNOFF FROM PAVED OR. UNPAVED AREAS ON THE PROPERTY
- THE MINIMUM PIPE VELOCITY SHOULD BE 0.6 m/s AND A MAXIMUM PIPE VELOCITY OF 6.0 m/s DURING THE DESIGN STORM

THE MINIMUM PIPE GRADE SHALL BE:

- 1.0% FOR PIPES LESS THAN 225mm DIA (UNO)
- 0.5% FOR ALL LARGER PIPES (UNO)

PIPES WITH A GRADIENT GREATER THAN 20% WILL REQUIRE ANCHOR BLOCKS AT THE TOP AND BOTTOM OF THE INCLINED SECTION; AND AT INTERVALS NOT

ANCHOR BLOCKS ARE DESIGNED ACCORDING TO CLAUSE 3.5.3 OF AS3500.3-1990

DEPTH OF COVER FOR PVC PIPES:

LOCATION	MINIMUM COVER
NOT SUBJECT TO VEHICLE LOADING	100mm SINGLE RESIDENTIAL 300mm ALL OTHER DEVELOPMENTS
SUBJECT TO VEHICLE LOADING UNDER A SEALED ROAD UNSEALED ROAD PAVED DRIVEWAY	450mm WHERE NOT IN A ROAD 600mm 750mm 100mm PLUS DEPTH OF CONCRETE

SEE AS2032 INSTALLATION OF UPVC PIPES FOR FURTHER INFORMATION.

CONCRETE PIPE COVER SHALL BE IN ACCORDANCE WITH AS3725-1989 LOADS ON BURIED CONCRETE PIPES. HOWEVER A MINIMUM COVER OF 450mm WILL APPLY.

WHERE INSUFFICIENT COVER IS PROVIDED, THE PIPE SHALL BE COVERED AT LEAST 50mm THICK OVERLAY AND SHALL THEN BE PAVED WITH AT LEAST: 150mm REINFORCED CONCRETE WHERE SUBJECT TO HEAVY VEHICLE

- 75mm THICKNESS OF BRICK OR 100mm OF CONCRETE PAVING WHERE SUBJECT TO LIGHT VEHICLE TRAFFIC: OR
- 50mm THICK BRICK OR CONCRETE PAVING WHERE NOT SUBJECT TO VEHICLE TRAFFIC

CONNECTIONS TO STORMWATER DRAINS UNDER BUILDINGS:

SHALL BE CARRIED OUT IN ACCORDANCE WITH SECTION 3.10 OF AS3500.3-1990

CONNECTIONS TO COUNCIL SYSTEM:

IF PROPOSED DRAINAGE SYSTEM IS DESIGNED TO CONNECT TO COUNCIL'S DRAINAGE SYSTEM IT IS ADVISED THAT A 'WORKS PERMIT' IS OBTAINED FROM THE RESPECTIVE COUNCIL PRIOR TO COMMENCEMENT OF WORKS

ABOVE GROUND PIPEWORK:

SHALL BE CARRIED OUT IN ACCORDANCE WITH SECTION 6 OF AS3500.3-1990

PIT SIZES AND DESIGN:

DEPTH (mm)	MINIMUM PIT SIZE (mm)
UP TO 450mm	450 x 450
450mm TO to 600mm	600 x 600
600mm TO 900mm	600 x 900
900mm TO 1500mm	900 x 900 (WITH STEP IRONS)
1500mm TO 2000mm	1200 x 1200 (WITH STEP IRONS)

ALL PIPES SHOULD BE CUT FLUSH WITH THE WALL OF THE PIT.

PITS GREATER THAN 600mm DEEP SHALL HAVE A MINIMUM ACCESS OPENING OF 600 x 600mm

THE GRATED COVERS OF PITS LARGER THAN 600 x 600mm ARE TO BE HINGED TO PREVENT THE GRATE FROM FALLING INTO THE PIT.

THE BASE OF THE DRAINAGE PITS SHOULD BE AT THE SAME LEVEL AS THE INVERT OF THE OUTLET PIPE. RAINWATER SHOULD NOT BE PERMITTED TO POND WITHIN THE STORMWATER SYSTEM

TRENCH DRAINS:

CONTINUOUS TRENCH DRAINS ARE TO BE OF WIDTH NOT LESS THAN 150mm AND DEPTH NOT LESS THAN 100mm. THE BARS OF THE GRATING ARE TO BE PARALLEL TO THE DIRECTION OF SURFACE FLOW.

PITS BETWEEN 1.2m AND 6m ARE TO HAVE STEP IRONS IN ACCORDANCE WITH AS1657. FOR PITS GREATER THAN 6m OTHER MEANS OF ACCESS MUST BE PROVIDED.

PVC PITS WILL ONLY BE PERMITTED IF THEY ARE NOT A GREATER SIZE THAN 450 x 450mm (MAXIMUM DEPTH 450mm) AND ARE HEAVY DUTY

IN-SITU PITS:

IN-SITU PITS ARE TO BE CONSTRUCTED ON A CONCRETE BED OF AT LEAST 150mm THICK. THE WALLS ARE TO BE DESIGNED TO MEET THE MINIMUM REQUIREMENTS OF CLAUSE 4.6.3 OF AS3500.4-1990. PITS DEEPER THAN 1.8m SHALL BE CONSTRUCTED WITH REINFORCED CONCRETE.

GRATES ARE TO BE GALVANISED STEEL GRID TYPE. GRATES ARE TO BE OF HEAVY-DUTY TYPE IN AREAS WHERE THEY MAY BE SUBJECT TO VEHICLE LOADING.

18/04/19



NCORPORATED ENGSURVEY PTY LTD ABN: 84 134 616 078 PH/ 02 9806 3000 F/ 02 9891 2806 F/ admine 15 PARKES STREET PARRAMATTA NSW 2150

RAWING TITLE:
DETAILS, NOTES & LEGEND
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RAWN	DATE	DESCRIPTION	ISSUE	FOR
R.P.	18.04.2019	ISSUED FOR DA	А	CHAMPION HOMES PTY LTD
				SITE ADDRESS:
				LOT 42, No. 7
				BRIGHTON STREET
PROJECT		PROPOSED RESIDENCE		CURL CURL

SCOTT SHARMA. M.I.E. Aust.

DESIGNED BY:		S.S	ISSUE
CHECKED BY:		S.S	Λ
SCALE		-	A
SHEET SIZE		А3	SHEET No.
CLIENT REF. DF		RAWING No.	
4066N E		309591	D1

AREA CALCULATIONS								
TOTAL SITE AREA 347.8 m²								
EXISTING DEVELOPMENT								
ROOF AREA	84.1	m²						
PAVED AREA	50.7	m²						
DRIVEWAY AREA	29.0	m²						
IMPERVIOUS AREA	163.8	m²						
TOTAL IMPERVIOUS AREA PERCENTAGE	47.10%							
PROPOSED DEVELOPMENT								
PROPOSED ROOF AREA	148.5	m²						
PROPOSED PAVED AREA	1.9	m²						
PROPOSED DRIVEWAY AREA	24.4	m²						
TOTAL IMPERVIOUS AREA	174.8	m²						
TOTAL IMPERVIOUS AREA PERCENTAGE	50.26%							

NOTE: ENSURE ANY PROPOSED PAVING IS GRADED SO THAT IT IS NOT IMPACTING ADJOINING PROPERTIES.

INSPECTION RISER (IR)

PROVIDE 'SCREW CAP' INSPECTION RISER AT LOWEST POINT OF 'CHARGED LINES'

COMBINED RE-USE/OSD TANK

(AS PER BASIX & COUNCIL REQUIREMENTS)

SIZE: 2 x 4,390 LITRES
MODLINE TANK BY "KINGSPAN WATER" OR SIMILAR
(2100L x 1100W x 2020H)
INSTALL TO MANUFACTURES SPECIFICATIONS, AS3500 AND
COUNCIL REQUIREMENTS

- FOR RE-USE AS PER BASIX CERTIFICATE & MUST BE RE-USED FOR TOILET, LAUNDARY, AND IRRIGATION SYSTEMS
- ENSURE TOP OF TANK IS MIN 1.00m BELOW ROOF GUTTERS TO ENSURE SUFFICIENT HEAD FOR THE SYSTEM
- TANK TO BE INSTALLED BY LICENSED PLUMBER IN ACCORDANCE WITH AS/NZS 3500:2003 AND NSW CODE OF PRACTICE PLUMBING AND DRAINAGE 2006

OSD WARRANT

LGA: - WARRINGAH COUNCIL

RELEVANT CODE - "2.1 PLANNING AND DESIGN - APPLICATIONS"

OSD REQUIRED WHERE THE TOTAL EXISTING AND PROPOSED IMPERVIOUS AREAS EXCEED 40% OF THE SITE AREA

- SITE AREA 347.8m²
- PRE-DEV IMPERVIOUS AREA
 163.8m² (47.10%)
- POST-DEV IMPERVIOUS AREA 174.8m² (50.26%)

THEREFORE >40% POST-DEV IMPERVIOUS AREA
OSD REQUIRED

OSD CALCULATIONS

LGA: WARRINGAH COUNCIL
RELEVANT CODE: "ON-SITE TECHNICAL SPECIFICATION 2012"

- 20% UN-DEV PSD = 13.0 L/s
- 1% POST-DEV PSD
- TO BY-PASS OSD = 12.0 L/s

THEREFORE, LIMIT THE DISCHARGE FROM THE OSD TO 1.0 L/s (13.0 L/s - 12.0 L/s)

"DRAINS" MODEL OSD VOLUME = 8.4m³
RAINWATER OFFSET FROM BASIX = 3.0m³
MAXIMUM OFFSET FOR OSD (50%) = 4.2m³

HENCE, PROVIDE OSD VOLUME OF 5.4m3

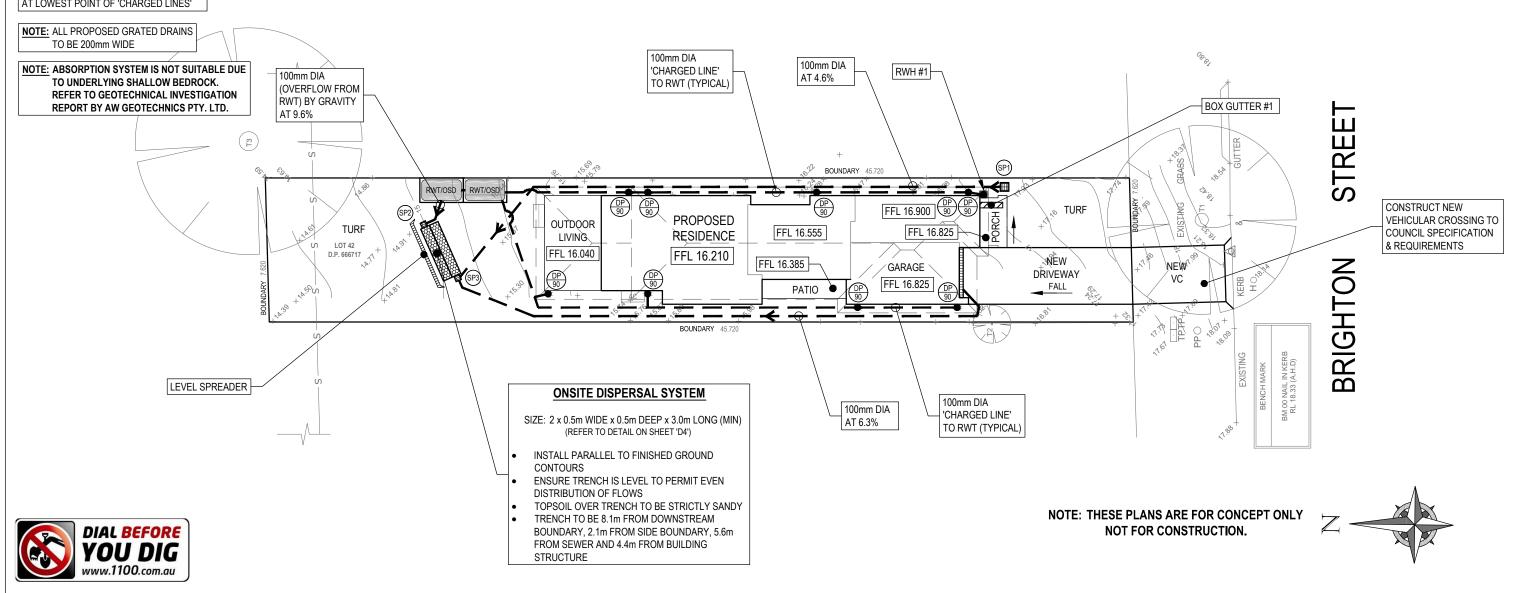
PIT SCHEDULE (U.N.O)								
PIT No.	PIT TYPE	PIT SIZE	SURFACE	INVERT				
			LEVEL	LEVEL				
SP1	GRATED INLET	450 x 450	16.67	16.22				
SP2	GRATED INLET	300 x 300	15.00	14.70				
SP3	GRATED INLET	300 x 300	15.08	14.78				

BOX GUTTER DRAINAGE

- RAINWATER HEAD SUMP #1 250mm x 150mm x 350mm DEPTH

RWH (EXTERNAL) -

NOTE: ALL RAINHEADS TO HAVE OVERFLOW SLOT 50mm LOWER THAN TOP OF BOX GUTTER





ASSOCIATES

INCORPORATED ENGSURVEY PTY LTD ABN: 84 134 616 078
PH/ 02 9806 3000 F/ 02 9891 2806 E/ admineng@donovanassociates.com.au
1.5 PARKES STREET PARRAMATTA NSW 2.1.50

STORMWATER MANAGEMENT PLAN

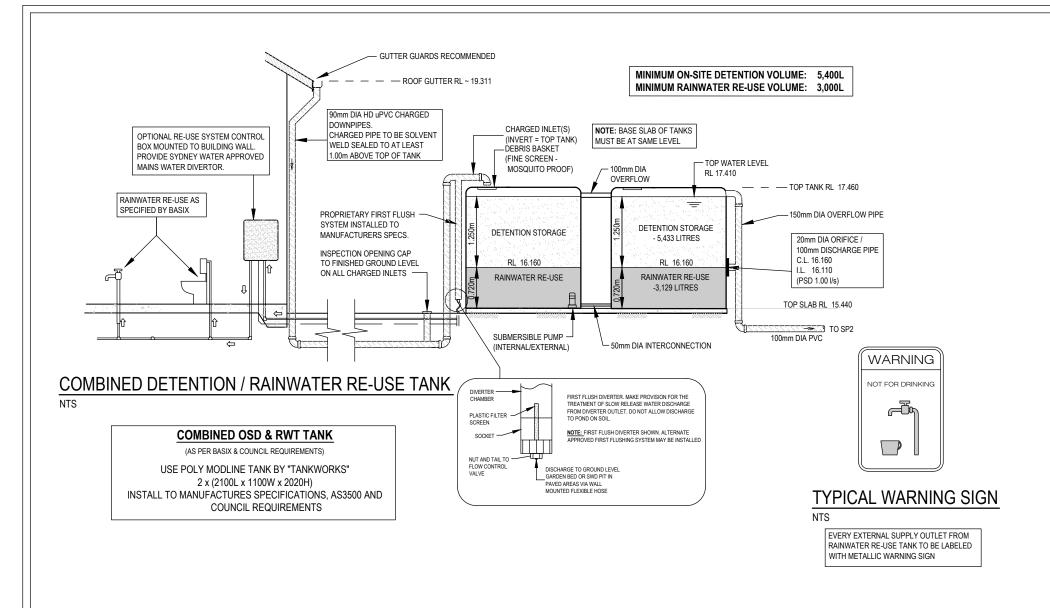
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DRAWN	DATE	DESCRIPTION	ISSUE	FOR
R.P.	18.04.2019	ISSUED FOR DA	Α	CHAMPION HOMES PTY LTD
				SITE ADDRESS:
				LOT 42, No. 7
				BRIGHTON STREET
PROJECT		PROPOSED RESIDENCE		CURL CURL
	R.P.	R.P. 18.04.2019	R.P. 18.04.2019 ISSUED FOR DA	R.P. 18.04.2019 ISSUED FOR DA A

APPROVED BY:

SCOTT SHARMA. M.I.E. Aust.

	DESIGNED BY:		S.S	ISSUE		
_			CHECKED BY:		S.S	•
	SCALE		1:200	A		
	SHEET SIZE		A3	SHEET No.		
	CLIENT REF.	DF	RAWING No.			
			309591	D2		



ORIFICE PLATE SIZE CALCULATIONS

Discharge Orifice Design

 $Q(m_3/s) = C_d A_o (2gh)^{1/2}$

 $C_d = 0.6$ (Assumed) A_o= area of orifice

h = head to centre of orifice

Head to orifice centre = 1.25 m 1.00 L/s PSD =

 0.000 m^2 Area of orifice =

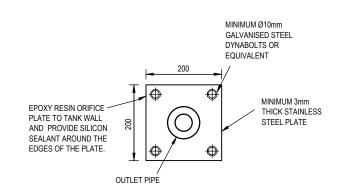
Diameter of orifice = 20.7 mm diameter

> 0.002 m^2 Area of plate =

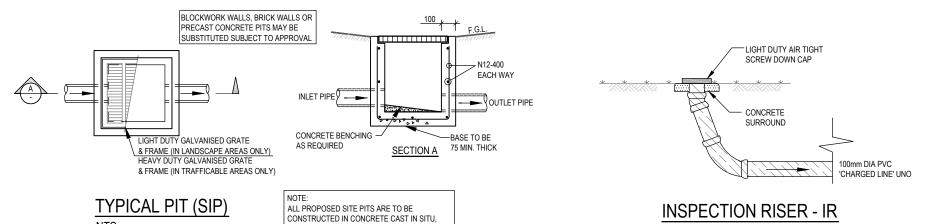
5 times area of orifice

Each side (minimum) = 0.041 m

Dimension of Orifice Plate = 41 mm (min. Adopt 200mm x 200m square plate)



ORIFICE PLATE DETAIL



* - REFER TO STORMWATER PLAN ON DRAWING D2 M DUTY GALVANISED FOR GRATE WIDTH GRATING 125mm THICK SLAB CONCRETE TRENCH WITH N72 TOP MESH -'K' JOINT GALVANISED STEEL GRATING MAY BE SUBSTITUTED FOR U.V STABILISED POLYPROPYLENE U CHANNEL & GRATE SUBJECT TO ENGINEERS APPROVAL

GRATED DRAIN

APPROVED BY

SCOTT SHARMA. M.I.E. Aust.



15 PARKES STREET PARRAMATTA NSW 2150

PH/ 02 9806 3000 F/ 02 9891 2806 E/ admine

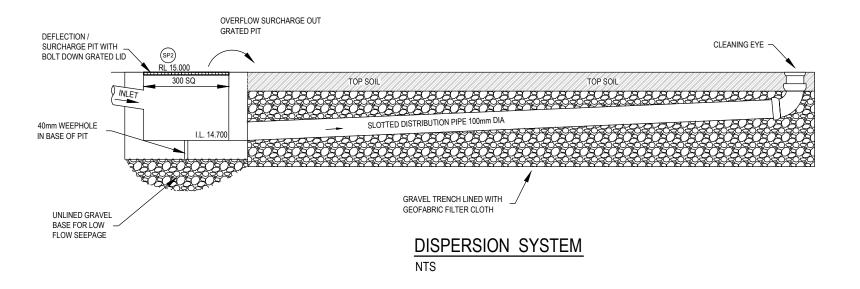
STORMWATER

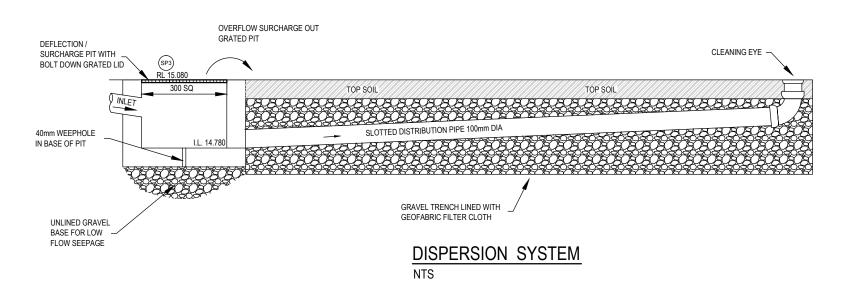
DETAILS

PLASTIC OR BRICK PITS ARE NOT ACCEPTABLE. HOWEVER, 'COUNCIL MAY CONSIDER PRE-CAST UNITS IF THE UNITS ARE PLACED ON A SOLID BASE OF GRAVEL OR CONCRETE OF 75mm THICK AND BACKFILL UP TO HALF THE DEPTH OF THE PIT SURROUND WITH CONCRETE.

DRAWN	DATE	DESCRIPTION	ISSUE	FOR
R.P.	18.04.2019	ISSUED FOR DA	Α	CHAMPION HOMES PTY LTD
				SITE ADDRESS:
				LOT 42, No. 7
				BRIGHTON STREET
PROJECT		PROPOSED RESIDENCE		CURL CURL

DESIGNED BY: S.S ISSUE CHECKED BY S.S SCALE AS NOTED SHEET SIZE SHEET No. А3 CLIENT REF. DRAWING No. D3 E309591 4066N





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			AS	SOCIA	TES				
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F	PH/ 02 98	06 3000 F	/ 02 9891	2806 E/ admi	ineng@dono	vanassocia	tes.com.au		
1	15 PA	RKES	STRE	ET PARI	RAMAT'	TA NSV	V 2150		

DRAWING TITLE:	DRAWN	DATE	DESCRIPTION		FOR	APPROVED BY:
	R.P.	18.04.2019	ISSUED FOR DA	А	CHAMPION HOMES PTY LTD	
DISPERSAL SYSTEM					SITE ADDRESS:	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
					LOT 42, No. 7	11/1
COPYRIGHT - THIS DRAWING REMAINS THE PROPERTY					BRIGHTON STREET	1
OF DONOVAN AND MAY NOT BE ALTERED IN ANY WAY WITHOUT DONOVAN ASSOCIATES WRITTEN CONSENT.	PROJECT		PROPOSED RESIDENCE		CURL CURL	SCOTT SHARMA. M.I.E.

/ :	DESIGNED BY	' :	S.S	ISSUE
,	CHECKED BY:		S.S	Λ
1/ 1/	SCALE		AS NOTED	A
H // _	SHEET SIZE		А3	SHEET No.
1 Juan	CLIENT REF.	DF	RAWING No.	
	4000N	E,	309591	D4
A.I.E. Aust.	4066N		303331	

							PIT / NODE DETAILS							
Name	Type	Family	Size	Ponding	Pressure	Surface	Max Pond	Base	Blocking	x	У	Bolt-down	id	Part Full
				Volume	Change	Elev (m)	Depth (m)	Inflow	Factor			lid		Shock Loss
				(cu.m)	Coeff. Ku			(cu.m/s)						
Pre Node	Node					15		0		480.093	-155.44		4	
ROOF	OnGrade	Downpipe	Downpipe		1.5	22		0	0	372.222	-250.694	No	14	1 x Ku
OSD Node	Node					20		0		493.981	-314.005		28	
Bypass nod	Node					15		0		475.463	-337.153		703669	
							DETENTION BASIN DETAILS							
Name	Elev	Surf. Area	Not Used	Outlet Type	К	Dia(mm)	Centre RL	Pit Family	Pit Type	х	v	HED	Crest RL	Crest Length(m)
OSD	15	2		Orifice		80	15.05	,		488,889	-254.167	No		. ,
	16	2												
							SUB-CATCHMENT DETAILS							
Name	Pit or	Total	Paved	Grass	Supp	Paved	Grass	Supp	Paved	Grass	Supp	Paved	Grass	Supp
	Node	Area	Area	Area	Area	Time	Time	Time	Length	Length	Length	Slope(%)	Slope	Slope
		(ha)	%	%	%	(min)	(min)	(min)	(m)	(m)	(m)	%	%	%
PRE DEV	Pre Node	0.0347	47	53	0	3	6	0						
ROOF 1 TO OSD	ROOF	0.0148	100	0	0	3	0	0						
BYPASS OSD	Bypass nod	0.0199	13	87	0	3	6	0						
							PIPE DETAILS							
Name	From	To	Length	U/S IL	D/S IL	Slope	Туре	Dia	I.D.	Rough	Pipe Is	No. Pipes	Chg From	AtChg
			(m)	(m)	(m)	(%)		(mm)	(mm)					
Pipe 4	ROOF	OSD	10	21	15	60	Concrete, not under roads, 1% mini	150	150	0.013	New Fixed	1	ROOF	0
Pipe 9	OSD	OSD Node	10	15	13	20	Concrete, not under roads, 1% mini	150	150	0.013	New Fixed	1	OSD	0
							OVERFLOW ROUTE DETAILS							
Name	From	To	Travel	Spill	Crest	Weir	Cross	Safe Depth	Safe Depth	Safe	Bed	D/S Area		id
			Time	Level	Length	Coeff. C	Section	Major Storms	Minor Storms	DxV	Slope	Contributing		
			(min)	(m)	(m)			(m)		(sq.m/sec)	(%)	%		
OF1	OSD	OSD Node	2	16	1	1.7	4 m wide pathway	0.3	0.15	0.4	1	0		353317

DRAINS DATA

		PIT / NO	DE DETAILS										
Name	Max HGL	Max Pond	Max Surface	Max Pond	Min	Overflow	Constraint						
		HGL	Flow Arriving	Volume	Freeboard								
		i i i i	(cu.m/s)	(cu.m)	(m)	(00.11)							
ROOF	21.07		0.006	(ca.iii)	0.93		None						
	13.03		0.000		0.53		None						
OSD Node	13.05		U										-
			IMENT DETAILS		-	_							_
Name	Max	Paved	Grassed	Paved	Grassed	Supp.	Due to Ston	n					
	Flow Q	Max Q	Max Q	Tc	Tc	Tc							
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)							
PRE DEV	0.013	0.007	0.006	3	6	0	AR&R 5 year						
ROOF 1 TO OSD	0.006	0.006	0	3	0	0	AR&R5yea	, 5 minute	s storm, a	rerage 157	7 mm/h, Zo	ne 1	
BYPASS OSD	0.007	0.001	0.006	3	6	0	AR&R5yea	, 30 minut	es storm, a	verage 74	1.3 mm/h, Z	one 1	
utflow Volumes for Total Catchme	ent (0.03 impen	vious +0.04 perviou	us = 0.07 total ha)										
Storm	Total Rainfall		Impervious Runoff	Pervious Runoff									
100.00-0000	cu.m	cu.m (Runoff %)	cu.m (Runoff %)	cu.m (Runoff %)									
AR&R 5 year, 5 minutes storm,													
average 157 mm/h, Zone 1	9.07	5.60 (61.7%)	4.07 (92.3%)	1.53 (32.8%)									
AR&R 5 year, 10 minutes storm,	5.07	3.00 (01.770)	1.07 (32.370)	2.33 (32.0/0)									
average 122 mm/h, Zone 1	14.06	9.84 (70.0%)	6.49 (95.1%)	3.35 (46.3%)									
	14.00	3.04 (70.076)	0.49 (95.1%)	3.33 (40.3%)									
AR&R 5 year, 20 minutes storm,	30.00	45 57/74 400	0.00 /05 000	F 75 (53 464)									
average 90.4 mm/h, Zone 1	20.92	15.57 (74.4%)	9.82 (96.7%)	5.75 (53.4%)									
AR&R 5 year, 30 minutes storm,	F-00-00 - 100 -	Periodical de la Maria della d	No. of the Control of	Date March Million and Company									
average 74.3 mm/h, Zone 1	25.77	19.33 (75.0%)	12.17 (97.3%)	7.16 (54.0%)									
AR&R 5 year, 1 hour storm,													
average 51.0 mm/h, Zone 1	35.4	26.90 (76.0%)	16.85 (98.0%)	10.05 (55.2%)									
AR&R 5 year, 3 hours storm,													
average 26.2 mm/h, Zone 1	54.48	41.35 (75.9%)	26.12 (98.7%)	15.23 (54.4%)									
AR&R 5 year, 6 hours storm,													
average 16.9 mm/h, Zone 1	70.3	52.08 (74.1%)	33.80 (99.0%)	18.29 (50.6%)									
				EM									
		PIPE	DETAILS										
Name	Max Q	Max V	Max U/S	Max D/S	Due to Stor	m							
,,,,,,,,	(cu.m/s)	(m/s)	HGL (m)	HGL (m)	Due to Stor								
Pipe4	0.006	3.58	21.024	15.195	ARRE EVE	r 5 minute	s storm, ave	rage 157 m	m/h Zone	1			
Pi pe9	0.006	2.32	15.029	13.029	ичеч э деа	r, zominut	es storm, av	-rage 90.4	mmyn, Zol	ie 1			
		OVER	IOW POLET DETAIL	-									
N	Many Court		LOW ROUTE DETAIL		M- 5 11	6.4 15.C (-1	8.4- 12	D	111				-
Name	Max Q U/S	Max Q D/S	Safe Q	Max D		Max Width		Due to Sto	orm				
OF1	0	0	0.908	0	0	0	0						
			TION BASIN DETAIL				1						
Name	Max WL	MaxVol	Max Q	Max Q	Max Q								
			Total	Low Level	High Level								
OSD	15.2	0.4	0.006	0.006	0								
ONTINUITY CHECK for AR&R 5 year,	, 30 minutes sto	orm, average 74.3 n	nm/h, Zone 1										
Node	Inflow	Outflow	Storage Change	Difference									
	(cu.m)	(cu.m)	(cu.m)	%									
Pre Node	9.58	9.58	0	0									
ROOF	5.35	5.35	0	0									
OSD	5.35	5.3	0.03	0.4									
OSD Node	5.3	5.3	0.03	0.4									
			0	0									
Bypass nod	4.41	4.41	U	U									

DRAINS RESULTS - 20% AEP STORM EVENT

DESIGNED BY: ISSUE DRAWING TITLE: DRAWN DATE DESCRIPTION ISSUE FOR APPROVED BY: S.S CHECKED BY: S.S R.P. 18.04.2019 ISSUED FOR DA Α CHAMPION HOMES PTY LTD OSD CALCULATIONS SCALE AS NOTED SITE ADDRESS: SHEET No. 1 OF 2 SHEET SIZE А3 LOT 42, No. 7 CLIENT REF. DRAWING No. INCORPORATED ENGSURVEY PTY LTD ABN: 84 134 616 078 PH/ 02 9806 3000 F/ 02 9891 2806 E/ admineng@donovanassociates.com.au 15 PARKES STREET PARRAMATTA NSW 2150 **BRIGHTON STREET** D5 E309591 4066N **CURL CURL** PROJECT PROPOSED RESIDENCE SCOTT SHARMA. M.I.E. Aust.

		PIT / N	NODE DETAILS										
Name	Max HGL	Max Pond	Max Surface	Max Pond	Min	Overflow	Constraint						
	CHARLES THE STATE OF	HGL	Flow Arriving	Volume	Freeboard	(cu.m/s)							
			(cu.m/s)	(cu.m)	(m)	(
ROOF	21.09		0.011	()	0.91		None						
OSD Node	13.01		0										
		SUB-CATO	CHMENT DETAILS										
Name	Max	Paved	Grassed	Paved	Grassed	Supp.	Due to Stori	n					
	Flow Q	Max Q	Max Q	Tc	Tc	Tc							
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)							
PRE DEV	0.022	0.011	0.011	3	6	0	AR&R 100 ye	ear. 20 min	utes storr	n. average	156 mm/h.	Zone 1	
ROOF 1 TO OSD	0.011	0.011	0	3	0	0	AR&R 100 ye						
BYPASS OSD	0.012	0.002	0.01	3	6	0	AR&R 100 ye						
5117105 000	0.012	J.CCL	5,02				7 III CAN 200 J	2017 20 111111	aces seen	, arerage	250,,	Lone 1	
utflow Volumes for Total Catchme	nt (0.03 imper	vious + 0.04 pervio	us = 0.07 total ha)										
Storm		Total Runoff	Impervious Runoff	Pervious Runoff									
	cu.m	cu.m (Runoff %)	cu.m (Runoff %)	cu.m (Runoff %)									
AR&R 100 year, 5 minutes storm,		(((
average 261 mm/h, Zone 1	15.1	11.59 (76.8%)	6.99 (95.4%)	4.59 (59.2%)									
AR&R 100 year, 10 minutes storm,				(33,2,5)									
average 205 mm/h, Zone 1	23.69	19.42 (82.0%)	11.16 (97.1%)	8.26 (67.8%)									
AR&R 100 year, 20 minutes storm,													
average 156 mm/h, Zone 1	36.03	30.55 (84.8%)	17.16 (98.1%)	13.39 (72.2%)									
AR&R 100 year, 30 minutes storm,	50.05	30.33 (04.070)	17.10 (50.170)	15.55 (72.270)									
average 130 mm/h, Zone 1	44.95	38.42 (85.5%)	21.49 (98.5%)	16.93 (73.2%)									
AR&R 100 year, 1 hour storm,	1.11.20	201.12 (03.370)	22.15 (50.570)	10.55 (15.270)									
average 90.2 mm/h, Zone 1	62.61	53.96 (86.2%)	30.06 (98.9%)	23.90 (74.2%)									
AR&R 100 year, 3 hours storm,	WA	22.22 (00.270)	22.22 (2012/0)	20.20 (7.7.270)									
average 46.1 mm/h, Zone 1	95.91	82.38 (85.9%)	46.23 (99.3%)	36.15 (73.3%)									
AR&R 100 year, 6 hours storm,	TUIL	SE.30 (03.370)	40.23 (33.370)	30.13 (73.370)									
average 29.4 mm/h, Zone 1	122.35	102.92 (84.1%)	59.07 (99.4%)	43.85 (69.7%)									
average 25.41111/11, 2011c 1	122.55	102.32 (04.170)	33.07 (33.470)	45.05 (05.770)									
		PIE	PE DETAILS				1						
Name	Max Q	Max V	Max U/S	Max D/S	Due to Storn	1							
	(cu.m/s)	(m/s)	HGL (m)	HGL (m)	10 010111								
Pipe4	0.011	4.15	21.031	16.876	AR&R 100 ye	ar. 5 minute	es storm, ave	rage 261 m	m/h. Zon	e 1			
Pipe9	0.001	1.45	15.014	13.015	AR&R 100 ye								
, ipc3	0.001	1.79	20,017	10.013	100 yc	,	July avera	Pc 40(1 11111	, .,				
		OVERFLOY	N ROUTE DETAILS				1						
Name	Max QU/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Sto	rm				
OF1	0	0	1.479	0	0	0	0						
2.1	,		2.173										
		DETENTIO	N BASIN DETAILS				1						
Name	Max WL	MaxVol	Max Q	Max Q	Max Q								
			Total	Low Level	High Level								
OSD	16.88	8.4	0.001	0.001	0								
ONTINUITY CHECK for AR&R 100 year	ar, 20 minutes	storm, average 15	6 mm/h, Zone 1										
Node	Inflow	Outflow	Storage Change	Difference									
	(cu.m)	(cu.m)	(cu.m)	%									
Pre Node	15.2	15.2	0	0									
ROOF	7.54	7.54	0	0									
OSD	7.54	2.22	3.85	19.5									
OSD Node	2.22	2.22	0	0									

DRAINS RESULTS - 1% AEP STORM EVENT

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	ASSOCIATES											
		INCOR	RPORA	TED E	NGSUR	VEY PTY	LTD	ABN:	84 134	616	078	
		PH/ 02 9	9806 30	00 F/ 0	2 9891 2	306 E/adm	ineng@	donova	nassocia	tes.con	n.au	
		15 P	ARKI	ES S	TREE	T PAR	RAM.	ATTA	NSV	V 21	5 0	

-	DRAWING TITLE:							
_	OSD CALCULATIONS							
	2 OF 2							
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VING TITLE:	DRAWN	DATE	DESCRIPTION	ISSUE	FOR		
SD CALCULATIONS	R.P.	18.04.2019	ISSUED FOR DA	Α	CHAMPION HOMES PTY LTD		
				SITE ADDRESS:			
2 OF 2					LOT 42, No. 7		
OPYRIGHT - THIS DRAWING REMAINS THE PROPERTY					BRIGHTON STREET		
F DONOVAN AND MAY NOT BE ALTERED IN ANY WAY ITHOUT DONOVAN ASSOCIATES WRITTEN CONSENT.	PROJECT		PROPOSED RESIDENCE		CURL CURL		

	APPROVED BY:	DES
		CHE
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	Juli Juna	CLIE
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	SCOTT SHARMA. M.I.E. Aust.	4

DESIGNED BY	' :	S.S	ISSUE
CHECKED BY:		S.S	Δ
SCALE		AS NOTED	A
SHEET SIZE		A3	SHEET No.
CLIENT REF.	DF	RAWING No.	
4066N	E	309591	D6