

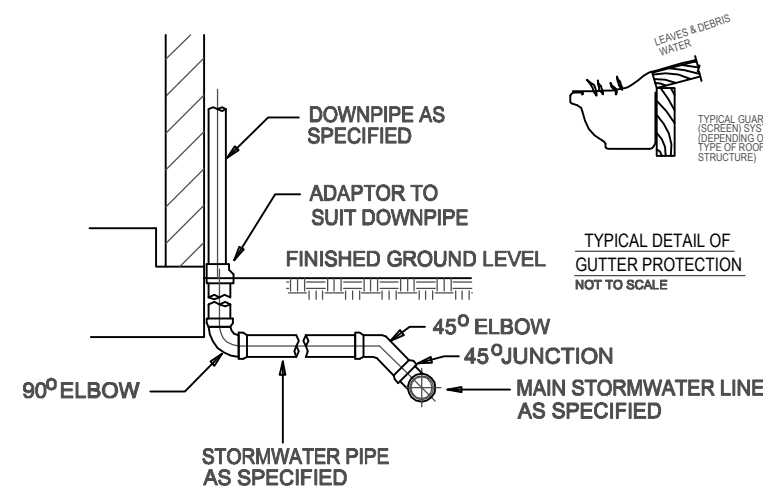
CONCEPT STORMWATER MANAGEMENT PLANS

PROPOSED NEW RESIDENTIAL DEVELOPMENT

No. 23 HEATHCLIFF CRESCENT, BALGOWLAH HEIGHTS NSW 2093

LEGEND

	GRATED INLET PIT
450x450	450mm SQUARE INTERNAL
GRT 75.54	GRATE LEVEL = RL 75.54
IL 75.12	INVERT LEVEL = RL 75.12
o IO	INSPECTION OPENING CAP
o DP	PROPOSED DOWNPIPE 90mm dia or 100mm x 50mm RECTANGULAR UNO
	EXISTING TREE
	GRATED TRENCH DRAIN
	GRATED ROUND OUTLET 100mm DIAMETER
	PROPOSED DOWNPIPE SPREADER
	STRUCTURE No 1 (FOR HYDRAULIC CALCS)
---	STORMWATER DRAINAGE
- . - . -	100 DIA CHARGED/1% MIN ROOF AREA ONLY UNO



TYPICAL DETAIL - DOWNPIPE CONNECTION
NOT TO SCALE

NORTHERN BEACHES COUNCIL'S STORMWATER MANAGEMENT CODE

DESIGN CODE: MANLY COUNCIL'S ON-SITE STORMWATER MANAGEMENT 2003- APPENDIX 2

COUNCIL DESIGN CODE:

AS EASEMENT UNATTAINABLE COUNCIL HAS PERMITTED ONSITE DETENTION WITH DISCHARGE TO A SPREADER AS PER THE EMAIL ABSTRACT BELOW.

PROPOSED DEVELOPMENT: NEW TWO STOREY DWELLING

SITE AREA: 550 m2

-TOTAL NEW IMPERVIOUS AREA: 307m2 (MEASURED BY CAD AREA TOOL)

LOW LEVEL PROPERTY AND EASEMENT UNATTAINABLE THEREFORE ONSITE DETENTION TO A LEVEL SPREADER.

Alternative, I suggest a level spreader system shall be designed.

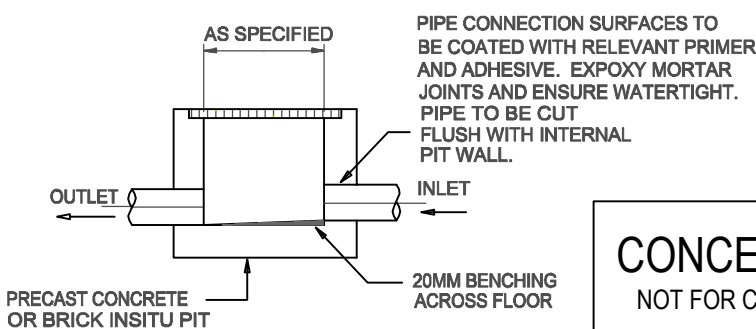
As the original stormwater plan, there has a 24 cubic metre tank under the deck plus another 3 cubic metre rainwater tank, it shall have enough storage for the level spreader.

It means the an orifice shall be designed and installed into the tank to control the discharge, which must be less than 5 year ARI state of nature (100% landscape)in the pre-development.
I believe it is the better solution in this case.

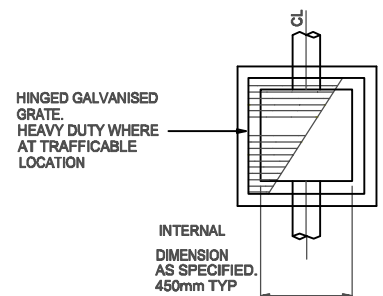
COLLECT ALL THE NEW ROOF AREA OF THE DWELLING AND DISCHARGE INTO THE BASIX RAINWATER TANK WITH THE OVERFLOW AND DRIVEWAY RUNOFF DRAINING INTO THE OSD TANK LOCATED UNDER THE ALFRESCO. A LEVEL SPREADER SHALL BE PROVIDED DOWNSTREAM OF THE OSD TANK TO ACCEPT THE DISCHARGE FROM THIS SYSTEM.

REFER TO DRAINS MODEL PROVIDED TO ENSURE THE DISCHARGE IS LESS THAN THE 5 YEAR ARI STATE OF NATURE.

DESIGNED BASED ON AR & R, AS 3500 & COUNCIL STORMWATER MANAGEMENT CODE 1994



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NOT FOR CONSTRUCTION



TYPICAL DETAIL - STANDARD PIT
NOT TO SCALE

B	13.08.18	COUNCIL EMAIL
A	01.02.18	DA ISSUE
ISS	DATE	AMENDMENT

ARCHITECT/BUILDER	WINCREST HOMES
CLIENT	MR. & MRS. AMORES

EZE DRAINAGE SOLUTIONS	CONSULTING ENGINEERS
Pty Ltd ACN 619 135 198	CIVIL & STORMWATER MANAGEMENT
Ph: (02) 97067767	Mobile: 0405507654
Fax: (02) 94754315	Email : info@ezeeng.com.au

DWG TITLE	COVER SHEET & CALCULATION TABLE
PROJECT TITLE	PROPOSED NEW RESIDENTIAL DEVELOPMENT
	No.23 HEATHCLIFF CRESCENT, BALGOWLAH HEIGHTS NSW 2093

DESIGNED BY :	EZ	ISSUED BY :	BE MIE Aust PENG
JOB No	DWG No	No IN SET	ISSUE
15089	D1	5	B

BASIX COMMITMENT
PROPOSED DWELLING TO HAVE A
3000 LITRE (MINIMUM)
RAINWATER TANK TO BE
CONNECTED TO 200m² OF ROOF
AREA IN ACCORDANCE WITH
BASIX REQUIREMENTS.

NOTE
CONNECT ONLY ROOF AREA TO
PROPOSED RAINWATER TANK. FIRST
FLUSH DEVICES TO BE INSTALLED TO
MANUFACTURERS SPECIFICATIONS.

NOTE
THIS DRAWING IS NOT TO BE USED
FOR SETOUT PURPOSES. REFER TO
ARCHITECTURAL DRAWINGS.

NOTE
LOCATION OF NEW DOWNPIPES
SHOWN ON THIS DRAWING ARE
SUBJECT TO VERIFICATION BY
BUILDER DURING CONSTRUCTION.
DOWNPIPE LOCATION MAY BE VARIED
PROVIDED INTENT OF THIS DESIGN
IS MAINTAINED.

NOTE
LOCATION OF NEW PITS
SHOWN ON THIS DRAWING ARE
SUBJECT TO VERIFICATION BY
BUILDER DURING CONSTRUCTION.
PIT LOCATIONS MAY BE VARIED
PROVIDED INTENT OF THIS DESIGN
IS MAINTAINED.

NOTE
THIS DRAWING IS FOR STORMWATER
MANAGEMENT DESIGN AND DOES
NOT COVER ANY OVERLAND FLOW
DESIGN REQUIREMENTS.

NOTE
THIS DRAWING IS TO BE READ
IN CONJUNCTION WITH
ARCHITECTURAL DRAWINGS :
WINCREST HOMES
JOB NO. 17156 ISSUE D
DATED 13.12.2017



PROVIDE LEVEL SPREADER AS
INDICATED. FINAL DETAILS AT CC STAGE.

APPROX LOCATION OF SEWER

WARNING
LOCATION AND DEPTH OF ALL
UNDERGROUND SERVICES TO
BE INVESTIGATED WITH THE
RELEVANT AUTHORITIES PRIOR
TO COMMENCING WORKS.

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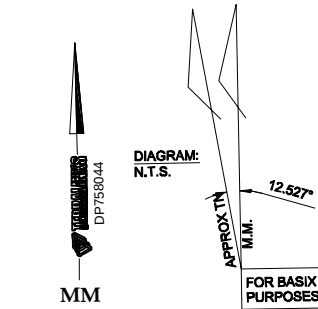
BASIX RAINWATER/RE-USE TANK
1 x 3000 litre ABOVE GROUND TANK
DIMENSIONS : 2400 LONG x 950 WIDE x 1480 HEIGHT
"TANKWORKS EVOLUTION SERIES MKII TANK"
OR EQUAL.FOR RE-USE IN ACCORDANCE WITH
BASIX CERTIFICATE. INSTALL TO MANUFACTURERS
SPECIFICATIONS, AS 3500, DEPT HEALTH
AND COUNCIL'S REQUIREMENTS.
REFER TYPICAL DETAIL SHEET D4.
TANK INVERT = RL 66.20 nom
TOP TANK = RL 67.68
CONNECT AT LEAST 200m² OF ROOF AREA TO
TANK AS REQUIRED BASIX CERTIFICATE

STORMWATER DETENTION TANK - BELOW GROUND
EXTENT OF OSD TANK SHOWN SHADED.
TANK DIMENSIONS: 9810 LONG x 2460 WIDE x 1050 DEEP
DESIGN AREA = 24m²
AVERAGE DEPTH = 1050mm
MAXIMUM DEPTH = 1100mm
TOP WATER LEVEL = RL 65.70
DESIGN VOLUME = 24.0m³ MINIMUM
DISCHARGE CONTROL PIT : REFER DETAIL SHEET D4
TANK OVERFLOW : GRATED PIT SURCHARGE
OSD TANK TO BE MASONRY & WATERTIGHT
TO SEPARATE STRUCTURAL ENGINEERS DETAIL.

100 DIA ROOF ONLY.
CHARGED LINE PRESSURE GRADE
uPVC SOLVENT WELDED.
NOTE CHARGED SYSTEM TO BE
FULLY SEALED FROM TANK INLET
TO ROOF GUTTER LEVEL.
ROOF GUTTER RL = 68.80, 71.50
TANK INLET RL = 67.70
DIFFERENTIAL HEAD = 1.10, 3.80
SUFFICIENT TO DRIVE SYSTEM.

PIT P2: 450 x 450 SQ
GRATE RL : 66.35 nom
INVERT : 65.90

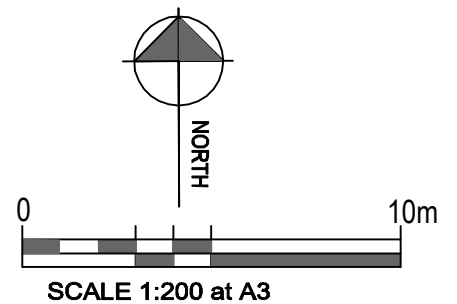
HD GRATED TRENCH DRAIN
200 mm WIDE min
120 mm DEEP min
GRATE RL : 66.47 NOM
100 DIA OUTLET 1 % MIN



ORIGIN OF LEVELS :
SSM 52319 RL=59.75 (AHD) FOUND NEAR
THE INTERSECTION OF CONCISE STREET
& CURBAN ROAD.
ACCURACY OF ORIGIN : ± 0.010m

STORMWATER MANAGEMENT PLAN

SCALE 1: 200 A3



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ISS	DATE	AMENDMENT

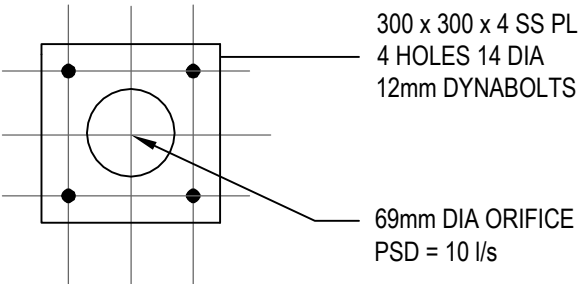
ARCHITECT/BUILDER	WINCREST HOMES
CLIENT	MR. & MRS. AMORES

EZE DRAINAGE SOLUTIONS Pty Ltd ACN 619 135 198	CONSULTING ENGINEERS CIVIL & STORMWATER MANAGEMENT
Ph: (02) 97067767 Fax: (02) 94754315	Mobile: 0405507654 Email : info@ezeeng.com.au

DWG TITLE	STORMWATER MANAGEMENT PLAN
PROJECT TITLE	PROPOSED NEW RESIDENTIAL DEVELOPMENT No.23 HEATHCLIFF CRESCENT, BALGOWLAH HEIGHTS NSW 2093

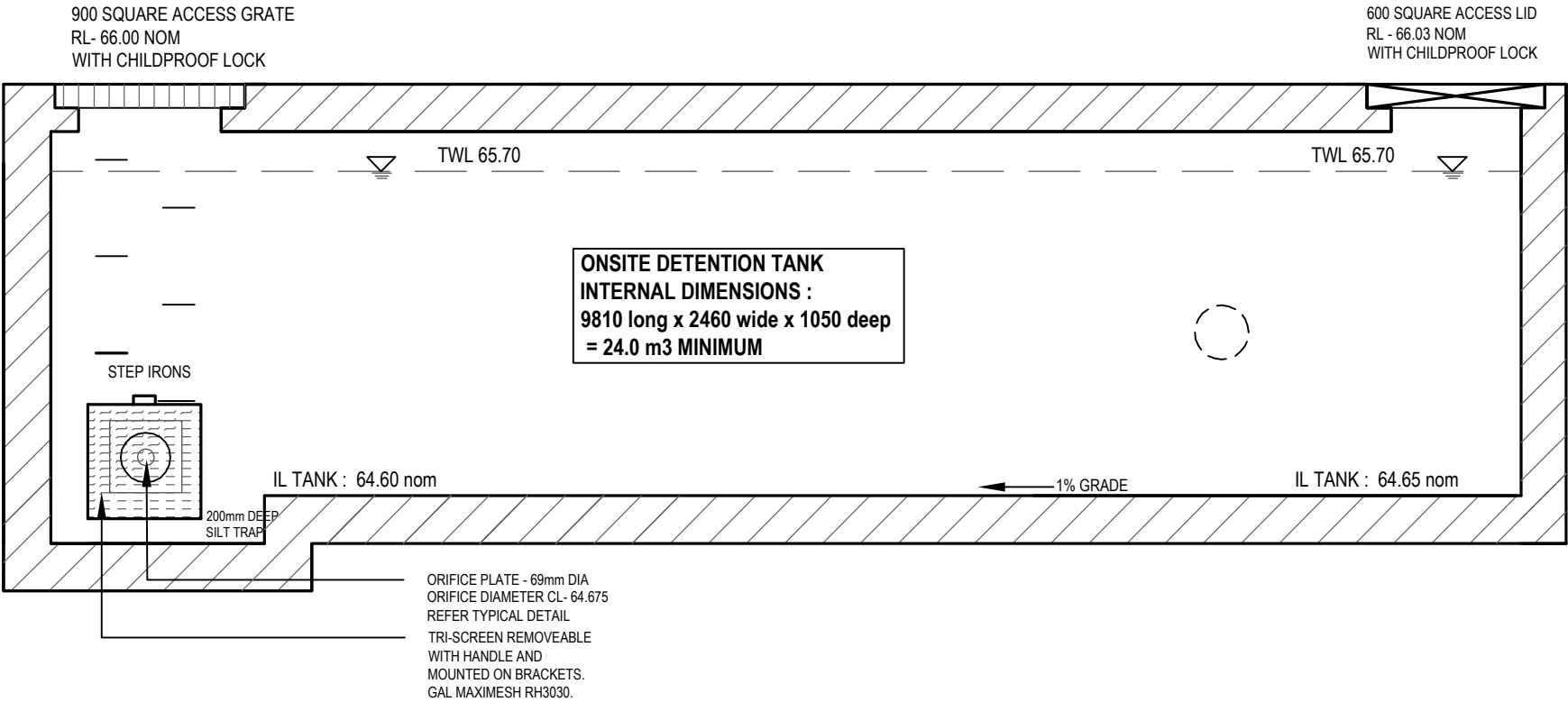
DESIGNED BY :	EZ	ISSUED BY :	BE MIE Aust PENG
JOB No	DWG No	No IN SET	ISSUE
15089	D2	5	B

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TYPICAL DETAIL - ORIFICE PLATE

NTS



TYPICAL DETAIL - PROPOSED OSD TANK

NTS

To Calculate Orifice Size Plate		
		$D=21.9*(PSD/(h^{.5}))^{.5}$
D(Orifice Size)mm	68.82768279	
PSD(Permitted Site Discharge) L/s	10	
h(Pressure Head)	1.025	

ORIFICE PLATE CALCULATOR

NOT TO SCALE

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Ph: (02) 97067767
Fax: (02) 94754315

Mobile: 0405507654
Email : info@ezeeng.com.au

DWG TITLE
PROPOSED OSD TANK DETAILS

PROJECT TITLE
PROPOSED NEW RESIDENTIAL DEVELOPMENT
No.23 HEATHCLIFF CRESCENT, BALGOWLAH HEIGHTS NSW 2093

DESIGNED BY :

EZ

ISSUED BY :

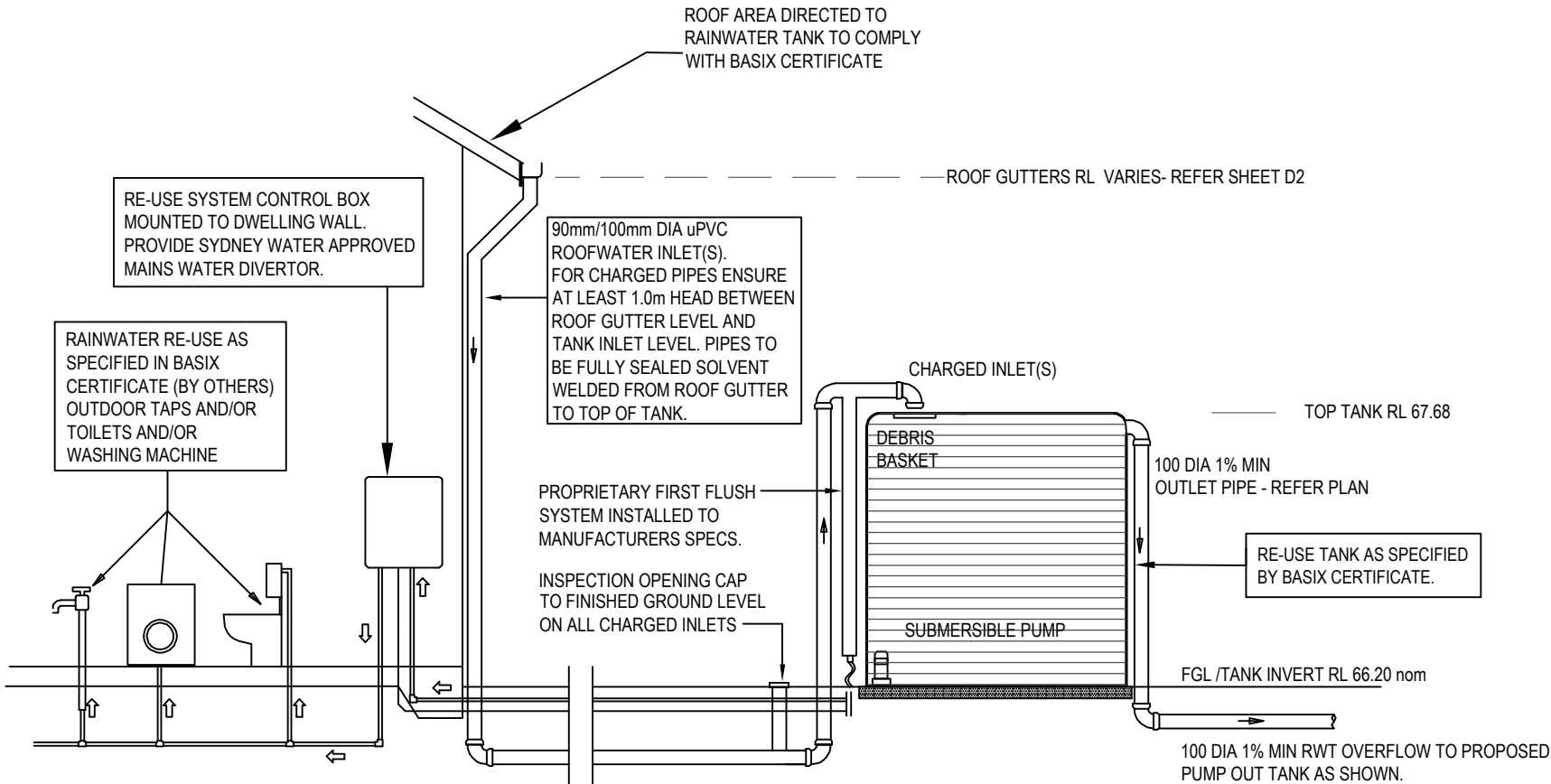


BE MIE Aust PENG

JOB No	DWG No	No IN SET	ISSUE
15089	D3	5	B

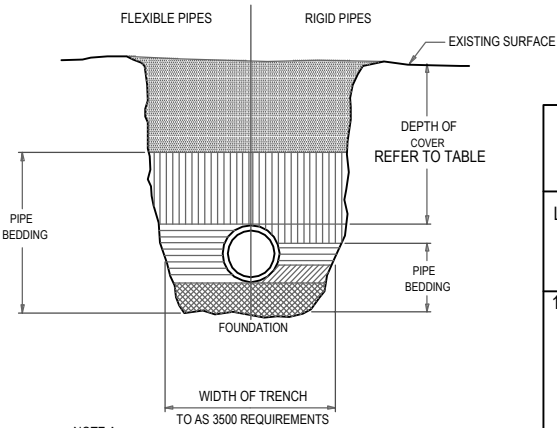
RAINWATER RE-USE SYSTEM NOTES

- TOWNWATER CONNECTION TO RAINWATER TANK TO BE TO THE SATISFACTION OF SYDNEY WATER. THIS MAY REQUIRE PROVISION OF:
 - PERMANENT AIR GAP.
 - A BACKFLOW PREVENTION DEVICE.
 - NO DIRECT CONNECTION BETWEEN TOWN WATER SUPPLY AND THE RAIN WATER SUPPLY.
 - AN APPROVED STOP VALVE AND/OR PRESSURE LIMITING VALVE AT THE RAINWATER TANK.
- PROVIDE AT LEAST ONE (1) EXTERNAL HOSE COCK ON THE TOWN WATER SUPPLY FOR FIRE FIGHTING.
- PROVIDE APPROPRIATE FLOAT VALVES AND/OR SOLENOID VALVES
- ALL PLUMBING WORKS ARE TO BE CARRIED OUT BY LICENSED PLUMBERS IN ACCORDANCE WITH AS3500.1 NATIONAL PLUMBING AND DRAINAGE CODE.
- PRESSURE PUMP ELECTRICAL CONNECTION TO BE CARRIED OUT BY LICENSED ELECTRICIAN.
- ONLY ROOF RUN-OFF IS TO BE DIRECTED TO THE RAINWATER TANK. SURFACE WATER INLETS ARE NOT TO BE CONNECTED.
- PIPE MATERIALS FOR RAINWATER SUPPLY PLUMBING ARE TO BE APPROVED MATERIALS TO AS 3500 PART 1 SECTION 2 AND TO BE CLEARLY AND PERMANENTLY IDENTIFIED "RAINWATER". THIS MAY BE ACHIEVED FOR BELOW GROUND PIPES USING IDENTIFICATION TAPE (MADE IN ACCORDANCE WITH AS 2648) OR FOR ABOVE GROUND PIPES BY USING ADHESIVE PIPE MARKERS (MADE IN ACCORDANCE WITH AS1345).
- EVERY RAINWATER SUPPLY OUTLET POINT AND THE RAINWATER TANK ARE TO BE LABELLED "RAINWATER" ON A METALLIC SIGN IN ACCORDANCE WITH AS 1319.
- ALL INLETS AND OUTLETS TO THE RAINWATER TANK ARE TO HAVE SUITABLE MEASURES PROVIDED TO PREVENT MOSQUITO AND VERMIN ENTRY.
- SYSTEM TO COMPLY WITH SYDNEY WATER REQUIREMENTS AND ANY CONDITIONS OF LOCAL COUNCIL DEVELOPMENT CONSENT.



TYPICAL DETAIL - RAINWATER RE-USE TANK

NOT TO SCALE

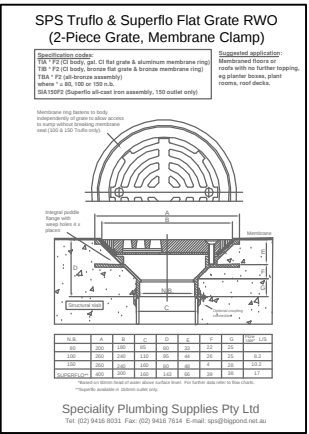
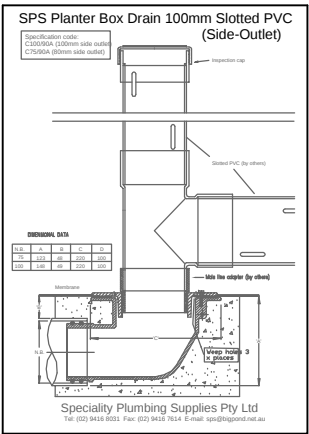
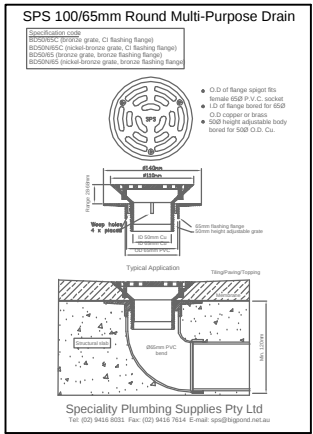


NOTE A
STORMWATER DRAINS CONSTRUCTED OF OTHER THAN CAST IRON, DUCTILE IRON OR GALVANISED STEEL HAVING COVER LESS THAN THAT SPECIFIED IN TABLE SHALL BE COVERED WITH AT LEAST 50mm OVERLAY AND SHALL BE PAVED WITH AT LEAST—
(a) 100mm THICKNESS OF REINFORCED CONCRETE WHERE SUBJECT TO HEAVY VEHICULAR LOADING

LEGEND - TRENCH BACKFILL		
SYMBOL	FLEXIBLE PIPES	RIGID PIPES
	BACKFILL	
	PIPE OVERLAY	
	PIPE SIDE SUPPORT	SIDE ZONE
	—	HAUNCH ZONE
	PIPE UNDERLAY	BED ZONE

MINIMUM PIPE COVER (FROM FINISHED SURFACE TO TOP OF PIPE)		
LOCATION	MINIMUM COVER (mm)	
	CAST/DUCTILE IRON GAL STEEL	OTHER AUTHORISED PRODUCTS (*)
1. NOT SUBJECT TO VEHICULAR LOADING: A. WITHOUT PAVEMENT: i. FOR SINGLE DWELLINGS - ii. OTHER THAN SINGLE DWELLINGS - B. WITH PAVEMENT OF BRICK/UNREINFORCED CONCRETE -	0 0	100 300
	0 (**)	50 (**)
2. SUBJECT TO VEHICULAR LOADING: A. OTHER THAN ROADS: i. WITHOUT PAVEMENT - ii. WITH PAVEMENT OF: - REINF. CONC. FOR HEAVY VEHICLES - - BRICK/UNREINF. CONC LIGHT VEHICLES - B. ROADS i. SEALED ii. UNSEALED	300	450
	0 (** #)	100 (** #)
	0 (** #)	75 (** #)
	300 300	500 (#) 500 (#)
3. SUBJECT TO CONSTRUCTION VEHICLES OR IN EMBANKMENT CONDITIONS	300	500 (#)
(*) INCLUDES OVERLAY ABOVE THE TOP OF THE PIPE OF NOT LESS THAN 50mm THICK (**) BELOW THE UNDERSIDE OF THE PAVEMENT (#) SUBJECT TO COMPLIANCE WITH AS1762, AS2033, AS/NZS 2566.1, AS3725 OR AS 4060		

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TYPICAL DETAILS- PLANTER BOX, ROOF DRAIN & TERRACE GRATE

NTS

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ARCHITECT/BUILDER WINCREST HOMES
CLIENT MR. & MRS. AMORES

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Ph: (02) 97067767 Fax: (02) 94754315	Mobile: 0405507654 Email : info@ezeeng.com.au

DWG TITLE TYPICAL DETAILS
PROJECT TITLE PROPOSED NEW RESIDENTIAL DEVELOPMENT No.23 HEATHCLIFF CRESCENT, BALGOWLAH HEIGHTS NSW 2093

DESIGNED BY : EZ		ISSUED BY :   BE MIE Aust PENG	
JOB No 15089	DWG No D4	No IN SET 5	ISSUE B

PIT / NODE DETAILS															Version 9											
Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Elev (m)	Surface Depth (m)	Max Pond Inflow (cu.m/s)	Base Factor	Blocking	x lid	y	Bolt-down Shock Loss	id	Part Full											
N1	Node				19.90	0		386.526		-213.723				2												
DETENTION BASIN DETAILS																										
Name	Elev	Surf. Area	Init Vol. (cu.m)	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Length(m)	id											
SUB-CATCHMENT DETAILS																										
Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Supp Area %	Paved Time (min)	Grass Time (min)	Supp Time (min)	Paved Length (m)	Grass Length (m)	Supp Length (m)	Paved Slope(%)	Grass Slope (%)	Supp Slope (%)	Paved Slope	Grass Rough	Supp Rough	Lag Time (m)	Gutter or Factor %	Gutter Length	Gutter Slope	Gutter FlowFactor				
Pre_Dev	N1	0.0550	0.0	100.0	0.0	0	0	0	0	36.2	36.2	0	9	9	0	0.013	0.33	0	0							
PIPE DETAILS																										
Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From (m)	At Chg (m)	Chg (m)	RI (m)	Chg (m)	RL	etc							
DETAILS of SERVICES CROSSING PIPES																										
Pipe	Chg (m)	Bottom Elev (m)	Height of Service (m)	Chg (m)	Bottom Elev (m)	Height of Service (m)	Chg (m)	Bottom Elev (m)	Height of Service (m)	etc																
CHANNEL DETAILS																										
Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth	Roofed													

DRAINS DATA MODEL

NOT TO SCALE

CONCEPT ONLY

NOT FOR CONSTRUCTION

DRAINS results prepared 14 August, 2018 from Version 2007.09

PIT / NODE DETAILS										Version 8	
Name	Max HGL	Max Pond	Max Surface	Max Pond	Min	Overflow	Constraint				
	HGL	Flow Arriving	Volume	Freeboard	(cu.m/s)						
		(cu.m/s)	(cu.m)	(m)							
SUB-CATCHMENT DETAILS											
Name	Max	Paved	Grassed	Paved	Grassed	Supp.	Due to Storm				
	Flow Q	Max Q	Max Q	Tc	Tc						
	(cu.m/s)		(cu.m/s)	(cu.m/s)	(min)	(min)	(min)				
Pre_Dev	0.017	0.000	0.017	2.46	17.11	0.00	AR&R 5 year, 3 hour storm, average 29.1 mm/h, Zone 1				
PIPE DETAILS											
Name	Max Q	Max V	Max U/S	Max D/S	Due to Storm						
	(cu.m/s)		(m/s)	HGL (m)	HGL (m)						
CHANNEL DETAILS											
Name	Max Q	Max V	Chainage	Max	Due to Storm						
	(cu.m/s)		(m/s)	(m)	HGL (m)						
DETENTION BASIN DETAILS											
Name	Max WL	Max Vol	Max Q	Max Q	Max Q						
		Total	Low Level	High Level							
CONTINUITY CHECK for AR&R 5 year, 3 hour storm, average 29.1 mm/h, Zone 1											
Node	Inflow	Outflow	Storage	Change	Difference						
	(cu.m)	(cu.m)	(cu.m)	%							
N1	25.66	25.66	0.00	0.0							

DRAINS RESULT MODEL

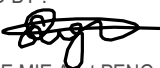
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DWG TITLE	DRAINS MODEL DATA & RESULTS
PROJECT TITLE	PROPOSED NEW RESIDENTIAL DEVELOPMENT
	No.23 HEATHCLIFF CRESCENT, BALGOWLAH HEIGHTS NSW 2093

DESIGNED BY :	EZ	ISSUED BY :	
JOB No	DWG No	No IN SET	ISSUE
15089	D5	5	B