REF : C11825-17089-calcs-b.XLS
Rev. B

STORMWATER DESIGN CALCULATIONS

At 43 INGLESIDE ROAD

INGLESIDE

P.O. Box 400 Cherrybrook NSW 2126

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Files On Disk

C11825-17089-calcs-b.XLS -DRAINS.DRN

1.0 Detention System Requirements

Proposed Residence

At 43 INGLESIDE ROAD

INGLESIDE

1.1 Storage-Area calcs.

DATA:

Site Area Assessed due to easements

Site Area = **0.2300** ha 2300 sq.m

Impervious Area Pre Development = 462 sqm

Percentage Impervious Pre Development = 20%

Impervious Area POST Development = 935.96 sqm

Percentage Impervious POST Development = 41%

Catchment directed through OSD = 379.76 sqm 40.6 %

OSD Bypass Areas : Impervious 556.2 sqm 29.0 %

Pervious 1364.04 sqm 71.0 %

Total 1920.24 sqm

Slope of Site = 5 %

Effective Flow Length = 27.7 m

Hortons n= 0.1

Time of Concentration tc =

1 min. 1:5

1 min. 1:100

FFL of house = 107.51 m

Roof Gutter Level = 110.33 m

Invert of Boundary Pit= 106.48 m

Invert of Outlet= 106.4 m

Detention A

Volume Required 8.57 cu.m

Total Area 6.56 sq.m

Stage Storage-Discharge Relationship

Stage (m)	Storage Area (sq.m)	Avg. Depth (m)	Storage (cu.m)
107.90	0	0	0.000
108.55	6.564	0.653	4.280
109.21	6.564	1.30	8.570

Invert of pit = 107.90 m Q=d^2*sqrt(h)/0.48

Orifice Dia. = 52 mm d=sqrt((0.48*Q)/sqrt(h))

Max. Water Level achieved = 109.210 m

Storage achieved 8.60 cu.m

Basix Allowance

Raintank Basix = 2000 L

Raintank Provided = 3670 L

Raintank Pad Level = 107.35 m

Water Level in Tank RL for Basix = 107.90 m = orifice IL. Depth=0.56m

Total Effective Tank Required = 12269 L NOT OK Max. WL.=109.21m

OSD Volume Available = 8570 L

Nominal tank Volume used = 13260 L

Total Tank Height = 2.020 m TOP OF TANK.=109.37m

1.2 DRAINS Data File for Pre & Post Developed Conditions

PIT / NODE DETAILS Version 9

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	Part Full Shock Loss
Pre	Node					10		0		256	-139	2	
Ground	Node					107.45		0		444	-153	8	
N1	Node					106.98		0		571	-185	12	
Outlet	Node					106.9		0		617.232	-211.091	45	
Roof	Node					110.33		0		440	-74	9	

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 Lid
OSD Basin	107.90	6.5644	0	Orifice		52	107.926			558	-103	No		5
	108.55	6.5644												
	109.21	6.5644												

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 Rough	Grass Rough	Supp Rough	Lag Time or Factor	Gutter Length (m)	Gutter Slope %	Gutter FlowFactor
Pre Site	Pre	0.2300	20	80	0	0	0	0	27.7	27.7	0	5	5	0	0.01	0.33	0	0			
Bypass	Ground	0.1920	29.0	71.0	0	0	0	0	27.7	27.7	0	5	5	0	0.01	0.33	0	0			
Roof Area	Roof	0.0380	100	0	0	0	0	0	21	0	0	20	0	0	0.01	0	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	At Chg (m)	Chg Rl (m)	Chg RL (m)	etc (m)
Pipe1	Roof	OSD Basin	20	108.10	107.90	3.6	uPVC, not un	150	154	0.03	NewFixed	1	Roof	0			
Pipe2	Ground	N1	35	106.85	106.48	8	uPVC, not un	300	303	0.03	New	1	Ground	0			
Pipe3	OSD Basin	N1	42	107.90	106.48	66	uPVC, not un	150	154	0.03	NewFixed	1	OSD Basi	0			
Pipe4	N1	Outlet	4	106.48	106.4	1	uPVC, not un	300	303	0.03	New	1	N1	0			

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of Ser (m)	Chg (m)	Bottom Elev (m)	Height of (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	etc 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 (m)	Roofed

1.3 DRAINS Summary of Pre & Post Developed Discharges

5 YEAR

DRAINS results prepared from Version 2023.11.8726.15750

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
Ground	106.95		0.047				
N1	106.57		0				
Outlet	106.49		0				
Roof	108.88		0.017				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
Pre Site	**0.04**	0.016	0.028	1.25	10.22	0	20% AEP, 15 min burst, Storm 5
Bypass	0.036	0.019	0.018	1.17	9.51	0	20% AEP, 10 min burst, Storm 8
Roof Area	0.016	0.016	0	0.6	0	0	20% AEP, 5 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe2	0.036	1.73	106.953	106.58	20% AEP, 10 min burst, Storm 8
Pipe4	**0.04**	2.27	106.57	106.49	20% AEP, 10 min burst, Storm 8
Pipe1	0.018	0.95	108.88	108.815	20% AEP, 5 min burst, Storm 1
Pipe3	0.005	0.48	108.648	106.57	20% AEP, 20 min burst, Storm 6

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
Orifice 2	0	0	0	0	0	0	0	

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSD Basin	108.81	6	0.005	0.005	0

Run Log for DRAINS v2023.11.8726.15750 - C11825-17089-Drains

20 YEAR

DRAINS results prepared from Version 2023.11.8726.15750

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
Ground	107		0.084				
N1	106.61		0				
Outlet	106.53		0				
Roof	109.11		0.026				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
Pre Site	0.079	0.022	0.057	1.02	8.29	0	5% AEP, 10 min burst, Storm 7
Bypass	0.069	0.026	0.043	1.02	8.29	0	5% AEP, 10 min burst, Storm 7
Roof Area	0.022	0.022	0	0.52	0	0	5% AEP, 5 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe2	0.068	2.05	106.995	106.623	5% AEP, 10 min burst, Storm 7
Pipe4	0.081	2.74	106.611	106.53	5% AEP, 10 min burst, Storm 7
Pipe1	0.024	1.31	109.107	108.988	5% AEP, 5 min burst, Storm 1
Pipe3	0.006	0.35	108.808	106.611	5% AEP, 20 min burst, Storm 10

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
Orifice 2	0.009	0	0	0.23	0	49.99	0	5% AEP, 20 min burst, Storm 10

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSD Basin	108.99	7.1	0.014	0.006	0.009

Run Log for DRAINS v2023.11.8726.15750 - C11825-17089-Drains

100 YEAR