



Ibrahim Stormwater Consultants



REF : B10543-103705

STORMWATER DESIGN CALCULATIONS

AT 26 CLAUDARE STREET,

COLLARROY PLATEAU

FOR ALIMAX PTY LTD ATF

Contents

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Files On Disk

B10543-103705 -DRAINS.DRN

2.0 Infiltration System Requirements

Geotech report conducted
Permeability rate determined
Ksat = 3.5641 cm/min

0.5 L/s/sqm
>=0.5L/s/sqm - ok

1.0 Detention System Requirements

1.1 Storage-Area calcs.

DATA:

Site Area Assessed due to easements

Site Area = **0.0615** ha **615** sq.m

Impervious Area Pre Development = **385.2** sqm

Percentage Impervious Pre Development = 0% assumed

Impervious Area POST Development = **355.1** sqm

Percentage Impervious POST Development = 58%

Catchment directed through OSD A = **89.82** sqm 25.3 %

OSD Bypass Areas : Impervious **265.25** sqm 100.0 %

Pervious 0 sqm 0.0 %

Total 265.25 sqm

Area bypassing OSD B = 234 sqm

Slope of Site = **6** %

Effective Flow Length = **28.7** m Time of Concentration t_c =

Hortons n = 0.1 1 min. 1:5
1 min. 1:100

FFL of house = **95.69** m

Roof Gutter Level = **98.255** m

Invert of Outlet = **94.6** m

Raintank Pad Level = **95.52** m

Freeboard to Roof Gutter = **0.715** m

Detention A

Volume Required 2.34 cu.m

Total Area 2.93 sq.m

Stage Storage-Discharge Relationship

Stage	Storage Area	Avg. Depth	Storage
(m)	(sq.m)	(m)	(cu.m)
96.62	0	0	0.000
97.12	2.9	0.500	1.460
97.42	2.9	0.80	2.339

Invert of pit = 96.62 m

Orifice Dia. = **30** mm

Max. Water Level achieved = 97.410 m

Storage achieved 2.31 cu.m

Basix Allowance

Raintank Basix = **3000** L

Raintank Provided = **3220** L

Water Level in Tank RL for Basix = 96.62 m = orifice IL. Depth=1.1m

0% OSD Compensation = 1155 L

Net OSD required 1155 L -RL. 97.41 m

Nominal tank Volume used = **5910** L

Total Tank Height = **2.020** m TOP OF TANK.=97.54m

Overflow to ---> **OSD**, then Level Spreader

Trench Length = 6 m x 1 rows x 0.2 m wide

Absorption trench

Volume Required 21.97 cu.m

Total Area 35.00 sq.m

Stage Storage-Discharge Relationship

Stage	Storage Area	Avg. Depth	Storage
(m)	(sq.m)	(m)	(cu.m)
94.65	0	0	0.000
94.90	0.4	0.250	0.090
94.95	35.0	0.025	0.965
95.55	35.0	0.63	21.965

Invert of pit = 94.65 m

Orifice Dia. = **30** mm

Max. Water Level achieved = 95.520 m

Storage achieved 10.94 cu.m

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					95.52		0			444	-153	8										
Level Spreader	OnGrade	Sutherland grate	Grated pit with 0.9 m x 0.9 m		1.5	94.95		0	0		618.441	-210.487	No	566686	1 x Ku								
Dummy Node	Node					94.65		0			664.978	-235.87	45										
Roof	Node					98.255		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 Leng	id								
OSD -2	94.65		0.00	0.3 Orifice		30	94.665				571.865	-185.735	No			36990							
	94.90		0.36																				
	94.95		35.00																				
	95.55		35.00																				
OSD -1	96.62		2.9	0 Orifice		30	96.6355753				558	-103	No			5							
	97.12		2.9																				
	97.42		2.9																				
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	0.0615	0	100	0	0	0	0	28.7		28.7	0	6	6	0	0.01	0.33	0	0				
Ground -2	Ground	0.026525	100.0	0.0	0	0	0	0	25		25	0	6	6	0	0.01	0.33	0	0				
bypass-2	Level Spreader	0.0234	5	95	0	0	0	0	7		28.7	0	2.7	2.7	0	0.01	0.33	0	0				
Roof Area	Roof	0.008982	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	Chg (m)	RI (m)	Chg (m)	RL (m)	etc (m)				
Pipe2	Ground	OSD -2	45	94.95	94.65	1.44	uPVC, not un	150	154		0.03 NewFixed	1	Ground		0								
Pipe4	OSD -2	Level Spreader	5	94.65	94.55	2	uPVC, not un	150	154		0.03 NewFixed	1	OSD -2		0								
Pipe5	Level Spreader	Dummy Node	5	94.55	94.45	2	uPVC, not un	225	230		0.03 New	1	Level Spreader		0								
Pipe1	Roof	OSD -1	20	97.755	96.62	1	uPVC, not un	150	154		0.03 NewFixed	1	Roof		0								
Pipe3	OSD -1	OSD -2	10	96.62	94.75	9.8	uPVC, not un	150	154		0.03 NewFixed	1	OSD -1		0								
DETAILS of SERVICES CROSSING PIPES																							
Pipe	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of : (m)	Chg (m)	Bottom Elev (m)	Height of S (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 (m)	Roofed										
OVERFLOW ROUTE DETAILS																							
Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major (m)	SafeDepth Storm (m)	Safe Depth Minor (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id									
OSD Overflow	OSD -2	Level Spreader	1	95.55	6	1.7	Pathway 6 m	0.1	0.05	0.4	1	0	37044										

1.3 DRAINS Summary of Pre & Post Developed Discharges

5 YEAR

DRAINS results prepared from Version 2021.031

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	95.31		0.012				
Level Spreader	94.61		0.004		0.34	0	None
Dummy Node	94.48		0				
Roof	97.78		0.004				

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	0.011		0	0.011	1.2	9.81	0 20% AEP, 15 min burst, Storm 4
Ground -2	0.011		0.011	0	0.95	7.72	0 20% AEP, 5 min burst, Storm 1
bypass-2	0.004		0	0.004	0.7	13.22	0 20% AEP, 20 min burst, Storm 7
Roof Area	0.004		0.004	0	0.59	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	0.012		0.63	95.314	95.204 20% AEP, 5 min burst, Storm 1
Pipe4	0.001		0.21	95.007	94.61 20% AEP, 1.5 hour burst, Storm 1
Pipe5	0.005		1.28	94.61	94.484 20% AEP, 20 min burst, Storm 7
Pipe1	0.004		1.63	97.784	96.963 20% AEP, 5 min burst, Storm 1
Pipe3	0.001		0.06	96.768	95.204 20% AEP, 20 min burst, Storm 4

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
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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
OSD Overflow	0		0	0.268	0	0	0	0
INFILTRATION	0		0	0.256	0	0	0	0

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSD -2	95.2		9.6	0.001	0.001
OSD -1	96.96		1	0.001	0.001

Run Log for B10543 run at 17:59:19 on 13/5/2022 using version 2021.031

No water upwelling from any pit. Freeboard was adequate at all pits.

Flows were safe in all overflow routes.

100 YEAR

DRAINS results prepared from Version 2021.031

PIT / NODE DETAILS

Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow	Max Pond Arriving Volume (cu.m/s)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
Ground	95.97			0.024			
Level Spreader	94.64			0.012		0.31	0 None
Dummy Node	94.5			0			
Roof	97.79			0.008			

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	0.031		0	0.031	0.89	7.24	0 1% AEP, 10 min burst, Storm 7
Ground -2	0.019		0.019	0	0.76	6.18	0 1% AEP, 5 min burst, Storm 1
bypass-2	0.011		0.001	0.01	0.48	9.2	0 1% AEP, 10 min burst, Storm 7
Roof Area	0.007		0.007	0	0.48	0	0 1% 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	0.022		1.16	95.975	95.517 1% AEP, 5 min burst, Storm 1
Pipe4	0.002		0.15	95.216	94.642 1% AEP, 2 hour burst, Storm 4
Pipe5	0.012		1.63	94.642	94.502 1% AEP, 10 min burst, Storm 7
Pipe1	0.007		1.95	97.793	97.412 1% AEP, 5 min burst, Storm 1
Pipe3	0.002		0.09	97.181	95.517 1% AEP, 20 min burst, Storm 4

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
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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
OSD Overflow	0		0	0.843	0	0	0	0
INFILTRATION	0		0	7.665	0	0	0	0

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level	
OSD -2	95.52		20.5	0.002	0.002	0
OSD -1	97.41		2.3	0.002	0.002	0

Run Log for B10543 run at 17:59:42 on 13/5/2022 using version 2021.031

No water upwelling from any pit. Freeboard was adequate at all pits.

Flows were safe in all overflow routes.