

File Ref: 21/055

15 March 2022

DA2021/2064 – Flow Calculations
68 Memorial Avenue Stroud

 Catchment Area (A) = 23.33ha = 0.233km²

Refer to Catchment Plan

 Time of Concentration $t_c = 0.76A^{0.38}$
 $t_c = 0.76 \times 0.233^{0.38} = 0.437$ hours = 26 minutes

1% AEP Flow

 $I_{1\%}$ for 26 minutes = 145

Refer Bureau of meteorology Rainfall Intensity Data

 Assume $C_{10} = 0.4$ (rural catchment)

 $C_{100} = 0.4 \times 1.2 = 0.48$
 $Q = CIA/360 = (0.48 \times 145 \times 23.33)/360$
 $Q_{1\%} = 4.51$ cumecs

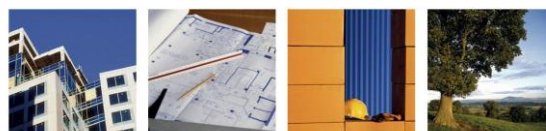
10% AEP Flow

 $t_c = 0.76 \times 0.233^{0.38} = 0.437$ hours = 26 minutes

 $I_{10\%}$ for 26 minutes = 86.5

Refer Bureau of meteorology Rainfall Intensity Data

 Assume $C_{10} = 0.4$ (rural catchment)

 $Q = CIA/360 = (0.4 \times 86.5 \times 23.33)/360$
 $Q_{10\%} = 2.24$ cumecs


Existing Pipe in Nairn Street

450Ø

Upstream IL 41.41

Downstream IL 41.34

Length 8.7m

Grade of pipe 0.8%

Calculation

<https://ingeniir.com/stormwater/colebrookwhitepipe>

Flow Volume: 0.289m³/s

Flow Velocity: 1.818m/s

Pipe Size: 450mm

☒ Input

Diameter (mm)

450

mm ▼

Pipe Material

Precast Concrete

Pipe Slope (%)

.8

% ▼

Submit

Design Flow Rate (m³/s)

design flow

m³/s ▼

Roughness (k)

0.6

Capacity of Existing Pipe in Nairn Street = 0.289 cumecs



Yours sincerely

HDB Town Planning & Design

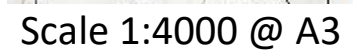
Rod Fletcher

Civil Designer

Attachments

- Catchment Plan
- Refer Bureau of meteorology Rainfall Intensity Data

68 Memorial Avenue Stroud





Location

Label: 68 Memorial Ave Stroud

Latitude: -32.4019 [Nearest grid cell: 32.4125 (S)]

Longitude: 151.9747 [Nearest grid cell: 151.9625 (E)]

IFD Design Rainfall Intensity (mm/h)

Issued: 15 December 2021

Rainfall intensity for Durations, Exceedance per Year (EY), and Annual Exceedance Probabilities (AEP).

[FAQ for New ARR probability terminology](#)

Duration	Annual Exceedance Probability (AEP)						
	63.2%	50%#	20%*	10%	5%	2%	1%
1 min	126	144	206	251	297	364	419
2 min	104	120	172	210	249	303	348
3 min	96.7	111	159	194	230	281	323
4 min	91.5	105	150	183	217	265	304
5 min	87.0	99.7	142	173	206	251	289
10 min	69.8	79.8	113	138	164	201	231
15 min	58.4	66.8	94.9	116	137	168	194
20 min	50.4	57.6	82.0	100	119	146	168
25 min	44.5	50.9	72.5	88.5	105	129	148
26 min	43.5	49.8	70.9	86.5	103	126	145
30 min	39.9	45.8	65.2	79.6	94.5	116	133
45 min	31.0	35.6	50.8	61.9	73.6	90.1	104
1 hour	25.7	29.5	42.1	51.4	61.1	74.7	86.0
1.5 hour	19.7	22.5	32.2	39.2	46.6	57.0	65.5
2 hour	16.2	18.6	26.5	32.4	38.4	47.0	54.0
3 hour	12.5	14.3	20.3	24.7	29.3	35.9	41.2
4.5 hour	9.68	11.1	15.6	19.0	22.5	27.6	31.7
6 hour	8.14	9.27	13.1	15.9	18.8	23.0	26.4
9 hour	6.42	7.30	10.2	12.4	14.7	17.9	20.7
12 hour	5.46	6.19	8.66	10.5	12.4	15.1	17.4
18 hour	4.34	4.92	6.86	8.28	9.75	11.9	13.8
24 hour	3.69	4.18	5.81	7.01	8.24	10.1	11.7
30 hour	3.23	3.67	5.10	6.14	7.22	8.85	10.2
36 hour	2.90	3.29	4.57	5.51	6.46	7.93	9.14
48 hour	2.41	2.74	3.82	4.60	5.40	6.62	7.63
72 hour	1.82	2.08	2.91	3.50	4.10	5.03	5.78
96 hour	1.46	1.67	2.35	2.83	3.32	4.05	4.65

120 hour	1.22	1.39	1.96	2.36	2.78	3.38	3.87
144 hour	1.04	1.19	1.67	2.02	2.38	2.88	3.29
168 hour	0.902	1.03	1.45	1.75	2.07	2.50	2.85

Note:

The 50% AEP IFD **does not** correspond to the 2 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 1.44 ARI.

* The 20% AEP IFD **does not** correspond to the 5 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 4.48 ARI.

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