

Utility Programs for Drainage

Flood calculations



Sinotech

Project name: 323 - Wellington Erven 15712
Analysed by: Jana Marais
Name of river: Unknown
Description of site: Erf 15712
Filename: C:\Dropbox (Triple 3 Engineering)\T3CivilEng\Projects\323 - Erf 15712 Wellington\design\storm water\UPD Drainage\Erf 15712.fld
Date: 10 May 2018

Printed: 17 May 2018

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Flood Frequency Analysis: Alternative Rational Method

Project = 323 - Wellington Erven 15712
Analysed by = Jana Marais
Name of river = Unknown
Description of site = Erf 15712
Date = 5/10/2018
Area of catchment = 2.448 km²
Dolomitic area = 0.0 %
Length of longest watercourse = 1.997 km
Flow of water = Defined water course
Height difference along 10-85 slope = 75.0 m
Area distribution = Rural: 100 %, Urban: 0 %, Lakes: 0 %

Catchment description - Urban area (%)

Lawns	Residential and industry	Business
Sandy, flat (<2%) 0	Houses 0	City centre 0
Sandy, steep (>7%) 0	Flats 0	Suburban 0
Heavy soil, flat (<2%) 0	Light industry 0	Streets 0
Heavy soil, steep (>7%) 0	Heavy industry 0	Maximum flood 0

Catchment description - Rural area (%)

Surface slopes	Permeability	Vegetation
Lakes and pans 10	Very permeable 0	Thick bush & forests 0
Flat area 80	Permeable 50	Light bush & cultivated land 90
Hilly 10	Semi-permeable 50	Grasslands 10
Steep areas 0	Impermeable 0	Bare 0

Days on which thunder was heard = 5 days/year

Weather Services station number = 21878

Weather Services station location = WELLINGTON

Mean annual precipitation (MAP) = 620 mm

Duration	2	5	10	20	50	100	200
1 day	44	58	67	78	93	105	118
2 days	59	78	92	106	127	144	162
3 days	67	90	107	125	150	171	194
7 days	87	118	141	165	199	226	256

The modified recalibrated Hershfield relationship was used to determine point rainfall.

Average slope = 0.05008 m/m

Time of concentration = 21.5 min

Run-off factor

Rural - C1 = 0.323

Urban - C2 = 0.000

Lakes - C3 = 0.000

Combined - C = 0.323

Return period (years)	Time of concentration (hours)	Point rainfall (mm)	ARF (%)	Average intensity (mm/h)	Factor Ft	Runoff coefficient (%)	Peak flow (m ³ /s)
1:2	0.36	10.28	100.0	28.72	0.75	24.2	4.731
1:5	0.36	17.34	100.0	48.45	0.80	25.8	8.514
1:10	0.36	22.68	100.0	63.38	0.85	27.5	11.83
1:20	0.36	28.02	100.0	78.30	0.90	29.1	15.48
1:50	0.36	35.08	100.0	98.04	0.95	30.7	20.46
1:100	0.36	40.42	100.0	112.96	1.00	32.3	24.81
1:200	0.36	45.76	100.0	127.89	1.00	32.3	28.09

Run-off coefficient percentage includes adjustment saturation factors (Ft) for steep and impermeable catchments

Calculated using Utility Programs for Drainage 1.1.0

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