Description of catchment:	Sibaya Node 6	**Calculated by:**	
Element Description:	South of M27	**Date:**	Tuesday, 14 March 2023
Project Number:	2019_0173	**Source:**	SANRAL, 2007

PHYSICAL PROPERTIES OF CATCHMENT:

Area of catchment:	A=	0,33	km^2
Water path (overland)	L_1=	0,3	km
Average slope:	H_{L1}=	122,000	m
Overland	H_{L2}=	80,000	m
	L_1=	0,3	km
	S_{avg1}=	0,14	m/m
Area dolomite	D=	0%	

Longest water path	L=	0,75	km
Water path (water course)	L_2=	0,45	km
Average slope:	$H_{0.85L}$=	80,000	m
Watercourse	$H_{0.10L}$=	59,000	m
	0.75L=	0,3375	km
	S_{avg2}=	0,0622222	m/m

Area distribution factors (α + ß + γ = 1)

Rural		Urban		Lakes	
α=	1	ß=	0	γ=	0

0,259

RURAL									URBAN		
SLOPE SLOPE C_S (%)			PERMEABILITY C_p(%)			VEGETATION C_v (%)			USE		
Lakes and pans	0%	0,05	Very permeable	50%	0,05	Thick bush & plantations	20%	0,05	Lawns & Parks	0%	0,1
Flat areas	10%	0,11	Permeable	50%	0,1	Light bush & cultivated areas	60%	0,15	Industrial areas	0%	0,8
Hilly areas	60%	0,2	Semi-permeable	0%	0,2	Grasveld	15%	0,25	City / residential	0%	0,6
Mountaneous	30%	0,3	Unpermeable	0%	0,3	No vegetation	5%	0,3	Streets	0%	0,95
Total (100)	**100%**	0,221	**Total (100)**	**100%**	0,075	**Total (100)**	**100%**	0,15	Total (100)	0%	0,0

Rural coeficient C_1=	0,449

Urban coeficient C_2=	0,00

Return period	2	5	10	20	50	100	200
F_t	1	1	1	1	1	1	1
C	0,45	0,45	0,45	0,45	0,45	0,45	0,45
Adjusted C_1	0,45	0,45	0,45	0,45	0,45	0,45	0,45
Total C	0,45	0,45	0,45	0,45	0,45	0,45	0,45

RAINFALL:

T_c (overland flow)

$$T_C = 0.604 \times \left(\frac{rL_1}{S_{avg1}^{0.5}} \right)^{0.467}$$

r =	0,4
T_c =	0,3551

V = 0,2347 m/s
(0.2 - 0.5m/s)

Values for r	
Paved areas	0,02
Clean soil	0,1
Sparse Grass	0,3
Moderate Grass	0,4
Thick Bush	0,8

T_c (channel flow)

$$T_C = \left(\frac{0.87 \times L_2^{\,2}}{1000\, S_{avg\,2}} \right)^{0.385}$$

T_c =	0,1040

V = 1,2019 m/s
(0.8 - 1.3m/s)

Dolomite reduction (D_r)	
Steep (>30%)	0,5
Hilly (10 -30%)	0,35
Flat (3 - 10%)	0,2
Vlei's & Pans (<3%)	0,1

T_c =	0,4591
Storm duration	**27,548 min**

Average annual rainfall:	1018 mm / annum
Rainfall region:	Summer

Return period	2	5	10	20	50	100	200
Point rainfall (mm)	23,59	35,36	44,57	54,55	69,59	82,54	97,10
Point intensity I (mm/h)	51,4	77,0	97,1	118,8	151,6	179,8	211,5
Area reduction factor	1,00	1,00	1,00	1,00	1,00	1,00	1,00
Average intensity I (mm/hr)	51,4	77,0	97,1	118,8	151,6	179,8	211,5

PEAK FLOW:

Return period	2	5	10	20	25	50	100	200
Peak flow (m^3/s)	2,112	3,167	3,991	4,884	5,109	6,232	7,391	8,695
Peak flow (l/s)	2112	3167	3991	4884	5109	6232	7391	8695