

Management Plan 3; Appendix C

Letter WF SuDS Drainage Design

Rational Method Q = 0.278 CiA

Catchment Area											
Ref	Total Catchment A (m²)	A Hardstand (m²)	A excl Hardstand (m²)	A Hardstand (km²)	A excl Hardstand (km²)	Residual Volume (m3)	Width (m)	Height (m)	Required Length (m)	Optimised Length	Ratio
SP1	5910	5910	0	0.0059	0.0000	71.3	4.00	1.0	17.8	18	4.5
SP2	6850	5600	1250	0.0056	0.0013	91.2	3.00	1.0	30.4	12	4
SP3	1650	0	1650	0.0000	0.0017	31.2	3.00	1.0	10.4	12	4
SP4	5925	5925	0	0.0059	0.0000	71.4	4.00	1.0	17.9	18	4.5
SP5	1525	0	1525	0.0000	0.0015	28.9	3.00	1.0	9.6	12	4
SP6	4985	4985	0	0.0050	0.0000	60.1	4.00	1.0	15.0	15	3.75
SP7	2515	0	2515	0.0000	0.0025	47.6	4.00	1.0	11.9	12	3
SP8	4520	4520	0	0.0045	0.0000	54.5	4.00	1.0	13.6	15	3.75
SP9	1245	0	1245	0.0000	0.0012	23.6	3.00	1.0	7.9	9	3
SP10	1245	0	1245	0.0000	0.0012	23.6	3.00	1.0	7.9	9	3
SP11	2100	0	2100	0.0000	0.0021	39.7	4.00	1.0	9.9	12	3
SP12	1940	0	1940	0.0000	0.0019	36.7	3.00	1.0	12.2	12	4

Velocity Check			
Ref	Flow Rate (m³/sec)	Cross-sectional Area (m²)	Velocity (m/sec)
SP1	0.038	72	0.00052165
SP2	0.069	36	0.00192669
SP3	0.014	36	0.00037866
SP4	0.062	72	0.0008675
SP5	0.013	36	0.00034997
SP6	0.053	60	0.00087584
SP7	0.021	48	0.00043287
SP8	0.048	60	0.00079415
SP9	0.010	27	0.00038095
SP10	0.010	27	0.00038095
SP11	0.017	48	0.00036145
SP12	0.016	36	0.00044521

Catchment		SP1		Area Excl Hardstand		water discharge rate (l/s)					
Clean water natural flow						30.06		l/s/ha			
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.78	192	0.00000	0.000	0.0	9.0	0.0	0.0
M100 10min	10	22.3	0.278	0.78	133.8	0.00000	0.000	0.0	18.0	0.0	0.0
M100 15min	15	26.2	0.278	0.78	104.8	0.00000	0.000	0.0	27.1	0.0	0.0
M100 30min	30	31.6	0.278	0.78	63.2	0.00000	0.000	0.0	54.1	0.0	0.0
M100 60min	60	38.1	0.278	0.78	38.1	0.00000	0.000	0.0	108.2	0.0	0.0
M100 2hr	120	45.9	0.278	0.78	22.95	0.00000	0.000	0.0	216.4	0.0	0.0
M100 4hr	240	55.4	0.278	0.78	13.85	0.00000	0.000	0.0	432.9	0.0	0.0
M100 6hr	300	61.7	0.278	0.78	12.34	0.00000	0.000	0.0	649.3	0.0	0.0
M100 12hr	600	74.4	0.278	0.78	7.44	0.00000	0.000	0.0	1298.6	0.0	0.0
M100 24hr	1200	89.7	0.278	0.78	4.485	0.00000	0.000	0.0	2597.2	0.0	0.0
M100 48hr	2400	108.4	0.278	0.78	2.71	0.00000	0.000	0.0	5194.4	0.0	0.0

Catchment			SP1	Hardstand		water discharge rate (l/s)					
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.6	192	0.00591	0.189	56.8	9.0	5.3	51.5
M100 10min	10	22.3	0.278	0.6	133.8	0.00591	0.132	79.1	18.0	10.7	68.5
M100 15min	15	26.2	0.278	0.6	104.8	0.00591	0.103	93.0	27.1	16.0	77.0
M100 30min	30	31.6	0.278	0.6	63.2	0.00591	0.062	112.1	54.1	32.0	80.2
M100 60min	60	38.1	0.278	0.6	38.1	0.00591	0.038	135.2	108.2	64.0	71.3
M100 2hr	120	45.9	0.278	0.6	22.95	0.00591	0.023	162.9	216.4	127.9	35.0
M100 4hr	240	55.4	0.278	0.6	13.85	0.00591	0.014	196.6	432.9	255.8	-59.2
M100 6hr	300	61.7	0.278	0.6	12.34	0.00591	0.012	262.8	649.3	383.7	-121.0
M100 12hr	600	74.4	0.278	0.6	7.44	0.00591	0.007	316.8	1298.6	767.5	-450.6
M100 24hr	1200	89.7	0.278	0.6	4.485	0.00591	0.004	382.0	2597.2	1534.9	-1152.9
M100 48hr	2400	108.4	0.278	0.6	2.71	0.00591	0.003	461.6	5194.4	3069.9	-2608.2

Catchment			SP2	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.78	192	0.00125	0.052	15.6	9.0	1.1	14.5
M100 10min	10	22.3	0.278	0.78	133.8	0.00125	0.036	21.8	18.0	2.3	19.5
M100 15min	15	26.2	0.278	0.78	104.8	0.00125	0.028	25.6	27.1	3.4	22.2
M100 30min	30	31.6	0.278	0.78	63.2	0.00125	0.017	30.8	54.1	6.8	24.1
M100 60min	60	38.1	0.278	0.78	38.1	0.00125	0.010	37.2	108.2	13.5	23.7
M100 2hr	120	45.9	0.278	0.78	22.95	0.00125	0.006	44.8	216.4	27.1	17.7
M100 4hr	240	55.4	0.278	0.78	13.85	0.00125	0.004	54.1	432.9	54.1	0.0
M100 6hr	300	61.7	0.278	0.78	12.34	0.00125	0.003	72.2	649.3	81.2	-8.9
M100 12hr	600	74.4	0.278	0.78	7.44	0.00125	0.002	87.1	1298.6	162.3	-75.2
M100 24hr	1200	89.7	0.278	0.78	4.485	0.00125	0.001	105.0	2597.2	324.6	-219.6
M100 48hr	2400	108.4	0.278	0.78	2.71	0.00125	0.001	126.9	5194.4	649.3	-522.4

RECEIVED: 19/01/2024

Catchment			SP2	Hardstand					water discharge rate (l/s)		
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.6	192	0.00560	0.179	53.8	9.0	5.1	48.8
M100 10min	10	22.3	0.278	0.6	133.8	0.00560	0.125	75.0	18.0	10.1	64.9
M100 15min	15	26.2	0.278	0.6	104.8	0.00560	0.098	88.1	27.1	15.2	73.0
M100 30min	30	31.6	0.278	0.6	63.2	0.00560	0.059	106.3	54.1	30.3	76.0
M100 60min	60	38.1	0.278	0.6	38.1	0.00560	0.036	128.1	108.2	60.6	67.5
M100 2hr	120	45.9	0.278	0.6	22.95	0.00560	0.021	154.3	216.4	121.2	33.1
M100 4hr	240	55.4	0.278	0.6	13.85	0.00560	0.013	186.3	432.9	242.4	-56.1
M100 6hr	300	61.7	0.278	0.6	12.34	0.00560	0.012	249.0	649.3	363.6	-114.6
M100 12hr	600	74.4	0.278	0.6	7.44	0.00560	0.007	300.2	1298.6	727.2	-427.0
M100 24hr	1200	89.7	0.278	0.6	4.485	0.00560	0.004	362.0	2597.2	1454.4	-1092.5
M100 48hr	2400	108.4	0.278	0.6	2.71	0.00560	0.003	437.4	5194.4	2908.8	-2471.4

Catchment			SP3	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.78	192	0.00165	0.069	20.6	9.0	1.5	19.1
M100 10min	10	22.3	0.278	0.78	133.8	0.00165	0.048	28.7	18.0	3.0	25.7
M100 15min	15	26.2	0.278	0.78	104.8	0.00165	0.037	33.7	27.1	4.5	29.3
M100 30min	30	31.6	0.278	0.78	63.2	0.00165	0.023	40.7	54.1	8.9	31.8
M100 60min	60	38.1	0.278	0.78	38.1	0.00165	0.014	49.1	108.2	17.9	31.2
M100 2hr	120	45.9	0.278	0.78	22.95	0.00165	0.008	59.1	216.4	35.7	23.4
M100 4hr	240	55.4	0.278	0.78	13.85	0.00165	0.005	71.4	432.9	71.4	-0.1
M100 6hr	300	61.7	0.278	0.78	12.34	0.00165	0.004	95.4	649.3	107.1	-11.8
M100 12hr	600	74.4	0.278	0.78	7.44	0.00165	0.003	115.0	1298.6	214.3	-99.3
M100 24hr	1200	89.7	0.278	0.78	4.485	0.00165	0.002	138.6	2597.2	428.5	-289.9
M100 48hr	2400	108.4	0.278	0.78	2.71	0.00165	0.001	167.5	5194.4	857.1	-689.5

RECEIVED: 19/01/2024

Catchment			SP3	Hardstand					water discharge rate (l/s)		
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.6	192	0.00000	0.000	0.0	9.0	0.0	0.0
M100 10min	10	22.3	0.278	0.6	133.8	0.00000	0.000	0.0	18.0	0.0	0.0
M100 15min	15	26.2	0.278	0.6	104.8	0.00000	0.000	0.0	27.1	0.0	0.0
M100 30min	30	31.6	0.278	0.6	63.2	0.00000	0.000	0.0	54.1	0.0	0.0
M100 60min	60	38.1	0.278	0.6	38.1	0.00000	0.000	0.0	108.2	0.0	0.0
M100 2hr	120	45.9	0.278	0.6	22.95	0.00000	0.000	0.0	216.4	0.0	0.0
M100 4hr	240	55.4	0.278	0.6	13.85	0.00000	0.000	0.0	432.9	0.0	0.0
M100 6hr	300	61.7	0.278	0.6	12.34	0.00000	0.000	0.0	649.3	0.0	0.0
M100 12hr	600	74.4	0.278	0.6	7.44	0.00000	0.000	0.0	1298.6	0.0	0.0
M100 24hr	1200	89.7	0.278	0.6	4.485	0.00000	0.000	0.0	2597.2	0.0	0.0
M100 48hr	2400	108.4	0.278	0.6	2.71	0.00000	0.000	0.0	5194.4	0.0	0.0

Catchment			SP4	Area Excl Hardstand			water discharge rate (l/s)				
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.78	192	0.00000	0.000	0.0	9.0	0.0	0.0
M100 10min	10	22.3	0.278	0.78	133.8	0.00000	0.000	0.0	18.0	0.0	0.0
M100 15min	15	26.2	0.278	0.78	104.8	0.00000	0.000	0.0	27.1	0.0	0.0
M100 30min	30	31.6	0.278	0.78	63.2	0.00000	0.000	0.0	54.1	0.0	0.0
M100 60min	60	38.1	0.278	0.78	38.1	0.00000	0.000	0.0	108.2	0.0	0.0
M100 2hr	120	45.9	0.278	0.78	22.95	0.00000	0.000	0.0	216.4	0.0	0.0
M100 4hr	240	55.4	0.278	0.78	13.85	0.00000	0.000	0.0	432.9	0.0	0.0
M100 6hr	300	61.7	0.278	0.78	12.34	0.00000	0.000	0.0	649.3	0.0	0.0
M100 12hr	600	74.4	0.278	0.78	7.44	0.00000	0.000	0.0	1298.6	0.0	0.0
M100 24hr	1200	89.7	0.278	0.78	4.485	0.00000	0.000	0.0	2597.2	0.0	0.0
M100 48hr	2400	108.4	0.278	0.78	2.71	0.00000	0.000	0.0	5194.4	0.0	0.0

RECEIVED: 19/01/2024

Catchment			SP4	Hardstand		water discharge rate (l/s)					
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.6	192	0.00593	0.190	56.9	9.0	5.3	51.6
M100 10min	10	22.3	0.278	0.6	133.8	0.00593	0.132	79.3	18.0	10.7	68.7
M100 15min	15	26.2	0.278	0.6	104.8	0.00593	0.104	93.2	27.1	16.0	77.2
M100 30min	30	31.6	0.278	0.6	63.2	0.00593	0.062	112.4	54.1	32.1	80.4
M100 60min	60	38.1	0.278	0.6	38.1	0.00593	0.038	135.6	108.2	64.1	71.4
M100 2hr	120	45.9	0.278	0.6	22.95	0.00593	0.023	163.3	216.4	128.2	35.1
M100 4hr	240	55.4	0.278	0.6	13.85	0.00593	0.014	197.1	432.9	256.5	-59.4
M100 6hr	300	61.7	0.278	0.6	12.34	0.00593	0.012	263.4	649.3	384.7	-121.3
M100 12hr	600	74.4	0.278	0.6	7.44	0.00593	0.007	317.6	1298.6	769.4	-451.8
M100 24hr	1200	89.7	0.278	0.6	4.485	0.00593	0.004	383.0	2597.2	1538.8	-1155.9
M100 48hr	2400	108.4	0.278	0.6	2.71	0.00593	0.003	462.8	5194.4	3077.7	-2614.9

Catchment			SP5	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.78	192	0.00153	0.063	19.0	9.0	1.4	17.7
M100 10min	10	22.3	0.278	0.78	133.8	0.00153	0.044	26.5	18.0	2.8	23.8
M100 15min	15	26.2	0.278	0.78	104.8	0.00153	0.035	31.2	27.1	4.1	27.1
M100 30min	30	31.6	0.278	0.78	63.2	0.00153	0.021	37.6	54.1	8.3	29.4
M100 60min	60	38.1	0.278	0.78	38.1	0.00153	0.013	45.4	108.2	16.5	28.9
M100 2hr	120	45.9	0.278	0.78	22.95	0.00153	0.008	54.6	216.4	33.0	21.6
M100 4hr	240	55.4	0.278	0.78	13.85	0.00153	0.005	66.0	432.9	66.0	-0.1
M100 6hr	300	61.7	0.278	0.78	12.34	0.00153	0.004	88.1	649.3	99.0	-10.9
M100 12hr	600	74.4	0.278	0.78	7.44	0.00153	0.002	106.3	1298.6	198.0	-91.8
M100 24hr	1200	89.7	0.278	0.78	4.485	0.00153	0.001	128.1	2597.2	396.1	-267.9
M100 48hr	2400	108.4	0.278	0.78	2.71	0.00153	0.001	154.9	5194.4	792.1	-637.3

Catchment			SP5		Hardstand			water discharge rate (l/s)			
-----------	--	--	-----	--	-----------	--	--	----------------------------	--	--	--

RECEIVED: 19/01/2024

Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.6	192	0.00000	0.000	0.0	9.0	0.0	0.0
M100 10min	10	22.3	0.278	0.6	133.8	0.00000	0.000	0.0	18.0	0.0	0.0
M100 15min	15	26.2	0.278	0.6	104.8	0.00000	0.000	0.0	27.1	0.0	0.0
M100 30min	30	31.6	0.278	0.6	63.2	0.00000	0.000	0.0	54.1	0.0	0.0
M100 60min	60	38.1	0.278	0.6	38.1	0.00000	0.000	0.0	108.2	0.0	0.0
M100 2hr	120	45.9	0.278	0.6	22.95	0.00000	0.000	0.0	216.4	0.0	0.0
M100 4hr	240	55.4	0.278	0.6	13.85	0.00000	0.000	0.0	432.9	0.0	0.0
M100 6hr	300	61.7	0.278	0.6	12.34	0.00000	0.000	0.0	649.3	0.0	0.0
M100 12hr	600	74.4	0.278	0.6	7.44	0.00000	0.000	0.0	1298.6	0.0	0.0
M100 24hr	1200	89.7	0.278	0.6	4.485	0.00000	0.000	0.0	2597.2	0.0	0.0
M100 48hr	2400	108.4	0.278	0.6	2.71	0.00000	0.000	0.0	5194.4	0.0	0.0

Catchment		SP6		Area Excl Hardstand		water discharge rate (l/s)					
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.78	192	0.00000	0.000	0.0	9.0	0.0	0.0
M100 10min	10	22.3	0.278	0.78	133.8	0.00000	0.000	0.0	18.0	0.0	0.0
M100 15min	15	26.2	0.278	0.78	104.8	0.00000	0.000	0.0	27.1	0.0	0.0
M100 30min	30	31.6	0.278	0.78	63.2	0.00000	0.000	0.0	54.1	0.0	0.0
M100 60min	60	38.1	0.278	0.78	38.1	0.00000	0.000	0.0	108.2	0.0	0.0
M100 2hr	120	45.9	0.278	0.78	22.95	0.00000	0.000	0.0	216.4	0.0	0.0
M100 4hr	240	55.4	0.278	0.78	13.85	0.00000	0.000	0.0	432.9	0.0	0.0
M100 6hr	300	61.7	0.278	0.78	12.34	0.00000	0.000	0.0	649.3	0.0	0.0
M100 12hr	600	74.4	0.278	0.78	7.44	0.00000	0.000	0.0	1298.6	0.0	0.0
M100 24hr	1200	89.7	0.278	0.78	4.485	0.00000	0.000	0.0	2597.2	0.0	0.0
M100 48hr	2400	108.4	0.278	0.78	2.71	0.00000	0.000	0.0	5194.4	0.0	0.0

Catchment	SP6	Hardstand	water discharge rate (l/s)								
-----------	-----	-----------	----------------------------	--	--	--	--	--	--	--	--

RECEIVED: 19/01/2024

Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.6	192	0.00499	0.160	47.9	9.0	4.5	43.4
M100 10min	10	22.3	0.278	0.6	133.8	0.00499	0.111	66.8	18.0	9.0	57.8
M100 15min	15	26.2	0.278	0.6	104.8	0.00499	0.087	78.4	27.1	13.5	64.9
M100 30min	30	31.6	0.278	0.6	63.2	0.00499	0.053	94.6	54.1	27.0	67.6
M100 60min	60	38.1	0.278	0.6	38.1	0.00499	0.032	114.0	108.2	53.9	60.1
M100 2hr	120	45.9	0.278	0.6	22.95	0.00499	0.019	137.4	216.4	107.9	29.5
M100 4hr	240	55.4	0.278	0.6	13.85	0.00499	0.012	165.8	432.9	215.8	-49.9
M100 6hr	300	61.7	0.278	0.6	12.34	0.00499	0.010	221.6	649.3	323.7	-102.0
M100 12hr	600	74.4	0.278	0.6	7.44	0.00499	0.006	267.3	1298.6	647.3	-380.1
M100 24hr	1200	89.7	0.278	0.6	4.485	0.00499	0.004	322.2	2597.2	1294.7	-972.5
M100 48hr	2400	108.4	0.278	0.6	2.71	0.00499	0.002	389.4	5194.4	2589.4	-2200.0

Catchment			SP7	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.78	192	0.00252	0.105	31.4	9.0	2.3	29.1
M100 10min	10	22.3	0.278	0.78	133.8	0.00252	0.073	43.8	18.0	4.5	39.2
M100 15min	15	26.2	0.278	0.78	104.8	0.00252	0.057	51.4	27.1	6.8	44.6
M100 30min	30	31.6	0.278	0.78	63.2	0.00252	0.034	62.0	54.1	13.6	48.4
M100 60min	60	38.1	0.278	0.78	38.1	0.00252	0.021	74.8	108.2	27.2	47.6
M100 2hr	120	45.9	0.278	0.78	22.95	0.00252	0.013	90.1	216.4	54.4	35.7
M100 4hr	240	55.4	0.278	0.78	13.85	0.00252	0.008	108.8	432.9	108.9	-0.1
M100 6hr	300	61.7	0.278	0.78	12.34	0.00252	0.007	145.4	649.3	163.3	-17.9
M100 12hr	600	74.4	0.278	0.78	7.44	0.00252	0.004	175.3	1298.6	326.6	-151.3
M100 24hr	1200	89.7	0.278	0.78	4.485	0.00252	0.002	211.3	2597.2	653.2	-441.9
M100 48hr	2400	108.4	0.278	0.78	2.71	0.00252	0.001	255.4	5194.4	1306.4	-1051.0

Catchment	SP7	Hardstand	water discharge rate (l/s)
-----------	-----	-----------	----------------------------

RECEIVED: 19/01/2024

Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.6	192	0.00000	0.000	0.0	9.0	0.0	0.0
M100 10min	10	22.3	0.278	0.6	133.8	0.00000	0.000	0.0	18.0	0.0	0.0
M100 15min	15	26.2	0.278	0.6	104.8	0.00000	0.000	0.0	27.1	0.0	0.0
M100 30min	30	31.6	0.278	0.6	63.2	0.00000	0.000	0.0	54.1	0.0	0.0
M100 60min	60	38.1	0.278	0.6	38.1	0.00000	0.000	0.0	108.2	0.0	0.0
M100 2hr	120	45.9	0.278	0.6	22.95	0.00000	0.000	0.0	216.4	0.0	0.0
M100 4hr	240	55.4	0.278	0.6	13.85	0.00000	0.000	0.0	432.9	0.0	0.0
M100 6hr	300	61.7	0.278	0.6	12.34	0.00000	0.000	0.0	649.3	0.0	0.0
M100 12hr	600	74.4	0.278	0.6	7.44	0.00000	0.000	0.0	1298.6	0.0	0.0
M100 24hr	1200	89.7	0.278	0.6	4.485	0.00000	0.000	0.0	2597.2	0.0	0.0
M100 48hr	2400	108.4	0.278	0.6	2.71	0.00000	0.000	0.0	5194.4	0.0	0.0

Catchment			SP8	Area Excl Hardstand		water discharge rate (l/s)					
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.78	192	0.00000	0.000	0.0	9.0	0.0	0.0
M100 10min	10	22.3	0.278	0.78	133.8	0.00000	0.000	0.0	18.0	0.0	0.0
M100 15min	15	26.2	0.278	0.78	104.8	0.00000	0.000	0.0	27.1	0.0	0.0
M100 30min	30	31.6	0.278	0.78	63.2	0.00000	0.000	0.0	54.1	0.0	0.0
M100 60min	60	38.1	0.278	0.78	38.1	0.00000	0.000	0.0	108.2	0.0	0.0
M100 2hr	120	45.9	0.278	0.78	22.95	0.00000	0.000	0.0	216.4	0.0	0.0
M100 4hr	240	55.4	0.278	0.78	13.85	0.00000	0.000	0.0	432.9	0.0	0.0
M100 6hr	300	61.7	0.278	0.78	12.34	0.00000	0.000	0.0	649.3	0.0	0.0
M100 12hr	600	74.4	0.278	0.78	7.44	0.00000	0.000	0.0	1298.6	0.0	0.0
M100 24hr	1200	89.7	0.278	0.78	4.485	0.00000	0.000	0.0	2597.2	0.0	0.0
M100 48hr	2400	108.4	0.278	0.78	2.71	0.00000	0.000	0.0	5194.4	0.0	0.0

Catchment	SP8	Hardstand	water discharge rate (l/s)
-----------	-----	-----------	----------------------------

RECEIVED: 19/01/2024

Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.6	192	0.00452	0.145	43.4	9.0	4.1	39.4
M100 10min	10	22.3	0.278	0.6	133.8	0.00452	0.101	60.5	18.0	8.2	52.4
M100 15min	15	26.2	0.278	0.6	104.8	0.00452	0.079	71.1	27.1	12.2	58.9
M100 30min	30	31.6	0.278	0.6	63.2	0.00452	0.048	85.8	54.1	24.5	61.3
M100 60min	60	38.1	0.278	0.6	38.1	0.00452	0.029	103.4	108.2	48.9	54.5
M100 2hr	120	45.9	0.278	0.6	22.95	0.00452	0.017	124.6	216.4	97.8	26.8
M100 4hr	240	55.4	0.278	0.6	13.85	0.00452	0.010	150.4	432.9	195.7	-45.3
M100 6hr	300	61.7	0.278	0.6	12.34	0.00452	0.009	201.0	649.3	293.5	-92.5
M100 12hr	600	74.4	0.278	0.6	7.44	0.00452	0.006	242.3	1298.6	587.0	-344.6
M100 24hr	1200	89.7	0.278	0.6	4.485	0.00452	0.003	292.2	2597.2	1173.9	-881.8
M100 48hr	2400	108.4	0.278	0.6	2.71	0.00452	0.002	353.1	5194.4	2347.9	-1994.8

Catchment		SP9		Area Excl Hardstand		water discharge rate (l/s)					
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.78	192	0.00125	0.052	15.6	9.0	1.1	14.4
M100 10min	10	22.3	0.278	0.78	133.8	0.00125	0.036	21.7	18.0	2.2	19.4
M100 15min	15	26.2	0.278	0.78	104.8	0.00125	0.028	25.5	27.1	3.4	22.1
M100 30min	30	31.6	0.278	0.78	63.2	0.00125	0.017	30.7	54.1	6.7	24.0
M100 60min	60	38.1	0.278	0.78	38.1	0.00125	0.010	37.0	108.2	13.5	23.6
M100 2hr	120	45.9	0.278	0.78	22.95	0.00125	0.006	44.6	216.4	26.9	17.7
M100 4hr	240	55.4	0.278	0.78	13.85	0.00125	0.004	53.8	432.9	53.9	0.0
M100 6hr	300	61.7	0.278	0.78	12.34	0.00125	0.003	72.0	649.3	80.8	-8.9
M100 12hr	600	74.4	0.278	0.78	7.44	0.00125	0.002	86.8	1298.6	161.7	-74.9
M100 24hr	1200	89.7	0.278	0.78	4.485	0.00125	0.001	104.6	2597.2	323.3	-218.7
M100 48hr	2400	108.4	0.278	0.78	2.71	0.00125	0.001	126.4	5194.4	646.7	-520.3

Catchment	SP9	Hardstand	water discharge rate (l/s)
-----------	-----	-----------	----------------------------

RECEIVED: 19/01/2024

Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.6	192	0.00000	0.000	0.0	9.0	0.0	0.0
M100 10min	10	22.3	0.278	0.6	133.8	0.00000	0.000	0.0	18.0	0.0	0.0
M100 15min	15	26.2	0.278	0.6	104.8	0.00000	0.000	0.0	27.1	0.0	0.0
M100 30min	30	31.6	0.278	0.6	63.2	0.00000	0.000	0.0	54.1	0.0	0.0
M100 60min	60	38.1	0.278	0.6	38.1	0.00000	0.000	0.0	108.2	0.0	0.0
M100 2hr	120	45.9	0.278	0.6	22.95	0.00000	0.000	0.0	216.4	0.0	0.0
M100 4hr	240	55.4	0.278	0.6	13.85	0.00000	0.000	0.0	432.9	0.0	0.0
M100 6hr	300	61.7	0.278	0.6	12.34	0.00000	0.000	0.0	649.3	0.0	0.0
M100 12hr	600	74.4	0.278	0.6	7.44	0.00000	0.000	0.0	1298.6	0.0	0.0
M100 24hr	1200	89.7	0.278	0.6	4.485	0.00000	0.000	0.0	2597.2	0.0	0.0
M100 48hr	2400	108.4	0.278	0.6	2.71	0.00000	0.000	0.0	5194.4	0.0	0.0

Catchment			SP10	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow								30.06	l/s/ha		
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.78	192	0.00125	0.052	15.6	9.0	1.1	14.4
M100 10min	10	22.3	0.278	0.78	133.8	0.00125	0.036	21.7	18.0	2.2	19.4
M100 15min	15	26.2	0.278	0.78	104.8	0.00125	0.028	25.5	27.1	3.4	22.1
M100 30min	30	31.6	0.278	0.78	63.2	0.00125	0.017	30.7	54.1	6.7	24.0
M100 60min	60	38.1	0.278	0.78	38.1	0.00125	0.010	37.0	108.2	13.5	23.6
M100 2hr	120	45.9	0.278	0.78	22.95	0.00125	0.006	44.6	216.4	26.9	17.7
M100 4hr	240	55.4	0.278	0.78	13.85	0.00125	0.004	53.8	432.9	53.9	0.0
M100 6hr	300	61.7	0.278	0.78	12.34	0.00125	0.003	72.0	649.3	80.8	-8.9
M100 12hr	600	74.4	0.278	0.78	7.44	0.00125	0.002	86.8	1298.6	161.7	-74.9
M100 24hr	1200	89.7	0.278	0.78	4.485	0.00125	0.001	104.6	2597.2	323.3	-218.7
M100 48hr	2400	108.4	0.278	0.78	2.71	0.00125	0.001	126.4	5194.4	646.7	-520.3

Catchment		SP10		Hardstand				water discharge rate (l/s)			
-----------	--	------	--	-----------	--	--	--	----------------------------	--	--	--

RECEIVED: 19/01/2024

Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.6	192	0.00000	0.000	0.0	9.0	0.0	0.0
M100 10min	10	22.3	0.278	0.6	133.8	0.00000	0.000	0.0	18.0	0.0	0.0
M100 15min	15	26.2	0.278	0.6	104.8	0.00000	0.000	0.0	27.1	0.0	0.0
M100 30min	30	31.6	0.278	0.6	63.2	0.00000	0.000	0.0	54.1	0.0	0.0
M100 60min	60	38.1	0.278	0.6	38.1	0.00000	0.000	0.0	108.2	0.0	0.0
M100 2hr	120	45.9	0.278	0.6	22.95	0.00000	0.000	0.0	216.4	0.0	0.0
M100 4hr	240	55.4	0.278	0.6	13.85	0.00000	0.000	0.0	432.9	0.0	0.0
M100 6hr	300	61.7	0.278	0.6	12.34	0.00000	0.000	0.0	649.3	0.0	0.0
M100 12hr	600	74.4	0.278	0.6	7.44	0.00000	0.000	0.0	1298.6	0.0	0.0
M100 24hr	1200	89.7	0.278	0.6	4.485	0.00000	0.000	0.0	2597.2	0.0	0.0
M100 48hr	2400	108.4	0.278	0.6	2.71	0.00000	0.000	0.0	5194.4	0.0	0.0

Catchment		SP11		Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.78	192	0.00210	0.087	26.2	9.0	1.9	24.3
M100 10min	10	22.3	0.278	0.78	133.8	0.00210	0.061	36.6	18.0	3.8	32.8
M100 15min	15	26.2	0.278	0.78	104.8	0.00210	0.048	42.9	27.1	5.7	37.3
M100 30min	30	31.6	0.278	0.78	63.2	0.00210	0.029	51.8	54.1	11.4	40.4
M100 60min	60	38.1	0.278	0.78	38.1	0.00210	0.017	62.5	108.2	22.7	39.7
M100 2hr	120	45.9	0.278	0.78	22.95	0.00210	0.010	75.2	216.4	45.5	29.8
M100 4hr	240	55.4	0.278	0.78	13.85	0.00210	0.006	90.8	432.9	90.9	-0.1
M100 6hr	300	61.7	0.278	0.78	12.34	0.00210	0.006	121.4	649.3	136.4	-15.0
M100 12hr	600	74.4	0.278	0.78	7.44	0.00210	0.003	146.4	1298.6	272.7	-126.3
M100 24hr	1200	89.7	0.278	0.78	4.485	0.00210	0.002	176.5	2597.2	545.4	-369.0
M100 48hr	2400	108.4	0.278	0.78	2.71	0.00210	0.001	213.2	5194.4	1090.8	-877.6

Catchment	SP11	Hardstand	water discharge rate (l/s)
-----------	------	-----------	----------------------------

RECEIVED: 19/01/2024

Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.6	192	0.00000	0.000	0.0	9.0	0.0	0.0
M100 10min	10	22.3	0.278	0.6	133.8	0.00000	0.000	0.0	18.0	0.0	0.0
M100 15min	15	26.2	0.278	0.6	104.8	0.00000	0.000	0.0	27.1	0.0	0.0
M100 30min	30	31.6	0.278	0.6	63.2	0.00000	0.000	0.0	54.1	0.0	0.0
M100 60min	60	38.1	0.278	0.6	38.1	0.00000	0.000	0.0	108.2	0.0	0.0
M100 2hr	120	45.9	0.278	0.6	22.95	0.00000	0.000	0.0	216.4	0.0	0.0
M100 4hr	240	55.4	0.278	0.6	13.85	0.00000	0.000	0.0	432.9	0.0	0.0
M100 6hr	300	61.7	0.278	0.6	12.34	0.00000	0.000	0.0	649.3	0.0	0.0
M100 12hr	600	74.4	0.278	0.6	7.44	0.00000	0.000	0.0	1298.6	0.0	0.0
M100 24hr	1200	89.7	0.278	0.6	4.485	0.00000	0.000	0.0	2597.2	0.0	0.0
M100 48hr	2400	108.4	0.278	0.6	2.71	0.00000	0.000	0.0	5194.4	0.0	0.0

Catchment			SP12	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km²)	(m³/s)	Volume (m³)	Discharge (m³/ha)	Discharge (m³)	Residual Volume (m³)
M100 5min	5	16.0	0.278	0.78	192	0.00194	0.081	24.2	9.0	1.7	22.5
M100 10min	10	22.3	0.278	0.78	133.8	0.00194	0.056	33.8	18.0	3.5	30.3
M100 15min	15	26.2	0.278	0.78	104.8	0.00194	0.044	39.7	27.1	5.2	34.4
M100 30min	30	31.6	0.278	0.78	63.2	0.00194	0.027	47.9	54.1	10.5	37.4
M100 60min	60	38.1	0.278	0.78	38.1	0.00194	0.016	57.7	108.2	21.0	36.7
M100 2hr	120	45.9	0.278	0.78	22.95	0.00194	0.010	69.5	216.4	42.0	27.5
M100 4hr	240	55.4	0.278	0.78	13.85	0.00194	0.006	83.9	432.9	84.0	-0.1
M100 6hr	300	61.7	0.278	0.78	12.34	0.00194	0.005	112.1	649.3	126.0	-13.8
M100 12hr	600	74.4	0.278	0.78	7.44	0.00194	0.003	135.2	1298.6	251.9	-116.7
M100 24hr	1200	89.7	0.278	0.78	4.485	0.00194	0.002	163.0	2597.2	503.9	-340.8
M100 48hr	2400	108.4	0.278	0.78	2.71	0.00194	0.001	197.0	5194.4	1007.7	-810.7

RECEIVED: 19/01/2024

Catchment			SP12	Hardstand					water discharge rate (l/s)		
Clean water natural flow									30.06	l/s/ha	
1 in 100 year return	minutes	Rainfall (mm)		C	i (mm/hr)	A (km ²)	(m ³ /s)	Volume (m ³)	Discharge (m ³ /ha)	Discharge (m ³)	Residual Volume (m ³)
M100 5min	5	16.0	0.278	0.6	192	0.00000	0.000	0.0	9.0	0.0	0.0
M100 10min	10	22.3	0.278	0.6	133.8	0.00000	0.000	0.0	18.0	0.0	0.0
M100 15min	15	26.2	0.278	0.6	104.8	0.00000	0.000	0.0	27.1	0.0	0.0
M100 30min	30	31.6	0.278	0.6	63.2	0.00000	0.000	0.0	54.1	0.0	0.0
M100 60min	60	38.1	0.278	0.6	38.1	0.00000	0.000	0.0	108.2	0.0	0.0
M100 2hr	120	45.9	0.278	0.6	22.95	0.00000	0.000	0.0	216.4	0.0	0.0
M100 4hr	240	55.4	0.278	0.6	13.85	0.00000	0.000	0.0	432.9	0.0	0.0
M100 6hr	300	61.7	0.278	0.6	12.34	0.00000	0.000	0.0	649.3	0.0	0.0
M100 12hr	600	74.4	0.278	0.6	7.44	0.00000	0.000	0.0	1298.6	0.0	0.0
M100 24hr	1200	89.7	0.278	0.6	4.485	0.00000	0.000	0.0	2597.2	0.0	0.0
M100 48hr	2400	108.4	0.278	0.6	2.71	0.00000	0.000	0.0	5194.4	0.0	0.0

RECEIVED: 19/01/2024