FOLLOWING PLAN No. NKP(p)432/GL/02

Stormwater Schedule									
Name	Y-Coord	X-Coord	Cover	Inlet	Depth	Length	Slope	Type	Size
1a	3114.732	2855910.193	834.879	833.779	1.100	10.999	3.391 %	100D Concrete	600 mm
1b	3103.937	2855908.083	834.757	833.406	1.351				
2A	3093.522	2855947.878	831.909	827.839	4.070	35.150	1.815 %	Box Culvert	2400 x 2400
2B	3083.276	2855914.254	827.496	827.201	0.295				
3A	2910.173	2855950.070	835.671	833.815	1.856	13.765	3.400 %	100D Concrete	600 mm
3B	2912.230	2855936.460	834.347	833.347	1.000				
4A	2628.563	2855972.901	834.624	833.024	1.600	14.408	1.499 %	Box Culvert	2 x 1200 x 1200
4B	2629.939	2855958.559	832.914	832.808	0.106				

KAMADAKWA RD				
Position	SV(m)	Y-Coord	X-Coord	R(m)
Start	0	3361.258	2855930.626	0.000
BCC1	22.390	3339.239	2855926.567	
PI1	36.926	3324.919	2855923.928	200.000
ECC1	51.461	3310.368	2855923.390	
	100	3261.862	2855921.598	
BCC2	192.799	3169.126	2855918.171	
	200	3161.927	2855918.035	
PI2	226.072	3135.565	2855916.931	200.000
ECC2	259.346	3103.439	2855926.721	
	300	3064.551	2855938.572	
BCC3	314.508	3050.674	2855942.801	
PI3	370.234	2996.467	2855959.320	250.000
	400	2966.259	2855953.392	
ECC3	425.960	2940.436	2855950.851	
BCC4	468.137	2898.732	2855944.548	
	500	2867.070	2855941.046	
PI4	534.380	2832.627	2855934.557	400.000
	600	2767.480	2855946.494	
ECC4	600.624	2766.866	2855946.606	
BCC5	696.076	2672.977	2855963.808	
	700	2669.109	2855964.468	
PI5	745.682	2622.558	2855973.046	160.000
ECC5	795.287	2576.157	2855951.266	
	800	2571.890	2855949.263	
	900	2481.367	2855906.772	
BCC6	925.291	2458.472	2855896.026	
PI6	981.376	2407.488	2855872.094	500.000
	1000	2393.461	2855859.356	

INTERSECT RD1				
Position	SV(m)	Y-Coord	X-Coord	R(m)
Start	0	3319.582	2855923.931	0.000
*End	30	3314.961	2855894.289	
INTERSECT RD2				
Position	SV(m)	Y-Coord	X-Coord	R(m)
Start	0	3330.670	2855964.665	0.000
*End	41.021	3323.514	2855924.273	
INTERSECT RD2				
Position	SV(m)	Y-Coord	X-Coord	R(m)
Start	0	3108.435	2855925.265	0.000
*End	43.955	3116.867	2855882.126	
INTERSECT RD3				
Position	SV(m)	Y-Coord	X-Coord	R(m)
Start	0	2960.799	2855953.076	0.000
*End	19.997	2959.705	2855933.109	
INTERSECT RD4				
Position	SV(m)	Y-Coord	X-Coord	R(m)
Start	0	2876.139	2855941.780	0.000
*End	20	2871.829	2855922.250	

Intersection Coordinate List			
INTERSECT RD1 - KAMADAKWA RD			
Name	Y-Coord	X-Coord	Z-Coord
ilSTART	3318.974	2855903.798	849.520
ilBCC1	3320.649	2855914.541	850.878
ilCP1	3328.553	2855913.309	851.133
ilECC1	3327.502	2855921.240	851.128
ilEND	3332.234	2855921.867	851.128
irBCC1	3314.962	2855910.528	850.214
irCP1	3307.058	2855911.760	850.865
irECC1	3306.763	2855919.754	851.040
irEND	3301.964	2855919.577	851.017
INTERSECT RD2 - KAMADAKWA RD			
Name	Y-Coord	X-Coord	Z-Coord
ilSTART	3324.719	2855945.408	853.037
ilBCC1	3322.652	2855933.740	851.789
ilCP1	3314.775	2855935.135	851.288
ilECC1	3315.228	2855927.148	851.227
ilEND	3311.657	2855926.945	851.209
irBCC1	3328.692	2855939.169	852.555
irCP1	3336.569	2855937.773	851.777
irECC1	3337.968	2855929.896	851.250
irEND	3338.616	2855930.011	851.249
INTERSECT DR3 - KAMADAKWA RD			
Name	Y-Coord	X-Coord	Z-Coord
ilBCC1	3114.206	2855908.772	835.160
ilCP1	3122.057	2855910.306	835.459
ilECC1	3123.541	2855918.168	836.166
ilEND	3126.496	2855917.610	836.361
irSTART	3109.817	2855905.162	835.059
irBCC1	3107.422	2855917.412	835.167
irCP1	3099.571	2855915.878	835.278
irECC1	3101.903	2855923.530	835.090
irEND	3101.794	2855923.564	835.087

INTERSECT DR4 - KAMADAKWA RD			
Name	Y-Coord	X-Coord	Z-Coord
ilBCC1	2962.723	2855942.483	835.251
ilCP1	2970.711	2855942.046	835.642
ilECC1	2970.421	2855950.041	835.957
ilEND	2971.348	2855950.074	835.981
irBCC1	2957.581	2855940.036	834.884
irCP1	2949.593	2855940.473	835.325
irECC1	2948.666	2855948.420	835.361
irEND	2946.779	2855948.199	835.325
INTERSECT RD5 - KAMADAKWA RD			
Name	Y-Coord	X-Coord	Z-Coord
ilSTART	2874.273	2855921.720	832.971
ilBCC1	2876.721	2855932.818	834.710
ilCP1	2884.533	2855931.094	835.121
ilECC1	2883.623	2855939.042	835.105
ilEND	2887.398	2855939.475	835.074
irBCC1	2870.431	2855927.514	833.641
irCP1	2862.619	2855929.238	834.823
irECC1	2862.206	2855937.227	835.374
irEND	2857.246	2855936.971	835.459

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ON RECEIPT OF REVISED DRAWING, DESTROY PREVIOUS DRAWING

NOTES

ISSUED FOR TENDER

LEGEND

― ― ―	CENTRELINE
―――	ROADEDGE
━━━	ROADKERB
-·-·-·-	FENCE
)━━(	STORMWATER DRAINAGE PIPE
━━━	SIDE DRAIN
━━━	SIDE WALK
―○―	ELECTRICAL LINE

CLIENT:

MBOMBELA LOCAL MUNICIPALITY

HEAD OFFICE
P.O.BOX 48
MBOMBELA. 1201

TEL NO.: (013) 759 9111
FAX NO.: (013) 759 2070

toba CONSULTING | CIVIL STRUCTURAL MANAGEMENT

PO BOX 237
BARBERTON
1300

TEL NO: (013) 712 2927
EMAIL: admin@toba.co.za

REG. NO. 2011/069299/23

PROJECT TITLE:

CONSTRUCTION OF KAMADAKWA RING ROAD

DRAWING TITLE:

GENERAL LAYOUT AND LONGITUDINAL PLAN

DESIGNED: P TSHABALALA

CHECKED: F BURGER
PR.ENG. 20090094

DRAWN: R VAN ZYL

SIGN:

SCALE: 1:1250

DATE: FEBRUARY 2023

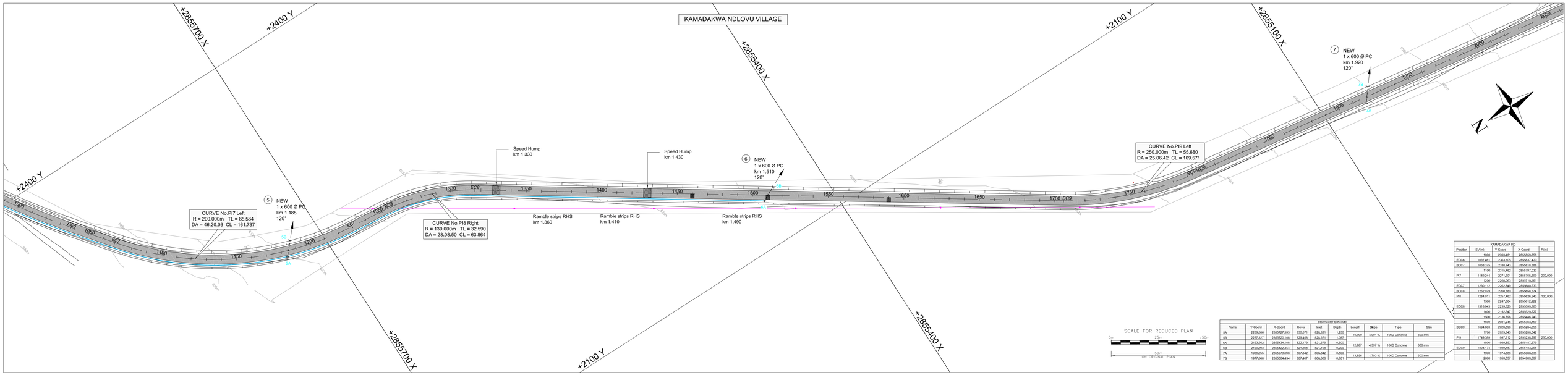
DRAWING NO: NKP(p)432_GL01

CONTRACT NO: AS SHOWN

REVISION:

FOLLOWING PLAN No. NKP(p)432/GL/01

FOLLOWING PLAN No. NKP(p)432/GL/03



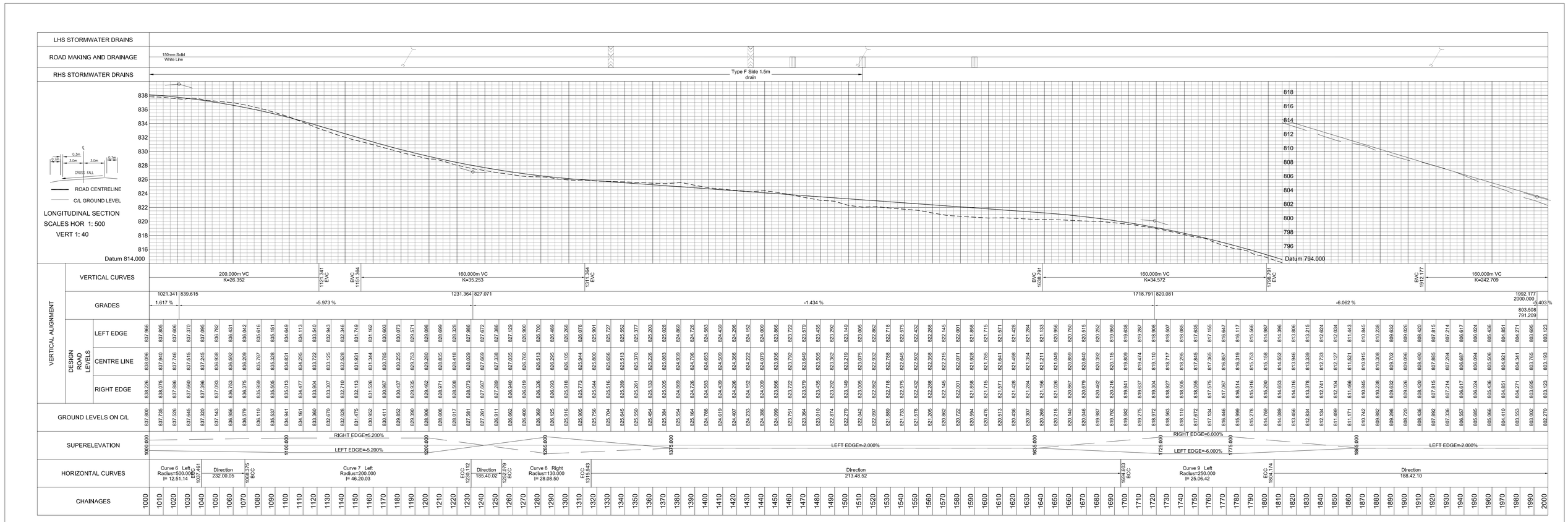
SCALE FOR REDUCED PLAN

0m 25m 50m

50m ON ORIGINAL PLAN

Stormwater Schedule										
Name	Y-Coord	X-Coord	Cover	Inlet	Depth	Length	Slope	Type	Size
5A	2269,066	2855727,393	839,071	838,821	1,250				
5B	2277,327	2855720,108	829,458	828,371	1,087	10,999	4,091 %	100D Concrete	600 mm
6A	2123,562	2855434,108	822,170	821,679	0,500				
6B	2129,293	2855422,454	821,308	821,108	0,200	12,987	-4,397 %	100D Concrete	600 mm
7A	1966,255	2855073,098	807,342	806,842	0,500				
7B	1977,068	2855064,434	807,407	806,606	0,801	13,856	1,703 %	100D Concrete	600 mm

KAMADAKWA RD				
Position	SV(m)	Y-Coord	X-Coord	R(m)
	1000	2365,461	2855856,356	
ECC6	1037,461	2363,105	2855837,420	
BCC7	1068,375	2338,743	2855818,388	
	1100	2315,452	2855797,033	
PI7	1149,244	2271,301	2855765,699	200,000
	1200	2268,063	2855715,161	
ECC7	1230,112	2262,845	2855680,533	
BCC8	1252,079	2260,680	2855658,674	
PI8	1294,211	2257,462	2855626,243	130,000
	1300	2247,364	2855612,922	
ECC8	1315,843	2235,325	2855599,165	
	1400	2150,547	2855520,327	
	1500	2136,896	2855446,243	
	1600	2081,246	2855363,135	
BCC9	1694,603	2028,598	2855284,558	
	1700	2025,643	2855280,042	
PI9	1749,389	1997,612	2855238,267	250,000
	1800	1989,853	2855187,579	
ECC9	1904,174	1989,197	2855183,258	
	1900	1974,688	2855088,536	
	2000	1959,057	2854989,697	



NOTES

ISSUED FOR TENDER

LEGEND

- CENTRELINE
- ROADEDGE
- ROADKERB
- FENCE
- STORMWATER DRAINAGE PIPE
- SIDE DRAIN
- SIDE WALK
- ELECTRICAL LINE

CLIENT:

CITY OF MBOMBELA — THE ULTIMATE DESTINATION

MBOMBELA LOCAL MUNICIPALITY

HEAD OFFICE
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PROJECT TITLE:

CONSTRUCTION OF KAMADAKWA RING ROAD

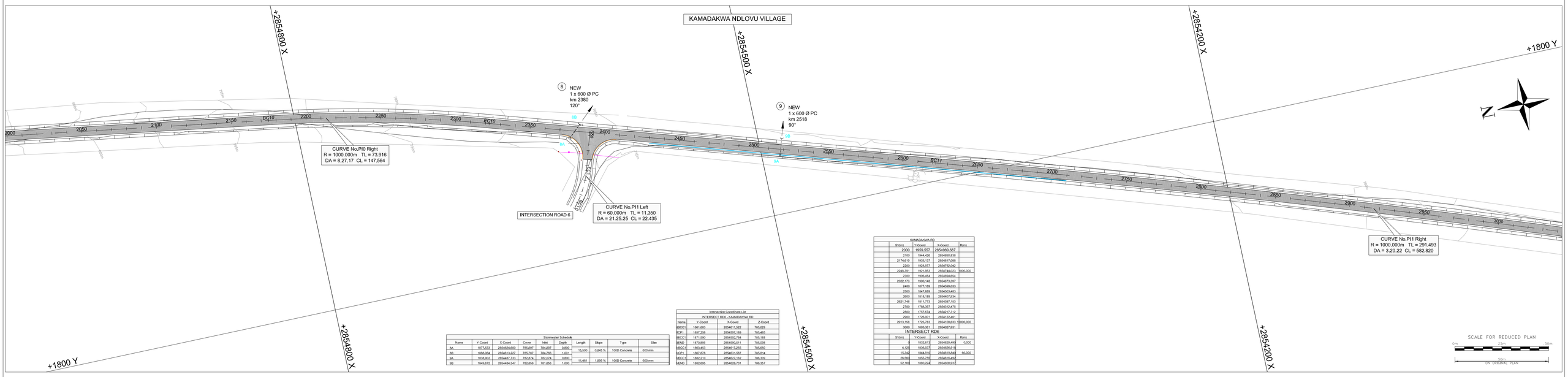
DRAWING TITLE:

GENERAL LAYOUT AND LONGITUDINAL PLAN

DESIGNED:	CHECKED:	SCALE:	DATE:
P TSHABALALA	F BURGER PR.ENG. 20090094	1:1250	FEBRUARY 2023
DRAWN:	SIGN:	DRAWING NO:	CONTRACT NO:
R VAN ZYL		NKP(p)432_GL02	AS SHOWN
		REVISION:	

FOLLOWING PLAN No. NKP(p)432/GL/02

FOLLOWING PLAN No. NKP(p)432/GL/04



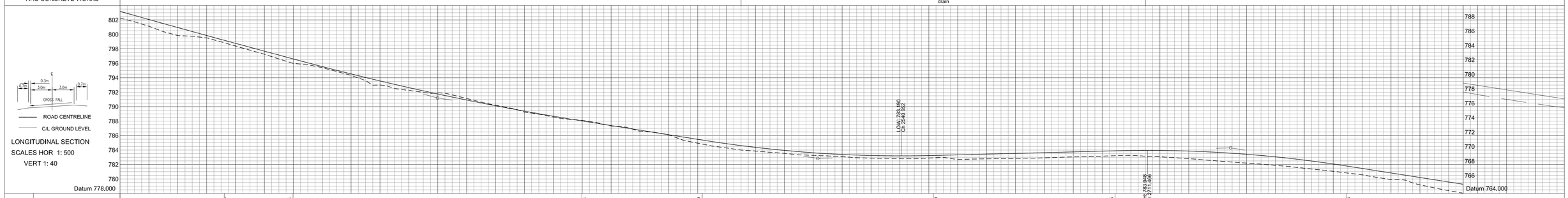
Stormwater Schedule									
Name	Y-Coord	X-Coord	Cover	Inlet	Depth	Length	Slope	Type	Size
8A	1877,533	2854024,600	795,697	794,897	0,800	15,500	0,845 %	100D Concrete	600 mm
8B	1888,064	2854013,227	795,767	794,766	1,001				
9A	1938,902	2854467,733	792,874	792,074	0,800	11,481	1,859 %	100D Concrete	600 mm
9B	1949,872	2854464,347	792,856	791,856	1,000				

Intersection Coordinate List			
INTERSECT RD6 - KAMADAKWA RD			
Name	Y-Coord	X-Coord	Z-Coord
BCC1	1861,683	2854611,522	795,629
BCP1	1857,258	2854587,188	795,465
BCC1	1871,050	2854582,764	795,168
BEND	1870,895	2854580,511	795,098
BSC1	1863,453	2854572,255	795,650
ECP1	1867,678	2854531,587	795,814
ECC1	1882,210	2854527,162	795,309
BEND	1882,695	2854528,731	795,357

KAMADAKWA RD			
B'(m)	Y-Coord	X-Coord	R(m)
2000	1959,557	2854989,687	
2100	1944,420	2854890,838	
2174,610	1933,137	2854817,088	
2200	1928,877	2854792,042	
2246,391	1921,953	2854744,023	1000,000
2300	1905,454	2854694,654	
2322,173	1900,146	2854673,397	
2400	1877,189	2854599,033	
2500	1847,689	2854503,463	
2600	1818,189	2854407,934	
2621,746	1811,773	2854387,153	
2700	1788,387	2854312,475	
2800	1757,874	2854217,012	
2900	1726,001	2854123,461	
2913,158	1725,793	2854118,633	1000,000
3000	1723,381	2854027,931	

INTERSECT RD6			
B'(m)	Y-Coord	X-Coord	R(m)
0	1832,813	2854529,490	0,000
4,126	1836,037	2854535,018	
15,342	1844,310	2854519,840	60,000
26,558	1855,705	2854516,458	
52,169	1880,224	2854508,937	

LHS CONCRETE WORKS	
ROAD MAKING AND DRAINAGE	150mm Solid White Line; 150mm Over taking White Line; 150mm Solid White Line
RHS CONCRETE WORKS	Type F Slide 1.5m drain



VERTICAL ALIGNMENT

VERTICAL CURVES: 160.000m VC K=242.709 | 2072.177 EVC | BVC 2119.814 | 200.000m VC K=89.945 | 2318.814 EVC | BVC 2403.110 | 160.000m VC K=43.356 | 2563.110 EVC | BVC 2688.985 | HIGH 783.948 Ch 2711.466 | 160.000m VC K=43.989 | 2943.985 EVC

GRADES: -5.403 % (2219.814 | 791.209) -3.179 % (2483.110 | 782.838) 0.511 % (2768.985 | 784.299) -3.126 % (3000.000 | 773.945)

DESIGN ROAD LEVELS

CHAINAGES	LEFT EDGE	CENTRE LINE	RIGHT EDGE	GROUND LEVELS ON C/L
2000	803,123	803,193	803,123	802,270
2010	802,555	802,625	802,555	801,745
2020	801,991	802,061	801,991	801,129
2030	801,431	801,501	801,431	800,382
2040	800,875	800,945	800,875	799,840
2050	800,324	800,394	800,324	799,748
2060	799,777	799,847	799,777	799,521
2070	799,233	799,303	799,233	798,972
2080	798,693	798,763	798,693	798,394
2090	798,153	798,223	798,153	797,816
2100	797,612	797,682	797,612	797,254
2110	797,072	797,142	797,072	796,604
2120	796,542	796,602	796,542	795,984
2130	796,028	796,067	796,028	795,815
2140	795,524	795,544	795,990	795,400
2150	795,032	795,032	795,462	794,876
2160	794,561	794,530	794,945	794,337
2170	794,082	794,040	794,439	793,614
2180	793,623	793,561	793,945	793,011
2190	793,175	793,094	793,461	792,518
2200	792,739	792,637	792,989	792,252
2210	792,303	792,191	792,527	791,984
2220	791,869	791,757	792,079	791,905
2230	791,446	791,334	791,645	791,634
2240	791,033	790,921	791,222	791,132
2250	790,632	790,520	790,809	790,636
2260	790,242	790,130	790,408	790,215
2270	789,863	789,751	790,018	789,815
2280	789,496	789,384	789,639	789,243
2290	789,139	789,027	789,272	788,857
2300	788,783	788,681	788,915	788,566
2310	788,429	788,347	788,572	788,268
2320	788,085	788,024	788,242	788,108
2330	787,747	787,706	787,923	787,803
2340	787,409	787,388	787,610	787,331
2350	787,071	787,070	787,297	787,184
2360	786,733	786,752	786,984	786,597
2370	786,394	786,434	786,670	786,447
2380	786,056	786,116	786,357	786,096
2390	785,728	785,798	786,044	785,553
2400	785,410	785,490	785,728	784,952
2410	785,098	785,168	785,410	784,550
2420	784,807	784,877	785,098	784,288
2430	784,540	784,610	784,807	784,001
2440	784,298	784,366	784,540	783,854
2450	784,074	784,144	784,298	783,688
2460	783,876	783,946	784,074	783,548
2470	783,701	783,771	783,876	783,336
2480	783,549	783,619	783,701	783,260
2490	783,420	783,490	783,549	783,183
2500	783,314	783,384	783,420	782,987
2510	783,231	783,301	783,314	782,930
2520	783,171	783,241	783,231	782,871
2530	783,134	783,204	783,171	782,850
2540	783,120	783,190	783,134	782,824
2550	783,130	783,200	783,120	782,797
2560	783,162	783,232	783,130	782,881
2570	783,212	783,282	783,162	782,877
2580	783,263	783,333	783,212	782,694
2590	783,314	783,384	783,263	782,747
2600	783,365	783,435	783,314	782,786
2610	783,417	783,487	783,365	782,820
2620	783,468	783,538	783,417	782,847
2630	783,519	783,589	783,468	782,874
2640	783,570	783,640	783,519	782,913
2650	783,621	783,691	783,570	782,863
2660	783,672	783,742	783,621	783,053
2670	783,723	783,793	783,672	783,081
2680	783,774	783,844	783,723	783,151
2690	783,825	783,895	783,774	783,223
2700	783,863	783,933	783,825	783,264
2710	783,877	783,947	783,863	783,142
2720	783,869	783,939	783,877	783,072
2730	783,839	783,909	783,869	782,936
2740	783,785	783,855	783,839	782,806
2750	783,709	783,779	783,785	782,849
2760	783,610	783,680	783,709	782,486
2770	783,488	783,558	783,610	782,337
2780	783,344	783,414	783,488	782,196
2790	783,177	783,247	783,344	782,057
2800	782,987	783,057	783,177	781,870
2810	782,774	782,844	782,987	781,713
2820	782,539	782,609	782,774	781,476
2830	782,281	782,351	782,539	781,270
2840	782,000	782,070	782,281	781,061
2850	781,696	781,766	782,000	780,814
2860	781,384	781,454	781,696	780,579
2870	781,071	781,141	781,384	780,230
2880	780,758	780,828	781,071	779,906
2890	780,446	780,516	780,758	779,838
2900	780,133	780,203	780,446	779,178
2910	779,821	779,891	780,133	778,769
2920	779,508	779,578	779,821	778,381
2930	779,195	779,265	779,508	778,025
2940	778,883	778,953	779,195	777,675
2950	778,570	778,640	778,883	777,332
2960	778,257	778,327	778,570	777,012
2970	777,945	778,015	778,257	776,699
2980	777,632	777,702	777,945	776,414
2990	777,007	777,320	777,632	776,196
3000	777,007	777,077	777,007	775,861

SUPERELEVATION: 2000.000 LEFT EDGE=-2.000% | 2115.000 LEFT EDGE=3.200% RIGHT EDGE=-3.200% | 2235.000 | 2285.000 | 2385.000 LEFT EDGE=-2.000%

HORIZONTAL CURVES: Direction 188.42.10 | 2174.610 BCC | Curve 10 Right Radius=1000.000 I= 8.27.17 | ECC 2322.173 | Direction 197.09.27 | 2621.746 ECC | Curve 11 Right Radius=10000.000 I= 3.20.22

CHAINAGES: 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110 2120 2130 2140 2150 2160 2170 2180 2190 2200 2210 2220 2230 2240 2250 2260 2270 2280 2290 2300 2310 2320 2330 2340 2350 2360 2370 2380 2390 2400 2410 2420 2430 2440 2450 2460 2470 2480 2490 2500 2510 2520 2530 2540 2550 2560 2570 2580 2590 2600 2610 2620 2630 2640 2650 2660 2670 2680 2690 2700 2710 2720 2730 2740 2750 2760 2770 2780 2790 2800 2810 2820 2830 2840 2850 2860 2870 2880 2890 2900 2910 2920 2930 2940 2950 2960 2970 2980 2990 3000

NOTES

ISSUED FOR TENDER

LEGEND: CENTRELINE; ROADEDGE; ROADKERB; FENCE; STORMWATER DRAINAGE PIPE; SIDE DRAIN; SIDE WALK; ELECTRICAL LINE

CLIENT:
CITY OF MBOMBELA THE ULTIMATE DESTINATION
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REG. NO. 2011/069299/23
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PROJECT TITLE: CONSTRUCTION OF KAMADAKWA RING ROAD

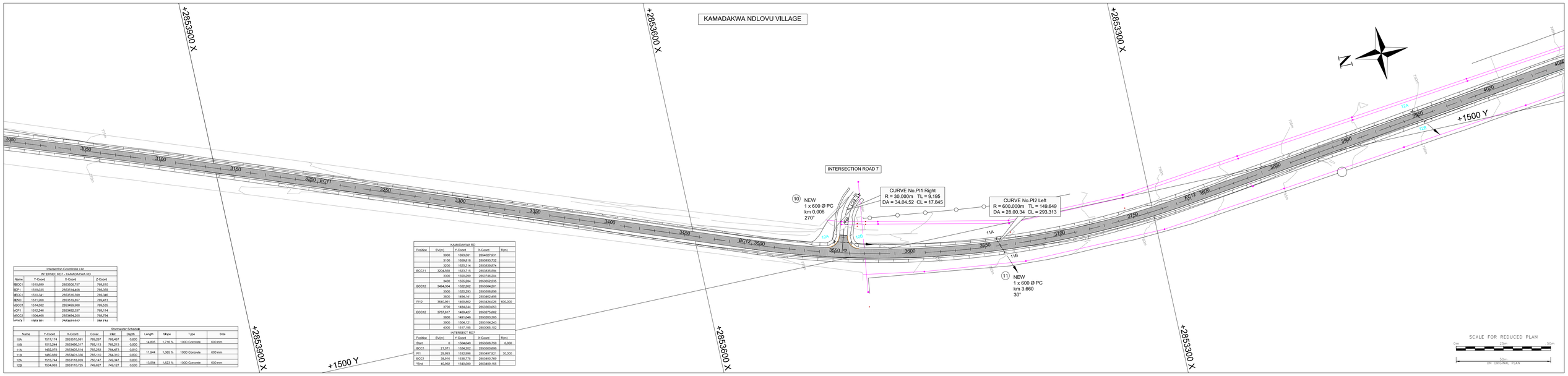
DRAWING TITLE: GENERAL LAYOUT AND LONGITUDINAL PLAN

DESIGNED: P TSHABALALA
CHECKED: F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL
SIGN:

SCALE: 1:1250
DATE: FEBRUARY 2023
DRAWING NO: NKP(p)432_GL03
CONTRACT NO: AS SHOWN
REVISION:

FOLLOWING PLAN No. NKP(p)432/GL/03

FOLLOWING PLAN No. NKP(p)432/GL/05

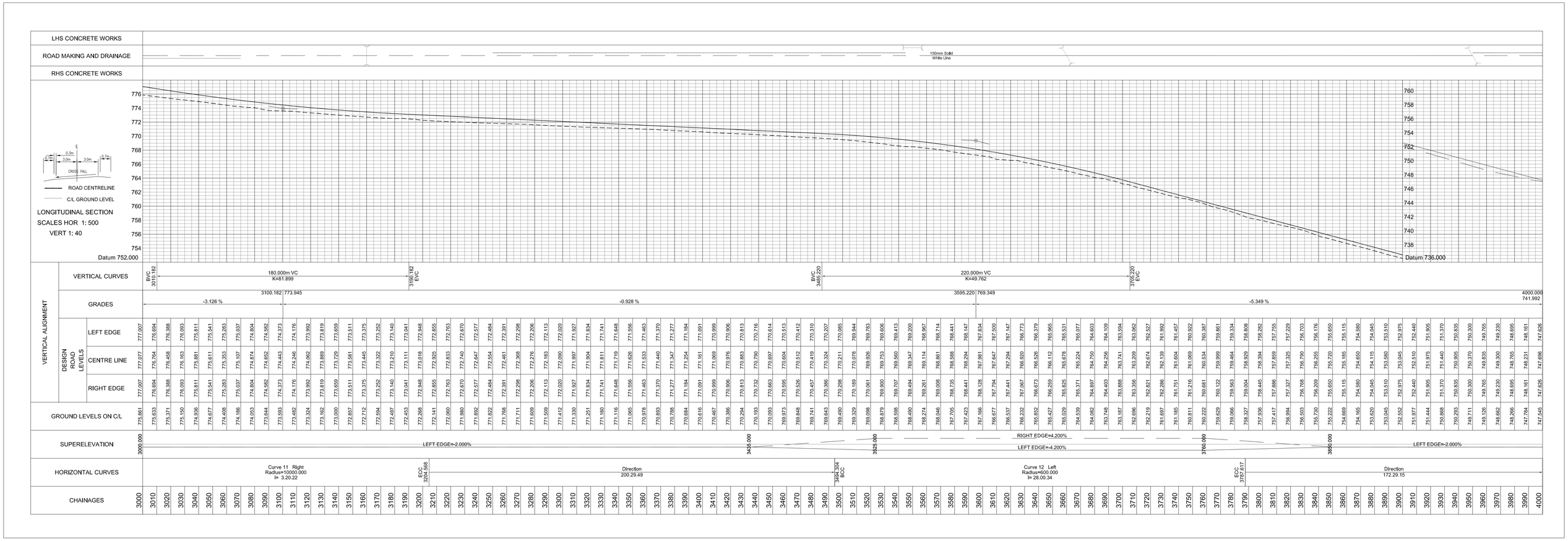


Intersection Coordinate List			
INTERSEC R027 - KAMADAKWA RD			
Name	Y-Coord	X-Coord	Z-Coord
IBCC1	1515.699	2853506.757	769.610
ICP1	1518.035	2853514.408	769.359
IECC1	1533.341	2853516.599	769.346
IEND	1511.268	2853518.657	769.413
IBCC1	1514.562	2853466.988	769.535
IGP1	1512.246	2853460.337	769.114
IECC1	1506.468	2853454.205	769.794
IGP1	1505.051	2853451.017	769.714

Stormwater Schedule									
Name	Y-Coord	X-Coord	Cover	Inlet	Depth	Length	Slope	Type	Size
10A	1517.174	2853515.061	769.267	769.467	0.800	14.805	1.716 %	100D Concrete	600 mm
10B	1513.244	2853496.317	769.113	768.213	0.800				
11A	1492.078	2853455.514	765.283	764.473	0.810	11.944	1.365 %	100D Concrete	600 mm
11B	1480.889	2853451.336	765.110	764.310	0.800				
12A	1515.744	2853118.939	755.147	749.347	0.800	13.554	1.623 %	100D Concrete	600 mm
12B	1504.063	2853115.725	749.627	748.127	0.500				

KAMADAKWA RD				
Position	S(m)	Y-Coord	X-Coord	R(m)
	3000	1659.381	2854027.931	
	3100	1659.818	2853933.732	
	3200	1625.314	2853839.874	
EC11	3204.568	1623.715	2853835.594	
	3300	1590.299	2853746.204	
	3400	1555.284	2853652.535	
BC12	3494.304	1522.262	2853564.201	
	3500	1520.293	2853558.856	
	3600	1484.141	2853462.456	
PI12	3640.061	1469.862	2853424.026	600.000
	3700	1454.344	2853363.053	
EC12	3787.617	1469.427	2853275.682	
	3800	1491.046	2853263.385	
	3900	1504.121	2853184.243	
	4000	1517.195	2853065.102	

INTERSECT RD2				
Position	S(m)	Y-Coord	X-Coord	R(m)
Start	0	1504.049	2853506.759	0.000
BCC1	21.071	1524.202	2853500.606	
PI1	26.693	1532.996	2853497.021	30.000
ECC1	38.816	1538.775	2853490.788	
*End	40.892	1540.080	2853489.155	



NOTES

ISSUED FOR TENDER

LEGEND

- CENTRELINE
- ROADEDGE
- ROADKERB
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- STORMWATER DRAINAGE PIPE
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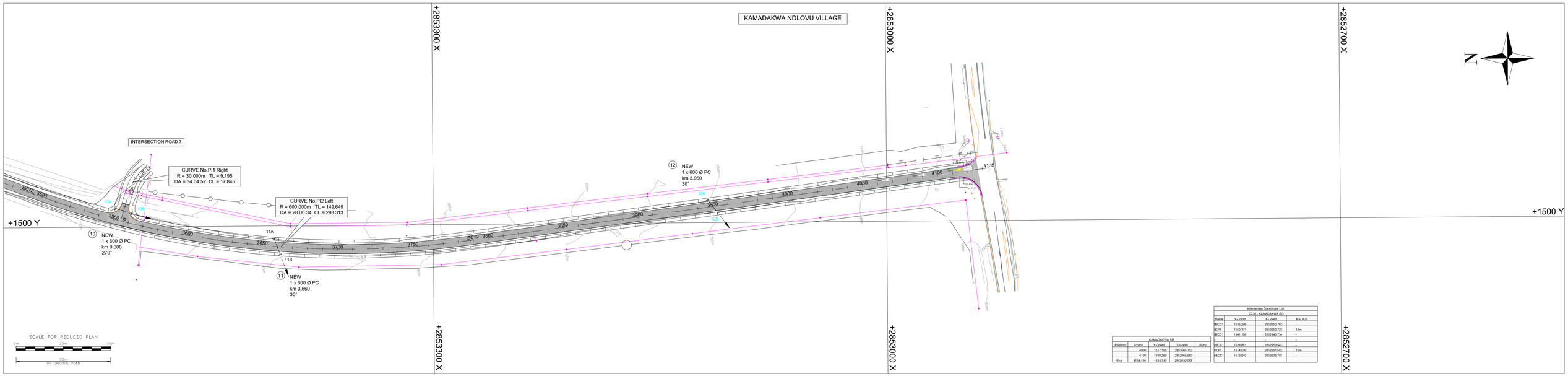
P TSHABALALA	F BURGER PR.ENG. 20090094
DRAWN:	SIGN:
R VAN ZYL	

SCALE:	DATE:
1:1250	FEBRUARY 2023
DRAWING NO:	CONTRACT NO:
NKP(p)432_GL04	AS SHOWN
REVISION:	

FOLLOWING PLAN No. NKP(p)432/GL/04



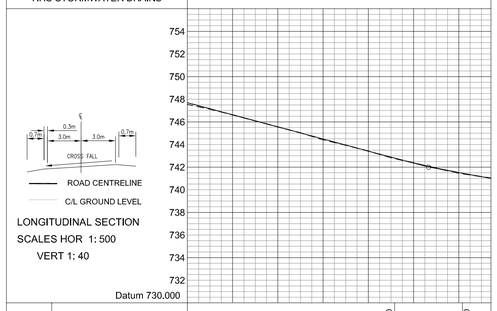
KAMADAKWA RD				
Position	SV(m)	Y-Coord	X-Coord	R(m)
	4000	1517.195	2853065.102	
	4100	1530.269	2852965.980	
*End	4134.196	1534.740	2852932.058	

Intersection Coordinate List			
D236 - KAMADAKWA RD			
Name	Y-Coord	X-Coord	RADIUS
BCC1	1535.268	2852950.762	-
ICP1	1550.171	2852952.723	15m
ECC1	1541.156	2852946.734	-
-	-	-	-
BCC1	1528.881	2852953.543	-
ICP1	1514.009	2852951.582	15m
ECC1	1516.040	2852936.797	-
-	-	-	-

LHS STORMWATER DRAINS

ROAD MAKING AND DRAINAGE — 150mm Solid White Line

RHS STORMWATER DRAINS



VERTICAL CURVES: BVC 4091.620 — 30.000m VC K=16.775 — EVC 4121.620

GRADES: 4106.620 741.992 — -5.349 % — -3.561 % — 4134.196 740.940

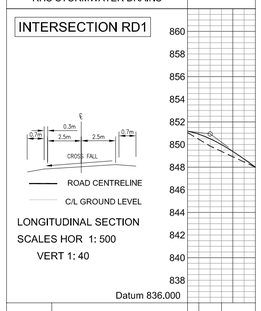
VERTICAL ALIGNMENT — DESIGN ROAD LEVELS	
LEFT EDGE	747.626
CENTRE LINE	747.696
RIGHT EDGE	747.626

CHAINAGES	GROUND LEVELS ON C/L	LEFT EDGE	CENTRE LINE	RIGHT EDGE
4000	747.545	747.626	747.696	747.626
4010	747.617	747.091	747.161	747.091
4020	746.817	746.556	746.626	746.556
4030	746.086	746.021	746.091	746.021
4040	745.555	745.486	745.556	745.486
4050	745.037	744.951	745.021	744.951
4060	744.409	744.416	744.486	744.416
4070	743.935	743.881	743.951	743.881
4080	743.413	743.346	743.416	743.346
4090	742.826	742.811	742.881	742.811
4100	742.378	742.297	742.367	742.297
4110	741.911	741.842	741.912	741.842
4120	741.458	741.446	741.516	741.446
4130	741.155	741.089	741.159	741.089
4134.196	741.047	740.940	741.010	740.940

SUPERELEVATION: 4000.000 — LEFT EDGE=-2.000%

HORIZONTAL CURVES: Direction 172.29.15

INTERSECTION RD1



VERTICAL CURVES: BVC 5.000 — 10.000m VC K=0.818 — EVC 15.000

GRADES: 10.000 850.938 — -2.470 % — 14.700 % — 36.992 851.274

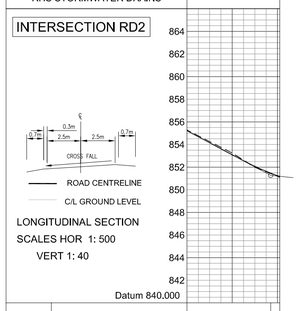
VERTICAL ALIGNMENT — DESIGN ROAD LEVELS	
LEFT EDGE	851.295
CENTRE LINE	851.195
RIGHT EDGE	851.195

CHAINAGES	GROUND LEVELS ON C/L	LEFT EDGE	CENTRE LINE	RIGHT EDGE
0	851.046	851.295	851.195	851.195
10	849.860	850.835	850.765	850.735
20	848.918	849.518	849.468	849.418
30	847.893	848.048	847.998	847.948

SUPERELEVATION: 0.000 — LEFT EDGE=2.000% — 0.000 — RIGHT EDGE=-2.000%

HORIZONTAL CURVES: Direction 188.51.42

INTERSECTION RD2



VERTICAL CURVES: BVC 36.992 — 0.000m VC K=0.000 — EVC 73.984

GRADES: -10.670 % — -2.035 %

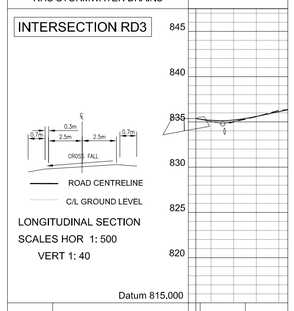
VERTICAL ALIGNMENT — DESIGN ROAD LEVELS	
LEFT EDGE	855.271
CENTRE LINE	855.221
RIGHT EDGE	855.171

CHAINAGES	GROUND LEVELS ON C/L	LEFT EDGE	CENTRE LINE	RIGHT EDGE
0	855.276	855.271	855.221	855.171
10	854.261	854.204	854.154	854.104
20	853.245	853.137	853.087	853.037
30	851.981	852.070	852.020	851.970
41.921	851.104	851.263	851.192	851.142

SUPERELEVATION: 0.000 — LEFT EDGE=2.000% — 0.000 — RIGHT EDGE=-2.000%

HORIZONTAL CURVES: Direction 190.02.48

INTERSECTION RD3



VERTICAL CURVES: BVC 15.206 — VCL=20.000 K=-1.908 — EVC 25.206

GRADES: 15.206 834.775 — -5.027 % — 5.453 %

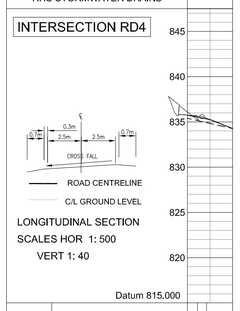
VERTICAL ALIGNMENT — DESIGN ROAD LEVELS	
LEFT EDGE	835.157
CENTRE LINE	835.107
RIGHT EDGE	835.057

CHAINAGES	GROUND LEVELS ON C/L	LEFT EDGE	CENTRE LINE	RIGHT EDGE
-3.329	834.988	835.157	835.107	835.057
20	836.267	836.177	836.127	836.077
40 43.960	836.541	836.243	836.243	836.243

SUPERELEVATION: 2.000 — -2.000

HORIZONTAL CURVES: Direction 168.56.25

INTERSECTION RD4



VERTICAL CURVES: BVC 8.475 — VCL=4.000 K=0.526 — EVC 8.080

GRADES: 6.475 835.593 — -2.208 % — 5.806 %

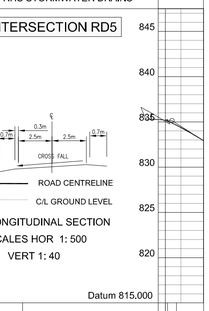
VERTICAL ALIGNMENT — DESIGN ROAD LEVELS	
LEFT EDGE	835.786
CENTRE LINE	835.736
RIGHT EDGE	835.686

CHAINAGES	GROUND LEVELS ON C/L	LEFT EDGE	CENTRE LINE	RIGHT EDGE
0	835.399	835.786	835.736	835.686
19.997	834.270	834.317	834.267	834.217

SUPERELEVATION: 2.000 — -2.000

HORIZONTAL CURVES: Direction 183.08.05

INTERSECTION RD5



VERTICAL CURVES: BVC 3.142 — 3.000 — 3.142 — EVC 6.284

GRADES: 6.080 835.140 — -1.974 % — 5.938 %

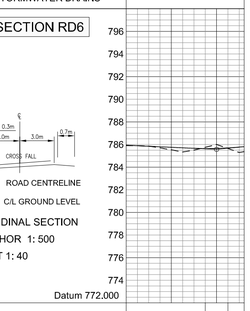
VERTICAL ALIGNMENT — DESIGN ROAD LEVELS	
LEFT EDGE	835.115
CENTRE LINE	835.188
RIGHT EDGE	

CHAINAGES	GROUND LEVELS ON C/L	LEFT EDGE	CENTRE LINE	RIGHT EDGE
3.142		832.979	832.929	832.879
20.009	832.899			

SUPERELEVATION: 2.000 — -2.000

HORIZONTAL CURVES: Direction 192.26.33

INTERSECTION RD6



VERTICAL CURVES: BVC 35.000 — 10.000m VC K=3.432 — EVC 45.000

GRADES: 40.000 785.568 — -0.925 % — 1.989 %

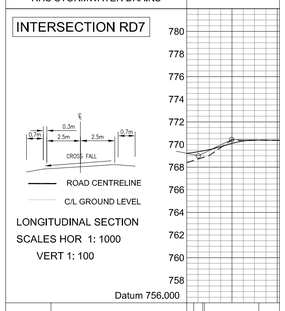
VERTICAL ALIGNMENT — DESIGN ROAD LEVELS	
LEFT EDGE	785.870
CENTRE LINE	785.938
RIGHT EDGE	786.096

CHAINAGES	GROUND LEVELS ON C/L	LEFT EDGE	CENTRE LINE	RIGHT EDGE
0	785.903	785.870	785.938	786.096
10	785.853	785.778	785.846	785.914
20	785.527	785.695	785.753	785.821
30	785.500	785.649	785.661	785.672
40	786.005	785.650	785.604	785.559
50 52.169	786.294	785.869	785.767	785.665
	785.867	785.912	785.810	785.708

SUPERELEVATION: 0.000 — RIGHT EDGE=2.000% — LEFT EDGE=-2.000% — 20.000 — LEFT EDGE=3.000% — RIGHT EDGE=-3.000% — 50.000

HORIZONTAL CURVES: Direction 128.34.52 — Curve 1 Left Radius=60.000 l= 21.25.25 — Direction 107.09.27

INTERSECTION RD7



VERTICAL CURVES: 24.000m VC K=2.374 — EVC 31.688

GRADES: 5.131 768.999 770.439 — 9.759 % — -0.351 %

VERTICAL ALIGNMENT — DESIGN ROAD LEVELS	
LEFT EDGE	769.282
CENTRE LINE	769.214
RIGHT EDGE	769.146

CHAINAGES	GROUND LEVELS ON C/L	LEFT EDGE	CENTRE LINE	RIGHT EDGE
0	768.991	769.533	769.465	769.397
10	769.030	769.209	769.141	769.073
20	770.413	770.464	770.396	770.328
30	770.374	770.436	770.368	770.300
40	770.368	770.436	770.368	770.300

SUPERELEVATION: 0.000 — LEFT EDGE=2.000% — RIGHT EDGE=-2.000%

HORIZONTAL CURVES: Direction 106.58.40 — Curve 1 Right Radius=30.000 l= 34.04.52

NOTES

ISSUED FOR TENDER

LEGEND

- CENTRELINE
- ROADEDGE
- ROADKERB
- FENCE
- STORMWATER DRAINAGE PIPE
- SIDE DRAIN
- SIDE WALK
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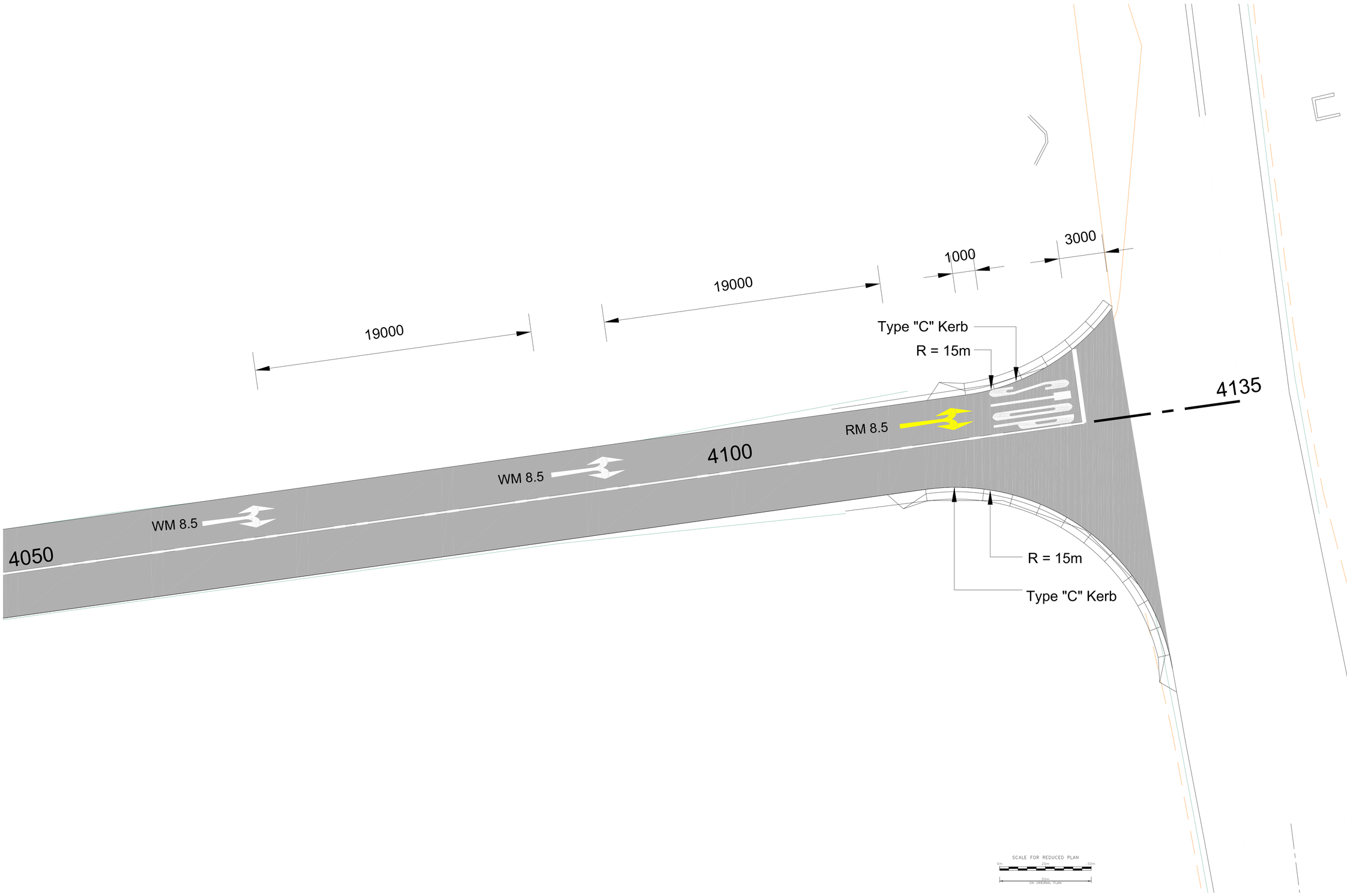
DESIGNED: P TSHABALALA	CHECKED: F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL	SIGN:

SCALE: 1:1250	DATE: FEBRUARY 2023
DRAWING NO: NKP(p)432_GL05	CONTRACT NO: AS SHOWN
REVISION:	



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PROJECT TITLE:

CONSTRUCTION OF KAMADAKWA RING ROAD

DRAWING TITLE:

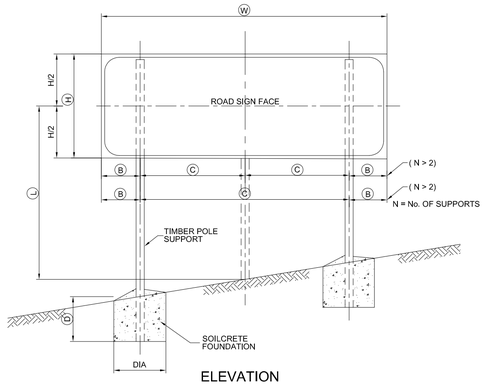
KAMADAKWA - D236 INTERSECTION

DESIGNED: P TSHABALALA	CHECKED: F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL	SIGN:

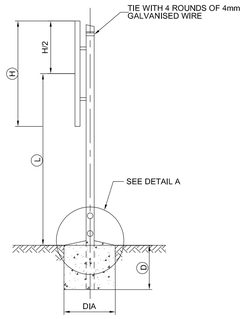
SCALE: 1:1000	DATE: FEBRUARY 2023
DRAWING NO: NKP(p)432_INT01	CONTRACT NO: AS SHOWN

REVISION:

ROAD SIGNS
DETERMINATION OF SUPPORTS AND FOUNDATIONS



ELEVATION



TYPICAL SECTION

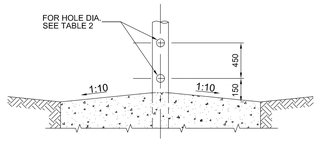
FREE STANDING SUPPORT

SCALE - N.T.S

TABLE 1

WIDTH OF SIGN	No. OF SUPPORTS	DIMENSIONS	
W	N	B	C
1,2m OR LESS	1	W/2	-
1,2m - 4,0m	2	W/5	3W/5
4,0m - 7,2m	3	W/2N	W/N
7,2m - 9,6m	4		
9,6m - 12,0m	5		

NOTE : MAXIMUM DISTANCE BETWEEN SUPPORTS = 2,4 m

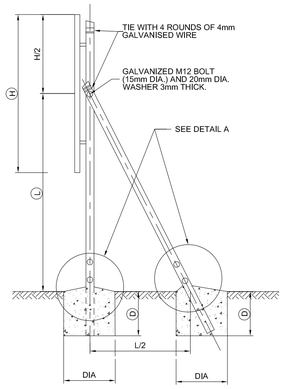


DETAIL A

SCALE - N.T.S

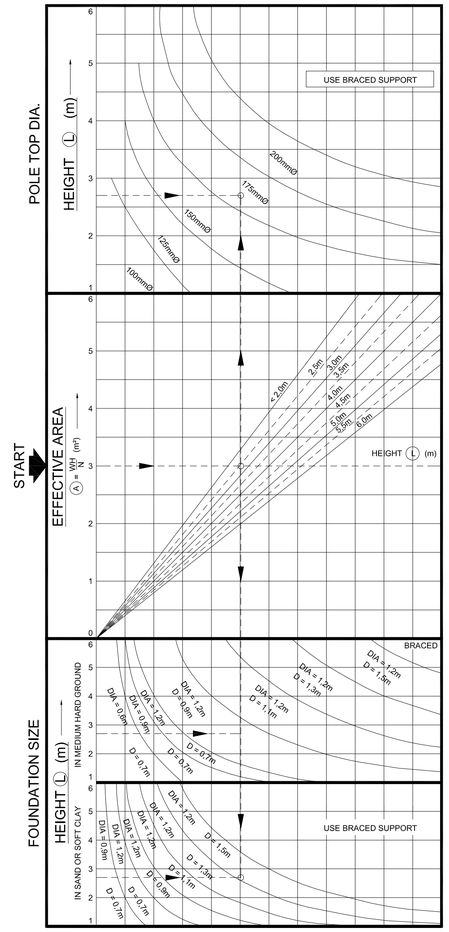
TABLE 2

TIMBER POLE DIA. AT GROUND LEVEL (mm)	HOLE DIA. (mm)
≤ 140	NONE
141 - 170	40
171 - 200	50
201 - 225	65



TYPICAL SECTION BRACED SUPPORT

SCALE - N.T.S



DESIGN CHART 1
FREE STANDING SUPPORT

SCALE - N.T.S

NOTE:

1. DESIGN LOADING
   NOMINAL WIND LOAD ACTING ON THE SIGN FACE HAS BEEN ASSUMED AS FOLLOWS:-
   AVERAGE SIGN HEIGHT L < 2m : 0,75 kPa
   AVERAGE SIGN HEIGHT L > 6m : 1,25 kPa
   WIND LOADING IS ASSUMED TO VARY LINEARLY FOR AVERAGE SIGN HEIGHTS FALLING BETWEEN THE ABOVE LIMITS.

2. FOUNDING MATERIAL
   FOUNDATIONS FOR FREE STANDING SUPPORTS DEPEND ON SOIL TYPE ENCOUNTERED.
   THE GRAPHS FOR "MEDIUM HARD GROUND" ARE APPLICABLE FOR ANY MATERIAL WHICH REQUIRES A PICK FOR EXCAVATION.
   FOR SOFTER FOUNDING MATERIAL THE GRAPH FOR "SAND OR SOFT CLAY" MUST BE USED.
   FOUNDATIONS FOR SIGNS USING BRACED SUPPORTS ARE INDEPENDENT OF FOUNDING MATERIAL TYPE.
   FOUNDATIONS FOR SIGNS LOCATED IN HARD ROCK MAY REQUIRE SPECIAL DESIGNS.

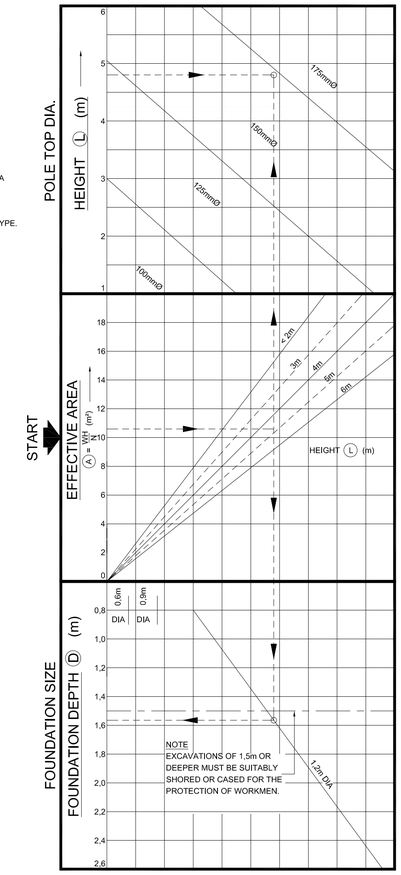
3. DESIGN PROCEDURE
   i) FROM TABLE 1 DETERMINE FOR SIGN WIDTH W ,
      THE NUMBER OF SUPPORTS N AND DIMENSIONS B AND C
   ii) CALCULATE THE EFFECTIVE SIGN AREA $A = \frac{W \times H}{N}$ (m²) AND AVERAGE HEIGHT L (m)
   iii) FROM DESIGN CHART 1 (FREE STANDING SUPPORT), DETERMINE THE FOLLOWING:-
      a) THE TOP DIAMETER OF THE POLE
      b) THE FOUNDATION DIAMETER AND DEPTH FOR THE APPLICABLE FOUNDING MATERIAL. (SEE NOTE 3)
   iv) WHERE THE EFFECTIVE SIGN AREA EXCEEDS 6m² OR WHERE NECESSARY AS INDICATED ON DESIGN CHART 1 , CHART 2 FOR BRACED SUPPORTS MUST BE USED.
      IN THIS CASE THE POLE TOP DIAMETER AND FOUNDATION SIZES OBTAINED ARE APPLICABLE TO BOTH THE UPRIGHT AND DIAGONAL BRACE MEMBERS.
   v) DETERMINE FROM TABLE 2 THE DIAMETER OF HOLES TO BE DRILLED IN THE POLES AS SHOWN IN DETAIL "A"

4. EXAMPLE (FREE STANDING SUPPORT)
   W = 5m H = 1,8m L = 2,7m

   FROM TABLE 1
   N = 3m B = 0,830m C = 1,670m
   $A = \frac{5 \times 1,8}{3} = 3,0m^2$

   FROM DESIGN CHART 1
   FOR A = 3,0m² AND L = 2,7m
   POLE TOP DIA. = 175mm
   FOUNDATION SIZE = 1,2m DIA. 0,9m DEEP (MEDIUM HARD GROUND)
   OR 1,2m DIA. 1,5m DEEP (SAND OR SOFT CLAY)

   FROM TABLE 2
   HOLES TO BE DRILLED (DETAIL A = 50mm DIA.)



DESIGN CHART 2
BRACED SUPPORT

SCALE - N.T.S

SIZE AND SPACING OF ROAD SIGN SUPPORTS AND FOUNDATIONS

SIZE AND SPACING SUPPORTS AND FOUNDATIONS SHALL BE DETERMINED FROM INFORMATION AND DESIGN CHARTS SHOW. THE SIZES AND SPACING OBTAINED ARE FOR USE WITH THE SIGN FACE SHOWN ON DRAWING DD/2015/01/Rs/04.

POSITION

ROAD SIGNS SHALL BE ERECTED IN THE POSITIONS SHOWN ON THE DRAWINGS OR INDICATED BY THE ENGINEER. STANDARD CLEARANCES ARE SHOWN IN THE SADC ROAD TRAFFIC SIGNS MANUAL.

EXCAVATIONS

EXCAVATIONS FOR FOUNDATIONS MUST BE MADE TO THE NEAT DIMENSIONS SPECIFIED.
WHERE THE FOUNDATION DEPTH IS 1.5m OR GREATER, EXCAVATIONS MUST BE SUITABLY SHORED FOR THE PROTECTION OF WORKMEN.

TIMBER POLE SUPPORTS

TIMBER SUPPORTS SHALL BE STRAIGHT ROUND POLES COMPLYING WITH THE REQUIREMENTS OF SANS 457-3 AND SHALL NOT EXHIBIT EXCESSIVE CRACKING AT THE ENDS.

LENGTH

WHEREVER POSSIBLE POLE LENGTHS CORRESPONDING TO AVAILABLE NORMAL LENGTHS SHALL BE USED.

CUTTING

WHERE CUTING TO LENGTH AFTER PRESERVATIVE TREATMENT IS UNAVOIDABLE, ONLY ONE CUT PER POLE SHALLE BE ALLOWED. THE CUT SHALL BE NEAR THE TOP END OF THE POLE AND THE EXPOSED SURFACE SHALL BE TREATED WITH TWO COATS OF THE APPLICABLE PRESERVATIVE AND THE POLE BANDEDIN ACCORDANCE WITH SANS 457-3.

TIMBER POLE SUPPORTS

- PRESERVATIVE TREATMENT:

THE POLES SHALL BE TREATED WITH EITHER A MIXTURE OF COPPER-CHROMIUM-ARSENIC COMPOUNDS COMPLYING WITH THE REQUIREMENTS OF TYPE II OF SANS 673 (HICKSONS "TANALITH C" OR EQUAL) OR WITH CREOSOTE THAT COMPLIES WITH SANS 538 OR SANS 539.

- ERECTION:

POLES SHALL BE SELECTED FOR STRAIGHTNESS AND ERECTED AT AN ORIENTATION WHICH WILL PERMIT THE SIGN FACE TO BE FASTENED IN A VERTICAL PLANE WITHOUT UNDUE DISTORTION.

- BREAKAWAY HOLES:

ALL TIMBER POLES HAVING A DIAMETER >140mm SHALL BE DRILLED WITH TWO HOLES PERPENDICULAR TO THE DIRECTION OF TRAFFIC AS SHOWN IN DETAIL A. THE EXPOSED TIMBER SURFACES SHALL BE TREATED WITH TWO COATS OF THE APPLICABLE PRESERVATIVE.

SOILCRETE FOUNDATIONS

SOILCRETE SHALL CONSIST OF 12 PARTS APPROVED GRANULAR SOIL OR GRAVEL MIXED WITH 1 PART PORTLAND CEMENT AND ONLY SUFFICIENT WATER TO GIVE IT A CONSISTENCY THAT WILL PERMIT THE SOILCRETE TO BE VIBRATED OR TAMPED TO EXCLUDE VOIDS. TIMBER SUPPORT POLES SHALL BE SET VERTICAL AND FIRMLY PROPPED IN POSITION PRIOR TO PLACING OF THE SOILCRETE. PROPS SHALL REMAIN IN POSITION FOR A MINIMUM OF 12 HOURS AFTER PLACING THE SOILCRETE. THE SURFACE OF THE SOILCRETE SHALL BE NEATLY FINISHED WITH SUFFICIENT FALL TO ENSURE PROPER DRAINAGE. CONCRETE SHALL NOT BE SUBSTITUTED FOR SOILCRETE.TOPPING OF SOILCRETE FOUNDATION TO BE STEEL FLOATED.

BOLTS, NUTS AND WASHERS

EXCEPT WHERE OTHERWISE SPECIFIED STEEL BOLTS AND NUTS SHALL CONFORM TO SANS 135 OR SANS 1143 AND ALL COMPONENTS SHALL HAVE A HOT-DIP (GALVANIZED) ZINC COATING THAT COMPLIES WITH THE REQUIREMENTS OF SANS 121 : 2000 (ISO 1461 : 1999) FOR COATINGS ON TYPE C1 ARTICLES.

ROAD SIGN FACES

ROAD SIGN FACES SHALL BE MANUFACTURED STRICTLY IN ACCORDANCE WITH THE DETAILS SHOWN ON DRAWING DD/2015/01/Rs/04. TRANSPORTATION AND ERECTION OF SIGN FACES SHALL BE CARRIED OUT IN SUCH A WAY THAT DAMAGE TO THE SIGN IS PREVENTED. THE LOWER EDGE OF SIGN FACES SHALL BE HORIZONTAL AFTER COMPLETION OF ERECTION. THE MONTH AND YEAR OF ERECTION OF THE ROAD SIGN SHALL BE INDICATED BY MEANS OF WHITE PAINT ON THE BACK OF THE SIGN IN THE BOTTOM RIGHT HAND CORNER. THE LETTERS AND FIGURES SHALL BE 25mm HIGH.

NOTES

ISSUED FOR TENDER

LEGEND

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PROJECT TITLE:

CONSTRUCTION OF KAMADAKWA RING ROAD

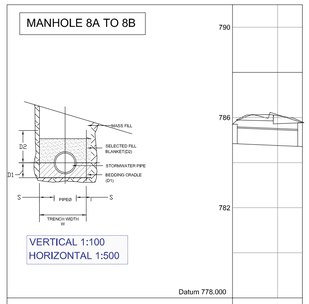
DRAWING TITLE:

ROAD SIGNS : SUPPORT AND FOUNDATIONS GENERAL DETAILS

DESIGNED:	CHECKED:
P TSHABALALA	F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL	SIGN:

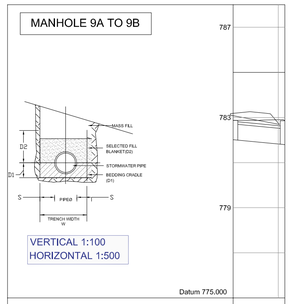
SCALE:	DATE:
FEBRUARY 2023	AS SHOWN
DRAWING NO: NKP(p)432_RS02	CONTRACT NO: AS SHOWN
REVISION:	

MANHOLE 8A TO 8B



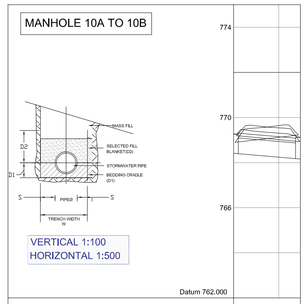
Chainage	0.000	8.332	15.500
Ground Level	785.697	786.227	785.767
Manhole Name/Depth	8A 0.800		8B 1.001
Inlet / Outlet	784.897		784.766 784.766
Hydraulic Elevation	785.595		785.464
Length	15.500 m		
Link Size / Link Type / Bedding	600 mm100D Concrete Class B		
Slope	0.845 %		
Flow Capacity	0.492 m³/s 0.528 m³/s		
Velocity	2.229 m/s		

MANHOLE 9A TO 9B



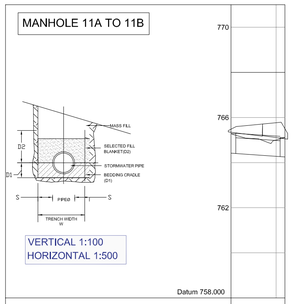
Chainage	0.000	3.750	11.481
Ground Level	792.874	792.871	792.856
Manhole Name/Depth	9A 0.800		9B 1.000
Inlet / Outlet	792.074		791.856 791.856
Hydraulic Elevation	792.828		792.610
Length	11.481 m		
Link Size / Link Type / Bedding	600 mm100D Concrete Class B		
Slope	1.899 %		
Flow Capacity	0.421 m³/s 0.791 m³/s		
Velocity	2.990 m/s		

MANHOLE 10A TO 10B



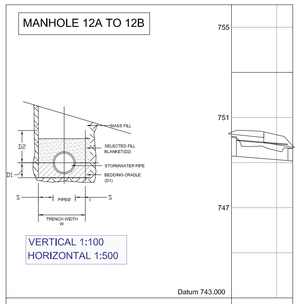
Chainage	0.000	7.891	14.805
Ground Level	769.267	769.344	769.113
Manhole Name/Depth	10A 0.800		10B 0.900
Inlet / Outlet	768.467		768.213 768.213
Hydraulic Elevation	769.319		769.065
Length	14.805 m		
Link Size / Link Type / Bedding	600 mm100D Concrete Class B		
Slope	1.716 %		
Flow Capacity	0.557 m³/s 0.752 m³/s		
Velocity	3.061 m/s		

MANHOLE 11A TO 11B



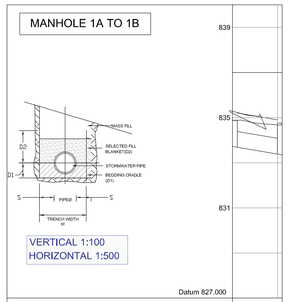
Chainage	0.000	6.164	11.944
Ground Level	765.283	765.046	765.110
Manhole Name/Depth	11A 0.810		11B 0.800
Inlet / Outlet	764.473		764.310 764.310
Hydraulic Elevation	765.312		765.149
Length	11.944 m		
Link Size / Link Type / Bedding	600 mm100D Concrete Class B		
Slope	1.365 %		
Flow Capacity	0.602 m³/s 0.670 m³/s		
Velocity	2.821 m/s		

MANHOLE 12A TO 12B



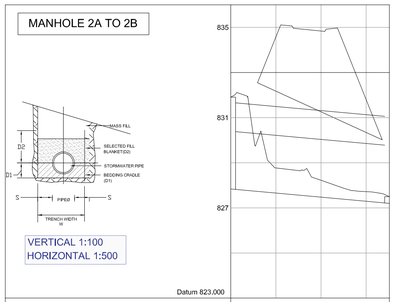
Chainage	0.000	6.453	13.554
Ground Level	750.147	749.733	749.627
Manhole Name/Depth	12A 0.800		12B 1.000
Inlet / Outlet	749.347		749.127 749.127
Hydraulic Elevation	750.032		749.892
Length	13.554 m		
Link Size / Link Type / Bedding	600 mm100D Concrete Class B		
Slope	1.623 %		
Flow Capacity	0.376 m³/s 0.731 m³/s		
Velocity	2.741 m/s		

MANHOLE 1A TO 1B



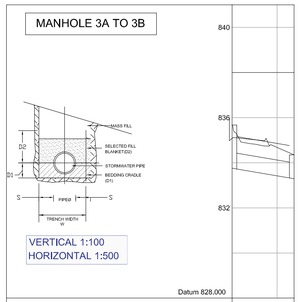
Chainage	0.000	3.289	10.999
Ground Level	834.879	834.832	834.757
Manhole Name/Depth	1B 1.100		1B 1.251
Inlet / Outlet	833.779		833.506 833.506
Hydraulic Elevation	835.249		834.867
Length	10.999 m		
Link Size / Link Type / Bedding	600 mm100D Concrete Class B		
Slope	3.391 %		
Flow Capacity	0.987 m³/s 1.057 m³/s		
Velocity	4.466 m/s		

MANHOLE 2A TO 2B



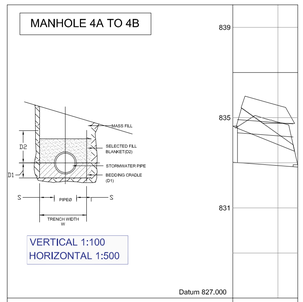
Chainage	0.000	17.347	20.000	35.150
Ground Level	831.969	828.564	828.222	827.496
Manhole Name/Depth	2A 4.000		0.746	2B 0.295
Inlet / Outlet	827.939		827.476	827.201 827.201
Hydraulic Elevation	831.674			831.039
Length	35.150 m			
Link Size / Link Type / Bedding	2400 x 2400Box Culvert Class B			
Slope	1.815 %			
Flow Capacity	15.510 m³/s 60.795 m³/s			
Velocity	7.665 m/s			

MANHOLE 3A TO 3B



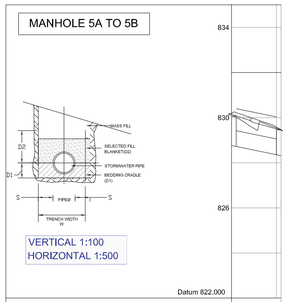
Chainage	0.000	3.750	13.765
Ground Level	835.671	834.864	834.347
Manhole Name/Depth	3A 1.256		3B 1.000
Inlet / Outlet	833.815		833.347 833.347
Hydraulic Elevation	835.184		834.726
Length	13.765 m		
Link Size / Link Type / Bedding	600 mm100D Concrete Class B		
Slope	3.400 %		
Flow Capacity	0.863 m³/s 1.058 m³/s		
Velocity	4.388 m/s		

MANHOLE 4A TO 4B



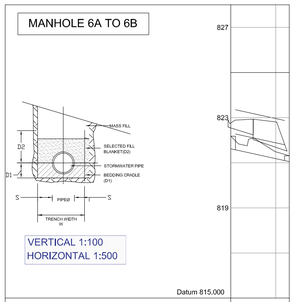
Chainage	0.000	7.200	14.408
Ground Level	834.624	834.065	832.914
Manhole Name/Depth	4A 1.000		4B 0.106
Inlet / Outlet	833.024		832.808 832.808
Hydraulic Elevation	834.928		834.710
Length	14.408 m		
Link Size / Link Type / Bedding	2 x 1200 x 1200Box Culvert Class B		
Slope	1.499 %		
Flow Capacity	7.428 m³/s 17.403 m³/s		
Velocity	5.031 m/s		

MANHOLE 5A TO 5B



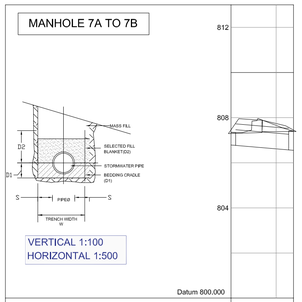
Chainage	0.000	4.901	10.999
Ground Level	830.071	829.610	829.458
Manhole Name/Depth	5A 1.250		5B 1.087
Inlet / Outlet	828.821		828.371 828.371
Hydraulic Elevation	830.438		829.988
Length	10.999 m		
Link Size / Link Type / Bedding	600 mm100D Concrete Class B		
Slope	4.091 %		
Flow Capacity	0.999 m³/s 1.161 m³/s		
Velocity	4.856 m/s		

MANHOLE 6A TO 6B



Chainage	0.000	4.984	12.987
Ground Level	822.179	822.087	821.308
Manhole Name/Depth	6A 0.000		6B 0.200
Inlet / Outlet	821.679		821.108 821.108
Hydraulic Elevation	823.388		822.527
Length	12.987 m		
Link Size / Link Type / Bedding	600 mm100D Concrete Class B		
Slope	4.397 %		
Flow Capacity	1.054 m³/s 1.203 m³/s		
Velocity	5.046 m/s		

MANHOLE 7A TO 7B



Chainage	0.000	6.928	13.856
Ground Level	807.342	807.892	807.407
Manhole Name/Depth	7A 1.000		7B 0.801
Inlet / Outlet	806.942		806.606 806.606
Hydraulic Elevation	807.739		807.503
Length	13.856 m		
Link Size / Link Type / Bedding	600 mm100D Concrete Class B		
Slope	1.703 %		
Flow Capacity	0.618 m³/s 0.749 m³/s		
Velocity	3.112 m/s		

NOTES

ISSUED FOR TENDER

LEGEND

CLIENT:

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PROJECT TITLE:

CONSTRUCTION OF KAMADAKWA RING ROAD

DRAWING TITLE:

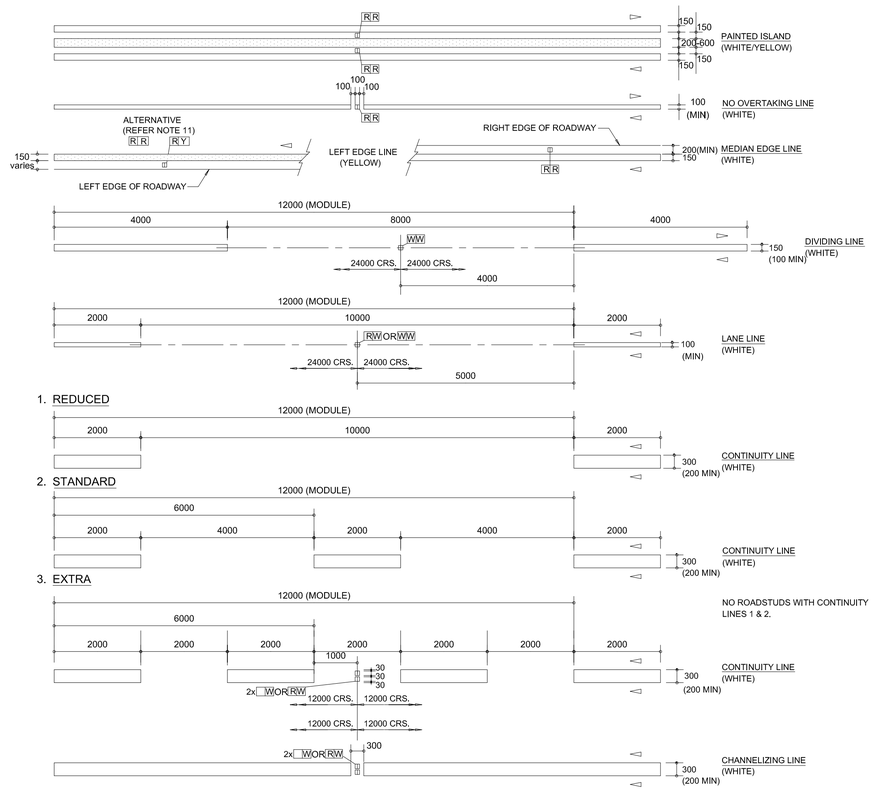
STORMWATER LONGITUDINAL SECTION

DESIGNED: P TSHABALALA	CHECKED: F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL	SIGN:

SCALE: FEBRUARY 2023	DATE: AS SHOWN
DRAWING NO: NKP(p)432_LSW01	CONTRACT NO: AS SHOWN

REVISION:

RURAL AND URBAN LONGITUDINAL LINE TYPES & REGULATORY/WARNING/GUIDANCE SYMBOLS



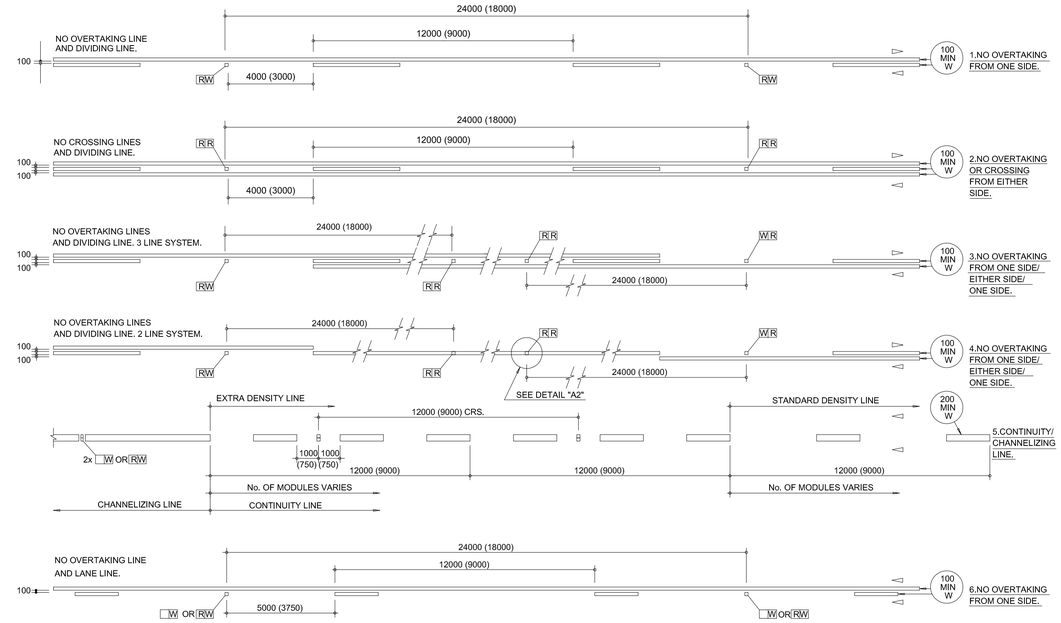
RURAL LONGITUDINAL LINE TYPES

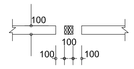
SCALE 1:50

NOTES: (RURAL LONGITUDINAL LINE TYPES)

1. DIRECTION OF TRAFFIC MOVEMENT WITH RESPECT TO LINE MARKING INDICATED THUS ▷ OR ◁.
2. PAINTED ISLAND MARKINGS SHALL BE USED AS A STANDARD DIVIDING MARKING ON ALL 4-LANE 2-WAY ROADWAYS. (SEE URBAN LONGITUDINAL LINE TYPES)
3. A NO OVERTAKING LINE MAY BE USED TO REPLACE A DIVIDING LINE MARKING ON MINOR ROADS OR TO MATCH PROVINCIAL ROAD MARKING POLICY ON AN INTERSECTING ROADWAY AS APPROPRIATE. A NO OVERTAKING LINE MAY BE USED IN COMBINATION WITH A LANE LINE. (NORMALLY ON A FREEWAY CARRIAGEWAY.)
4. A LEFT EDGE LINE MARKING SHALL NOT EXTEND ACROSS THE POINT OF DEPATURE FROM A THROUGH PORTION OF ROADWAY.
5. A RIGHT EDGE LINE MARKING IS ONLY REQUIRED TO DEMARCATE AN UNKERBED MEDIAN (A MEDIAN GUARDRAIL OR CONCRETE SEPERATOR BARRIER DOES NOT CONSTITUTE A KERBED MEDIAN.)
6. THE DIVIDING LINE MARKING REPLACES THE PREVIOUS "CENTRE LINE" MARKING AND SHALL ONLY BE USED BETWEEN LANES CARRYING OPPOSING TRAFFIC FLOWS WHERE OVERTAKING IS PERMITTED.
7. A CONTINUITY LINE MAY BE SPECIFIED IN ONE OF THREE DENSITIES - 1. REDUCED 2. STANDARD OR 3. EXTRA. A CONTINUITY LINE MAY BE USED TO DEFINE THE LIMIT OF THE THROUGH PORTION OF A ROADWAY, EITHER AT A HIGH SPEED EXIT (OFF-RAMP OR SLIP ROAD), A DEDICATED EXIT LANE ON FREEWAY, OR AT-GRADE ROAD. (RIGHT OR LEFT TURN.)
8. A CHANNELIZING LINE MAY BE USED AS AN EXTENSION OF A CONTINUITY LINE FOR CERTAIN APPLICATIONS ON THE APPROACH TO AN AT-GRADE SLIP ROAD GORE AREA.
9. A LANE LINE, CONTINUITY LINE OR CHANNELIZING LINE SHALL NOT BE USED BETWEEN OPPOSING TRAFFIC MOVEMENTS.
10. THE WIDTHS OF LINES SHOWN ARE RECOMMENDATIONS ONLY. (SEE LONGITUDINAL LINE COMBINATIONS.)
11. ROAD STUDS TO BE PLACED NEXT TO EDGE OF SURFACING (70mm Min) IN A STRAIGHT LINE PARALLEL TO YELLOW LINE

LEGEND FOR ROAD STUDS			
Y/R	YELLOW	/	RED
W/W	WHITE	/	WHITE
R/R	RED	/	RED
R/W	RED	/	WHITE





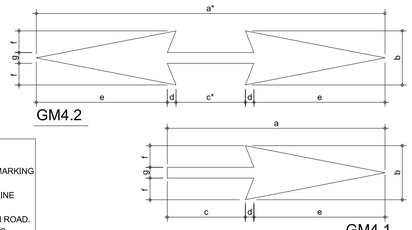
DETAIL "A2"

SCALE: 1:25

NOTES: (LONGITUDINAL LINE COMBINATIONS)

1. DIRECTION OF TRAFFIC MOVEMENT WITH RESPECT TO THE MARKING INDICATED THUS ▷ OR ◁.
2. FOR FULL LONGITUDINAL DIMENSIONS OF COMPONENT MARKINGS SEE RURAL AND URBAN LONGITUDINAL LINE TYPES.
3. COMBINATION MARKING 1 TO 4 ARE FOR TWO WAY TRAFFIC AND ARE APPLICABLE TO NATIONAL NON-FREEWAY ROUTES WHICH INTERSECT FREEWAYS.
4. COMBINATION MARKING 5 SHALL BE USED TO INDICATE THE DIVISIONS BETWEEN THE THROUGH ROADWAY AND ANY EXCLUSIVE EXIT/TURN LANES. WHEREVER POSSIBLE A CONTINUITY LINE SHOULD LEAD TO, OR TERMINATE IN A CHANNELIZING LINE WHICH MAY BE SHORT. RECOMMENDED MINIMUM LENGTH IS 12m FOR RURAL AND 9m FOR URBAN APPLICATIONS.
5. FOR MARKINGS 1 TO 4 ROADSTUDS SHOULD BE LOCATED ON CENTRE LINE OF THE DIVIDING LINE (OR SINGLE NO OVERTAKING LINE MARKING 4)
6. WHERE POSSIBLE THE LENGTH OF CHANNELIZING MARKING SHOULD BE ADJUSTED SO THAT THE CONTINUITY LINE ROADSTUDS MATCH OTHER ROADSTUDS ON CROSS-SECTION AND FALL IN THE CENTRE OF A GAP IN THE CONTINUITY LINE.
7. DIMENSIONS FOR URBAN APPLICATIONS ARE INDICATED IN BRACKETS.
8. ROADSTUDS ON THE SINGLE NO OVERTAKING LINE IN MARKING 4 MAY BE COVERED DURING LINE MARKING OR PLACED AS INDICATED IN DETAIL "A2".

LONGITUDINAL LINE COMBINATIONS



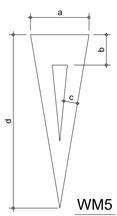
GM4.2

GM4.1

GM4.2 REVERSIBLE FLOW ARROW / GM4.1 INFORMATION ARROW

DIMENSIONS (mm)

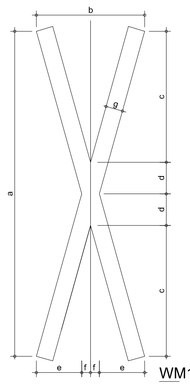
Operating Speed km/h	Typical Applications	a	a*	b	c	c*	d	e	f	g
30 - 40	City Centre	1250	2000	1250	450	400	50	750	500	250
50 - 60	Urban	2500	4000	1250	900	800	100	1500	500	250
70 - 90	Urban Arterial/Rural Expressway	4000	6400	1250	1440	1280	160	2400	500	250
100 - 120	Rural and Freeways	5000	8000	1250	1800	1600	200	3000	500	250



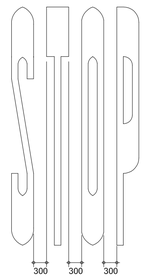
WM5

Marking	a	Area	a*	Area
	Area m ²			
WM1	4000	1.84		
	7500	6.00		
GM4.1/ GM4.2(a*)	1250	0.59	2000	1.05
	2500	1.17	4000	2.10
	4000	1.88	6400	3.36
	5000	2.35	8000	4.20
WM5	450	0.20		
	850	0.83		
	1350	2.15		
GM7	5500	6.90		

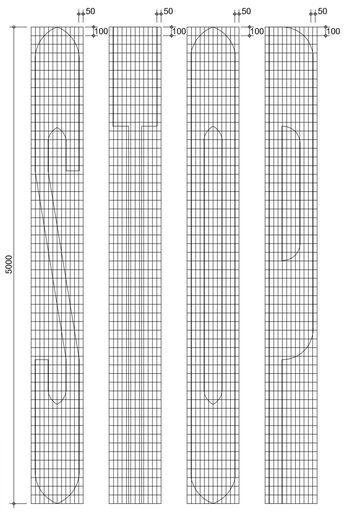
NOTES:
1. THIS DRAWING DETAILS A RANGE OF GENERAL WARNING OR GUIDANCE SYMBOLS. APPLICATION SHALL BE IN ACCORDANCE WITH THE SOUTH AFRICAN ROAD TRAFFIC SIGNS MANUAL.
2. MARKING WM5 - YIELD CONTROL AHEAD MAY BE REPEATED 1m FROM THE YIELD LINE MARKING.



WM1



GM 7 STOP



GM 7

SCALE: 1:25

WM5 YIELD CONTROL AHEAD

DIMENSIONS (mm)

Operating Speed km/h	Typical Applications	Distance from Yield line	a	b	c	d
30 - 40	City Centre	90m	450	250	100	1250
50 - 60	Urban	120m	850	450	150	2500
70 - 120	Rural	155m	1350	700	250	4000

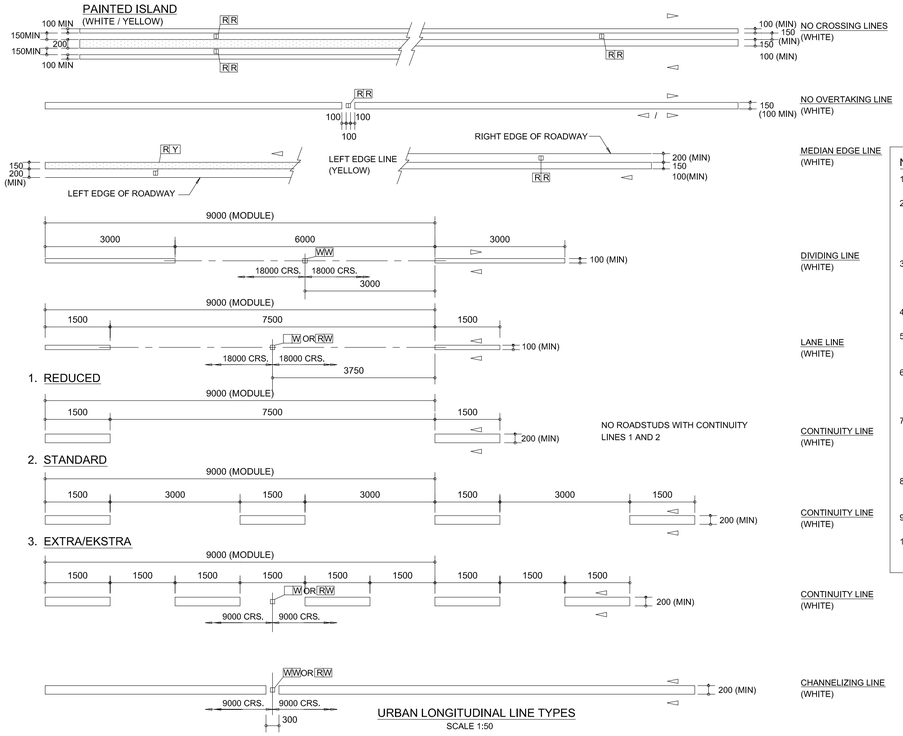
WM1 RAILWAY LEVEL CROSSING AHEAD

DIMENSIONS (mm)

Typical Applications	a	b	c	d	e	f	g
Urban	4000	2500	1797	203	1135	115	200
Rural	7500	2500	3003	747	1042	208	400

REGULATORY/WARNING /GUIDANCE SYMBOLS

PAINTED ISLAND (WHITE / YELLOW)



URBAN LONGITUDINAL LINE TYPES

SCALE 1:50

NOTES: (URBAN LONGITUDINAL LINE TYPES)

1. DIRECTION OF TRAFFIC MOVEMENT WITH RESPECT TO LINE MARKING INDICATED THUS ▷ OR ◁.
2. A NO CROSSING LINE MAY BE USED AS A FORM OF DIVIDING LINE MARKING, IN PLACE OF A NO OVERTAKING LINE, TO PROHIBIT ACCESS TO OR FROM PROPERTIES AT THE SIDE OF AN URBAN ROAD. A PAINTED ISLAND MAY BE USED AS AN ALTERNATIVE MARKING FOR THIS PURPOSE.
3. A NO OVERTAKING LINE MAY BE USED TO REPLACE A DIVIDING LINE MARKING TO PROHIBIT OVERTAKING IN THE PATH OF ON-COMING TRAFFIC. A NO OVERTAKING LINE MAY BE USED IN COMBINATION WITH A LANE LINE.
4. LEFT EDGE LINE MARKING SHALL NOT BE EXTENDED ACROSS THE POINT OF DEPARTURE FROM A THROUGH PORTION OF ROADWAY.
5. A RIGHT EDGE LINE MARKING IS ONLY REQUIRED TO DEMARCATE AN UNKERBED MEDIAN. (A MEDIAN GUARDRAIL OR CONCRETE SEPARATOR BARRIER DOES NOT CONSTITUTE A KERBED MEDIAN.)
6. THE DIVIDING LINE MARKING REPLACES THE PREVIOUS "CENTRE LINE" MARKING AND SHALL ONLY BE USED BETWEEN LANES CARRYING OPPOSING TRAFFIC FLOWS WHEN OVERTAKING IS PERMITTED.
7. A CONTINUITY LINE MAY BE SPECIFIED IN ONE OR THREE DENSITIES 1. REDUCED. 2. STANDARD OR 3. EXTRA. THROUGH PORTION OF A ROADWAY EITHER AT A HIGH SPEED EXIT (OFF-RAMP OR SLIPROAD), A DEDICATED EXIT LANE ON A FREEWAY, OR AT-GRADE ROAD (RIGHT OR LEFT TURN.)
8. A CHANNELIZING LINE MAY BE USED AS AN EXTENSION OF A CONTINUITY LINE OR INSTEAD OF A PAINTED ISLAND TO CHANNELIZE TRAFFIC MOVEMENT WHERE SPACE IS LIMITED.
9. A LANE LINE, CONTINUITY LINE OR CHANNELIZING LINE SHALL NOT BE USED BETWEEN OPPOSING TRAFFIC MOVEMENTS.
10. THE WIDTHS OF LINES SHOWN ARE RECOMMENDATIONS ONLY (SEE LONGITUDINAL LINE COMBINATIONS).

NOTES

ISSUED FOR TENDER

LEGEND

CLIENT:

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PROJECT TITLE:

CONSTRUCTION OF KAMADAKWA RING ROAD

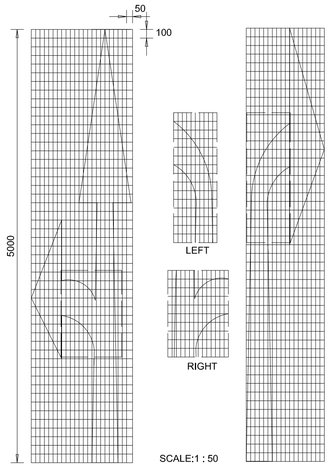
DRAWING TITLE:

RURAL AND URBAN LONGITUDINAL LINE TYPES AND SYMBOLS

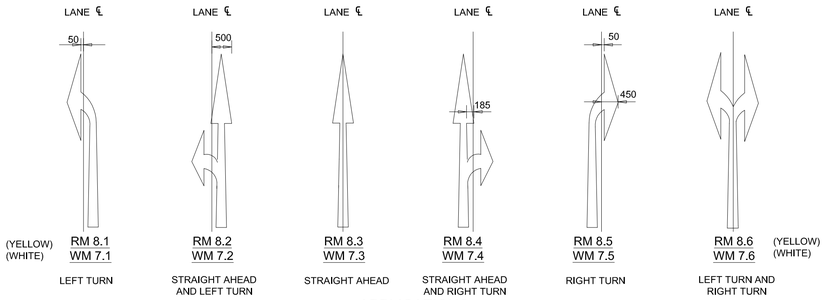
DESIGNED:	CHECKED:
P TSHABALALA	F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL	SIGN:

SCALE:	DATE:
FEBRUARY 2023	AS SHOWN
DRAWING NO: NKP(p)432_RM01	CONTRACT NO: AS SHOWN
REVISION:	

MANDATORY DIRECTION, FURCATION, BARRIER LINE AHEAD AND LANE REDUCTION ARROWS AHEAD



SCALE:1 : 50



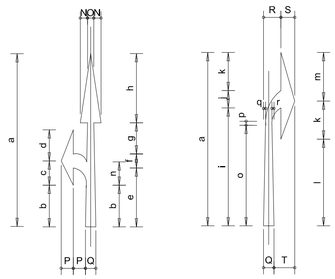
APPLICATIONS

SCALE: 1:100

DIMENSIONS (mm)

Operating Speed km/h	Typical Applications	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r
30 -40	City Centre	2500	600	350	450	884	200	417	1000	1700	250	550	1250	700	380	1450	58	30	29
50 - 90	Urban/Rural Expressway	4000	960	560	720	1406	320	666	1600	2720	400	880	2000	1120	608	2320	93	48	46
100 - 120	Rural and Freeways	5000	1200	700	900	1767	400	833	2000	3400	500	1100	2500	1400	760	2900	116	60	58
ALL	Special Applications	7500	1800	1050	1350	2651	600	1250	3000	5100	750	1650	3750	2100	1140	4350	174	90	87

All Operating Speeds and Applications	N	O	P	Q	R	S	T
	210	180	350	300	500	400	600

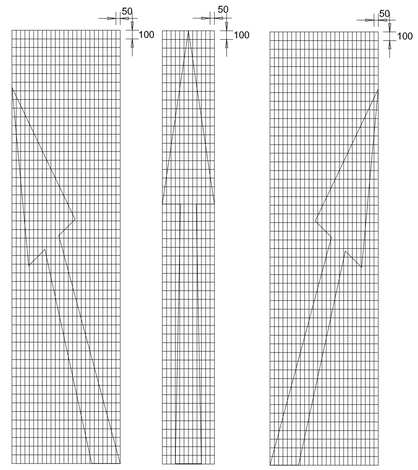


ARROW AREA / (m)^2				
a	RM8.1/RM8.5 WM7.1/WM7.5	RM8.2/RM8.4 WM7.2/WM7.4	RM8.3 WM7.3	RM8.6 WM7.6
2500	0.67	0.89	0.66	1.03
4000	1.14	1.43	1.06	1.68
5000	1.45	1.78	1.32	2.12
7500	2.23	2.66	1.98	3.20

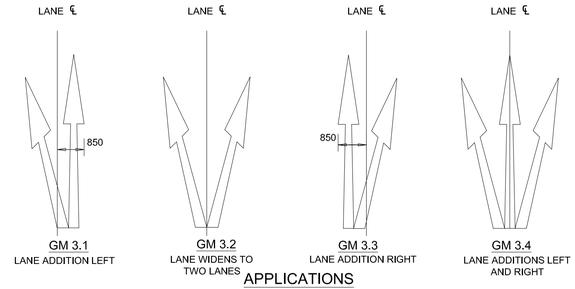
NOTES: (MANDATORY DIRECTION ARROWS)

1. THESE ARROWS MAY BE USED IN LANES TO INDICATE THAT DRIVERS SHALL PROCEED ONLY IN THE DIRECTION OR DIRECTIONS SHOWN. THEY SHOULD ONLY BE USED IF THE JUNCTION CONCERNED REQUIRED TURNING MOVEMENT CONTROL BY LANE.
2. THE FINAL ARROW NEAREST THE POINT OF TURN OR STRAIGHT ON MOVEMENT SHALL BE YELLOW. ANY ARROWS MARKED IN ADVANCE OF THIS POINT TO WARN DRIVERS OF THE MANDATORY MOVEMENT AHEAD SHALL BE WHITE.
3. A MANDATORY OR WARNING DIRECTION ARROW SHALL NOT BE USED IN ADVANCE OF A WIDENING OF THE ROADWAY TO A GREATER NUMBER OF LANES. THIS SHALL BE INDICATED IF NECESSARY, BY USING FURCATION ARROWS.

MANDATORY DIRECTION ARROWS



SCALE:1 : 50



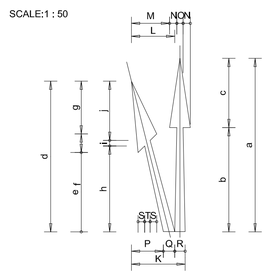
APPLICATIONS

SCALE 1 : 100

DIMENSIONS (mm)

Operating Speed km/h	Typical Applications	a	b	c	d	e	f	g	h	i	j
30 -40	City Centre	2500	1500	1000	2170	1141	268	761	1235	81	855
50 - 60	Urban Roads	4000	2400	1600	3472	1826	429	1218	1976	129	1367
70 - 90	Urban Arterial Roads/ Rural Expressways	5000	3000	2000	4340	2282	536	1522	2470	161	1709
100 - 120	Rural Roads and Freeways	7500	4500	3000	6510	3423	804	2283	3705	242	2564

All Operating Speeds and Applications	K	L	M	N	O	P	Q	R	S	T
	1700	1250	1100	210	180	921	329	300	188	161

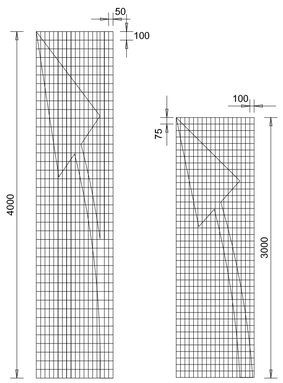


NOTES: (FURCATION ARROWS)

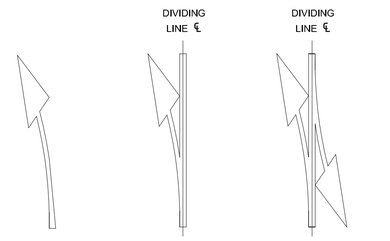
1. THESE ARROWS MAY BE USED TO INDICATE THAT THE NUMBER OF LANES IS INCREASING AHEAD. ONLY ONE SET OF ARROWS SHOULD BE USED UNLESS A LEFT AND RIGHT TURN LANE ARE ADDED TO A MULTI-LANE ROADWAY AT THE SAME POINT WHERE TWO SETS MAY BE USED.
2. DIRECTION ARROWS AHEAD SHALL NOT BE USED TO INDICATE THE ADDITION OF LANES AHEAD.
3. AS A GENERAL RULE BIFURACTION ARROWS SHOULD BE LOCATED TWO TO THREE MARKING MODULES BEFORE THE START OF THE LANE GENERATING TAPER OR CURVE.

ARROW AREA / (m)^2			
a	GM3.1/GM3.3	GM3.2	GM3.4
2500	1.30	1.27	1.93
4000	2.07	2.04	3.09
5000	2.59	2.55	3.87
7500	3.89	3.82	5.80

FURCATION ARROWS



SCALE:1 : 50



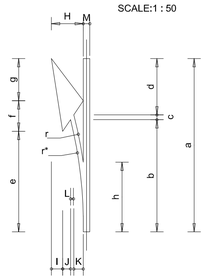
APPLICATIONS

SCALE 1 : 100

DIMENSIONS (mm)

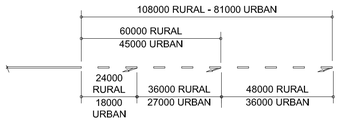
Typical Applications	a	b	c	d	e	f	g	h	r	r*
Urban	3000	1941	83	976	1741	528	731	1206	5620	5820
Rural	4000	2588	111	1301	2321	704	975	1608	9900	10000

All Applications	H	I	J	K	L	M
	735	260	181	219	75	100 or 150



NOTES: (BARRIER LINE AHEAD ARROWS)

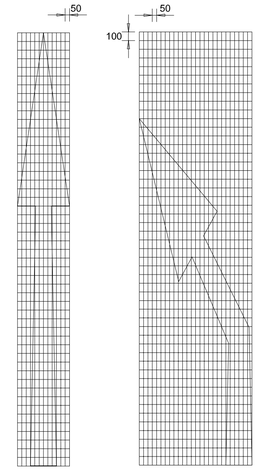
1. THESE ARROWS SHOULD BE USED IN MULTIPLES OF THREE (AT LEAST) IN ADVANCE OF THE START OF A SECTION OF NO OVERTAKING LINE , NO CROSSING LINE OR PAINTED ISLAND WHEN SUCH BARRIER LINES REPLACE A DIVIDING LINE.
2. THE ARROWS MAY BE MARKED ON TOP OF EXISTING DIVIDING LINE MARKINGS (IF THE EXISTING LINE IS A CENTRE LINE TO A 12m OR 7.2m MODULE THE POINT OF THE ARROW SHOULD BE LINED UP WITH THE FORWARD END OF THE LINE).
3. WHEN OVERTAKING SECTIONS ARE REGULARLY INTERSPERSED WITH NO OVERTAKING SECTIONS AND ARE SHORT IN LENGTH MARKING WM 8.2 MAY BE USED AT THE CENTRE OF THE OVERTAKING SECTION..



MARKING SPACING

ARROW AREA / (m)^2	
a	Per Arrow
3000	0.62
4000	0.82

BARRIER LINE AHEAD ARROWS



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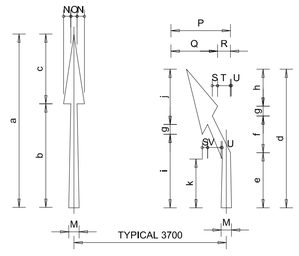

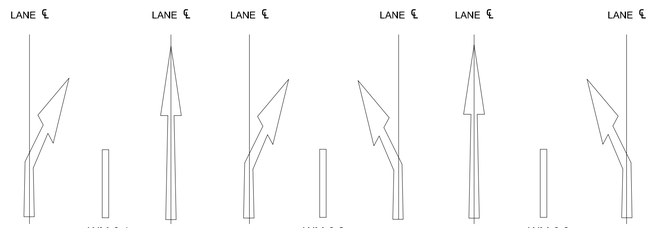

APPLICATIONS

SCALE 1 : 100

DIMENSIONS (mm)

Operating Speed km/h	Typical Applications	a	b	c	d	e	f	g	h	i	j	k
30 -40	City Centre	4000	2400	1600	3200	1271	847	227	855	1696	1277	1126
50 - 60	Urban Roads	5000	3000	2000	4000	1589	1058	284	1069	2120	1596	1407
70 - 90	Urban Arterial Roads/ Rural Expressways	7500	4500	3000	6000	2384	1587	426	1603	3180	2394	2111
100 - 120	Rural Roads and Freeways	12000	7200	4800	9600	3814	2539	681	2566	5089	3830	3377

All Operating Speeds and Applications	M	N	O	P	Q	R	S	T	U	V
	300	210	180	1300	898	402	155	370	32	390

NOTES: (LANE REDUCTION ARROWS)

1. IT IS RECOMMENDED THAT THREE SETS OF ARROWS BE USED ON HIGH SPEED ROADS, SPACED AT FOUR MODULE INTERVALS BEFORE THE END OF THE LANE LINE. SINGLE ARROWS SETS MAY BE USED ON LOWER SPEED ROADS.
2. THE BENT ARROWS MAY BE USED IN ADDITION TO THE THREE-ARROW SETS ALONG THE LENGTH OF THE LANE REDUCTION TAPER.

ARROW AREA / (m)^2		
a	WM6.1/WM6.3	WM6.2
4000	2.08	2.06
5000	2.61	2.58
7500	3.92	3.88
12000	6.56	6.20

LANE REDUCTION ARROWS

NOTES

ISSUED FOR TENDER

LEGEND

CLIENT:

CITY OF MBOMBELA — THE ULTIMATE DESTINATION

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PROJECT TITLE:

CONSTRUCTION OF KAMADAKWA RING ROAD

DRAWING TITLE:

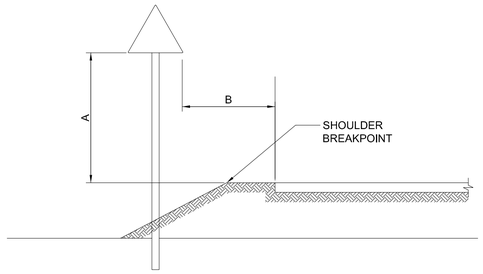
MANDATORY DIRECTION, FURCATION, BARRIER LINE & LANE REDUCTION ARROWS

DESIGNED:	CHECKED:
P TSHABALALA	F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL	SIGN:

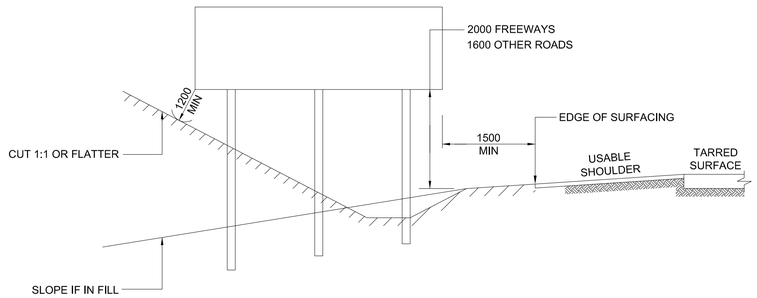
SCALE:	DATE:
FEBRUARY 2023	AS SHOWN
DRAWING NO: NKP(p)432_RM02	CONTRACT NO: AS SHOWN

REVISION:

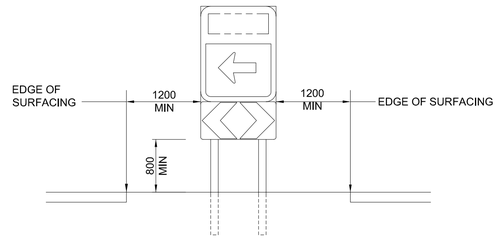
GROND MOUN TED TRAFFIC SIGNS : CLEARANCES



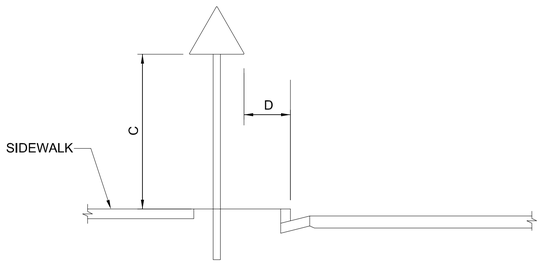
SHOULDER (NO KERB)



ELEVATION

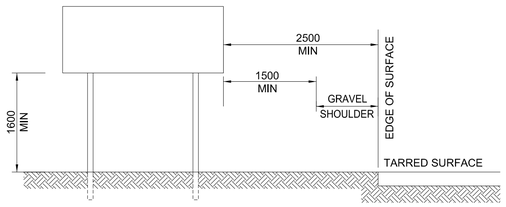


ELEVATION

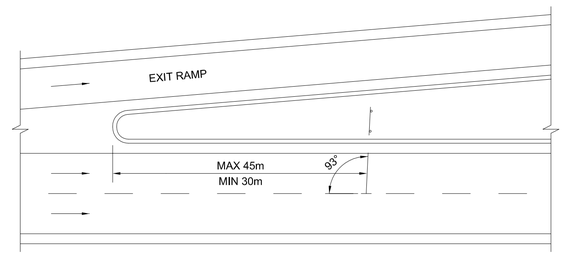


WITH KERB AND SIDEWALK
GENERAL CASES
N.T.S

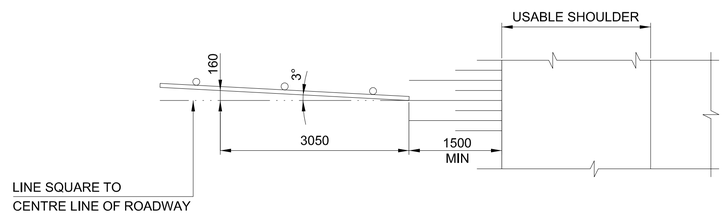
	MAXIMUM	PREFERRED	MINIMUM
A	2500	2100	600
B	2000	1500	1200
C	3000	2500	2100
D	-	750	600



ELEVATION



PLAN
GROUND - MOUNTED GORE SIGN
N.T.S



PLAN
GROUND - MOUNTED SHOULDER SIGN
N.T.S

NOTES

ISSUED FOR TENDER

LEGEND

CLIENT:

CITY OF MBOMBELA
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REG. NO. 2011/069299/23

PROJECT TITLE:

CONSTRUCTION OF KAMADAKWA RING ROAD

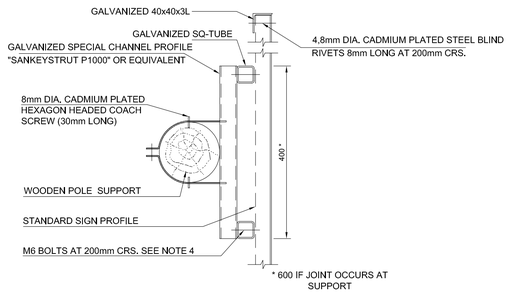
DRAWING TITLE:

GROUND MOUNTED TRAFFIC SIGNS : CLEARANCES

DESIGNED:	CHECKED:
P TSHABALALA	F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL	SIGN:

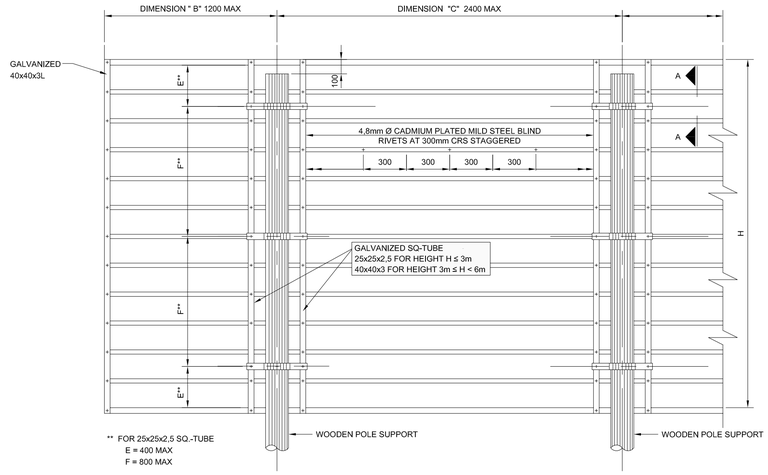
SCALE:	DATE:
FEBRUARY 2023	AS SHOWN
DRAWING NO: NKP(p)432_RS01	CONTRACT NO: AS SHOWN

REVISION:



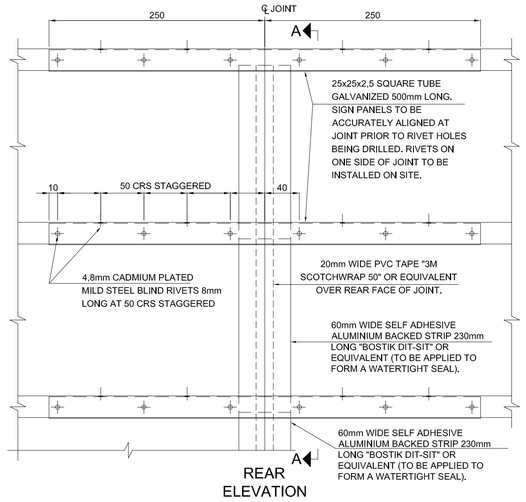
SECTION B - B

SCALE - 1 : 10



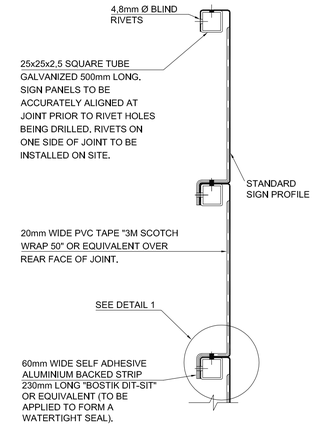
REAR ELEVATION

SCALE 1:30



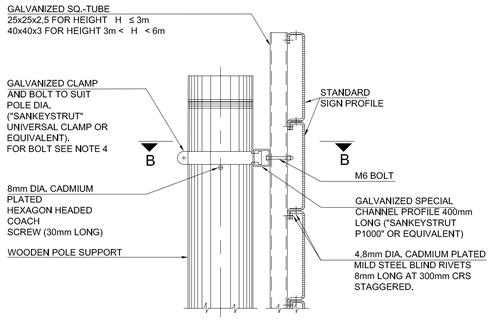
JOINT DETAIL (SIGN FACE > 6m IN LENGTH)

SCALE 1:5



SECTION A-A

SCALE 1:5



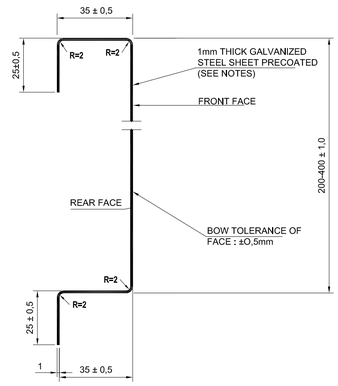
ELEVATION A-A

SCALE 1:10

NOTES :

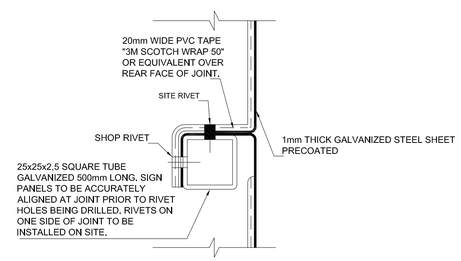
THE ROAD SIGN FACES SHALL BE MANUFACTURED AND ERECTED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS :

1. STRUCTURAL STEEL SECTIONS SHALL BE MILD STEEL CONFORMING TO THE REQUIREMENTS OF SANS 1431, GRADE 300W. RECTANGULAR HOLLOW SECTION AND SPECIAL CHANNEL PROFILES MAY BE COLD FORMED OF COMMERCIAL QUALITY MILD STEEL. ALL SECTIONS SHALL BE HOT-DIP GALVANISED IN ACCORDANCE WITH THE REQUIREMENTS OF SANS 121 : 2000 (ISO 1461 : 1999).
2. BOLTS, WASHERS AND NUTS SHALL COMPLY WITH THE REQUIREMENTS OF SANS 1700-5-1 AND SHALL BE GALVANISED IN ACCORDANCE WITH THE REQUIREMENTS OF SANS 121 : 2000 (ISO 1461 : 1999).
3. BLIND RIVETS SHALL BE 4.8mm DIA CADMIUM PLATED MILD STEEL.
4. REFERENCE MUST BE MADE TO THE RELEVANT ROAD SIGNS DETAIL DRAWING FOR DETAILS OF THE ROAD SYMBOLS AND LEGEND FOR EACH INDIVIDUAL SIGN.



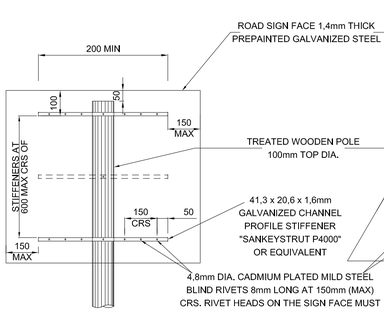
STANDARD SIGN PROFILE

SCALE 1:2

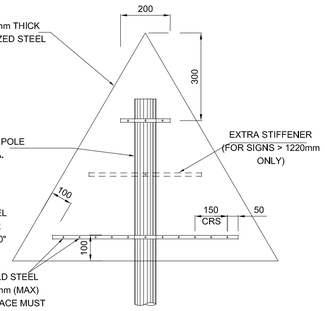


DETAIL 1

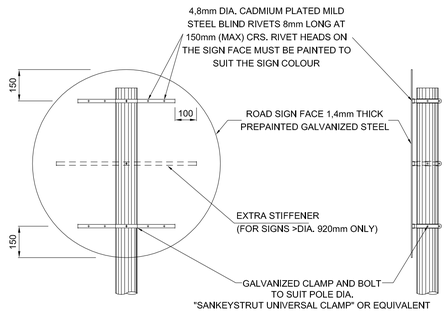
SCALE 1:2



REAR ELEVATION

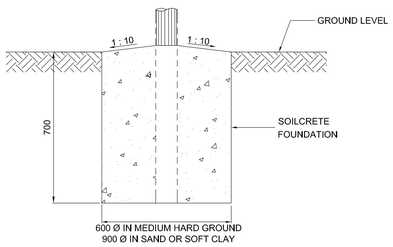


REAR ELEVATION



REAR ELEVATION

TYPICAL SIDE ELEVATION



TYPICAL FOUNDATION

NOTES :

THE ROAD SIGN FACES SHALL BE MANUFACTURED AND ERECTED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS :

1. DETAILS ON THIS DRAWING ARE APPLICABLE TO ROAD SIGNS SMALLER THAN 1,5m² REQUIRING DOUBLE / SINGLE SUPPORTS.
2. BOLTS, WASHERS AND NUTS SHALL COMPLY WITH THE REQUIREMENTS OF SANS 1700-5-1 AND SHALL BE GALVANISED IN ACCORDANCE WITH THE REQUIREMENTS OF SANS 121 : 2000 (ISO 1461 : 1999).
3. BLIND RIVETS SHALL BE 4,8mm DIA CADMIUM PLATED MILD STEEL.
4. REFERENCE MUST BE MADE TO THE RELEVANT ROAD SIGNS DETAIL DRAWING FOR DETAILS OF THE ROAD SIGN SYMBOLS AND LEGEND FOR EACH INDIVIDUAL SIGN.

NOTES :

STANDARD SIGN PROFILE

1. THE STANDARD SIGN PROFILE SHALL BE MADE FROM 1mm THICK PREPAINTED GALVANIZED MILD STEEL PLATE.
2. THE BACK FACE OF THE SIGN PROFILE SHALL BE GRAY IN COLOUR : G29 TO SANS 1091 OR SIMILAR.
3. THE PREPAINTED STEEL SHALL BE CUT TO LENGTH TO A TOLERANCE OF ±2mm PRIOR TO PROFILING.
4. WHERE STANDARD SIGN PROFILES ARE TO BE FACED WITH RETRO-REFLECTIVE BACKGROUND MATERIAL, IT SHALL BE APPLIED IN ADVANCE TO INDIVIDUAL SECTIONS BEFORE ASSEMBLY, WITH THE MATERIAL TAKEN AROUND THE FACE EDGES OF EACH SECTION FOR AT LEAST 10mm.

JOINT

1. THE JOINT SHALL BE ACCURATELY ALIGNED PRIOR TO DRILLING RIVET HOLES.
2. THE CAP BETWEEN THE ADJOINING HALVES OF THE SIGN SHALL AT NO POINT EXCEED 2mm.
3. THE COMPLETED SECTION SHALL BE ASSEMBLED IN THE SHOP PRIOR TO DELIVERY TO SITE TO ENSURE THAT ALL SECTIONS FIT TOGETHER PROPERLY AND THAT LEGENDS ARE PROPERLY SPACED AND ALIGNED.
4. ON SITE THE TWO SECTIONS SHALL AGAIN BE ALIGNED AND FASTENED TOGETHER BY MEANS OF RIVETS PLACED IN THE PRE-DRILLED HOLES.

NOTES

ISSUED FOR TENDER

LEGEND

CLIENT:
CITY OF MBOMBELA — THE ULTIMATE DESTINATION
MBOMBELA LOCAL MUNICIPALITY
HEAD OFFICE
P.O.BOX 48
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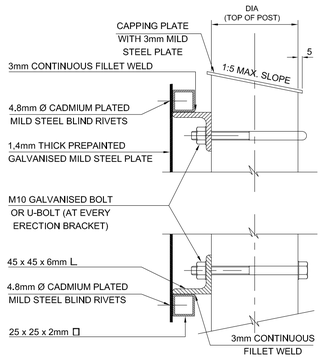
toba CONSULTING | CIVIL STRUCTURAL MANAGEMENT
REG. NO. 2011/069299/23
PO BOX 237
BARBERTON
1300
TEL NO: (013) 712 2927
ADMIN: admin@toba.co.za

PROJECT TITLE:
CONSTRUCTION OF KAMADAKWA RING ROAD

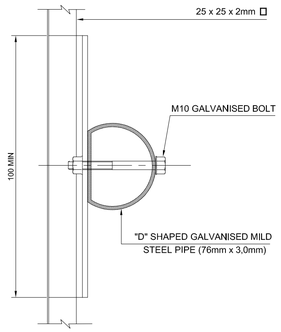
DRAWING TITLE:
ROAD SIGNS : DETAIL OF ROAD SIGN FACE: STANDARD PROFILE & JOINTS: SMALLER ROAD SIGN DETAILS

DESIGNED: P TSHABALALA	CHECKED: F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL	SIGN:

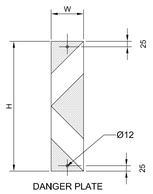
SCALE: FEBRUARY 2023	DATE: AS SHOWN
DRAWING NO: NKP(p)432_RS03	CONTRACT NO: AS SHOWN
REVISION:	



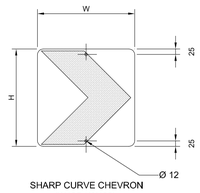
SIDE ELEVATION
N.T.S.



SIDE ELEVATION
N.T.S.



DANGER PLATE
(W401 / W402)



SHARP CURVE CHEVRON
(W405 / W406)

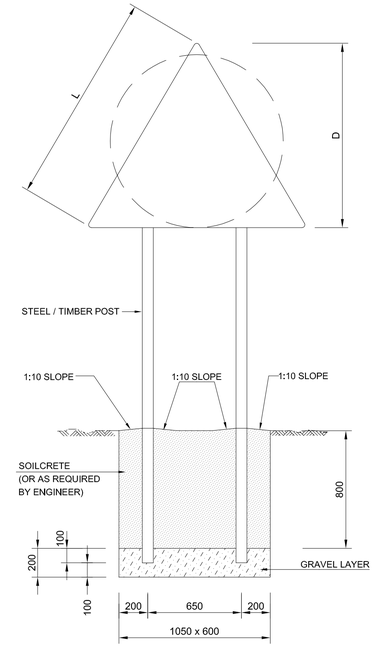
MOUNTING HOLES FOR HAZARD MARKER SIGNS WITHOUT FRAMEWORK
N.T.S.

HAZARD MARKER SIGNS		
	DANGER PLATE SIGN W401-RIGHT W402-LEFT	SHARP CURVE CHEVRON W405-RIGHT W406-LEFT
OPERATING SPEED (km/h)	SIZE H x W (mm)	SIZE H x W (mm)
120	800 x 200	600 x 600
100	800 x 200	600 x 600

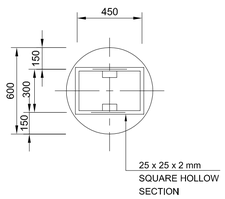
NOTES :

THE ROAD SIGN FACES SHALL BE MANUFACTURED AND ERECTED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS :

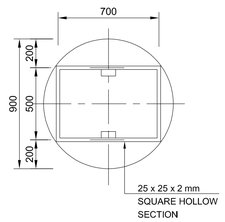
1. STRUCTURAL STEEL SECTIONS SHALL BE MILD STEEL CONFORMING TO THE REQUIREMENTS OF SANS 1431, GRADE 300W. RECTANGULAR HOLLOW SECTION AND SPECIAL CHANNEL PROFILES MAY BE COLD FORMED OF COMMERCIAL QUALITY MILD STEEL. ALL SECTIONS SHALL BE HOT-DIP GALVANISED IN ACCORDANCE WITH THE REQUIREMENTS OF SANS 121 : 2000 (ISO 1461 : 1999).
2. TIMBER POLE SUPPORTS SHALL COMPLY WITH THE REQUIREMENTS SHOWN ON SHEET 2.
3. BOLTS, WASHERS AND NUTS SHALL COMPLY WITH THE REQUIREMENTS OF SANS 1700-5-1 AND SHALL BE GALVANISED IN ACCORDANCE WITH THE REQUIREMENTS OF SANS 121 : 2000 (ISO 1461 : 1999).
4. BLIND RIVETS SHALL BE 4.8mm DIA CADMIUM PLATED MILD STEEL.



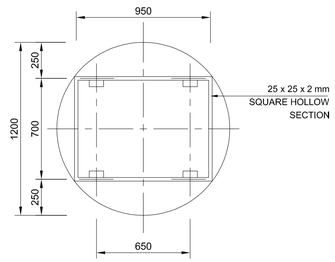
FOUNDATION DETAIL
L = 1500 AND D = 1200
SCALE 1:30



SINGLE SUPPORT

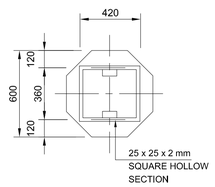


SINGLE SUPPORT

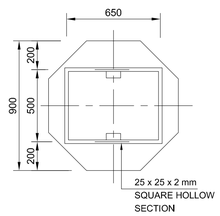


DOUBLE SUPPORT

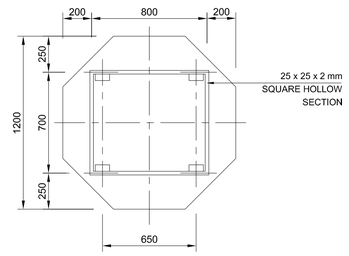
REINFORCEMENT FOR CIRCULAR ROAD SIGNS
SCALE 1:30



SINGLE SUPPORT



SINGLE SUPPORT



DOUBLE SUPPORT

REINFORCEMENT FOR STOP SIGNS
SCALE 1:30

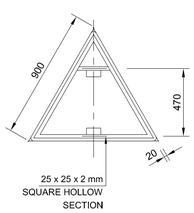
MINIMUM REGULATORY SIGN SIZES			
	OPERATING SPEED (km/h)		
	100 - 120	70 - 90	60
CIRCULAR SIGN DIAMETER (mm)	1200	900	600
RECTANGULAR SIGN WxH (mm)	1200 x 900	900 x 675	600 x 450
TRIANGULAR SIGN SIDE LENGTH (mm)	1500	1200	900

ADVANCE WARNING SIGN LOCATION AND SIZE		
OPERATING SPEED (km/h)	LOCATION (DISTANCE FROM HAZARD) (m)	SIZE (mm)
120	330	1500
100	240	1500
80	160	1200
60	120	900

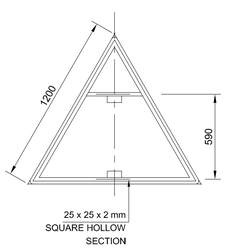
NOTES :

THE ROAD SIGN FACES SHALL BE MANUFACTURED AND ERECTED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS :

1. DETAILS ON THIS DRAWING ARE APPLICABLE TO ROAD SIGNS SMALLER THAN 1,5m² REQUIRING DOUBLE / SINGLE SUPPORTS.
2. STRUCTURAL STEEL SECTIONS SHALL BE MILD STEEL CONFORMING TO THE REQUIREMENTS OF SANS 1431, GRADE 300W. RECTANGULAR HOLLOW SECTION AND SPECIAL CHANNEL PROFILES MAY BE COLD FORMED OF COMMERCIAL QUALITY MILD STEEL. ALL SECTIONS SHALL BE HOT-DIP GALVANISED IN ACCORDANCE WITH THE REQUIREMENTS OF SANS 121 : 2000 (ISO 1461 : 1999).

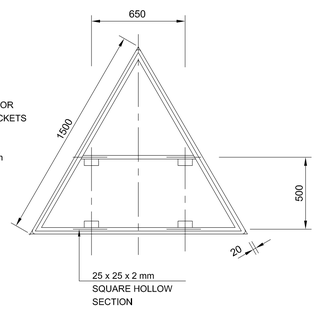


SINGLE SUPPORT



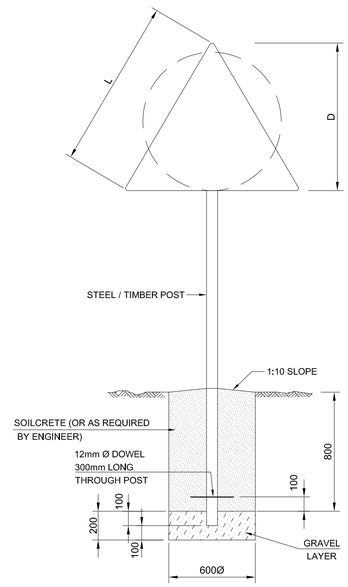
SINGLE SUPPORT

NOTE:
MINIMUM SIZE FOR
ERECTION BRACKETS
ON R/W SIGNS :
L 45 x 45 x 6
LENGTH : 100mm



DOUBLE SUPPORT

REINFORCEMENT FOR TRIANGULAR ROAD SIGNS
SCALE 1:30



FOUNDATION DETAIL
L < 1200 AND D < 900
SCALE 1:30

NOTES

ISSUED FOR TENDER

LEGEND

CLIENT:

CITY OF MBOMBELA
THE ULTIMATE DESTINATION

MBOMBELA LOCAL MUNICIPALITY
HEAD OFFICE
P.O.BOX 48
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TEL NO.: (013) 759 9111
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toba CONSULTING
CIVIL STRUCTURAL MANAGEMENT
REG. NO. 2011/069299/23
PO BOX 237
BARBERTON
1300
TEL NO: (013) 712 2927
ADMIN: admin@toba.co.za

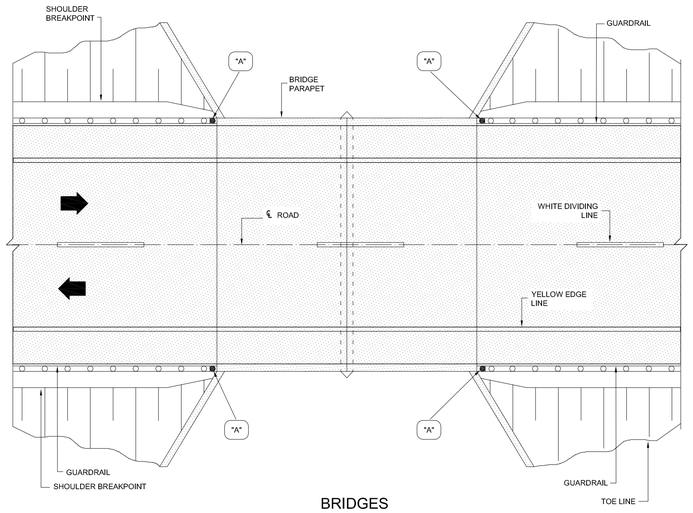
PROJECT TITLE:
CONSTRUCTION OF KAMADAKWA RING ROAD

DRAWING TITLE:
ROAD SIGNS : SMALLER ROAD SIGN ATTACHMENT AND FIXING DETAILS

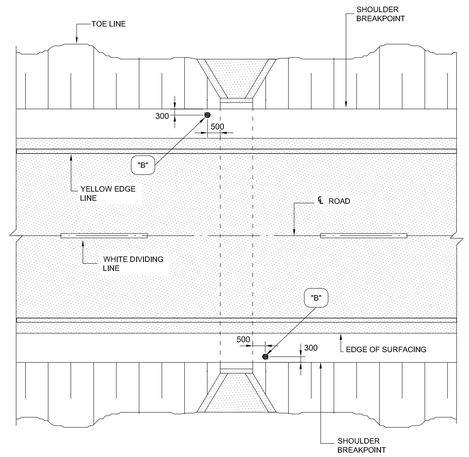
DESIGNED: P TSHABALALA
CHECKED: F BURGER
PR.ENG. 20090094
DRAWN: R VAN ZYL
SIGN:

SCALE: FEBRUARY 2023
DATE: AS SHOWN
DRAWING NO: NKP(p)432_RS04
CONTRACT NO: AS SHOWN
REVISION:

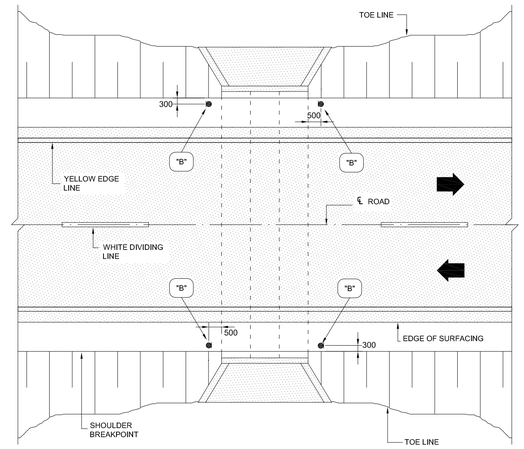
TYPICAL DETAILS OF DANGER PLATES



BRIDGES



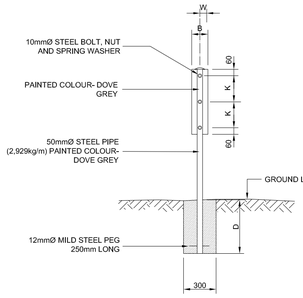
SINGLE CULVERTS



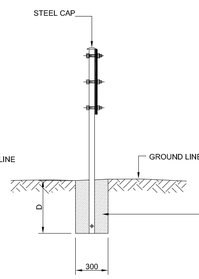
CULVERTS

POSITION OF TYPE "A" DANGER PLATES AT BRIDGES AND TYPE "B" DANGER PLATES AT CULVERTS

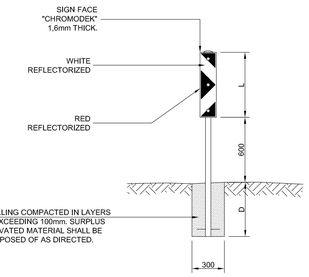
SCALE 1:100



REAR ELEVATION



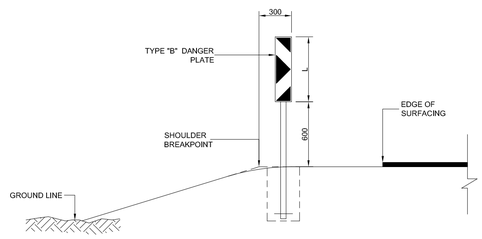
SIDE ELEVATION



FRONT ELEVATION

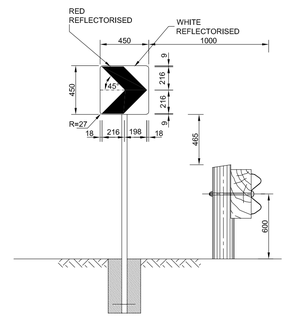
TYPE "A" AND "B" DANGER PLATES (AT BRIDGES AND CULVERTS)

SCALE 1:20

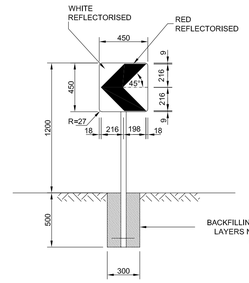


SECTION SHOWING POSITION OF TYPE "B" DANGER PLATES AT CULVERTS

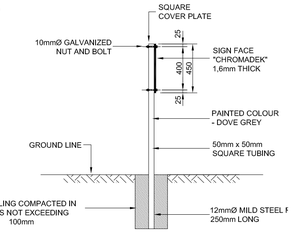
SCALE 1:20



FRONT ELEVATION with GUARDRIL



FRONT ELEVATION without GUARDRIL



SIDE ELEVATION

TYPE "C" DANGER PLATES (AT HORIZONTAL CURVES)

SCALE 1:20

NOTES:

DANGER PLATES:

1. THE COLOURS AND SHADES SHALL CONFORM TO THE COLOURS AND SHADES SPECIFIED IN CKS 193 AND SHOWN IN CKS 279.
2. THE PREPARATION OF SURFACES AND PAINTING SHALL BE CARRIED OUT AS SPECIFIED IN SECTION 8400 OF THE STANDARD SPECIFICATIONS.

DIMENSIONS FOR DANGER PLATES (TYPE "A" AND "B")

	TYPE	L	B	D	W	K
AT BRIDGES	A	1200	300	700	150	540
AT CULVERTS	B	800	200	500	100	240

1m 0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m 11m 12m 13m 14m

ORIGINAL SCALE : 1 : 100

NOTES

ISSUED FOR TENDER

LEGEND

CLIENT:
CITY OF MBOMBELA THE ULTIMATE DESTINATION
MBOMBELA LOCAL MUNICIPALITY
HEAD OFFICE
P.O.BOX 48
MBOMBELA, 1201
TEL NO.: (013) 759 9111
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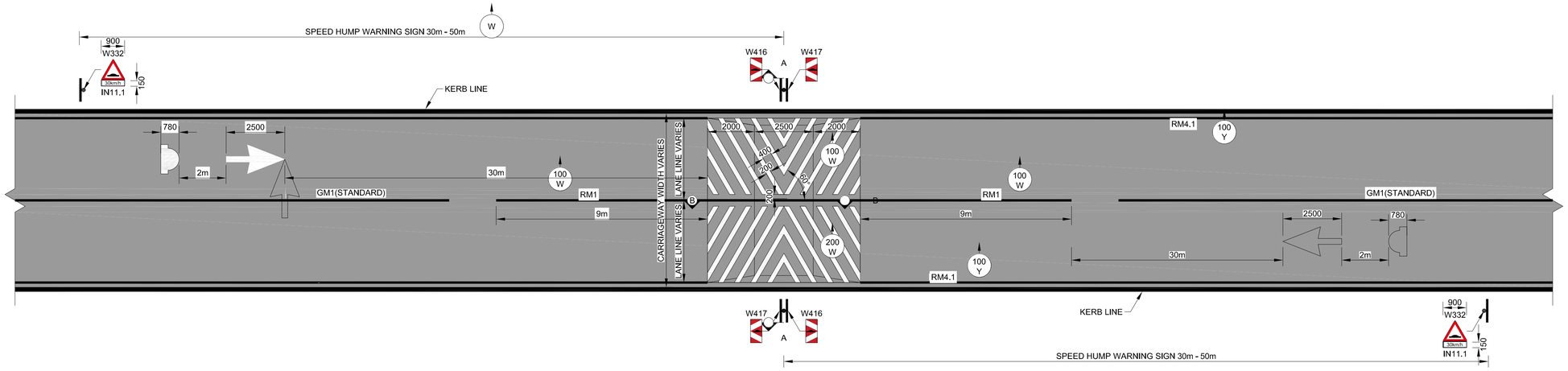
TEL NO: (013) 712 2927
ADMIN: admin@toba.co.za
REG. NO. 2011/069299/23

PROJECT TITLE:
CONSTRUCTION OF KAMADAKWA RING ROAD

DRAWING TITLE:
TYPICAL DETAILS OF DANGER PLATES

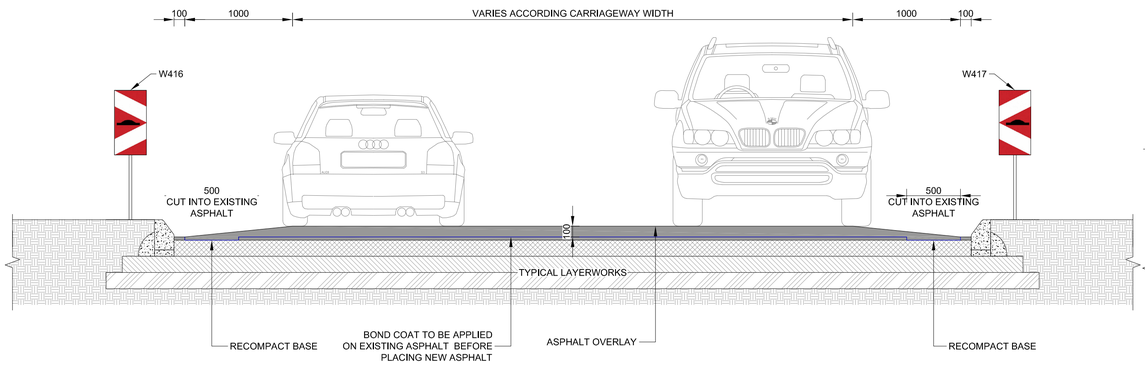
DESIGNED: P TSHABALALA
CHECKED: F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL
SIGN:

SCALE: FEBRUARY 2023
DATE: AS SHOWN
DRAWING NO: NKP(p)432_RS05
CONTRACT NO: AS SHOWN
REVISION:



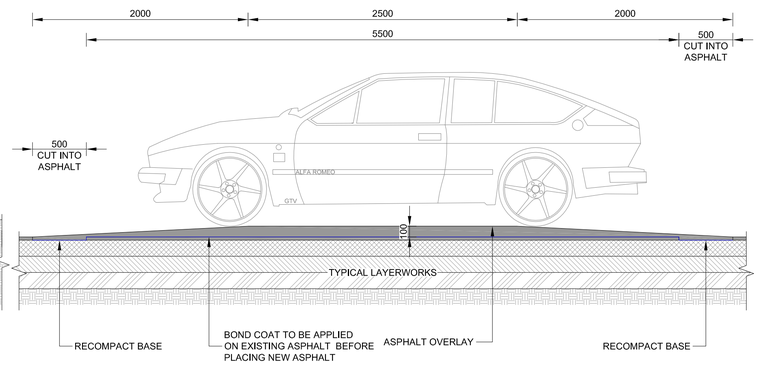
PLAN VIEW: WM10 SPEED HUMP

SCALE1:100



SECTION A-A

SCALE 1:25



SECTION B-B

SCALE 1:25

ISSUED FOR TENDER

-DO NOT HESITATE TO ASK, IF IN DOUBT-

ON RECEIPT OF REVISED DRAWING, DESTROY PREVIOUS DRAWING

LEGEND

NOTES

CLIENT

MBOMBELA LOCAL MUNICIPALITY

CITY OF MBOMBELA
THE ULTIMATE DESTINATION

HEAD OFFICE
P.O.BOX 48
MBOMBELA. 1201

TEL NO.: (013) 759 9111
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PO BOX 237
BARBERTON
1300

TEL NO: (013) 712 2927
ADMIN: admin@toba.co.za

REG. NO. 2011/069299/23

PROJECT TITLE:

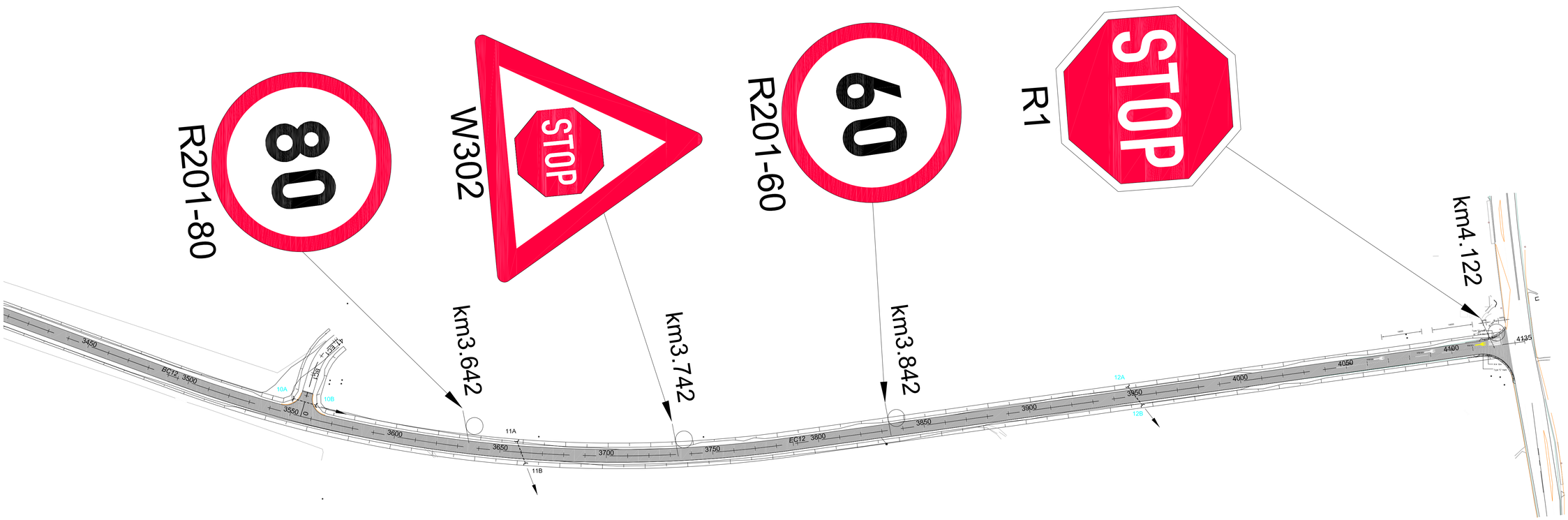
CONSTRUCTION OF KAMADAKWA RING ROAD

DRAWING TITLE:

TYPICAL SPEEDHUMP (30km/h)

DESIGNED: MP TSHABALALA	CHECKED: F BURGER PR.ENG. 20090094
DRAWN: R BURGER	SIGN:
SCALE: N.T.S.	DATE: FEBRUARY 2023
DRAWING NO: NKP(p)432_SH01	CONTRACT NO: -------

REV.	DATE.	REVISION



SCALE FOR REDUCED PLAN

0m 25m 50m

50m ON ORIGINAL PLAN

NOTES

ISSUED FOR TENDER

LEGEND

- CENTRELINE
- ROADEDGE
- ROADKERB
- FENCE
- STORMWATER DRAINAGE PIPE
- SIDE DRAIN
- SIDE WALK
- ELECTRICAL LINE

CLIENT:

CITY OF MBOMBELA
THE ULTIMATE DESTINATION

MBOMBELA LOCAL MUNICIPALITY

HEAD OFFICE
P.O.BOX 48
MBOMBELA, 1201

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REG. NO. 2011/069299/23

PO BOX 237
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PROJECT TITLE:

CONSTRUCTION OF KAMADAKWA RING ROAD

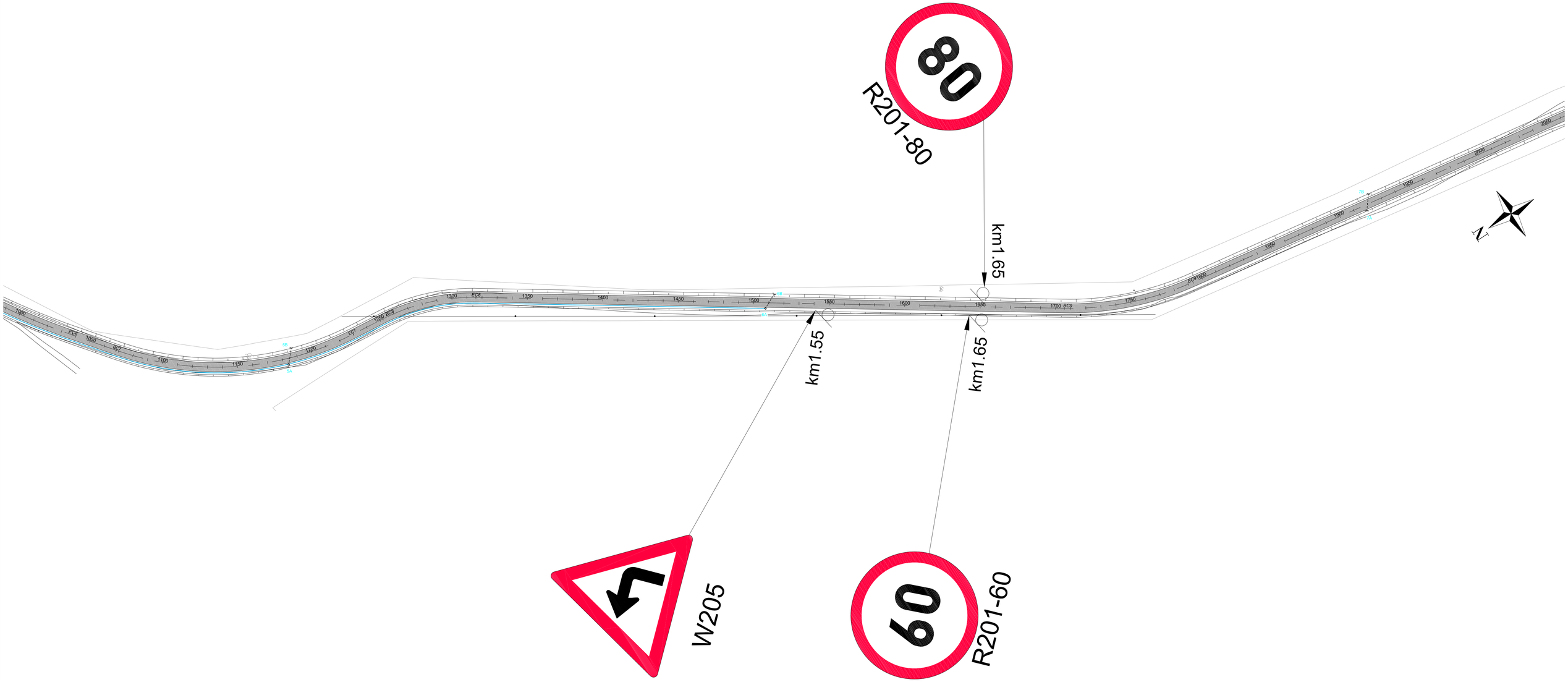
DRAWING TITLE:

ROAD SIGNS AT KAMADAKWA - D236 T-JUNCTION

DESIGNED:	CHECKED:
P TSHABALALA	F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL	SIGN:

SCALE:	DATE:
1:1000	FEBRUARY 2023
DRAWING NO: NKP(p)432_SR01	CONTRACT NO: AS SHOWN

REVISION:



SCALE FOR REDUCED PLAN

0m 25m 50m

50m ON ORIGINAL PLAN

NOTES

ISSUED FOR TENDER

LEGEND

- CENTRELINE
- ROADEDGE
- ROADKERB
- FENCE
- STORMWATER DRAINAGE PIPE
- SIDE DRAIN
- SIDE WALK
- ELECTRICAL LINE

CLIENT:

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PROJECT TITLE:

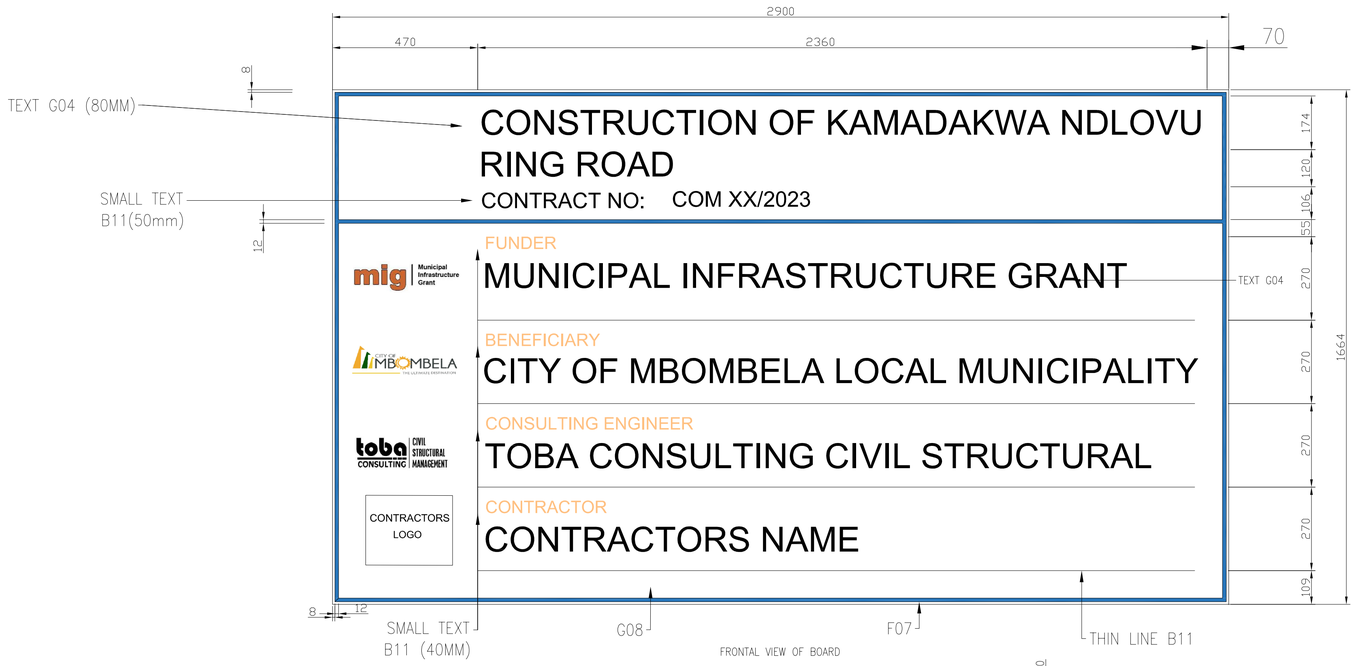
CONSTRUCTION OF KAMADAKWA RING ROAD

DRAWING TITLE:

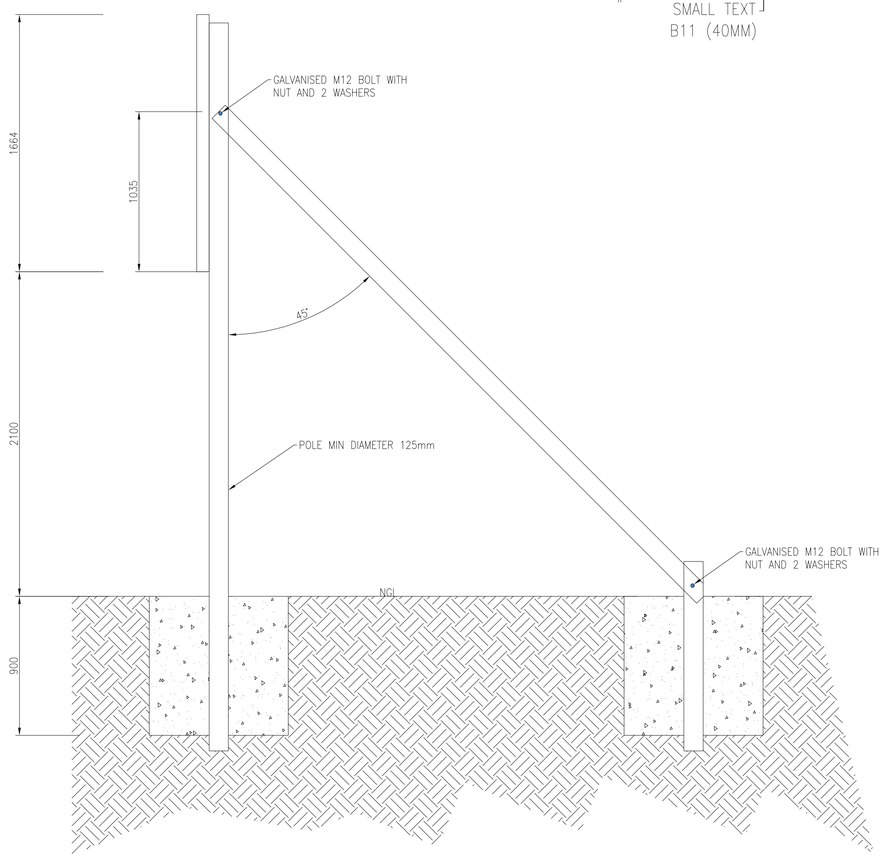
ROAD SIGNS AT 130m CURVE

DESIGNED: P TSHABALALA	CHECKED: F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL	SIGN:

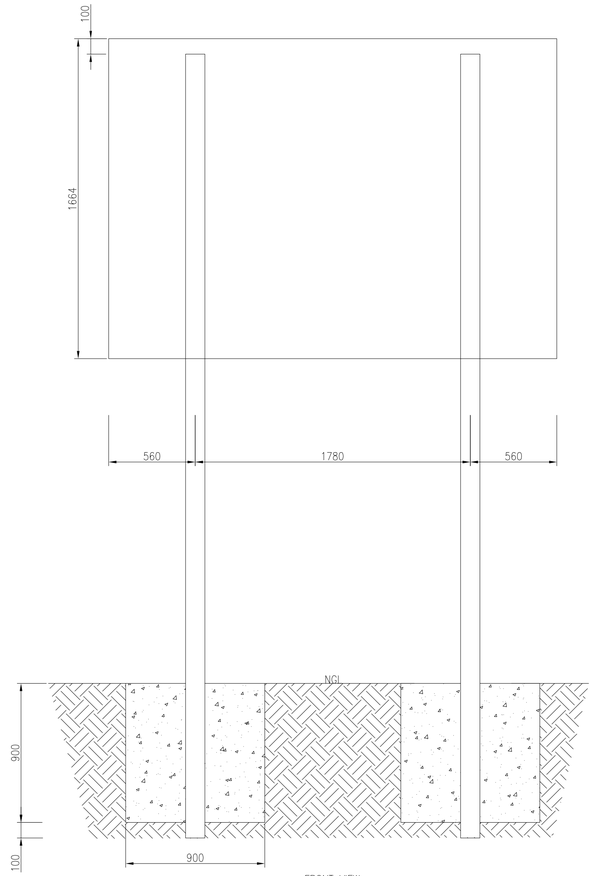
SCALE: 1:1000	DATE: FEBRUARY 2023
DRAWING NO: NKP(p)432_SR02	CONTRACT NO: AS SHOWN
REVISION:	



FRONTAL VIEW OF BOARD



SIDE VIEW



FRONT VIEW

-DO NOT HESITATE TO ASK, IF IN DOUBT-

ON RECEIPT OF REVISED DRAWING, DESTROY PREVIOUS DRAWING

NOTES:

ISSUED FOR TENDER

CLIENT

MBOMBELA LOCAL MUNICIPALITY

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EMAIL: admin@toba.co.za
REG. NO. 2011/069299/23

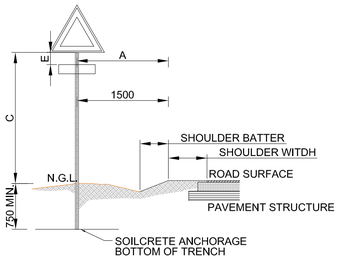
PROJECT TITLE:
CONSTRUCTION OF KAMADAKWA RING ROAD

DRAWING TITLE:
TYPICAL CONSTRUCTION BOARD

DESIGNED: MP TSHABALALA	CHECKED: F BURGER PR.ENG. 20090094
DRAWN: R BURGER	SIGN:
SCALE: AS INDICATED	DATE: FEBRUARY 2023
DRAWING NO: NKP(p)432_TCB-01	CONTRACT NO: _____

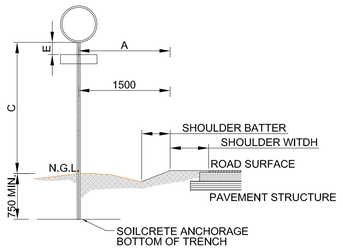
REV.	DATE.	REVISION

WARNING SIGNS



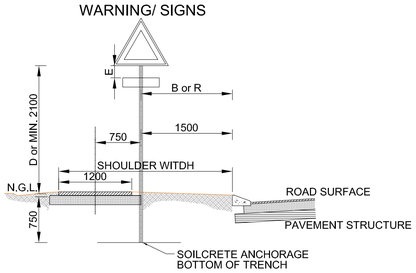
SHOULDER WITH NO KERBS
SCALE 1:50

REGULATING SIGNS



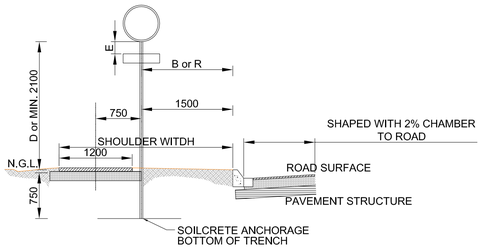
SHOULDER WITH NO KERBS
SCALE 1:50

WARNING/ SIGNS

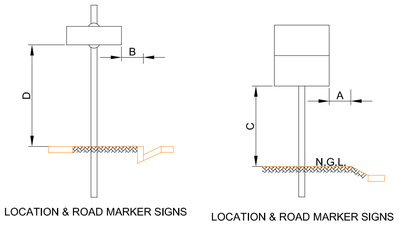


WITH KERBS & SIDEWALK
SCALE 1:50

REGULATING SIGNS



WITH KERBS & SIDEWALK
SCALE 1:50



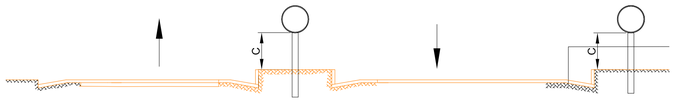
LOCATION & ROAD MARKER SIGNS

LOCATION & ROAD MARKER SIGNS

SMALL TO MEDIUM SIZED GUIDANCE & INFORMATION SIGNS
N.T.S.

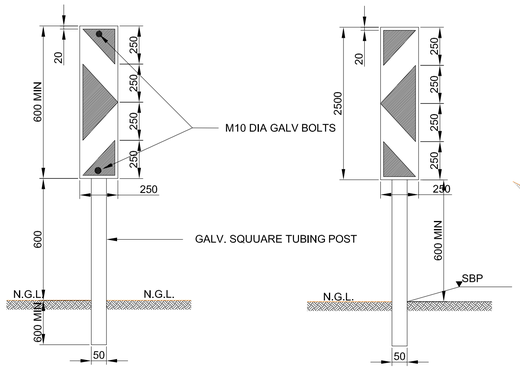
LATERAL & VERTICAL SIGN PLACEMENT DIMNESIONS

DIMENSION	MINIMUM (mm)	PREFERRED (mm)	MAXIMUM (mm)	REMARKS -
A	1200	1500	2000	SEE NOTE (8)
B	500	750	-	SEE "R" & NOTE (9)
C	600	2100	2500	SEE NOTE (10)
D	2100	2500	3000	SEE NOTE (11)
E	0	0	200	SEE CHAPTER 3
F	600	1200	2000	
G	800	1200	1600	
H	-	-	6000	SEE NOTE (12)
J	2000	4000	-	SEE NOTE (13)
K	1600	2000	2400	SEE NOTE(12)&(14)
L	750	-	-	
M	5200	5700	6200	
N	1000	1500	-	SEE "R" & NOTE (9)
P	50	1000	-	
R	600	1500	-	SEE"B","N" & NOTE(8)
T	1800	-	4200	SEE NOTE (15)

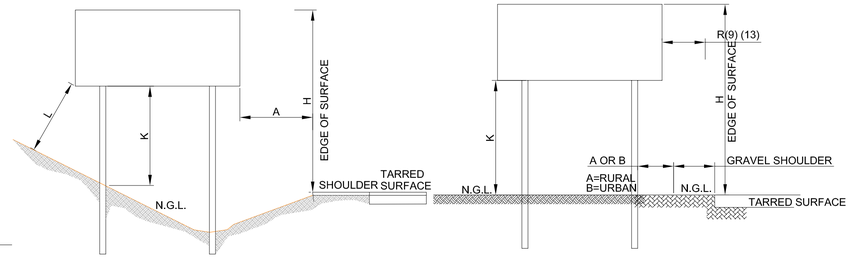


MEDIAN ISLAND OR BELLMOUTH

REGULATORY AND WARNING SIGNS
N.T.S.



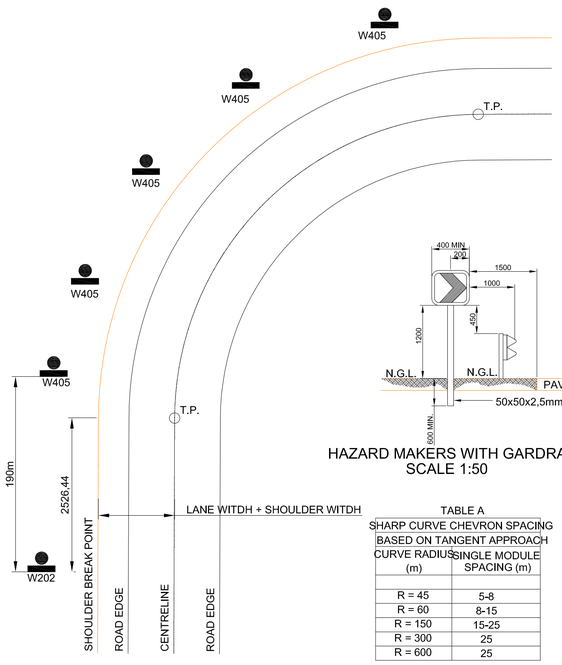
W401 & W402
N.T.S.



GROUND MOUNTED DIRECTION SIGNS- CLASS A AND CLASS B
N.T.S.

NOTES:
REFER TO THE LAYOUT DRAWING FOR THE POSITIONING OF THE SIGN BOARDS
& TO DETERMINE THE QUANTITY TO BE USED.

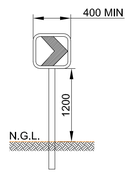
ISSUED FOR TENDER



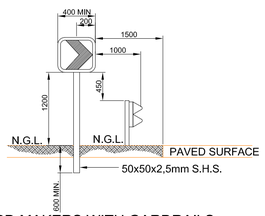
PLACEMENT OF HAZARD MARKERS ON SHARP TURNS
SCALE 1:50

TABLE A

SHARP CURVE CHEVRON SPACING BASED ON TANGENT APPROACH	
CURVE RADIUS (m)	SINGLE MODULE SPACING (m)
R = 45	5-8
R = 60	8-15
R = 150	15-25
R = 300	25
R = 600	25



HAZARD MAKERS (W405)
SCALE 1:50



HAZARD MAKERS WITH GARDRAILS
SCALE 1:50

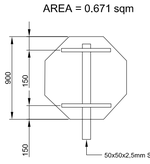
NOTES:

1) THE INNER EDGE OF THE HAZARD PLATE SHALL BE 300mm FROM THE SHOULDER BREAKPOINT.
2) WHERE W<2.0m ONLY ONE DUBBLE-SIDED HAZARD PLATE SHALL BE PROVIDED PER DIRECTION. SITUATED ON THE UPSTREAM SIDE OF THE TRAFFIC FLOW. WHERE W>2.0m TWO SINGLE-SIDED HAZARD PLATES SHALL BE PROVIDED ON EITHER SIDE OF THE CULVERT.
3) W401 AND W402 SIGNS SHALL COMPLY WITH THE REGULATIONS TO THE ROAD TRAFFIC ACT, 1989 AND THE SA ROAD TRAFFIC SIGNS MANUAL, 1993.
4) FOR THE BRIDGE STRUCTURES, HAZARD PLATES WITH DIMENSIONS OF 1200mm X 300mm WILL BE USED.

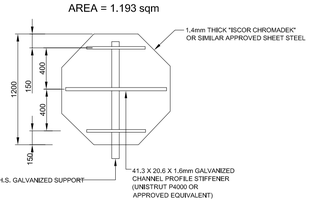
NOTES:

1) THE MINIMUM SIZE OF DANGER PLATE SIGNS W401 & W402 IS 600mmx150mm & THE MAXIMUM SIZE 1200mmx300mm. THE MAXIMUM SIZE SHOULD BE USED ON ROADS WITH AN OPERATING SPEED OF 100km/h or MORE & AT ALL BRIDGE ABUTMENTS, PIERS OR PARAPETS NOT PROTECTED BY A GUARDRAIL.
2) A DANGER PLATE SIGN SHOULD NOT BE USED IF IT LIKELY TO REPRESENT A GREATER HAZARD THAN THAN THE HAZARD IT IS INTENDED TO MARK e.g. CROSS-DRAIN/CULVERT ENDS.
3) ANY DIMENSION GIVEN IN RELATION TO QUARDRAILS PRESUME THESE ARE INSTALLED TO CORRECT SAFETY STANDARDS.
4) SHARP CURVE CHEVRON SIGNS W405 & W406 SHOULD ONLY BE DISPLAYED IN MINIMUM SETS OF THREE. EITHER AS A CONNECTED SET POINTED IN ONE DIRECTION, OR AS A SPACED SET (SEE SKETCH), ALSO POINTING IN ONE DIRECTION.
5) WHEN SHARP CURVE CHEVRON SIGNS ARE USED ON A LONG CURVE AT LEAST THREE SIGNS MUST ALWAYS BE VISIBLE THROUGH VERTICAL & HORIZONTAL CURVES. THIS REQUIREMENT OVERRIDES ANY SPACING RECOMMENDATIONS GIVEN IN TABLE 3.5. OF "SA ROAD TRAFFIC SIGNS MANUAL".
6) IN ORDER TO POSITION SHARP CURVE CHEVRONS TO BEST ADVANTAGE ON A LONG CURVE IT IS RECOMMENDED THAT THE FIRST SIGN TO BE POSITIONED SHOULD BE PLACED ON THE APPROXIMATE LINE OF SIGHT OF DRIVERS APPROACHING ON THE TANGENT TO THE CURVE.
SUBSEQUENT SIGNS SHOULD THEN BE SPACED AT A DISTANCE "S", BACKWARDS & FORWARDS AROUND THE CURVE FROM THIS POINT (TABLE A). FOR THE PURPOSE OF SUCH AN EXERCISE THE ROAD CENTRE LINE CAN BE BETWEEN 1200mm & 1600mm.
7) TEMPORARY SHARP CURVE CHEVRON SIGNS MAY BE USED AS AN ALTERNATIVE TO DELINEATOR SIGNS FOR GREATER IMPACT, IN A SIMILAR MANNER, AT ROADWORKS SITES & DETOURS.
8) DIMENSION "A" IS MEASURED FROM THE SHOULDER BREAK POINT.
9) IN AN URBAN ENVIRONMENT, WHERE SIGNS ARE COMMONLY LOCATED BEHIND A KERB, DIMENSION "B" IS SUITABLE FOR SMALL SIGNS. DIMENSION "R" IS MORE APPROPRIATE FOR LARGER SIGNS SUCH AS DIRECTION SIGNS.
ON HIGHER SPEED URBAN or PEDI-URBAN ROADS DIMENSION "N" MAY BE USED IN PREFERENCE TO "R" OR "B".
10) THE RANGE OF MOUNTING HEIGHTS BETWEEN 1500mm & 2000mm SHOULD BE AVOIDED FOR SINGLE POLE MOUNTED SIGNS (SEE DIMENSION "C"), BECAUSE THERE IS A SIGNIFICANT RISK THAT, ON IMPACT BY A MOTOR CAR, THE FAILURE OF A STEEL POLE MA RESULT IN SUCH A SIGN PENETRATING THE CAR WINDSCREEN.
FOR A LIMITED NUMBER OF APPLICATIONS CERTAIN REGULATORY & WARNING SIGNS MAY BE MOUNTED WITH A MINIMUM VERTICAL CLEARANCE OF AS LITTLE AS 300mm FROM N.G.L.
SUCH SIGNS ARE COMMONLY LOCATED IN THE NOSE RADUIS, MEDIANS (FOR DUAL CARRIAGEWAYS) & TRAFFIC ISLANDS or TO DECRAMINATE A BELL MOUTH AT A JUNCTION.
11) DIMENSION "D" SHOULD BE USED IN ANY SITUATION WHERE PEDESTRIANS ARE LIKELY TO WALK IN CLOSE PROXIMITY TO A ROAD SIGN or THE SIGN SHOULD BE MOUNTED AT THE MINIMUM VALUE OF DIMENSION "C"
12) THE MAXIMUM VALUE GIVEN FOR DIMENSION "H" SHOULD BE CONSIDERED A GUIDELINE. IT IS NOT DESIRABLE TO EXCEED THIS VALUE DUE TO THE LIMITATIONS ON LIGHT FROM VEHICLE HEAD LAMPS REACHING THE TOP OF SUCH A SIGN.
THIS VALUE ALLOWS FOR A SIGN 4800mm IN HEIGHT TO BE MOUNTED AT THE MINIMUM VALUE OF DIMENSION "K".
13) DIMENSION "J" PREFERRED FOR RURAL & HIGH SPEED URBAN ROADS.
IN LOW SPEED URBAN ENVIRONMENT THE LOWER VALUES OF DIMENSION "R" MAY BE CONSIDERED.
14) THE MAXIMUM VALUE FOR DIMENSION "K" IS PREFERRED FOR FREEWAY DIRECTION SIGNS.
15) THE MINIMUM HEIGHT APPROPRIATE FOR AN OVERHEAD SIGN IN THE UPWARD POINTING ARROW SYSTEM IS [30"D"].
A LETTER SIZE OF 420mm/300mm ["D" = 60mm] WILL THEREFORE RESULTS IN A MINIMUM SIGN HEIGHT OF 1800mm.
A SIGN HEIGHT LESS THAN THIS DIMENSION "T" IS LIKELY TO LOOK ILL-PROPORTIONED.
16) COUNTDOWN SIGNS CAN, UNDER CERTAIN CONDITIONS OF ALIGNMENT (PARTICULARLY ON A LEFT HAND CURVE) OBSCURE THE EXIT DIRECTION SIGN.
IT IS RECOMMENDED THAT THE COUNTDOWN SIGNS BE POSITIONED SO THAT THEY ARE IN A A STRAIGHT LINE WITH SIGN [IN1] WHICH IS LOCATED FURTHER FROM THE EDGE OF THE SHOULDER THAN SIGN [IN3].

AREA = 0.671 sqm

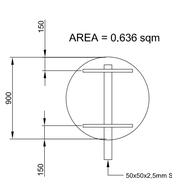


AREA = 1.193 sqm

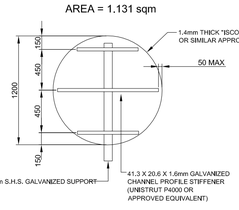


CONTROL SIGNS
N.T.S.

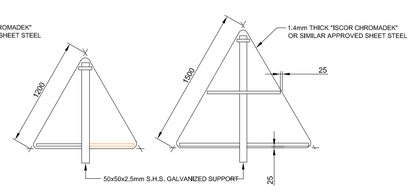
AREA = 0.636 sqm



AREA = 1.131 sqm



REGULATORY SIGNS
N.T.S.



WARNING SIGNS
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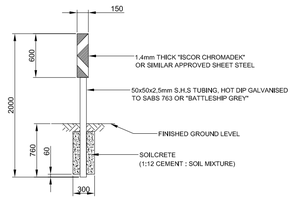
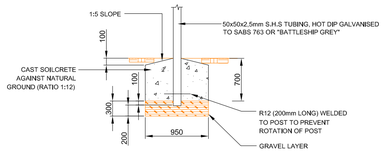


TYPICAL DETAILS OF W401 AND W402
HAZARD PLATE SIGNS
N.T.S.



FOUNDATION DETAIL
N.T.S.

CLIENT

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REG. NO. 2011/069299/23

PROJECT TITLE:

CONSTRUCTION OF KAMADAKWA RING ROAD

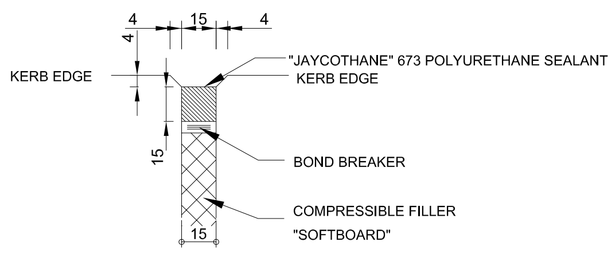
DRAWING TITLE:

TYPICAL CONSTRUCTION DETAILS
FOR URBAN ROAD TRAFFIC SIGNAGE

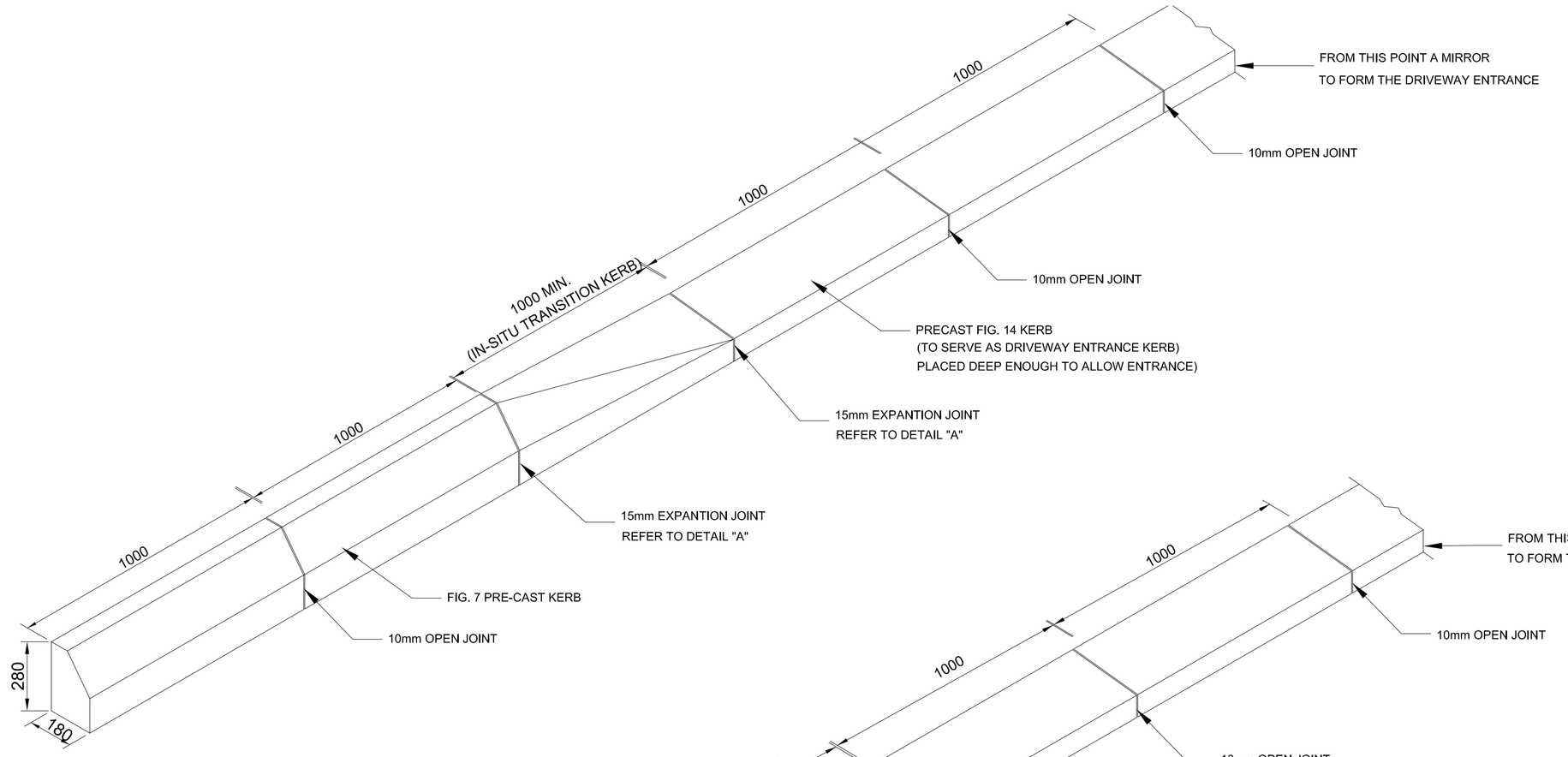
DESIGNED: MP TSHABALALA	CHECKED: F BURGER PR.ENG. 20090094
DRAWN: R BURGER	SIGN:
SCALE: 1:50	DATE: FEBRUARY 2023
DRAWING NO: NKP(p)432_TR01	CONTRACT NO: -------

REV.	DATE.	REVISION

NOTE:
ISOLATION JOINT EVERY 3,0m
or EVERY THIRD KERB UNIT



DETAIL "A"
DETAIL FOR JOINT FILLER AT
EXPANSION JOINTS



(DRIVEWAY KERBING / EDGE RESTRAINT)
ILLUSTRATION OF TRANSITION KERB BETWEEN FIG. 7 & FIG. 14
(AS DIRECTED BY ENGINEER)

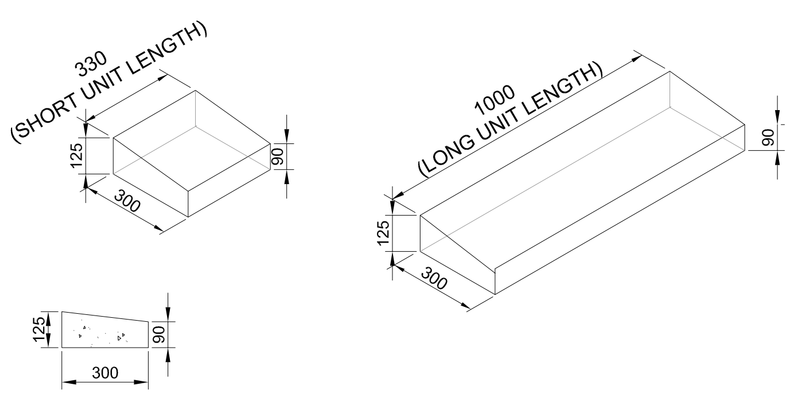
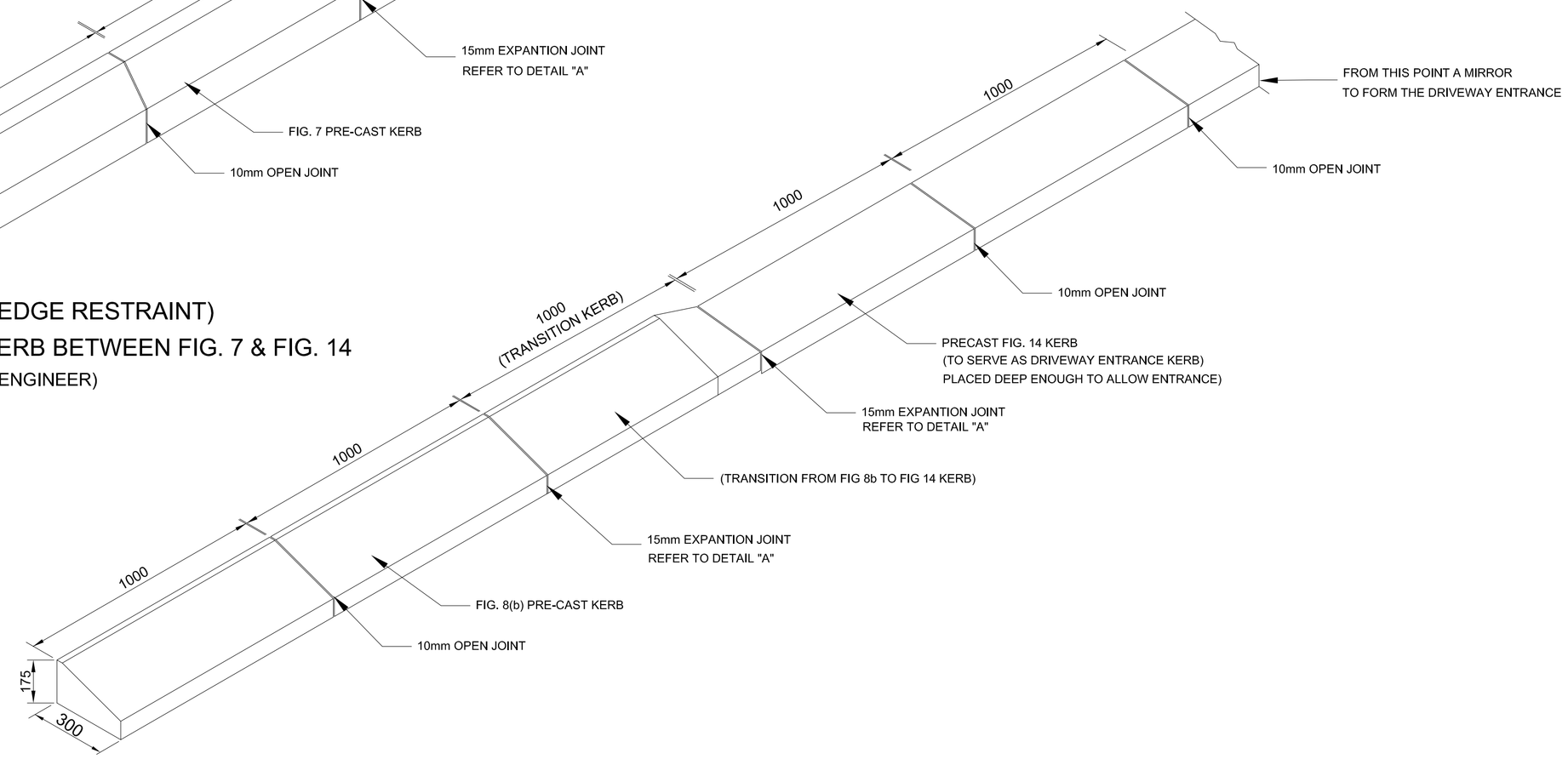


FIG. - 14 PRECAST



(DRIVEWAY KERBING / EDGE RESTRAINT)
(AS DIRECTED BY ENGINEER)
ILLUSTRATION OF TRANSITION KERB BETWEEN FIG. 8(b) & FIG. 14

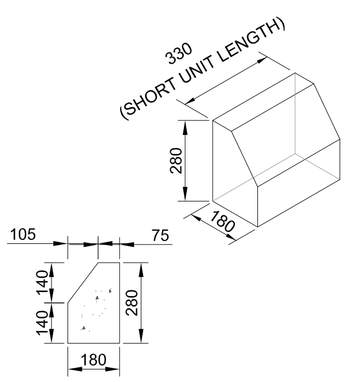
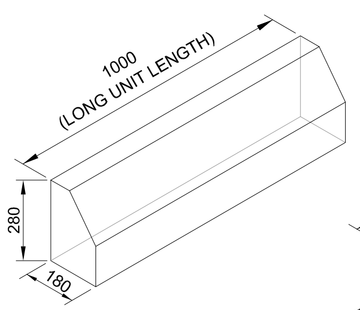


FIG. - 7 PRECAST



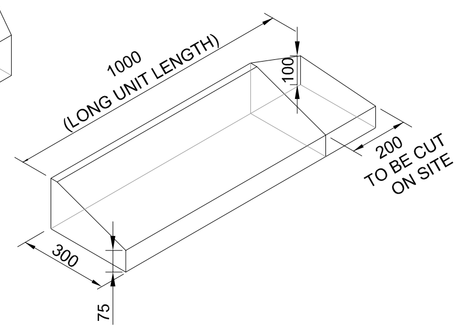


FIG. - 8(b) PRECAST

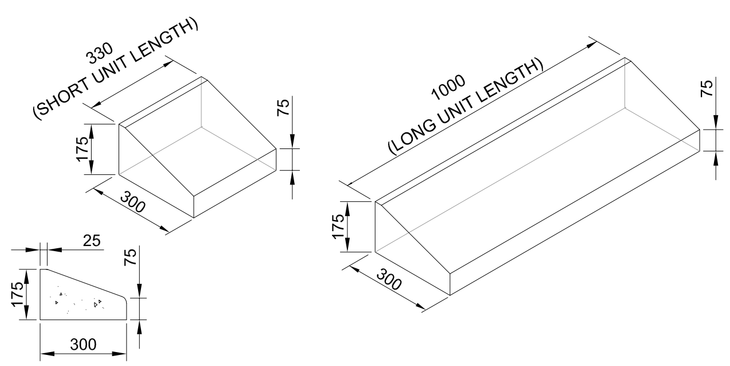
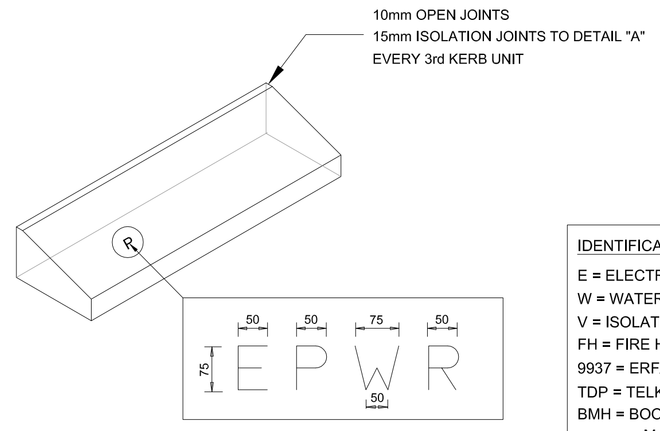


FIG. - 8(b) PRECAST



IDENTIFICATION MARKS:
E = ELECTRICAL CABLES
W = WATER MAIN [TURN NODE]
V = ISOLATION VALE [WATER MAINS]
FH = FIRE HYDRANT
9937 = ERF/STAND No.
TDP = TELKOM DRAWPIT
BMH = BOOSTER/STRAINER
MANHOLE [WATER MAINS]

LETTERS TO BE FORMED IN CONCRETE BEFORE SETTING, LETTERS TO BE 5mm THICK & 3mm DEEP (or STENSEL PAINTED) AS APPROVED.

DETAIL FOR IDENTIFICATION OF SLEEVE POSITIONS,
ERF No., FIRE HYDRANT POSITION, VALVE POSITION
& ALL RELEVANT CIVIL SERVICES

ISSUED FOR TENDER

-DO NOT HESITATE TO ASK, IF IN DOUBT-

ON RECEIPT OF REVISED DRAWING, DESTROY PREVIOUS DRAWING

NOTES

1) ALL WORK TO BE DONE TO SABS 1200: MK - 1983 [KERBING & CHANNELLING] & SABS 927 - 1969

2) ALL KERBING TO BE 20MPa PRE-CAST, VIBRO or SIMULAR APPROVED.

3) STRAIGHT KERBING TO BE 1000mm & CURVED KERBING TO BE IN LENGTHS OF 330mm (FOR SHORT RADII) & 500mm (FOR LONG RADII).

4) ALL ROUNDED CORNERS TO KERBS TO HAVE 20mm RADIUS UNLESS STATED OTHERWISE.

5) ALL KERBING TO BE PLACED ON A 20mm TO 25mm BEDDING, OF RIVERSAND.

6) ALL KERBING TO BE PLACED WITH A 10mm GAP/OPENING BETWEEN UNITS.
10mm JOINT FILLED WITH 1:3 CEMENT MORTAR AND GROOVED HALF ROUND (10mm OPEN JOINTS EVERY 1,0m)

7) EVERY THRID (3rd) KERB TO RECEIVE A 15mm EXPANTION JOINT & THE OPENING TO BE FILLED WITH 15mm "SOFTBOARD" COMPRESSIBLE FILLER, SEALED WITH JAYCOTHANE "673" POLYURETHANE SEALANT.

8) ALL HAUNCHING TO COMPLY TO THE FOLLOWING:
8.1) CONTINUOUS CLASS 19/20 CONCRETE AT ISLANDS
8.2) CLASS 20/19 CONCRETE TO BE CAST SIMULTANEOUSLY WITH GUTTER.

9) KERBS THAT ARE TO BE CUT ON SITE, SHALL BE DONE BY UTILIZING A DIAMOND BLADE, NO BROKEN EDGES SHALL BE USED.

10) ALL TRANSITION KERBS TO BE CAST IN-SITU, 20MPa/19mm "SOFTBOARD" TO BE PLACED AT EACH END TO THE NORMAL PRE-CAST KERBS.

11) THE COMPRESSIVE STRENGHT OF CONCRETE AS SPECIFIED WILL BE THE COMPRESSIVE STRENGTH OF THE INSITU CONCRETE IN ACCORDANCE WITH SERIES 09 OF THE STANDARD SPECIFICATIONS FOR CIVIL ENGINEERING WORKS (1991).

12) WHERE KERBS CAN NOT BE LAID DIRECTLY ON THE SUBBASE FILLING BETWEEN THE SUBBASE & THE KERB MUST BE DONE IN AN APPROVED MANNER.

CLIENT

MBOMBELA LOCAL MUNICIPALITY

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THE ULTIMATE DESTINATION

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ADMIN: admin@toba.co.za

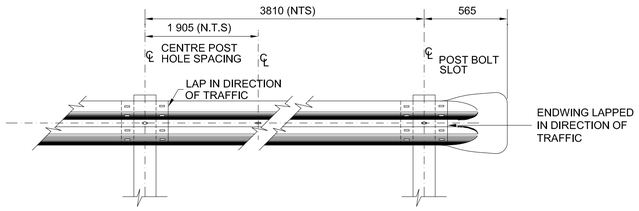
REG. NO. 2011/069299/23

PROJECT TITLE:
CONSTRUCTION OF KAMADAKWA RING ROAD

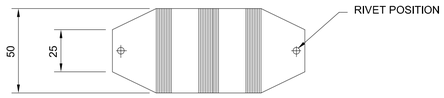
DRAWING TITLE:
DRIVEWAY ENTRANCE
KERBING DETAILS

DESIGNED: MP TSHABALALA	CHECKED: F BURGER PR.ENG. 20090094
DRAWN: R BURGER	SIGN:
SCALE: AS INDICATED	DATE: FEBRUARY 2023
DRAWING NO: NKP(p)432_TR02	CONTRACT NO: -------

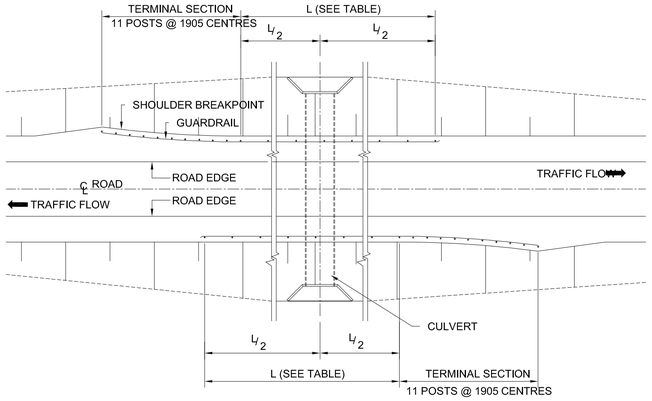
REV.	DATE.	REVISION

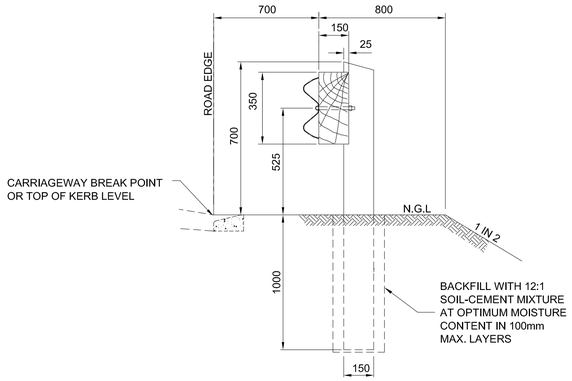


TYPICAL GUARDRAIL ARRANGEMENT
SCALE 1:1

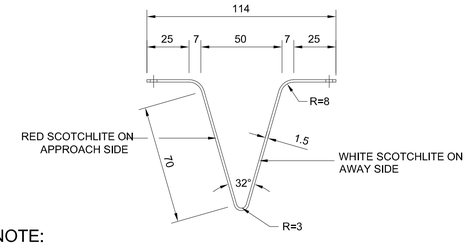


FRONT ELEVATION
SCALE 1:1





TYPICAL SECTION
SCALE 1:1



PLAN

NOTE:

1. ONE REFLECTOR IN THE CENTRE OF EACH SECOND LENGTH OF 3.810m
2. REFLECTIVE MATERIAL SHALL BE TO THE PROVISIONS OF CKS 191.

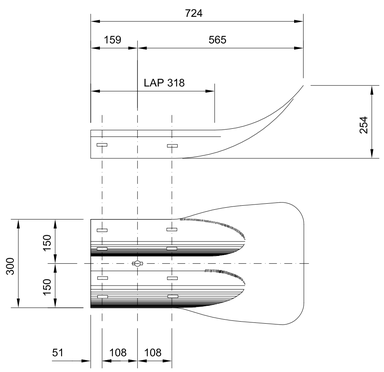
MINIMUM LENGTH OF GUARDRAIL REQUIRED (EXCLUDING TERMINAL SECTIONS)	
DESIGN SPEED km/h	MINIMUM LENGTH - L
60	12 LENGTHS (45.72m)
80	16 LENGTHS (60.96m)
100	23 LENGTHS (87.63m)
120	29 LENGTHS (110.49m)

NOTES:

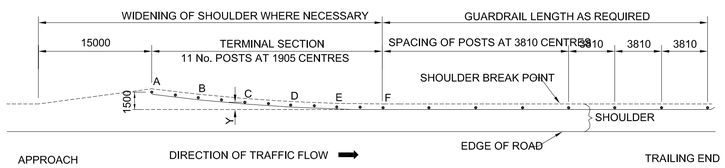
1. GUARDRAILS ARE REQUIRED WHERE:
   a) THE FILL IS MORE THAN 4.0m WITH NO RECOVERY AREA.
   b) THE WATER NEXT TO THE ROAD FORMATION IS DEEPER THAN 1.50m
   c) AT ALL BRIDGES.
   d) WHERE OBSTRUCTIONS ARE LESS THAN 1.0m FROM THE SHOULDER BREAKPOINT.
   e) WHERE AN OBSRUCTION APPEARS TO BE MORE DANGEROUS THAN A GUARDRAIL WOULD BE.

SPECIFICATIONS:

1. GUARDRAILS SHALL COMPLY WITH THE REQUIREMENTS OF SABS 1350.
2. BOLT:- 16mm DIA. Gr 8.8 TO SABS 135-1985.
3. WASHER:- SPRING STEEL.
4. SPACER BLOCK:- PINE OR GUM PRESSURE IMPREGNATED WITH CREOSOTE - TO SABS 05, 673, 538 AND 539 AS APPLICABLE.
5. POLE:- 160mm DIA PINE OR GUM PRESSURE IMPREGNATED WITH CREOSOTE - TO SABS 05, 673, 538 AND 539 AS APPLICABLE.
6. ALL GUARDRAILS, NUTS, BOLTS AND WASHERS MUST BE GALVANISED TO SABS 763 FOR THE COATING OF A1 COMPONENTS.

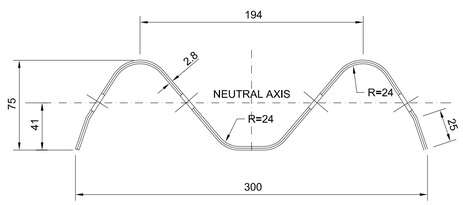


END WING
SCALE 1:1

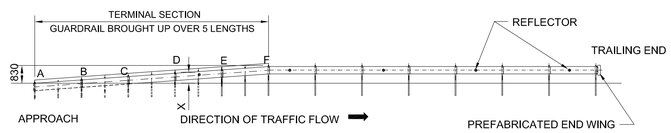


PLAN
SCALE 1:1

PLACING OF POLES AT TERMINAL SECTION		
	HORIZONTAL OFFSETS Y	VERTICAL OFFSETSX
A	1500	830
B	960	531
C	540	299
D	240	133
E	60	33
F	0	0



SECTION THROUGH GUARDRAIL
SCALE 1:1



FRONT ELEVATION
SCALE 1:1

NOTES

ISSUED FOR TENDER

LEGEND

CLIENT:

CITY OF MBOMBELA
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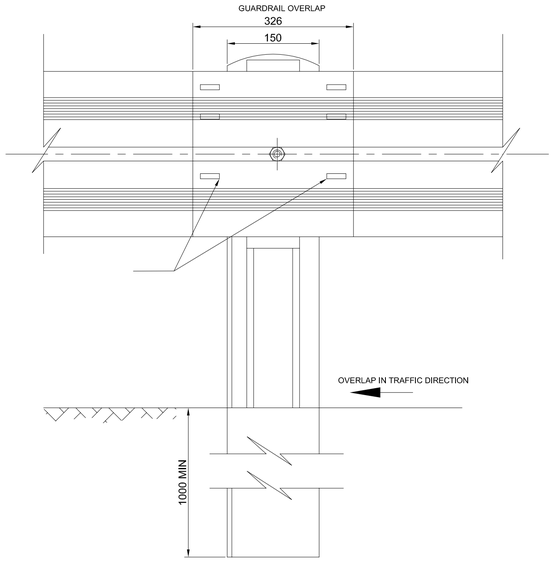
ADMIN: admin@toba.co.za
REG. NO. 2011/069299/23

PROJECT TITLE:
CONSTRUCTION OF KAMADAKWA RING ROAD

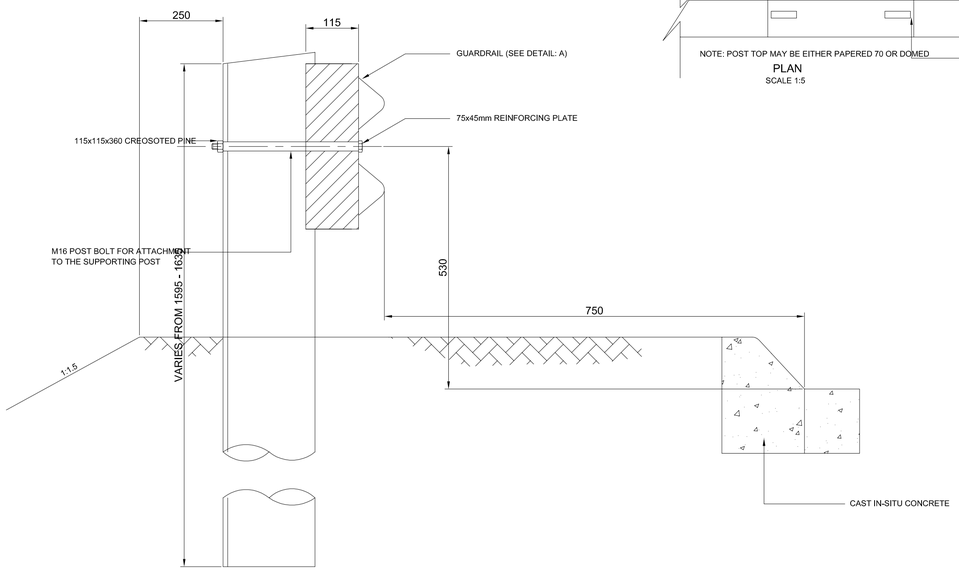
DRAWING TITLE:
TYPICAL DETAILS FOR: GUARDRAIL INSTALLATION & DESIGN

DESIGNED:	CHECKED:
P TSHABALALA	F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL	SIGN:

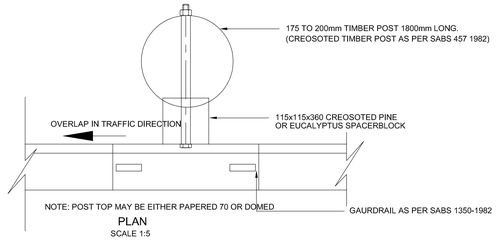
SCALE:	DATE:
FEBRUARY 2022	AS SHOWN
DRAWING NO: NKP(p)432_TR03	CONTRACT NO: AS SHOWN
REVISION:	



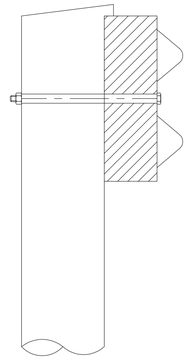
FRONT ELEVATION OF OVERLAP
SCALE 1:5



SIDE ELEVATION
SCALE 1:5



PLAN
SCALE 1:5



DETAILS OF FIXING
SCALE 1:5

NOTES:

1) GUARDRAILS ARE REQUIRED IN THE FOLLOWING CASES:

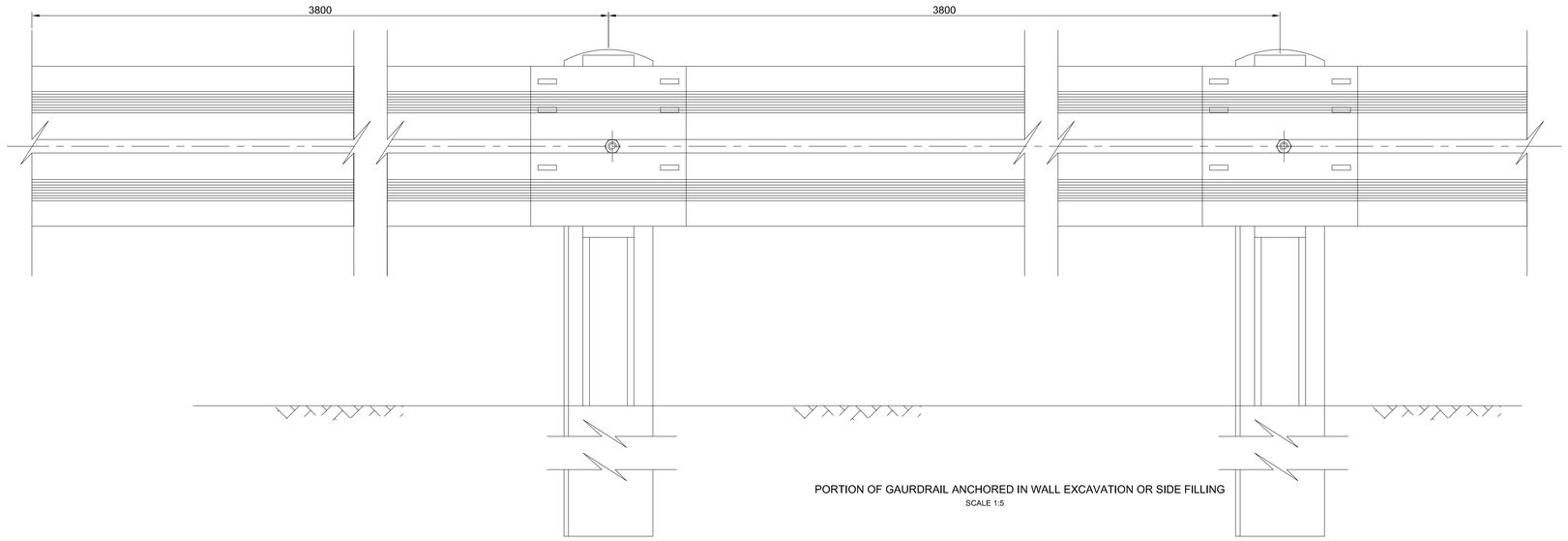
1.1) WHERE THE FILL IS MORE THAN 4m WITH NO RECOVERY AREA.
1.2) WHERE WATER NEXT TO THE ROAD IS DEEPER THAN 1.5m.
1.3) AT ALL BRIDGES.
1.4) ON THE OUTSIDE OF THE CURVES WITH RADII LESS THAN 300mm WITHOUT RECOVERY AREAS.
1.5) WHERE OBSTRUCTIONS ARE LESS THAN 1m FROM THE SHOULDER BREAKPOINT.
1.6) WHERE AN OBSTRUCTIONS APPEARS TO BE MORE DANGEROUS THAN WHAT A GAURDRAIL WOULD BE.

2) BEFORE GUARDRAILS ARE ERECTED APPROVAL MUST BE OBTAINED FROM THE GENERAL MANAGER ; ROAD AND STORMWATER.

3) SPECIFICATIONS:

3.1) BOLT =HIGH TENSILE STEEL 16mm
3.2) WASHER =STEEL SPRING 10mm THICK.
3.3) SPACE BLOCK =GUM OR PINE. THREATED WITH CREOSOTE ACCORDING TO ANY METHOD IN SABS 05.
3.4) POLE =160mm TO 230mm GUM OR PINE THREATED WITH CREOSOTE ACCORDING TO ANY METHOD IN SABS 05.
3.5) ALL GUARDRAILS SHALL BE GALVANIZED AS SPECIFIED (NOT TO BE PAINTED)

4) ALSO REFER TO SECTION 611 OF THE STANDARD SPECIFICATION FOR MUNICIPAL CIVIL ENGINEERING WORKS.



PORTION OF GAURDRAIL ANCHORED IN WALL EXCAVATION OR SIDE FILLING
SCALE 1:5

NOTES

ISSUED FOR TENDER

LEGEND

CLIENT:

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REG. NO. 2011/069299/23

PROJECT TITLE:

CONSTRUCTION OF KAMADAKWA RING ROAD

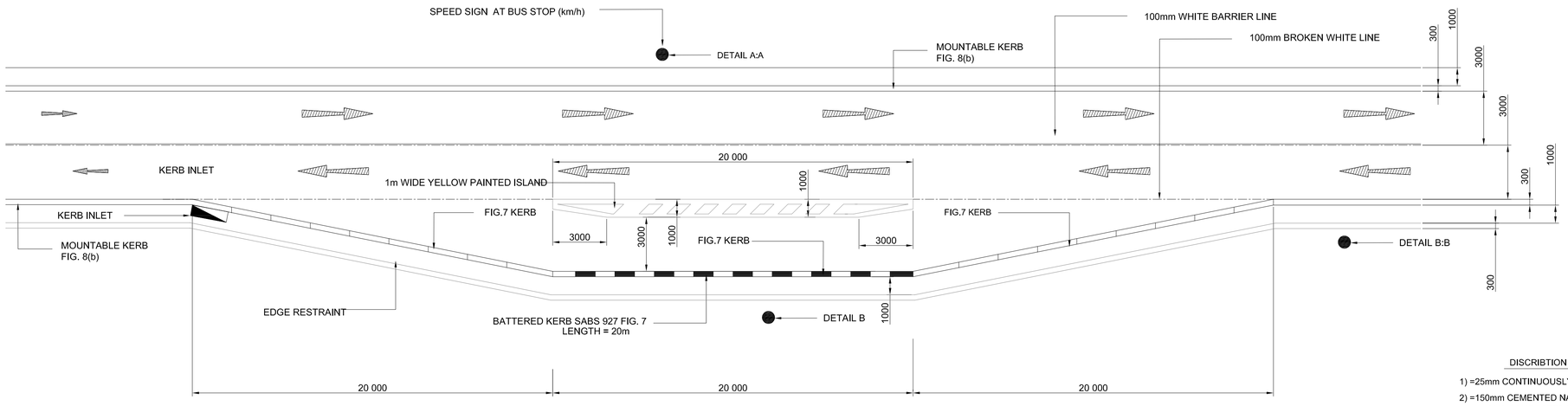
DRAWING TITLE:

LAYOUT OF REINFORCED CONCRTE

DESIGNED:	CHECKED:
P TSHABALALA	F BURGER PR.ENG. 20090094
DRAWN: R VAN ZYL	SIGN:

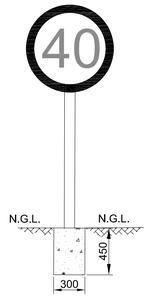
SCALE:	DATE:
FEBRUARY 2023	AS SHOWN
DRAWING NO: NKP(p)432_TR04	CONTRACT NO: AS SHOWN

REVISION:



TYPICAL DETAILS OF BUS STOP

SCALE 1:150



DETAIL A:A

SPEED SIGN(km/h)

SCALE 1:75

DISCRIBTION OF PAVEMENT DESING (TERTIARY)

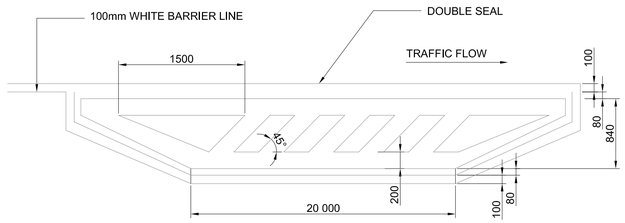
1) =25mm CONTINUOUSLY GRADED ASPHALT SURFACING.(TPA MEDIUM)
2) =150mm CEMENTED NATURAL GRAVEL, UCS >1.5kpa
   100% COMPACTED TO 97% MOD. AASHTO DENSITY (C3)
3) =150mm NATURAL GRAVEL (G5) COMPACTED TO 95%
   MOD. AASHTO DENSITY WITH MINIMUM CBR OF
   25 @ 93% MOD . AASHTO DENSITY.
4) =150mm IN-SITU ROADBED PREPARATION AND COMPACTED
   TO 90% MOD. AASHTO DENSITY.

REQUIREMENTS ARE GIVEN IN THE FOLLOWING ORDER:
LAYER THICKNESS /MATERIAL/MINIMUM STRENGTH
(CBR OR UCS) @ MIN DENSITY/MIN GM/MAX PI.

MIN UNCONFINED COMPRESSIVE STRENGTH(UCS) IS SHOWN IN kpa.

MIN DENSITY IS GIVEN AS % OF MAX MODIFIED AASHTO DENSITY.

G1 = GRADED CRUSHED STONE
G2 = GRADED CRUSHED STONE
SG = STABILIZED GRAVEL
NG = NATURAL GRAVEL
PI = PLASTICITY INDEX
NP = NON PLASTIC
SP = SEMI PLASTIC
GM = GRADING MODULUS
CG = CONTINUOSLY GRADED
AS = SEMI- GAP GRADED
GR-MF = GRADING AS PER SABS 1200



PAINTED ISLAND BUS STOPS

N.T.S.

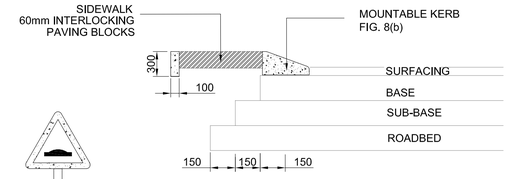


FIG: 7 NON-MOUNTABLE
KERBS IN BUS STOP

N.T.S.

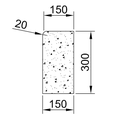


FIG. 1 KERB

N.T.S.

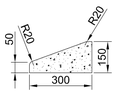


FIG. 8(b) KERB

N.T.S.

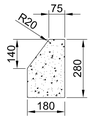
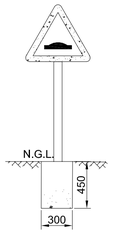


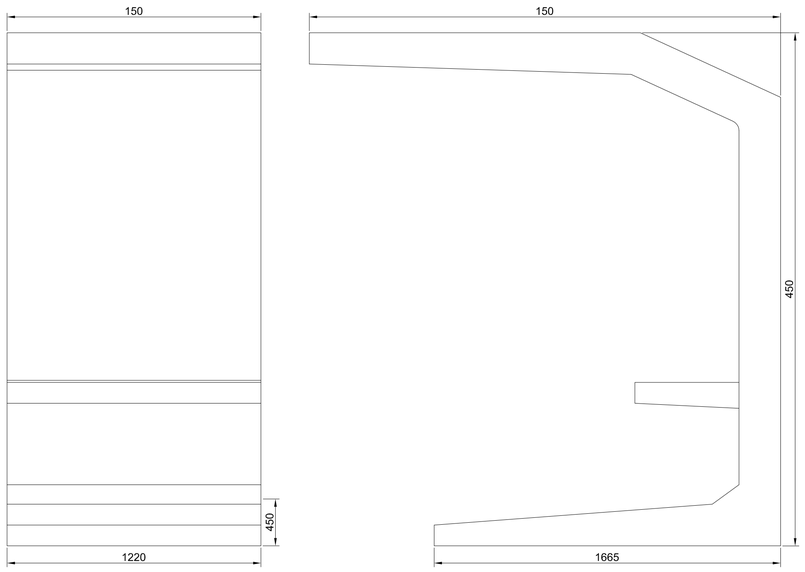
FIG. 7 KERB

N.T.S



W332

SPEED HUMP



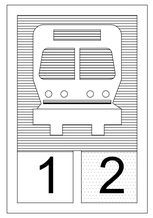
PRECAST BUS SHELTER

PRECAST BUS SHELTER

R327

DETAIL B (BUS & MINIBUS
RESEVATION SIGN)

N.T.S.



R325

BUS STOP RESEVATION

NTS.

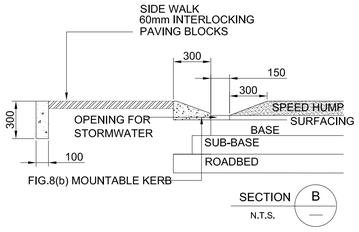
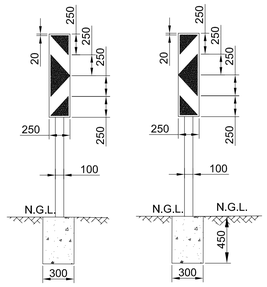


FIG.8(b) MOUNTABLE KERB

N.T.S.

NOTES:

1) SIZE OF ROADSIGNS: R SERIES - 600mm
2) POSITION OF SIDNS VARY ACCODING TO SIZE.
3) FINAL PLACEMENT OF SPEED HUMP SHALL BE
   DECIDEDON SITE BY THE ENGINEER.



HAZARD MAKER SIGNS
W401 & W402

N.T.S.

NOTES

ISSUED FOR TENDER

LEGEND

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REG. NO. 2011/069299/23

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PROJECT TITLE:

CONSTRUCTION OF
KAMADAKWA RING ROAD

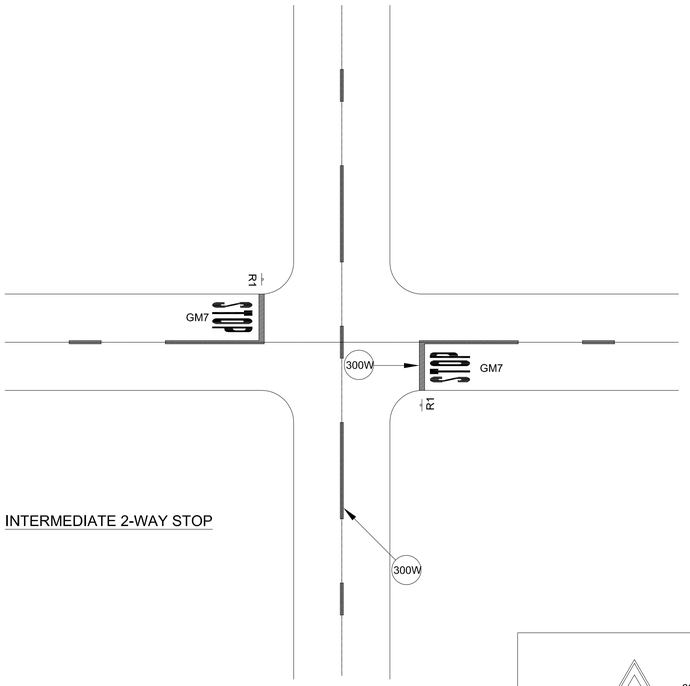
DRAWING TITLE:

TYPICAL DETAILS FOR BUS STOP

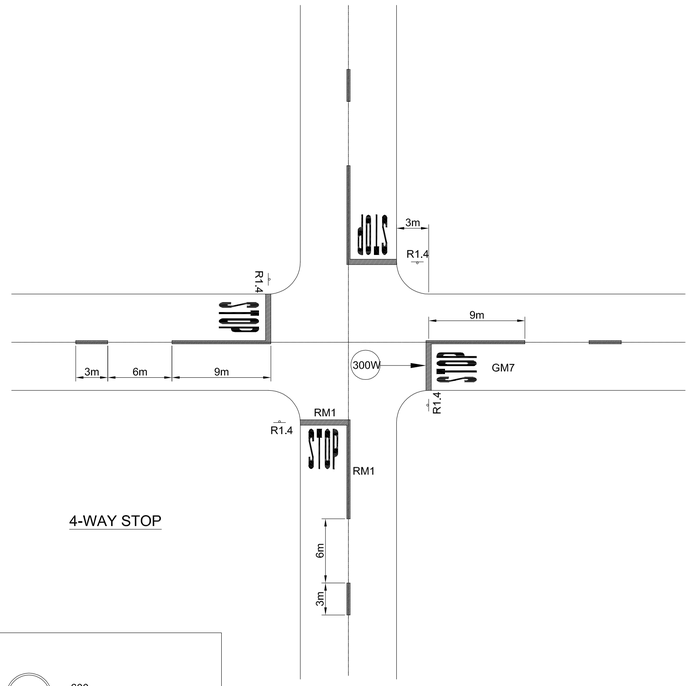
DESIGNED:	CHECKED:
P TSHABALALA	F BURGER PR.ENG. 20090094
DRAWN:	SIGN:
R VAN ZYL	

SCALE:	DATE:
NTS.	FEBRUARY 2023
DRAWING NO:	CONTRACT NO:
NKP(p)432_TR05	AS SHOWN

REVISION:

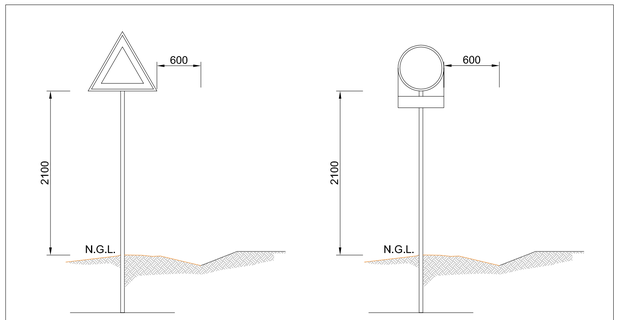


INTERMEDIATE 2-WAY STOP

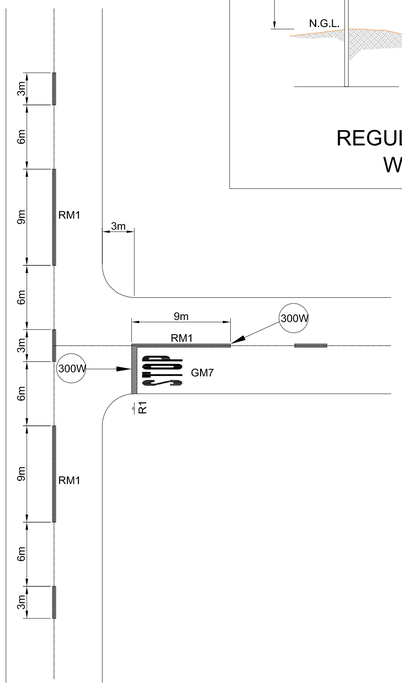


4-WAY STOP

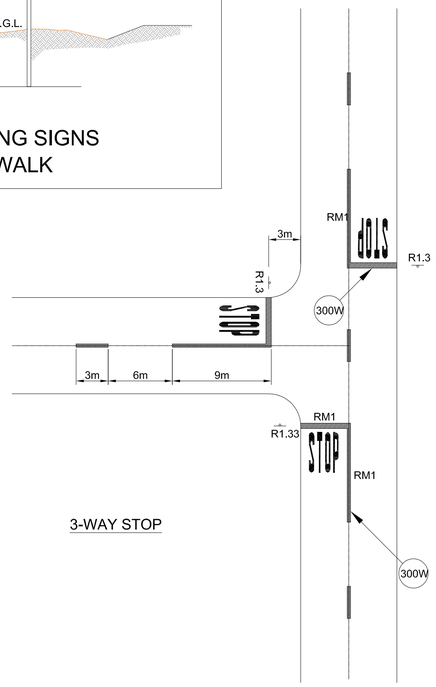
CROSS ROADS



REGULATORY AND WARNING SIGNS
WITH KERB AND SIDEWALK



INTERMEDIATE



3-WAY STOP

T- JUNCTIONS

ISSUED FOR TENDER

©

-DO NOT HESITATE TO ASK, IF IN DOUBT-

ON RECEIPT OF REVISED DRAWING, DESTROY PREVIOUS DRAWING

LEGEND

N O T E S

CLIENT

MBOMBELA LOCAL MUNICIPALITY

HEAD OFFICE
P.O.BOX 48
MBOMBELA. 1201

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REG. NO. 2011/069299/23

PROJECT TITLE:

CONSTRUCTION OF KAMADAKWA RING ROAD

DRAWING TITLE:

TYPICAL SPEEDHUMP (30km/h)

DESIGNED: MP TSHABALALA	CHECKED: F BURGER PR.ENG. 20090094
DRAWN: R BURGER	SIGN:
SCALE: 1:1000	DATE: FEBRUARY 2023
DRAWING NO: NKP(p)432_TS01	CONTRACT NO: -------

REV.	DATE.	REVISION