BLOUBERG LOCAL MUNICIPALITY

TENDER No.: BM01/19/20

FOR

KROEMHOEK INTERNAL STREET AND STORMWATER PHASE 5

TENDER DRAWINGS

July 2018

ISSUED TO:

BLOUBERG LOCAL MUNICIPALITY
P.o. Box 1593
Senwabarwana
0790

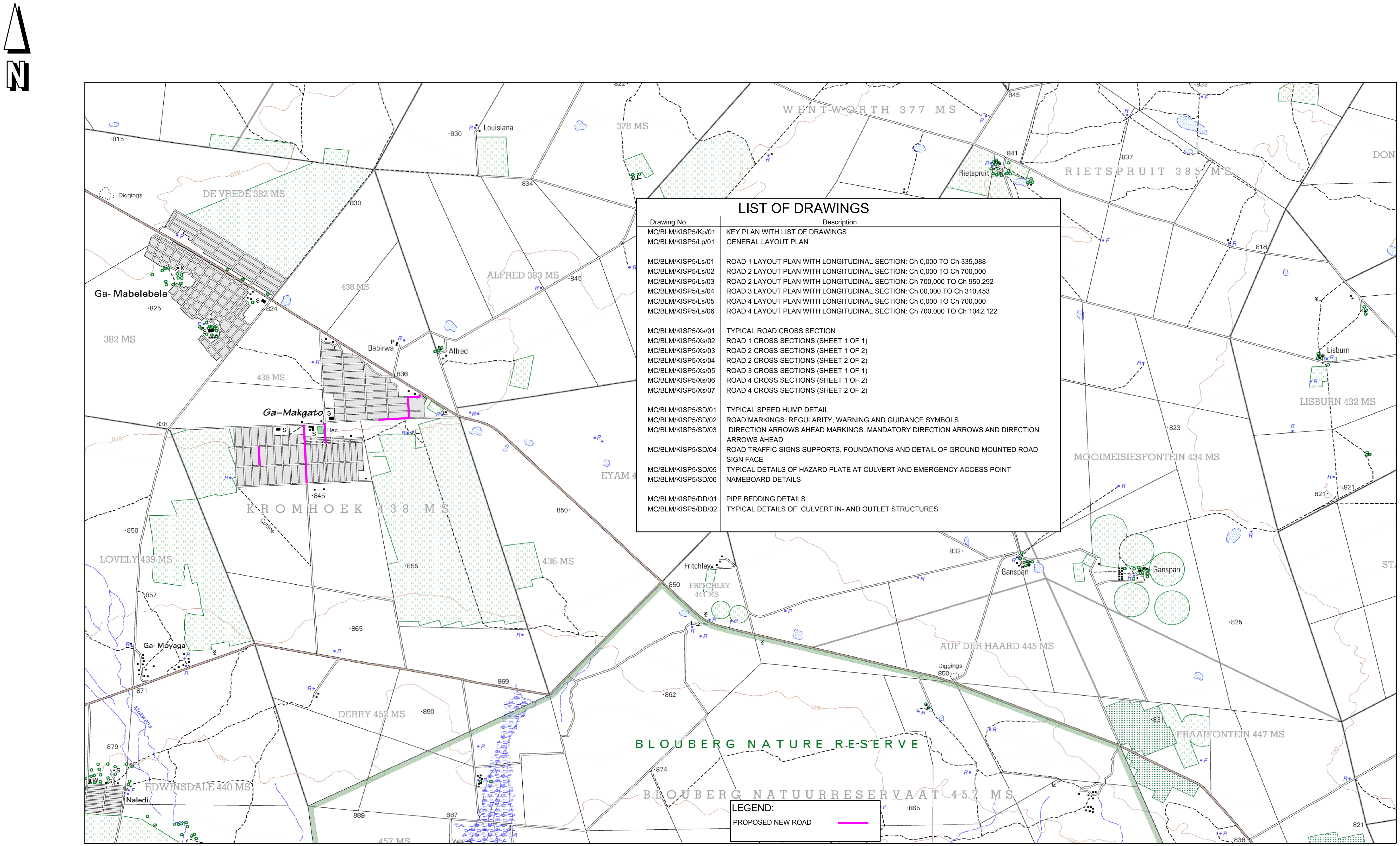
TEL. (015) 505 7100

ISSUED BY:

MORULA CONSULTING ENGINEERS
P.o.Box 2740
POLOKWANE
0700

Tel: (015) 291 1161
Fax: (086) 558 6446

ORIGINAL ON A1



LIST OF DRAWINGS

Drawing No.	Description
MC/BLM/KISP5/Kp/01	KEY PLAN WITH LIST OF DRAWINGS
MC/BLM/KISP5/Lp/01	GENERAL LAYOUT PLAN
MC/BLM/KISP5/Ls/01	ROAD 1 LAYOUT PLAN WITH LONGITUDINAL SECTION: Ch 0,000 TO Ch 335,088
MC/BLM/KISP5/Ls/02	ROAD 2 LAYOUT PLAN WITH LONGITUDINAL SECTION: Ch 0,000 TO Ch 700,000
MC/BLM/KISP5/Ls/03	ROAD 2 LAYOUT PLAN WITH LONGITUDINAL SECTION: Ch 700,000 TO Ch 950,292
MC/BLM/KISP5/Ls/04	ROAD 3 LAYOUT PLAN WITH LONGITUDINAL SECTION: Ch 00,000 TO Ch 310,453
MC/BLM/KISP5/Ls/05	ROAD 4 LAYOUT PLAN WITH LONGITUDINAL SECTION: Ch 0,000 TO Ch 700,000
MC/BLM/KISP5/Ls/06	ROAD 4 LAYOUT PLAN WITH LONGITUDINAL SECTION: Ch 700,000 TO Ch 1042,122
MC/BLM/KISP5/Xs/01	TYPICAL ROAD CROSS SECTION
MC/BLM/KISP5/Xs/02	ROAD 1 CROSS SECTIONS (SHEET 1 OF 1)
MC/BLM/KISP5/Xs/03	ROAD 2 CROSS SECTIONS (SHEET 1 OF 2)
MC/BLM/KISP5/Xs/04	ROAD 2 CROSS SECTIONS (SHEET 2 OF 2)
MC/BLM/KISP5/Xs/05	ROAD 3 CROSS SECTIONS (SHEET 1 OF 1)
MC/BLM/KISP5/Xs/06	ROAD 4 CROSS SECTIONS (SHEET 1 OF 2)
MC/BLM/KISP5/Xs/07	ROAD 4 CROSS SECTIONS (SHEET 2 OF 2)
MC/BLM/KISP5/SD/01	TYPICAL SPEED HUMP DETAIL
MC/BLM/KISP5/SD/02	ROAD MARKINGS: REGULARITY, WARNING AND GUIDANCE SYMBOLS
MC/BLM/KISP5/SD/03	DIRECTION ARROWS AHEAD MARKINGS: MANDATORY DIRECTION ARROWS AND DIRECTION ARROWS AHEAD
MC/BLM/KISP5/SD/04	ROAD TRAFFIC SIGNS SUPPORTS, FOUNDATIONS AND DETAIL OF GROUND MOUNTED ROAD SIGN FACE
MC/BLM/KISP5/SD/05	TYPICAL DETAILS OF HAZARD PLATE AT CULVERT AND EMERGENCY ACCESS POINT
MC/BLM/KISP5/SD/06	NAMEBOARD DETAILS
MC/BLM/KISP5/DD/01	PIPE BEDDING DETAILS
MC/BLM/KISP5/DD/02	TYPICAL DETAILS OF CULVERT IN- AND OUTLET STRUCTURES

LEGEND:

PROPOSED NEW ROAD	▬

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY
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P.o.Box 1593
SENWABARWANA
0790

Tel.: (015) 505-7100

MORULA CONSULTING ENGINEERS
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P.o.Box 2740
POLOKWANE
0700
TEL. (015) 296-4460
FAX. (015) 296-4103

.... VDM .... DATE

.... CONSULTING ENGINEER .... DATE

TENDER No.: BM01/19/20

PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

KEY PLAN WITH LIST OF DRAWINGS

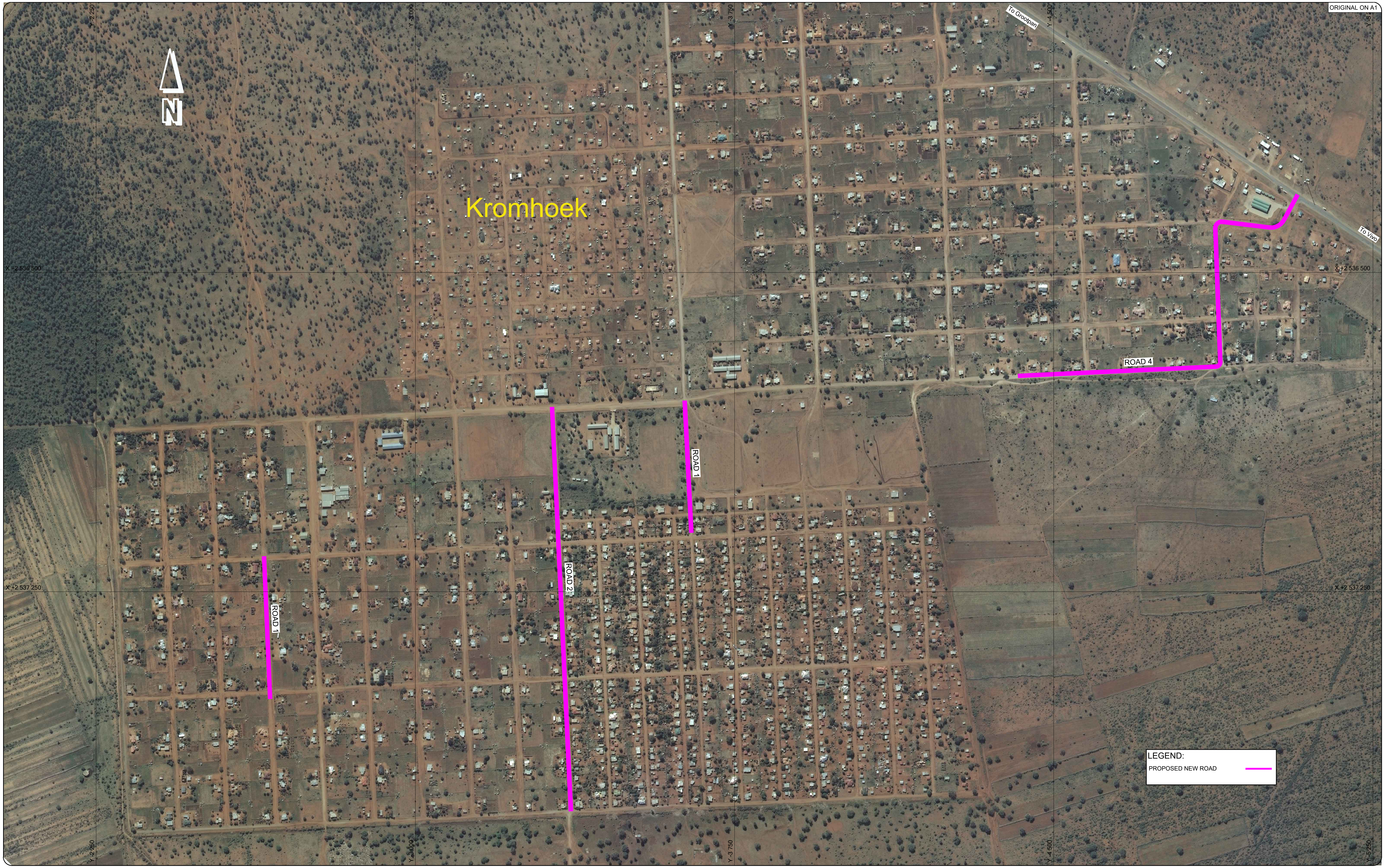
(Full signature)
.................................20 / / CCLM
.................................20 / / For: Consulting Engineer

DRAWING NUMBER
MC/BLM/KISP5/Kp/01

SHEET 1 OF 1

SCALE
1:50 000

REVISION
⓪



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VDM .... DATE ....

CONSULTING ENGINEER .... DATE ....

TENDER No.: BM01/19/20

PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

GENERAL LAYOUT PLAN

(Full signature)

CCLM .... 20 . / . / .

For: Consulting Engineer .... 20 . / . / .

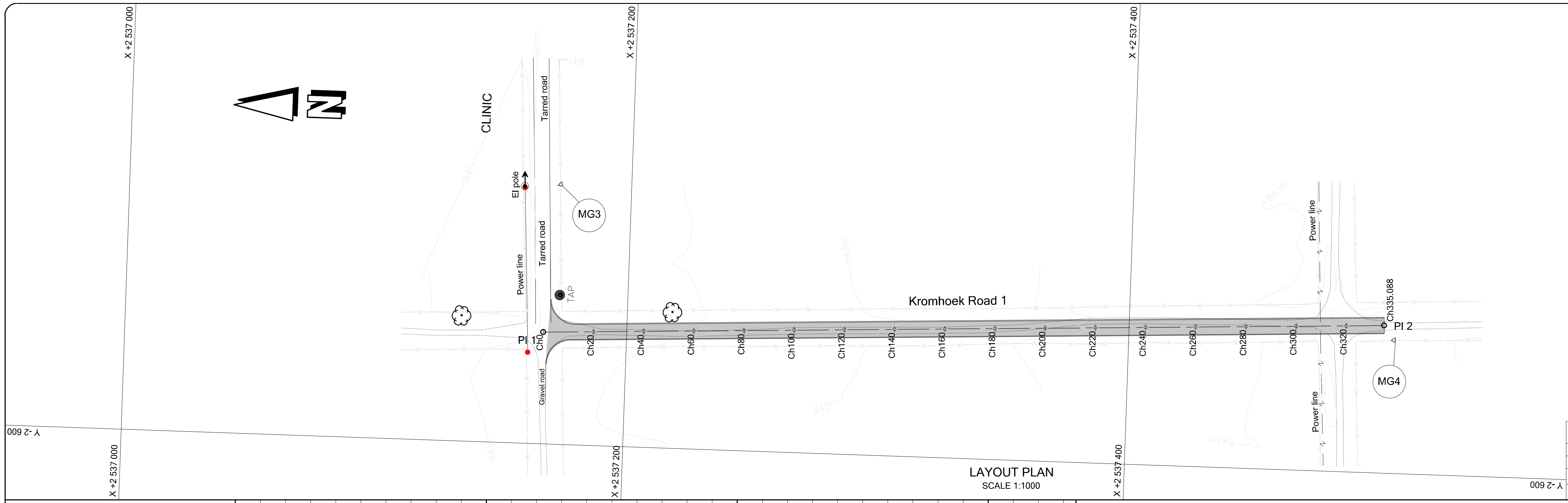
DRAWING NUMBER
MC/BLM/KISP5/Lp/01

SHEET 1 OF 1

SCALE
1:4000

REVISION
⓪

ORIGINAL ON A1



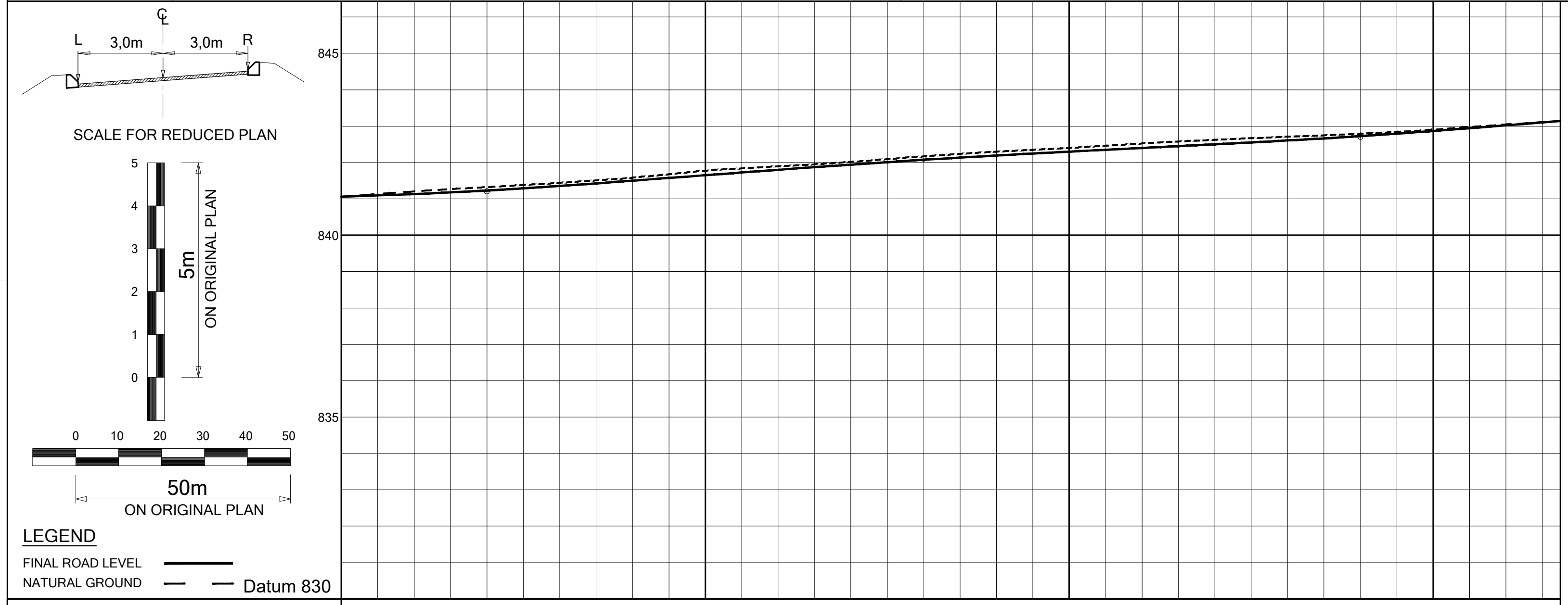
LAYOUT PLAN
SCALE 1:1000

LEGEND:

TREE	◌
TAP	⊙
ROAD SIGN	●
BENCHMARK	○
GRAVEL ROAD	
POWERLINE	
GATE	⋈
FENCE	
PIPELINE	
TELEPHONE LINE	
PROPED NEW ROAD	▨

ROAD SETTING OUT DATA Lo 29

PI No.	Ch	YLo	XLo	Radius	DA	TL	AL
Const:				(m)	D M S	(m)	(m)
PI 1	0.000	-2644.470	2537166.790	Kromhoek Road 1			
PI 2	335.088	-2658.791	2537501.571				



LEGEND
FINAL ROAD LEVEL ——
NATURAL GROUND — —

Chainages	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	335
Vertical Alignment – Design Road Levels – Left Edge (3.0m)	840.997	841.068	841.160	841.290	841.440	841.590	841.740	841.884	842.015	842.134	842.240	842.340	842.440	842.542	842.662	842.802	842.959	843.079
Centre Line (0.0m)	841.057	841.128	841.220	841.350	841.500	841.650	841.800	841.944	842.075	842.194	842.300	842.400	842.500	842.602	842.722	842.862	843.019	843.139
Right Edge (3.0m)	841.117	841.188	841.280	841.410	841.560	841.710	841.860	842.004	842.135	842.254	842.360	842.460	842.560	842.662	842.782	842.922	843.079	843.199
C/L/ Peg Levels	841.057	841.219	841.315	841.442	841.565	841.795	841.890	842.007	842.177	842.306	842.391	842.530	842.626	842.708	842.787	842.890	843.057	843.139
CUT/ FILL		-0.091	-0.095	-0.092	-0.065	-0.145	-0.090	-0.063	-0.102	-0.112	-0.091	-0.130	-0.126	-0.106	-0.065	-0.028	-0.038	

Grades: 0.358 % | 40.000 841.200 | 0.750 % | 160.000 842.100 | 0.500 % | 280.000 842.700 | 0.797 %

Vertical Curves: 20 – 40m VC K = 102 – 60; 120 – 80m VC K = 320 – 200; 250 – 60m VC K = 202 – 310

Superelevation: 2% / -2%

Horizontal Curves: Direction 357.33.02

No	DATE	REVISION	CONSULT	DIR

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CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

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CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

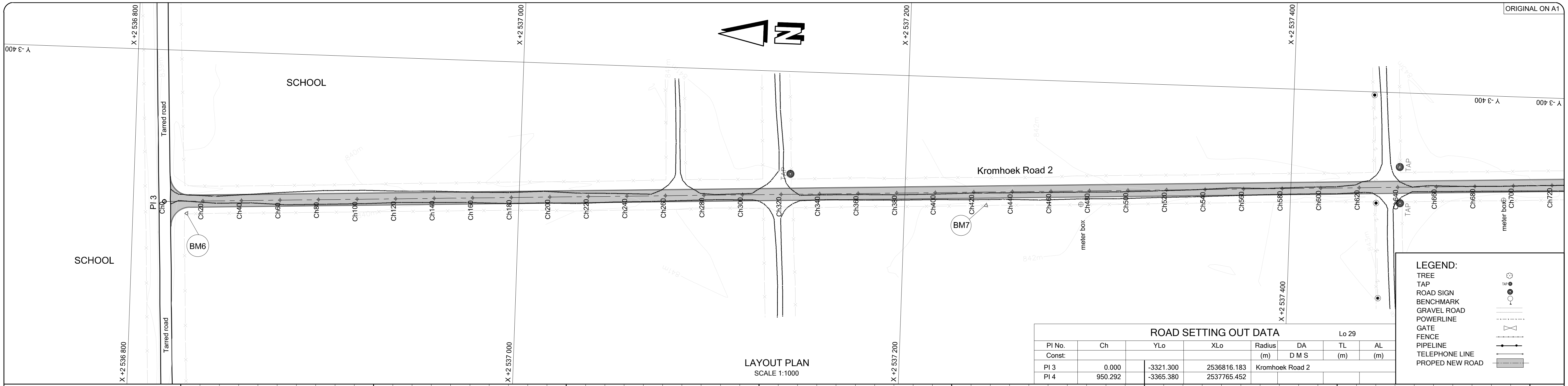
ROAD 1 LAYOUT PLAN WITH LONGITUDINAL SECTION: Ch 0,000 TO Ch 335,088

(Full signature)
.... CCLM 20 / /
For: Consulting Engineer .... 20 / /

DRAWING NUMBER
MC/BLM/KISP5/Ls/01

SHEET 1 OF 1
SCALE
AS SHOWN
REVISION
⓪

ORIGINAL ON A1



LAYOUT PLAN
SCALE 1:1000

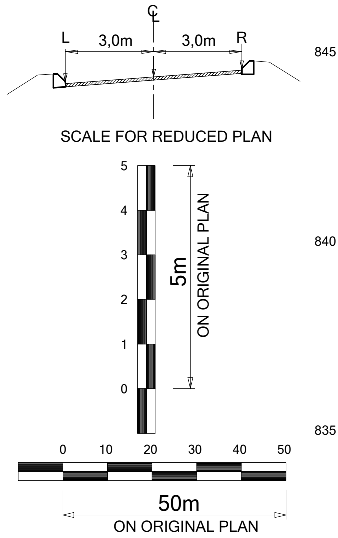
ROAD SETTING OUT DATA

Lo 29

PI No.	Ch	YLo	XLo	Radius	DA	TL	AL
Const:				(m)	D M S	(m)	(m)
PI 3	0.000	-3321.300	2536816.183	Kromhoek Road 2			
PI 4	950.292	-3365.380	2537765.452				

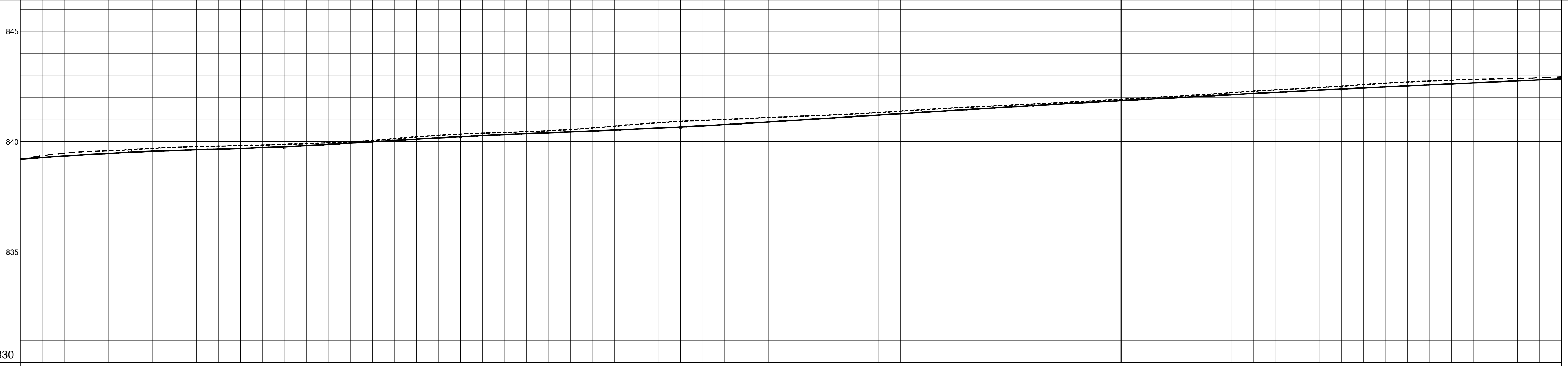
LEGEND:

TREE	
TAP	
ROAD SIGN	
BENCHMARK	
GRAVEL ROAD	
POWERLINE	
GATE	▷◁
FENCE	
PIPELINE	
TELEPHONE LINE	
PROPED NEW ROAD	▨



SCALE FOR REDUCED PLAN

ON ORIGINAL PLAN



LEGEND

FINAL ROAD LEVEL ▬▬
NATURAL GROUND — —
Datum 830

Vertical Alignment

Chainages	0	20	40	60	80	100	120	140	160	180	200	220
Design Road Levels – Left Edge (3.0m)	839.158	839.291	839.419	839.514	839.576	839.636	839.715	839.818	839.940	840.063	840.173	840.268
Design Road Levels – Centre Line (0.0m)	839.218	839.351	839.479	839.574	839.636	839.696	839.775	839.878	840.000	840.123	840.233	840.328
Design Road Levels – Right Edge (3.0m)	839.278	839.411	839.539	839.634	839.696	839.756	839.835	839.938	840.060	840.183	840.293	840.388
C/L/ Peg Levels	839.218	839.543	839.566	839.713	839.789	839.822	839.878	839.945	840.043	840.234	840.352	840.429
CUT/ FILL		-0.192	-0.087	-0.139	-0.153	-0.126	-0.103	-0.067	-0.043	-0.111	-0.119	-0.101

Chainages	240	260	280	300	320	340	360	380	400	420	440	460
Design Road Levels – Left Edge (3.0m)	840.350	840.430	840.512	840.607	840.717	840.840	840.965	841.090	841.215	841.340	841.461	841.579
Design Road Levels – Centre Line (0.0m)	840.410	840.490	840.572	840.667	840.777	840.900	841.025	841.150	841.275	841.400	841.521	841.639
Design Road Levels – Right Edge (3.0m)	840.470	840.550	840.632	840.727	840.837	840.960	841.085	841.210	841.335	841.460	841.581	841.699
C/L/ Peg Levels	840.486	840.615	840.801	840.938	841.004	841.106	841.173	841.265	841.385	841.524	841.606	841.715
CUT/ FILL	-0.076	-0.125	-0.229	-0.271	-0.227	-0.206	-0.148	-0.115	-0.110	-0.124	-0.085	-0.076

Chainages	480	500	520	540	560	580	600	620	640	660	680	700
Design Road Levels – Left Edge (3.0m)	841.693	841.804	841.911	842.019	842.126	842.232	842.334	842.429	842.520	842.610	842.700	842.790
Design Road Levels – Centre Line (0.0m)	841.753	841.864	841.971	842.079	842.186	842.292	842.394	842.489	842.580	842.670	842.760	842.850
Design Road Levels – Right Edge (3.0m)	841.813	841.924	842.031	842.139	842.246	842.352	842.454	842.549	842.640	842.730	842.820	842.910
C/L/ Peg Levels	841.807	841.932	842.039	842.141	842.306	842.402	842.511	842.668	842.754	842.831	842.864	842.937
CUT/ FILL	-0.054	-0.068	-0.068	-0.062	-0.120	-0.110	-0.117	-0.179	-0.174	-0.161	-0.104	-0.087

Grades

0.664 % | 50.000 | 839.550 | 0.286 % | 120.000 | 839.750 | 0.625 % | 200.000 | 840.250 | 0.400 % | 300.000 | 840.650 | 0.625 % | 460.000 | 841.650 | 0.536 % | 600.000 | 842.400 | 0.450 % | 700.000 843.300

Vertical Curves

30 | 40m VC K = 106 | 70 · 90 | 60m VC K = 177 | 150 · 170 | 60m VC K = 267 | 230 · 270 | 60m VC K = 267 | 330 · 410 | 100m VC K = 1120 | 510 · 570 | 60m VC K = 700 | 630 ·

Superelevation

2%
-2%

Horizontal Curves

Direction
357.20.29

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

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.... VDM .... DATE

.... CONSULTING ENGINEER .... DATE

TENDER No.: BM01/19/20
PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

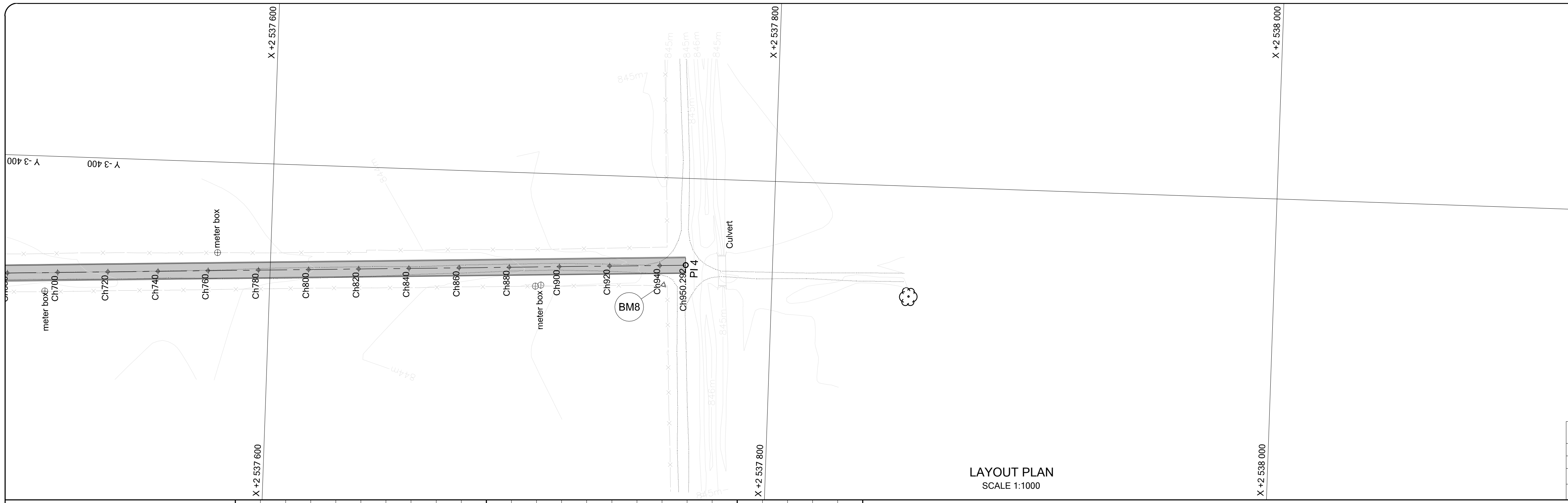
ROAD 2 LAYOUT PLAN WITH LONGITUDINAL SECTION: Ch 0,000 TO Ch 700,000

(Full signature)
.... CCLM 20 . / . / .
.... For: Consulting Engineer 20 . / . / .

DRAWING NUMBER
MC/BLM/KISP5/Ls/02

SHEET 1 OF 2
SCALE
AS SHOWN
REVISION
⓪

ORIGINAL ON A1



LAYOUT PLAN

SCALE 1:1000

X +2 538 200

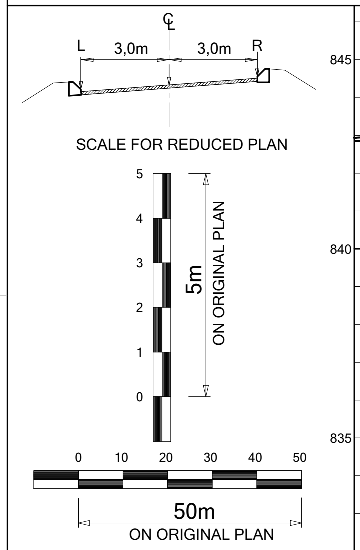
LEGEND:

TREE	⚙
TAP	TAP ●
ROAD SIGN	◉
BENCHMARK	○
GRAVEL ROAD	═
POWERLINE	-·-·-
GATE	⋈
FENCE	-x-x-x-
PIPELINE	●—●
TELEPHONE LINE	○—○
PROPED NEW ROAD	▨

ROAD SETTING OUT DATA

Lo 29

PI No.	Ch	YLo	XLo	Radius	DA	TL	AL
Const:				(m)	D M S	(m)	(m)
PI 3	0.000	-3321.300	2536816.183	Kromhoek Road 2			
PI 4	950.292	-3365.380	2537765.452				

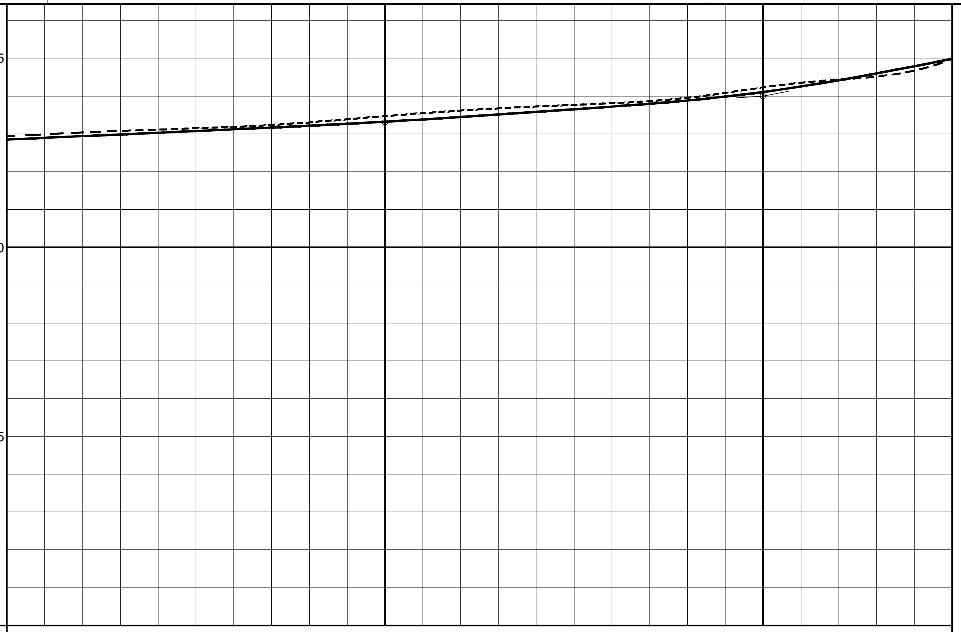


LEGEND

FINAL ROAD LEVEL ━━━

NATURAL GROUND — —

Datum 830



Chainages	700	720	740	760	780	800	820	840	860	880	900	920	940	950
Vertical Alignment – Design Road Levels – Left Edge (3.0m)	842.790	842.880	842.970	843.060	843.152	843.259	843.382	843.520	843.660	843.810	844.035	844.343	844.724	844.926
Vertical Alignment – Design Road Levels – Centre Line (0.0m)	842.850	842.940	843.030	843.120	843.212	843.319	843.442	843.580	843.720	843.870	844.095	844.403	844.784	844.986
Vertical Alignment – Design Road Levels – Right Edge (3.0m)	842.910	843.000	843.090	843.180	843.272	843.379	843.502	843.640	843.780	843.930	844.155	844.463	844.844	845.046
Vertical Alignment – Grades			0.450 %			800.000 | 843.300		0.700 %			900.000 | 844.000	1.961 %		
Vertical Alignment – Vertical Curves					770	60m VC K = 240	830			870	60m VC K = 48		930	
Superelevation							2% -2%							
Horizontal Curves							Direction 357.20.29							
C/L/ Peg Levels	842.937	843.041	843.121	843.171	843.297	843.473	843.626	843.727	843.806	843.913	844.252	844.462	844.559	844.986
CUT/ FILL	-0.087	-0.101	-0.091	-0.051	-0.085	-0.154	-0.184	-0.147	-0.086	-0.043	-0.157	-0.059	0.225	

No	DATE	REVISION	CONSULT	DIR

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CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

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CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

ROAD 2 LAYOUT PLAN WITH LONGITUDINAL SECTION: Ch 700,000 TO Ch 950,292

(Full signature)

.... CCLM .... 20 . / . / .

.... For: Consulting Engineer .... 20 . / . / .

DRAWING NUMBER

MC/BLM/KISP5/Ls/03

SHEET 2 OF 2

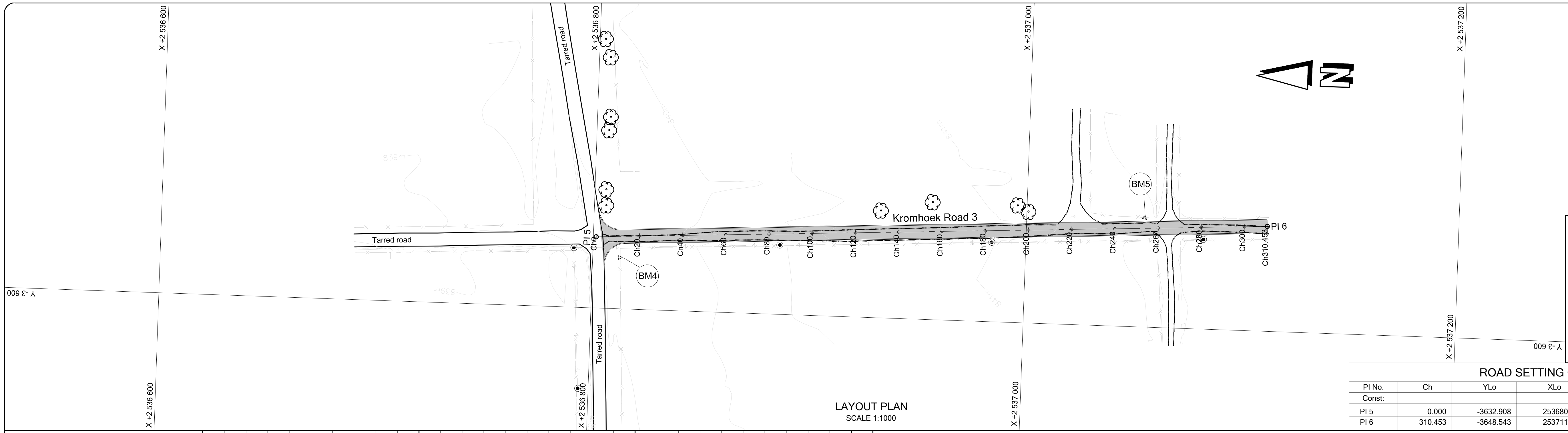
SCALE

AS SHOWN

REVISION

⓪

ORIGINAL ON A1



LAYOUT PLAN

SCALE 1:1000

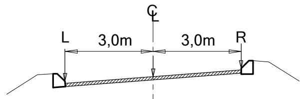
LEGEND:

TREE	✿
TAP	●
ROAD SIGN	◉
BENCHMARK	○
GRAVEL ROAD	
POWERLINE	
GATE	⋈
FENCE	×—×—×
PIPELINE	—●—●—
TELEPHONE LINE	○——○
PROPED NEW ROAD	▨

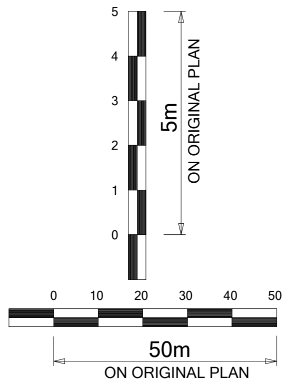
ROAD SETTING OUT DATA

Lo 29

PI No.	Ch	YLo	XLo	Radius	DA	TL	AL
Const:				(m)	D M S	(m)	(m)
PI 5	0.000	-3632.908	2536801.325	Kromhoek Road 3			
PI 6	310.453	-3648.543	2537111.384				



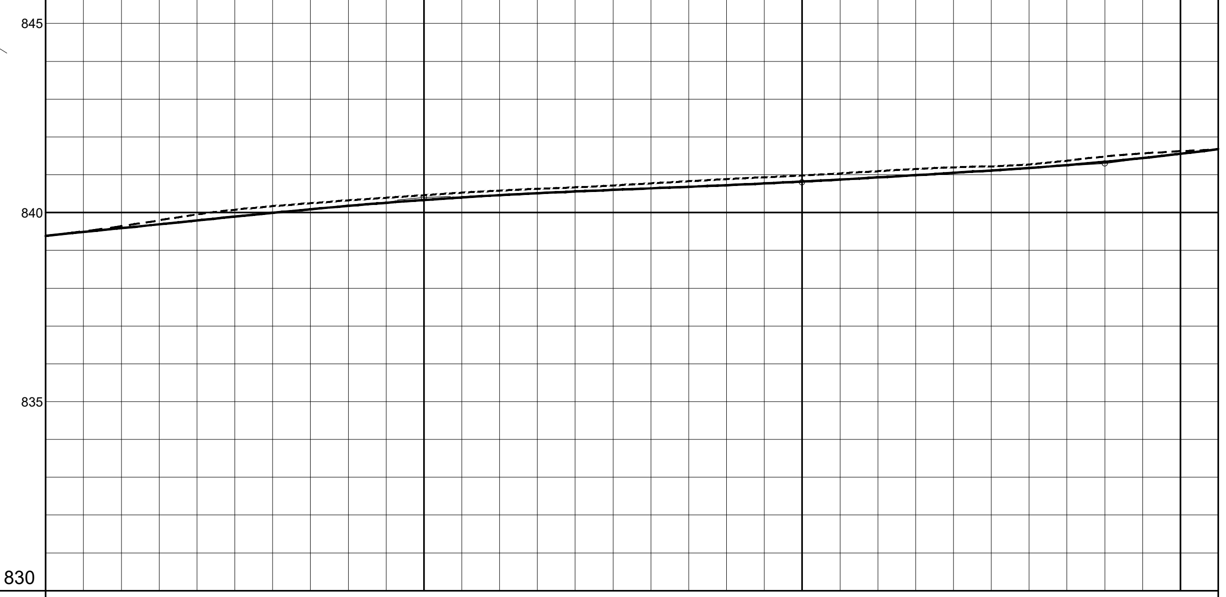
SCALE FOR REDUCED PLAN



LEGEND

FINAL ROAD LEVEL ——

NATURAL GROUND — —



Chainages	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	310
Vertical Alignment — Design Road Levels — Left Edge (3.0m)	839.325	839.528	839.731	839.934	840.122	840.279	840.405	840.500	840.580	840.662	840.757	840.867	840.990	841.115	841.270	841.486	841.614
Centre Line (0.0m)	839.385	839.588	839.791	839.994	840.182	840.339	840.465	840.560	840.640	840.722	840.817	840.927	841.050	841.175	841.330	841.546	841.674
Right Edge (3.0m)	839.445	839.648	839.851	840.054	840.242	840.398	840.525	840.620	840.700	840.782	840.877	840.987	841.110	841.235	841.390	841.606	841.734
C/L/ Peg Levels	839.385	839.613	839.989	840.174	840.322	840.461	840.591	840.662	840.768	840.891	840.973	841.095	841.214	841.228	841.520	841.626	841.674
CUT/ FILL		-0.025	-0.198	-0.180	-0.140	-0.122	-0.126	-0.102	-0.128	-0.169	-0.156	-0.168	-0.164	-0.053	-0.190	-0.080	

Grades: 1.015 % | 100.000 | 840.400 | 0.400 % | 200.000 | 840.800 | 0.625 % | 280.000 | 841.300 | 1.228 %

Vertical Curves: 60 | 80m VC K = 130 | 140 · 170 | 60m VC K = 267 | 230 · 260 | 40m VC K = 66 | 300

Superelevation: 2% -2%

Horizontal Curves: Direction 357.06.48

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY

P.o.Box 1593
SENWABARWANA
0790

Tel.: (015) 505-7100

BLOUBERG MUNICIPALITY

MORULA CONSULTING ENGINEERS

morula CONSULTING ENGINEERS & PROJECT MANAGERS "a new dawn"

P.o.Box 2740
POLOKWANE
0700

TEL. (015) 296-4460
FAX. (015) 296-4103

.... VDM .... DATE

.... CONSULTING ENGINEER .... DATE

TENDER No.: BM01/19/20

PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

ROAD 3 LAYOUT PLAN WITH LONGITUDINAL SECTION: Ch 00,000 TO Ch 310,453

(Full signature)

.... CCLM 20 / /

.... For: Consulting Engineer 20 / /

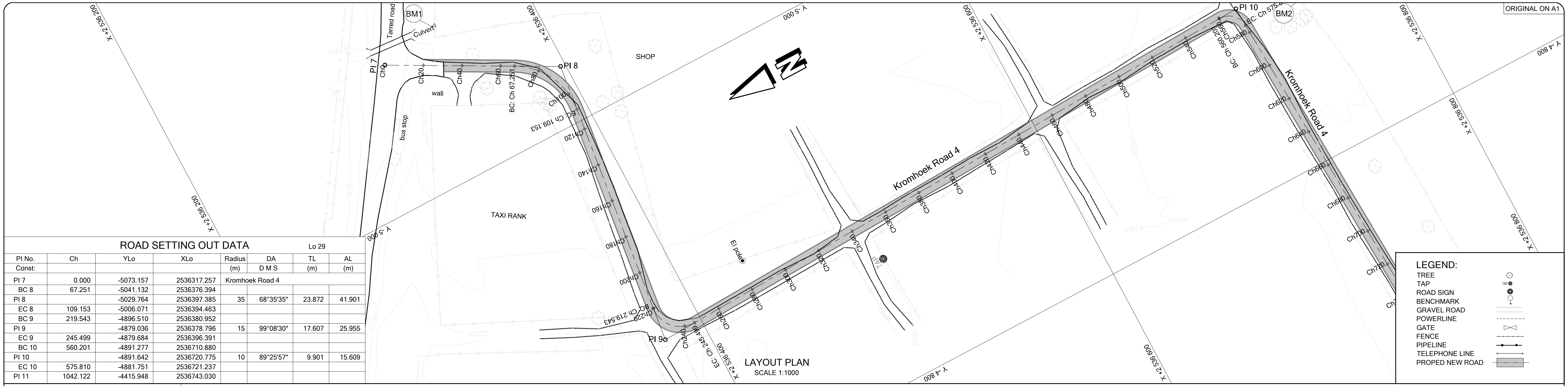
DRAWING NUMBER
MC/BLM/KISP5/Ls/04

SHEET 1 OF 1

SCALE
AS SHOWN

REVISION
⓪

ORIGINAL ON A1

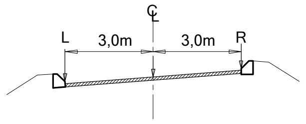


LAYOUT PLAN
SCALE 1:1000

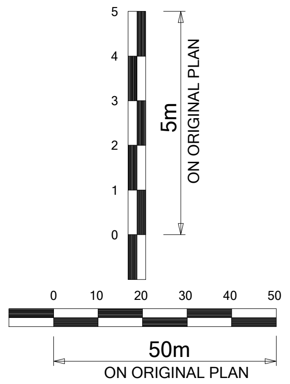
ROAD SETTING OUT DATA

Lo 29

PI No.	Ch	YLo	XLo	Radius	DA	TL	AL
Const:				(m)	D M S	(m)	(m)
PI 7	0.000	-5073.157	2536317.257	Kromhoek Road 4			
BC 8	67.251	-5041.132	2536376.394				
PI 8		-5029.764	2536397.385	35	68°35'35"	23.872	41.901
EC 8	109.153	-5006.071	2536394.463				
BC 9	219.543	-4896.510	2536380.952				
PI 9		-4879.036	2536378.796	15	99°08'30"	17.607	25.955
EC 9	245.499	-4879.684	2536396.391				
BC 10	560.201	-4891.277	2536710.880				
PI 10		-4891.642	2536720.775	10	89°25'57"	9.901	15.609
EC 10	575.810	-4881.751	2536721.237				
PI 11	1042.122	-4415.948	2536743.030				

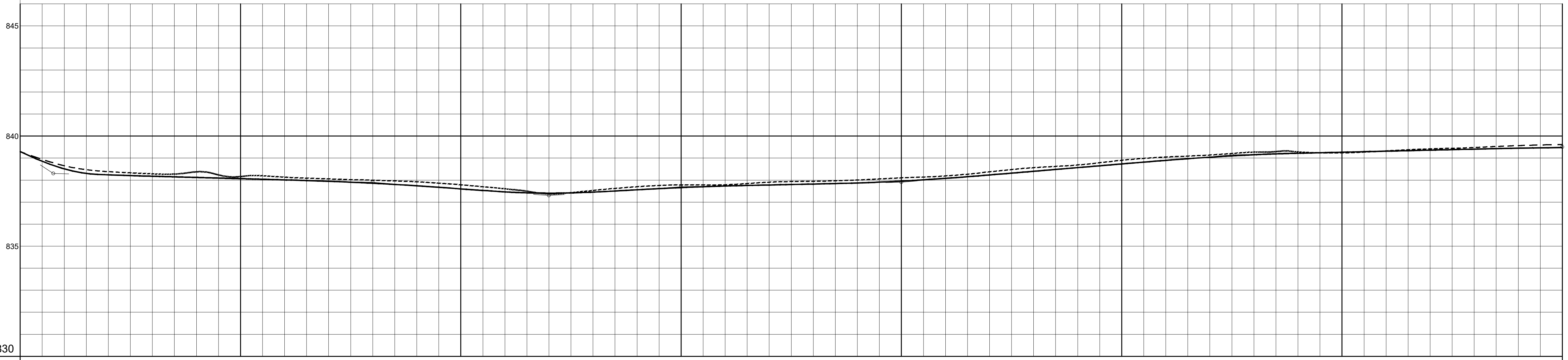


SCALE FOR REDUCED PLAN



LEGEND

FINAL ROAD LEVEL
NATURAL GROUND
Datum 830



Chainages	0	20	40	60	70	80	90	100	120	140
Vertical Alignment – Design Road Levels – Left Edge (3.0m)	839.235	838.266	838.171	838.116	838.088	838.061	838.033	838.006	837.950	837.891
Vertical Alignment – Design Road Levels – Centre Line (0.0m)	839.295	838.326	838.231	838.176	838.148	838.121	838.093	838.065	838.010	837.951
Vertical Alignment – Design Road Levels – Right Edge (3.0m)	839.355	838.386	838.291	838.236	838.208	838.181	838.153	838.125	838.070	838.011
C/L/ Peg Levels	839.295	838.520	838.381	838.272	838.259	838.390	838.225	838.144	838.120	838.054
CUT/ FILL		-0.194	-0.150	-0.096	-0.111	-0.269	-0.132	-0.079	-0.110	-0.103

Chainages	160	180	200	220	230	240	260	280	300	320
Vertical Alignment – Design Road Levels – Left Edge (3.0m)	837.804	837.686	837.540	837.402	837.363	837.347	837.385	837.503	837.605	837.676
Vertical Alignment – Design Road Levels – Centre Line (0.0m)	837.864	837.746	837.600	837.462	837.422	837.406	837.445	837.563	837.665	837.736
Vertical Alignment – Design Road Levels – Right Edge (3.0m)	837.924	837.806	837.660	837.522	837.481	837.465	837.505	837.623	837.725	837.796
C/L/ Peg Levels	837.994	837.935	837.793	837.607	837.508	837.368	837.539	837.710	837.814	837.743
CUT/ FILL	-0.130	-0.189	-0.193	-0.145	-0.086	0.038	-0.094	-0.147	-0.149	-0.007

Chainages	340	360	380	400	420	440	460	480	500	520
Vertical Alignment – Design Road Levels – Left Edge (3.0m)	837.720	837.760	837.805	837.888	838.012	838.173	838.340	838.507	838.673	838.840
Vertical Alignment – Design Road Levels – Centre Line (0.0m)	837.780	837.820	837.865	837.948	838.072	838.233	838.400	838.567	838.733	838.900
Vertical Alignment – Design Road Levels – Right Edge (3.0m)	837.840	837.880	837.925	838.008	838.132	838.293	838.460	838.627	838.793	838.960
C/L/ Peg Levels	837.939	837.940	837.993	838.117	838.159	838.374	838.590	838.653	838.922	839.063
CUT/ FILL	-0.159	-0.120	-0.128	-0.169	-0.087	-0.141	-0.190	-0.086	-0.189	-0.163

Chainages	540	560	570	580	600	620	640	660	680	700
Vertical Alignment – Design Road Levels – Left Edge (3.0m)	838.987	839.094	839.134	839.160	839.207	839.253	839.300	839.347	839.391	839.417
Vertical Alignment – Design Road Levels – Centre Line (0.0m)	839.047	839.153	839.192	839.220	839.267	839.313	839.360	839.407	839.451	839.477
Vertical Alignment – Design Road Levels – Right Edge (3.0m)	839.107	839.211	839.250	839.280	839.327	839.373	839.420	839.467	839.511	839.537
C/L/ Peg Levels	839.119	839.297	839.287	839.259	839.209	839.326	839.436	839.454	839.594	839.609
CUT/ FILL	-0.072	-0.144	-0.095	-0.039	0.058	-0.013	-0.076	-0.047	-0.143	-0.132

Grades: 15.000 838.300 -6.633 % | -0.276 % | 160.000 837.900 | -0.750 % | 240.000 837.300 | 0.667 % | 300.000 837.700 | 0.200 % | 400.000 837.900 | 0.833 % | 550.000 839.150 | 0.233 % | 700.000 839.500

Vertical Curves: 5 20m VC K = 3 25 | 130 60m VC K = 127 190 | 210 60m VC K = 42 270 | 270 60m VC K = 129 330 | 370 60m VC K = 95 430 | 520 60m VC K = 100 580 | 670 60m VC K = 199

Superelevation: 2% -2%

Horizontal Curves: Direction 28.26.15 | 67 BCC Curve 1 Right Radius=35m I= 68.35.35 ECC 109 | Direction 97.01.50 | 220 BCC Curve 2 Left Radius=15m I= 99.08.30 ECC 245 | Direction 357.53.20 | 560 BCC Curve 3 Right Radius=10m I= 89.25.57 ECC 576 | Direction 87.19.17

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY
P.o.Box 1593
SENWABARWANA
0790
Tel.: (015) 505-7100
BLOUBERG MUNICIPALITY

MORULA CONSULTING ENGINEERS
morula CONSULTING ENGNEERS & PROJECT MANAGERS "a new dawn"
P.o.Box 2740
POLOKWANE
0700
TEL. (015) 296-4460
FAX. (015) 296-4103

.... VDM .... DATE
.... CONSULTING ENGINEER .... DATE

TENDER No.: BM01/19/20
PROJECT STATUS: TENDER

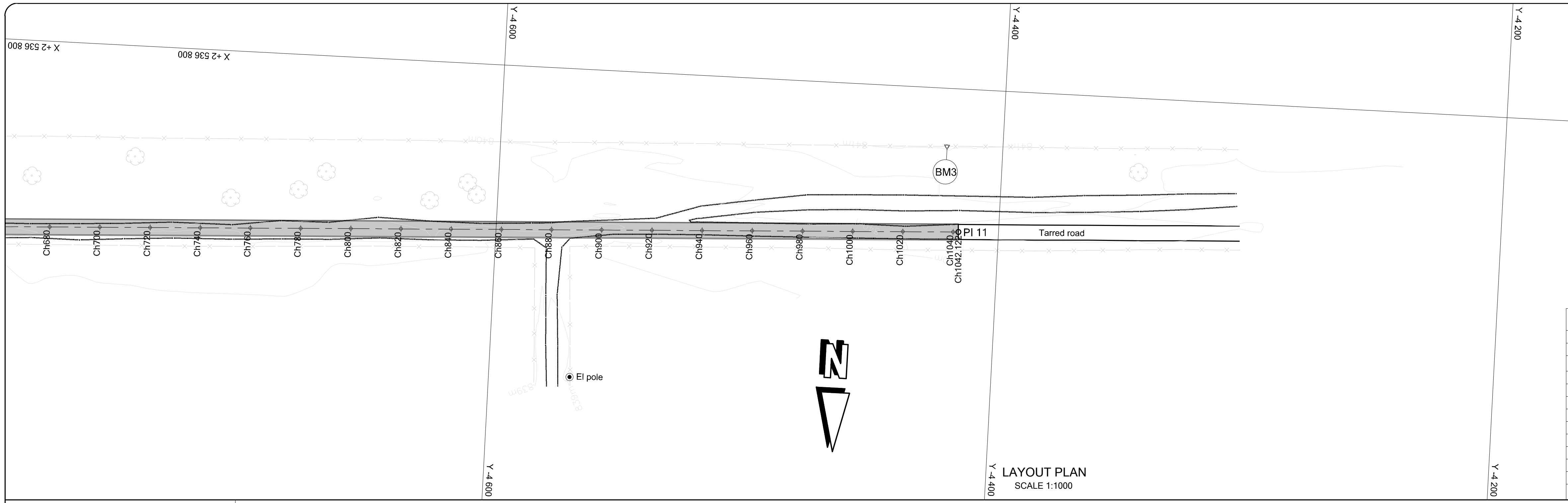
CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

ROAD 4 LAYOUT PLAN WITH LONGITUDINAL SECTION: Ch 0,000 TO Ch 700,000

(Full signature)
.... CCLM 20 / /
.... For: Consulting Engineer 20 / /

SHEET 1 OF 2
SCALE AS SHOWN
DRAWING NUMBER MC/BLM/KISP5/Ls/05
REVISION ⓪

ORIGINAL ON A1



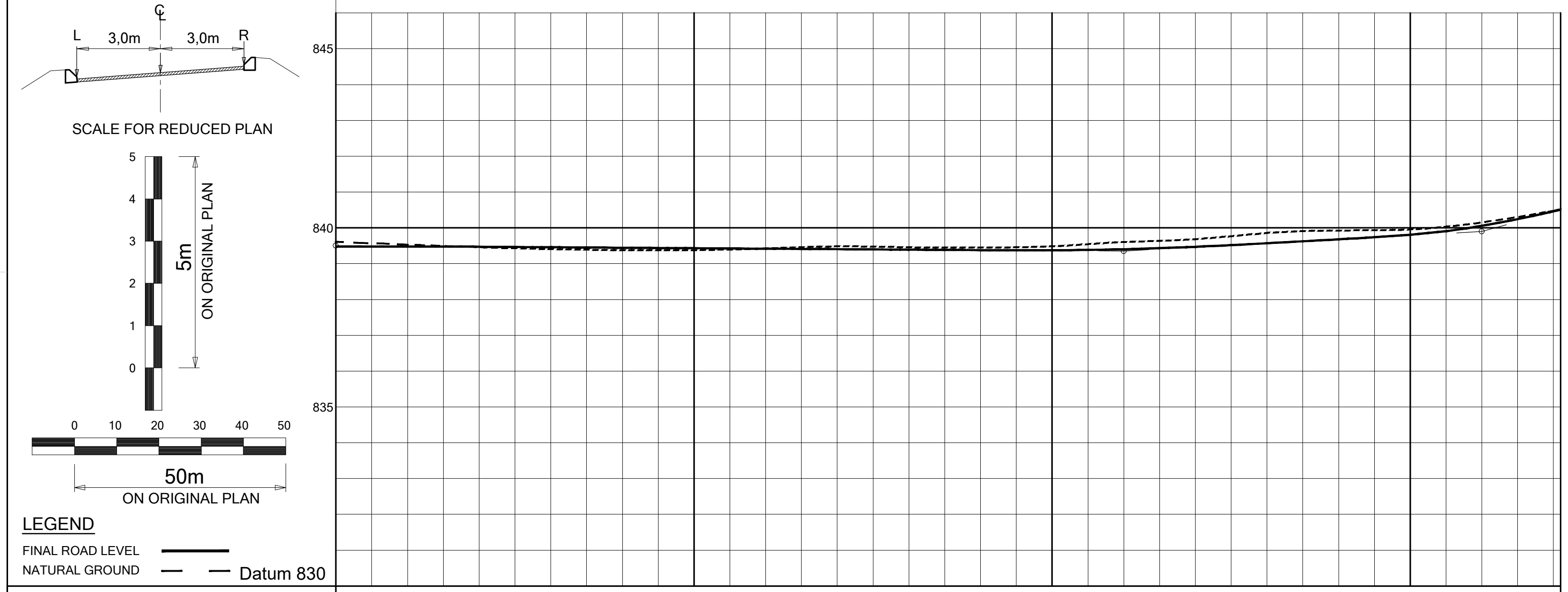
LAYOUT PLAN
SCALE 1:1000

LEGEND:

TREE	⌾
TAP	TAP ●
ROAD SIGN	⊚
BENCHMARK	⚲
GRAVEL ROAD	┄
POWERLINE	-·-·-
GATE	⋈
FENCE	-x-x-
PIPELINE	●—●
TELEPHONE LINE	○—○
PROPED NEW ROAD	▨

ROAD SETTING OUT DATA
Lo 29

PI No.	Ch	YLo	XLo	Radius	DA	TL	AL
Const:				(m)	D M S	(m)	(m)
PI 7	0.000	-5073.157	2536317.257	Kromhoek Road 4			
BC 8	67.251	-5041.132	2536376.394				
PI 8		-5029.764	2536397.385	35	68°35'35"	23.872	41.901
EC 8	109.153	-5006.071	2536394.463				
BC 9	219.543	-4896.510	2536380.952				
PI 9		-4879.036	2536378.796	15	99°08'30"	17.607	25.955
EC 9	245.499	-4879.684	2536396.391				
BC 10	560.201	-4891.277	2536710.880				
PI 10		-4891.642	2536720.775	10	89°25'57"	9.901	15.609
EC 10	575.810	-4881.751	2536721.237				
PI 11	1042.122	-4415.948	2536743.030				



LEGEND

FINAL ROAD LEVEL ——
NATURAL GROUND — —

Datum 830

Chainages		700	720	740	760	780	800	820	840	860	880	900	920	940	960	980	1000	1020	1040 1042
Vertical Alignment — *Design Road Levels*	*Left Edge (3.0m)*	839.417	839.424	839.413	839.399	839.385	839.372	839.358	839.345	839.331	839.317	839.309	839.336	839.405	839.510	839.620	839.730	839.951	840.393 840.452
	Centre Line (0.0m)	839.477	839.484	839.473	839.459	839.445	839.432	839.418	839.405	839.391	839.377	839.369	839.396	839.465	839.570	839.680	839.790	840.011	840.453 840.512
	Right Edge (3.0m)	839.537	839.544	839.533	839.519	839.505	839.492	839.478	839.465	839.451	839.437	839.429	839.456	839.525	839.630	839.740	839.850	840.071	840.513 840.572
C/L/ Peg Levels		839.609	839.532	839.453	839.405	839.370	839.371	839.416	839.509	839.448	839.450	839.457	839.632	839.646	839.887	839.940	839.918	840.122	840.474 840.512
CUT/ FILL		-0.132	-0.048	0.020	0.054	0.075	0.061	0.002	-0.104	-0.057	-0.073	-0.088	-0.236	-0.181	-0.317	-0.260	-0.128	-0.111	-0.021

Grades
700.000 839.500 -0.068 % 920.000 839.350 0.550 % 1020.000 839.900 2.766 %

Vertical Curves
60m VC K = 199 730
890 60m VC K = 97 950
1000 40m VC K = 18 1040

Superelevation
2%
-2%

Horizontal Curves
Direction 87.19.17

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY

P.o.Box 1593
SENWABARWANA
0790

Tel.: (015) 505-7100

BLOUBERG MUNICIPALITY

MORULA CONSULTING ENGINEERS

morula CONSULTING ENGINEERS & PROJECT MANAGERS "a new dawn"

P.o.Box 2740
POLOKWANE
0700

TEL. (015) 296-4460
FAX. (015) 296-4103

.... VDM .... DATE

.... CONSULTING ENGINEER .... DATE

TENDER No.: BM01/19/20

PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

ROAD 4 LAYOUT PLAN WITH LONGITUDINAL SECTION: Ch 700,000 TO Ch 1042,122

(Full signature)

.... CCLM .... 20 . / . / .

.... For: Consulting Engineer .... 20 . / . / .

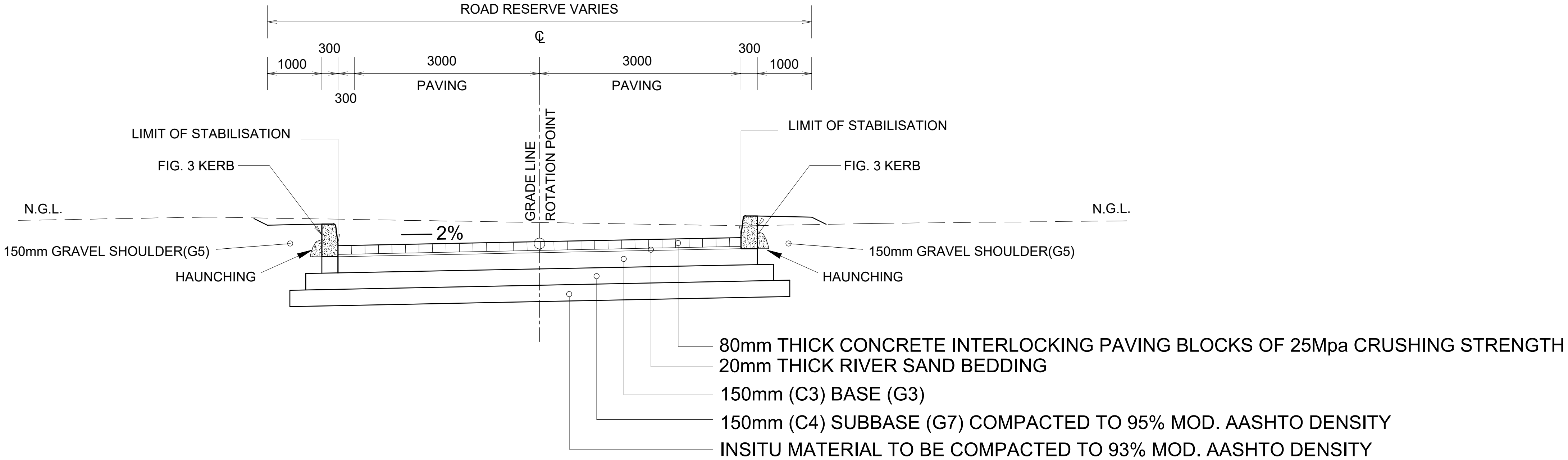
DRAWING NUMBER
MC/BLM/KISP5/Ls/06

SHEET 2 OF 2

SCALE
AS SHOWN

REVISION
⓪

ORIGINAL ON A1



PAVEMENT DESIGN

SCALE HOR. 1:500
VERT. 1:50

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY

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P.o.Box 1593
SENWABARWANA
0790

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morula CONSULTING ENGNEERS & PROJECT MANAGERS "a new dawn"

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POLOKWANE
0700

TEL. (015) 296-4460
FAX. (015) 296-4103

.... VDM .... DATE

.... CONSULTING ENGINEER .... DATE

TENDER No.: BM01/19/20

PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

TYPICAL CROSS SECTION

(Full signature)

.... CCLM 20 / /

For: Consulting Engineer .... 20 / /

DRAWING NUMBER
MC/BLM/KISP5/Xs/01

SHEET 1 OF 1

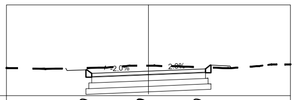
SCALE
AS SHOWN

REVISION
⓪

ORIGINAL ON A1

CHAINAGE 100

H.SCALE 1:200
V.SCALE 1:100

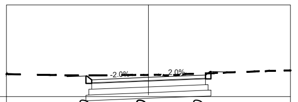


DATUM = 841

FINISHED	841.590	841.650	841.710
GROUND		841.795	
OFFSET	-3.000	0.000	3.000

CHAINAGE 80

H.SCALE 1:200
V.SCALE 1:100

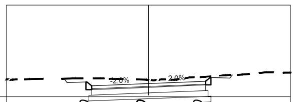


DATUM = 841

FINISHED	841.440	841.500	841.560
GROUND		841.565	
OFFSET	-3.000	0.000	3.000

CHAINAGE 60

H.SCALE 1:200
V.SCALE 1:100

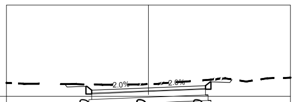


DATUM = 841

FINISHED	841.290	841.350	841.410
GROUND		841.442	
OFFSET	-3.000	0.000	3.000

CHAINAGE 40

H.SCALE 1:200
V.SCALE 1:100

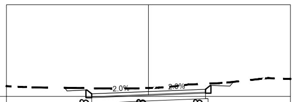


DATUM = 841

FINISHED	841.160	841.220	841.280
GROUND		841.315	
OFFSET	-3.000	0.000	3.000

CHAINAGE 20

H.SCALE 1:200
V.SCALE 1:100

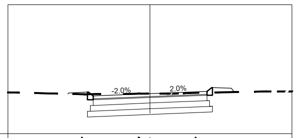


DATUM = 841

FINISHED	841.068	841.128	841.188
GROUND		841.219	
OFFSET	-3.000	0.000	3.000

CHAINAGE 0

H.SCALE 1:200
V.SCALE 1:100

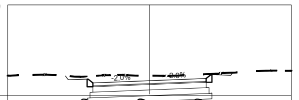


DATUM = 840

FINISHED	840.997	841.057	841.117
GROUND		841.057	
OFFSET	-3.000	0.000	3.000

CHAINAGE 220

H.SCALE 1:200
V.SCALE 1:100

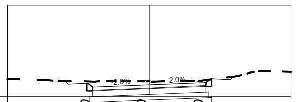


DATUM = 842

FINISHED	842.340	842.400	842.460
GROUND		842.530	
OFFSET	-3.000	0.000	3.000

CHAINAGE 200

H.SCALE 1:200
V.SCALE 1:100

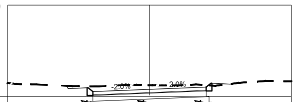


DATUM = 842

FINISHED	842.240	842.300	842.360
GROUND		842.391	
OFFSET	-3.000	0.000	3.000

CHAINAGE 180

H.SCALE 1:200
V.SCALE 1:100

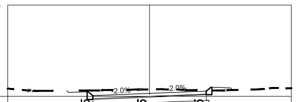


DATUM = 842

FINISHED	842.134	842.194	842.254
GROUND		842.306	
OFFSET	-3.000	0.000	3.000

CHAINAGE 160

H.SCALE 1:200
V.SCALE 1:100

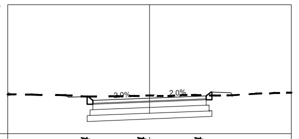


DATUM = 842

FINISHED	842.015	842.075	842.135
GROUND		842.177	
OFFSET	-3.000	0.000	3.000

CHAINAGE 140

H.SCALE 1:200
V.SCALE 1:100

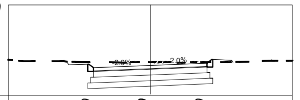


DATUM = 841

FINISHED	841.884	841.944	842.004
GROUND		842.007	
OFFSET	-3.000	0.000	3.000

CHAINAGE 120

H.SCALE 1:200
V.SCALE 1:100

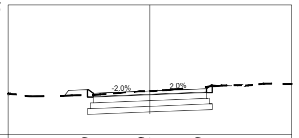


DATUM = 841

FINISHED	841.740	841.800	841.860
GROUND		841.890	
OFFSET	-3.000	0.000	3.000

CHAINAGE 335

H.SCALE 1:200
V.SCALE 1:100

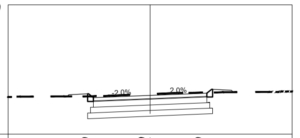


DATUM = 842

FINISHED	843.079	843.139	843.199
GROUND		843.139	
OFFSET	-3.000	0.000	3.000

CHAINAGE 320

H.SCALE 1:200
V.SCALE 1:100

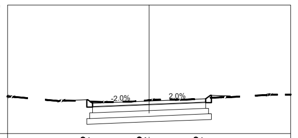


DATUM = 842

FINISHED	842.959	843.019	843.079
GROUND		843.057	
OFFSET	-3.000	0.000	3.000

CHAINAGE 300

H.SCALE 1:200
V.SCALE 1:100

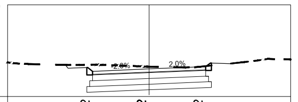


DATUM = 842

FINISHED	842.802	842.862	842.922
GROUND		842.890	
OFFSET	-3.000	0.000	3.000

CHAINAGE 280

H.SCALE 1:200
V.SCALE 1:100

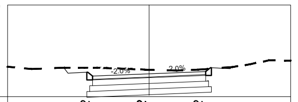


DATUM = 842

FINISHED	842.662	842.722	842.782
GROUND		842.787	
OFFSET	-3.000	0.000	3.000

CHAINAGE 260

H.SCALE 1:200
V.SCALE 1:100

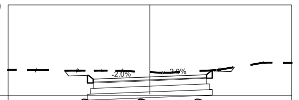


DATUM = 842

FINISHED	842.542	842.602	842.662
GROUND		842.708	
OFFSET	-3.000	0.000	3.000

CHAINAGE 240

H.SCALE 1:200
V.SCALE 1:100



DATUM = 842

FINISHED	842.440	842.500	842.560
GROUND		842.626	
OFFSET	-3.000	0.000	3.000

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY

P.o.Box 1593
SENWABARWANA
0790

Tel.: (015) 505-7100

BLOUBERG MUNICIPALITY

MORULA CONSULTING ENGINEERS

morula CONSULTING ENGNEERS & PROJECT MANAGERS "a new dawn"

P.o.Box 2740
POLOKWANE
0700

TEL. (015) 296-4460
FAX. (015) 296-4103

VDM DATE

CONSULTING ENGINEER DATE

TENDER No.: BM01/19/20

PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

ROAD 1 CROSS SECTIONS: (SHEET 1 OF 1)

(Full signature)

CCLM 20 / /

For: Consulting Engineer 20 / /

DRAWING NUMBER
MC/BLM/KISP5/Xs/02

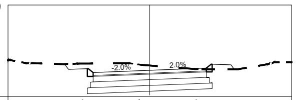
SHEET 1 OF 1

SCALE
AS SHOWN

REVISION
⓪

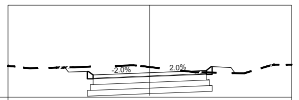
ORIGINAL ON A1

CHAINAGE 100
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



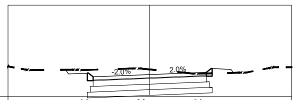
FINISHED	839.636	839.696	839.756
GROUND		839.822	
OFFSET	-3.000	0.000	3.000

CHAINAGE 80
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



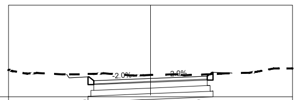
FINISHED	839.576	839.636	839.696
GROUND		839.789	
OFFSET	-3.000	0.000	3.000

CHAINAGE 60
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



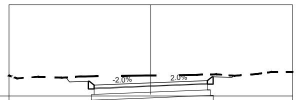
FINISHED	839.514	839.574	839.634
GROUND		839.713	
OFFSET	-3.000	0.000	3.000

CHAINAGE 40
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



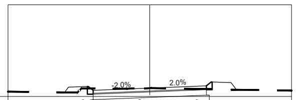
FINISHED	839.419	839.479	839.539
GROUND		839.566	
OFFSET	-3.000	0.000	3.000

CHAINAGE 20
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



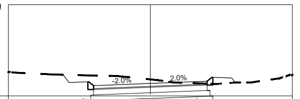
FINISHED	839.291	839.351	839.411
GROUND		839.543	
OFFSET	-3.000	0.000	3.000

CHAINAGE 0
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



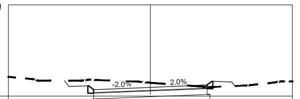
FINISHED	839.158	839.218	839.278
GROUND		839.218	
OFFSET	-3.000	0.000	3.000

CHAINAGE 220
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



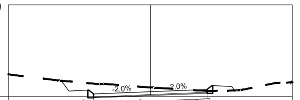
FINISHED	840.268	840.328	840.388
GROUND		840.429	
OFFSET	-3.000	0.000	3.000

CHAINAGE 200
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



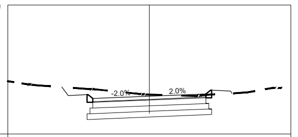
FINISHED	840.173	840.233	840.293
GROUND		840.352	
OFFSET	-3.000	0.000	3.000

CHAINAGE 180
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



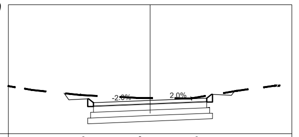
FINISHED	840.063	840.123	840.183
GROUND		840.234	
OFFSET	-3.000	0.000	3.000

CHAINAGE 160
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



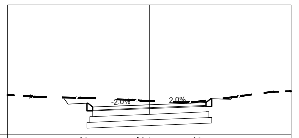
FINISHED	839.940	840.000	840.060
GROUND		840.043	
OFFSET	-3.000	0.000	3.000

CHAINAGE 140
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



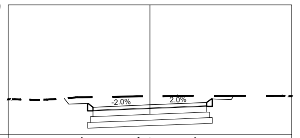
FINISHED	839.818	839.878	839.938
GROUND		839.945	
OFFSET	-3.000	0.000	3.000

CHAINAGE 120
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



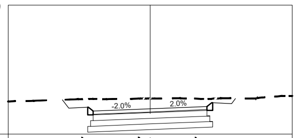
FINISHED	839.715	839.775	839.835
GROUND		839.878	
OFFSET	-3.000	0.000	3.000

CHAINAGE 320
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



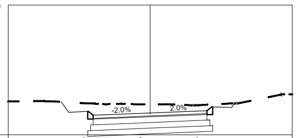
FINISHED	840.717	840.777	840.837
GROUND		841.004	
OFFSET	-3.000	0.000	3.000

CHAINAGE 300
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



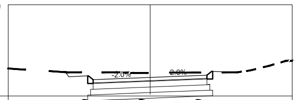
FINISHED	840.607	840.667	840.727
GROUND		840.938	
OFFSET	-3.000	0.000	3.000

CHAINAGE 280
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



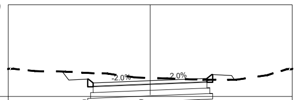
FINISHED	840.512	840.572	840.632
GROUND		840.801	
OFFSET	-3.000	0.000	3.000

CHAINAGE 260
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



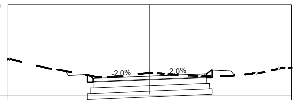
FINISHED	840.430	840.490	840.550
GROUND		840.615	
OFFSET	-3.000	0.000	3.000

CHAINAGE 240
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



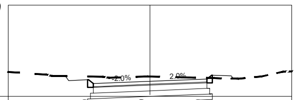
FINISHED	840.350	840.410	840.470
GROUND		840.486	
OFFSET	-3.000	0.000	3.000

CHAINAGE 440
H.SCALE 1:200
V.SCALE 1:100
DATUM = 841



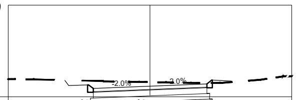
FINISHED	841.461	841.521	841.581
GROUND		841.606	
OFFSET	-3.000	0.000	3.000

CHAINAGE 420
H.SCALE 1:200
V.SCALE 1:100
DATUM = 841



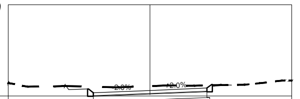
FINISHED	841.340	841.400	841.460
GROUND		841.524	
OFFSET	-3.000	0.000	3.000

CHAINAGE 400
H.SCALE 1:200
V.SCALE 1:100
DATUM = 841



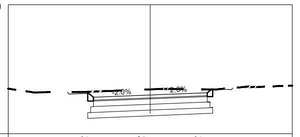
FINISHED	841.215	841.275	841.335
GROUND		841.385	
OFFSET	-3.000	0.000	3.000

CHAINAGE 380
H.SCALE 1:200
V.SCALE 1:100
DATUM = 841



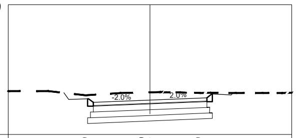
FINISHED	841.090	841.150	841.210
GROUND		841.265	
OFFSET	-3.000	0.000	3.000

CHAINAGE 360
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



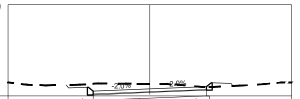
FINISHED	840.965	841.025	841.085
GROUND		841.173	
OFFSET	-3.000	0.000	3.000

CHAINAGE 340
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



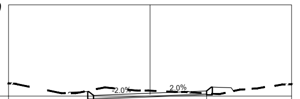
FINISHED	840.840	840.900	840.960
GROUND		841.106	
OFFSET	-3.000	0.000	3.000

CHAINAGE 560
H.SCALE 1:200
V.SCALE 1:100
DATUM = 842



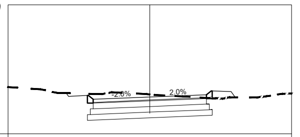
FINISHED	842.126	842.186	842.246
GROUND		842.306	
OFFSET	-3.000	0.000	3.000

CHAINAGE 540
H.SCALE 1:200
V.SCALE 1:100
DATUM = 842



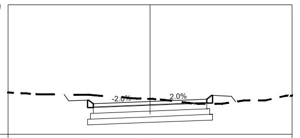
FINISHED	842.019	842.079	842.139
GROUND		842.141	
OFFSET	-3.000	0.000	3.000

CHAINAGE 520
H.SCALE 1:200
V.SCALE 1:100
DATUM = 841



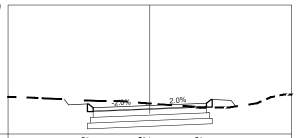
FINISHED	841.911	841.971	842.031
GROUND		842.039	
OFFSET	-3.000	0.000	3.000

CHAINAGE 500
H.SCALE 1:200
V.SCALE 1:100
DATUM = 841



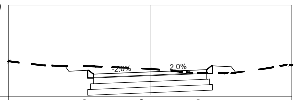
FINISHED	841.804	841.864	841.924
GROUND		841.932	
OFFSET	-3.000	0.000	3.000

CHAINAGE 480
H.SCALE 1:200
V.SCALE 1:100
DATUM = 841



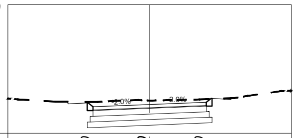
FINISHED	841.693	841.753	841.813
GROUND		841.807	
OFFSET	-3.000	0.000	3.000

CHAINAGE 460
H.SCALE 1:200
V.SCALE 1:100
DATUM = 841



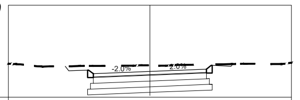
FINISHED	841.579	841.639	841.699
GROUND		841.715	
OFFSET	-3.000	0.000	3.000

CHAINAGE 680
H.SCALE 1:200
V.SCALE 1:100
DATUM = 842



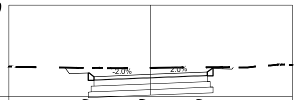
FINISHED	842.700	842.760	842.820
GROUND		842.864	
OFFSET	-3.000	0.000	3.000

CHAINAGE 660
H.SCALE 1:200
V.SCALE 1:100
DATUM = 842



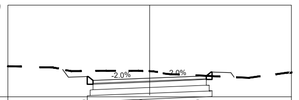
FINISHED	842.610	842.670	842.730
GROUND		842.831	
OFFSET	-3.000	0.000	3.000

CHAINAGE 640
H.SCALE 1:200
V.SCALE 1:100
DATUM = 842



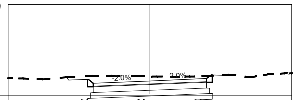
FINISHED	842.520	842.580	842.640
GROUND		842.754	
OFFSET	-3.000	0.000	3.000

CHAINAGE 620
H.SCALE 1:200
V.SCALE 1:100
DATUM = 842



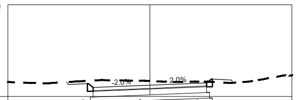
FINISHED	842.429	842.489	842.549
GROUND		842.668	
OFFSET	-3.000	0.000	3.000

CHAINAGE 600
H.SCALE 1:200
V.SCALE 1:100
DATUM = 842



FINISHED	842.334	842.394	842.454
GROUND		842.511	
OFFSET	-3.000	0.000	3.000

CHAINAGE 580
H.SCALE 1:200
V.SCALE 1:100
DATUM = 842



FINISHED	842.232	842.292	842.352
GROUND		842.402	
OFFSET	-3.000	0.000	3.000

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY
P.o.Box 1593
SENWABARWANA
0790
Tel.: (015) 505-7100
BLOUBERG MUNICIPALITY

MORULA CONSULTING ENGINEERS
morula
CONSULTING ENGINEERS & PROJECT MANAGERS
"a new dawn"
P.o.Box 2740
POLOKWANE
0700
TEL. (015) 296-4460
FAX. (015) 296-4103

VDM .... DATE ....
CONSULTING ENGINEER .... DATE ....

TENDER No.: BM01/19/20
PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

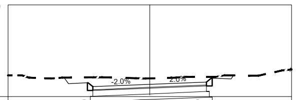
ROAD 2 CROSS SECTIONS: (SHEET 1 OF 2)

(Full signature)
CCLM 20 / /
For Consulting Engineer 20 / /

SHEET 1 OF 2
SCALE
AS SHOWN
DRAWING NUMBER
MC/BLM/KISP5/Xs/03
REVISION
0

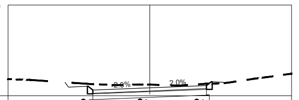
ORIGINAL ON A1

CHAINAGE 800
H.SCALE 1:200
V.SCALE 1:100
DATUM = 843



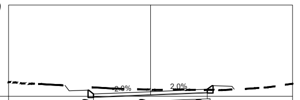
FINISHED	843.259	843.319	843.379
GROUND		843.473	
OFFSET	-3.000	0.000	3.000

CHAINAGE 780
H.SCALE 1:200
V.SCALE 1:100
DATUM = 843



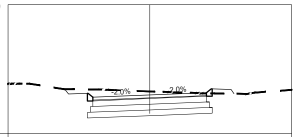
FINISHED	843.152	843.212	843.272
GROUND		843.297	
OFFSET	-3.000	0.000	3.000

CHAINAGE 760
H.SCALE 1:200
V.SCALE 1:100
DATUM = 843



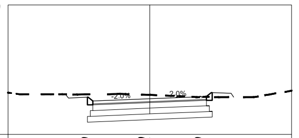
FINISHED	843.060	843.120	843.180
GROUND		843.171	
OFFSET	-3.000	0.000	3.000

CHAINAGE 740
H.SCALE 1:200
V.SCALE 1:100
DATUM = 842



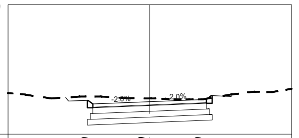
FINISHED	842.970	843.030	843.090
GROUND		843.121	
OFFSET	-3.000	0.000	3.000

CHAINAGE 720
H.SCALE 1:200
V.SCALE 1:100
DATUM = 842



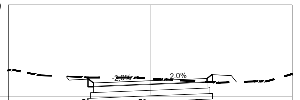
FINISHED	842.880	842.940	843.000
GROUND		843.041	
OFFSET	-3.000	0.000	3.000

CHAINAGE 700
H.SCALE 1:200
V.SCALE 1:100
DATUM = 842



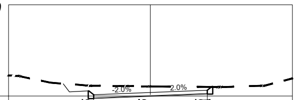
FINISHED	842.790	842.850	842.910
GROUND		842.937	
OFFSET	-3.000	0.000	3.000

CHAINAGE 920
H.SCALE 1:200
V.SCALE 1:100
DATUM = 844



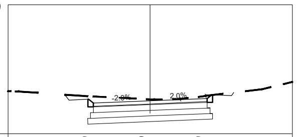
FINISHED	844.343	844.403	844.463
GROUND		844.462	
OFFSET	-3.000	0.000	3.000

CHAINAGE 900
H.SCALE 1:200
V.SCALE 1:100
DATUM = 844



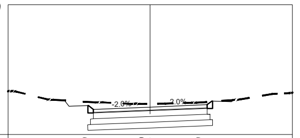
FINISHED	844.035	844.095	844.155
GROUND		844.252	
OFFSET	-3.000	0.000	3.000

CHAINAGE 880
H.SCALE 1:200
V.SCALE 1:100
DATUM = 843



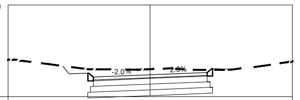
FINISHED	843.810	843.870	843.930
GROUND		843.913	
OFFSET	-3.000	0.000	3.000

CHAINAGE 860
H.SCALE 1:200
V.SCALE 1:100
DATUM = 843



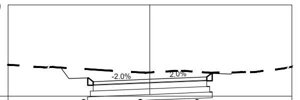
FINISHED	843.660	843.720	843.780
GROUND		843.806	
OFFSET	-3.000	0.000	3.000

CHAINAGE 840
H.SCALE 1:200
V.SCALE 1:100
DATUM = 843



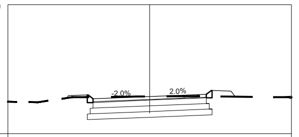
FINISHED	843.520	843.580	843.640
GROUND		843.727	
OFFSET	-3.000	0.000	3.000

CHAINAGE 820
H.SCALE 1:200
V.SCALE 1:100
DATUM = 843



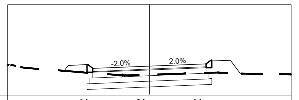
FINISHED	843.382	843.442	843.502
GROUND		843.626	
OFFSET	-3.000	0.000	3.000

CHAINAGE 950
H.SCALE 1:200
V.SCALE 1:100
DATUM = 844



FINISHED	844.926	844.986	845.046
GROUND		844.986	
OFFSET	-3.000	0.000	3.000

CHAINAGE 940
H.SCALE 1:200
V.SCALE 1:100
DATUM = 844



FINISHED	844.724	844.784	844.844
GROUND		844.559	
OFFSET	-3.000	0.000	3.000

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY
BLOUBERG MUNICIPALITY
P.o.Box 1593
SENWABARWANA
0790
Tel.: (015) 505-7100

MORULA CONSULTING ENGINEERS
morula
CONSULTING ENGINEERS
& PROJECT MANAGERS
"a new dawn"
P.o.Box 2740
POLOKWANE
0700
TEL. (015) 296-4460
FAX. (015) 296-4103

.... VDM .... DATE
.... CONSULTING ENGINEER .... DATE

TENDER No.: BM01/19/20
PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

ROAD 2 CROSS SECTIONS: (SHEET 2 OF 2)

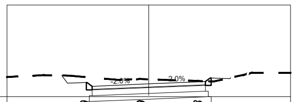
(Full signature)
.... CCLM 20 / /
.... For: Consulting Engineer 20 / /

DRAWING NUMBER
MC/BLM/KISP5/Xs/04

SHEET 2 OF 2
SCALE
AS SHOWN
REVISION
⓪

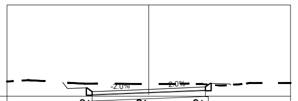
ORIGINAL ON A1

CHAINAGE 100
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



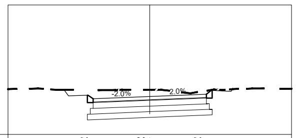
FINISHED	840.279	840.339	840.398
GROUND		840.461	
OFFSET	-3.000	0.000	3.000

CHAINAGE 80
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



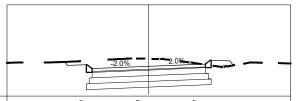
FINISHED	840.122	840.182	840.242
GROUND		840.322	
OFFSET	-3.000	0.000	3.000

CHAINAGE 60
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



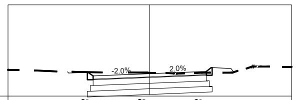
FINISHED	839.934	839.994	840.054
GROUND		840.174	
OFFSET	-3.000	0.000	3.000

CHAINAGE 40
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



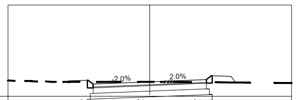
FINISHED	839.731	839.791	839.851
GROUND		839.989	
OFFSET	-3.000	0.000	3.000

CHAINAGE 20
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



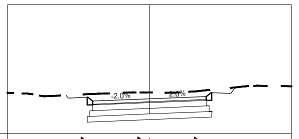
FINISHED	839.528	839.588	839.648
GROUND		839.613	
OFFSET	-3.000	0.000	3.000

CHAINAGE 0
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



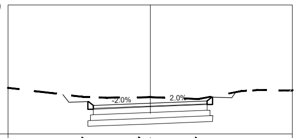
FINISHED	839.325	839.385	839.445
GROUND		839.385	
OFFSET	-3.000	0.000	3.000

CHAINAGE 220
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



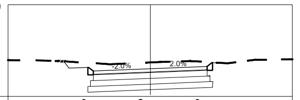
FINISHED	840.867	840.927	840.987
GROUND		841.095	
OFFSET	-3.000	0.000	3.000

CHAINAGE 200
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



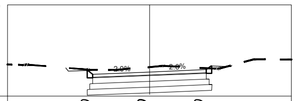
FINISHED	840.757	840.817	840.877
GROUND		840.973	
OFFSET	-3.000	0.000	3.000

CHAINAGE 180
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



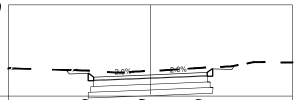
FINISHED	840.662	840.722	840.782
GROUND		840.891	
OFFSET	-3.000	0.000	3.000

CHAINAGE 160
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



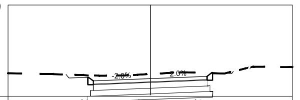
FINISHED	840.580	840.640	840.700
GROUND		840.768	
OFFSET	-3.000	0.000	3.000

CHAINAGE 140
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



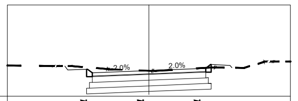
FINISHED	840.500	840.560	840.620
GROUND		840.662	
OFFSET	-3.000	0.000	3.000

CHAINAGE 120
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



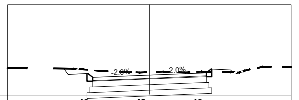
FINISHED	840.405	840.465	840.525
GROUND		840.591	
OFFSET	-3.000	0.000	3.000

CHAINAGE 310
H.SCALE 1:200
V.SCALE 1:100
DATUM = 841



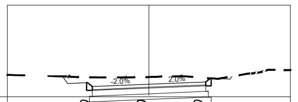
FINISHED	841.614	841.674	841.734
GROUND		841.674	
OFFSET	-3.000	0.000	3.000

CHAINAGE 300
H.SCALE 1:200
V.SCALE 1:100
DATUM = 841



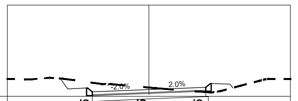
FINISHED	841.486	841.546	841.606
GROUND		841.626	
OFFSET	-3.000	0.000	3.000

CHAINAGE 280
H.SCALE 1:200
V.SCALE 1:100
DATUM = 841



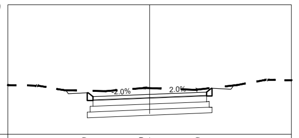
FINISHED	841.270	841.330	841.390
GROUND		841.520	
OFFSET	-3.000	0.000	3.000

CHAINAGE 260
H.SCALE 1:200
V.SCALE 1:100
DATUM = 841



FINISHED	841.115	841.175	841.235
GROUND		841.228	
OFFSET	-3.000	0.000	3.000

CHAINAGE 240
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



FINISHED	840.990	841.050	841.110
GROUND		841.214	
OFFSET	-3.000	0.000	3.000

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY
P.o.Box 1593
SENWABARWANA
0790

Tel.: (015) 505-7100

KODUMELA
BLOUBERG MUNICIPALITY

MORULA CONSULTING ENGINEERS
morula CONSULTING ENGNEERS & PROJECT MANAGERS "a new dawn"
P.o.Box 2740
POLOKWANE
0700
TEL. (015) 296-4460
FAX. (015) 296-4103

.... VDM .... DATE

.... CONSULTING ENGINEER .... DATE

TENDER No.: BM01/19/20

PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

ROAD 3 CROSS SECTIONS: (SHEET 1 OF 1)

(Full signature)
.... CCLM ....20 / /
For: Consulting Engineer ....20 / /

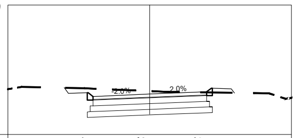
DRAWING NUMBER
MC/BLM/KISP5/Xs/05

SHEET 1 OF 1

SCALE
AS SHOWN

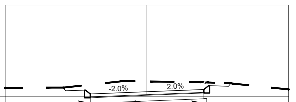
REVISION
⓪

ORIGINAL ON A1

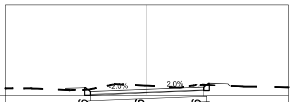
CHAINAGE 100
H.SCALE 1:200
V.SCALE 1:100


DATUM = 837

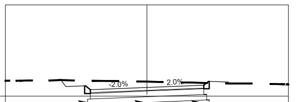
FINISHED	838.006	838.065	838.125
GROUND		838.144	
OFFSET	-3.000	0.000	3.000

CHAINAGE 80
H.SCALE 1:200
V.SCALE 1:100
DATUM = 838


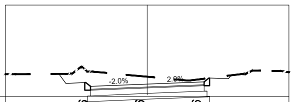
FINISHED	838.061	838.121	838.181
GROUND		838.390	
OFFSET	-3.000	0.000	3.000

CHAINAGE 60
H.SCALE 1:200
V.SCALE 1:100
DATUM = 838


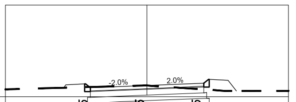
FINISHED	838.116	838.176	838.236
GROUND		838.272	
OFFSET	-3.000	0.000	3.000

CHAINAGE 40
H.SCALE 1:200
V.SCALE 1:100
DATUM = 838


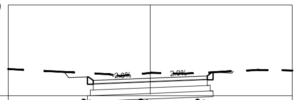
FINISHED	838.171	838.231	838.291
GROUND		838.381	
OFFSET	-3.000	0.000	3.000

CHAINAGE 20
H.SCALE 1:200
V.SCALE 1:100
DATUM = 838


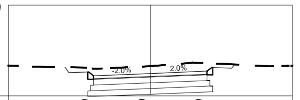
FINISHED	838.266	838.326	838.386
GROUND		838.520	
OFFSET	-3.000	0.000	3.000

CHAINAGE 0
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839


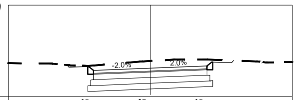
FINISHED	839.235	839.295	839.355
GROUND		839.295	
OFFSET	-3.000	0.000	3.000

CHAINAGE 220
H.SCALE 1:200
V.SCALE 1:100
DATUM = 837


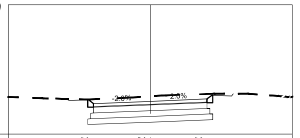
FINISHED	837.402	837.462	837.522
GROUND		837.607	
OFFSET	-3.000	0.000	3.000

CHAINAGE 200
H.SCALE 1:200
V.SCALE 1:100
DATUM = 837


FINISHED	837.540	837.600	837.660
GROUND		837.793	
OFFSET	-3.000	0.000	3.000

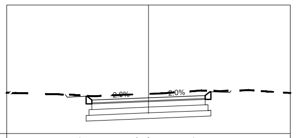
CHAINAGE 180
H.SCALE 1:200
V.SCALE 1:100
DATUM = 837


FINISHED	837.686	837.746	837.806
GROUND		837.935	
OFFSET	-3.000	0.000	3.000

CHAINAGE 160
H.SCALE 1:200
V.SCALE 1:100


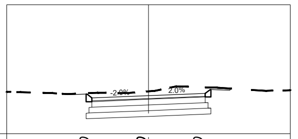
DATUM = 837

FINISHED	837.804	837.864	837.924
GROUND		837.994	
OFFSET	-3.000	0.000	3.000

CHAINAGE 140
H.SCALE 1:200
V.SCALE 1:100


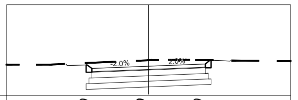
DATUM = 837

FINISHED	837.891	837.951	838.011
GROUND		838.054	
OFFSET	-3.000	0.000	3.000

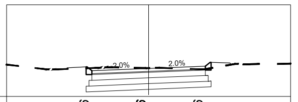
CHAINAGE 120
H.SCALE 1:200
V.SCALE 1:100


DATUM = 837

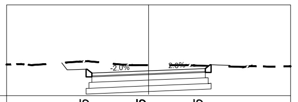
FINISHED	837.950	838.010	838.070
GROUND		838.120	
OFFSET	-3.000	0.000	3.000

CHAINAGE 340
H.SCALE 1:200
V.SCALE 1:100
DATUM = 837


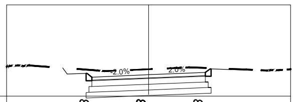
FINISHED	837.720	837.780	837.840
GROUND		837.939	
OFFSET	-3.000	0.000	3.000

CHAINAGE 320
H.SCALE 1:200
V.SCALE 1:100
DATUM = 837


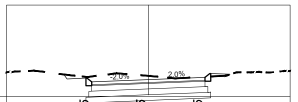
FINISHED	837.676	837.736	837.796
GROUND		837.743	
OFFSET	-3.000	0.000	3.000

CHAINAGE 300
H.SCALE 1:200
V.SCALE 1:100
DATUM = 837


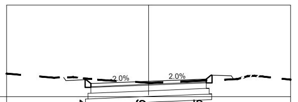
FINISHED	837.605	837.665	837.725
GROUND		837.814	
OFFSET	-3.000	0.000	3.000

CHAINAGE 280
H.SCALE 1:200
V.SCALE 1:100
DATUM = 837


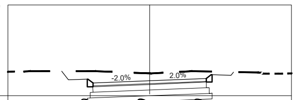
FINISHED	837.503	837.563	837.623
GROUND		837.710	
OFFSET	-3.000	0.000	3.000

CHAINAGE 260
H.SCALE 1:200
V.SCALE 1:100
DATUM = 837


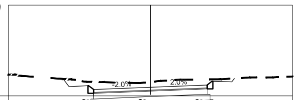
FINISHED	837.385	837.445	837.505
GROUND		837.539	
OFFSET	-3.000	0.000	3.000

CHAINAGE 240
H.SCALE 1:200
V.SCALE 1:100
DATUM = 837


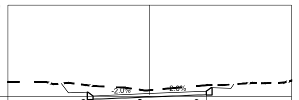
FINISHED	837.347	837.406	837.465
GROUND		837.368	
OFFSET	-3.000	0.000	3.000

CHAINAGE 460
H.SCALE 1:200
V.SCALE 1:100
DATUM = 838


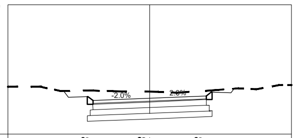
FINISHED	838.340	838.400	838.460
GROUND		838.590	
OFFSET	-3.000	0.000	3.000

CHAINAGE 440
H.SCALE 1:200
V.SCALE 1:100
DATUM = 838


FINISHED	838.173	838.233	838.293
GROUND		838.374	
OFFSET	-3.000	0.000	3.000

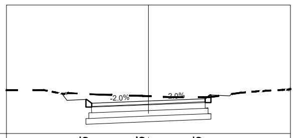
CHAINAGE 420
H.SCALE 1:200
V.SCALE 1:100
DATUM = 838


FINISHED	838.012	838.072	838.132
GROUND		838.159	
OFFSET	-3.000	0.000	3.000

CHAINAGE 400
H.SCALE 1:200
V.SCALE 1:100


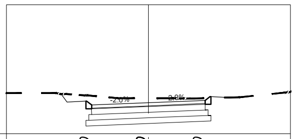
DATUM = 837

FINISHED	837.888	837.948	838.008
GROUND		838.117	
OFFSET	-3.000	0.000	3.000

CHAINAGE 380
H.SCALE 1:200
V.SCALE 1:100


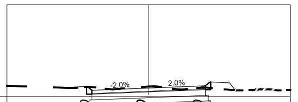
DATUM = 837

FINISHED	837.805	837.865	837.925
GROUND		837.993	
OFFSET	-3.000	0.000	3.000

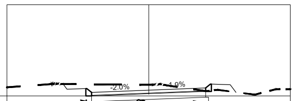
CHAINAGE 360
H.SCALE 1:200
V.SCALE 1:100


DATUM = 837

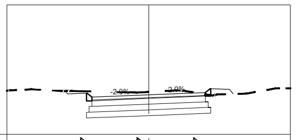
FINISHED	837.760	837.820	837.880
GROUND		837.940	
OFFSET	-3.000	0.000	3.000

CHAINAGE 580
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839


FINISHED	839.160	839.220	839.280
GROUND		839.259	
OFFSET	-3.000	0.000	3.000

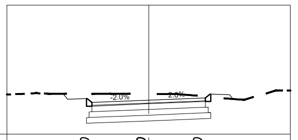
CHAINAGE 560
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839


FINISHED	839.094	839.153	839.211
GROUND		839.297	
OFFSET	-3.000	0.000	3.000

CHAINAGE 540
H.SCALE 1:200
V.SCALE 1:100


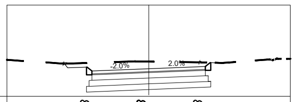
DATUM = 838

FINISHED	838.987	839.047	839.107
GROUND		839.119	
OFFSET	-3.000	0.000	3.000

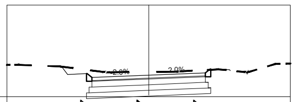
CHAINAGE 520
H.SCALE 1:200
V.SCALE 1:100


DATUM = 838

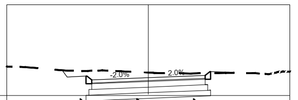
FINISHED	838.840	838.900	838.960
GROUND		839.063	
OFFSET	-3.000	0.000	3.000

CHAINAGE 500
H.SCALE 1:200
V.SCALE 1:100
DATUM = 838


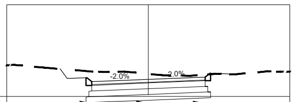
FINISHED	838.673	838.733	838.793
GROUND		838.922	
OFFSET	-3.000	0.000	3.000

CHAINAGE 480
H.SCALE 1:200
V.SCALE 1:100
DATUM = 838


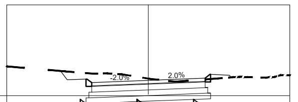
FINISHED	838.507	838.567	838.627
GROUND		838.653	
OFFSET	-3.000	0.000	3.000

CHAINAGE 700
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839


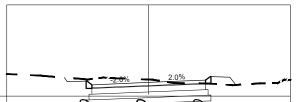
FINISHED	839.417	839.477	839.537
GROUND		839.609	
OFFSET	-3.000	0.000	3.000

CHAINAGE 680
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839


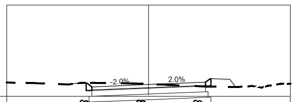
FINISHED	839.391	839.451	839.511
GROUND		839.594	
OFFSET	-3.000	0.000	3.000

CHAINAGE 660
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839


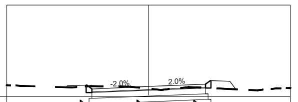
FINISHED	839.347	839.407	839.467
GROUND		839.454	
OFFSET	-3.000	0.000	3.000

CHAINAGE 640
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839


FINISHED	839.300	839.360	839.420
GROUND		839.436	
OFFSET	-3.000	0.000	3.000

CHAINAGE 620
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839


FINISHED	839.253	839.313	839.373
GROUND		839.326	
OFFSET	-3.000	0.000	3.000

CHAINAGE 600
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839


FINISHED	839.207	839.267	839.327
GROUND		839.209	
OFFSET	-3.000	0.000	3.000

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY
P.o.Box 1593
SENWABARWANA
0790
Tel.: (015) 505-7100
BLOUBERG MUNICIPALITY

MORULA CONSULTING ENGINEERS
morula
CONSULTING ENGINEERS & PROJECT MANAGERS
"a new dawn"
P.o.Box 2740
POLOKWANE
0700
TEL. (015) 296-4460
FAX. (015) 296-4103

.... VDM .... DATE
.... CONSULTING ENGINEER .... DATE

TENDER No.: BM01/19/20
PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

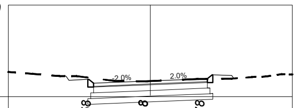
ROAD 4 CROSS SECTIONS: (SHEET 1 OF 2)

(Full signature)
.... CCLM .... 20 / /
.... For Consulting Engineer .... 20 / /

SHEET 1 OF 2
SCALE
AS SHOWN
DRAWING NUMBER
MC/BLM/KISP5Xs/06
REVISION
0

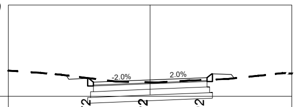
ORIGINAL ON A1

CHAINAGE 820
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



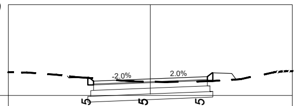
FINISHED	839.358	839.418	839.478
GROUND		839.416	
OFFSET	-3.000	0.000	3.000

CHAINAGE 800
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



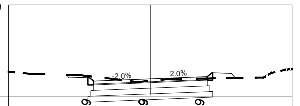
FINISHED	839.372	839.432	839.492
GROUND		839.371	
OFFSET	-3.000	0.000	3.000

CHAINAGE 780
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



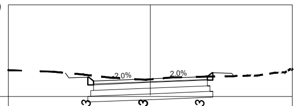
FINISHED	839.385	839.445	839.505
GROUND		839.370	
OFFSET	-3.000	0.000	3.000

CHAINAGE 760
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



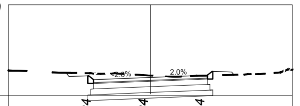
FINISHED	839.399	839.459	839.519
GROUND		839.405	
OFFSET	-3.000	0.000	3.000

CHAINAGE 740
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



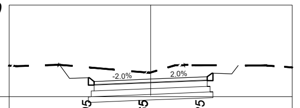
FINISHED	839.413	839.473	839.533
GROUND		839.453	
OFFSET	-3.000	0.000	3.000

CHAINAGE 720
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



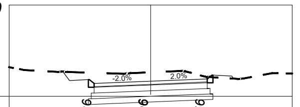
FINISHED	839.424	839.484	839.544
GROUND		839.532	
OFFSET	-3.000	0.000	3.000

CHAINAGE 940
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



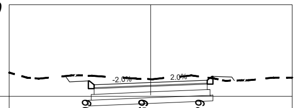
FINISHED	839.405	839.465	839.525
GROUND		839.646	
OFFSET	-3.000	0.000	3.000

CHAINAGE 920
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



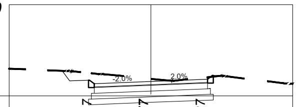
FINISHED	839.336	839.396	839.456
GROUND		839.632	
OFFSET	-3.000	0.000	3.000

CHAINAGE 900
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



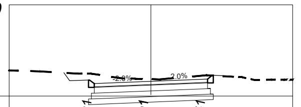
FINISHED	839.309	839.369	839.429
GROUND		839.457	
OFFSET	-3.000	0.000	3.000

CHAINAGE 880
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



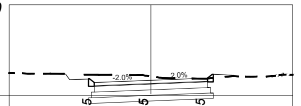
FINISHED	839.317	839.377	839.437
GROUND		839.450	
OFFSET	-3.000	0.000	3.000

CHAINAGE 860
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



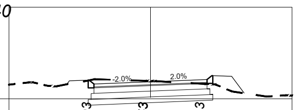
FINISHED	839.331	839.391	839.451
GROUND		839.448	
OFFSET	-3.000	0.000	3.000

CHAINAGE 840
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



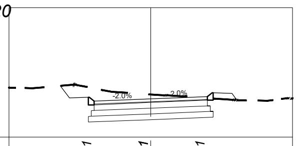
FINISHED	839.345	839.405	839.465
GROUND		839.509	
OFFSET	-3.000	0.000	3.000

CHAINAGE 1040
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



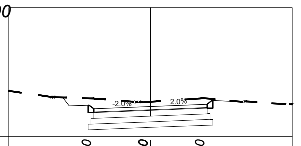
FINISHED	840.393	840.453	840.513
GROUND		840.474	
OFFSET	-3.000	0.000	3.000

CHAINAGE 1020
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



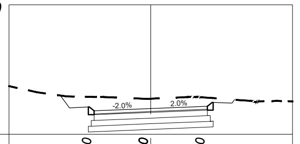
FINISHED	839.951	840.011	840.071
GROUND		840.122	
OFFSET	-3.000	0.000	3.000

CHAINAGE 1000
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



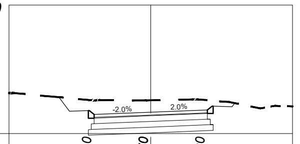
FINISHED	839.730	839.790	839.850
GROUND		839.918	
OFFSET	-3.000	0.000	3.000

CHAINAGE 980
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



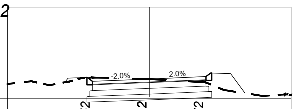
FINISHED	839.620	839.680	839.740
GROUND		839.940	
OFFSET	-3.000	0.000	3.000

CHAINAGE 960
H.SCALE 1:200
V.SCALE 1:100
DATUM = 839



FINISHED	839.510	839.570	839.630
GROUND		839.887	
OFFSET	-3.000	0.000	3.000

CHAINAGE 1042
H.SCALE 1:200
V.SCALE 1:100
DATUM = 840



FINISHED	840.452	840.512	840.572
GROUND		840.512	
OFFSET	-3.000	0.000	3.000

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY
BLOUBERG MUNICIPALITY
P.o.Box 1593
SENWABARWANA
0790
Tel.: (015) 505-7100

MORULA CONSULTING ENGINEERS
morula CONSULTING ENGINEERS & PROJECT MANAGERS "a new dawn"
P.o.Box 2740
POLOKWANE
0700
TEL. (015) 296-4460
FAX. (015) 296-4103

VDM .... DATE ....
CONSULTING ENGINEER .... DATE ....

TENDER No.: BM01/19/20
PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

ROAD 4 CROSS SECTIONS: (SHEET 2 OF 2)

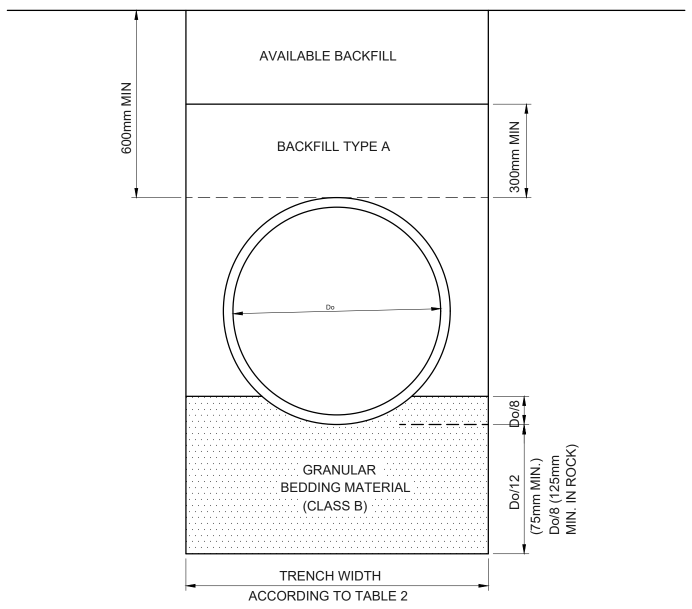
(Full signature)
CCLM .... 20 / /
For: Consulting Engineer .... 20 / /

SHEET 2 OF 2
SCALE AS SHOWN
DRAWING NUMBER MC/BLM/KISP5/Xs/07
REVISION ⓪

ORIGINAL ON A1

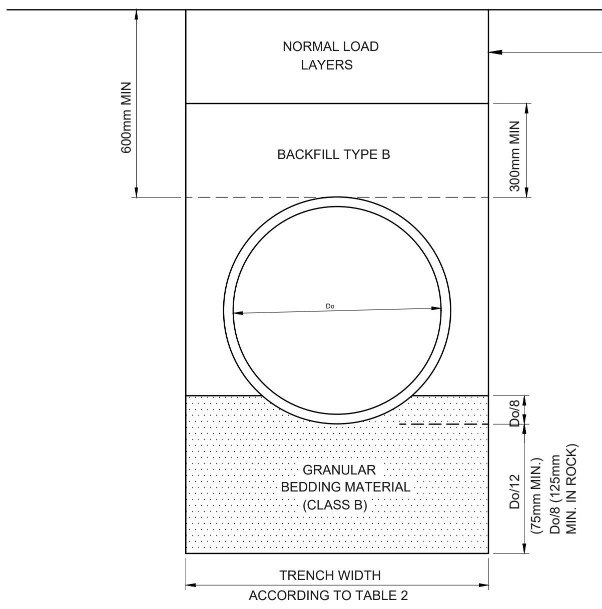
STORMWATER UNDER SIDEWALKS

DETAIL 1



STORMWATER UNDER ROADS. ACCESS ROADS AND PARKING AREAS

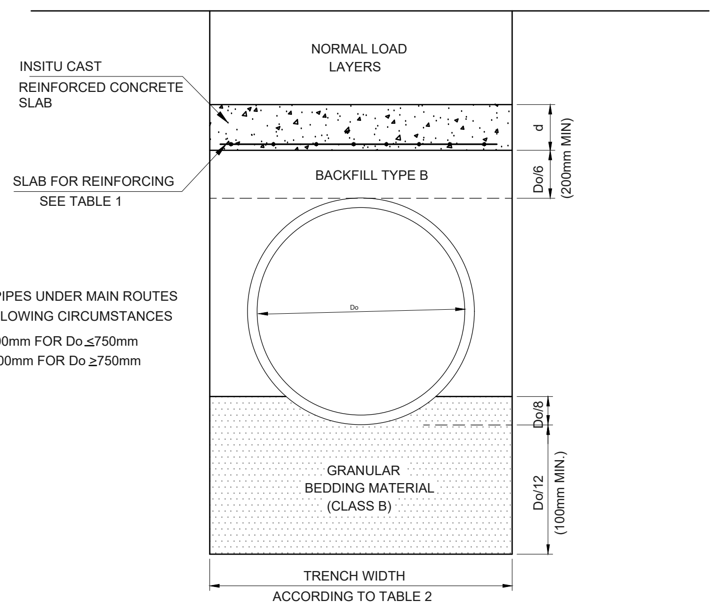
DETAIL 2



USE THIS LAYER IN
CASE OF EXISTING
ROADS AND PARKING
AREAS. REPLACE
THIS LAYER WITH
BACKFILL TYPE B.
IN CASE OF NEW
ROADS AND
PARKING AREAS.

SITUATION WHERE A CONCRETE SLAB IS REQUIRED

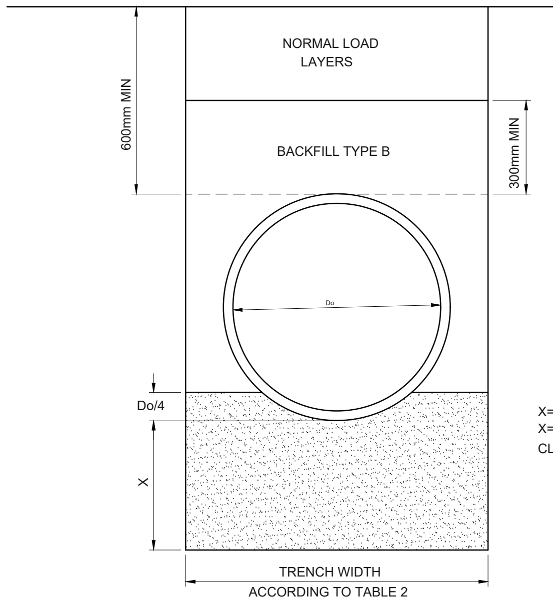
DETAIL 3



STORMWATER PIPES UNDER MAIN ROUTES
UNDER THE FOLLOWING CIRCUMSTANCES
(i) COVER ≤ 600mm FOR Do ≤750mm
(ii) COVER ≤ 900mm FOR Do ≥750mm

SITUATION WHERE A CONCRETE BEDDING IS REQUIRED

DETAIL 4



X=Do/4 - TRENCH IN GROUND
X=Do/8 - TRENCH IN ROCK
CLASS 20/19 CONCRETE

DETAIL 3

CONCRETE SLAB: 25MPa CONCRETE	DEPTH	REINFORCING	MINIMUM COVER
Do ≤ 900mm	150mm	245 WELDED MESH	40mm
900mm < Do ≤ 180mm	200mm	311 WELDED MESH	40mm

Ø	TRENCH WIDTH	COVER (m)											
mm	mm	0.6	0.9	1.0	1.2	1.5	1.8	2.0	2.5	3.0	4.0	5.0	6.0
450	950	75D	75D	750	75D	50D	50D	50D	75D	75D	75D	75D	75D
525	1020	75D	75D	50D	50D	50D	50D	50D	75D	75D	75D	75D	75D
600	1620	75D	50D	50D	50D	50D	50D	75D	75D	75D	100D	100D*	100D†
675	1710	75D	75D	75D	75D	75D	75D	75D	75D	75D	100D	100D	100D
750	1790	75D	50D	50D	50D	50D	75D	75D	75D	75D	100D	100D*	75D †
825	1870	75D	50D	50D	50D	50D	50D	75D	75D	75D	100D	100D	100D*
900	1950	75D	50D	50D	50D	50D	75D	75D	75D	75D	100D	100D	100D*
1050	2120	75D	75D	75D	75D	75D	75D	75D	75D	75D	75D	100D	100D
1200	2280	75D	50D	50D	50D	50D	50D	50D	75D	75D	75D	100D	100D
1350	2450	50D	50D	50D	50D	50D	50D	50D	75D	75D	75D	100D	100D
1500	2610	50D	50D	50D	50D	50D	50D	50D	50D	75D	75D	100D	100D
1650	2780	50D	50D	50D	50D	50D	50D	50D	75D	75D	100D	100D	100D
1800	2940	50D	50D	50D	50D	50D	50D	50D	50D	75D	75D	100D	100D

PIPE CLASSES FOR PIPES UNDER SECONDARY STREETS.
LIGHT ACCESS ROADS, PARKING AREAS, PRIVATE
ENTRANCES AND SIDEWALKS FOR 40KN WHEEL LOAD
WITH DUE ALLOWANCE FOR IMPACT LOADS.
NORMAL BEDDING ACCORDING TO DETAIL 1
* BEDDING ACCORDING TO DETAIL 2
† CONCRETE BEDDING TO DETAIL 4

Ø	TRENCH WIDTH	COVER (m)											
mm	mm	0.6	0.9	1.0	1.2	1.5	1.8	2.0	2.5	3.0	4.0	5.0	6.0
450	950	75D#	100D	100D	100D	100D	100D	100D	100D	100D	75D	75D	75D
525	1020	75D#	100D	100D	100D	100D	100D	100D	100D	100D	100D	100D	100D
600	1620	75D#	100D	100D	100D	100D	100D	100D	100D	100D	100D*	100D†	100D†
675	1710	75D#	100D	100D	100D	100D	100D	100D	100D	100D	100D	100D	100D
750	1790	75D#	100D	100D	100D	100D	100D	100D	100D	100D	100D*	100D*	100D†
825	1870	75D#	50D#	100D	100D	100D	100D	100D	100D	100D	100D	100D*	100D*
900	1950	75D #	50D #	100D	100D	100D	100D	100D	100D	100D	100D	100D	100D*
1050	2120	75D#	50D#	100D	100D	100D	100D	100D	100D	100D	100D	100D	100D*
1200	2280	75D#	50D#	100D	100D	100D	100D	100D	100D	100D	100D	100D	100D*
1350	2450	75D #	50D #	100D	100D	100D	100D	100D	100D	100D	100D	100D	100D*
1500	2610	75D#	50D#	100D	100D	100D	100D	100D	100D	100D	100D	100D	100D*
1650	2780	50D #	50D #	100D	100D	100D	100D	100D	75D	100D	75D *	75D *	75D *
1800	2940	50D#	50D #	100D	50D	75D	75D	75D	75D	100D	100D	100D	100D

PIPE CLASSES FOR PIPES UNDER MAIN ROUTES
FOR A HB-WHEEL ARRANGEMENT OF EIGHT 90KN WHEEL
LOADS WITH DUE ALLOWANCE FOR IMPACT LOADS.
WITH DUE ALLOWANCE FOR IMPACT LOADS.
NORMAL BEDDING ACCORDING TO DETAIL 1
* BEDDING ACCORDING TO DETAIL 2
\# BEDDING ACCORDING TO DETAIL 2
† CONCRETE BEDDING TO DETAIL 4

NOTES

1. BEDDING MATERIAL

THE MATERIAL USED FOR BEDDING CONSISTS OF SELECTED GRAVEL WITH PI<6 AND MUST BE FREE OF STONE LARGER THAN 20mm, ORGANIC MATERIAL AND CLAY LUMPS. THE BEDDING MATERIAL AT THE SIDES OF THE PIPE MUST BE COMPACTED TO 90% MOD. AASHTO DENSITY AFTER THE PIPE HAS BEEN LAID.

2. BACKFILL TYPE A

THE MATERIAL USED FOR BACKFILL MUST BE UNIFORMLY GRADED AND MUST BE COMPACTED TO 90% MOD. AASHTO DENSITY IN LAYERS OF NOT MORE THAN 100mm. THE FOLLOWING SHALL NOT BE PRESENT IN THE MATERIAL:

(i) ROOTS OF TREES, BUILDING RUBBLE AND ORGANIC MATERIAL
(ii) CLAY LUMPS LARGER THAN 75mm
(iii) STONES LARGER THAN 20mm

3. BACKFILL TYPE B

MINIMUM G9 MATERIAL ACCORDING TO TRH4 CLASSIFICATION COMPACTED TO A MINIMUM OF 90% MOD. AASHTO DENSITY IN LAYERS OF NOT MORE THAN 150mm.

4. AVAILABLE BACKFILL

THE MATERIAL USED FOR BACKFILL MUST BE UNIFORMLY GRADED AND COMPACTED TO 90% MOD. AASHTO DENSITY IN LAYERS OF NOT MORE THAN 150mm.

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY
BLOUBERG MUNICIPALITY
P.o.Box 1593
SENWABARWANA
0790
Tel.: (015) 505-7100

MORULA CONSULTING ENGINEERS
morula CONSULTING ENGNEERS & PROJECT MANAGERS "a new dawn"
P.o.Box 2740
POLOKWANE
0700
TEL. (015) 296-4460
FAX. (015) 296-4103

.... VDM .... DATE
.... CONSULTING ENGINEER .... DATE

TENDER No.: BM01/19/20
PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

PIPE BEDDING DETAILS

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.... 20 / / CCLM
.... 20 / / For: Consulting Engineer

DRAWING NUMBER
MC/BLM/KISP5/DD/01

SHEET 1 OF 1
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AS SHOWN
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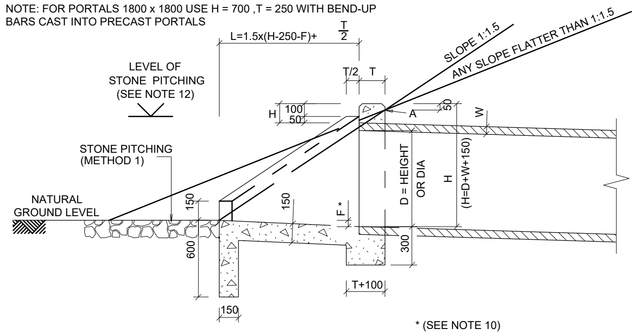
ORIGINAL ON A1

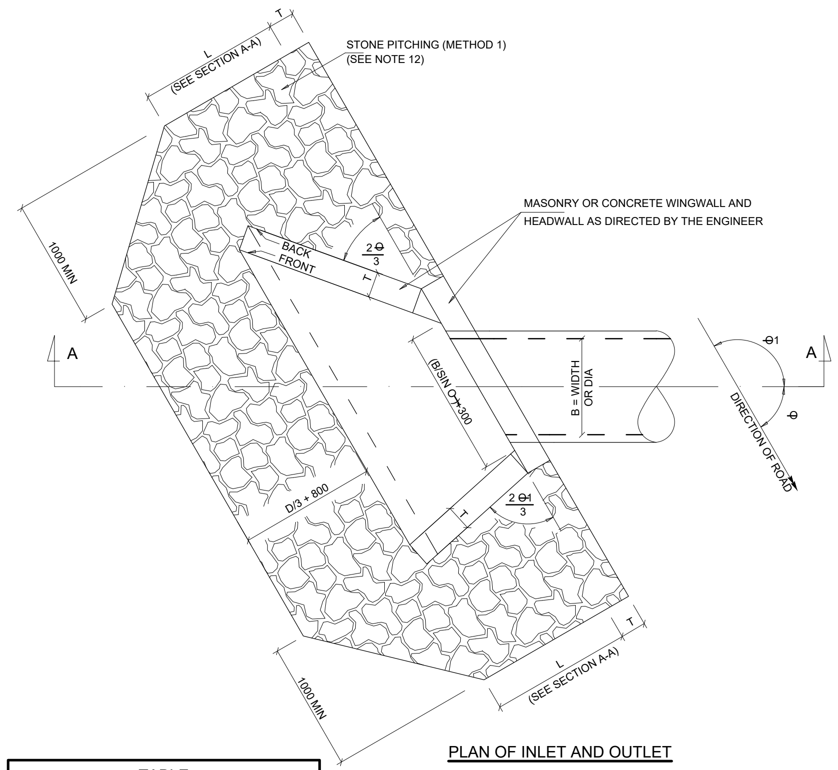
NOTE: FOR PORTALS 1800 x 1800 USE H = 700 ,T = 250 WITH BEND-UP BARS CAST INTO PRECAST PORTALS



* (SEE NOTE 10)

SECTION A-A (WHERE Θ = 90^)

SCALE 1:20



PLAN OF INLET AND OUTLET

SCALE 1:20

TABLE

CULVERT DIA OR HEIGHT	"X"	T(CONCRETE)	T(MASONRY)
600	1200	150	300
750	1500	200	
900	1800	200	400
1050	2100	250	
>1200	2400	250	

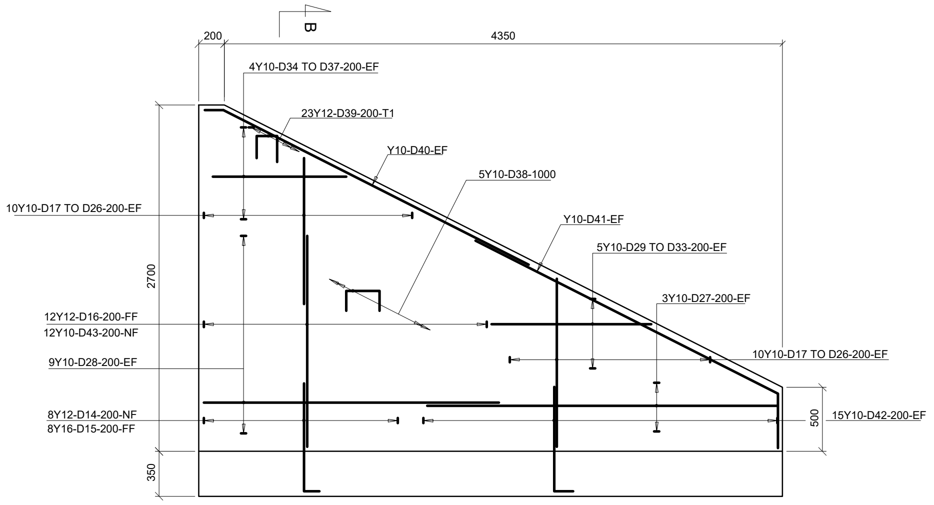
NOTES: INLET & OUTLET

1. ALL CONCRETE SHALL BE CLASS 20/19
2. ALL VISIBLE CORNERS SHALL BE CHAMFERED 25mm
3. WHERE REQUIRED BY THE ENGINEER, MITRE BANKS SHALL BE CONSTRUCTED DOWNSTREAM FROM THE CULVERTS
4. THE UPPER LEVEL OF THE FILL ALWAYS PASSES THROUGH A POINT 50mm BELOW THE TOP OF THE HEAD WALL.
5. REINFORCEMENT IN WING WALLS AND HEAD WALLS FOR INLET AND OUTLET STRUCTURES:
   i) IF D EXCEEDS 850mm
   - ON THE FRONT OF WALLS : No 245 (6,3 DIA - 200 x 200)
   - ON THE REAR OF WALLS : No 395 (8,0 DIA - 200 x 200)
   ii) IF D = 2.4m AND 3.0m:
   SEE DETAIL OF WINGWALL AND HEADWALL WITH 600mm BASE FOOTING LENGTHS IN BOTH CASES.
6. MINIMUM CONCRETE COVER OVER REINFORCEMENT (IF REQUIRED) SHALL BE 20mm AND MAXIMUM CONCRETE COVER 40mm
7. WHERE MORE THAN ONE CONCRETE PIPE CULVERT OR PORTAL CULVERT ARE BUILT INTO THE SAME HEAD WALL, DIMENSION B SHALL BE THE MAXIMUM DISTANCE BETWEEN THE INTERNAL WALLS OF THE EXTERNAL CULVERTS.
8. THE MAXIMUM SLOPE OF EARTHWORKS SURROUNDING A CULVERT INLET OR OUTLET SHALL BE 1:1.5
9. F = SLOPE OF CULVERT x 1.5 x (D+W)
10. NO BERM SHALL BE CONSTRUCTED WHERE THE SIDE-DRAIN INLET IS PLACED AT THE LOWEST POINT.
11. WHERE THE TOP OF THE HEAD WALL IS LESS THAN 500mm BELOW THE SHOULDER BREAKPOINT OF THE ROAD, THE TOP OF THE WALL SHALL BE CONSTRUCTED AT THE SAME LONGITUDINAL GRADIENT AS THAT OF THE ROAD.
12. EXTENT OF PITCHING TO BE INSTRUCTED BY THE ENGINEER.

BENDING SCHEDULE

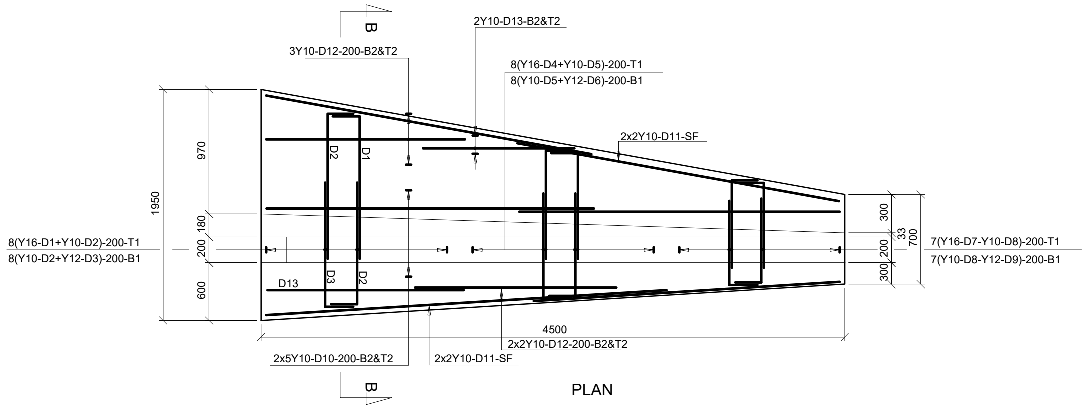
No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUMBER	MARK	S C	BENDING A	B	C	D	E/r
2	8	Y16	1400	16	D1	37	250	(1150)			
2	16	Y10	1400	32	D2	37	250	(1150)			
2	8	Y12	1400	16	D3	37	250	(1150)			
2	8	Y16	1250	16	D4	37	250	(1000)			
2	16	Y10	1250	32	D5	37	250	(1000)			
2	8	Y12	1250	16	D6	37	250	(1000)			
2	7	Y16	1000	14	D7	37	250	(755)			
2	14	Y10	1000	28	D8	37	250	(755)			
2	7	Y12	1000	14	D9	37	250	(755)			
2	20	Y10	2450	40	D10	20	(2440)				
2	8	Y10	2500	16	D11	20	(2480)				
2	10	Y10	1200	20	D12	20	(1200)				
2	4	Y10	2300	4	D13	20	(2300)				
2	8	Y16	1250	16	D14	37	200	(1050)			
2	8	Y16	950	16	D15	99B	200	50	1050		
2	12	Y12	1700	24	D16	20	(1700)				
2	4	Y10	1500	8	D17	20	(1505)				
2	4	Y10	1400	8	D18	20	(1405)				
2	4	Y10	1350	8	D19	20	(1310)				
2	4	Y10	1250	8	D20	20	(1210)				
2	4	Y10	1150	8	D21	20	(1110)				
2	4	Y10	1050	8	D22	20	(1010)				
2	4	Y10	950	8	D23	20	(915)				
2	4	Y10	850	8	D24	20	(820)				
2	4	Y10	750	8	D25	20	(720)				
2	4	Y10	650	8	D26	20	(625)				
2	6	Y10	2700	12	D27	20	(2665)				
2	18	Y10	2250	36	D28	20	(2235)				
2	2	Y10	2200	4	D29	20	(2200)				
2	2	Y10	1800	4	D30	20	(1800)				
2	2	Y10	1400	4	D31	20	(1400)				
2	2	Y10	900	4	D32	20	(875)				
2	2	Y10	600	4	D33	20	(580)				
2	2	Y10	1600	4	D34	20	(1600)				
2	2	Y10	1200	4	D35	20	(1200)				
2	2	Y10	750	4	D36	20	(740)				
2	2	Y10	450	4	D37	20	(445)				
2	5	Y10	550	10	D38	35	250				
2	23	Y12	700	46	D39	38	300	120	(300)		
2	2	Y10	2800	4	D40	62	150	68	(2650)		
2	2	Y10		4	D41	99C	450	204	2650		
2	30	Y10	1000	60	D42	37	200	(800)			
2	12	Y10	1000	24	D43	20	(1000)				

	8	10	12	16	20	25	32	40	TOT
R									
Y		394	114	144					652
TOT		394	114	144					652



ELEVATION

SCALE 1:20

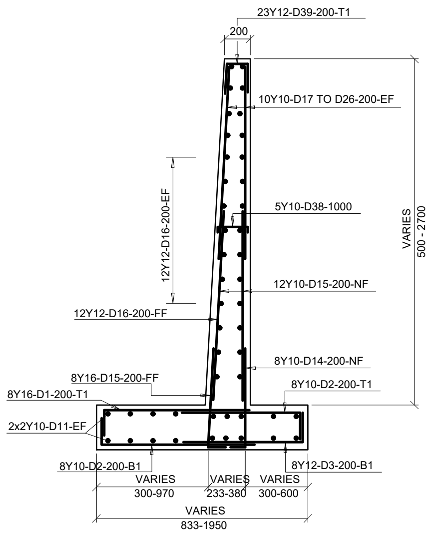


PLAN

SCALE 1:20

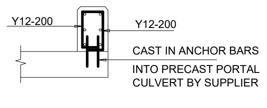
DETAIL OF WINGWALL AND HEADWALL

TYPICAL DETAIL OF CULVERT IN- AND OUTLET STRUCTURES



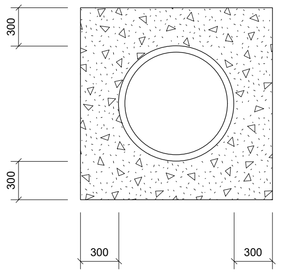
SECTION B-B

SCALE 1:20



HEADWALL

SCALE 1:20

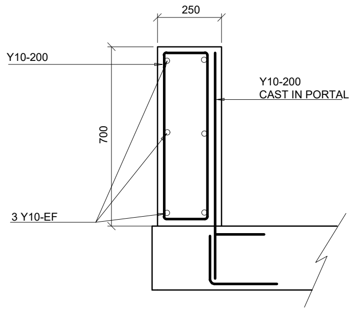


SECTION C-C

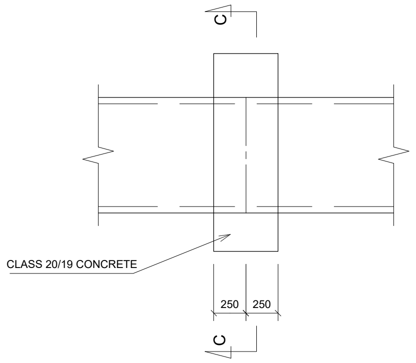
SCALE 1:20

NOTES:

1. COLLAR ONLY TO BE PROVIDED IF THE FIT BETWEEN THE EXISTING AND THE NEW PIPE IS UNSATISFACTORY.
2. WHERE A GAP EXISTS BETWEEN THE EXISTING AND NEW PIPE DUE TO A KINK IN THE PIPE ALIGNMENT THE GAP MUST BE FILLED WITH MORTAR AND FINISHED OFF.
3. PIPES TO BE CLEANED BEFORE CONSTRUCTION OF THE COLLAR.



TYPICAL HEAD WALL FOR 1800x1800 PORTALS



SIDE ELEVATION

SCALE 1:20

COLLAR DETAIL FOR JOINING NEW PIPE CULVERTS TO EXISTING PIPES

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY H.T.
CHECKED BY H.T.
DRAWN BY T.M.
CHECKED BY H.T.

BLOUBERG LOCAL MUNICIPALITY
BLOUBERG MUNICIPALITY
P.o.Box 1593
SENWABARWANA
0790

Tel.: (015) 505-7100

MORULA CONSULTING ENGINEERS
morula CONSULTING ENGINEERS & PROJECT MANAGERS "a new dawn"
P.o.Box 2740
POLOKWANE
0700
TEL. (015) 296-4460
FAX. (015) 296-4103

.... VDM .... DATE
.... CONSULTING ENGINEER .... DATE

TENDER No.: BM01/19/20
PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

TYPICAL DETAILS OF CULVERT IN- AND OUTLET STRUCTURES

(Full signature)
.... CCLM .... 20 . / . /
.... For: Consulting Engineer .... 20 . / . /

DRAWING NUMBER
MC/BLM/KISP5/DD/02

SHEET 1 OF 1
SCALE
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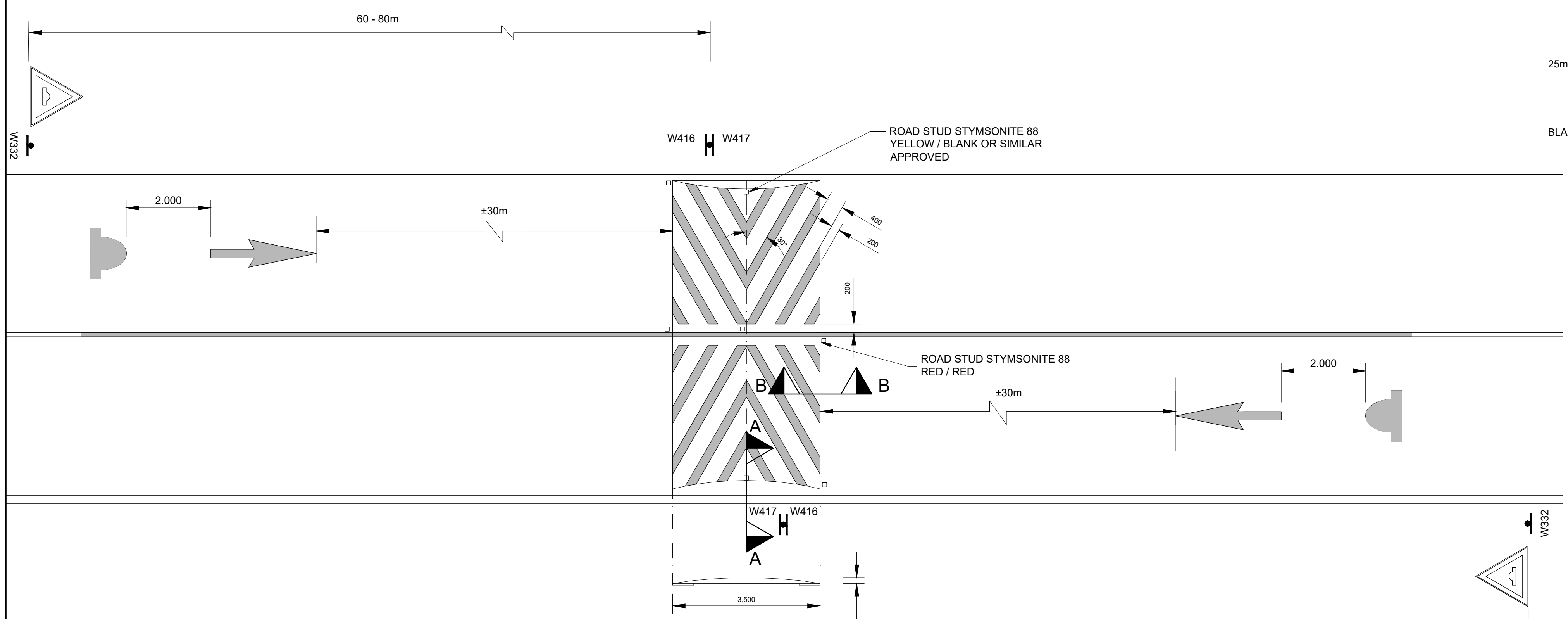
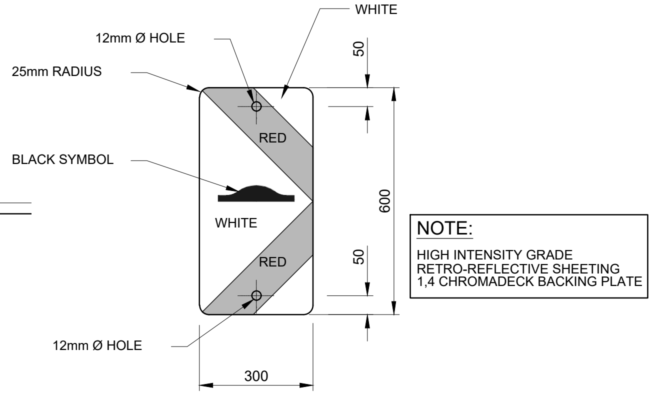


PLAN OF SPEED HUMP

SCALE 1:100

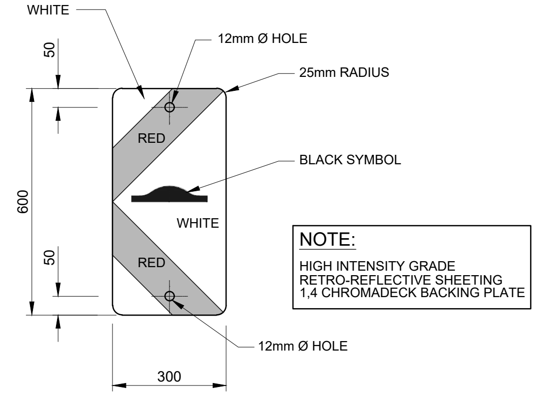


NOTE:
HIGH INTENSITY GRADE
RETRO-REFLECTIVE SHEETING
1,4 CHROMADECK BACKING PLATE

DANGER PLATE SPEEDHUMP (LEFT)

W416

SCALE 1:10



NOTE:
HIGH INTENSITY GRADE
RETRO-REFLECTIVE SHEETING
1,4 CHROMADECK BACKING PLATE

DANGER PLATE SPEEDHUMP (RIGHT)

W417

SCALE 1:10

NOTES

CONSTRUCTION METHOD: SPEED HUMPS

1. Setting out of hump - few days before construction.
2. Saw cuts one to two days before construction.

ON CONSTRUCTION DAY:

3. Remove 500 mm asphalt strips.
4. Start erecting road signs and paint warning road marking.
5. Place asphalt in strips and compact with two passes without vibrator.
6. Place templates - both sides of one lane at a time.
7. Place asphalt and rake till slightly higher than templates.
8. Shape asphalt with straight edge (channel section 6 m long).
9. Remove templates and compact without vibrator (three passes)
10. Measure profile and rectify if necessary.
11. Final compaction with three to four passes with vibrator.
12. Place road studs.
13. Paint speed hump the next day.

2. Traffic Signs:

2.1 Only galvanised bolts and nuts to be used on W and R series (no uni-struts)

2.2 All signs must be according to the Road Traffic Signs Manuals but use 900Φ STOP (60km/h zone) for 3-way and 4-way stops

2.3 All signs excluding R1 series must have rounded edges

3. **ROADMARKINGS:**
All new road markings in thermoplastic

Colour	Paint application rate (mm)	Premix bead application rate (%)	Initial coefficient of retro- retro-reflective (minicandelas/lux/m^2)
WHITE	1.2	35	200
YELLOW	1.2	35	135

NOTE
1. Traffic Signs:

1.1 Only galvanised bolts and nuts to be used on W and R series (no uni-struts)

1.2 All signs must be according to the Road Traffic Signs Manuals but use 900Φ STOP (60km/h zone) for 3-way and 4-way stops

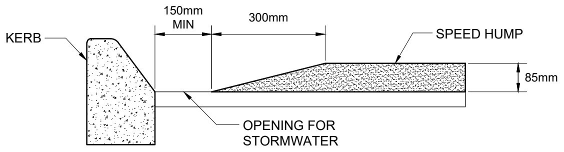
1.3 All signs excluding R1 series must have rounded edges

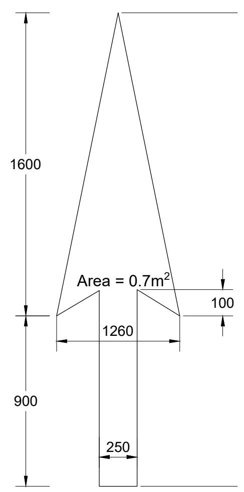
2. ROADMARKINGS:
All new road markings in thermoplastic

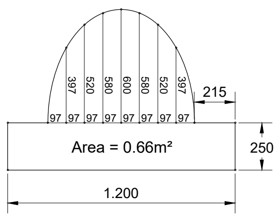
Colour	Paint application rate (mm)	Premix bead application rate (%)	Initial coefficient of retro- retro-reflective (minicandelas/lux/m^2)
WHITE	1.2	35	200
YELLOW	1.2	35	135

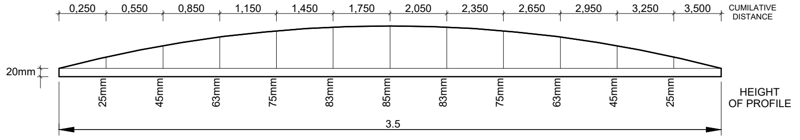
NOTE:

The Trafic Engineering and Operation section
must always be consulted to assist with the setting out of speed humps.

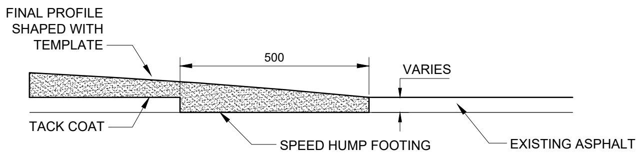


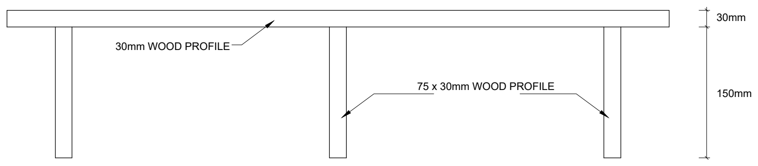






SIDE ELEVATION





PLAN

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY H.T.
CHECKED BY H.T.
DRAWN BY T.M.
CHECKED BY H.T.

BLOUBERG LOCAL MUNICIPALITY
P.o.Box 1593
SENWABARWANA
0790
Tel.: (015) 505-7100
BLOUBERG MUNICIPALITY

MORULA CONSULTING ENGINEERS
morula CONSULTING ENGINEERS & PROJECT MANAGERS
"a new dawn"
P.o.Box 2740
POLOKWANE
0700
TEL. (015) 296-4460
FAX. (015) 296-4103

VDM DATE
CONSULTING ENGINEER DATE

TENDER No.: BM01/19/20
PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL
STREETS AND STORMWATER PHASE 5

TYPICAL SPEED HUMP DETAIL

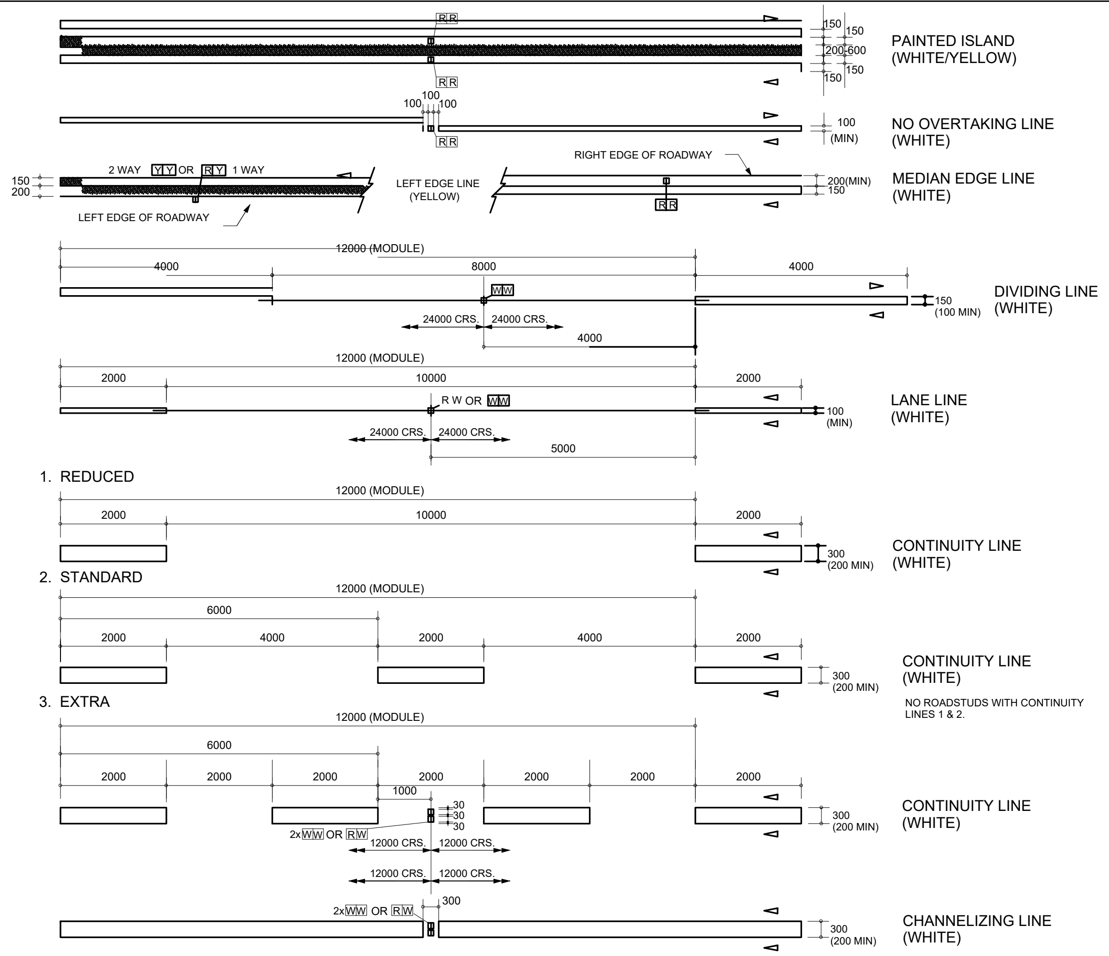
(Full signature)
CCLM 20 / /
For: Consulting Engineer 20 / /

SHEET 1 OF 1
SCALE
AS SHOWN
DRAWING NUMBER
MC/BLM/KISP5/SD/01
REVISION
⓪

ORIGINAL ON A1

ROAD MARKING DETAILS

SHEET 1 OF 2



RURAL LONGITUDINAL LINE TYPES

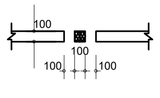
SCALE 1:50

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 LOMGITUDINAL 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.)

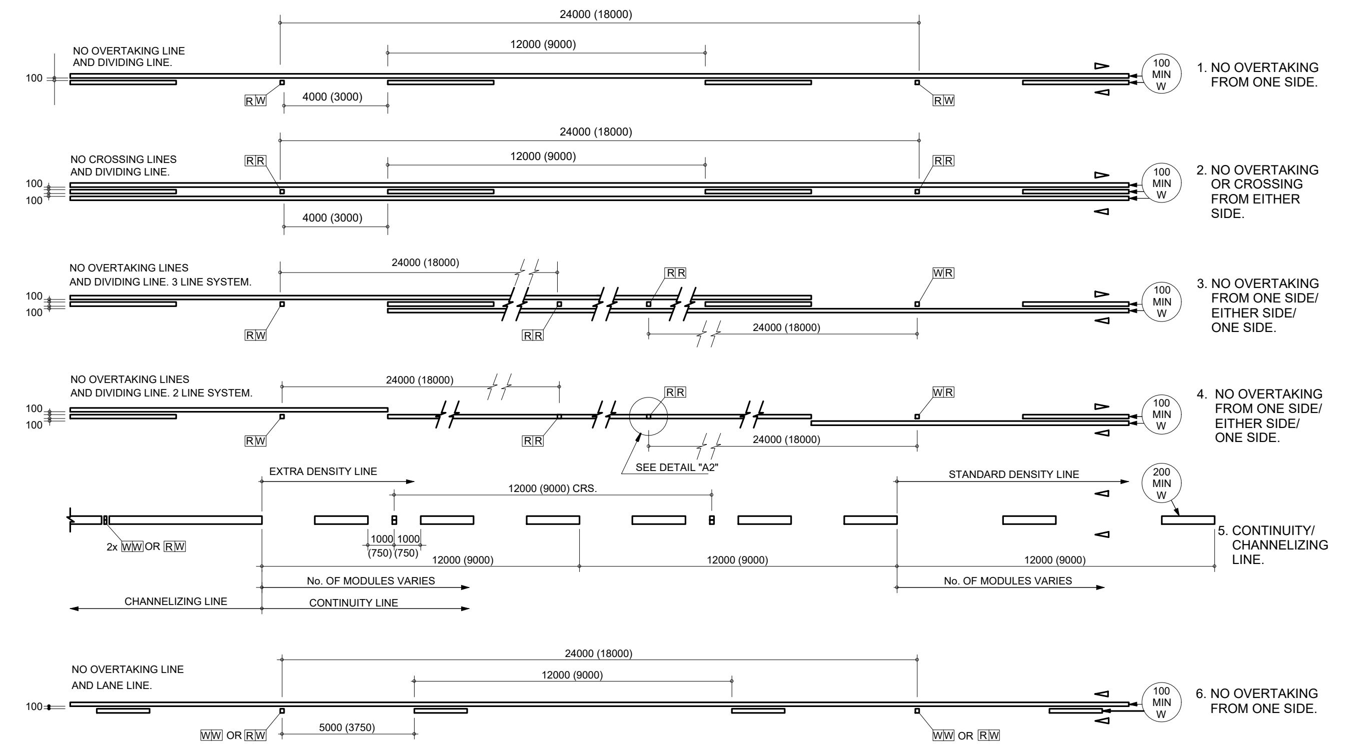
LEGEND:

R = RED ▨
W = WHITE □
Y = YELLOW ■



DETAIL "A2"

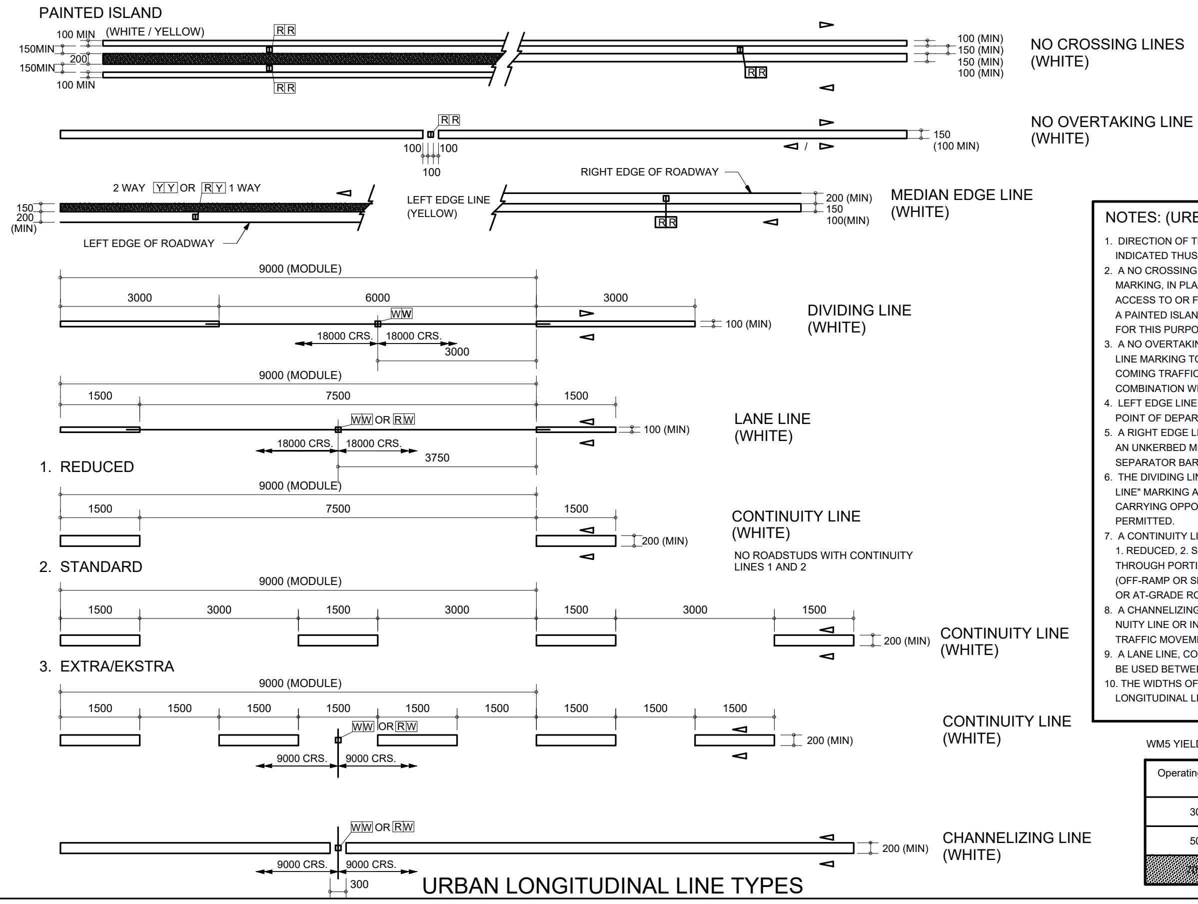
SCALE: 1:25



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".

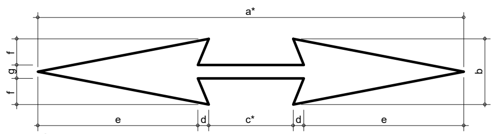
LONGITUDINAL LINE COMBINATIONS



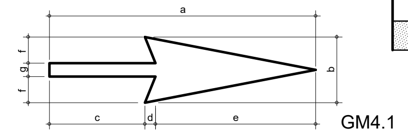
URBAN LONGITUDINAL LINE TYPES

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).



GM4.2



GM4.1

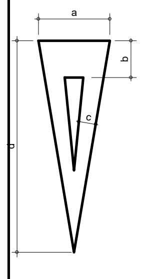
GM4.2 REVERSIBLE FLOW ARROW / GM4.1 INFORMATION ARROW

DIMENSIONS (mm)

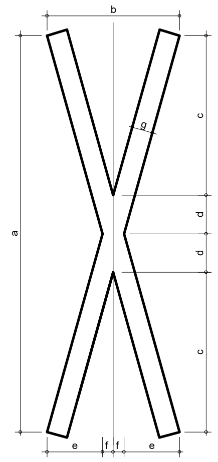
Operating Speed km/h	Typical Applications	a	a*	b	c	c*	d	e	f	g
30 - 40	City Centre	1250	2000	1250	450	400	50	750	500	250
50 - 60	Urban	2500	4000	1250	900	800	100	1500	500	250
70 - 90	Urban Arterial/Rural Expressway	4000	6400	1250	1440	1280	160	2400	500	250
100 - 120	Rural and Freeways	5000	8000	1250	1800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

Area m^2				
Marking	a	Area	a*	Area
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.

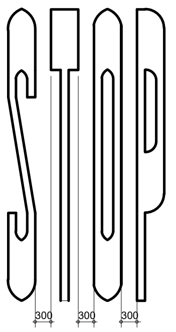


WM5

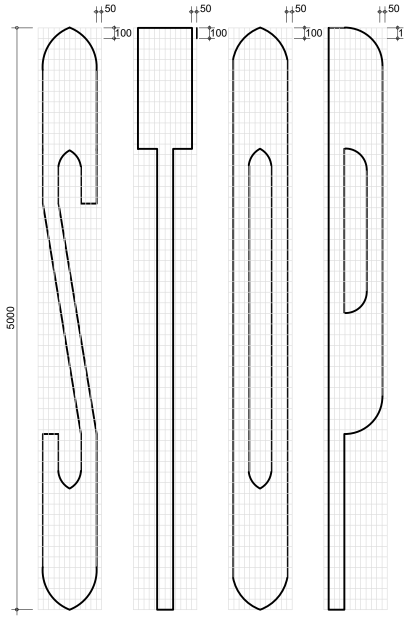


WM1

WM1 RAILWAY LEVEL CROSSING AHEAD



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

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

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY
BLOUBERG MUNICIPALITY
P.o.Box 1593
SENWABARWANA
0790

Tel.: (015) 505-7100

MORULA CONSULTING ENGINEERS
morula
CONSULTING ENGINEERS & PROJECT MANAGERS
"a new dawn"
P.o.Box 2740
POLOKWANE
0700
TEL. (015) 296-4460
FAX. (015) 296-4103

.... VDM .... DATE

.... CONSULTING ENGINEER .... DATE

TENDER No.: BM01/19/20

PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

ROAD MARKINGS: REGULARITY, WARNING AND GUIDANCE SYMBOLS

(Full signature)
.... 20 / /
CCLM
.... 20 / /
For: Consulting Engineer

SHEET 1 OF 2

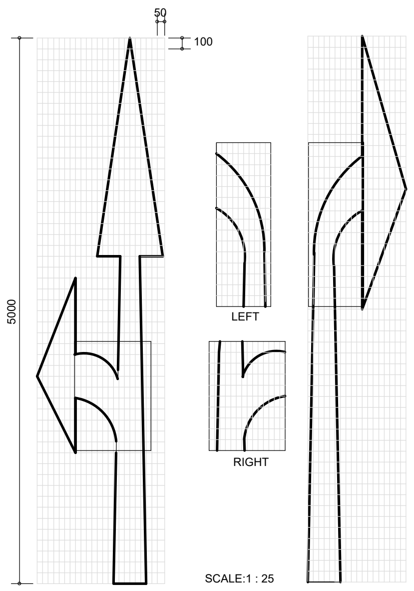
SCALE
AS SHOWN

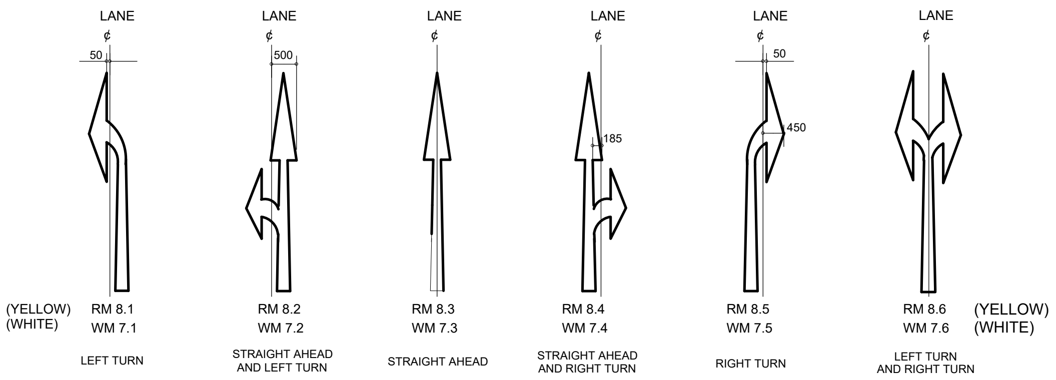
DRAWING NUMBER
MC/BLM/KISP5/SD/02

REVISION
0

ORIGINAL ON A1

ROAD MARKING DETAILS





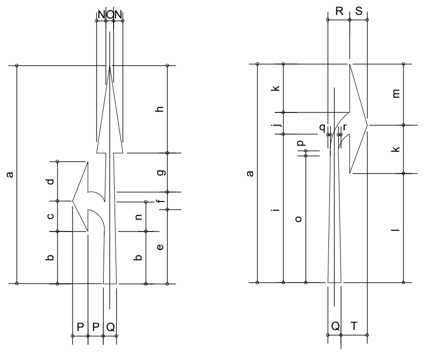
APPLICATIONS

SCALE: 1:50

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 / (m²)

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

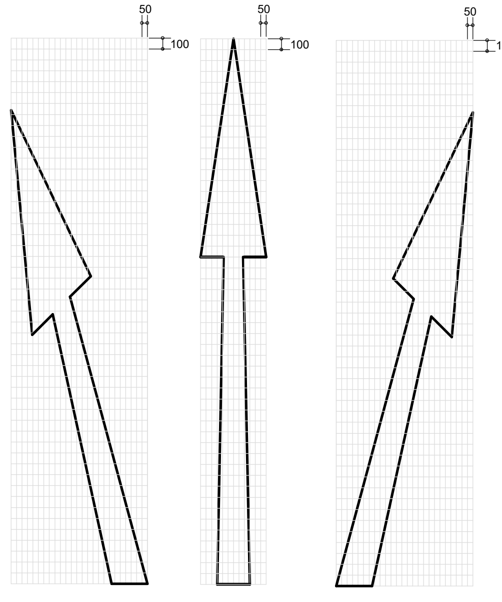
NOTES: (MANDATORY DIRECTION ARROWS)

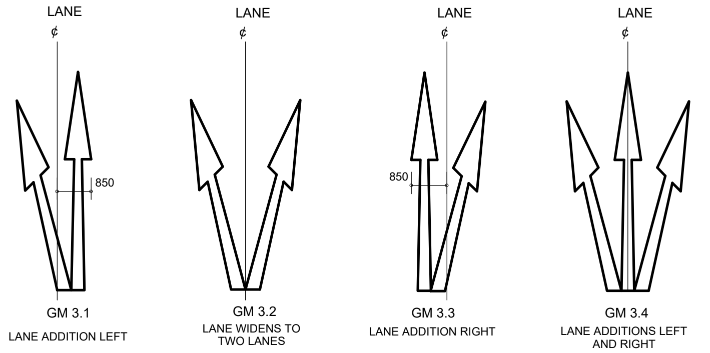
1. THESE ARROWS MAY BE USED IN LANES TO INDICATE THAT DRIVERS SHALL PROCEED ONLY IN THE DIRECTION OR DIRECTIONS SHOWN. THEY SHOULD ONLY BE USED IF THE JUNCTION CONCERNED REQUIRED TURNING MOVEMENT CONTROL BY LANE.

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





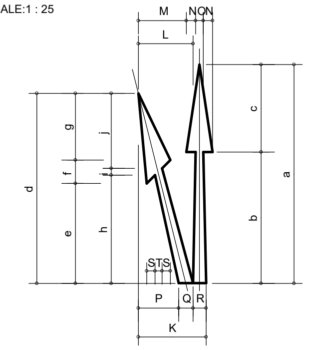
APPLICATIONS

SCALE 1 : 50

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 / (m²)

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

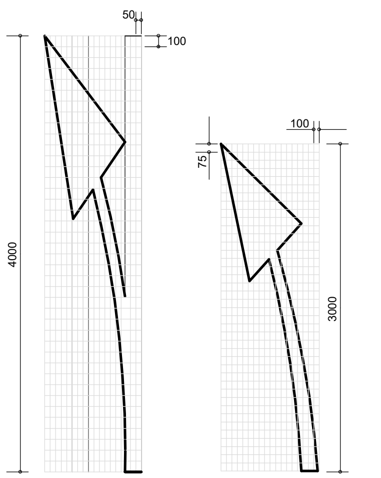
FURCATION ARROWS

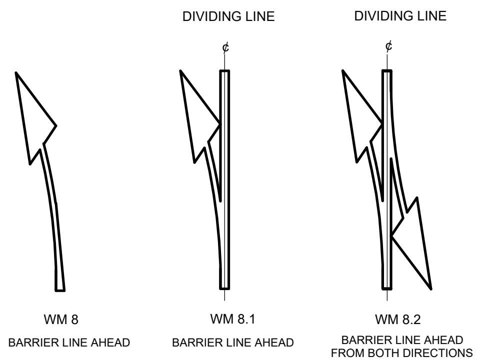
LEGEND:

R = RED ▩

W = WHITE ☐

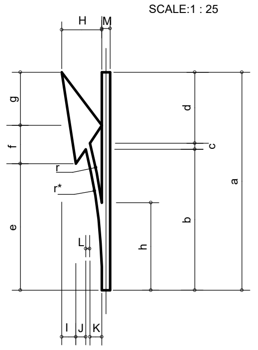
Y = YELLOW ▨





APPLICATIONS

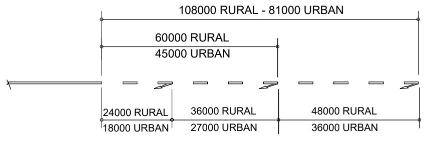
SCALE 1 : 50



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
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10000

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



MARKING SPACING

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.

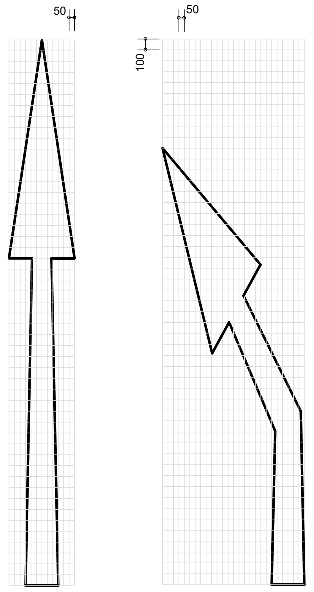
2. THE ARROWS MAY BE MARKED ON TOP OF EXISTING DIVIDING LINE MARKINGS (IF THE EXISTING LINE IS A CENTRE LINE TO A 12m OR 7.2m MODULE THE POINT OF THE ARROW SHOULD BE LINED UP WITH THE FORWARD END OF THE LINE).

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.

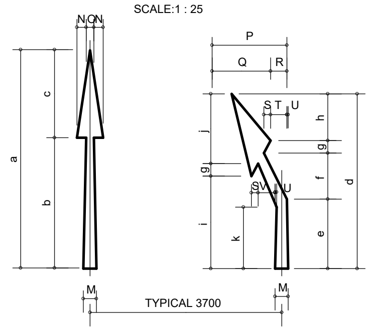
ARROW AREA / (m²)

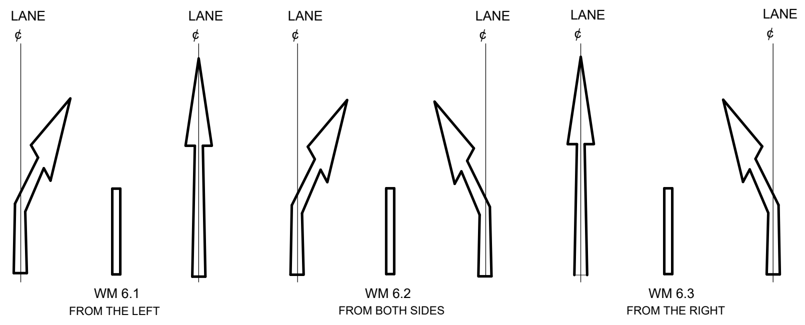
a	Per Arrow
3000	0.62
4000	0.82

BARRIER LINE AHEAD ARROWS



SCALE:1 : 25





APPLICATIONS

SCALE 1 : 50

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
[illegible]	Rural Roads and Freeways	12000	7200	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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 / (m²)

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

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY

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P.o.Box 1593
SENWABARWANA
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TEL. (015) 296-4460
FAX. (015) 296-4103

.... VDM .... DATE

.... CONSULTING ENGINEER .... DATE

TENDER No.: BM01/19/20

PROJECT STATUS: TENDER

CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

DIRECTION ARROWS AHEAD MARKINGS: MANDATORY DIRECTION ARROWS AND DIRECTION ARROWS AHEAD

(Full signature)

.... CCLM 20 / /

.... For: Consulting Engineer 20 / /

SHEET 2 OF 2

SCALE

AS SHOWN

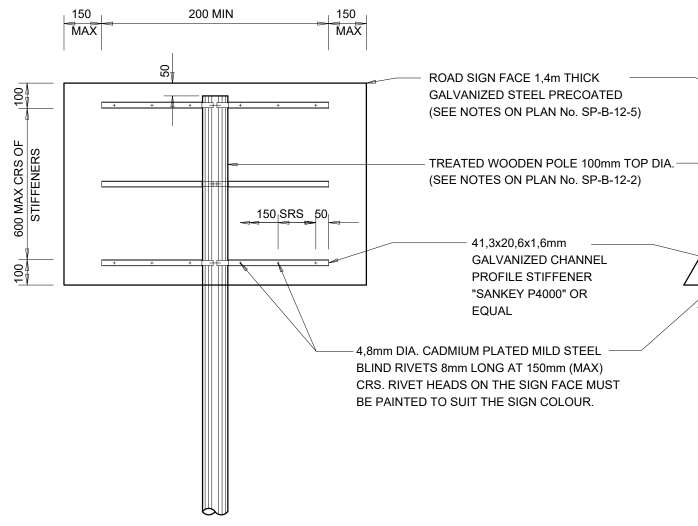
DRAWING NUMBER

MC/BLM/KISP5/SD/03

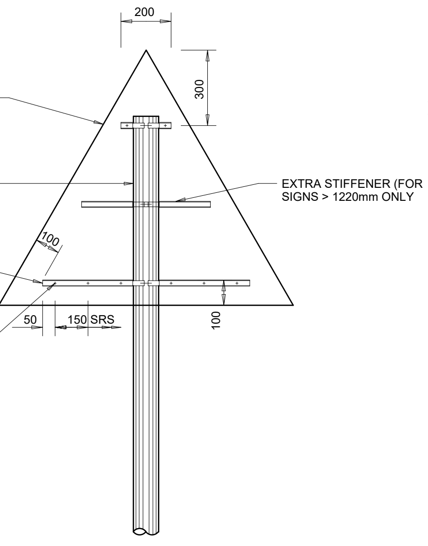
REVISION

⓪

ORIGINAL ON A1



REAR ELEVATION



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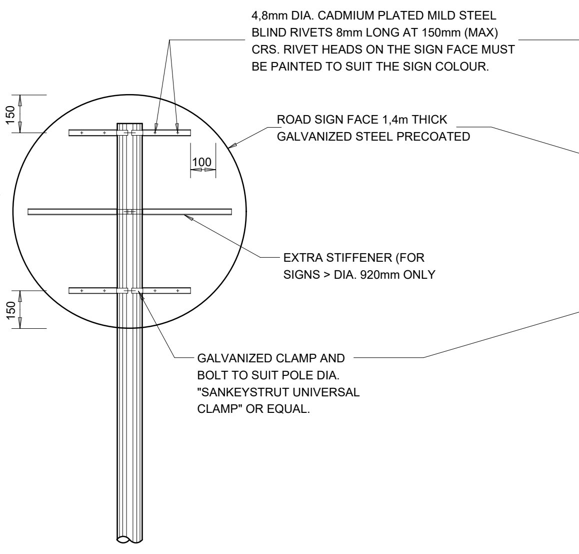

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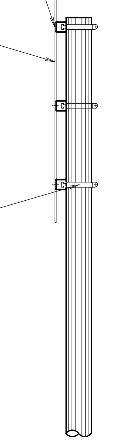
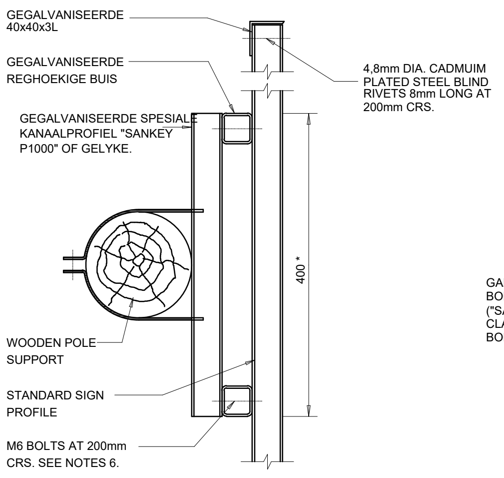


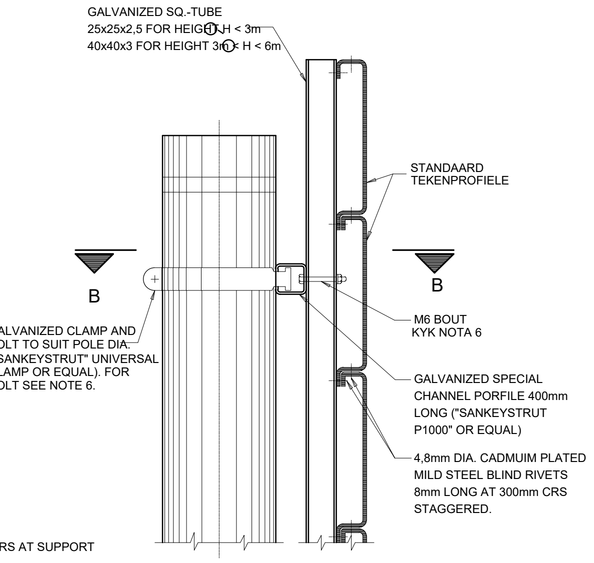
TYPICAL SIDE ELEVATION



* 600 IF JOINT OCCURS AT SUPPORT

SECTION

1:5

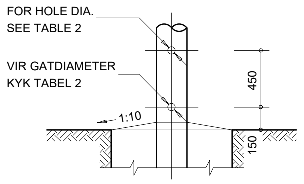


ELEVATION

1:5

TABLE 1

WIDTH OF SIGN W	No. OF SUPPORTS N	DIMENSIONS B	 C
1,2m	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		
9,6 - 12,0m	5		

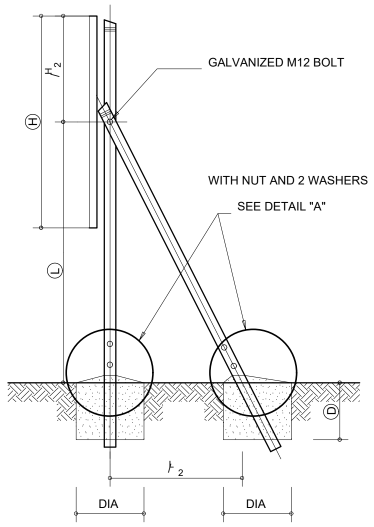


DETAIL "A"

TABEL 2

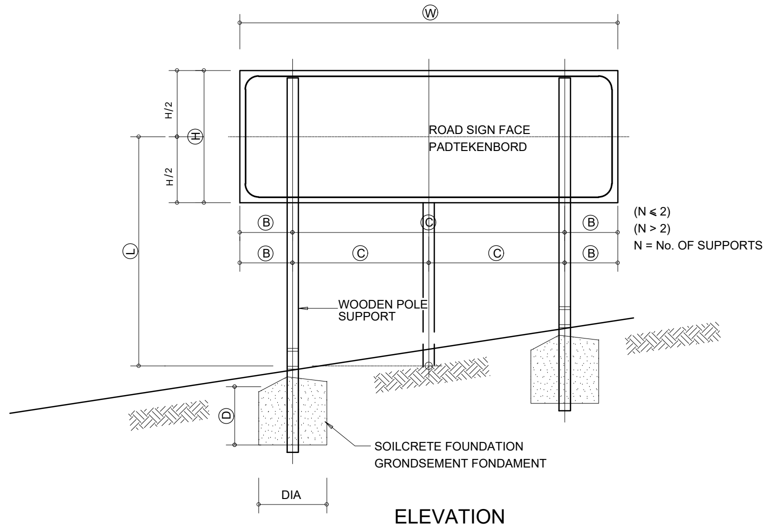
* AT GROUND LEVEL

POLE DIA * (mm)	HOLE DIA (mm)
⩽ 140	NONE
141 - 170	40
171 - 200	50
201 - 225	65

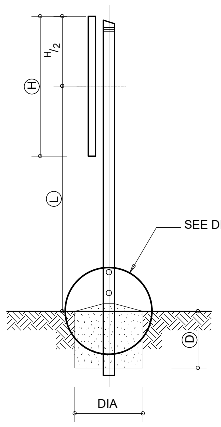


TYPICAL SECTION

BRACED SUPPORT

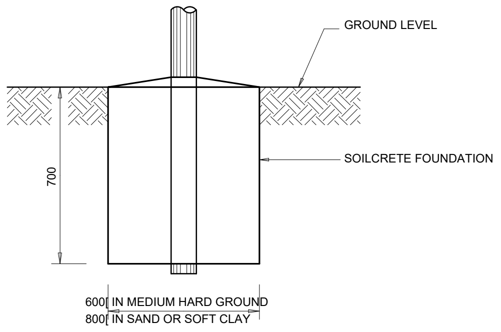


ELEVATION

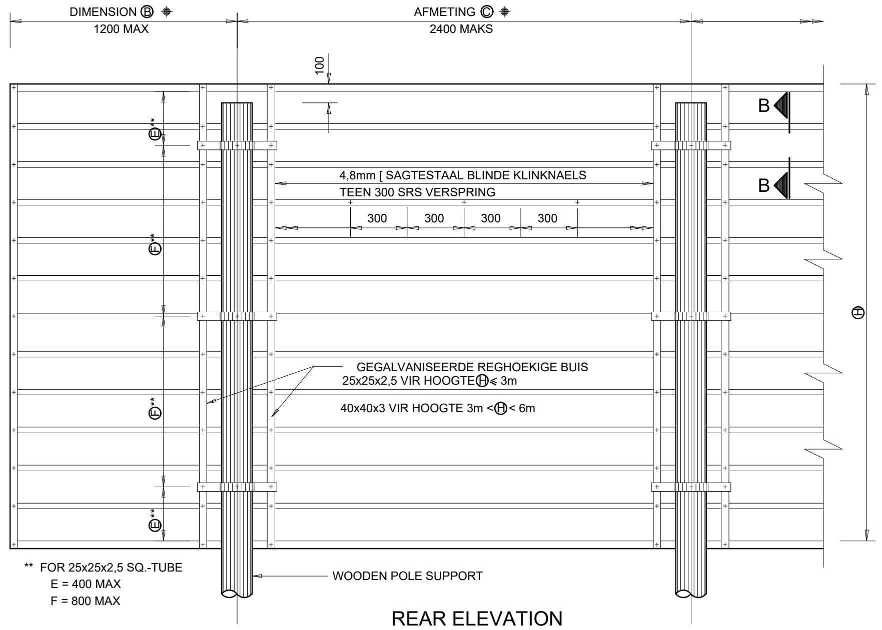


TYPICAL SECTION

FREE STANDING SUPPORT



TYPICAL FOUNDATION



** FOR 25x25x2,5 SQ.-TUBE
E = 400 MAX
F = 800 MAX

REAR ELEVATION

1:20

NOTES

THE ROAD SIGN FACES SHALL BE MANUFACTURED AND ERECTED IN ACCORDANCE WITH THE REV TIONS AS WELL AS THE FOLLOWING REQUIREMENTS:-

1. SIGN FACES SHALL BE FOR TYPE "A" OR "B" EXPOSURE AS INDICATED ON THE ROAD SI GN DETAIL DRAWINGS OR AS DIRECTED BY THE ENGINEER:-
   TYPE "A": ALL CASES OTHER THAN TYPE "B". ANT CLAUSES OF SECTION 5600 OF STANDARD SPECIFICA-
   TYPE "B": SIGN FACES FOR USE IN MARINE OR CHEMICALLY POLLUTED CORROSIVE E NVIRONMENTS.
2. THE COATING SYSTEMS FOR SIGN FACES TYPE "A" AND "B" ARE SPECIFIED ON PLAN No . SP-B-12-5.
3. THE STANDARD SIGN PROFILE SHALL BE MADE IN ACCORDANCE WITH THE DETAILS SHOWN ON PLAN No. SP-B-12-5.
4. A SIGN FACE WICH EXCEEDS 6m IN LENGTH MAY BE MANUFACTURED IN TWO SECTIONS. T HE JOINT SHALL BE MADE IN ACCORDANCE WITH DETAILS SHOWN ON PLAN No. SP-B-12-5.
5. STRUCTURAL STEEL SECTIONS SHALL BE OF MILD STEEL CONFORMING TO THE REQUIREME NTS OF SECTION 7100 OF THE STANDARD SPECIFICATIONS. RECTANGULAR HOLLOW SECTIONS AND SPECIAL CHANNEL PROFILES MAY BE COLD FORMED OF COMMERCIAL QUALITY MILD STEEL.
6. BOLTS, WASHERS AND NUTS SHALL BE AS FOLLOWS:-
   TYPE "A" SIGN FACES: GALVANIZED STEEL BOLTS COMPLYING WITH THE REQUIREMENT S OF CLAUSE 5602(b) OF THE STANDARD SPECIFICATIONS.
   TYPE "B" SIGN FACES: STAILESS STEEL BOLTS GRADE 304 MANUFACTURED TO SABS 1 36.
   NUTS FOR BOTH TYPE "A" AND "B" SIGN FACES SHALL BE SELFLOCKING "NYLOC" OR EQ UAL APPROVED.
7. BLIND RIVETS SHALL BE 4,8mm DIA CADMIUM PLATED MIL STEEL.
8. ALL STEEL SECTIONS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH CLAUSE 710 5(l) OF THE STANDARD SPECIFICATIONS AFTER MANUFAC- TURE.
9. REFERENCE MUST BE MADE TO THE RELEVANT ROAD SIGN DETAIL DRAWINGS FOR DETAILS OF THE SYMBOLS AND LEGEND FOR EACH INDIVIDUAL SIGN.
10. MEASUREMENT AND PAYMENT OF THE SIGN FACES SHALL BE IN ACCORDANCE WITH CLAUSE 5609 OF THE STANDARD SPECIFICATIONS. AN "EXTRA OVER" RATE SHALL BE APPLICABLE FOR TYPE "B" SIGN FACES.

No	DATE	REVISION	CONSULT	DIR

DESIGNED BY	H.T.
CHECKED BY	H.T.
DRAWN BY	T.M.
CHECKED BY	H.T.

BLOUBERG LOCAL MUNICIPALITY
P.o.Box 1593
SENWABARWANA
0790
Tel.: (015) 505-7100
BLOUBERG MUNICIPALITY

MORULA CONSULTING ENGINEERS
morula CONSULTING ENGINEERS & PROJECT MANAGERS "a new dawn"
P.o.Box 2740
POLOKWANE
0700
TEL. (015) 296-4460
FAX. (015) 296-4103

VDM DATE
CONSULTING ENGINEER DATE

TENDER No.: BM01/19/20
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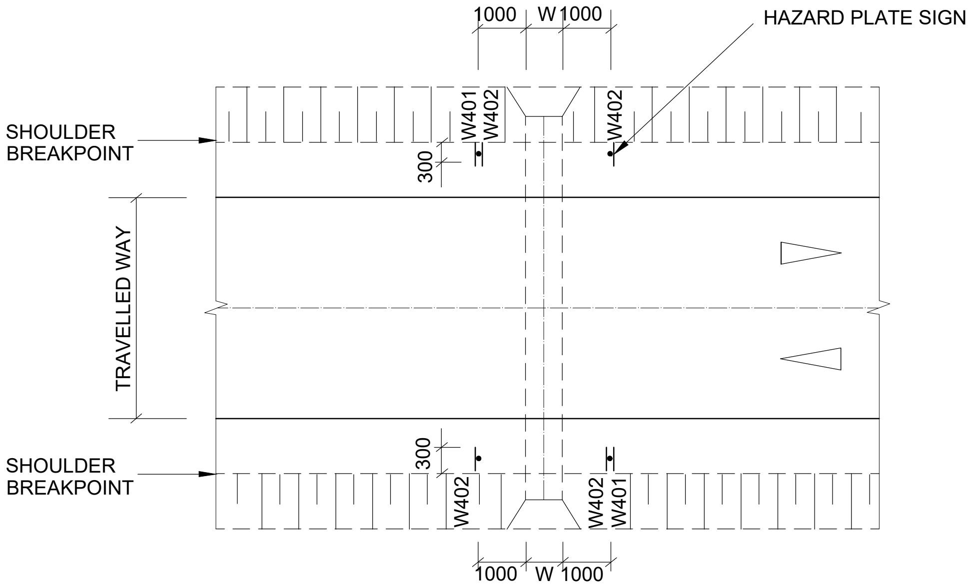
CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

ROAD TRAFFIC SIGNS SUPPORTS, FOUNDATIONS AND DETAIL OF GROUND MOUNTED ROAD SIGN FACE

(Full signature)
CCLM 20 / /
For: Consulting Engineer 20 / /

SHEET 1 OF 1
SCALE AS SHOWN
DRAWING NUMBER MC/BLM/KISP5/SD/04
REVISION 0

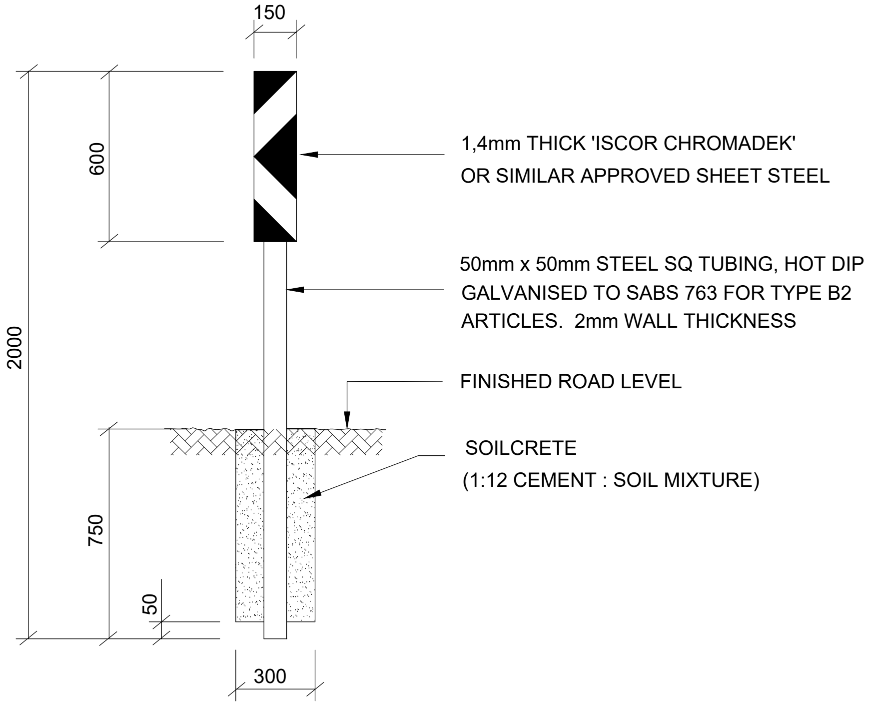
ORIGINAL ON A1



POSITION OF HAZARD PLATES

AT CULVERTS

N.T.S.



TYPICAL DETAIL OF HAZARD PLATE

(W402 SHOWN)

SCALE 1:20

NOTES:

A. HAZARD PLATES

1. HAZARD PLATE SHALL BE 300mm FROM THE SHOULDER BREAKPOINT.
2. FOR WIDE CULVERT (W> 2m WIDTH) SINGLE-SIDED HAZARD PLATES SHALL SHALL BE PLACED ON EACH SIDE OF CULVERT.
3. FOR NARROW CULVERTS (W<2m) PLACE ONE DOUBLE-SIDED HAZARD PLATE PER DIRECTION, ON UPSTREAM SIDE OF TRAFFIC FLOW.
4. W401 AND W402 SIGNS SHALL COMPLY WITH THE LATEST EDITION OF THE SA ROAD TRAFFIC SIGNS MANUAL.

B. EMERGENCY ACCESS

1. TO BE PLACED AT SAFE LOCATIONS WHERE THERE IS NO INTERFERENCE WITH DRAINAGE.
2. ENSURE 300m SIGHT DISTANCE TO BOTH SIDES.

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CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

TYPICAL DETAILS OF HAZARD PLATE AT CULVERT AND EMERGENCY ACCESS POINT

(Full signature)
CCLM 20 / /
For: Consulting Engineer 20 / /

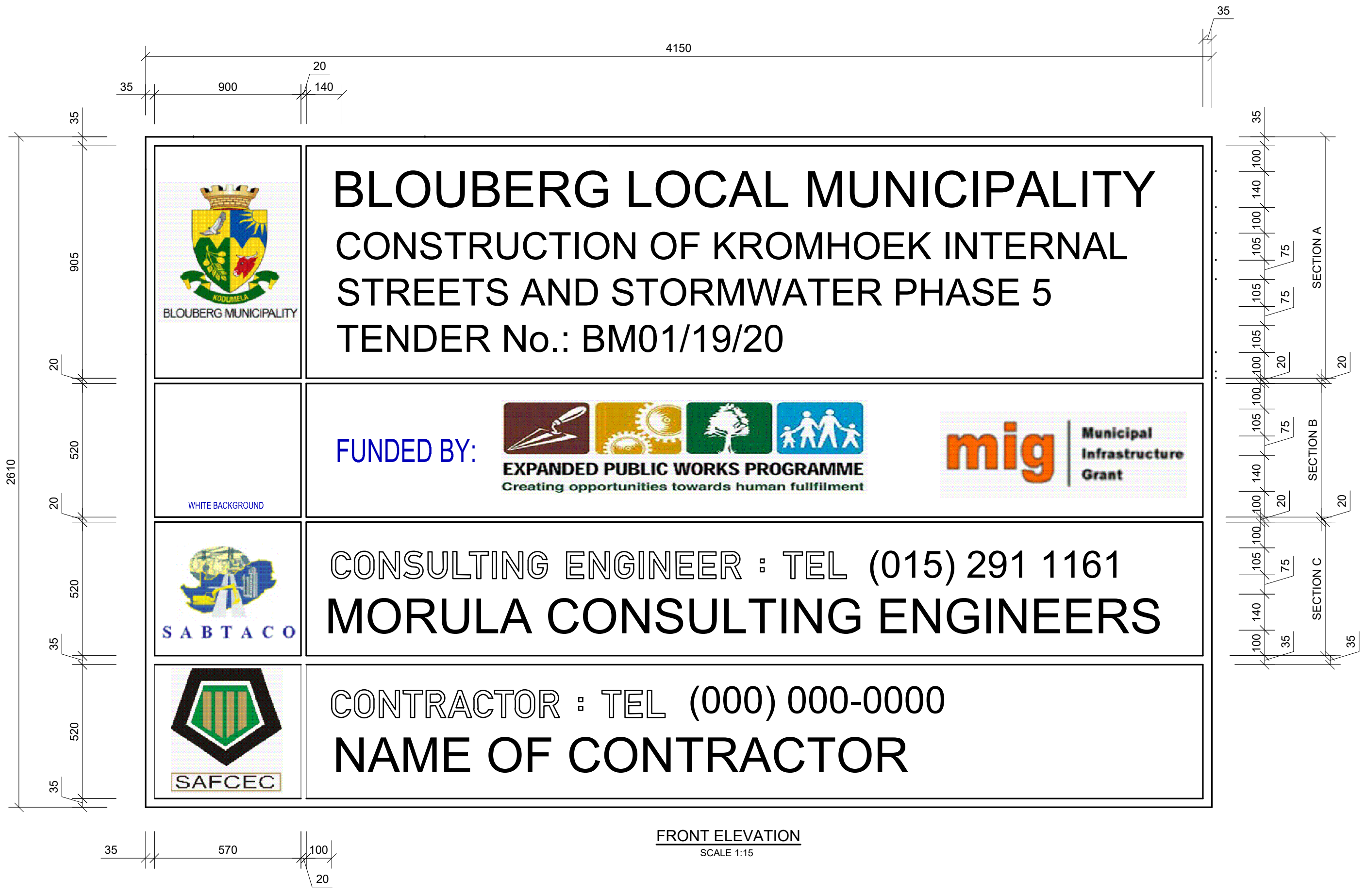
DRAWING NUMBER
MC/BLM/KISP5/SD/05

SHEET 1 OF 1

SCALE
AS SHOWN

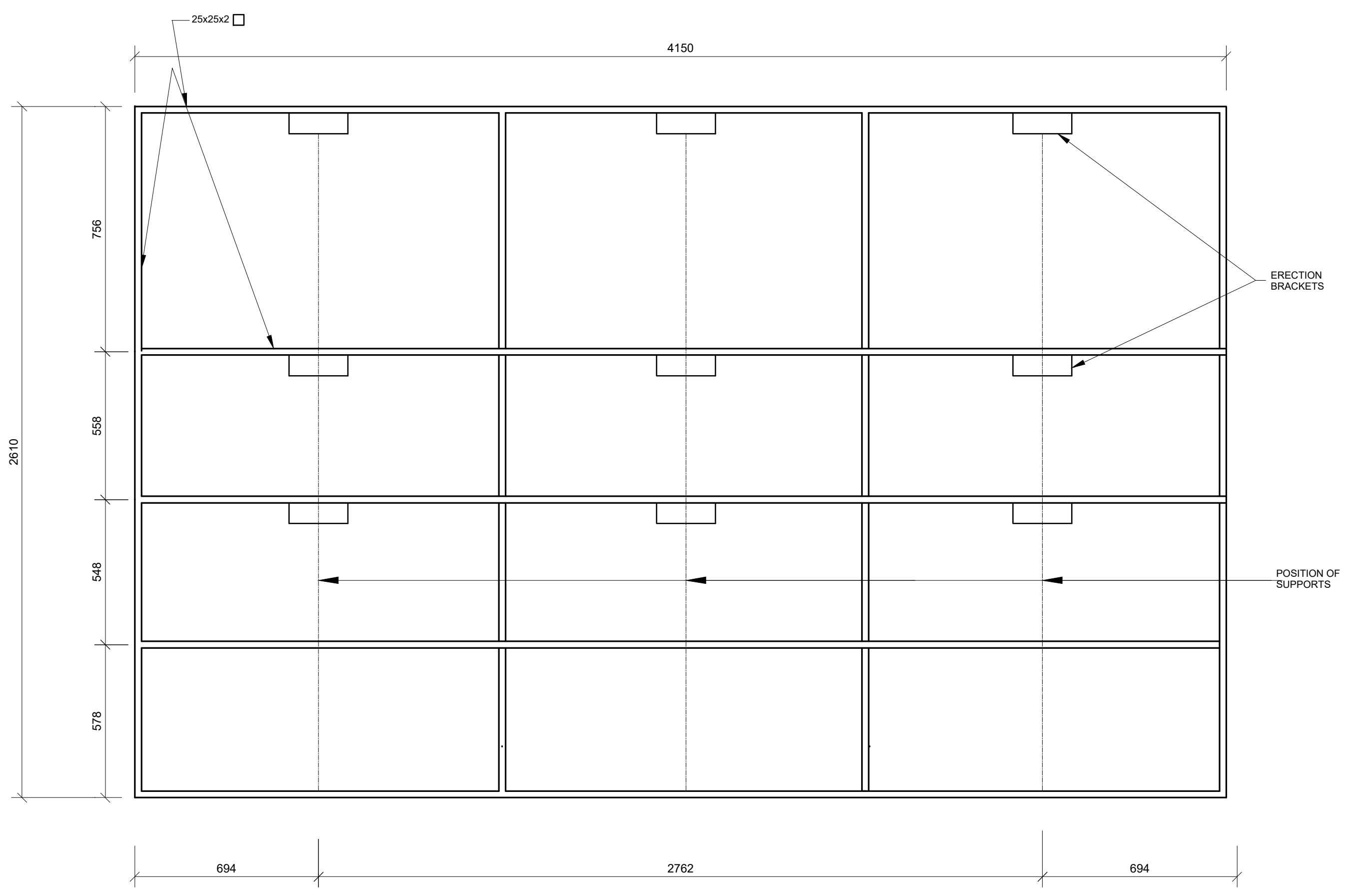
REVISION
⓪

ORIGINAL ON A1



FRONT ELEVATION

SCALE 1:15



SIGN BOARD DETAIL

REAR SIDE BRACING

SCALE 1:15

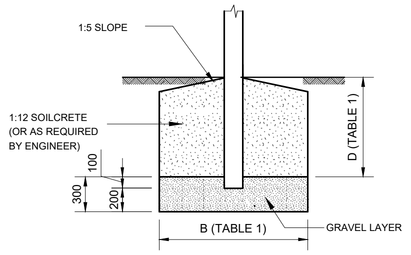
TABLE 1

ERECTION DETAILS

TYPE POST	UPRIGHT	STAY	D	B
TIMBER POST AND STAY	80mm	80mm	600mm	750mm
TIMBER POST	160mm	-	900mm	1350mm
D SECTION STEEL POST	100mm x 4mm	-	900mm	1350mm

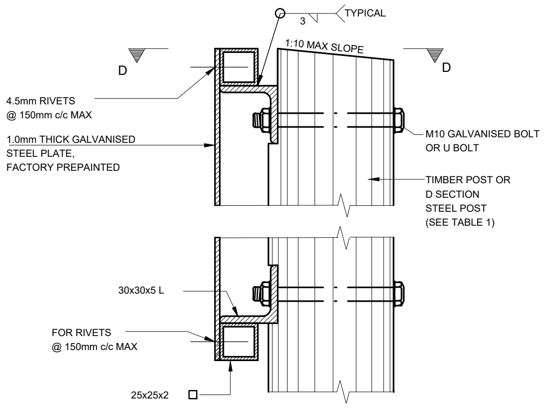
NOTE:

1. ALL EMBLEMS TO BE DISPLAYED IN FULL COLOUR ON A SEMI-MATT BACKGROUND.
2. DESCRIPTION: MATT-BLACK, SERIES DIN B LETTERS AND NUMBERS ON A SEMI-MATT SMOKE-GREY BACKGROUND (PANTONE 429U).
3. BORDER : GREEN NON-REFLECTORIZED.
4. TWO SIGN BOARDS SHALL BE ERECTED AS DETERMINED BY THE ENGINEER.
5. DESCRIPTION OF WORK (NUMBER OF KILOMETRES AND TYPE OF WORK, eg "13,5 km RE= CONSTRUCTION OF ROAD 1974"). DESCRIPTION STARTS CENTERED ON THE LEFT-HAND SIDE AND IN THE FIRST 105mm-DIMENSION BELOW "MAKHADO LOCAL MUNICIPALITY".
6. (a) SAFCEC EMBLEM ONLY, IF CONTRACTOR IS A MEMBER, ALL OTHER CASES, INCLUDING DEPARTMENTAL CONSTRUCTION, REMAIN BLANK.
   (b) IF DEPARMENTAL CONSTRUCTION,THE CONTRACTOR AND TELEPHONE ARE REPLACED WITH ROAD AGENCY LIMPOPO (PTY) LTD CONSTRUCTION UNIT : TEL :
7. SABTACO LOGO TO BE OBTAINED FROM SABTACO, JOHANNESBURG.



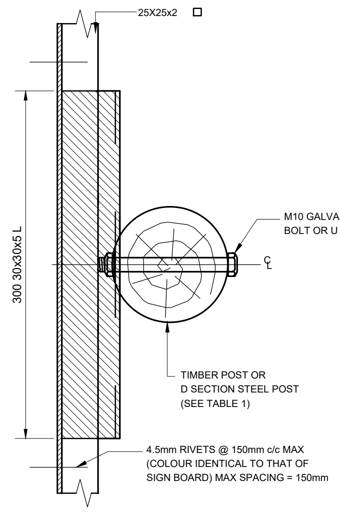
FOUNDATION DETAIL

N.T.S.



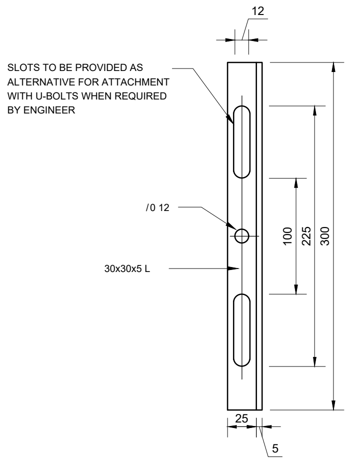
SIDE ELEVATION

N.T.S.



PLAN: SECTION D-D

N.T.S.



ELEVATION ERECTION BRACKET

N.T.S.

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CONSTRUCTION OF KROMHOEK INTERNAL STREETS AND STORMWATER PHASE 5

NAMEBOARD DETAILS

(Full signature)
.... CCLM .... 20 . / . / . .
.... For: Consulting Engineer .... 20 . / . / . .

SHEET 1 OF 1
SCALE
AS SHOWN
DRAWING NUMBER
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