



CITY OF MBOMBELA

CONTRACT NUMBER : BID 213/2020 VI

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

TENDER - JUNE 2023

Issued by:
CITY OF MBOMBELA
P.O Box 45
Nelspruit
1200

Tel: 013 759 9111

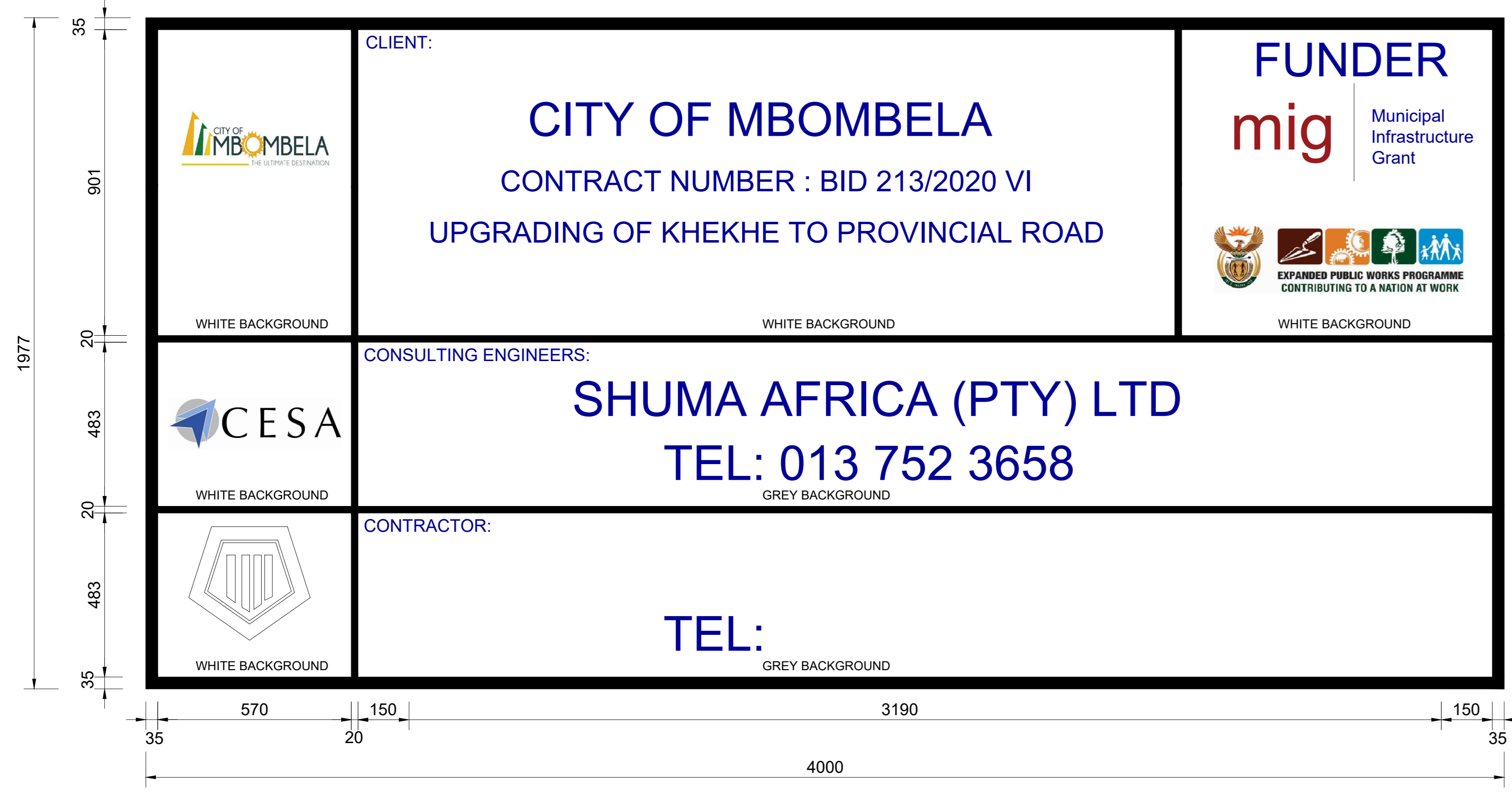
Prepared by:

SHUMA AFRICA
(PTY) LTD

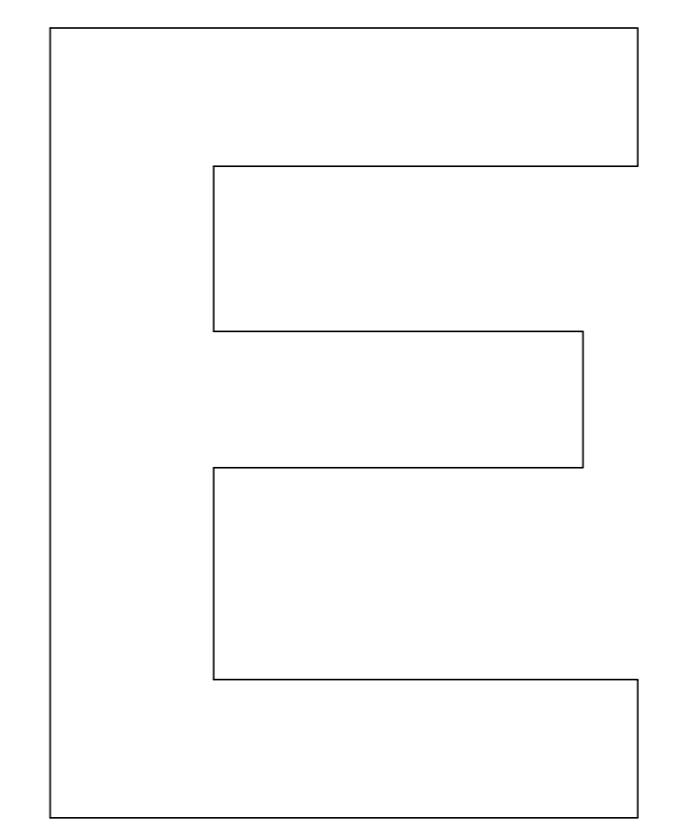
P O Box 1644
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1200

Unit 75, Building 11,
Sonpark Shopping Centre,
Cnr. Madiba Drive and
Piet Retief Street
Nelspruit

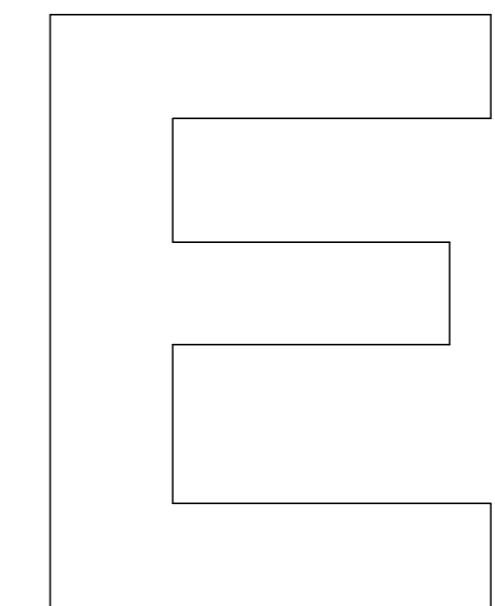
Tel : 013 752 3658
Fax : 086 545 7391
Email : info@shumafrica.co.za



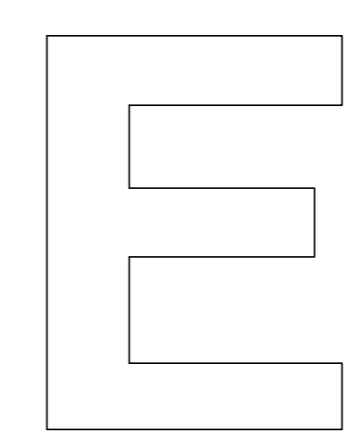
NAME BOARD
N.T.S



PROJECT AND OWNERS NAME.
HELVETICA MEDIUM 100mm WHITE
CAPITAL AND SMALL LETTERS
MUST BE USED FOR



CONSULTANTS AND FIRM NAMES.
HELVETICA MEDIUM 75mm BLACK CAPITAL
AND SMALL LETTERS MUST BE USED FOR

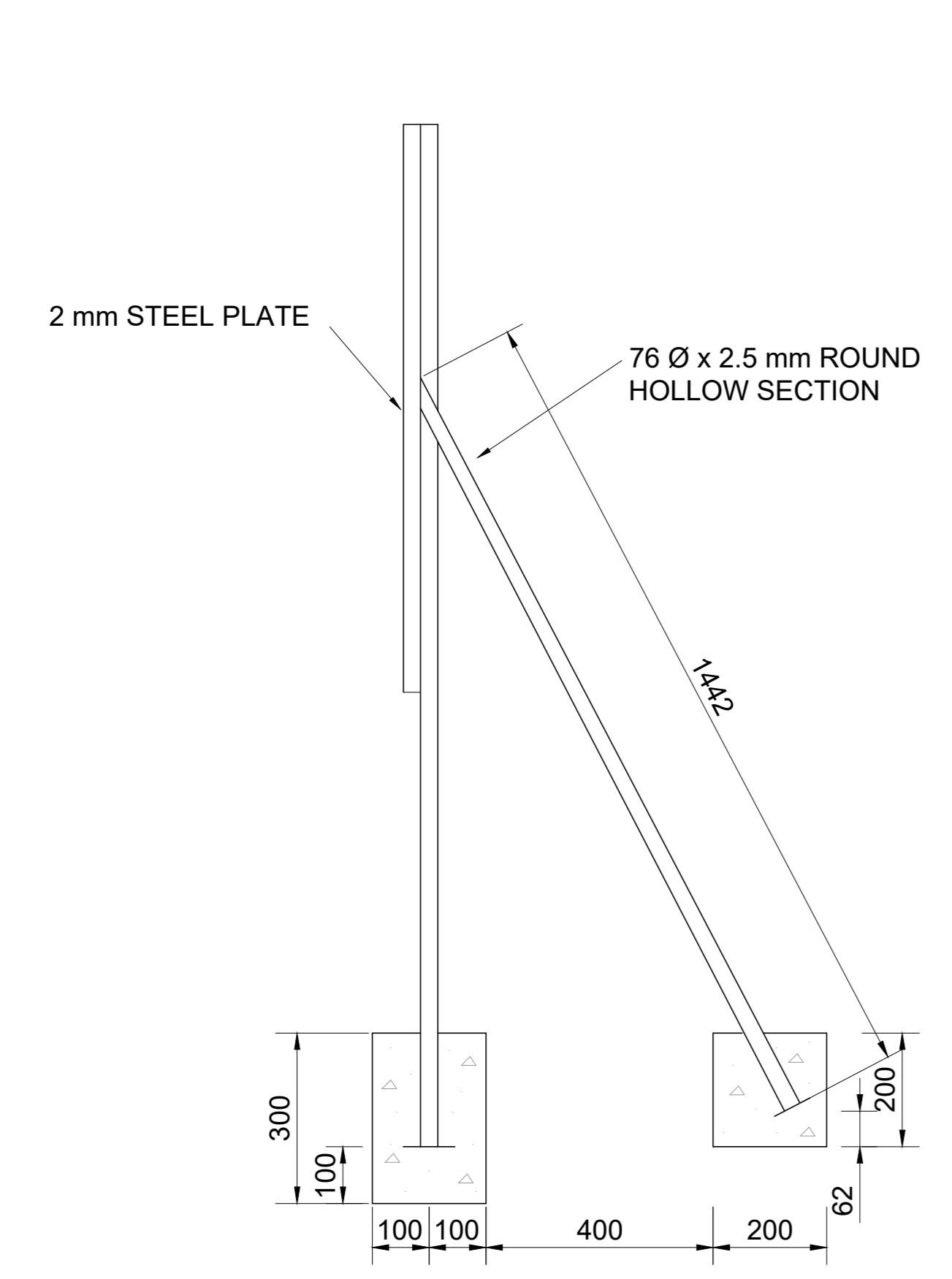


FOR PROFESSIONAL TITLE. HELETICA
MEDIUM 50mm BLACK CAPITAL
LETTERS ONLY MUST BE USED

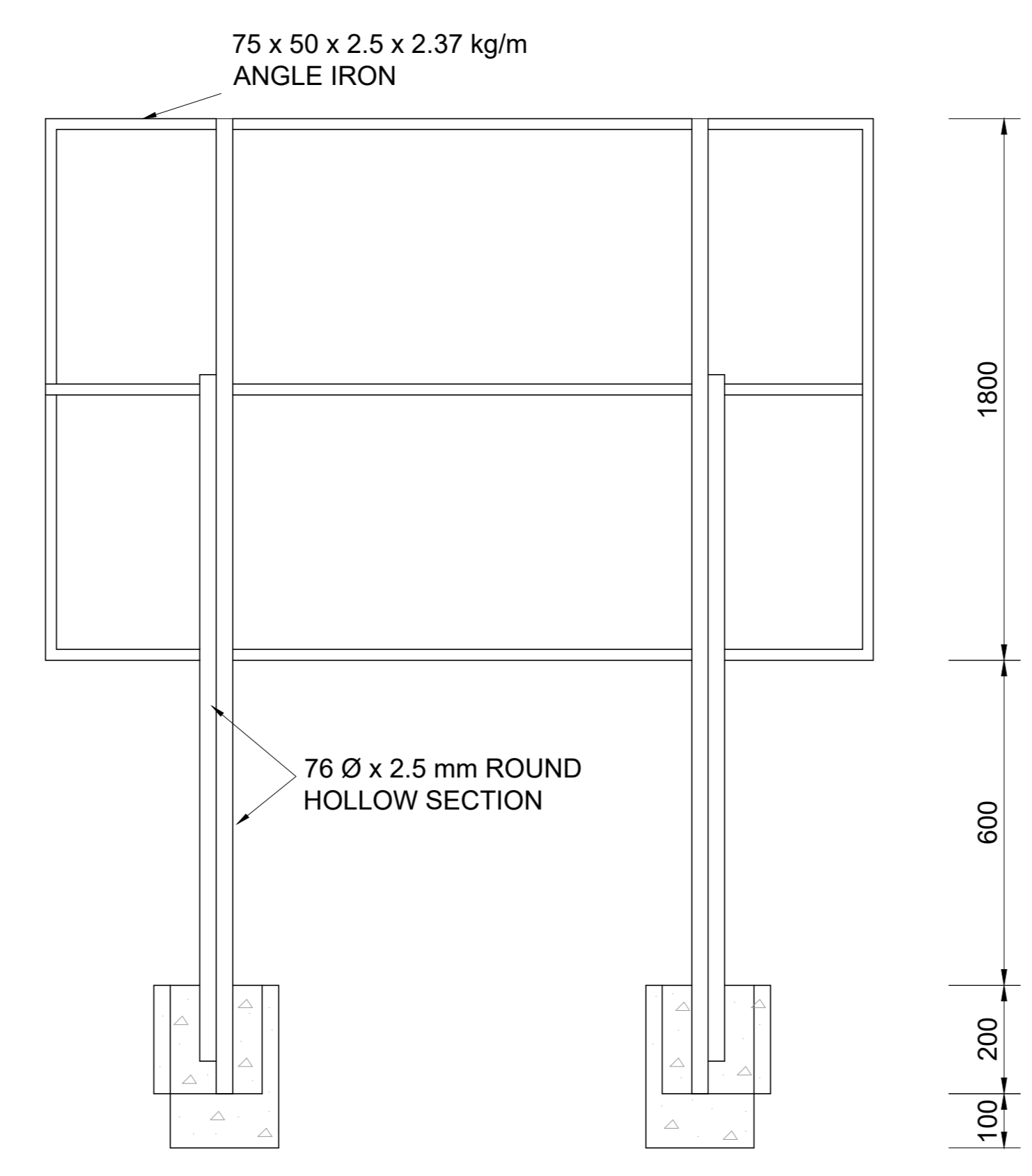
RULES

1. TYPEFACE TO BE USED SHALL BE HELVETICA MEDIUM.
2. SIZE OF LETTERING AND DIMENSIONS ARE INDICATED ON THE DIAGRAM AND SHALL BE STRICTLY ADHERED TO.

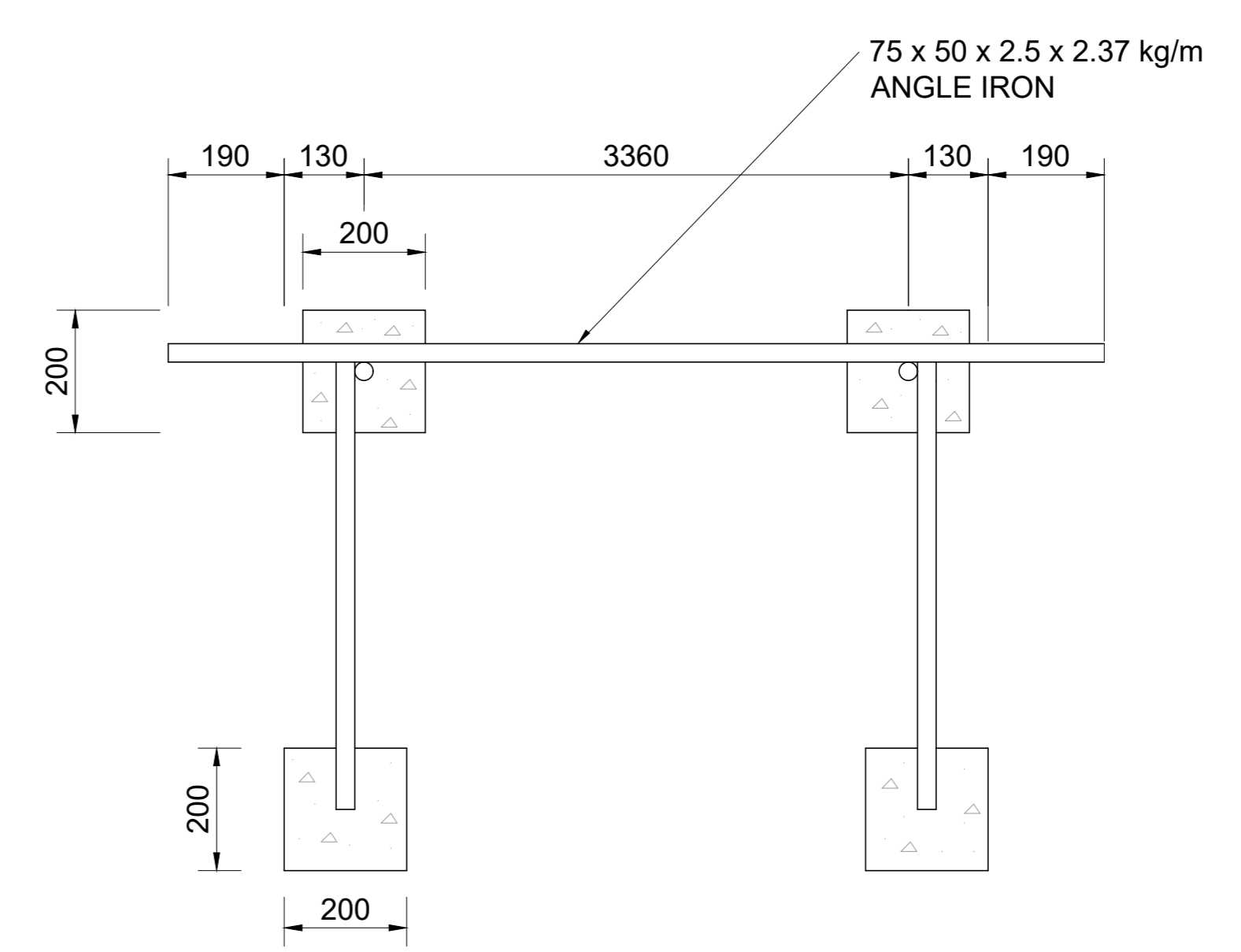
NOTA: PAINT COLOURS ARE BASED ON PLASCON-EVANS. WHITE VLO 1 : TEQUILLA VLO 10 ("VELVAGLO" POLYURETHANE VELVET ENAMEL) BLACK REF. 266, MIDDLE BLUE REF. 290 (ACRYLIC ROAD SIGN PAINTS)



SIDE ELEVATION
N.T.S



BACK ELEVATION
N.T.S



TOP ELEVATION
N.T.S

TENDER

A	MARCH 23	CONCEPT & VIABILITY
B	APRIL 23	DESIGN DEVELOPMENT
C	MAY 23	DESIGN DEVELOPMENT
00	JUNE 23	TENDER
No	DATE	REVISION

CLIENT

CITY OF MBOMBELA

P. O. BOX 45
NELSPRUIT
1200

1 NEL STREET
NELSPRUIT
1200

Tel.: (013) 759 9111 Fax.: (013) 759 2070

DESIGNED BY

DRAWN BY: L.N. MHLANGA

CHECKED BY: R. MAMUREMI
Pr Tech Eng: 2019300534

APPROVED BY: R. MAMUREMI
Pr Tech Eng: 2019300534

CONSULTANT

SHUMA AFRICA (PTY) LTD

UNIT 75, BUILDING 11,
SONPARK SHOPPING CENTRE,
CNR. MADIBA DRIVE AND
PIET RETIEF STREET
NELSPRUIT

P O BOX 1644
NELSPRUIT
1200

Tel.: (013) 752 3658 Fax.: (086) 545 7391

APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 VI

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION

PROJECT NAME BOARD DETAILS

DESIGN PLAN (Full signature)

For MEM

For Consulting Engineer

CONSULTANTS DRAWING NUMBER

SH-1110-00-01-NB

SCALE AS - SHOWN

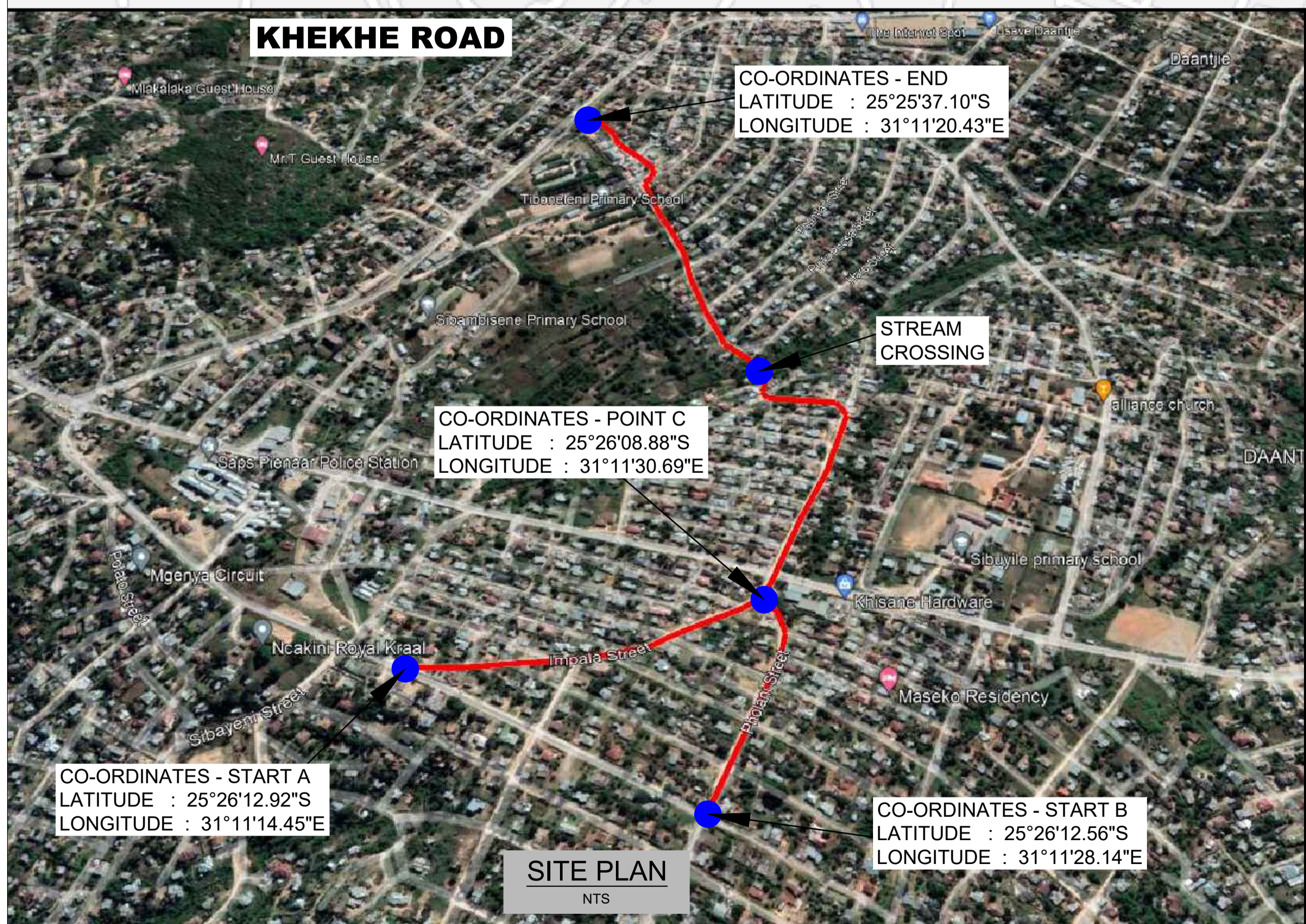
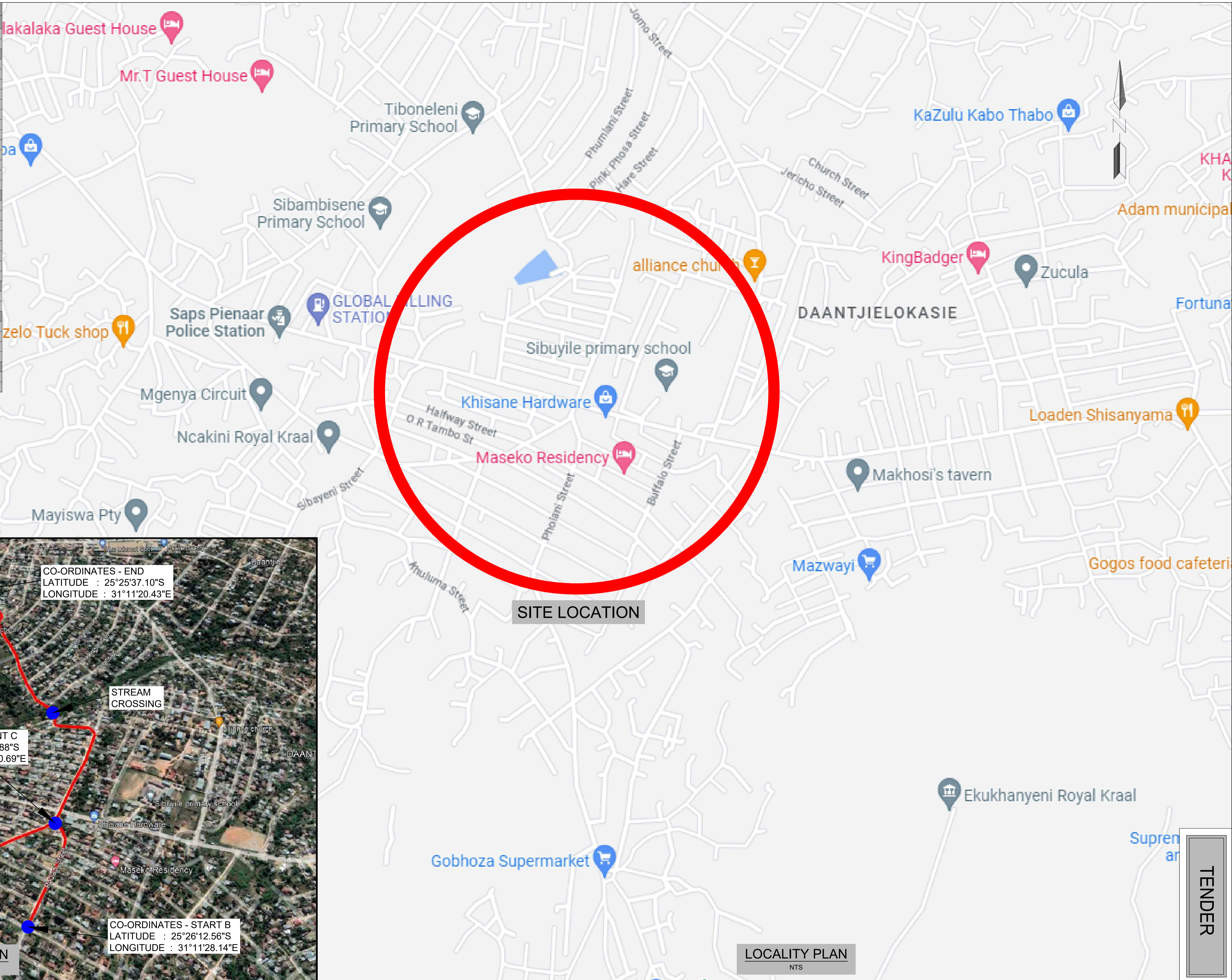
REVISION No. 00

SHEET 1 of 1

DATE JUNE 2023

LIST OF DRAWINGS

CONSULTANTS NO.	DESCRIPTION	REV
SH-1110-00-LOC	LOCALITY PLAN AND LIST OF DRAWINGS - (SHEET 1 OF 1)	00
SH-1110-00-01-NB	NAME BOARD DETAILS - (SHEET 1 OF 1)	00
SH-1110-20-00-LA	LAYOUT INFORMATION AND UPGRADE DISTRIBUTION - (SHEET 1 OF 4)	00
SH-1110-20-01-LA	LAYOUT INFORMATION AND UPGRADE DISTRIBUTION - (SHEET 2 OF 4)	00
SH-1110-20-02-LA	LAYOUT INFORMATION AND UPGRADE DISTRIBUTION - (SHEET 3 OF 4)	00
SH-1110-20-03-LA	LAYOUT INFORMATION AND UPGRADE DISTRIBUTION - (SHEET 4 OF 4)	00
SH-1110-20-04-LS	ROAD LAYOUT & LONGITUDINAL SECTIONS - (SHEET 1 OF 4)	00
SH-1110-20-05-LS	ROAD LAYOUT & LONGITUDINAL SECTIONS - (SHEET 2 OF 4)	00
SH-1110-20-06-LS	ROAD LAYOUT & LONGITUDINAL SECTIONS - (SHEET 3 OF 4)	00
SH-1110-20-07-LS	ROAD LAYOUT & LONGITUDINAL SECTIONS - (SHEET 4 OF 4)	00
SH-1110-20-08-CS	CROSS - SECTIONS - (SHEET 1 OF 5)	00
SH-1110-20-09-CS	CROSS - SECTIONS - (SHEET 2 OF 5)	00
SH-1110-20-10-CS	CROSS - SECTIONS - (SHEET 3 OF 5)	00
SH-1110-20-11-CS	CROSS - SECTIONS - (SHEET 4 OF 5)	00
SH-1110-20-12-CS	CROSS - SECTIONS - (SHEET 5 OF 5)	00
SH-1110-21-00-TD	PAVEMENT DESIGN - (SHEET 1 OF 1)	00
SH-1110-21-01-TD	INTERSECTION TYPE AND SPEED HUMP DETAIL - (SHEET 1 OF 1)	00
SH-1110-21-02-TD	ROAD MARKING DETAILS - (SHEET 1 OF 1)	00
SH-1110-21-03-TD	ROAD SIGNS ERECTION - (SHEET 1 OF 1)	00
SH-1110-21-04-TD	KERBS DETAILS - (SHEET 1 OF 1)	00
SH-1110-21-05-TD	KERBS & EDGE BEAM DETAILS - (SHEET 1 OF 1)	00
SH-1110-21-06-TD	GUARDRAILS - (SHEET 1 OF 1)	00
SH-1110-21-07-TD	GUARDRAIL ELEMENTS - (SHEET 1 OF 1)	00
SH-1110-30-00-LA	STORMWATER LAYOUT - (SHEET 1 OF 2)	00
SH-1110-31-01-LA	STORMWATER LAYOUT - (SHEET 2 OF 2)	00
SH-1110-31-01-TD	CONCRETE SIDE DRAINS - (SHEET 1 OF 1)	00
SH-1110-31-02-TD	GABIONS AND PITCHING - (SHEET 1 OF 1)	00
SH-1110-31-03-TD	SUB- SURFACE DRAINS - (SHEET 1 OF 1)	00
SH-1110-31-04-TD	TYPICAL DETAILS FOR STORMWATER CHANNEL - (SHEET 1 OF 1)	00
SH-1110-100-01-TD	CULVERT LAYOUT & DETAILS AT CHAINAGE 340 - (SHEET 1 OF 1)	00
SH-1110-100-02-TD	MAJOR CULVERT LAYOUT & DETAILS AT CHAINAGE 428 - (SHEET 1 OF 1)	00



No	DATE	REVISION	CONSULT	DIR

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APPROVED BY	R. MAMUREMI Pr Tech Eng: 2019300534

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APPROVED		DATE
MBOMBELA		
CONSULTING ENGINEER		DATE

CONTRACT NUMBER : BID 213/2020 VI
 PROJECT
 UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)
 DESCRIPTION
 LOCALITY PLAN, SITE PLAN AND LIST OF DRAWINGS

DESIGN PLAN (Full signature)	SCALE AS - SHOWN
For: M.M.	REVISION No. 00
For: Consulting Engineer	SHEET 1 of 1
CONSULTANTS DRAWING NUMBER SH-1110-00-LOC	DATE JUNE 2023

TENDER

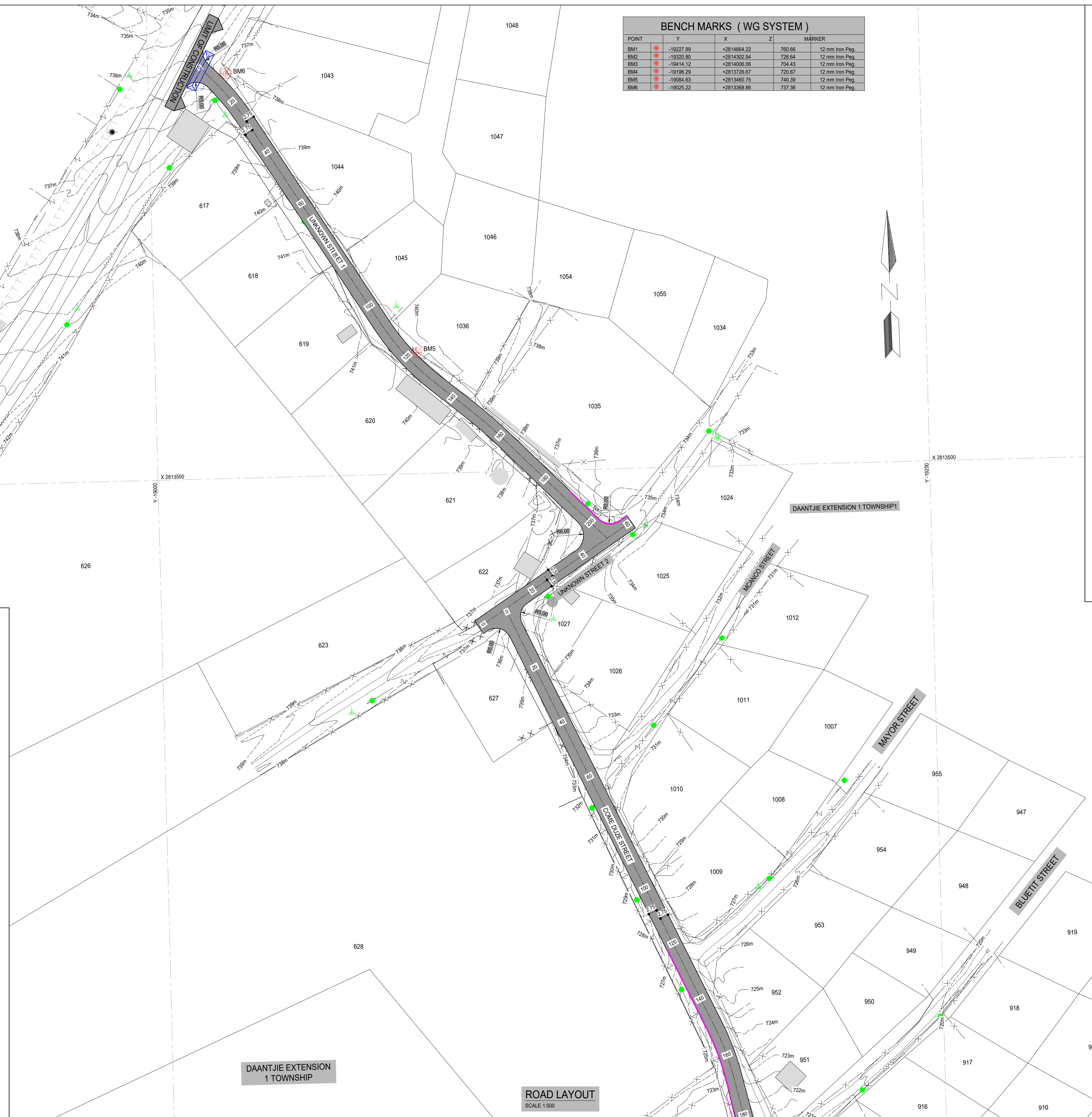
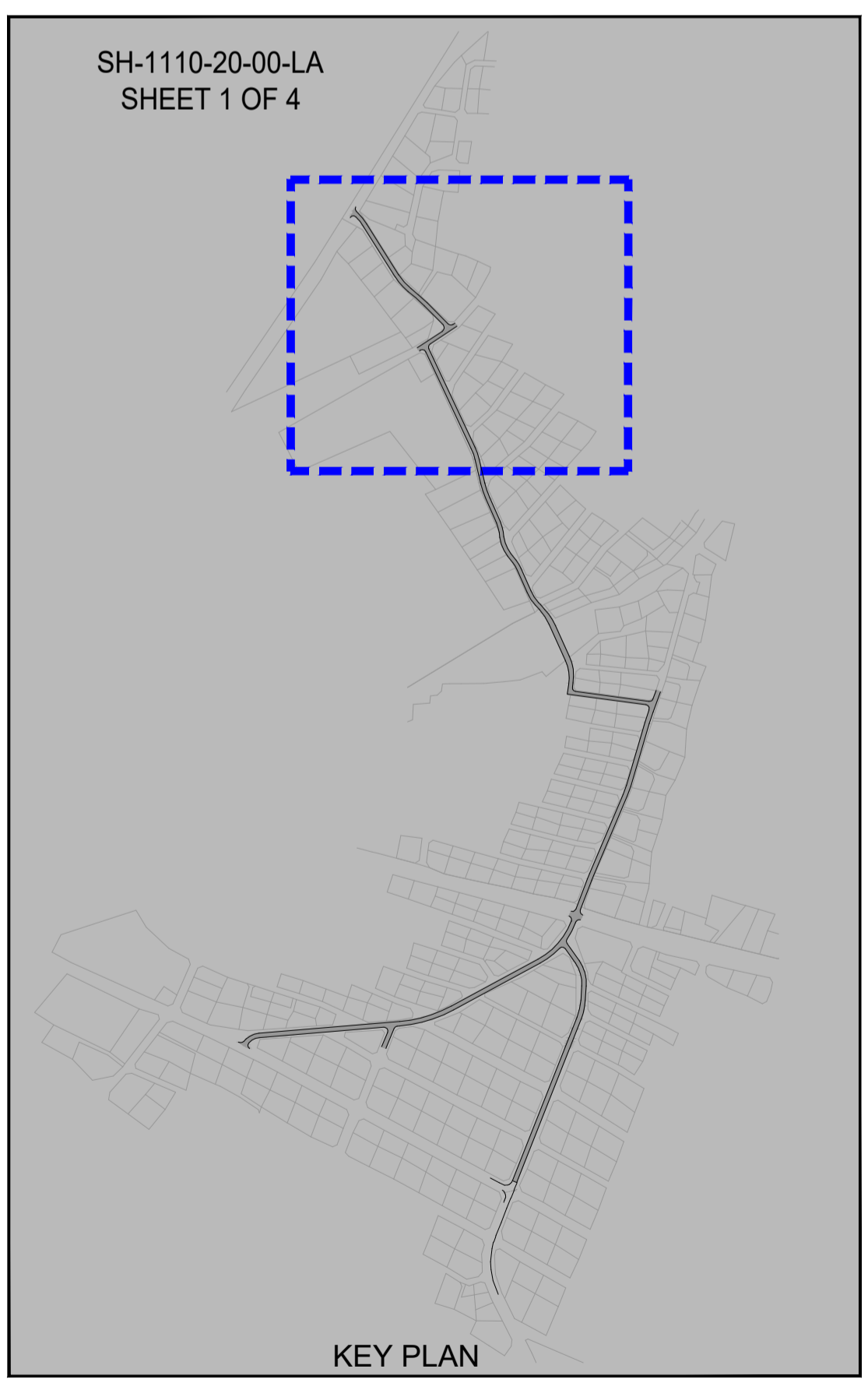
LEGEND	
CONTOUR INTERVAL = 0.5	
PROPOSED ROAD SURFACE	
PROPOSED STORMWATER / V-DRAIN	
EXISTING ROAD SIGNS	
EXISTING GRAVEL ROAD	
EXISTING STORMWATER	
EXISTING FENCE	
EXISTING ELECTRICAL POLE	
EXISTING POLESTAY	
EXISTING TREES	
BENCHMARKS	
EXISTING TAPS	
TELEPHONE LINE	
EXISTING MEDIUM VOLTAGE POWERLINE	
EXISTING LOW VOLTAGE POWERLINE	
EXISTING WATER PIPE	
EXISTING BUILDINGS	
SURVEY TOELINES	
EXISTING CULVERTS	
PROPOSED CULVERT/ BRIDGE	
CONCRETE DRIFT CHANNEL	

BENCH MARKS (WG SYSTEM)					
POINT	Y	X	Z	MARKER	
BM1	-19227.89	+2814864.22	700.66	12 mm Iron Peg	
BM2	-19329.89	+2814302.94	726.64	12 mm Iron Peg	
BM3	-19414.12	+2814006.06	704.43	12 mm Iron Peg	
BM4	-19196.29	+2813726.67	720.67	12 mm Iron Peg	
BM5	-19084.63	+2813460.75	740.39	12 mm Iron Peg	
BM6	-19025.22	+2813368.66	737.36	12 mm Iron Peg	

IMPALA STREET - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y - COORD	X - COORD
1	RIGHT HAND CIRCULAR ARC	17.169m	25m	START	0.000.00	-18 886.145	2 814 483.284
				BCC1	0.011.260	-18 874.228	2 814 475.425
				CENTRE	-	-18 891.633	2 814 469.372
2	LEFT HAND CIRCULAR ARC	74.092m	180m	PI1	-	-18 880.645	2 814 469.202
				ECC1	0.028.429	-18 889.553	2 814 468.458
				BCC2	0.217.247	-19 017.716	2 814 462.747
3	RIGHT HAND CIRCULAR ARC	71.196m	100m	PI2	-	-19 062.739	2 814 273.371
				ECC2	0.291.339	-19 148.233	2 814 431.772
				BCC3	0.423.275	-19 264.337	2 814 368.106
4	RIGHT HAND CIRCULAR ARC	40' 47' 33"	-	PI3	-	-19 216.840	2 814 281.106
				ECC3	0.494.471	-19 310.291	2 814 316.699
				END	0.503.000	-19 313.327	2 814 308.728

UNKNOWN STREET 2 - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y - COORD	X - COORD
1	RIGHT HAND CIRCULAR ARC	236' 39' 41"	-	START	0.000.000	-19 102.724	2 813 550.223
				BCC1	-	-	-
				CENTRE	-	-	-
2	LEFT HAND CIRCULAR ARC	-	-	PI1	-	-	-
				ECC1	-	-	-
				END	0.060.000	-19 152.850	2 813 517.248

COME DUZE STREET - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y - COORD	X - COORD
1	RIGHT HAND CIRCULAR ARC	16.679m	80m	START	0.000.000	-19 111.441	2 813 544.488
				BCC1	0.0151.721	-19 175.952	2 813 681.811
				CENTRE	-	-19 103.544	2 813 715.526
2	LEFT HAND CIRCULAR ARC	22.178m	120m	PI1	-	-19 179.511	2 813 686.386
				ECC1	0.0168.400	-19 181.425	2 813 697.534
				BCC2	0.200.803	-19 188.788	2 813 728.884
3	RIGHT HAND CIRCULAR ARC	14.014m	50m	PI2	-	-19 305.609	2 813 701.446
				ECC2	0.222.781	-19 191.331	2 813 739.710
				BCC3	0.257.368	-19 209.781	2 813 781.528
4	LEFT HAND CIRCULAR ARC	26.452m	50m	PI3	-	-19 164.035	2 813 891.711
				ECC3	0.271.382	-19 212.628	2 813 787.981
				BCC4	0.277.899	-19 214.453	2 813 891.394
5	RIGHT HAND CIRCULAR ARC	12.438m	50m	PI4	-	-19 283.997	2 813 794.653
				ECC4	0.304.318	-19 224.628	2 813 825.478
				BCC5	0.314.948	-19 231.181	2 813 833.847
6	LEFT HAND CIRCULAR ARC	19.465m	60m	PI5	-	-19 191.813	2 813 884.671
				ECC5	0.327.386	-19 235.035	2 813 838.769
				BCC6	0.360.208	-19 237.558	2 813 844.488
7	RIGHT HAND CIRCULAR ARC	25.053m	80m	PI6	-	-19 305.702	2 813 850.298
				ECC6	0.379.673	-19 261.391	2 813 890.752
				BCC7	0.389.803	-19 268.221	2 813 888.234
8	RIGHT HAND CIRCULAR ARC	34.471m	60m	PI7	-	-19 292.140	2 813 952.173
				ECC7	0.414.856	-19 281.965	2 813 919.058
				BCC8	0.463.811	-19302.229	2 813 963.622
9	RIGHT HAND CIRCULAR ARC	-	-	PI8	-	-19 247.610	2 813 968.458
				ECC8	0.498.282	-19 306.957	2 813 997.200
				END	0.513.001	-19 304.790	2 814 011.849



TENDER

No	DATE	REVISION	CONSULT	DIR
A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		

CLIENT

CITY OF MBOMBELA

P. O. BOX 45
NELSPRUIT
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1 NEL STREET
NELSPRUIT
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Tel.: (013) 759 9111 Fax.: (013) 759 2070

DESIGNED BY: T. MULAUDZI

DRAWN BY: L.N. MHLANGA

CHECKED BY: R. MAMUREMI
Pr Tech Eng: 2019300534

APPROVED BY: R. MAMUREMI
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MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 VI

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESIGN PLAN

LAYOUT INFORMATION AND UPGRADE DISTRIBUTION
UNKNOWN STREET 1, UNKNOWN STREET 2 & COME DUZE STREET

SCALE AS - SHOWN

REVISION No. 00

SHEET 1 of 4

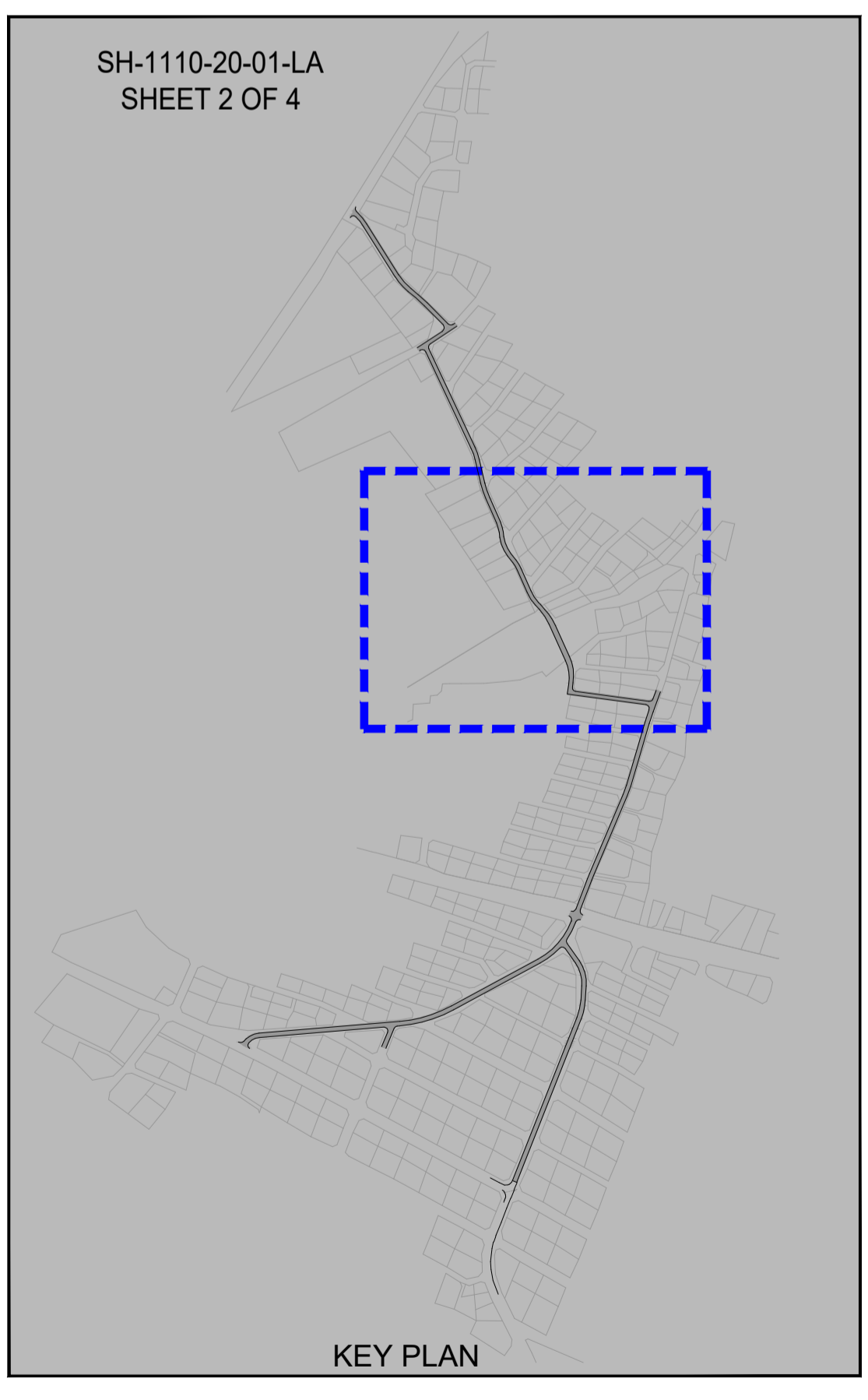
DATE JUNE 2023

LEGEND	
CONTOUR INTERVAL = 0.5	
PROPOSED ROAD SURFACE	
PROPOSED STORMWATER / V-DRAIN	
EXISTING ROAD SIGNS	
EXISTING GRAVEL ROAD	
EXISTING STORMWATER	
EXISTING FENCE	
EXISTING ELECTRICAL POLE	
EXISTING POLESTAY	
EXISTING TREES	
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EXISTING CULVERTS	
PROPOSED CULVERT/ BRIDGE	
CONCRETE DRIFT CHANNEL	

BENCH MARKS (WG SYSTEM)				
POINT	Y	X	Z	MARKER
BM1	-19227.89	+2814864.22	700.66	12 mm Iron Peg
BM2	-19330.80	+2814302.94	726.64	12 mm Iron Peg
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BM5	-19084.63	+2813460.75	740.39	12 mm Iron Peg
BM6	-19025.22	+2813368.86	737.36	12 mm Iron Peg

COME DUZE STREET - HORIZONTAL ALIGNMENT								
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)		
						Y - COORD +0.000	X - COORD +0.000	
1	RIGHT HAND CIRCULAR ARC	16.679m	80m	START	0.000.00	-19.111.441	2.813.544.488	
				BCC1	0.0151.721	-19.175.952	2.813.611.811	
				CENTRE	-	-19.103.544	2.813.715.826	
2	LEFT HAND CIRCULAR ARC	22.178m	120m	P11	-	-19.179.511	2.813.689.386	
				ECC1	0.0188.400	-19.181.425	2.813.697.534	
				BCC2	0.209.603	-19.186.786	2.813.726.894	
3	RIGHT HAND CIRCULAR ARC	14.014m	50m	CENTRE	-	-19.305.609	2.813.701.446	
				P12	-	-19.191.331	2.813.739.710	
				ECC2	0.222.781	-19.195.820	2.813.749.884	
4	LEFT HAND CIRCULAR ARC	26.452m	50m	BCC3	0.267.368	-19.206.781	2.813.781.526	
				CENTRE	-	-19.164.035	2.813.801.711	
				ECC3	0.271.382	-19.213.579	2.813.784.970	
5	RIGHT HAND CIRCULAR ARC	12.438m	50m	BCC4	0.277.866	-19.214.453	2.813.801.394	
				CENTRE	-	-19.263.997	2.813.784.653	
				ECC4	0.304.318	-19.224.628	2.813.825.478	
6	LEFT HAND CIRCULAR ARC	19.465m	60m	BCC5	0.314.948	-19.231.181	2.813.833.847	
				CENTRE	-	-19.191.313	2.813.864.671	
				P15	-	-19.235.035	2.813.838.769	
7	RIGHT HAND CIRCULAR ARC	25.053m	80m	ECC5	0.327.386	-19.237.558	2.813.844.488	
				BCC6	0.360.208	-19.250.808	2.813.874.518	
				CENTRE	-	-19.305.702	2.813.890.298	
8	LEFT HAND CIRCULAR ARC	18.35.16"	60m	P16	-	-19.254.771	2.813.983.501	
				ECC6	0.379.873	-19.261.991	2.813.890.752	
				BCC7	0.389.803	-19.268.221	2.813.888.234	
9	RIGHT HAND CIRCULAR ARC	17.56.35"	80m	CENTRE	-	-19.209.140	2.813.952.173	
				P17	-	-19.276.737	2.813.907.561	
				ECC7	0.414.856	-19.281.965	2.813.916.058	
10	RIGHT HAND CIRCULAR ARC	34.471m	60m	BCC8	0.463.811	-19.302.229	2.813.963.622	
				CENTRE	-	-19.247.610	2.813.988.458	
				P18	-	-19.309.566	2.813.979.736	
END				ECC8	0.498.202	-19.306.957	2.813.997.290	
						0.513.001	-19.304.790	2.814.011.849

UNKNOWN STREET 3 - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y - COORD +0.000	X - COORD +0.000
1	RIGHT HAND CIRCULAR ARC	77.35.07"	-	START	0.000.00	-19.305.123	2.814.009.609
				BCC1	-	-	-
				CENTRE	-	-	-
				P11	-	-	-
				ECC1	0.110.553	-19.414.709	2.814.024.202



TENDER

No	DATE	REVISION	CONSULT	DIR
A	MARCH 23	CONCEPT & VIABILITY		
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DD	JUNE 23	TENDER		

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PIET RETIEF STREET
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MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 VI

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESIGN PLAN

LAYOUT INFORMATION AND UPGRADE DISTRIBUTION
COME DUZE STREET & UNKNOWN STREET 3

SCALE AS - SHOWN

REVISION No. 00

SHEET 2 of 4

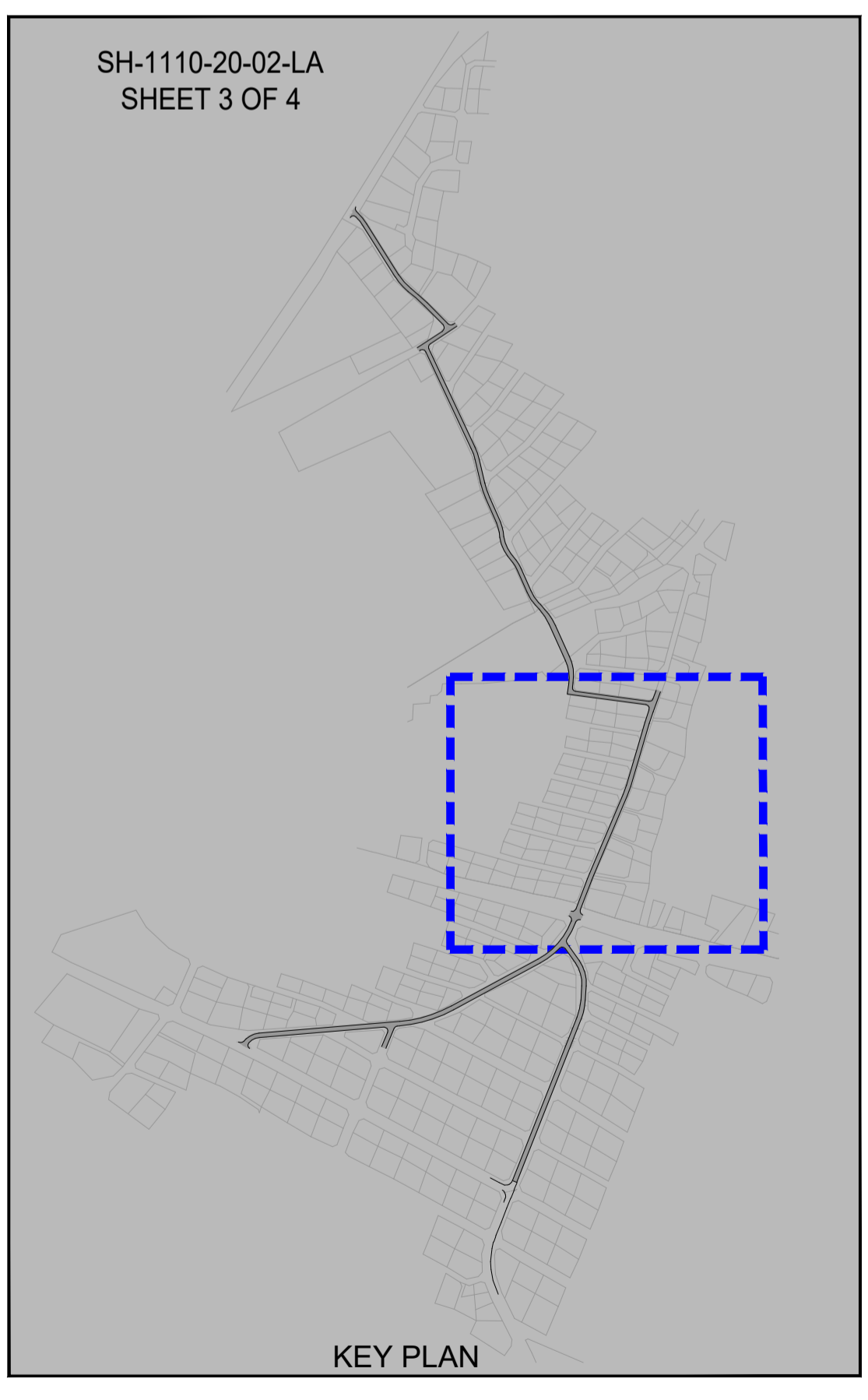
DATE JUNE 2023

LEGEND	
CONTOUR INTERVAL = 0.5	
PROPOSED ROAD SURFACE	
PROPOSED STORMWATER / V-DRAIN	
EXISTING ROAD SIGNS	
EXISTING GRAVEL ROAD	
EXISTING STORMWATER	
EXISTING FENCE	
EXISTING ELECTRICAL POLE	
EXISTING POLESTAY	
EXISTING TREES	
BENCHMARKS	
EXISTING TAPS	
TELEPHONE LINE	
EXISTING MEDIUM VOLTAGE POWERLINE	
EXISTING LOW VOLTAGE POWERLINE	
EXISTING WATER PIPE	
EXISTING BUILDINGS	
SURVEY TOELINES	
EXISTING CULVERTS	
PROPOSED CULVERT/ BRIDGE	
CONCRETE DRIFT CHANNEL	

BENCH MARKS (WG SYSTEM)				
POINT	Y	X	Z	MARKER
BM1	-19227.89	+2814664.22	760.66	12 mm Iron Peg
BM2	-19320.80	+2814302.94	726.64	12 mm Iron Peg
BM3	-19414.12	+2814006.06	704.43	12 mm Iron Peg
BM4	-19196.29	+2813726.67	720.67	12 mm Iron Peg
BM5	-19084.63	+2813460.75	740.39	12 mm Iron Peg
BM6	-19025.22	+2813368.86	737.36	12 mm Iron Peg

UNKNOWN STREET 3 - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y - COORD +0.000	X - COORD +0.000
1	DEFLECTION ANGLE 77° 39' 07"			START	0.000 00	-19 305.123	2 814 009.609
				BCC1	-	-	-
				CENTRE	-	-	-
				END	0.110 563	-19 414.709	2 814 024.202

IMPALA STREET EXT - HORIZONTAL ALIGNMENT								
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)		
						Y - COORD +0.000	X - COORD +0.000	
1	DEFLECTION ANGLE 02° 06' 49"	RIGHT HAND CIRCULAR ARC	7.495m	200m	START	0.000 000	-19 313.384	2 814 308.577
					BCC1	0.062 101	-19 331.928	2 814 259.868
					CENTRE	-	-19 518.831	2 814 331.074
					END	0.059 596	-19 334.726	2 814 252.936
2	DEFLECTION ANGLE 06° 36' 29"	LEFT HAND CIRCULAR ARC	13.840m	120m	START	0.114 369	-19 379.574	2 814 141.297
					BCC2	-	-19 269.112	2 814 100.384
					CENTRE	-	-19 382.281	2 814 140.890
					END	0.188 229	-19 384.236	2 814 134.244
3	DEFLECTION ANGLE 03° 52' 28"	RIGHT HAND CIRCULAR ARC	16.905m	250m	START	0.275 743	-19 408.929	2 814 056.786
					BCC3	-	-19 648.770	2 814 120.828
					CENTRE	-	-19 411.315	2 814 042.174
					END	0.292 648	-19 414.244	2 814 034.241



No	DATE	REVISION	CONSULT	DIR
A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		

CLIENT

CITY OF MBOMBELA

P. O. BOX 45
NELSPRUIT
1200

1 NEL STREET
NELSPRUIT
1200

Tel.: (013) 759 9111 Fax.: (013) 759 2070

DESIGNED BY: T. MULAUDZI

DRAWN BY: L.N. MHLANGA

CHECKED BY: R. MAMUREMI

APPROVED BY: R. MAMUREMI

Pr Tech Eng: 2019300534

CONSULTANT

SHUMA AFRICA (PTY) LTD

UNIT 75, BUILDING 11,
SONPARK SHOPPING CENTRE,
CNR. MADIBA DRIVE AND
PIET RETIEF STREET
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1200

Tel.: (013) 752 3658 Fax.: (086) 545 7391

APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 VI

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESIGN PLAN (Full signature)

For: M.E.M.

For: Consulting Engineer

CONSULTANTS DRAWING NUMBER

SH-1110-20-02-LA

SCALE AS - SHOWN

REVISION No. 00

SHEET 3 of 4

DATE JUNE 2023

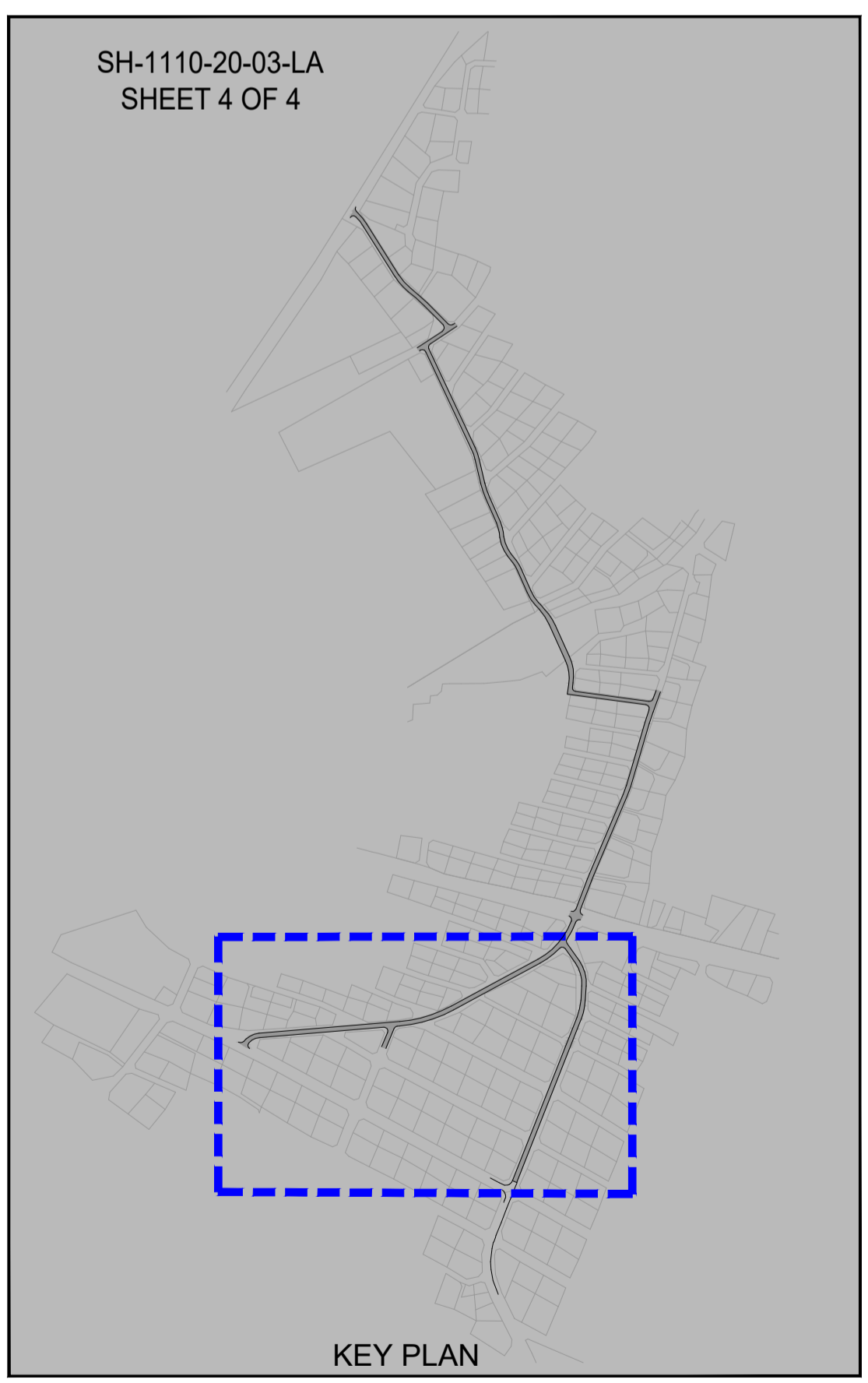
TENDER

LEGEND	
CONTOUR INTERVAL = 0.5	
PROPOSED ROAD SURFACE	
PROPOSED STORMWATER / V-DRAIN	
EXISTING ROAD SIGNS	
EXISTING GRAVEL ROAD	
EXISTING STORMWATER	
EXISTING FENCE	
EXISTING ELECTRICAL POLE	
EXISTING POLESTAY	
EXISTING TREES	
BENCHMARKS	
EXISTING TAPS	
TELEPHONE LINE	
EXISTING MEDIUM VOLTAGE POWERLINE	
EXISTING LOW VOLTAGE POWERLINE	
EXISTING WATER PIPE	
EXISTING BUILDINGS	
SURVEY TOELINES	
EXISTING CULVERTS	
PROPOSED CULVERT / BRIDGE	
CONCRETE DRIFT CHANNEL	

PHOLANI STREET - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y - COORD +0.000	
						X - COORD +0.000	
1	DEFLECTION ANGLE 17° 46' 32"	24.819m	80m	START	0.000 000	-19 226 747	2 814 676 111
				BCC1	0.247 794	-19 317 853	2 814 445 873
				CENTRE	-	-19 243 457	2 814 416 259
				PI1	-	-19 322 453	2 814 434 039
				ECC1	0.272 613	-19 323 281	2 814 421 556
				BCC2	0.291 937	-19 324 561	2 814 402 275
2	DEFLECTION ANGLE 39° 01' 48"	34.060m	50m	CENTRE	-	-19 274 670	2 814 388 964
				PI2	-	-19 325 734	2 814 384 593
				ECC2	0.325 997	-19 315 511	2 814 370 119
				END	0.360 000	-19 295 894	2 814 342 345

IMPALA STREET EXT - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y - COORD +0.000	
						X - COORD +0.000	
1	DEFLECTION ANGLE 02° 08' 49"	7.495m	200m	START	0.000 000	-19 313 384	2 814 308 577
				BCC1	0.052 101	-19 331 928	2 814 259 888
				CENTRE	-	-19 518 831	2 814 331 074
				PI1	-	-19 333 262	2 814 256 386
				ECC1	0.059 596	-19 334 726	2 814 252 936
				BCC2	0.174 389	-19 379 574	2 814 147 267
2	DEFLECTION ANGLE 06° 30' 20"	13.840m	120m	CENTRE	-	-19 289 112	2 814 100 384
				PI2	-	-19 362 281	2 814 140 890
				ECC2	0.188 229	-19 384 236	2 814 134 244
				BCC3	0.275 743	-19 408 929	2 814 050 286
3	DEFLECTION ANGLE 03° 52' 28"	16.905m	250m	CENTRE	-	-19 648 770	2 814 120 828
				PI3	-	-19 411 315	2 814 042 174
				ECC3	0.292 648	-19 414 244	2 814 034 241
				END	0.320 000	-19 423 717	2 814 006 582

BENCH MARKS (WG SYSTEM)					
POINT	Y	X	Z	MARKER	
BM1	-19227.89	+2814664.22	760.86	12 mm Iron Peg	
BM2	-19320.80	+2814302.94	726.64	12 mm Iron Peg	
BM3	-19414.12	+2814006.06	704.43	12 mm Iron Peg	
BM4	-19196.29	+2813726.67	720.67	12 mm Iron Peg	
BM5	-19084.63	+2813460.75	740.39	12 mm Iron Peg	
BM6	-19025.22	+2813368.66	737.36	12 mm Iron Peg	



ROAD LAYOUT
SCALE 1:500

TENDER

No	DATE	REVISION	CONSULT	DIR
A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
DD	JUNE 23	TENDER		

CLIENT
CITY OF MBOMBELA
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1 NEL STREET
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DESIGNED BY	T. MULAUDZI
DRAWN BY	L.N. MHLANGA
CHECKED BY	R. MAMUREMI Pr Tech Eng: 2019300534
APPROVED BY	R. MAMUREMI Pr Tech Eng: 2019300534

CONSULTANT
SHUMA AFRICA (PTY) LTD
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SONPARK SHOPPING CENTRE,
CIV. MADISA DRIVE AND
PIET RETIEF STREET
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1200
Fax.: (086) 545 7391

APPROVED	DATE
MBOMBELA	
CONSULTING ENGINEER	DATE

CONTRACT NUMBER : BID 213/2020 VI
PROJECT
UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)
DESCRIPTION
LAYOUT INFORMATION AND UPGRADE DISTRIBUTION
IMPALA STREET & PHOLANI STREET
SH-1110-20-03-LA

DESIGN PLAN (Full signature)	SCALE AS - SHOWN
For M&M	REVISION No. 00
For Consulting Engineer	SHEET 4 of 4
CONSULTANTS DRAWING NUMBER	DATE JUNE 2023

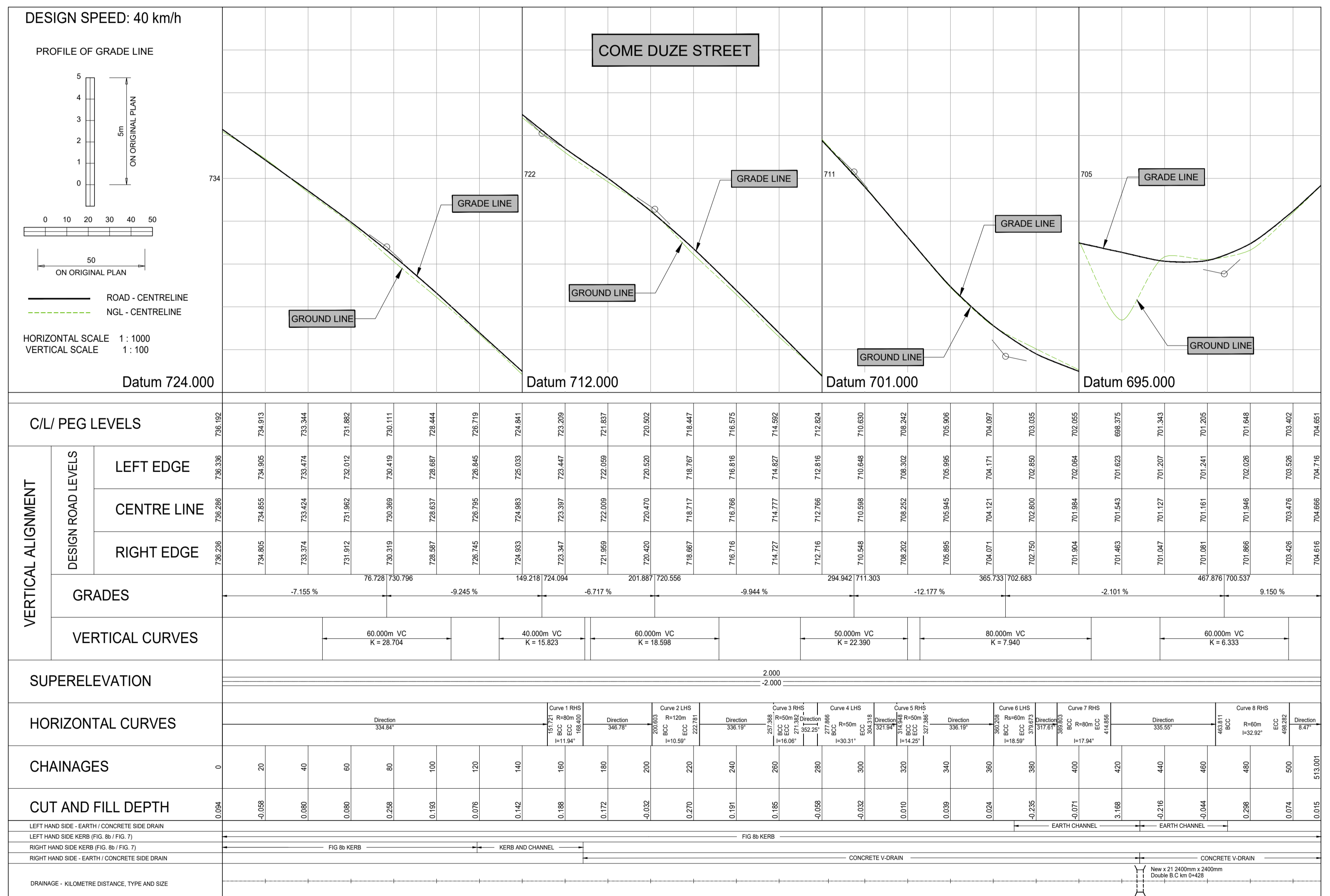
LEGEND	
CONTOUR INTERVAL = 0.5	
PROPOSED ROAD SURFACE	
PROPOSED STORMWATER / V-DRAIN	
EXISTING ROAD SIGNS	
EXISTING GRAVEL ROAD	
EXISTING STORMWATER	
EXISTING FENCE	
EXISTING ELECTRICAL POLE	
EXISTING POLESTAY	
EXISTING TREES	
BENCHMARKS	
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EXISTING WATER PIPE	
EXISTING BUILDINGS	
SURVEY TOELINES	
EXISTING CULVERTS	
PROPOSED CULVERT/ BRIDGE	
CONCRETE DRIFT CHANNEL	



BENCH MARKS (WG SYSTEM)					
POINT	Y	X	Z	MARKER	
BM1	-19227.89	+2814664.22	700.66	12 mm Iron Peg	
BM2	-19320.80	+2814302.94	726.84	12 mm Iron Peg	
BM3	-19414.12	+2814006.06	704.43	12 mm Iron Peg	
BM4	-19196.29	+2813726.67	720.67	12 mm Iron Peg	
BM5	-19084.63	+2813460.75	740.39	12 mm Iron Peg	
BM6	-19025.22	+2813368.66	737.36	12 mm Iron Peg	

COME DUZE STREET - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y - COORD +0.000	X - COORD +0.000
1	RIGHT HAND CIRCULAR ARC	16.679m	80m	START	0.000 00	-19 111 441	2 813 544 488
				BCC1	0.0151 721	-19 175 962	2 813 681 811
				CENTRE	-	-19 103 544	2 813 715 826
2	LEFT HAND CIRCULAR ARC	22.178m	120m	PI1	-	-19 179 511	2 813 689 386
				ECC1	0.0168 400	-19 181 425	2 813 697 534
				BCC2	0.200 603	-19 188 768	2 813 726 884
3	RIGHT HAND CIRCULAR ARC	14.014m	50m	CENTRE	-	-19 305 629	2 813 701 446
				PI2	-	-19 191 331	2 813 739 710
				ECC2	0.222 781	-19 195 820	2 813 749 884
4	LEFT HAND CIRCULAR ARC	26.452m	50m	BCC3	0.257 368	-19 209 781	2 813 781 528
				CENTRE	-	-19 154 035	2 813 801 711
				PI3	-	-19 212 628	2 813 787 981
5	RIGHT HAND CIRCULAR ARC	12.438m	50m	ECC3	0.271 382	-19 213 579	2 813 794 970
				BCC4	0.277 866	-19 214 453	2 813 801 394
				CENTRE	-	-19 263 997	2 813 794 653
6	LEFT HAND CIRCULAR ARC	14° 18' 41"	26.452m	PI4	-	-19 216 279	2 813 814 814
				ECC4	0.304 318	-19 224 628	2 813 825 478
				BCC5	0.314 948	-19 231 181	2 813 833 847
7	RIGHT HAND CIRCULAR ARC	12.438m	50m	CENTRE	-	-19 191 813	2 813 864 671
				PI5	-	-19 235 035	2 813 836 769
				ECC5	0.327 386	-19 237 558	2 813 844 488
8	LEFT HAND CIRCULAR ARC	19.465m	60m	BCC6	0.360 208	-19 250 808	2 813 874 518
				CENTRE	-	-19 305 702	2 813 850 298
				PI6	-	-19 254 771	2 813 863 501
9	RIGHT HAND CIRCULAR ARC	18° 30' 16"	19.465m	ECC6	0.379 673	-19 261 391	2 813 890 752
				BCC7	0.389 803	-19 268 221	2 813 898 234
				CENTRE	-	-19 209 140	2 813 952 173
10	LEFT HAND CIRCULAR ARC	17° 56' 35"	25.053m	PI7	-	-19 276 737	2 813 907 561
				ECC7	0.414 856	-19 281 965	2 813 919 358
				BCC8	0.463 811	-19 302 229	2 813 963 622
11	RIGHT HAND CIRCULAR ARC	32° 55' 01"	34.471m	CENTRE	-	-19 247 610	2 813 988 458
				PI8	-	-19 309 566	2 813 979 758
				ECC8	0.498 282	-19 306 957	2 813 987 290
END					0.513 001	-19 304 790	2 814 011 849

ROAD MARKINGS SEE DRAWING N°:



TENDER

No	DATE	REVISION	CONSULT	DIR
A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		

CLIENT

CITY OF MBOMBELA

P. O. BOX 45
NELSPRUIT
1200

1 NEL STREET
NELSPRUIT
1200

Tel.: (013) 759 9111 Fax.: (013) 759 2070

DESIGNED BY: **T. MULAUDZI**

DRAWN BY: **L.N. MHLANGA**

CHECKED BY: **R. MAMUREMI**
Pr Tech Eng: 2019300534

APPROVED BY: **R. MAMUREMI**
Pr Tech Eng: 2019300534

CONSULTANT

SHUMA AFRICA (PTY) LTD

UNIT 75, BUILDING 11,
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CHR. MADIBA DRIVE AND
PIET RETIEF STREET
NELSPRUIT

P O BOX 1644
NELSPRUIT
1200

Tel.: (013) 752 3658 Fax.: (086) 545 7391

APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 VI

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESIGNATION

LAYOUT AND LONGITUDINAL SECTIONS

DESIGN PLAN (Full signature)

SCALE AS - SHOWN

REVISION No. 00

SHEET 1 of 4

DATE JUNE 2023

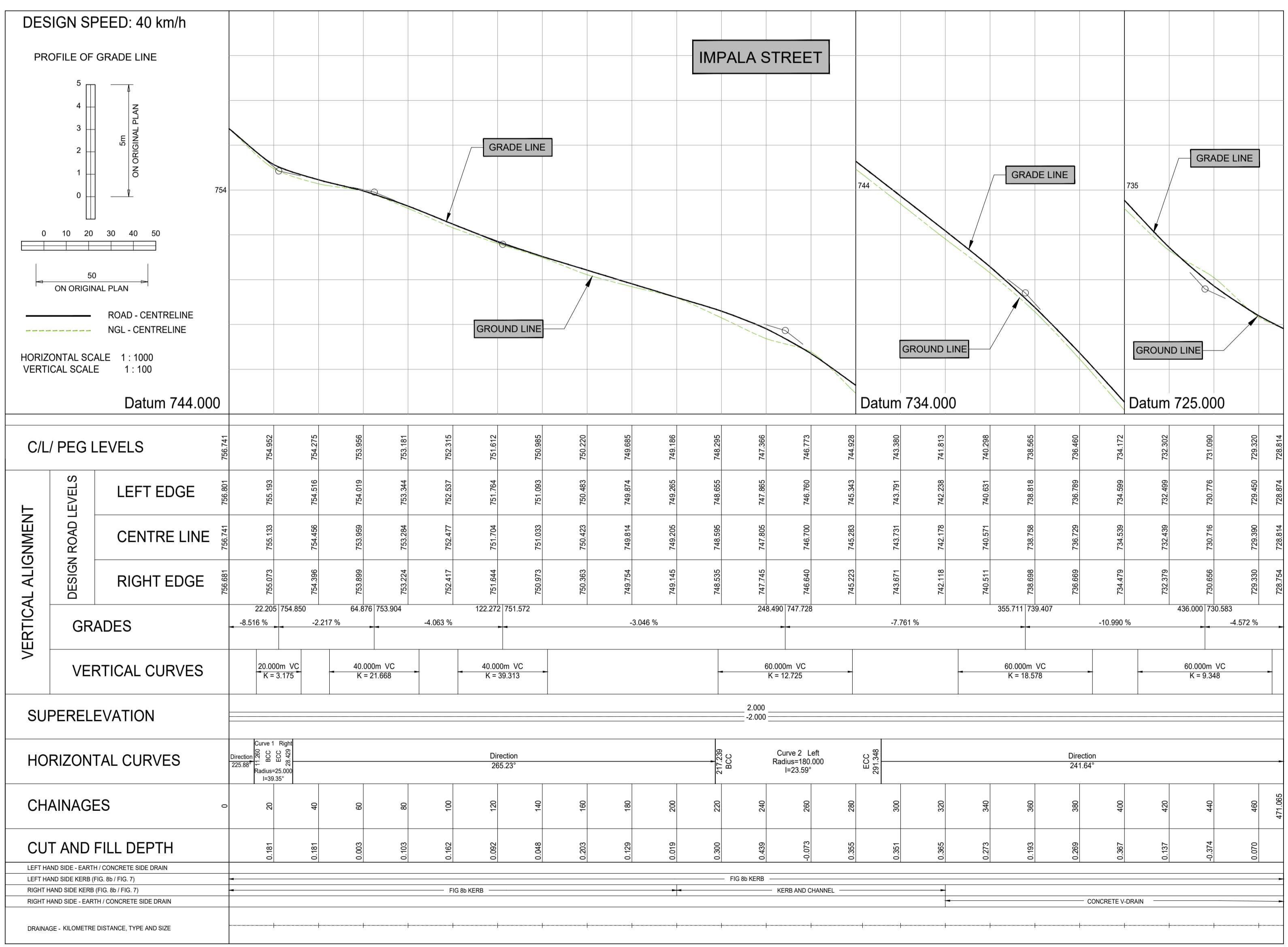
LEGEND	
CONTOUR INTERVAL = 0.5	
PROPOSED ROAD SURFACE	
PROPOSED STORMWATER / V-DRAIN	
EXISTING ROAD SIGNS	
EXISTING GRAVEL ROAD	
EXISTING STORMWATER	
EXISTING FENCE	
EXISTING ELECTRICAL POLE	
EXISTING POLESTAY	
EXISTING TREES	
BENCHMARKS	
EXISTING TAPS	
TELEPHONE LINE	
EXISTING MEDIUM VOLTAGE POWERLINE	
EXISTING LOW VOLTAGE POWERLINE	
EXISTING WATER PIPE	
EXISTING BUILDINGS	
SURVEY TOELINES	
EXISTING CULVERTS	
PROPOSED CULVERT/ BRIDGE	
CONCRETE DRIFT CHANNEL	



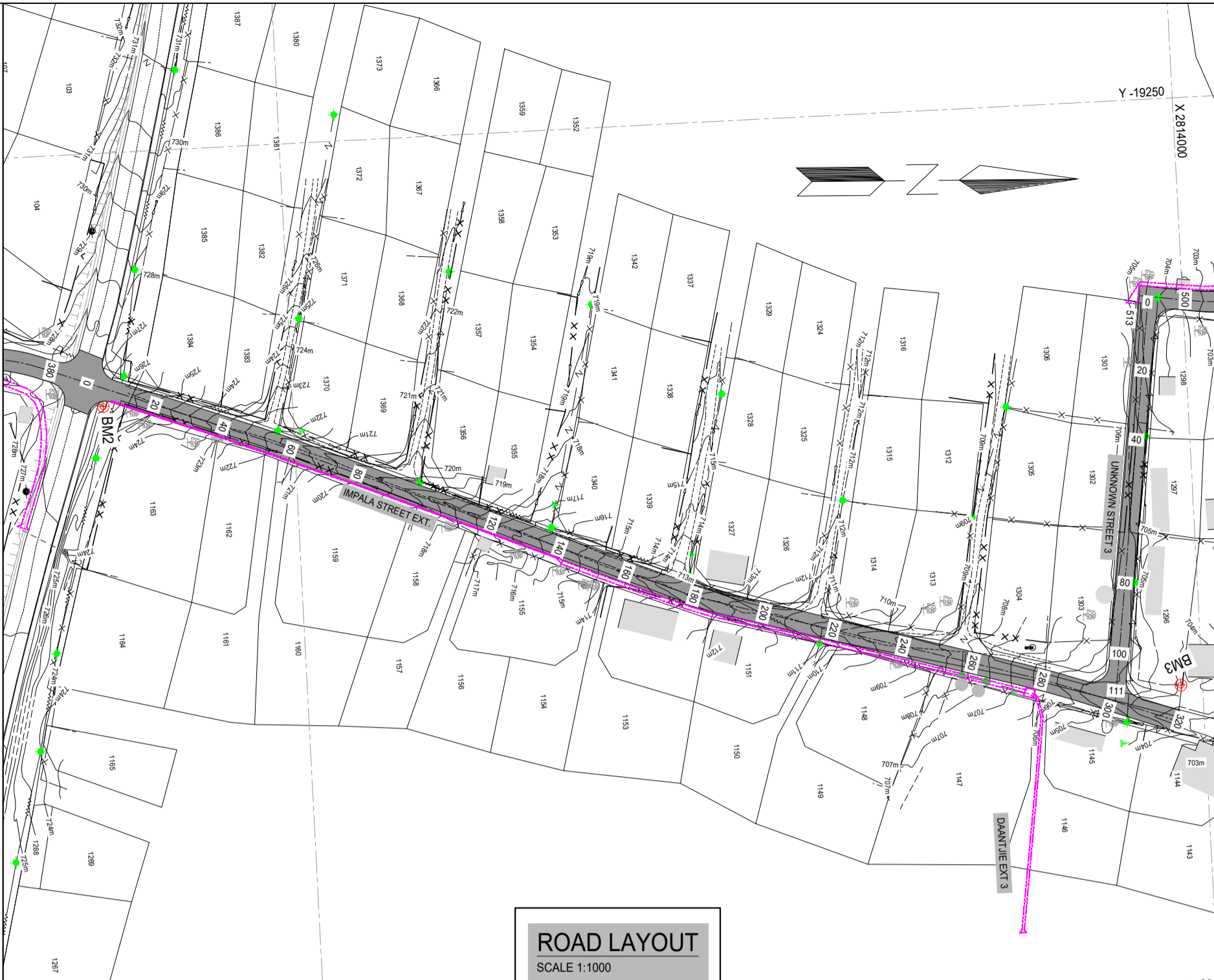
BENCH MARKS (WG SYSTEM)				
POINT	Y	X	Z	MARKER
BM1	-19227.89	+2814664.22	760.66	12 mm Iron Peg
BM2	-19320.80	+2814302.94	726.64	12 mm Iron Peg
BM3	-19414.12	+2814006.06	704.43	12 mm Iron Peg
BM4	-19196.29	+2813726.67	720.67	12 mm Iron Peg
BM5	-19084.63	+2813460.75	740.39	12 mm Iron Peg
BM6	-19025.22	+2813368.66	737.36	12 mm Iron Peg

IMPALA STREET - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y- COORD +0.000	X- COORD +0.000
1	DEFLECTION ANGLE 39° 20' 54"	17.169m	25m	START	0.000 000	-19 866.145	2 814 483.264
				BCC1	0.011 260	-18 874.228	2 814 475.425
				P1	-	-18 891.633	2 814 493.372
2	DEFLECTION ANGLE 23° 35' 03"	74.092m	180m	ECC1	0.028 429	+19 889.553	2 814 468.458
				BCC2	0.217 247	-19 077.716	2 814 452.747
				P2	-	-19 062.739	2 814 273.371
3	DEFLECTION ANGLE 40° 47' 33"	71.196m	100m	ECC2	0.291 339	-19 148.233	2 814 431.772
				BCC3	0.423 275	-19 264.337	2 814 368.106
				P3	-	-19 216.840	2 814 281.106
END				ECC3	0.494 471	-19 310.291	2 814 316.699
				P4	-	-19 297.557	2 814 351.446
				END	0.503 000	-19 313.327	2 814 308.728

ROAD MARKINGS SEE DRAWING N°:



LEGEND	
CONTOUR INTERVAL = 0.5	
PROPOSED ROAD SURFACE	
PROPOSED STORMWATER / V-DRAIN	
EXISTING ROAD SIGNS	
EXISTING GRAVEL ROAD	
EXISTING STORMWATER	
EXISTING FENCE	
EXISTING ELECTRICAL POLE	
EXISTING POLESTAY	
EXISTING TREES	
BENCHMARKS	
EXISTING TAPS	
TELEPHONE LINE	
EXISTING MEDIUM VOLTAGE POWERLINE	
EXISTING LOW VOLTAGE POWERLINE	
EXISTING WATER PIPE	
EXISTING BUILDINGS	
SURVEY TOELINES	
EXISTING CULVERTS	
PROPOSED CULVERT/ BRIDGE	
CONCRETE DRIFT CHANNEL	

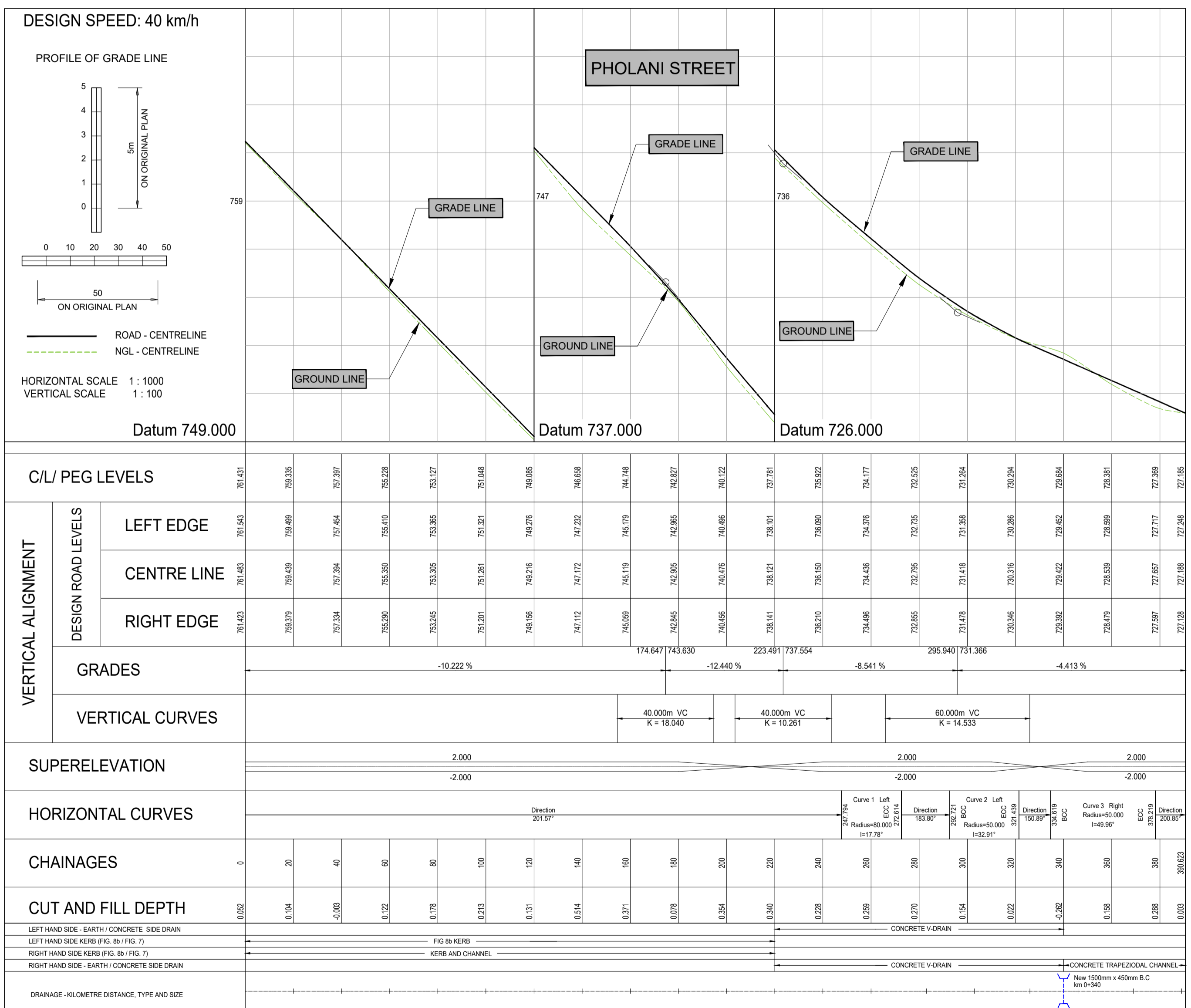
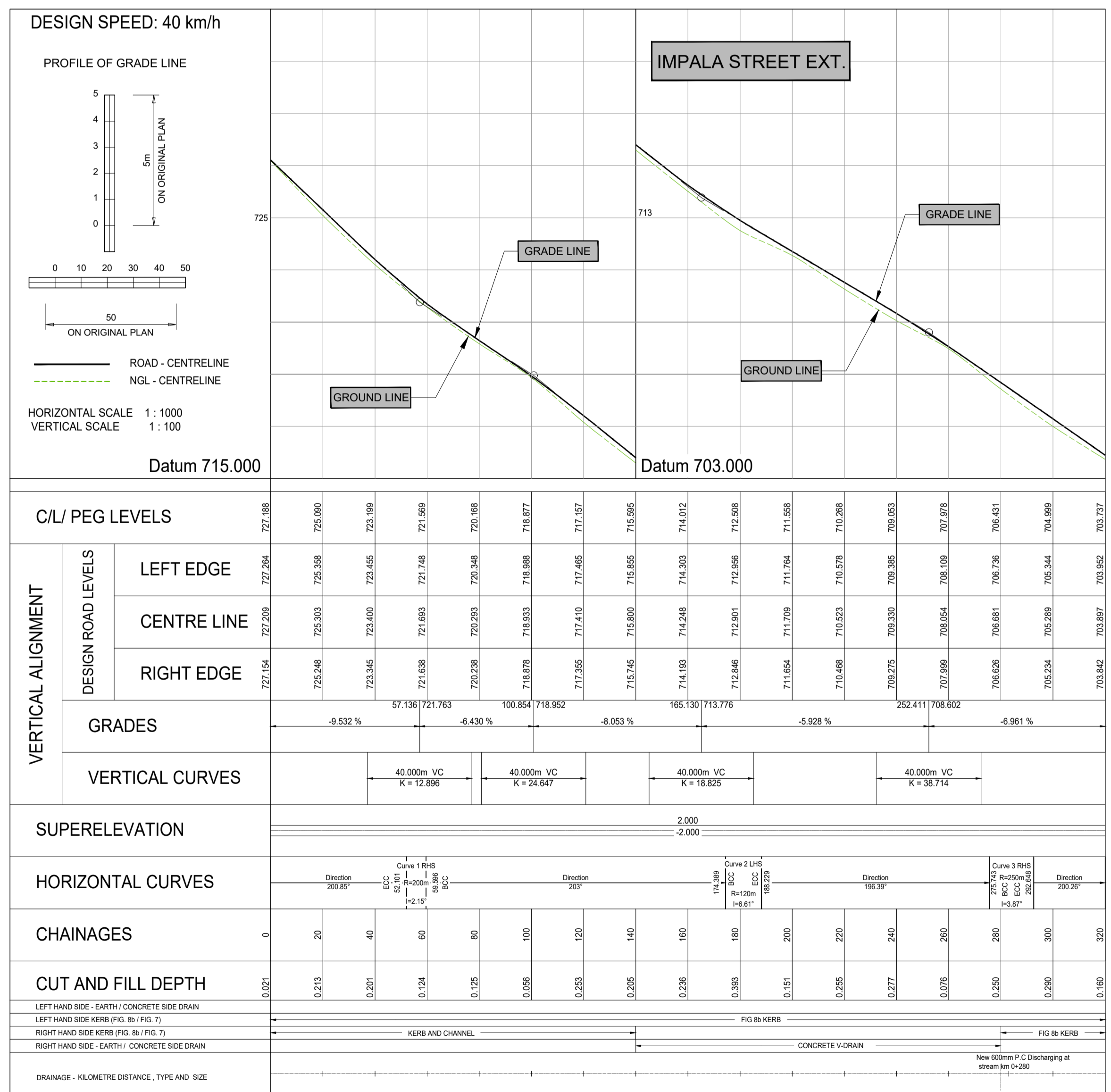


BENCH MARKS (WG SYSTEM)					
POINT	Y	X	Z	MARKER	
BM1	-10227.89	+2814664.22	750.66	12 mm Iron Peg	
BM2	-19300.80	+2814302.04	726.64	12 mm Iron Peg	
BM3	-19414.12	+2814006.06	704.43	12 mm Iron Peg	
BM4	-19196.29	+2813726.67	720.67	12 mm Iron Peg	
BM5	-19084.63	+2813460.75	740.39	12 mm Iron Peg	
BM6	-19025.22	+2813688.86	737.36	12 mm Iron Peg	

POLANI STREET - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y - COORD +0.000	X - COORD +0.000
1	LEFT HAND CIRCULAR ARC	24.819m	80m	START	0.000.000	-19.226.747	2.814.678.111
				BCC1	0.247.794	-19.317.853	2.814.445.673
				CENTRE	-	-19.243.457	2.814.416.259
				PI1	-	-19.322.453	2.814.434.039
2	LEFT HAND CIRCULAR ARC	34.000m	50m	ECC1	0.272.813	-19.323.281	2.814.421.556
				BCC2	0.291.937	-19.324.561	2.814.402.275
				CENTRE	-	-19.274.670	2.814.368.964
				PI2	-	-19.325.734	2.814.384.593
3	RIGHT HAND CIRCULAR ARC	17.467m	250m	ECC2	0.325.997	-19.315.511	2.814.370.119
				CENTRE	-	-19.295.894	2.814.342.345
				END	0.320.000	-19.295.894	2.814.342.345

IMPALA STREET EXT - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y - COORD +0.000	X - COORD +0.000
1	RIGHT HAND CIRCULAR ARC	7.495m	200m	START	0.000.000	-19.313.384	2.814.308.577
				BCC1	0.052.101	-19.331.928	2.814.259.885
				CENTRE	-	-19.318.831	2.814.331.074
				PI1	-	-19.333.262	2.814.256.396
2	LEFT HAND CIRCULAR ARC	13.840m	120m	ECC1	0.059.596	-19.334.726	2.814.252.936
				BCC2	0.174.389	-19.379.574	2.814.147.267
				CENTRE	-	-19.269.112	2.814.100.364
				PI2	-	-19.382.281	2.814.140.890
3	RIGHT HAND CIRCULAR ARC	16.905m	250m	ECC2	0.188.229	-19.384.236	2.814.134.244
				BCC3	0.275.743	-19.408.929	2.814.050.286
				CENTRE	-	-19.648.770	2.814.120.829
				PI3	-	-19.411.315	2.814.042.174
4	RIGHT HAND CIRCULAR ARC	0.320m	250m	ECC3	0.292.648	-19.414.244	2.814.034.241
				CENTRE	-	-19.414.244	2.814.034.241
				END	0.320.000	-19.414.244	2.814.034.241

ROAD MARKINGS SEE DRAWING N°:



TENDER

No	DATE	REVISION	CONSULT	DIR
A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		

CITY OF MBOMBELA

P. O. BOX 45 NELSPRUIT 1200
Tel.: (013) 759 9111

1 NEL STREET NELSPRUIT 1200
Fax.: (013) 759 2070

DESIGNED BY: T. MULAUDZI

DRAWN BY: L.N. MHLANGA

CHECKED BY: R. MAMUREMI
Pr Tech Eng: 2019300534

APPROVED BY: R. MAMUREMI
Pr Tech Eng: 2019300534

CONSULTANT: SHUMA AFRICA (PTY) LTD

UNIT 75, BUILDING 11, SONPARK SHOPPING CENTRE, CIVIL MANDABA DRIVE AND PIET RETIEF STREET, NELSPRUIT

P O BOX 1644 NELSPRUIT 1200
Tel.: (013) 752 3658 Fax.: (086) 545 7391

APPROVED: MBOMBELA

DATE: _____

CONSULTING ENGINEER: _____

DATE: _____

CONTRACT NUMBER: BID 213/2020 VI

PROJECT: UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION: LAYOUT AND LONGITUDINAL SECTIONS

DESIGN PLAN (Full signature)

For: M.M.

For: Consulting Engineer

CONSULTANTS DRAWING NUMBER: SH-1110-20-06-LS

SCALE: AS - SHOWN

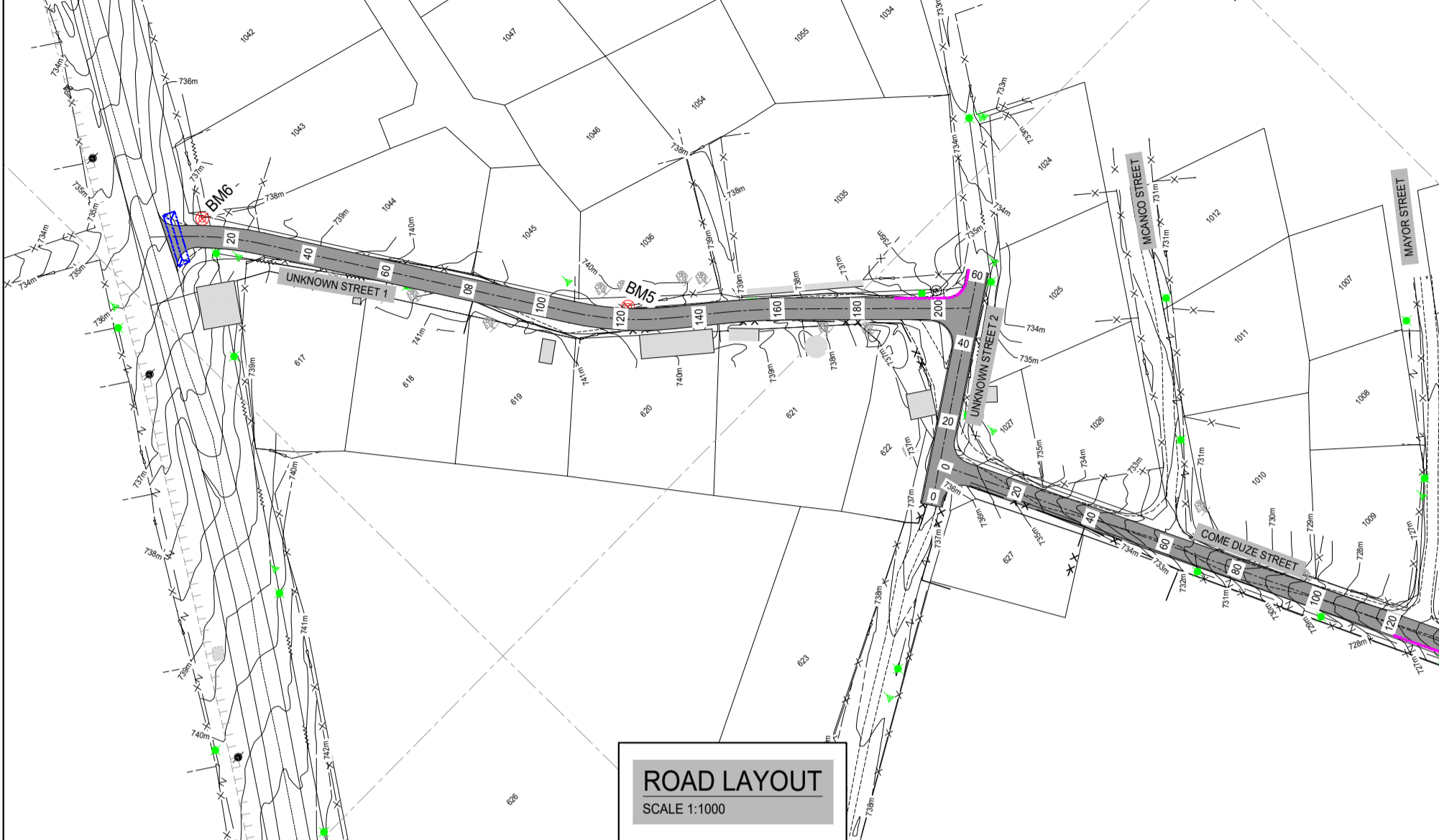
REVISION No.: 00

SHEET 3 of 4

DATE: JUNE 2023

LEGEND	
CONTOUR INTERVAL = 0.5	
PROPOSED ROAD SURFACE	
PROPOSED STORMWATER / V-DRAIN	
EXISTING ROAD SIGNS	
EXISTING GRAVEL ROAD	
EXISTING STORMWATER	
EXISTING FENCE	
EXISTING ELECTRICAL POLE	
EXISTING POLESTAY	
EXISTING TREES	
BENCHMARKS	
EXISTING TAPS	
TELEPHONE LINE	
EXISTING MEDIUM VOLTAGE POWERLINE	
EXISTING LOW VOLTAGE POWERLINE	
EXISTING WATER PIPE	
EXISTING BUILDINGS	
SURVEY TOELINES	
EXISTING CULVERTS	
PROPOSED CULVERT/ BRIDGE	
CONCRETE DRIFT CHANNEL	

BENCH MARKS (WG SYSTEM)				
POINT	Y	X	Z	MARKER
BM1	-19227.89	+2814664.22	760.66	12 mm Iron Peg
BM2	-19320.80	+2814302.94	726.64	12 mm Iron Peg
BM3	-19414.12	+2814006.06	704.43	12 mm Iron Peg
BM4	-19196.29	+2813726.67	720.67	12 mm Iron Peg
BM5	-19084.63	+2813460.75	740.39	12 mm Iron Peg
BM6	-19025.22	+2813368.66	737.36	12 mm Iron Peg



UNKNOWN STREET 1 - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y - COORD +0.000	X - COORD +0.000
1	RIGHT HAND CIRCULAR ARC 13° 31' 42"	18.889m	80m	START	0.000.00	-19 012.648	2 813 362.671
				BCC1	9.963	-19 019.468	2 813 369.354
				CENTRE	-	-19 963.576	2 813 426.572
				ECC1	26.452	-19 031.321	2 813 384.021
2	LEFT HAND CIRCULAR ARC 18° 30' 45"	25.848m	80m	START	0.000.00	-19 026.274	2 813 375.968
				BCC2	108.194	-19 073.729	2 813 461.539
				CENTRE	-	-19 141.475	2 813 408.988
				ECC2	134.032	-19 090.745	2 813 470.847
3	RIGHT HAND CIRCULAR ARC 5° 52' 54"	16.424m	160m	START	0.000.00	-19 100.542	2 813 478.882
				BCC3	146.702	-19 990.064	2 813 602.000
				CENTRE	-	-19 106.898	2 813 484.054
				ECC3	163.126	-19 112.686	2 813 489.930
END	210.000	-19 145.694	2 813 523.211				

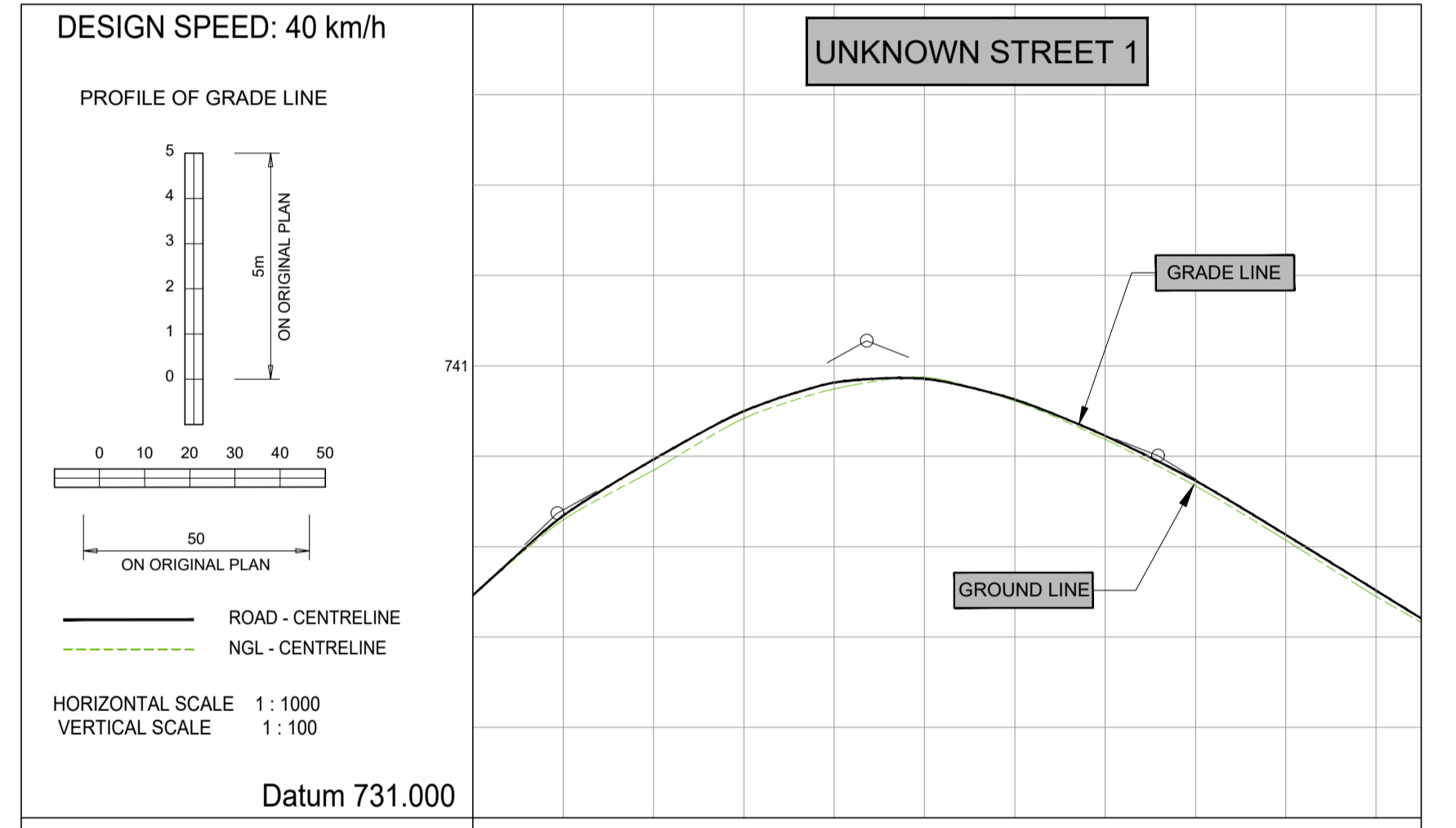
UNKNOWN STREET 2 - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y - COORD +0.000	X - COORD +0.000
1	DEFLECTION ANGLE 238° 39' 41"	-	-	START	0.000.00	-19 102.724	2 813 550.223
				BCC1	-	-	-
				CENTRE	-	-	-
				ECC1	-	-	-
END	0.060.000	-19 152.850	2 813 517.248				

UNKNOWN STREET 3 - HORIZONTAL ALIGNMENT							
CURVE No.	DESCRIPTION	CURVE LENGTH	CURVE RADIUS	POINT	DISTANCE km	CO-ORDINATES (WGS84 / Lo 29)	
						Y - COORD +0.000	X - COORD +0.000
1	DEFLECTION ANGLE 77° 35' 07"	-	-	START	0.000.00	-19 305.123	2 814 009.609
				BCC1	-	-	-
				CENTRE	-	-	-
				ECC1	-	-	-
END	0.110.553	-19 414.709	2 814 024.202				

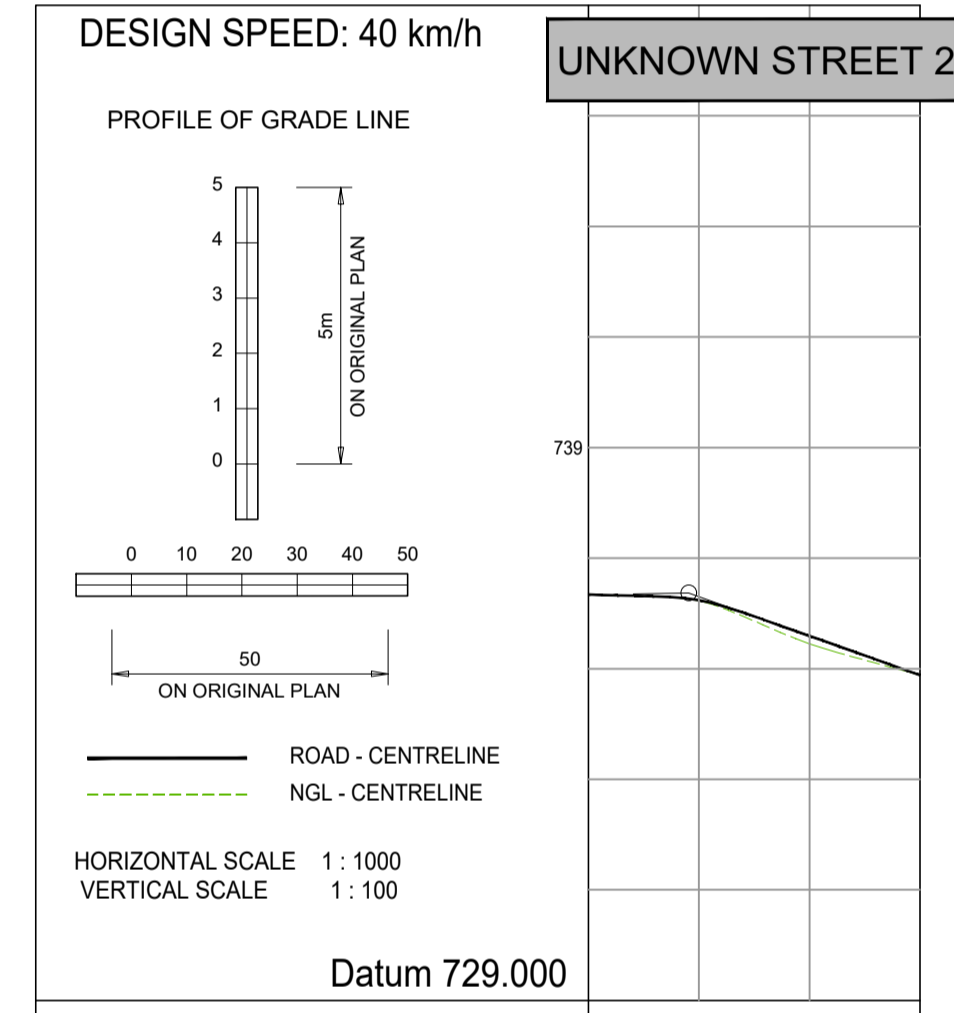


ROAD MARKINGS

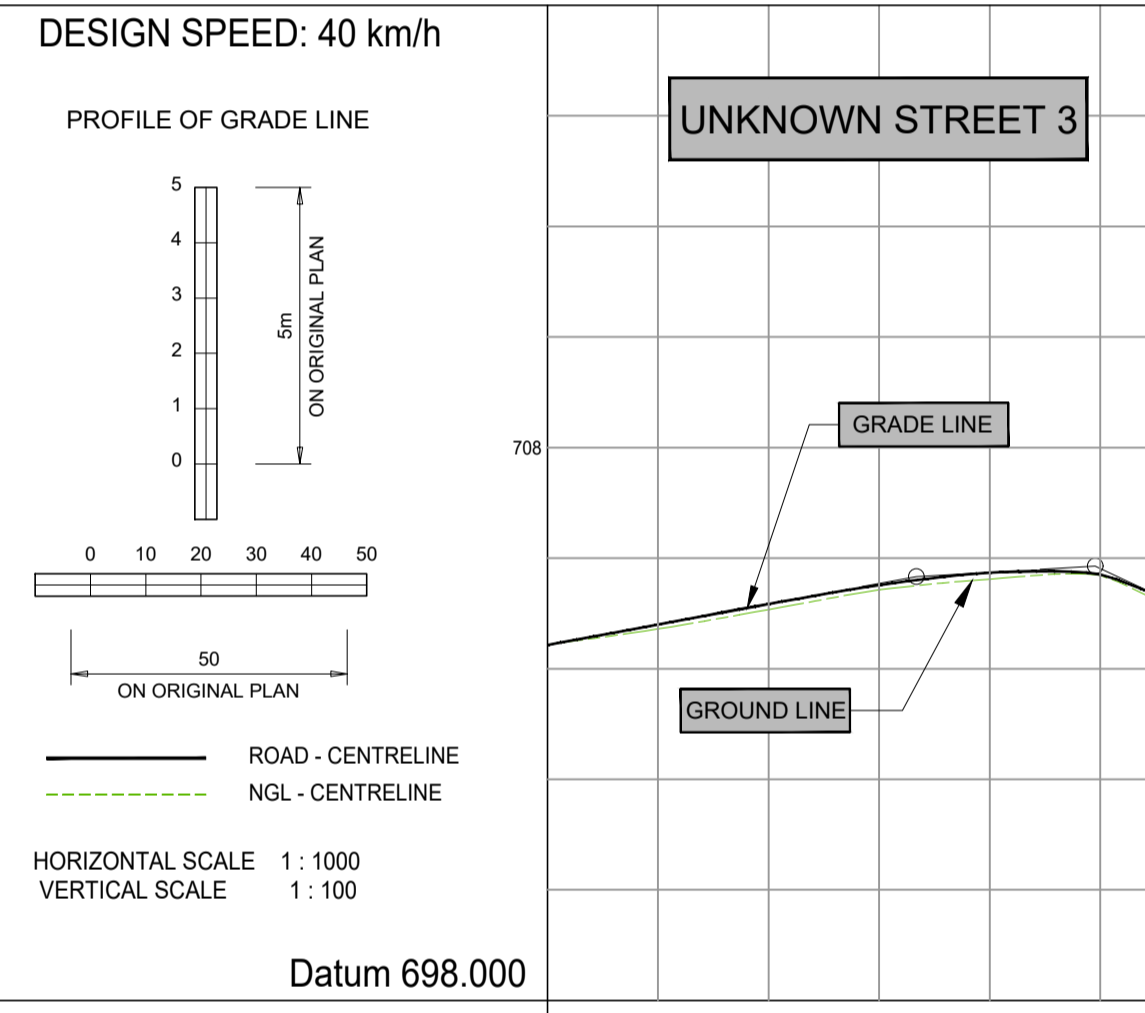
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C/L/ PEG LEVELS		735.927	735.927	737.629	738.690	739.839	740.469	740.750	740.222	739.372	738.342	737.441	736.695	735.322
VERTICAL ALIGNMENT	DESIGN ROAD LEVELS	LEFT EDGE	735.927	737.629	738.690	739.839	740.469	740.750	740.222	739.372	738.342	737.441	736.695	735.322
		CENTRE LINE	735.927	737.629	738.690	739.839	740.469	740.750	740.222	739.372	738.342	737.441	736.695	735.322
		RIGHT EDGE	735.927	737.629	738.690	739.839	740.469	740.750	740.222	739.372	738.342	737.441	736.695	735.322
GRADES			9.706 %		5.967 %				-3.944 %				-6.173 %	
VERTICAL CURVES			30.000m VC K = 7.250		70.000m VC K = 7.359				40.000m VC K = 17.946					
SUPERELEVATION					2.000				-2.000					
HORIZONTAL CURVES			Direction 314.34° Curve 1 RHS R=80m L=13.32m	Direction 327.87° Curve 2 LHS R=80m L=18.51m	Direction 305.30° Curve 3 RHS R=160m L=15.15m	Direction 315.24° Curve 4 LHS R=160m L=15.15m								
CHAINAGES		0	20	40	60	80	100	120	140	160	180	200	210	
CUT AND FILL DEPTH		0.000	0.090	0.237	0.100	0.139	-0.036	0.034	0.090	0.117	0.121	0.132	0.098	
DRAINAGE - KILOMETRE DISTANCE, TYPE AND SIZE														



C/L/ PEG LEVELS		736.342	736.229	735.449	734.862	
VERTICAL ALIGNMENT	DESIGN ROAD LEVELS	LEFT EDGE	736.342	736.229	735.449	734.862
		CENTRE LINE	736.342	736.229	735.449	734.862
		RIGHT EDGE	736.342	736.229	735.449	734.862
GRADES			0.149 %		-3.550 %	
VERTICAL CURVES			20.000m VC K = 5.406			
SUPERELEVATION			2.000		-2.000	
HORIZONTAL CURVES			Direction 295.16°			
CHAINAGES		0	20	40	50	
CUT AND FILL DEPTH		0.012	0.143			
DRAINAGE - KILOMETRE DISTANCE, TYPE AND SIZE						



C/L/ PEG LEVELS		704.459	704.718	705.068	705.425	705.650	705.696	705.218	
VERTICAL ALIGNMENT	DESIGN ROAD LEVELS	LEFT EDGE	704.459	704.718	705.068	705.425	705.650	705.696	705.218
		CENTRE LINE	704.459	704.718	705.068	705.425	705.650	705.696	705.218
		RIGHT EDGE	704.459	704.718	705.068	705.425	705.650	705.696	705.218
GRADES			1.853 %		0.596 %		-4.709 %		
VERTICAL CURVES			40.000m VC K = 31.802		20.000m VC K = 3.770				
SUPERELEVATION			2.000		-2.000				
HORIZONTAL CURVES			Direction 277.59°						
CHAINAGES		0	20	40	60	80	100	110.553	
CUT AND FILL DEPTH		0.092	0.102	0.098	0.117	0.019	0.100		
DRAINAGE - KILOMETRE DISTANCE, TYPE AND SIZE									

TENDER

No	DATE	REVISION	CONSULT	DIR
A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		

CLIENT

CITY OF MBOMBELA

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DESIGNED BY: T. MULAUDZI

DRAWN BY: L.N. MHLANGA

CHECKED BY: R. MAMUREMI
Pr Tech Eng: 2019300534

APPROVED BY: R. MAMUREMI
Pr Tech Eng: 2019300534

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APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 VI

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION

LAYOUT AND LONGITUDINAL SECTIONS

DESIGN PLAN (Full signature)

For M&M

For Consulting Engineer

CONSULTANTS DRAWING NUMBER

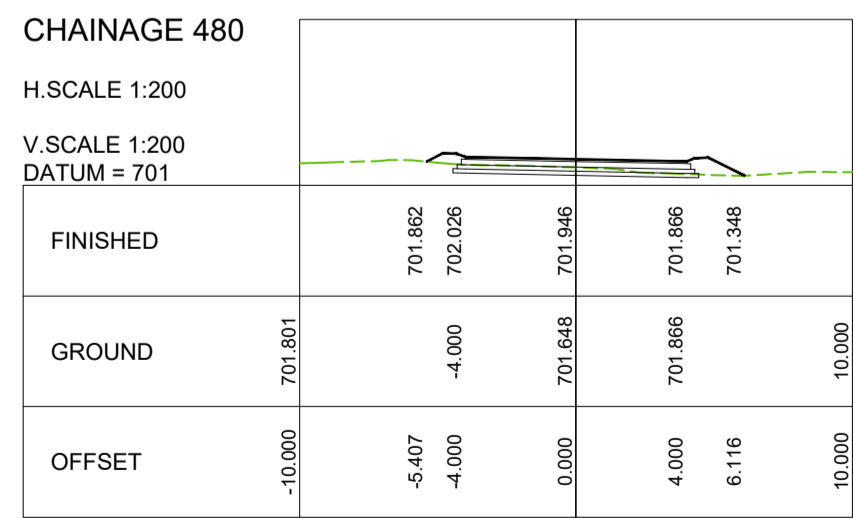
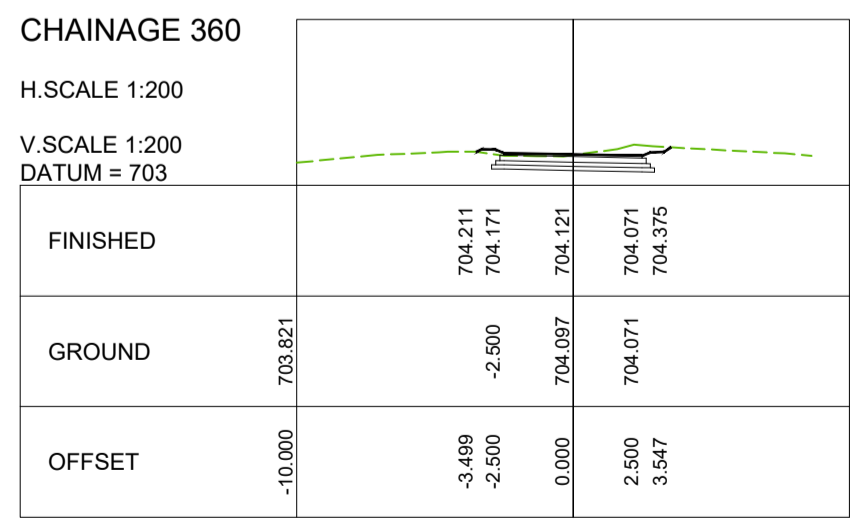
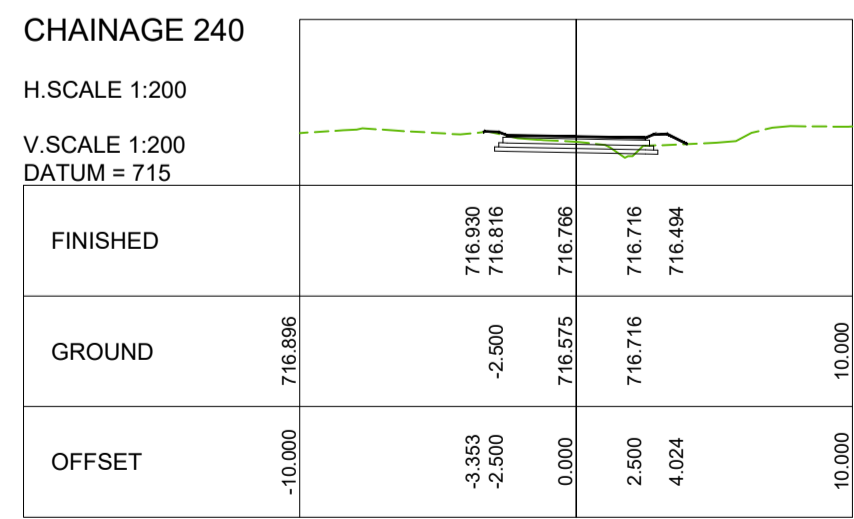
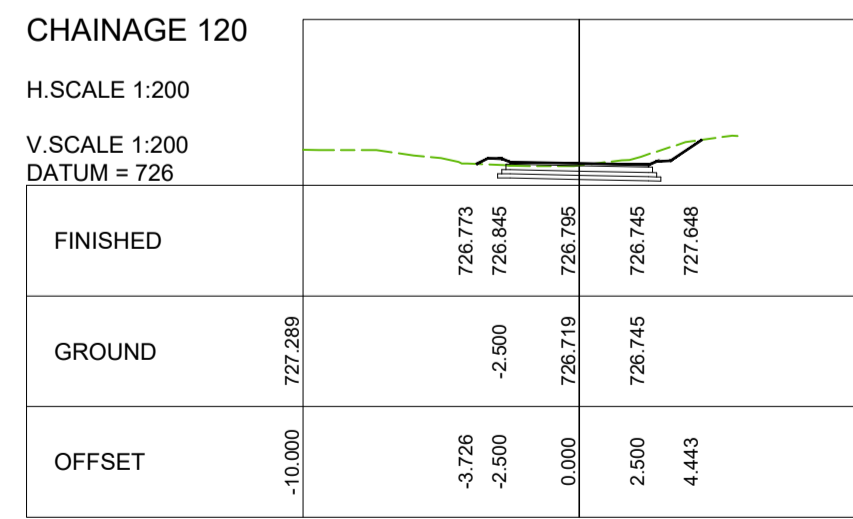
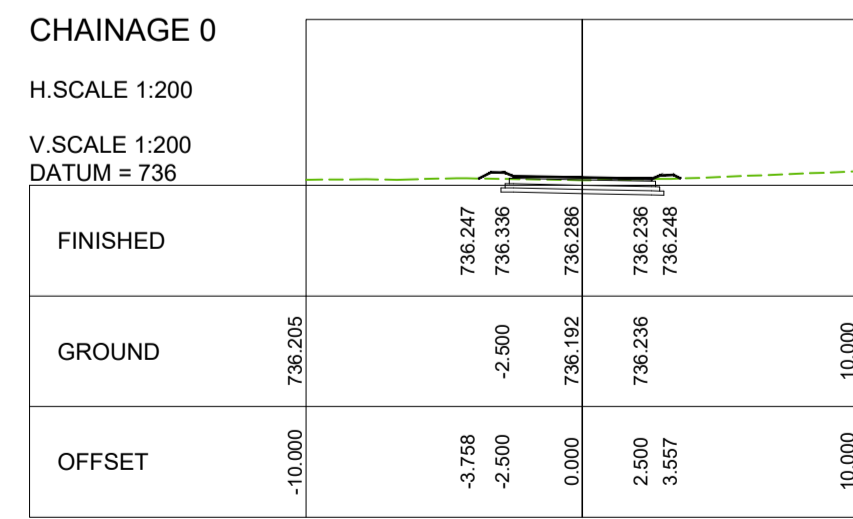
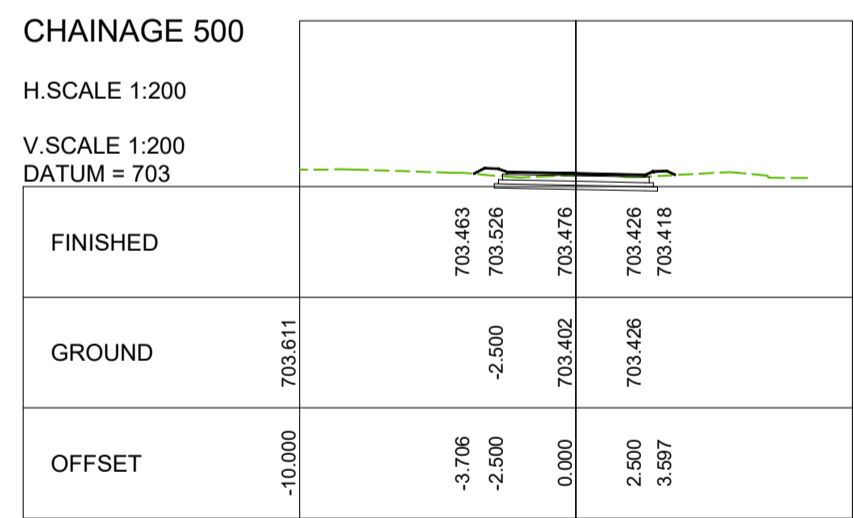
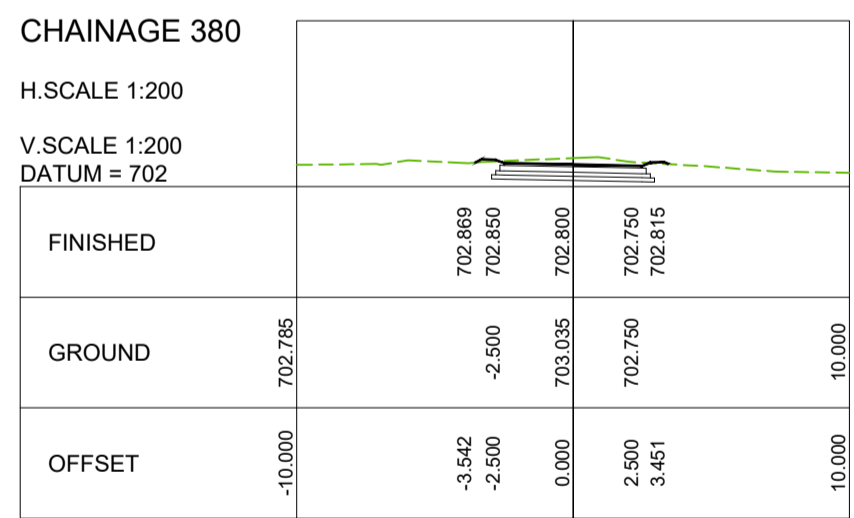
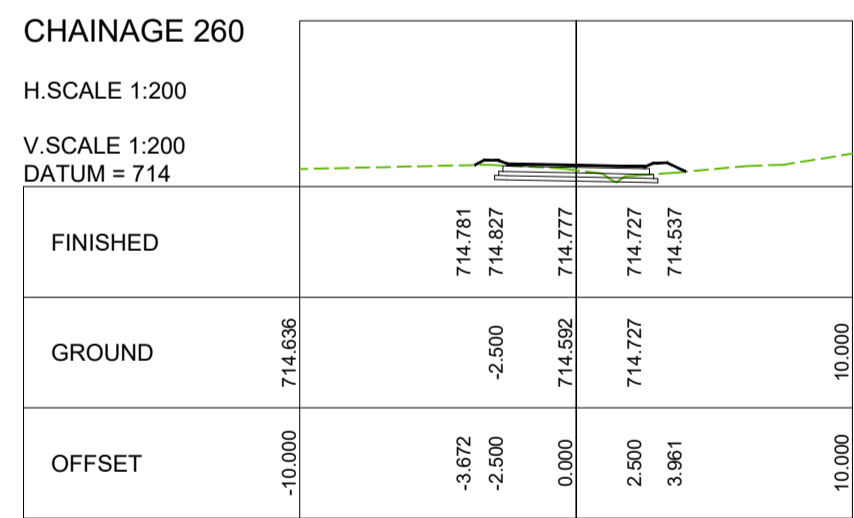
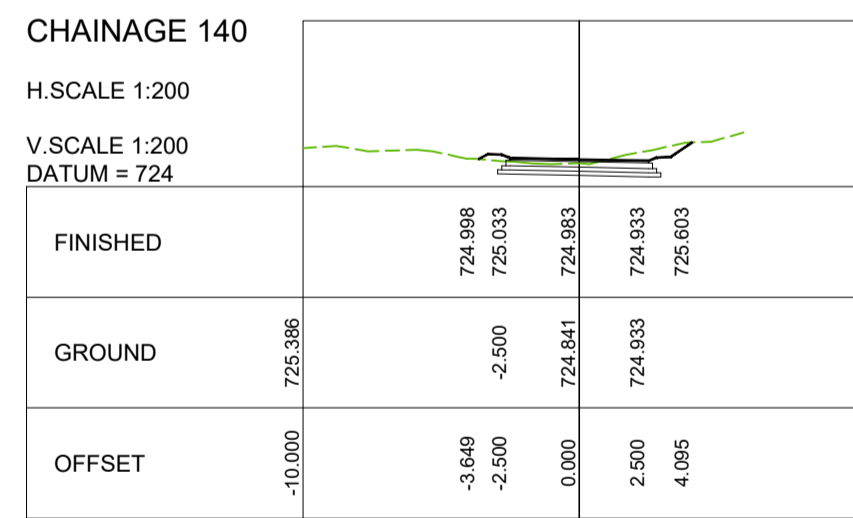
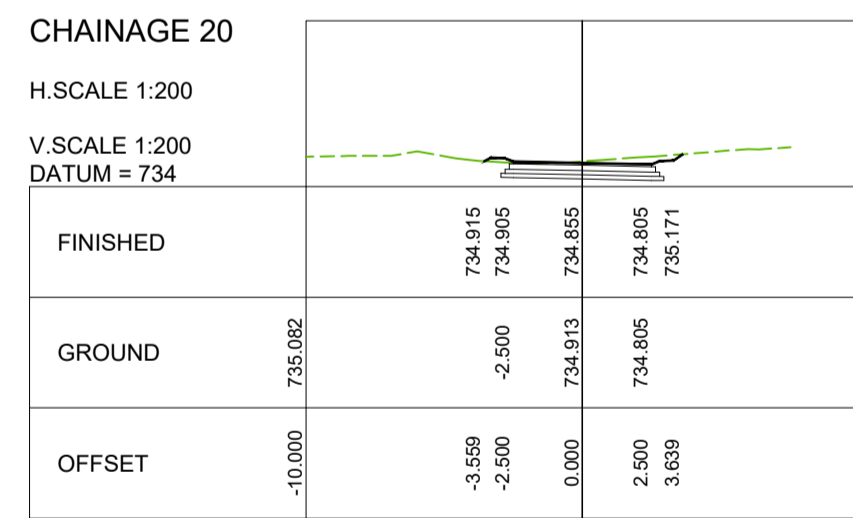
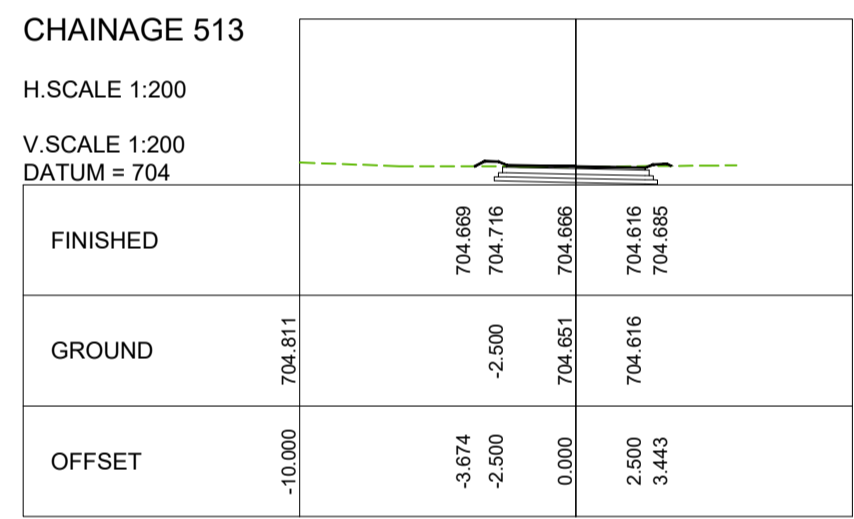
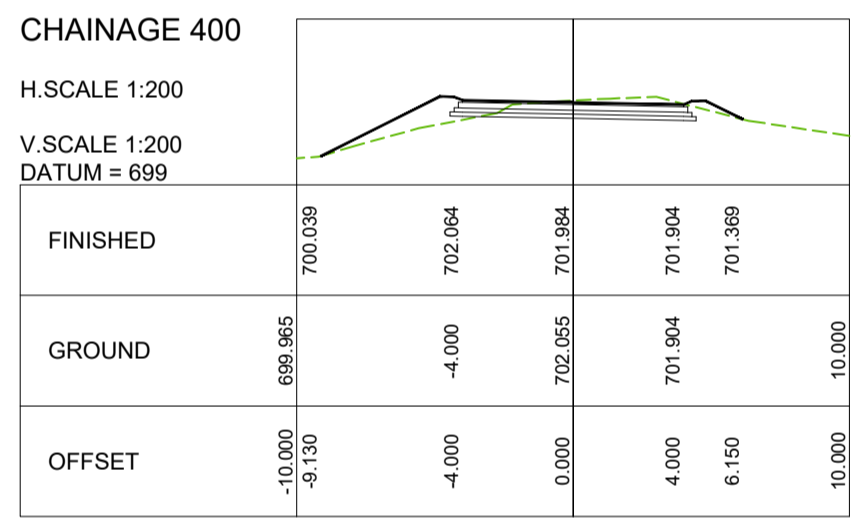
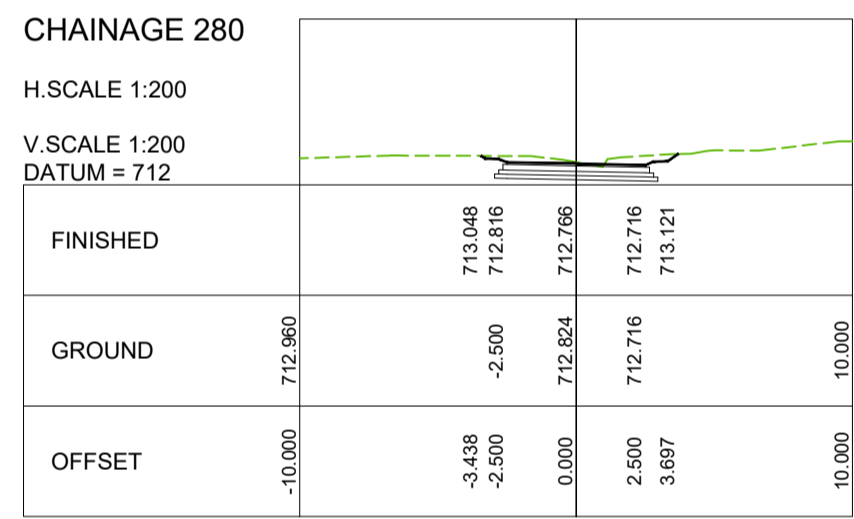
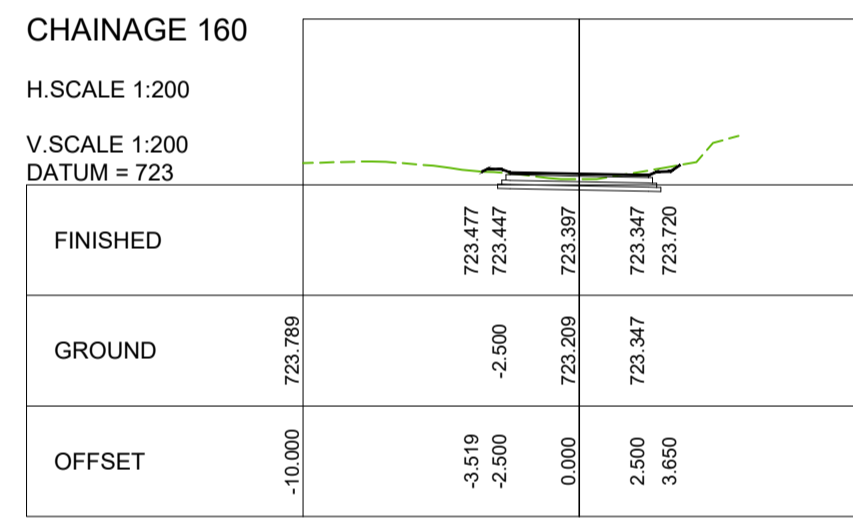
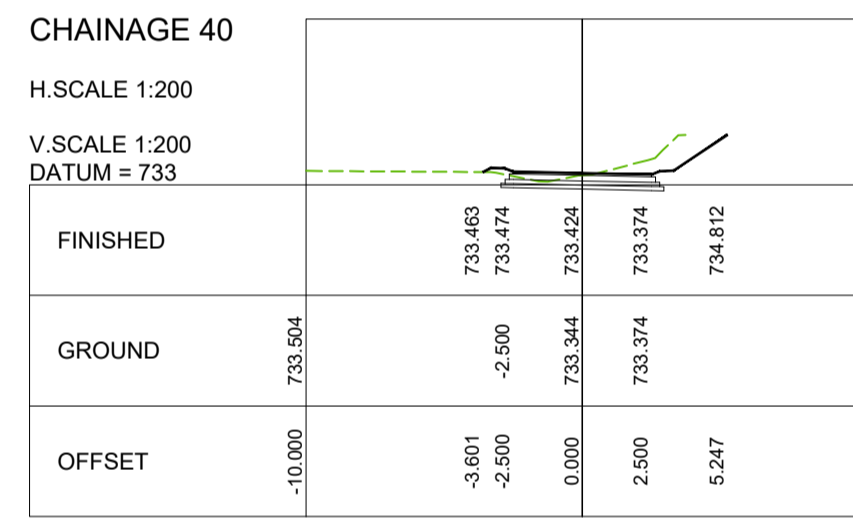
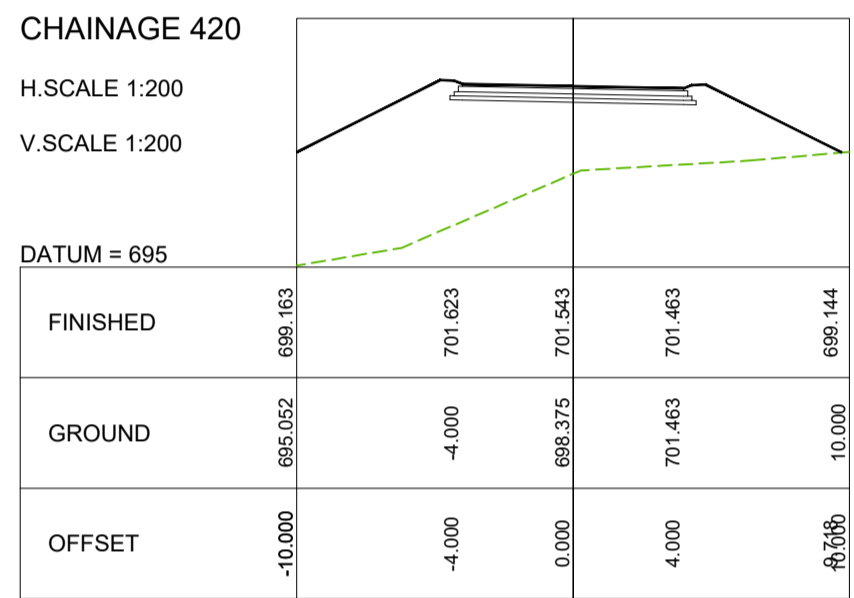
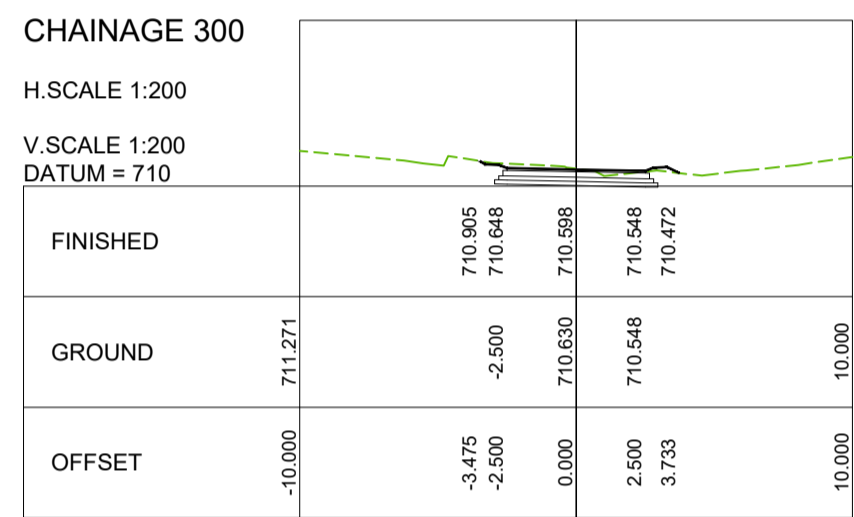
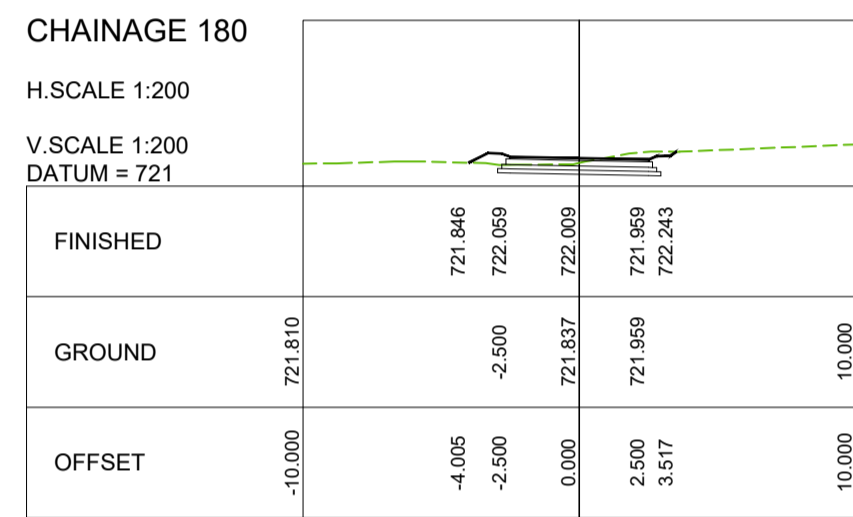
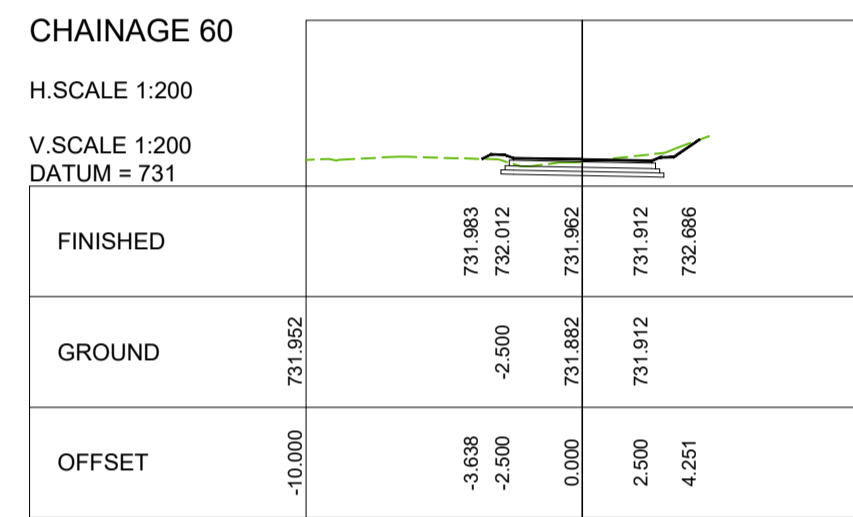
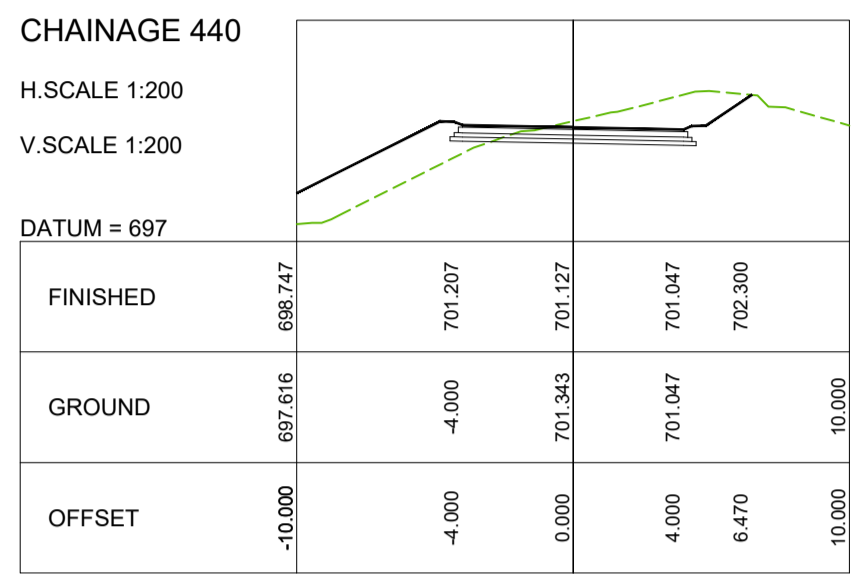
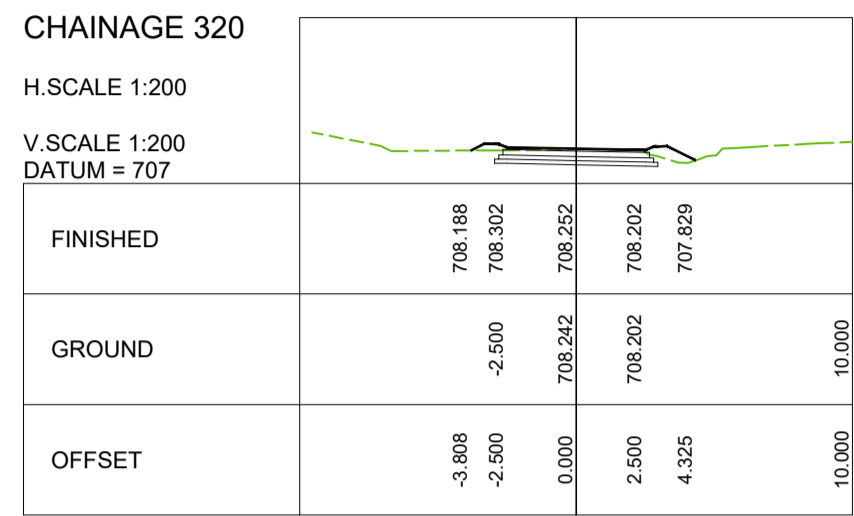
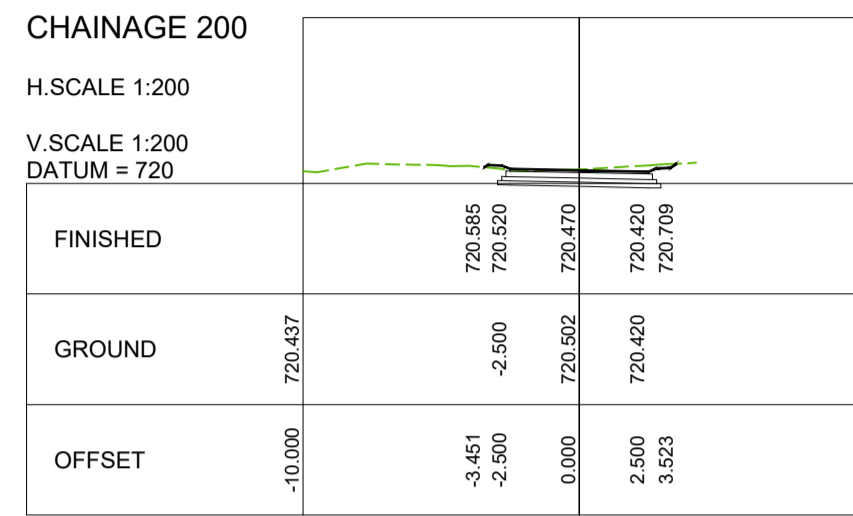
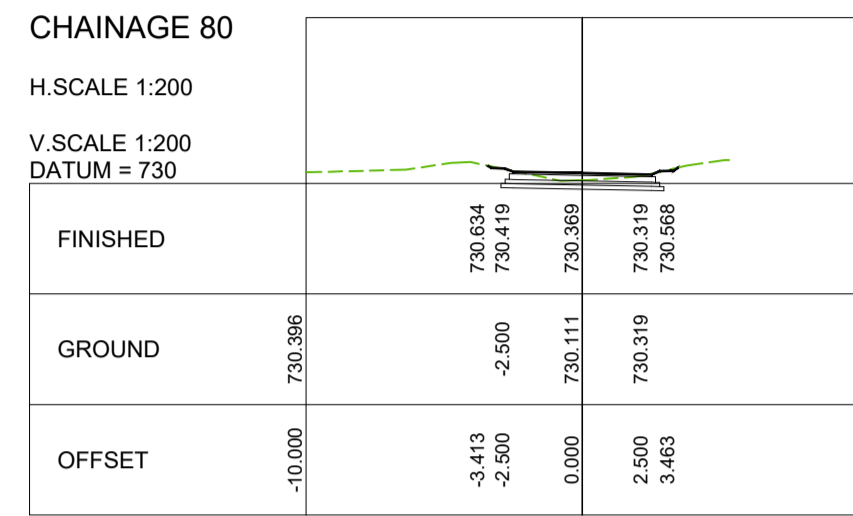
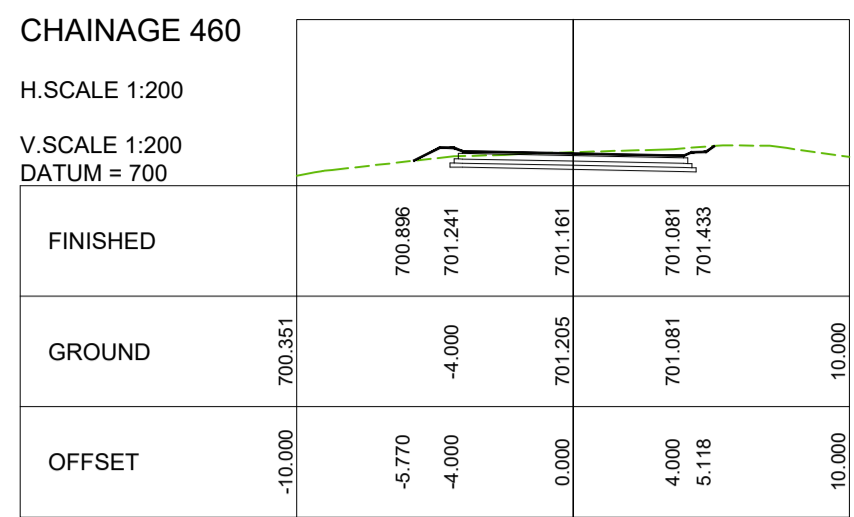
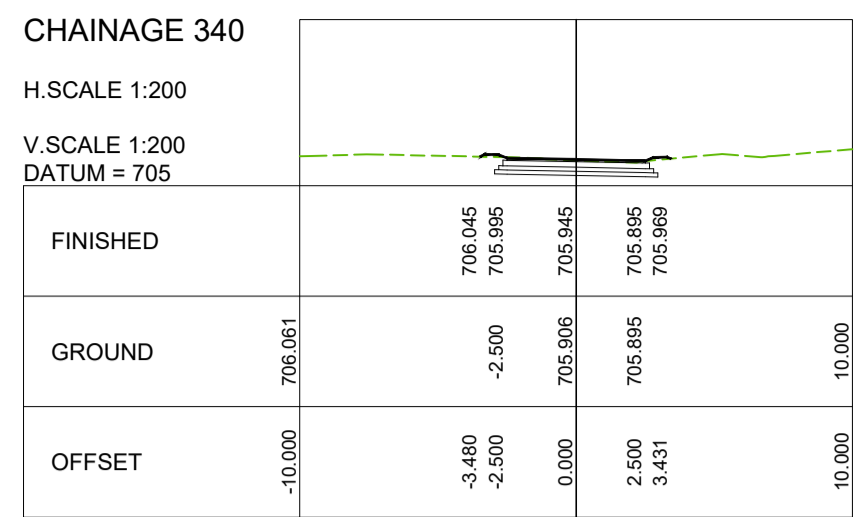
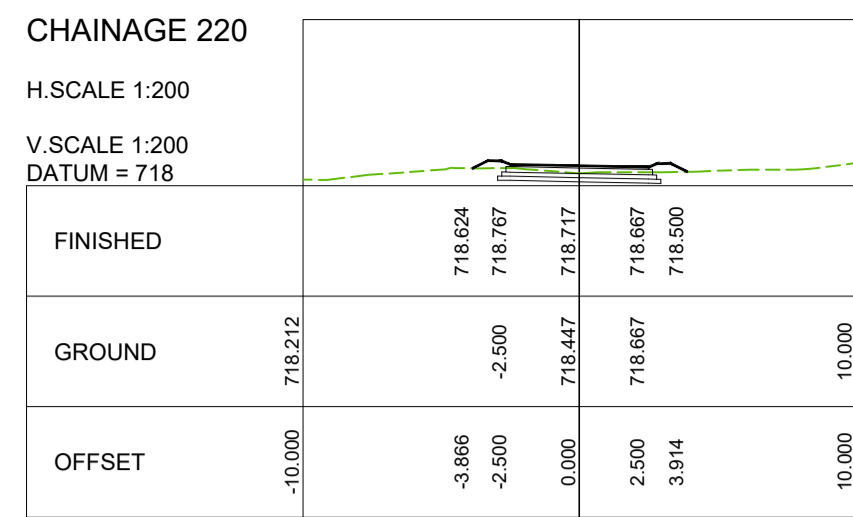
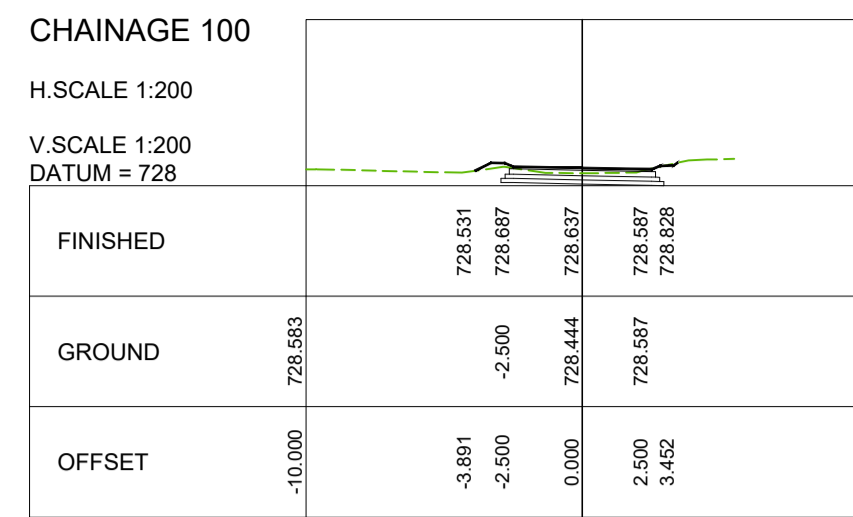
SH-1110-20-07-LS

SCALE AS - SHOWN

REVISION No. 00

SHEET 4 of 4

DATE JUNE 2023



COME DUZE STREET

TENDER

A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		
No	DATE	REVISION	CONSULT	DIR

CITY OF MBOMBELA

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Pr Tech Eng: 2019300534

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APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 VI

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION

CROSS SECTIONS - COME DUZE STREET

DESIGN PLAN
(Full signature)

For M.E.M.

For Consulting Engineer

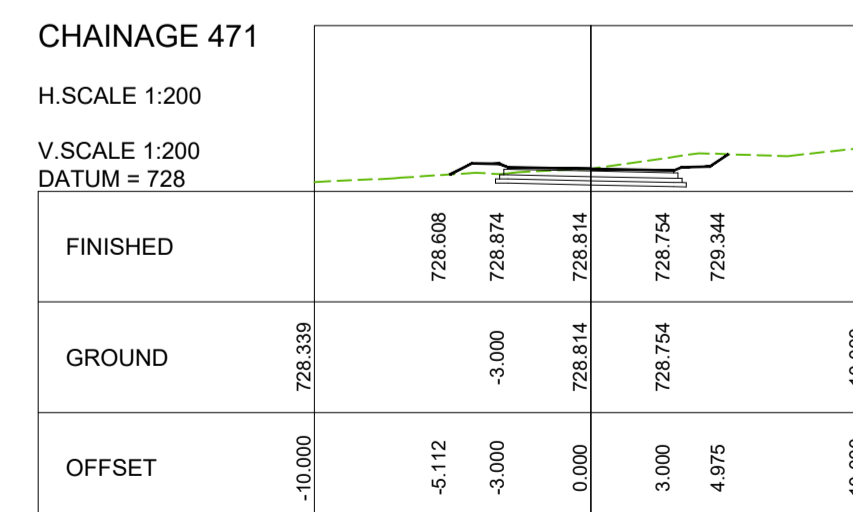
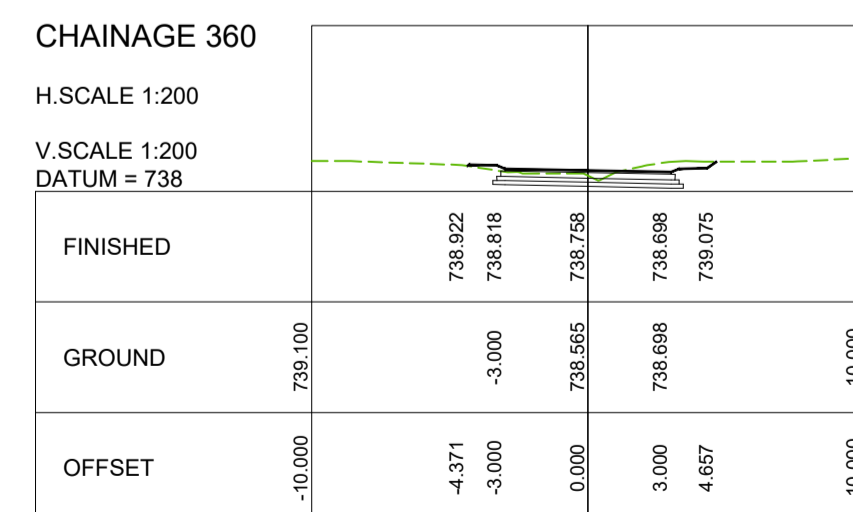
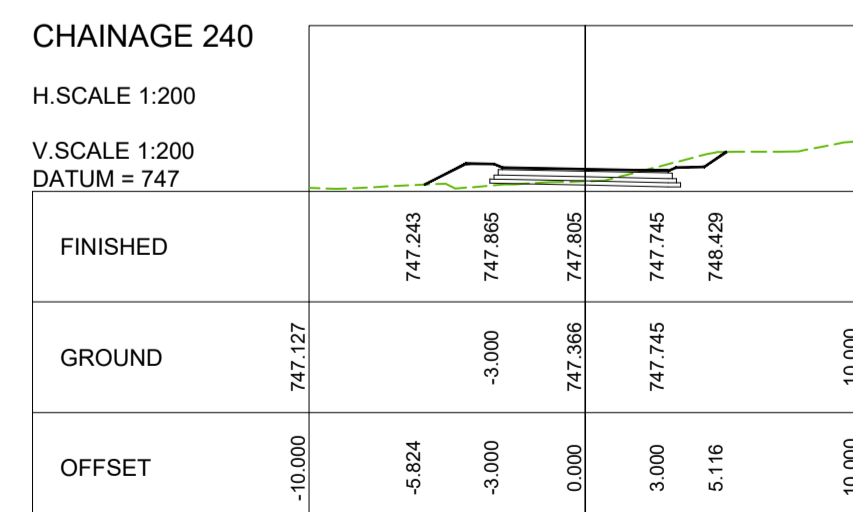
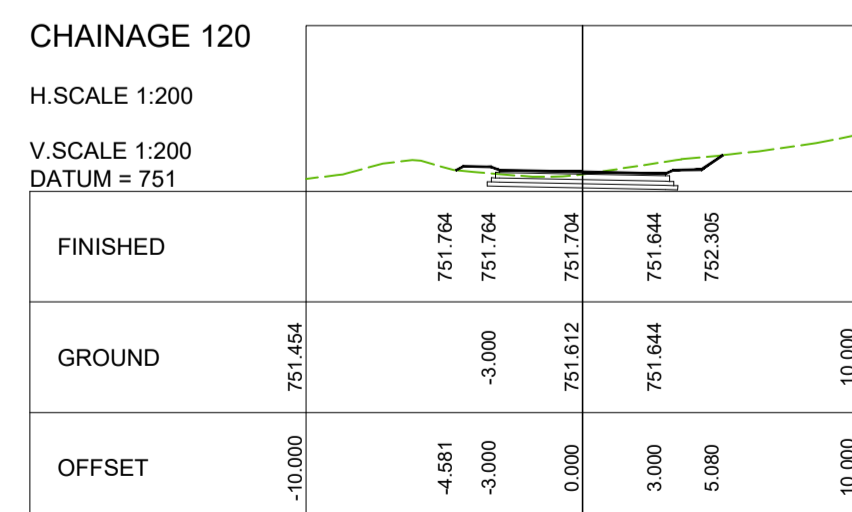
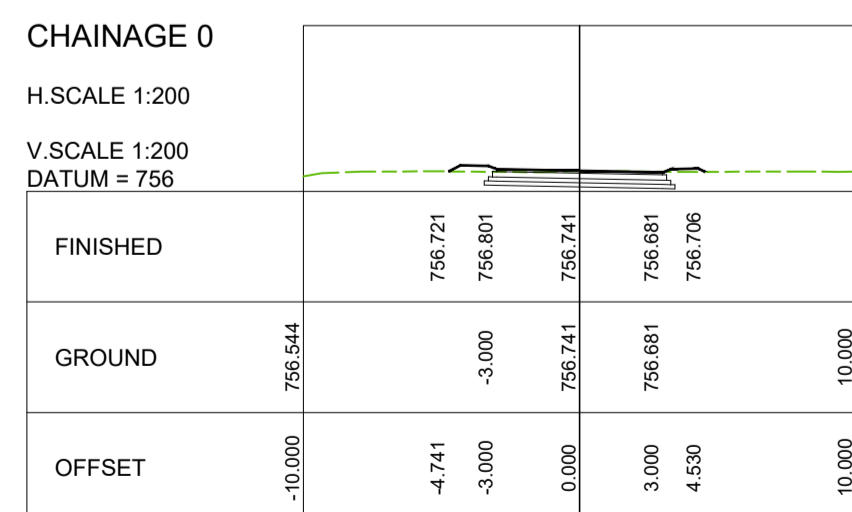
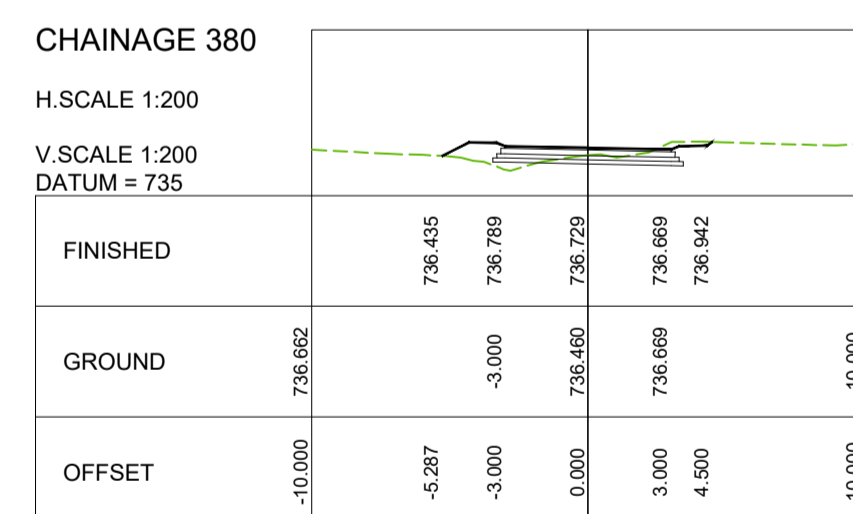
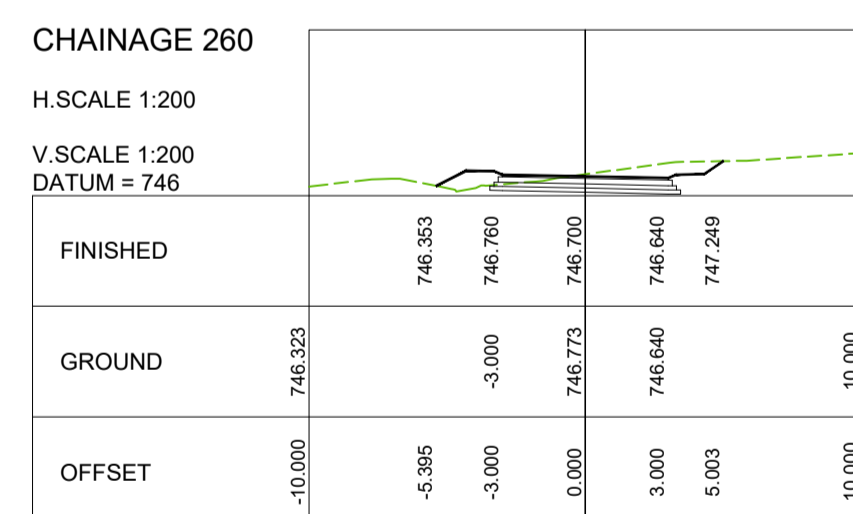
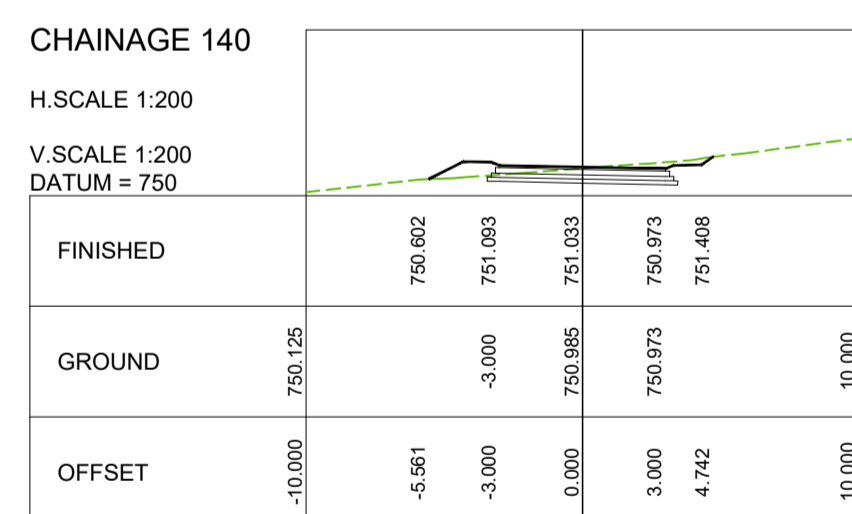
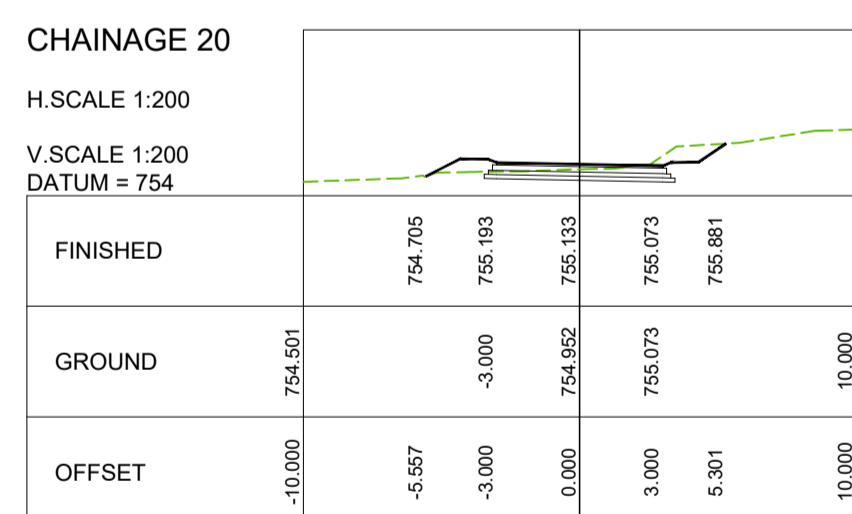
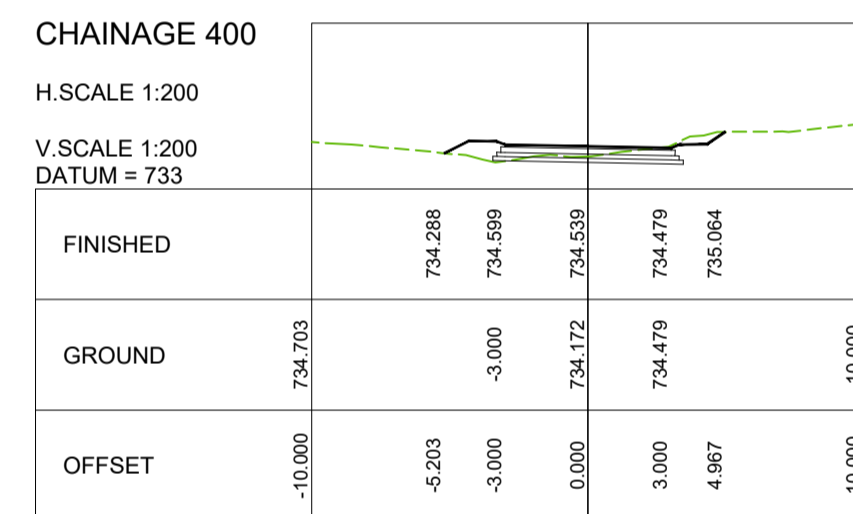
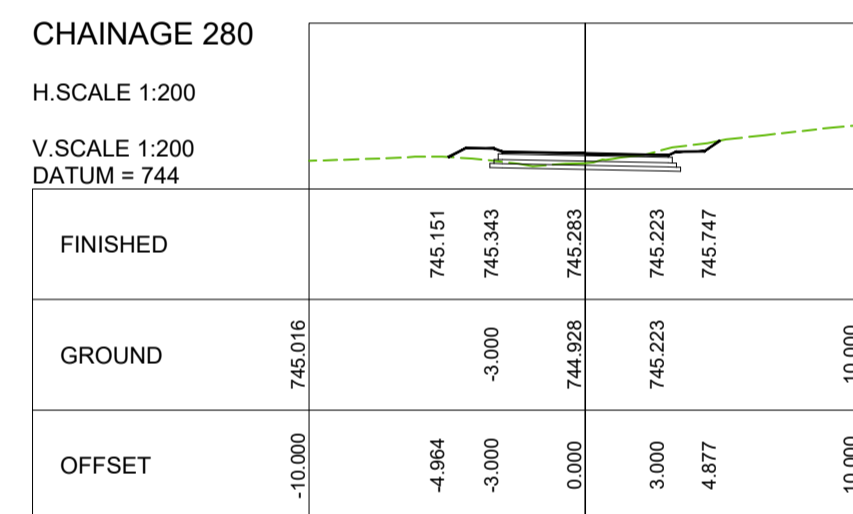
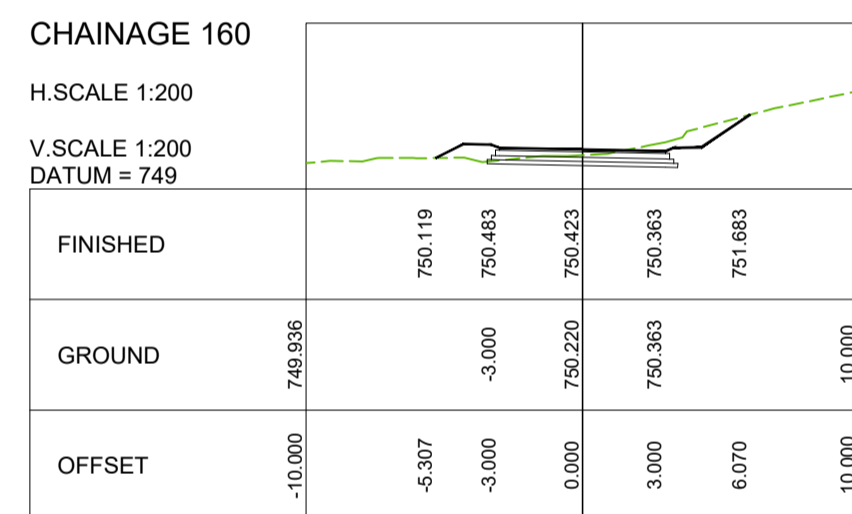
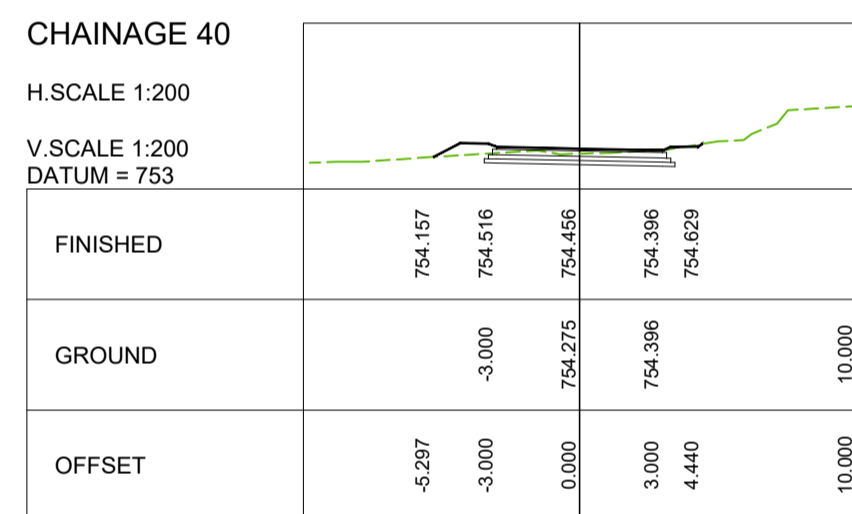
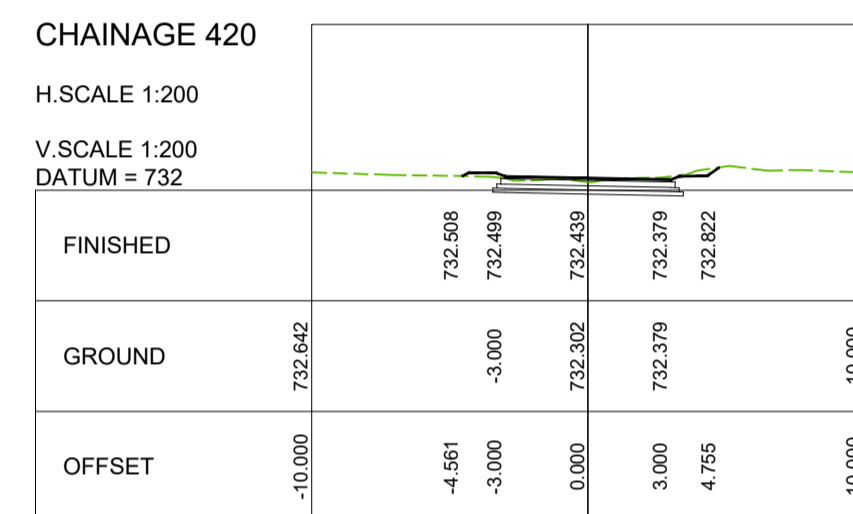
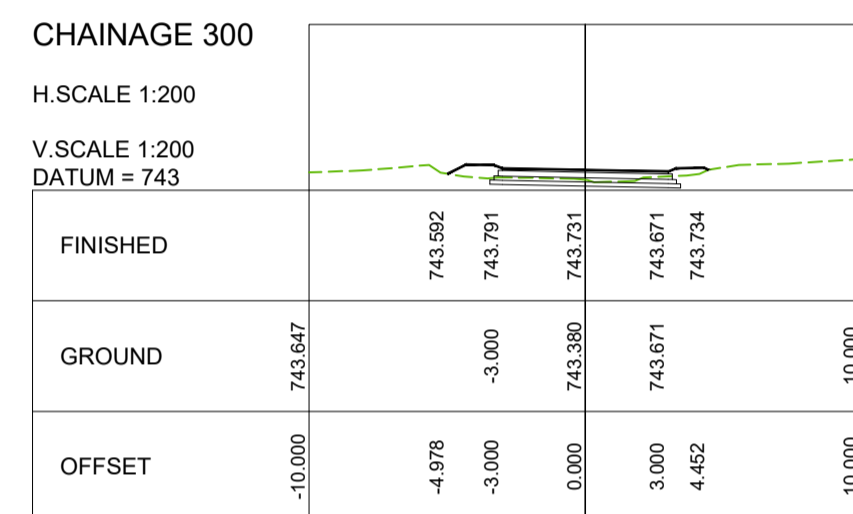
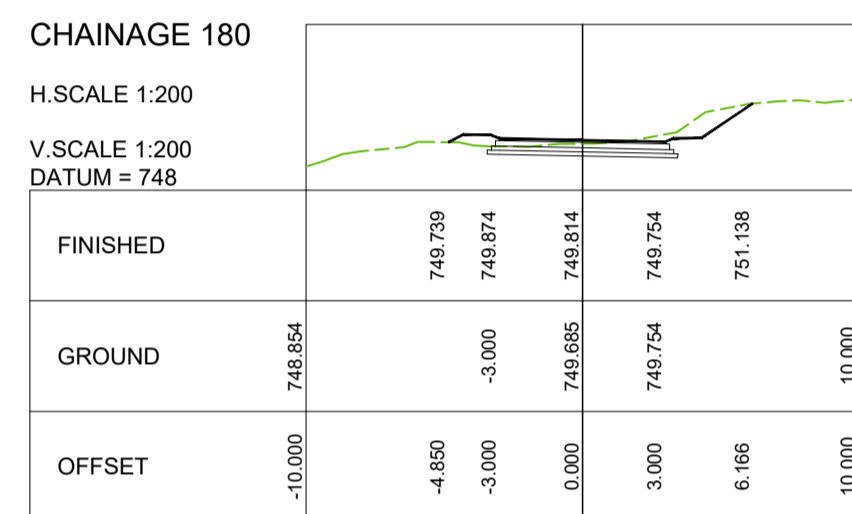
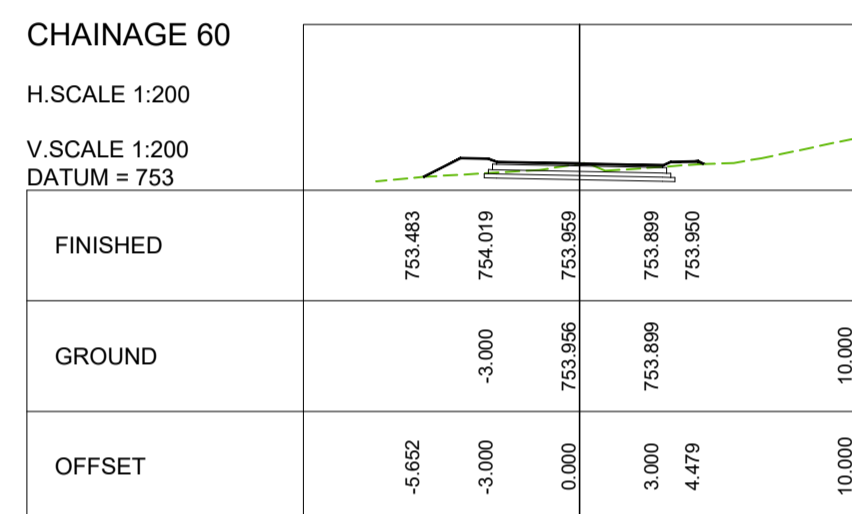
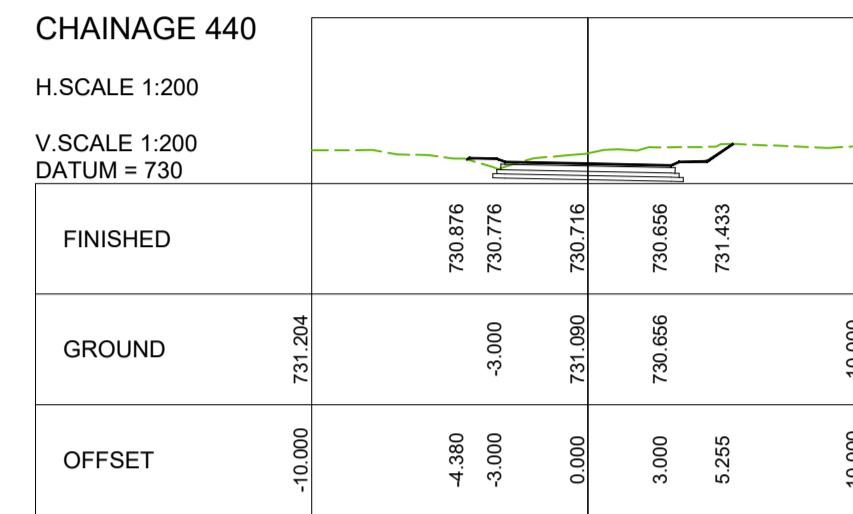
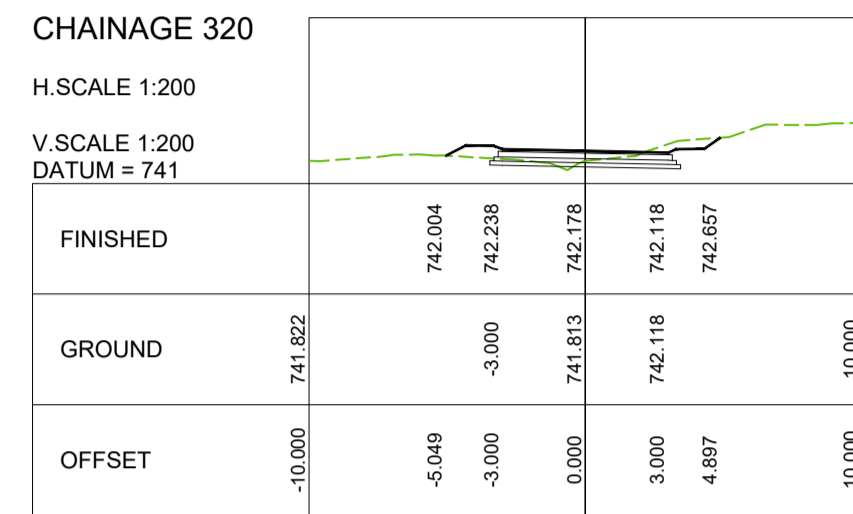
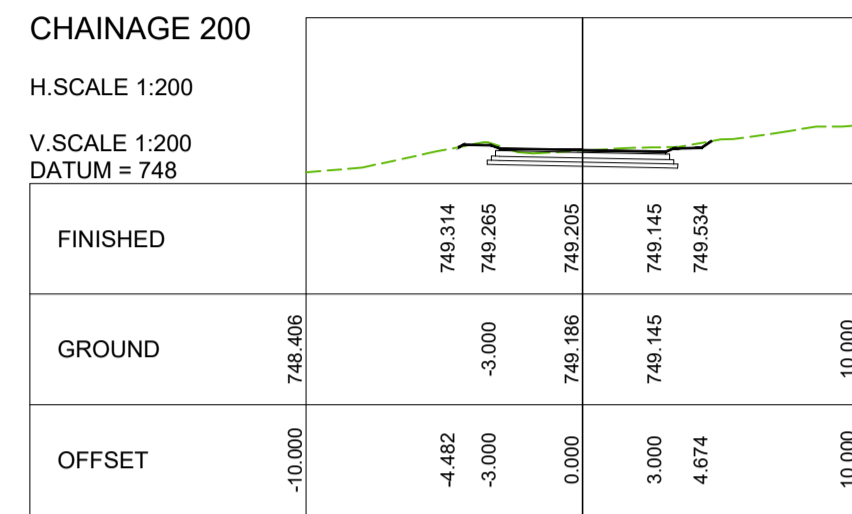
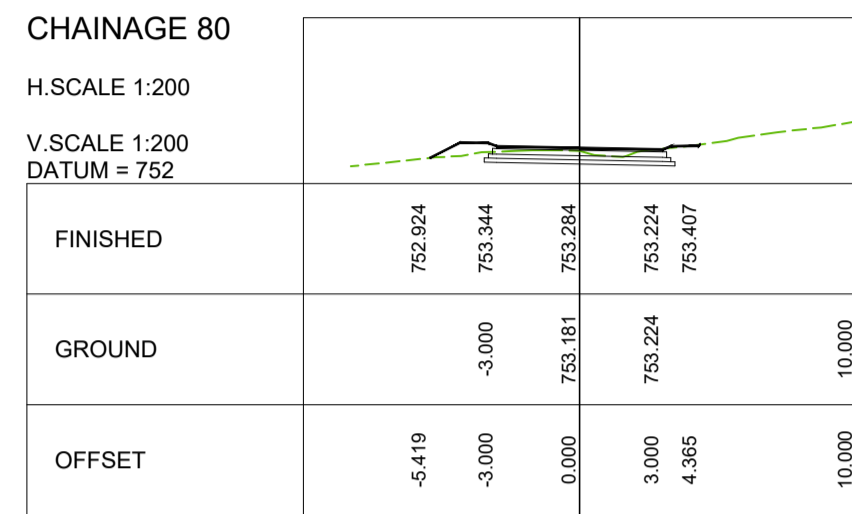
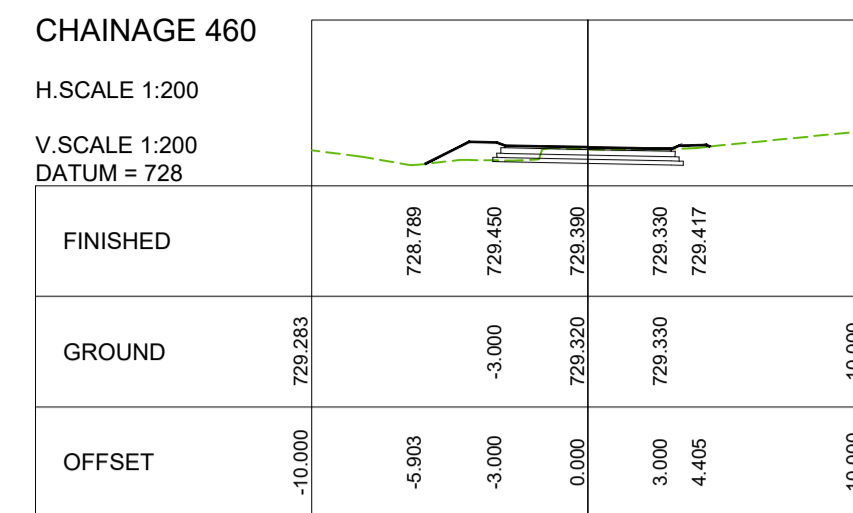
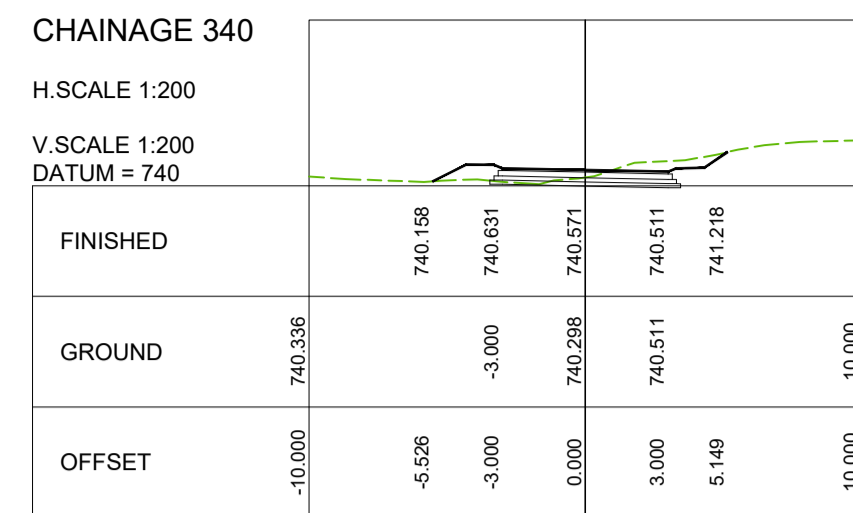
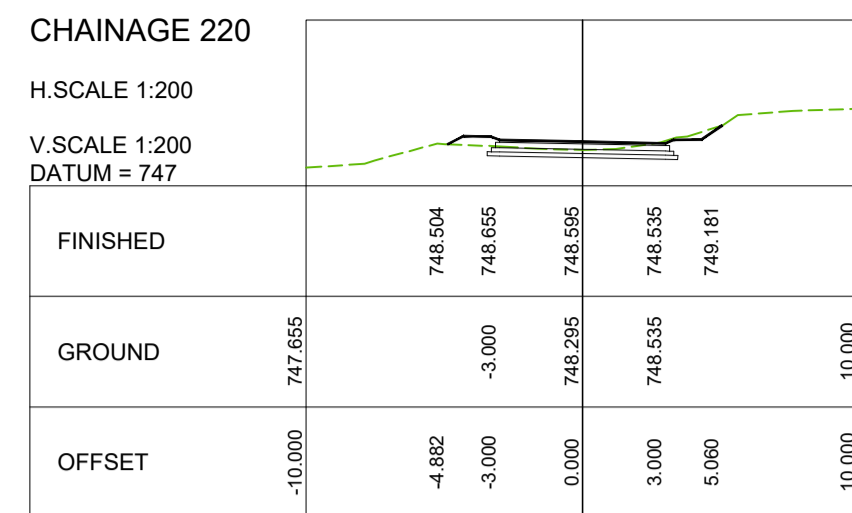
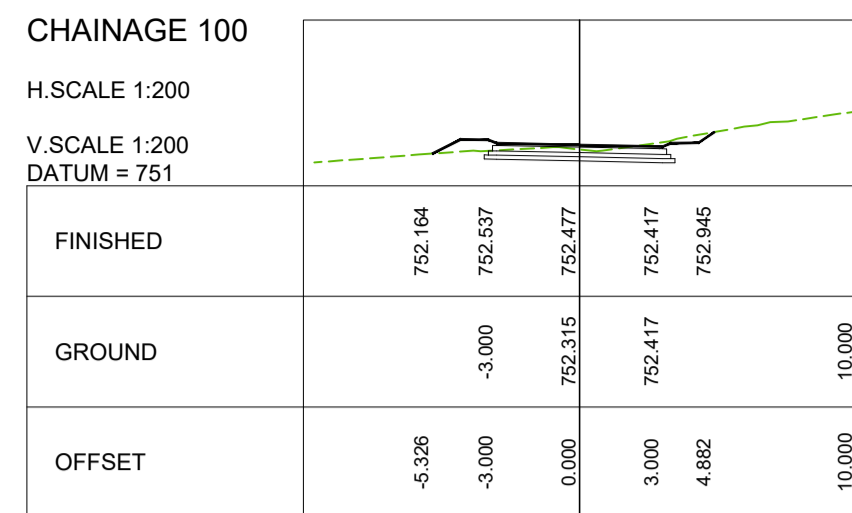
CONSULTANTS
DRAWING NUMBER
SH-1110-20-08-CS

SCALE
AS - SHOWN

REVISION No.
00

SHEET 1 of 5

DATE
JUNE 2023



IMPALA STREET

TENDER

A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		
No	DATE	REVISION	CONSULT	DIR

CITY OF MBOMBELA

P. O. BOX 45
NELSPRUIT
1200

1 NEL STREET
NELSPRUIT
1200

Tel.: (013) 759 9111 Fax.: (013) 759 2070

DESIGNED BY: **T. MULAUDI**

DRAWN BY: **L.N. MHLANGA**

CHECKED BY: **R. MAMUREMI**
Pr Tech Eng: 2019300534

APPROVED BY: **R. MAMUREMI**
Pr Tech Eng: 2019300534

CONSULTANT: **SHUMA AFRICA (PTY) LTD**

UNIT 75, BUILDING 11,
SONPARK SHOPPING CENTRE,
CIV. MABISA DRIVE AND
PIET RETIEF STREET
NELSPRUIT

P O BOX 1644
NELSPRUIT
1200

Tel.: (013) 752 3658 Fax.: (086) 545 7391

APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : **BID 213/2020 VI**

PROJECT: **UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)**

DESCRIPTION: **CROSS SECTIONS - IMPALA STREET**

DESIGN PLAN (Full signature)

For M.E.M.

For Consulting Engineer

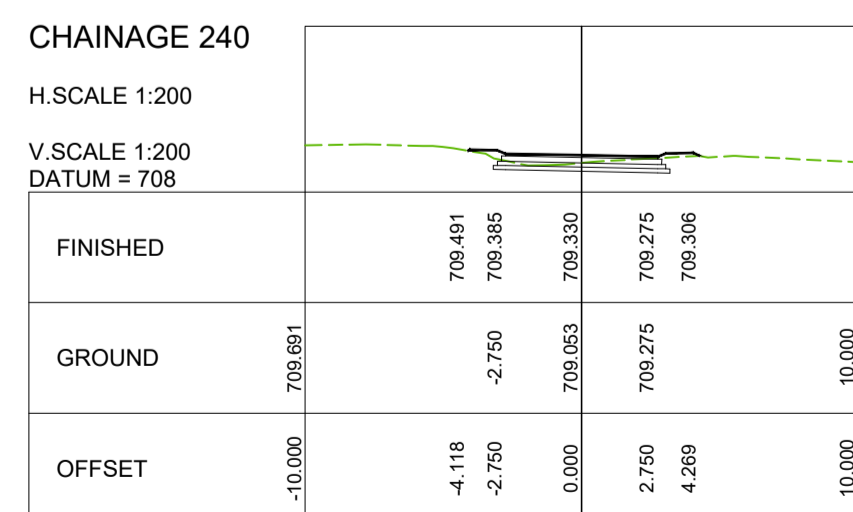
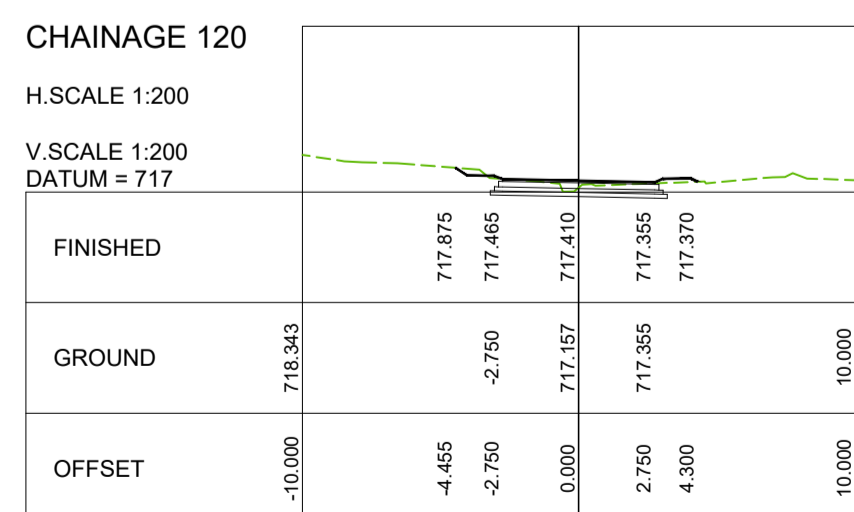
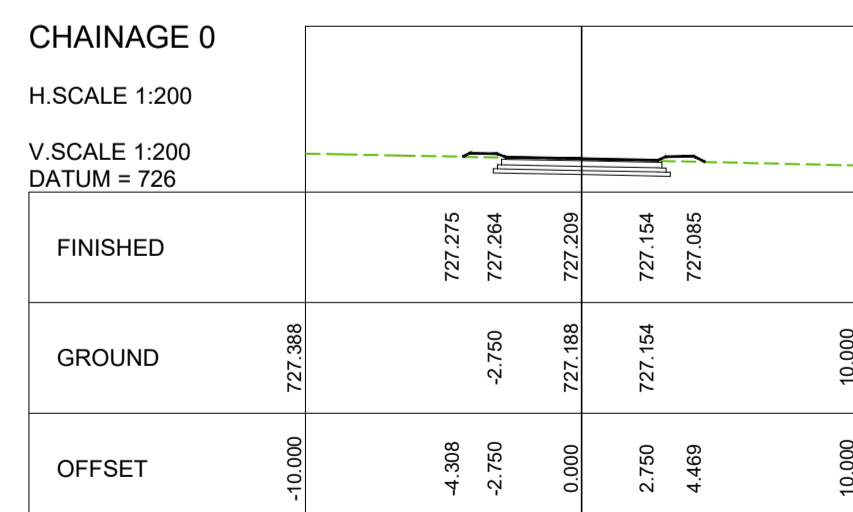
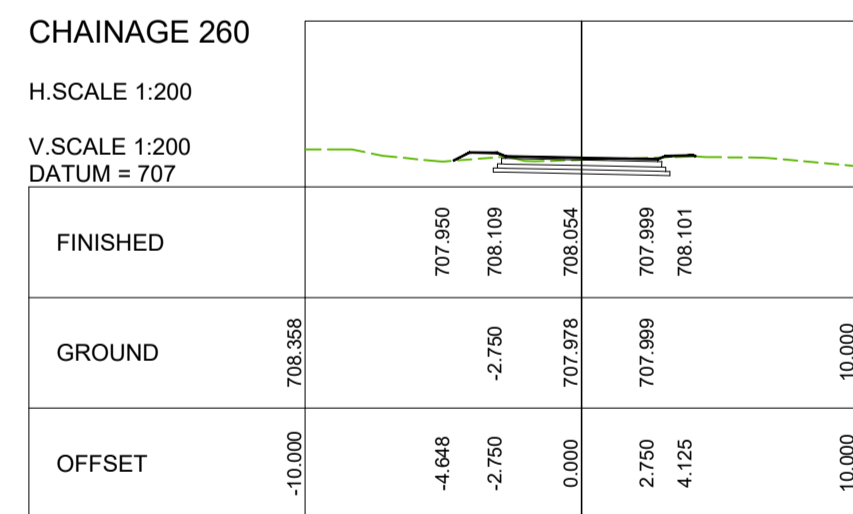
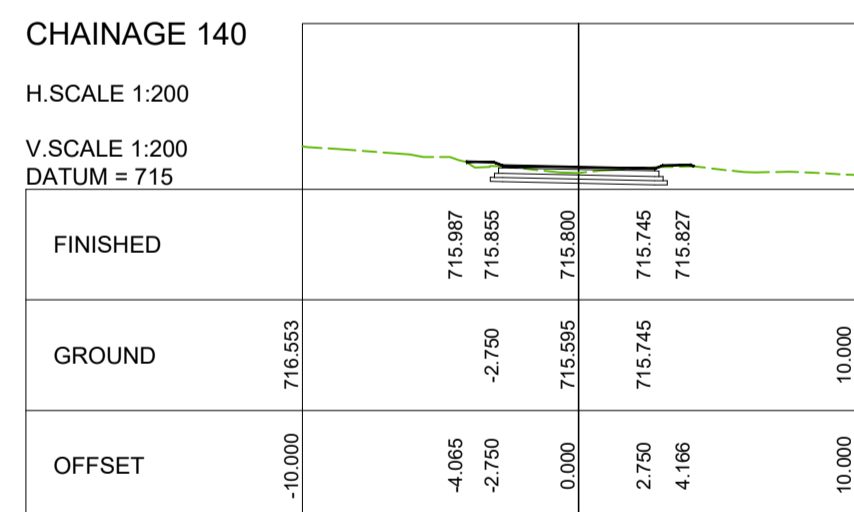
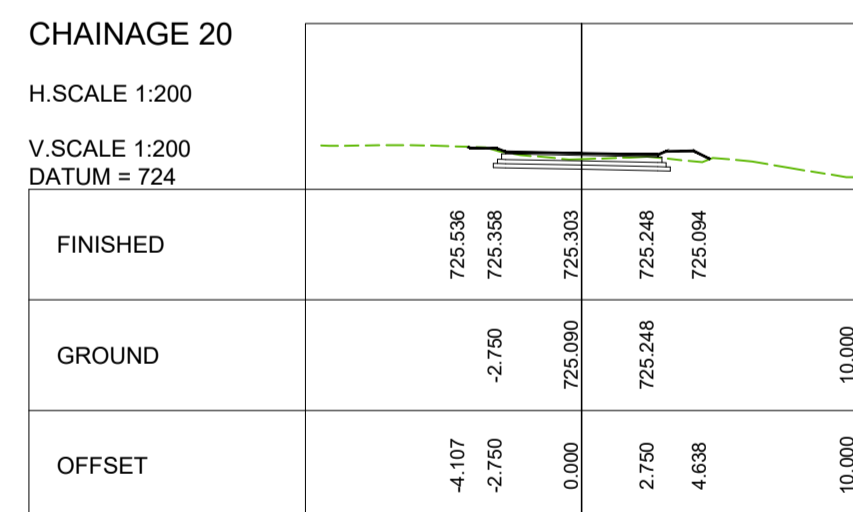
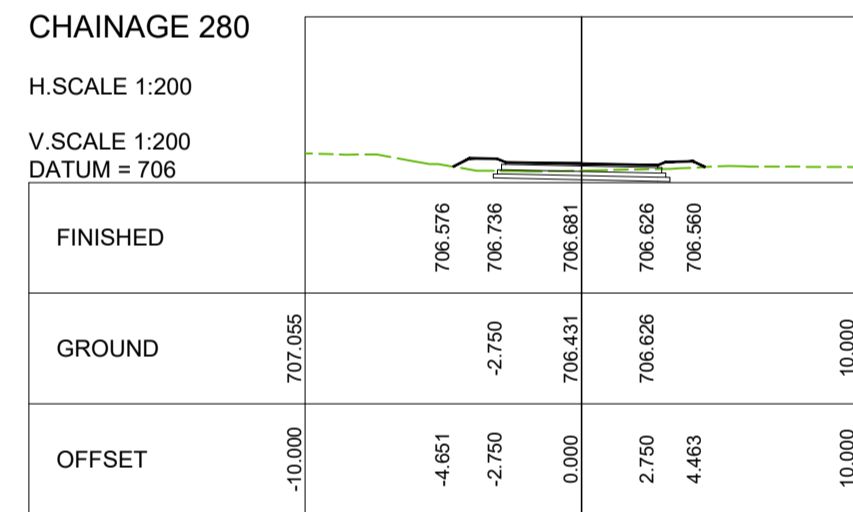
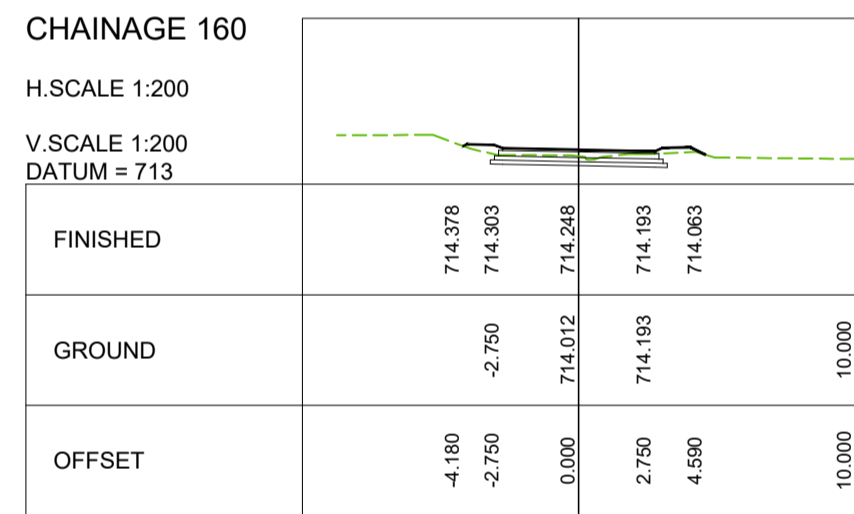
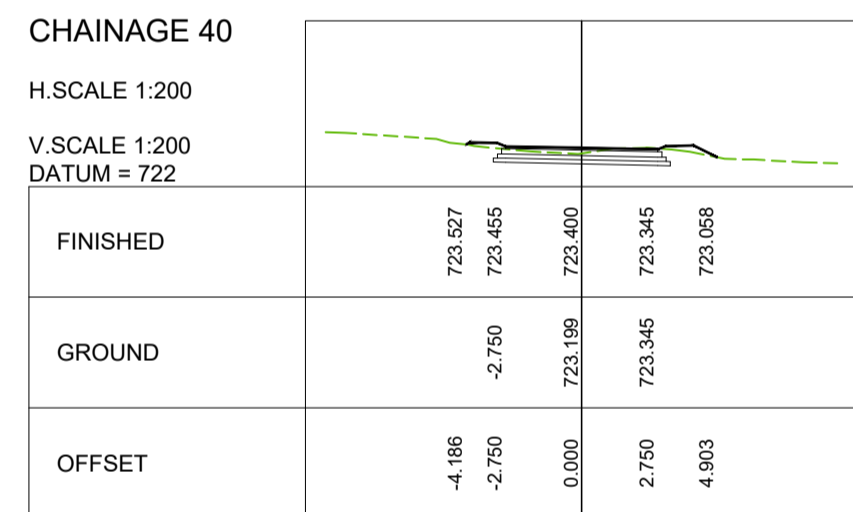
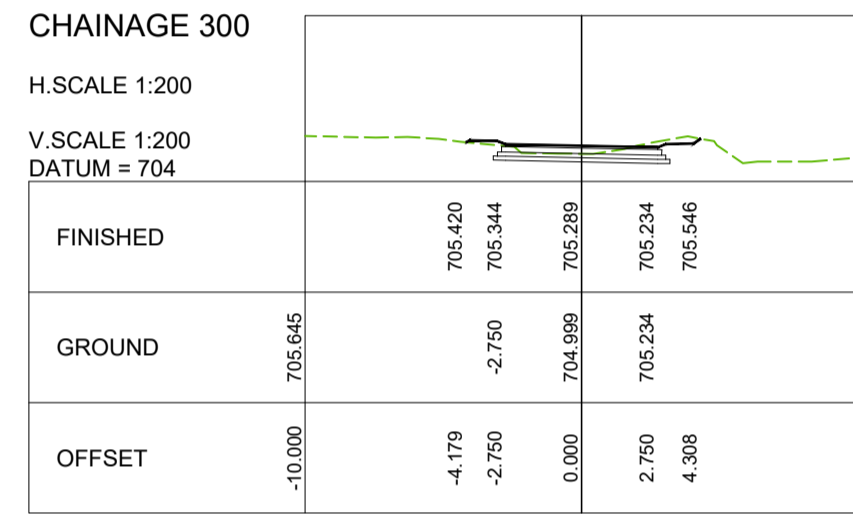
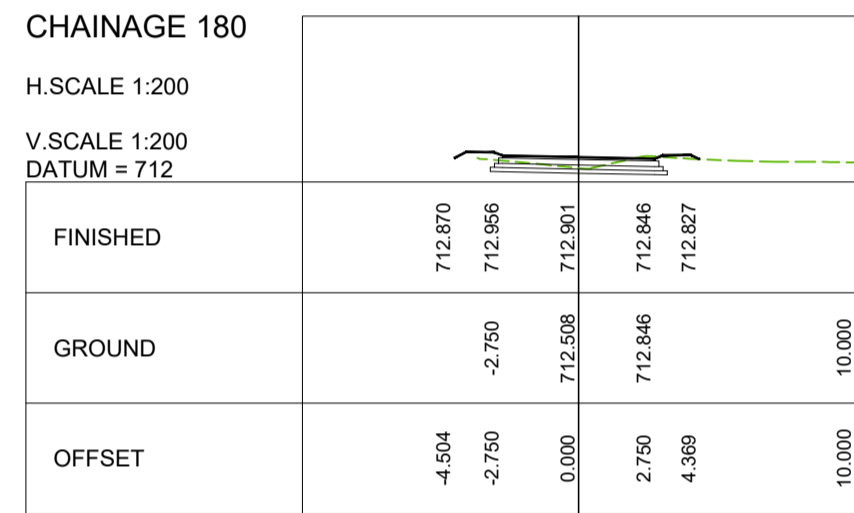
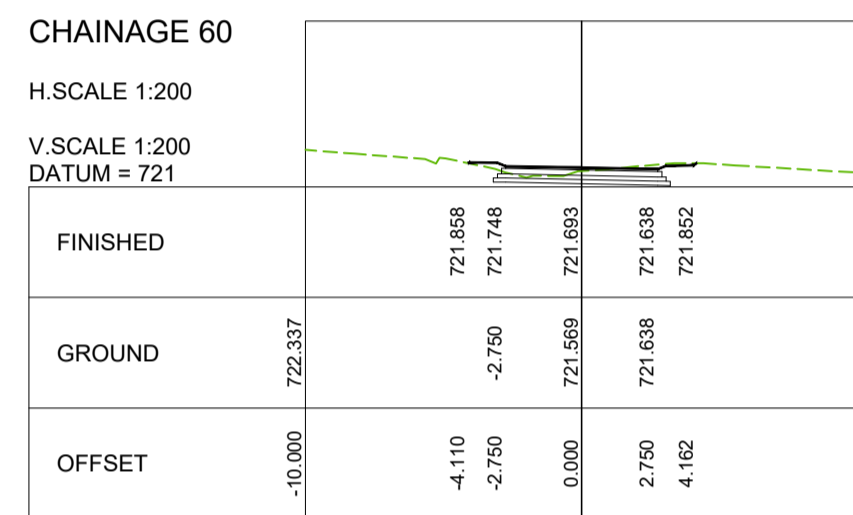
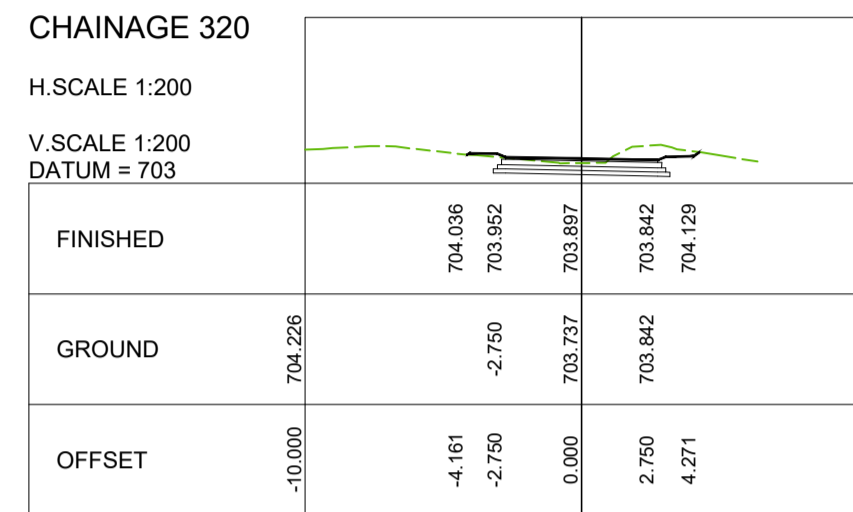
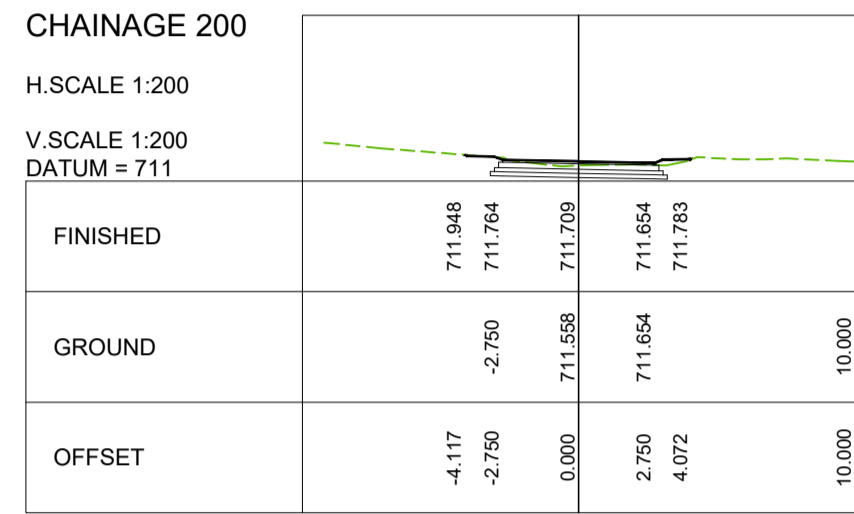
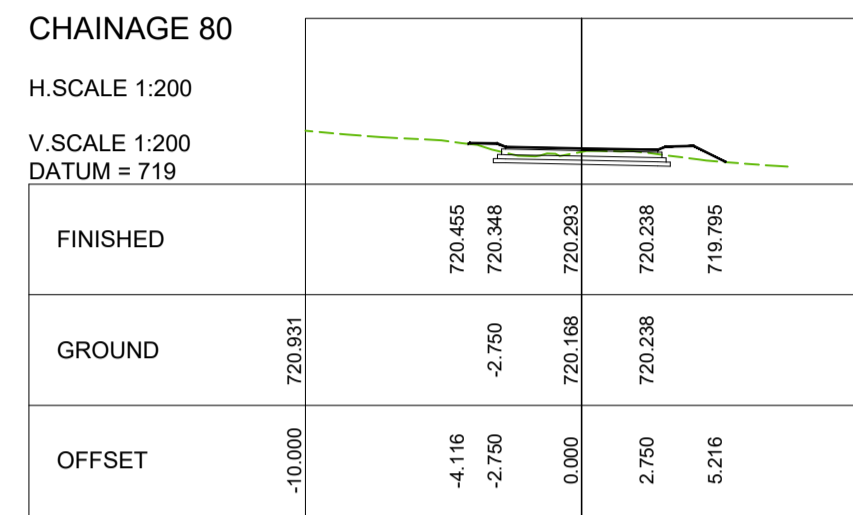
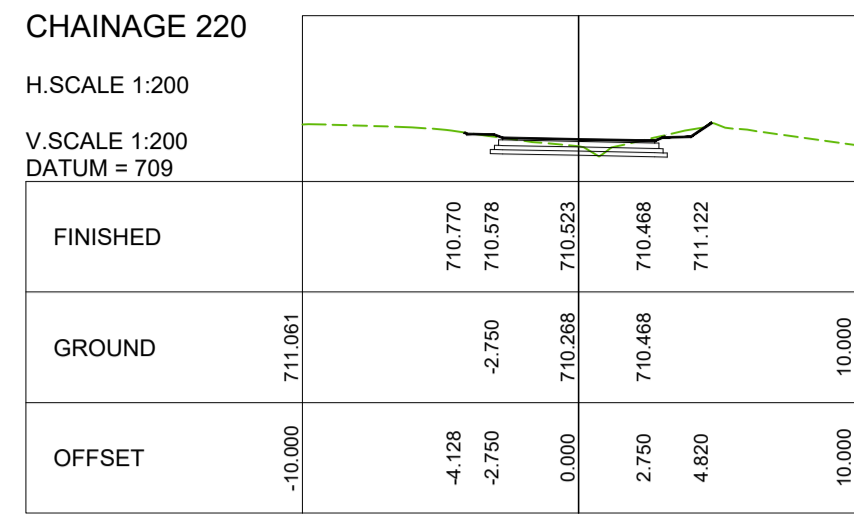
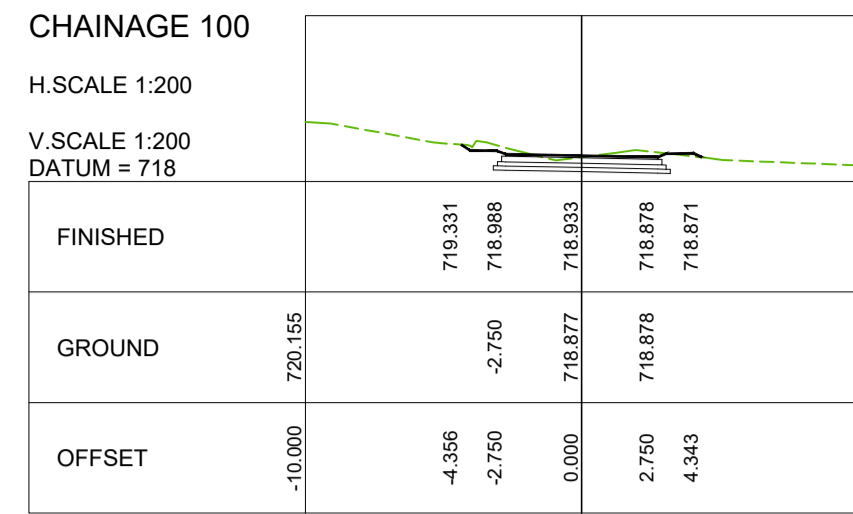
CONSULTANTS DRAWING NUMBER: **SH-1110-20-09-CS**

SCALE: **AS - SHOWN**

REVISION No.: **00**

SHEET **2** of **5**

DATE: **JUNE 2023**



IMPALA STREET EXT.

TENDER

A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		
No	DATE	REVISION	CONSULT	DIR

CITY OF MBOMBELA
P. O. BOX 45 NELSPRUIT 1200
1 NEL STREET NELSPRUIT 1200
Tel.: (013) 759 9111 Fax.: (013) 759 2070

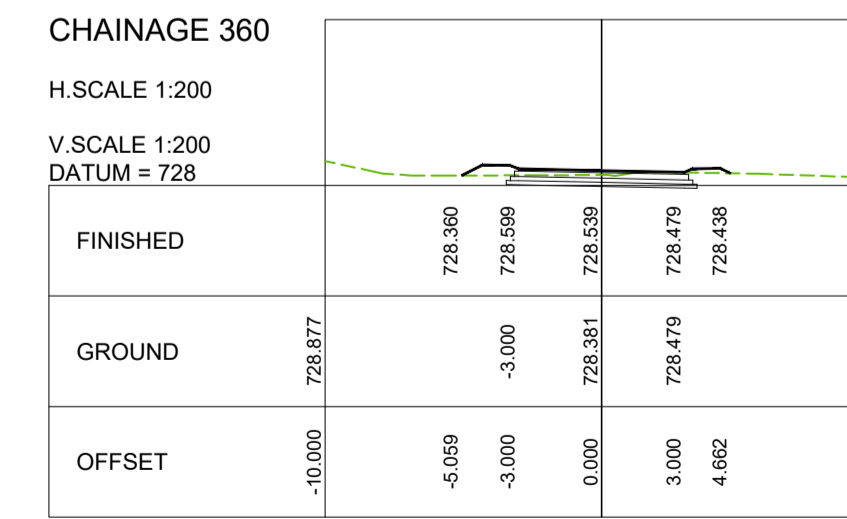
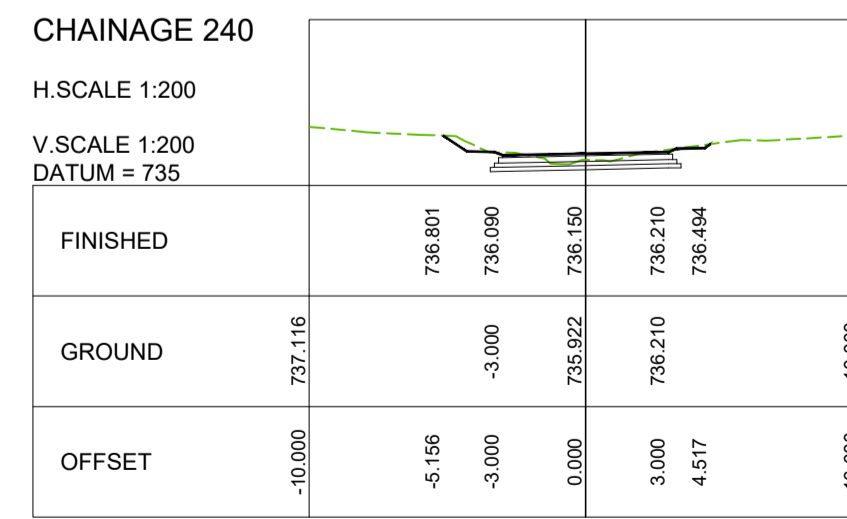
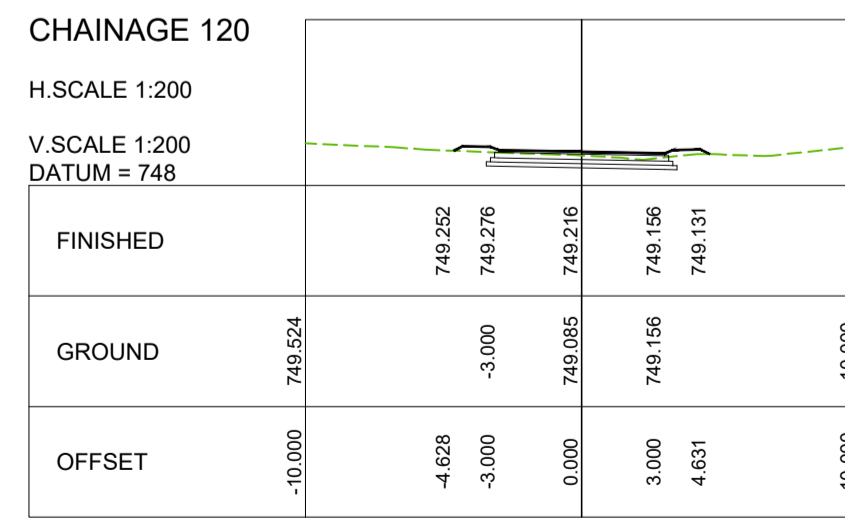
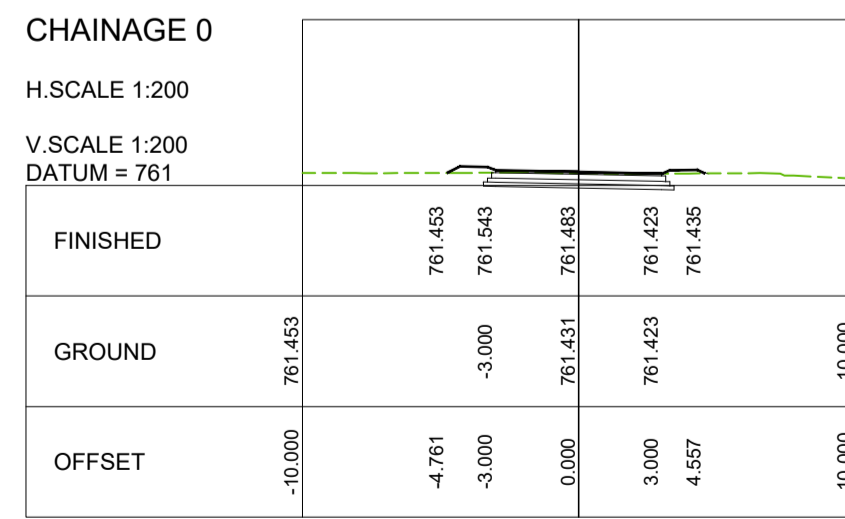
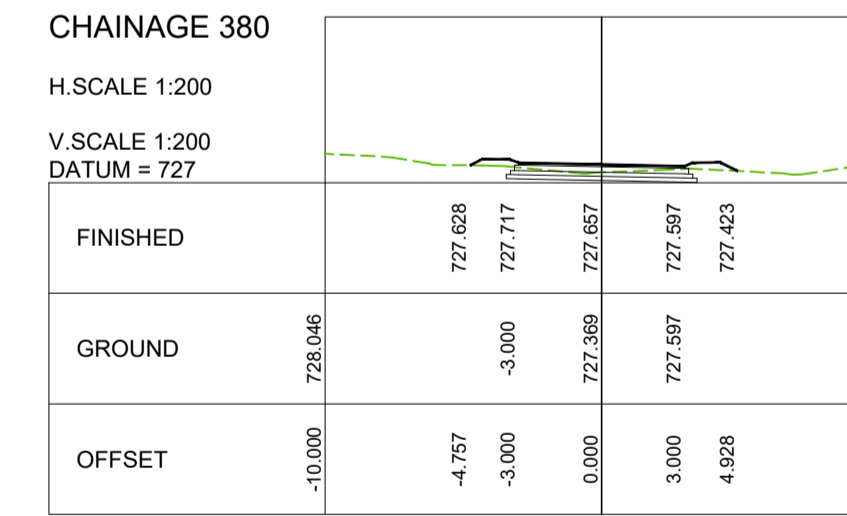
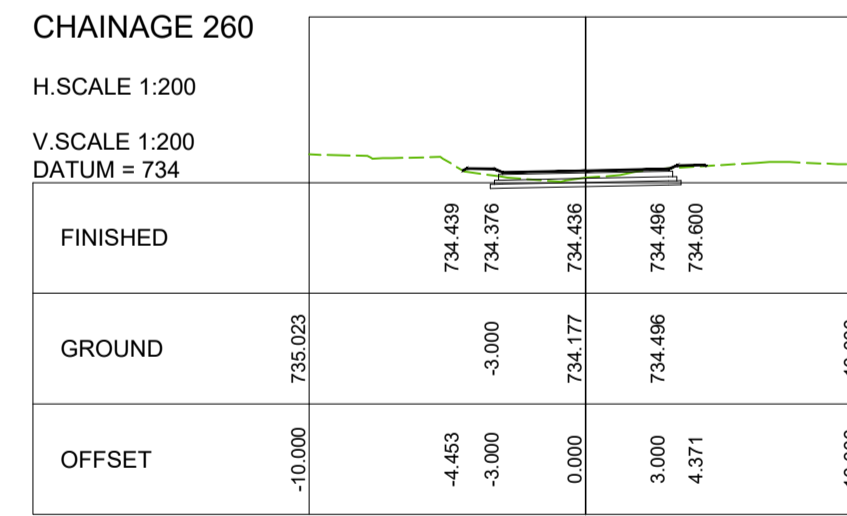
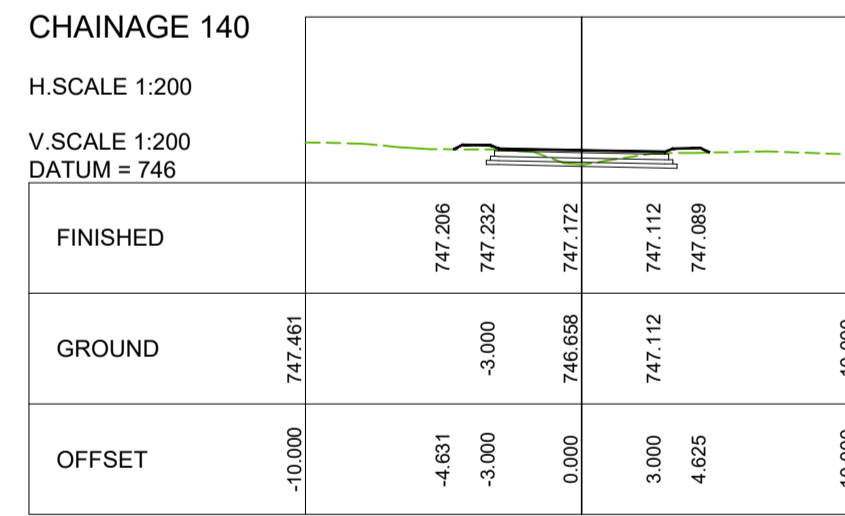
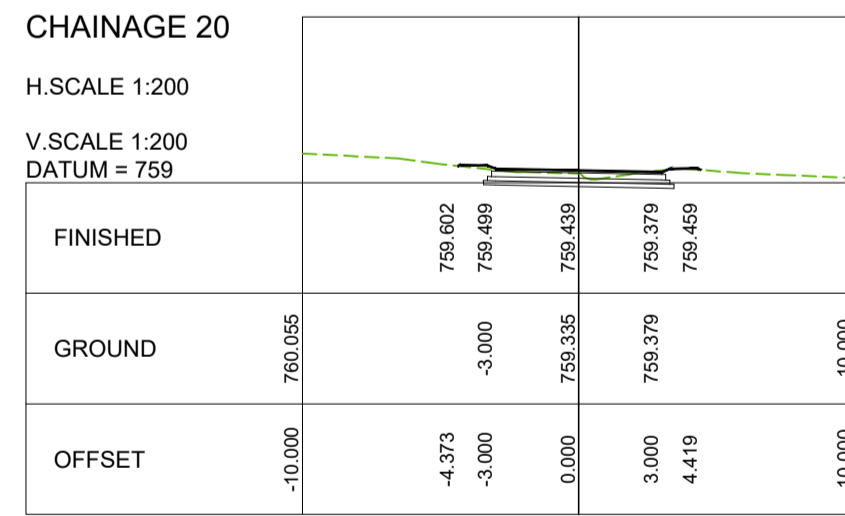
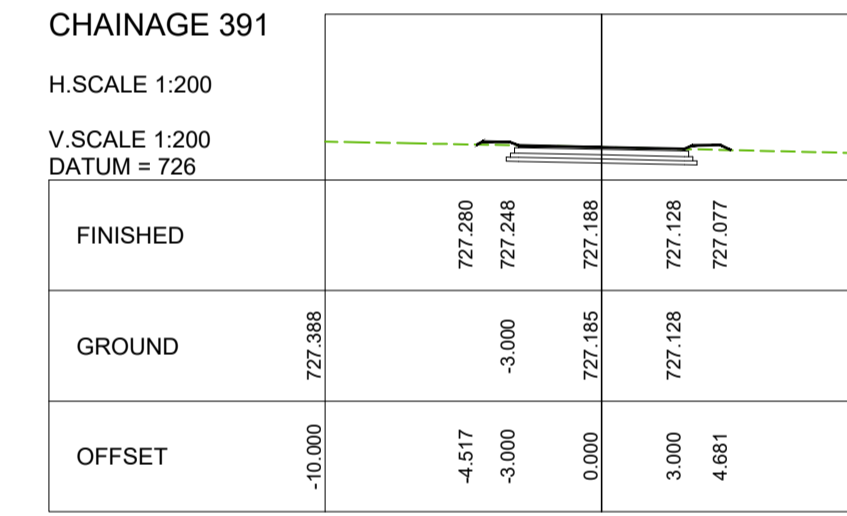
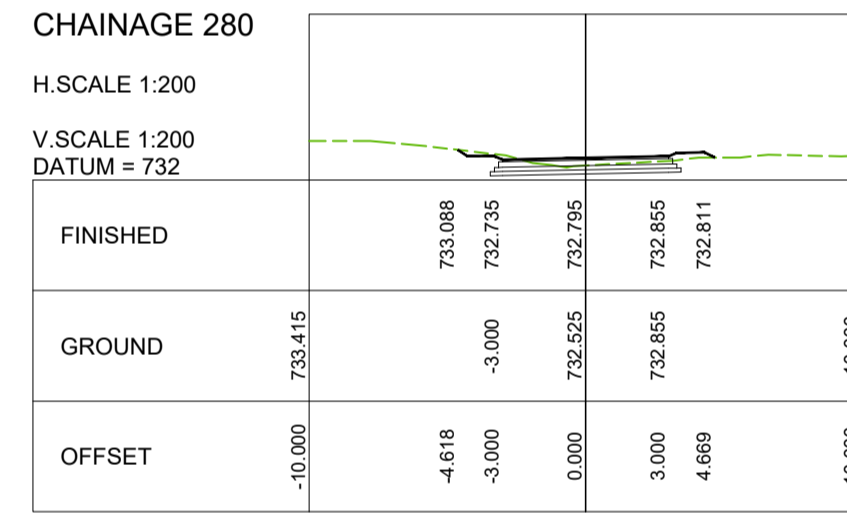
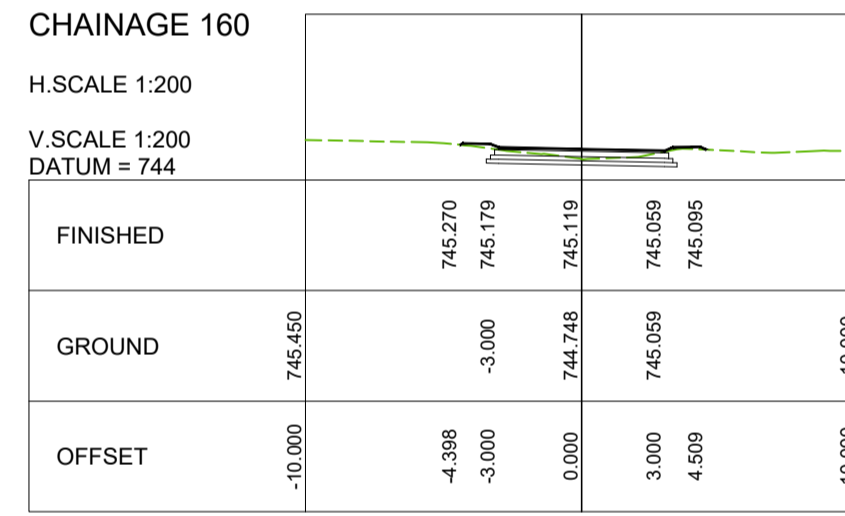
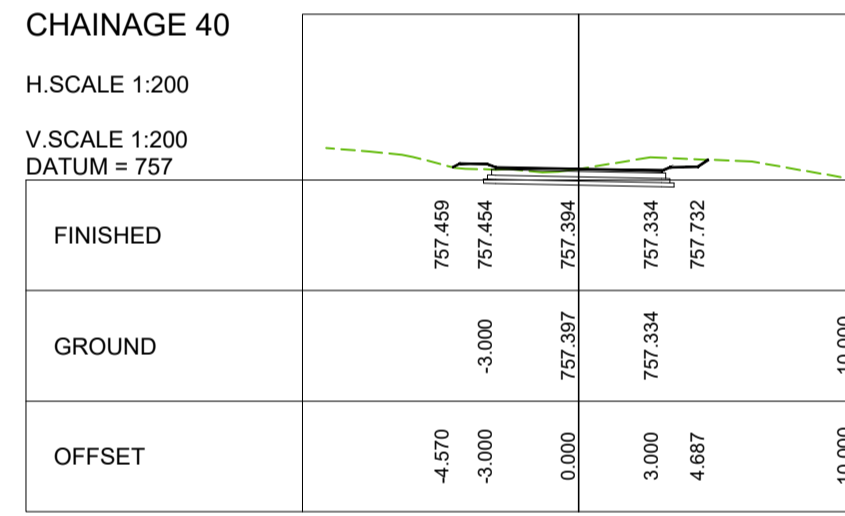
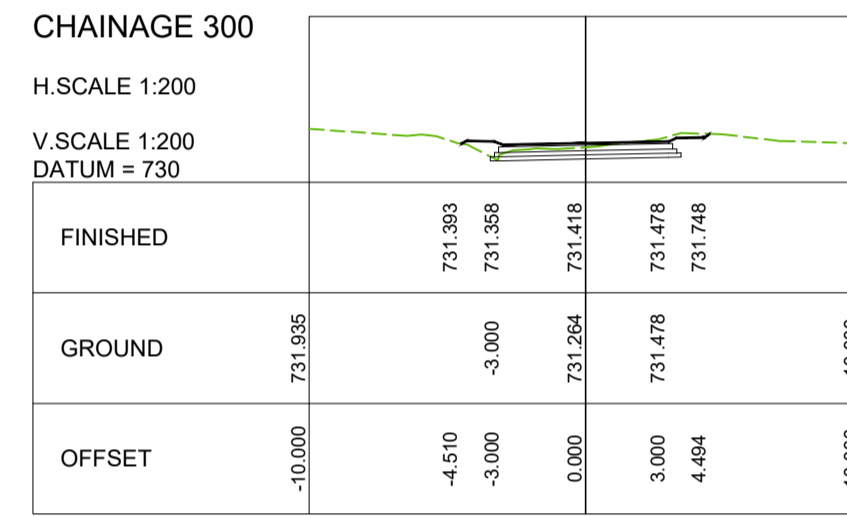
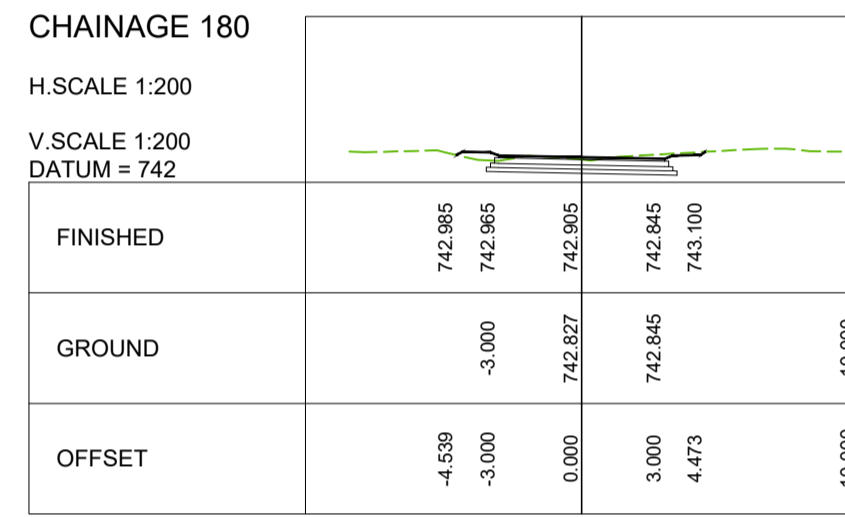
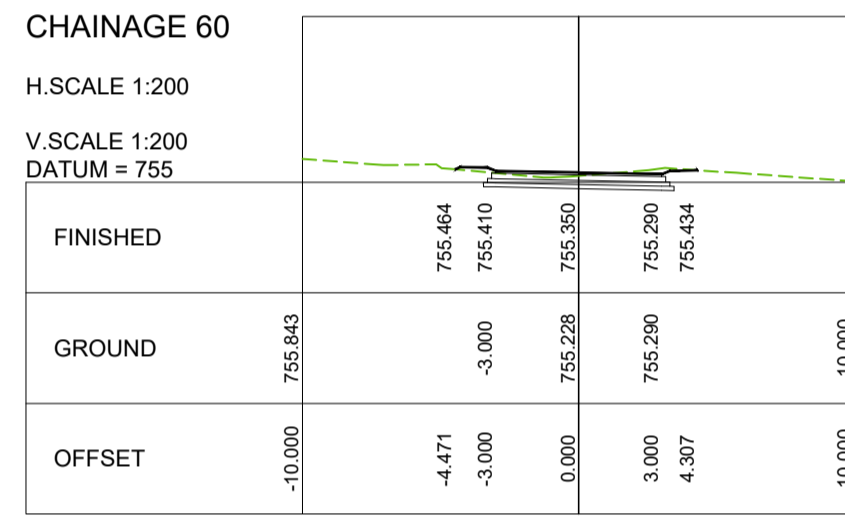
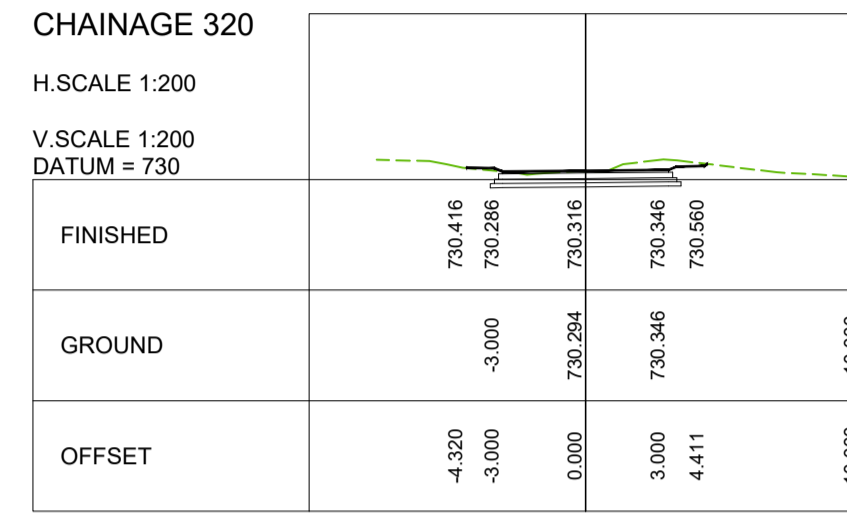
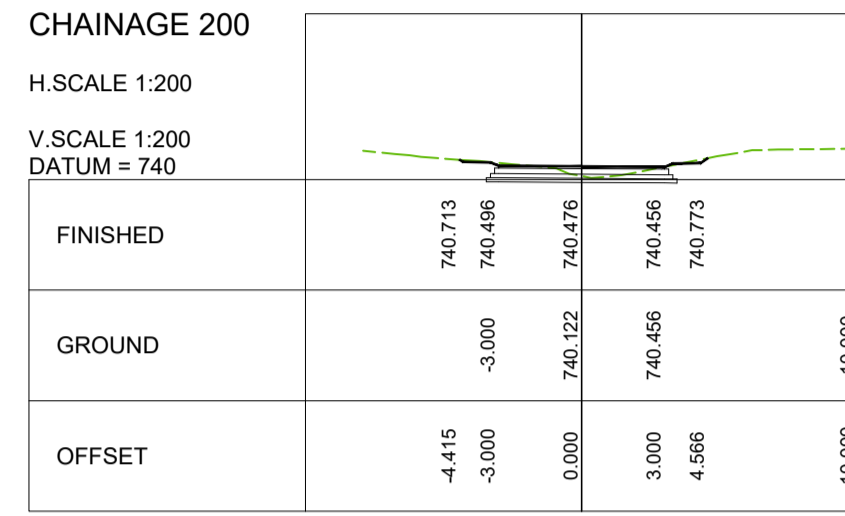
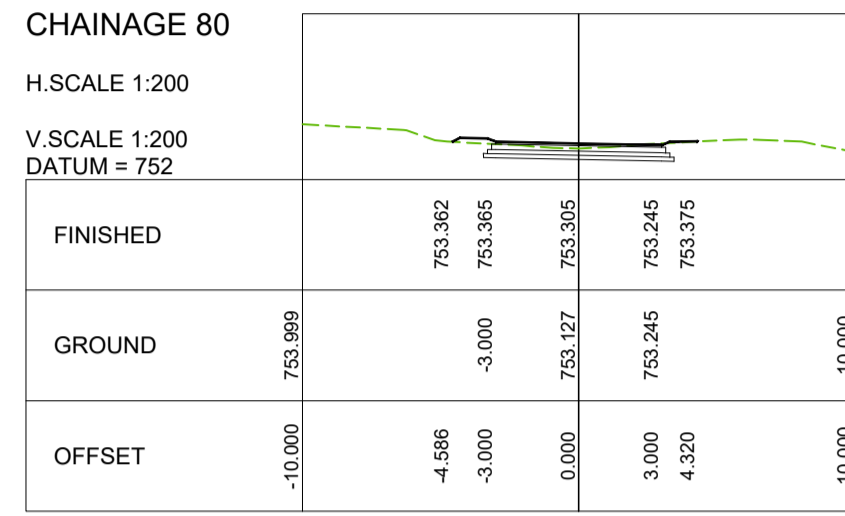
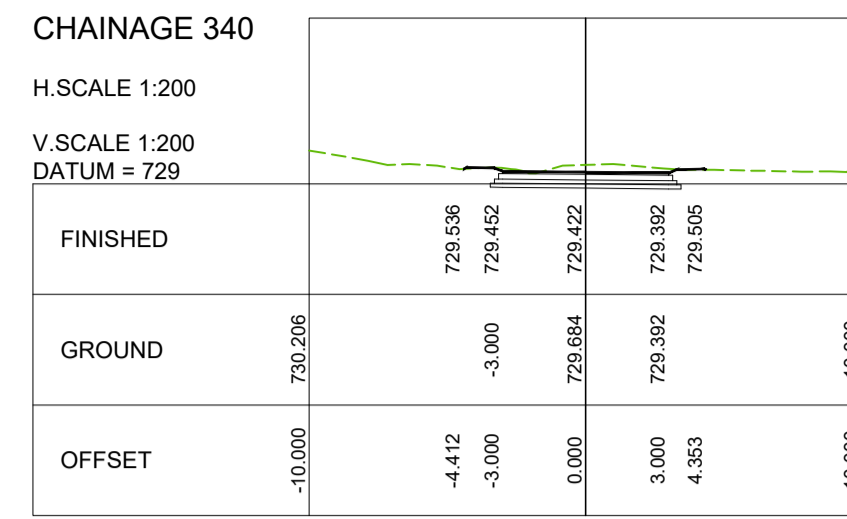
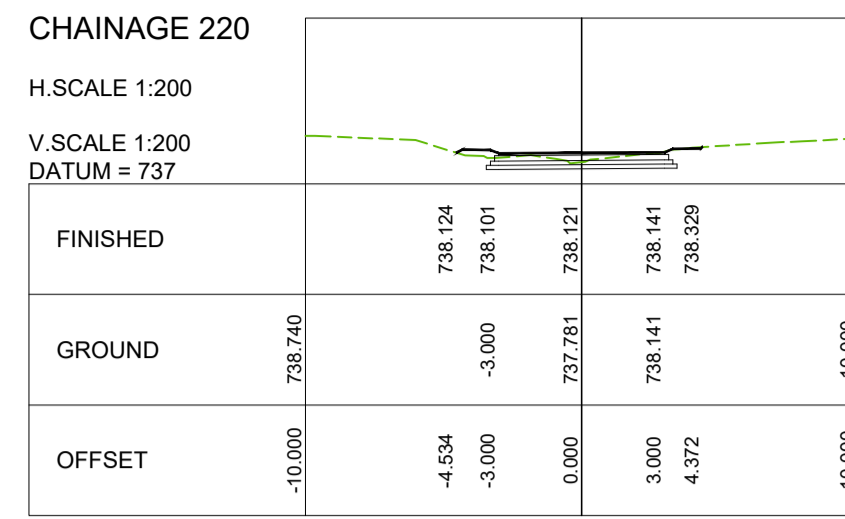
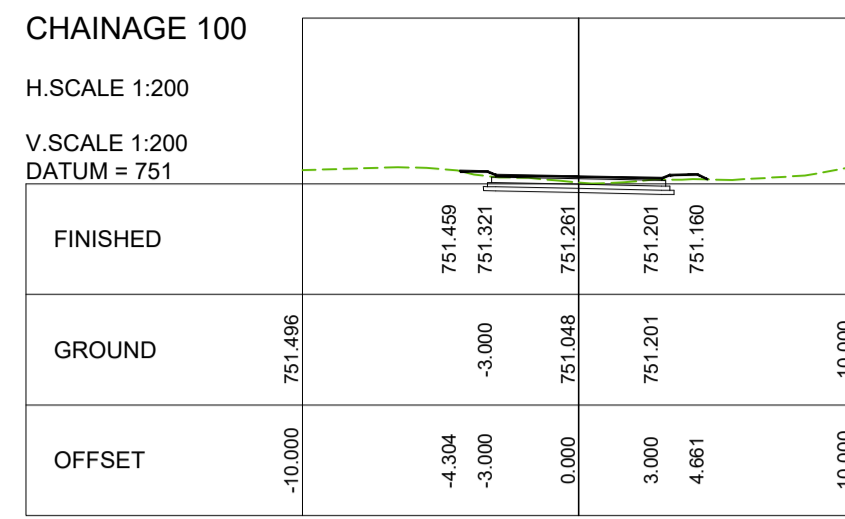
DESIGNED BY: T. MULAUDZI
DRAWN BY: L.N. MHLANGA
CHECKED BY: R. MAMUREMI
APPROVED BY: R. MAMUREMI

SHUMA AFRICA (PTY) LTD
UNIT 75, BUILDING 11, SONPARK SHOPPING CENTRE, CIVIL MARCH DRIVE AND PIET RETEF STREET NELSPRUIT
P O BOX 1644 NELSPRUIT 1200
Tel.: (013) 752 3658 Fax.: (086) 545 7391

APPROVED
MBOMBELA DATE
CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 VI
PROJECT: UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)
DESCRIPTION: CROSS SECTIONS - IMPALA STREET EXT.

DESIGN PLAN (Full signature)
For: M.M.M.
For: Consulting Engineer
CONSULTANTS DRAWING NUMBER: SH-1110-20-10-CS
SCALE: AS - SHOWN
REVISION No.: 00
SHEET 3 of 5
DATE: JUNE 2023



POLANI STREET

TENDER

A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		
No	DATE	REVISION	CONSULT	DIR

CITY OF MBOMBELA

P. O. BOX 45
NELSPRUIT
1200

1 NEL STREET
NELSPRUIT
1200

Tel.: (013) 759 9111 Fax: (013) 759 2070

DESIGNED BY: **T. MULAUDI**

DRAWN BY: **L.N. MHLANGA**

CHECKED BY: **R. MAMUREMI**
Pr Tech Eng: 2019300534

APPROVED BY: **R. MAMUREMI**
Pr Tech Eng: 2019300534

CONSULTANT

SHUMA AFRICA (PTY) LTD

UNIT 75, BUILDING 11,
SONPARK SHOPPING CENTRE,
CIVIL MACHABA DRIVE AND
PIET RETIEF STREET
NELSPRUIT

P O BOX 1644
NELSPRUIT
1200

Tel.: (013) 752 3658 Fax: (086) 545 7391

APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : **BID 213/2020 VI**

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION

CROSS SECTIONS - POLANI STREET

DESIGN PLAN
(Full signature)

For M.E.M.

For Consulting Engineer

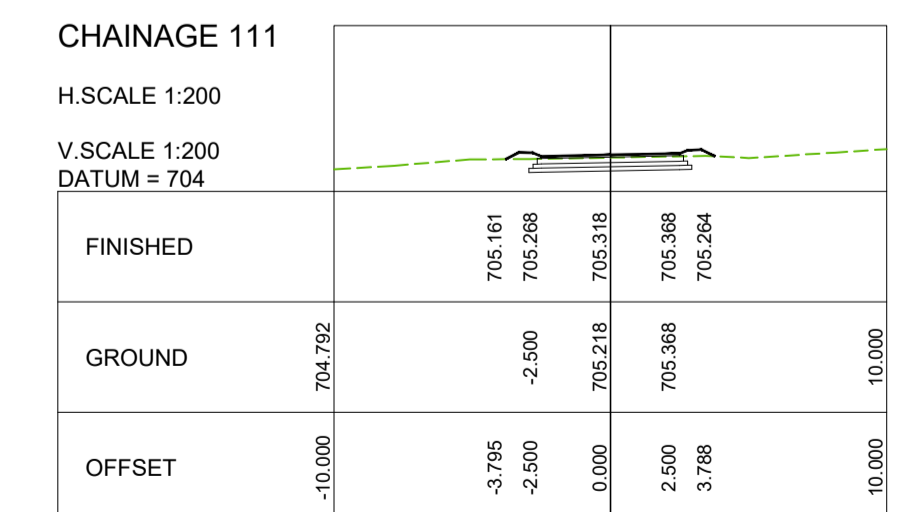
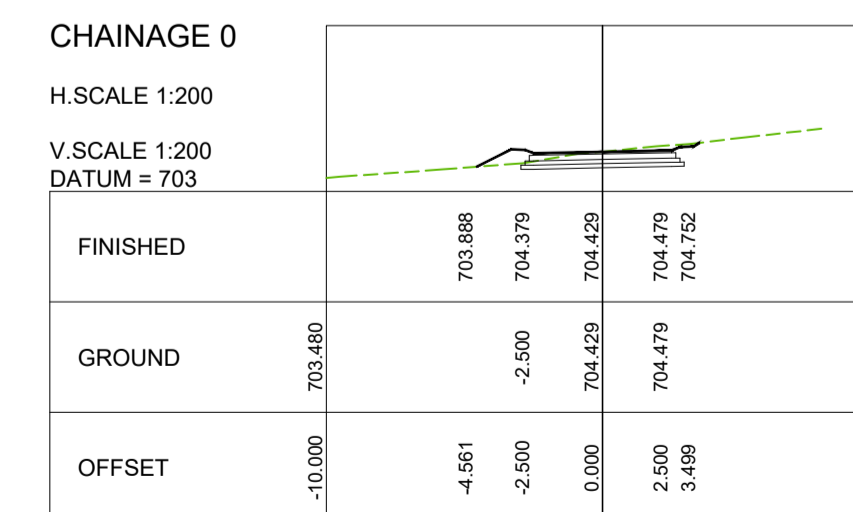
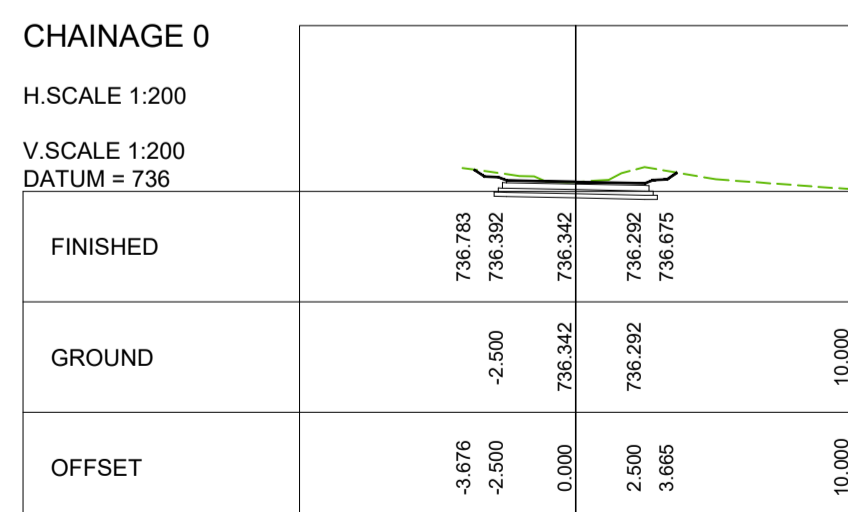
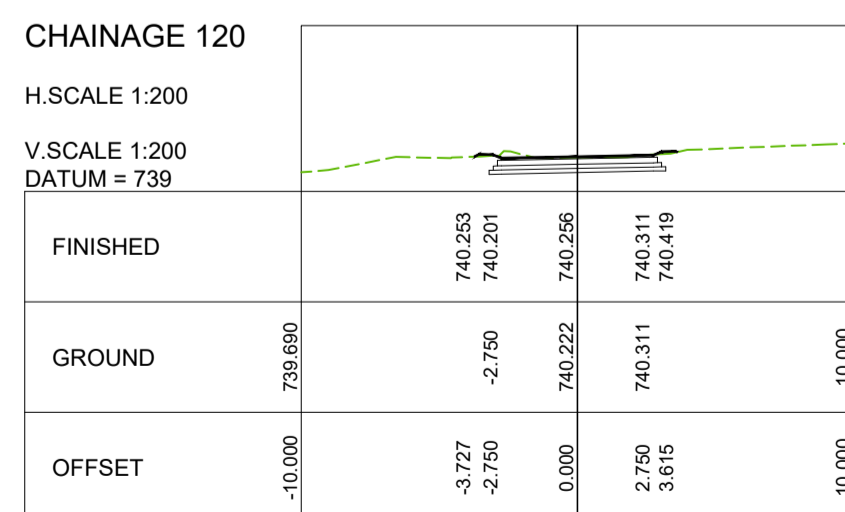
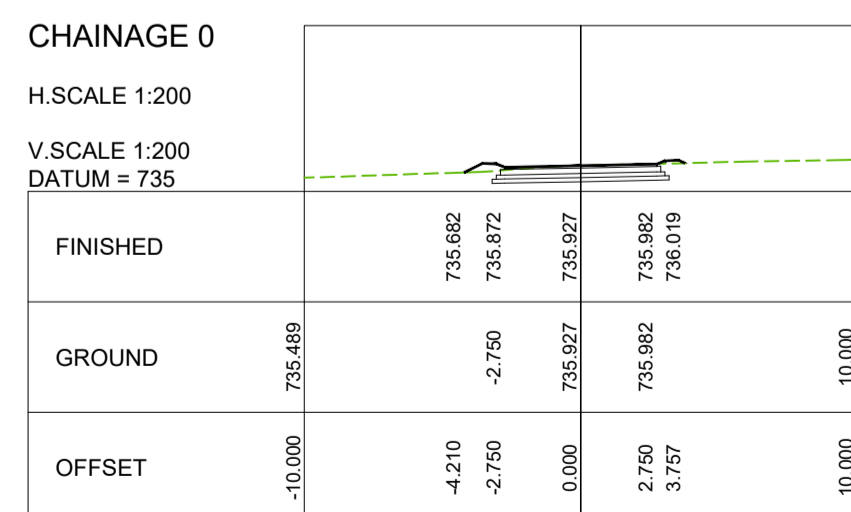
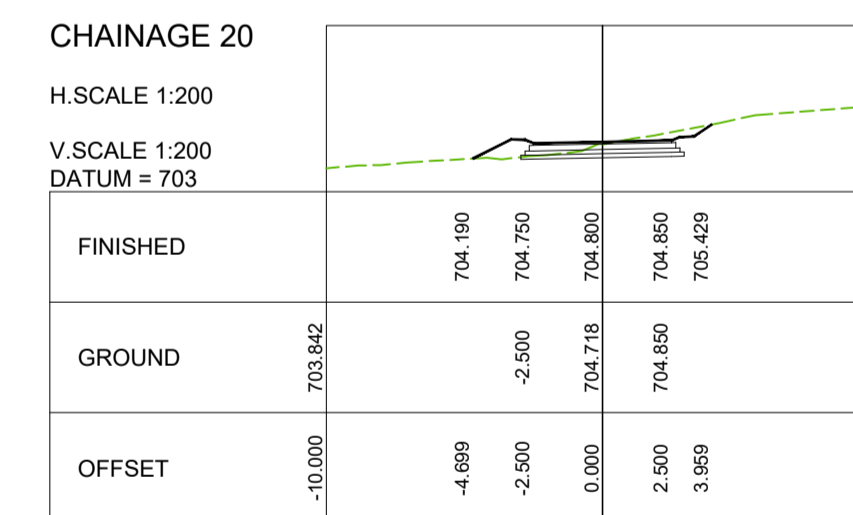
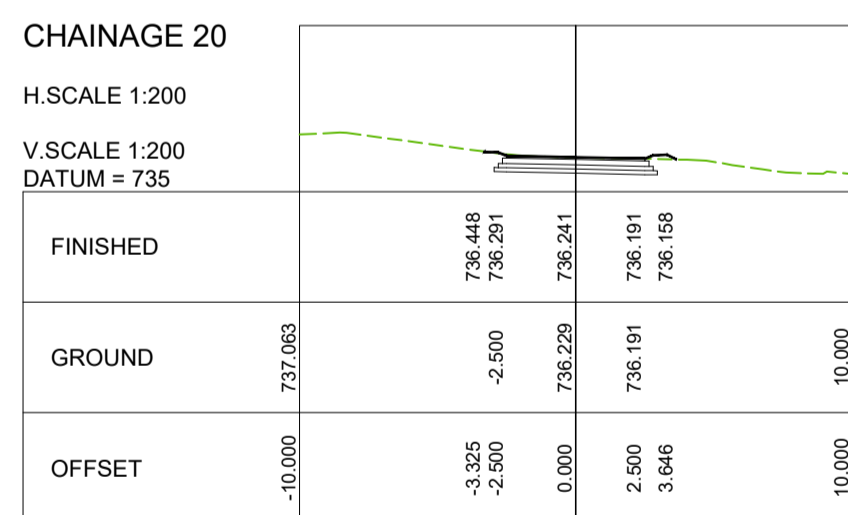
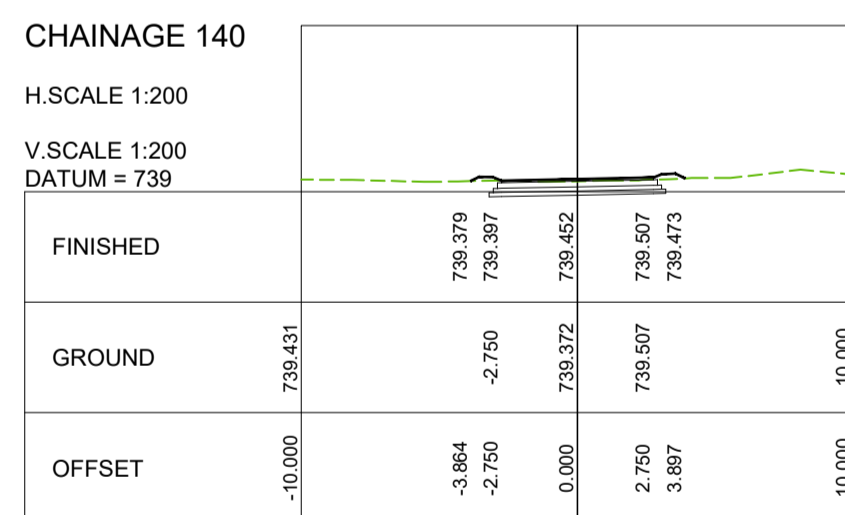
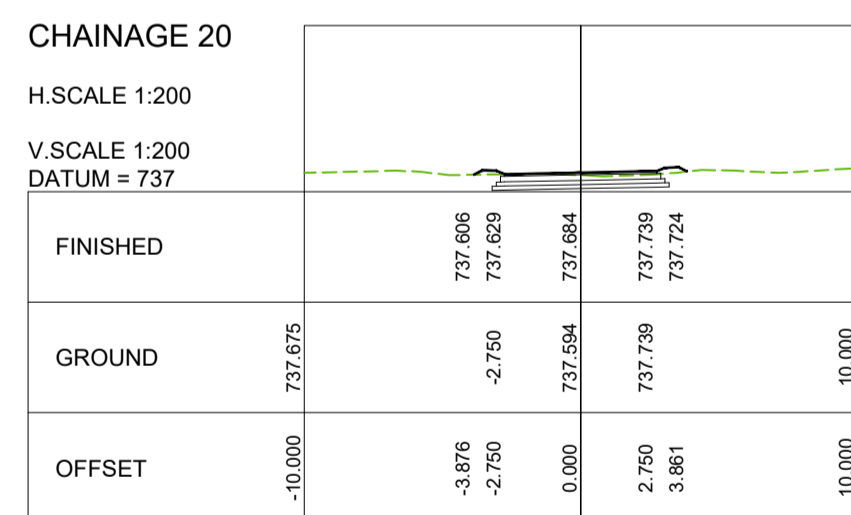
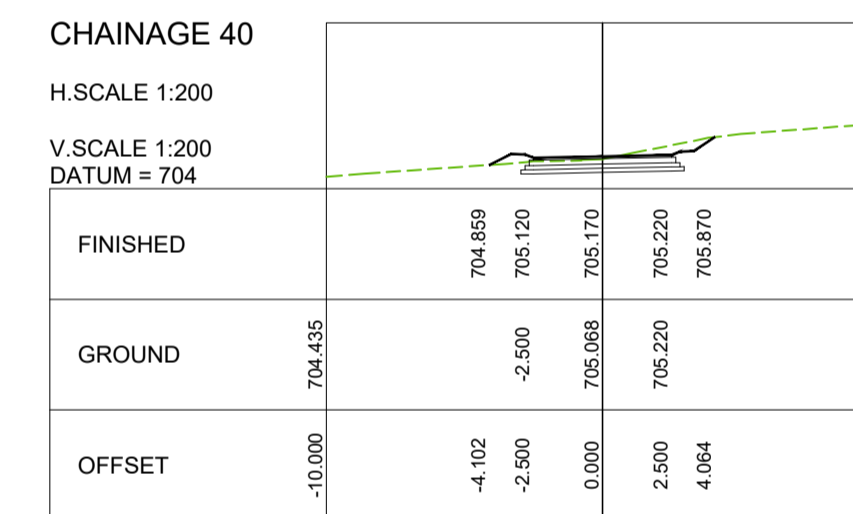
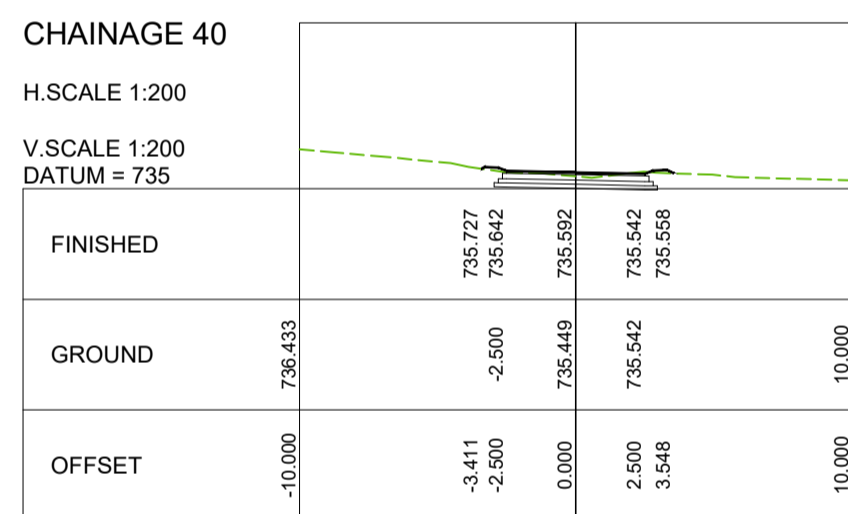
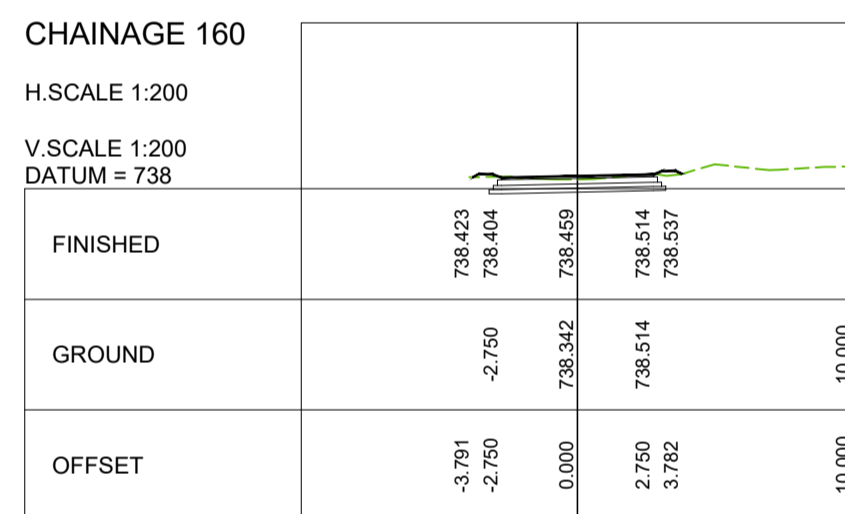
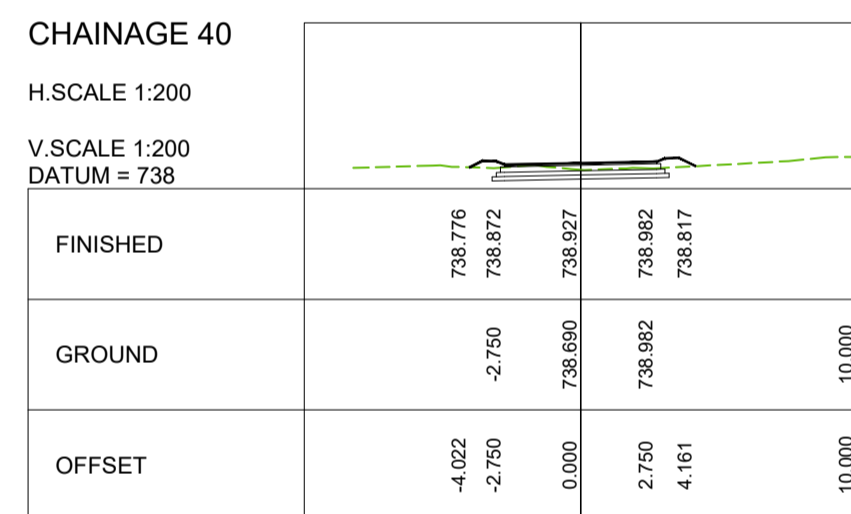
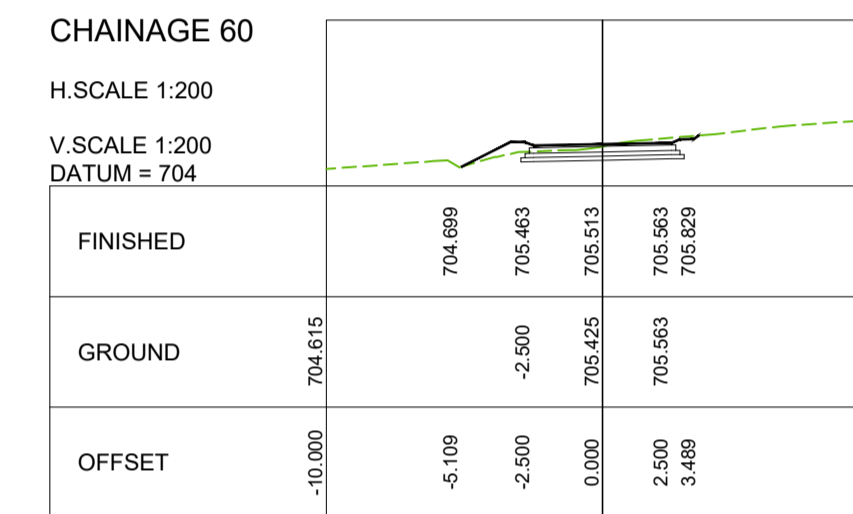
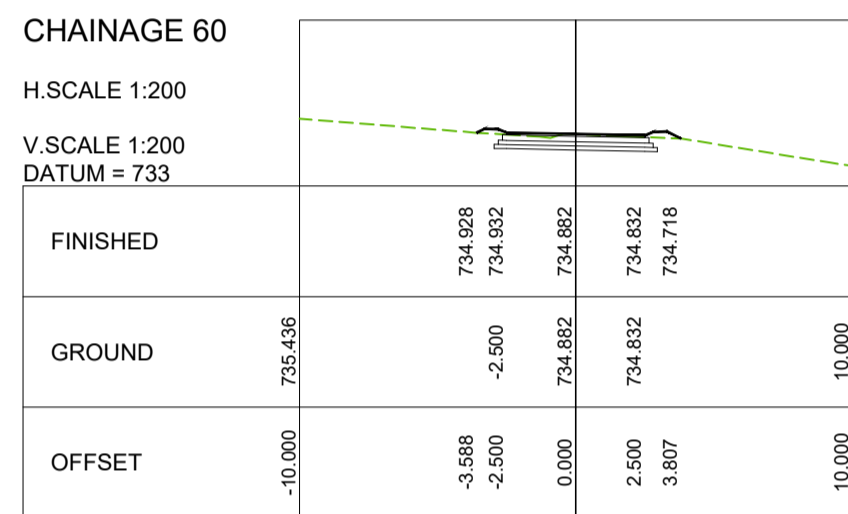
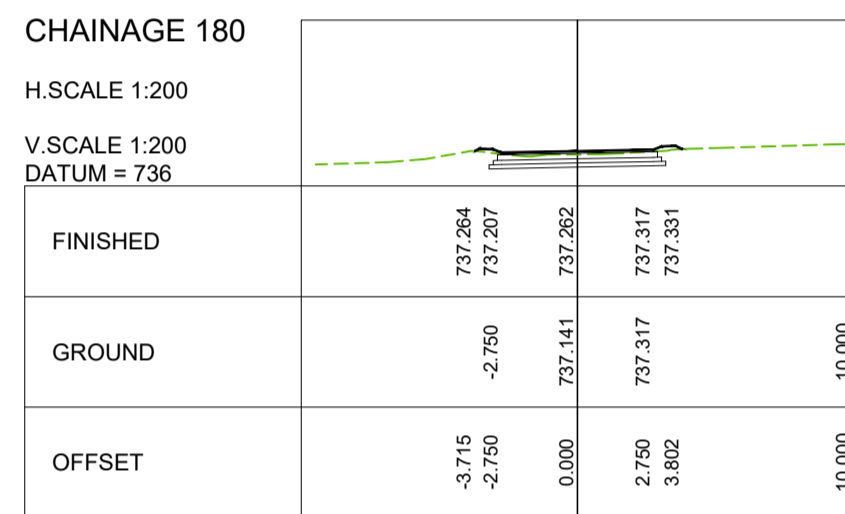
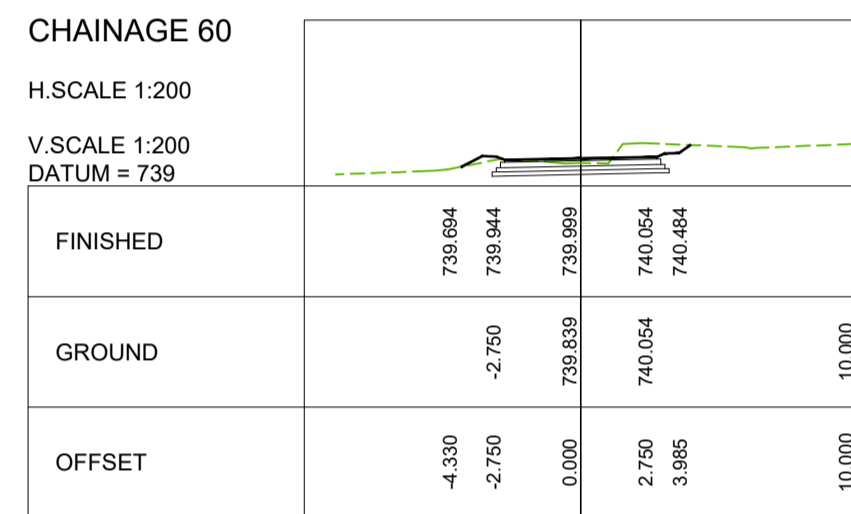
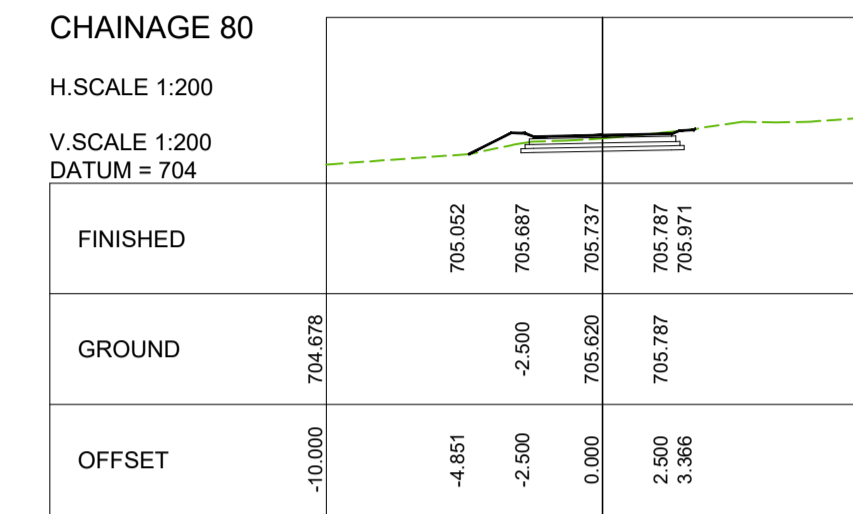
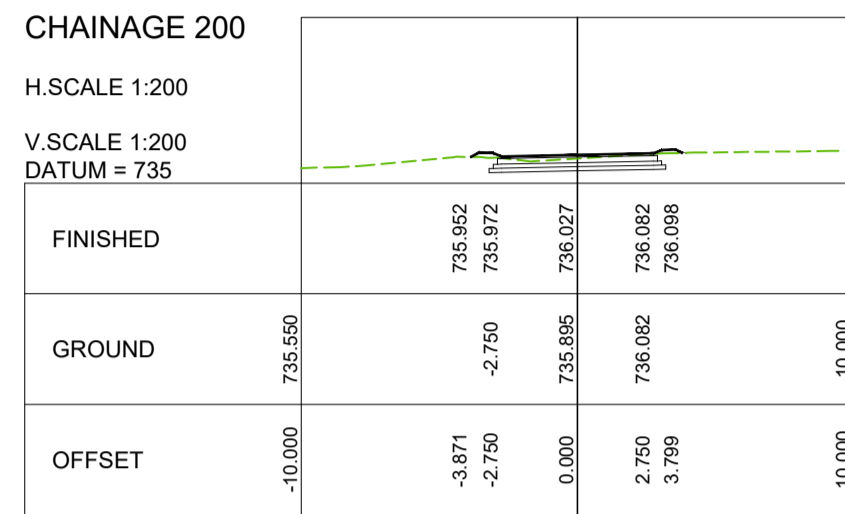
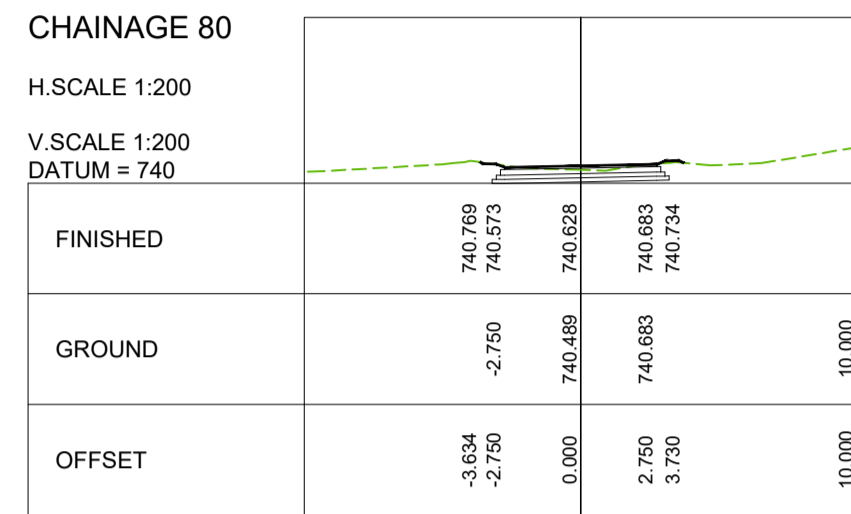
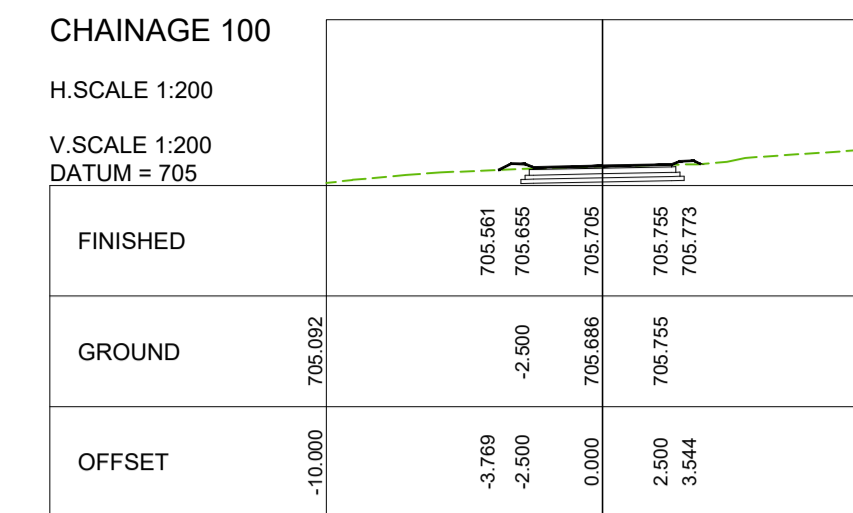
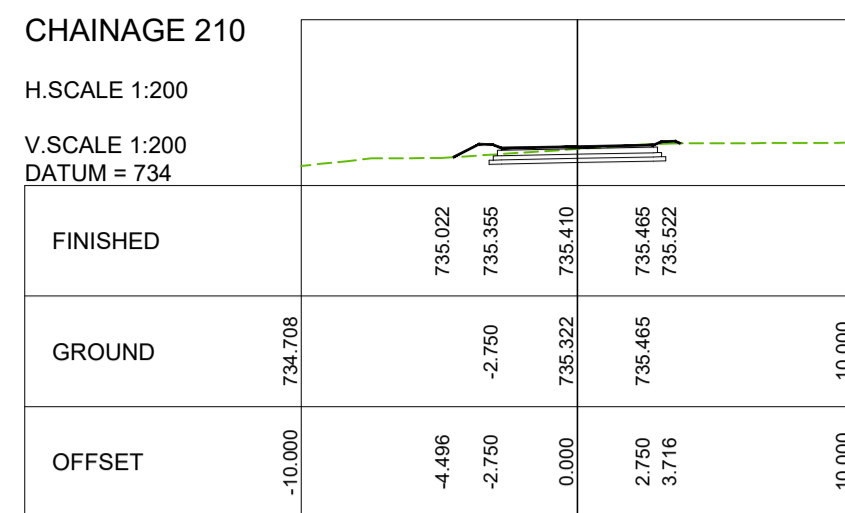
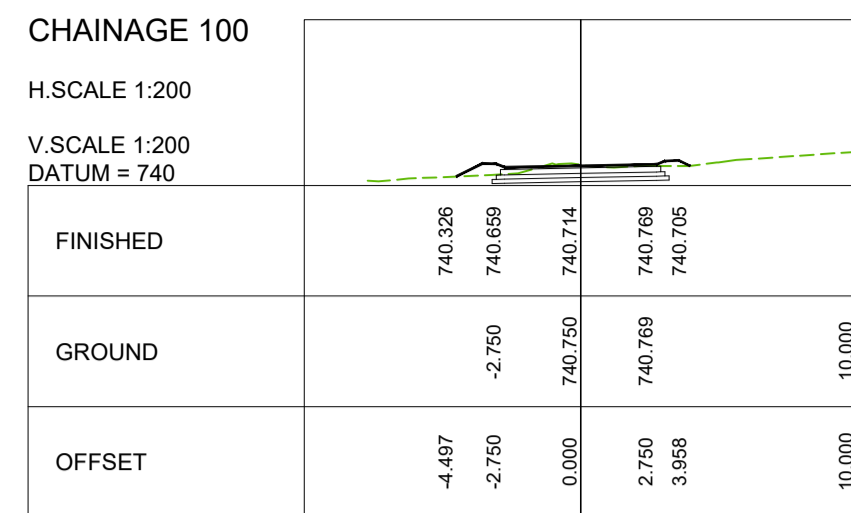
CONSULTANTS
DRAWING NUMBER
SH-1110-20-11-CS

SCALE
AS - SHOWN

REVISION No.
00

SHEET **4** of 5

DATE
JUNE 2023



UNKNOWN STREET 1

UNKNOWN STREET 2

UNKNOWN STREET 3

TENDER

A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		
No	DATE	REVISION	CONSULT	DIR

CLIENT

CITY OF MBOMBELA

P. O. BOX 45
NELSPRUIT
1200

1 NEL STREET
NELSPRUIT
1200

Tel.: (013) 759 9111 Fax.: (013) 759 2070

DESIGNED BY: T. MULAUDZI

DRAWN BY: L.N. MHLANGA

CHECKED BY: R. MAMUREMI
Pr Tech Eng: 2019300534

APPROVED BY: R. MAMUREMI
Pr Tech Eng: 2019300534

CONSULTANT

SHUMA AFRICA (PTY) LTD

UNIT 75 BUILDING 11,
SONPARK SHOPPING CENTRE,
CIVIC MANSION DRIVE AND
PIET RETIEF STREET
NELSPRUIT

P O BOX 1644
NELSPRUIT
1200

Tel.: (013) 752 3658 Fax.: (086) 545 7391

APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 VI

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION

CROSS SECTIONS - UNKNOWN STREET 1, 2 AND 3

DESIGN PLAN (Full signature)

For: MCM

For: Consulting Engineer

CONSULTANTS DRAWING NUMBER

SH-1110-20-12-CS

SCALE

AS - SHOWN

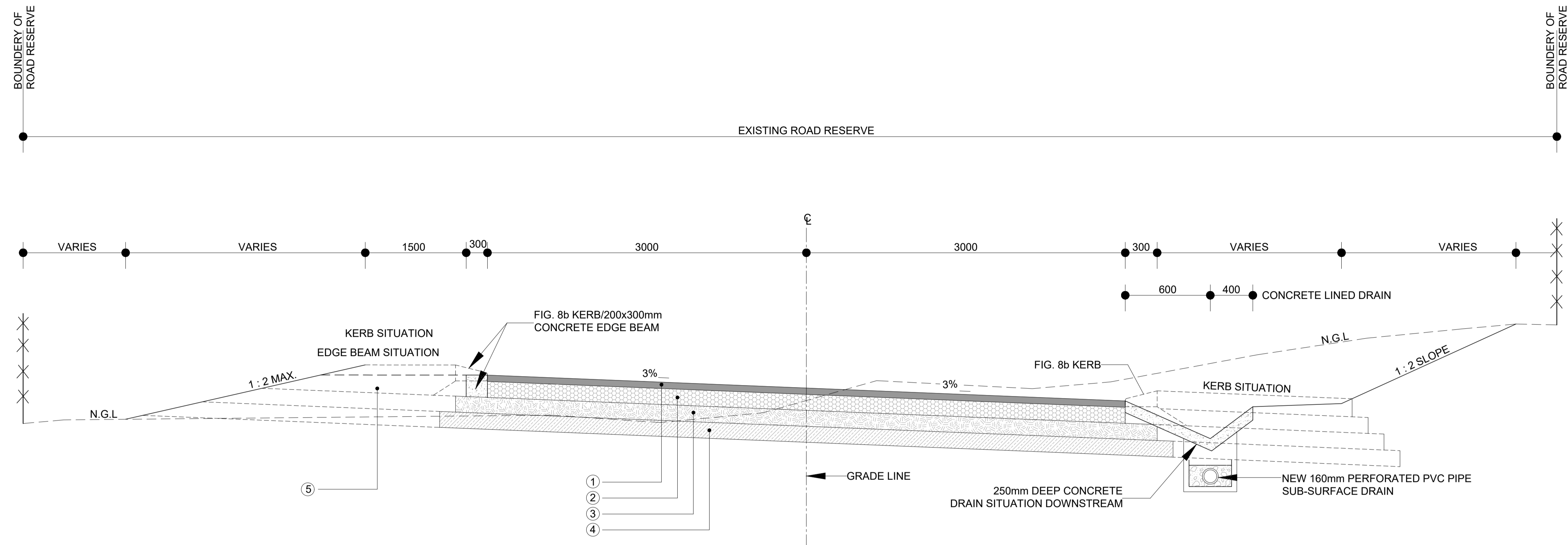
REVISION No.

00

SHEET 5 of 5

DATE

JUNE 2023



**KHEKHE ROADS
TYPICAL CROSS SECTION**
SCALE 1 : 20

PAVEMENT REQUIREMENTS										
No	THICKNESS (mm)	DESCRIPTION	% COMP. AASHTO	MAX. PI	GM MIN.	MIN. CBR AT % MAXIMUM DRY DENSITY	UCS Mpa	MIN. ITS kPa	TRH 4 CLASS	LEGEND
①	80	CONCRETE PAVING BLOCKS (S-A)	-	-	-	-	-	-	S-A	
②	200	STABILISED SUBBASE	97%	6	1.5	-	1.2@97%	200	C4	
③	150	GRAVEL SELECTED	95%	10	1.5	40@95%	-	-	G6	
④	150	SUBGRADE/FILL	93%	-	0,75	10@93%	-	-	G8	
⑤	150	GRAVEL SHOULDER	93%	12	1.2	25@93%	-	-	G6	

PAVEMENT DESIGN FOR THE CONSTRUCTION OF KHEKHE ROADS

- ① 80mm CONCRETE PAVING BLOCKS - CLASS 25, BLOCK TYPE S-A
- ② 200mm STABILISED SUBBASE (C4), 1000 / 1,5 / 6, COMPACTED TO 97% MDD. MAXIMUM DRY DENSITY
- ③ 150mm GRAVEL SELECTED (G6), 40 / 1,5 / 10, COMPACTED TO 95% MDD. MAXIMUM DRY DENSITY
- ④ 150mm SUBGRADE (INSITU) 10 / 0,75 / -, RIPPED & COMPACTED TO 93% MDD. MAXIMUM DRY DENSITY
- ⑤ 150mm GRAVEL SHOULDER (G6), 25 / 1,2 / 12, COMPACTED TO 93% MDD. MAXIMUM DRY DENSITY

LEGEND : LAYER THICKNESS, LAYER DESCRIPTION, UCS OR CBR (MIN.), GRADING MODULUS (MIN.), PI (MAX.), % MDD. MAXIMUM DRY COMPACTION (MIN.).

NOTES:

1. THE TYPICAL CROSS SECTION DOES NOT INDICATE THE WIDENING AT INTERSECTIONS.
2. SHOULDERS SHOULD HAVE A MIN. 1.0m WIDTH SLOPING AWAY FROM ROAD SURFACE AT 3.0% GRADIENT.
3. ALL SIDEWALK FILL AND SIDE FILL TO BE COMPACTED TO MINIMUM OF 93% MOD. AASHTO DENSITY.
4. ALL MATERIAL AND CONSTRUCTION TO CONFORM TO THE REQUIREMENTS OF COLTO AND SABS 1200.
5. ALL SERVICES SHOULD HAVE A MINIMUM COVER OF 600mm.
6. KERBS, CONCRETE LINED DRAINS, AND EDGE BEAMS WILL ALTERNATE DEPENDING ON THE GROUND LEVEL SITUATION.
7. THE FINAL POSITIONS OF CONCRETE LINED DRAINS AND EDGE BEAMS WILL BE VERIFIED BY THE ENGINEER ON SITE AND ALTERED IF NECESSARY
8. SUB-SOIL DRAINS MUST BE PLACED WHERE NECESSARY TO CONTROL HIGH WATERTABLES.
9. THE FINAL POSITIONS OF SUBSURFACE DRAINS WILL BE VERIFIED BY THE ENGINEER ON SITE AND ALTERED IF NECESSARY

SUB-SOIL DRAINS NOTES:

1. IMPERMEABLE BACKFILL MATERIAL, (MIN 150mm THICK) TAKEN TO TOP OF WATER BEARING LAYER, OR CONCRETE LINING
2. FILTER STONE : GRADED CRUSHED STONE (COARSE GRADE) 19mm;
3. PIPE: PERFORATED SUBSURFACE PIPES (NEXTUBE DN160 OR SIMILAR APPROVED)
4. GEOFABRIC: SYNTHETIC FIBRE FILTER FABRIC GRADE 2, CLASS A (BIDIM A4 OR APPROVED EQUIVALENT)
5. WHERE THE SUBSURFACE DRAINS ARE PLACED IN SOLID ROCK THE POLYETHYLENE LINING IS UNNECESSARY
6. THE FINAL POSITIONS OF SUBSURFACE DRAINS WILL BE VERIFIED BY THE ENGINEER ON SITE AND ALTERED IF NECESSARY
7. SEE DRG -SH-1110-31-03-TD FOR SUB-SURFACE DRAINS DETAILS.

TENDER

No	DATE	REVISION	CONSULT	DIR
A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		

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APPROVED BY R. MAMUREMI
Pr Tech Eng: 2019300534

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APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 VI

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION

PAVEMENT DESIGN

DESIGN PLAN
(Full signature)

For: M.M.

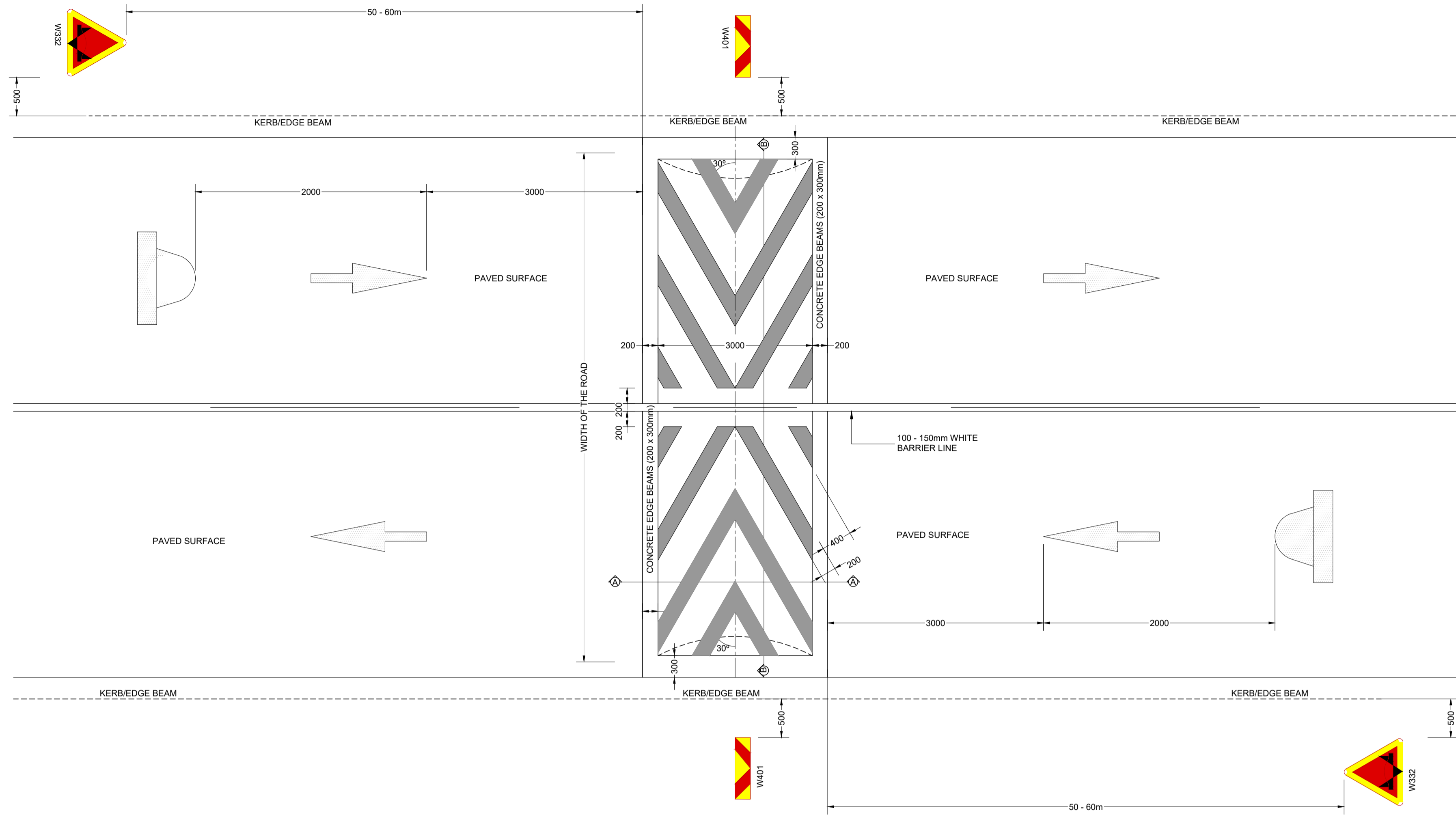
CONSULTANTS
DRAWING NUMBER
SH-1110-21-00-TD

SCALE
AS - SHOWN

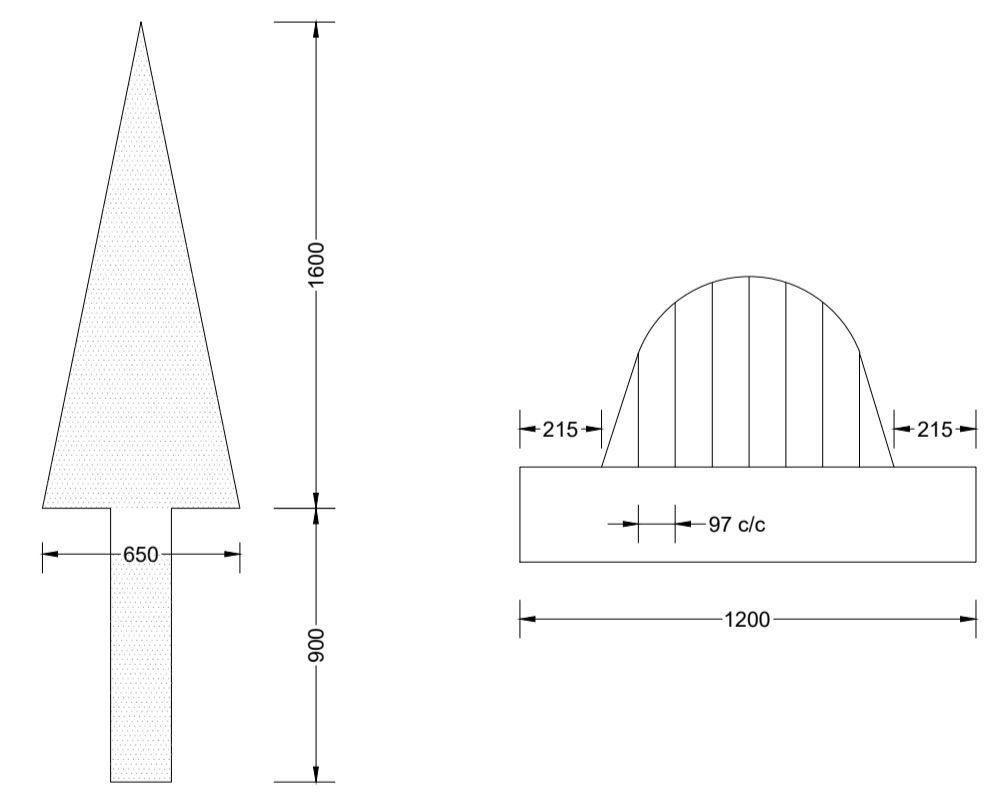
REVISION No.
00

SHEET 1 of 1

DATE
JUNE 2023

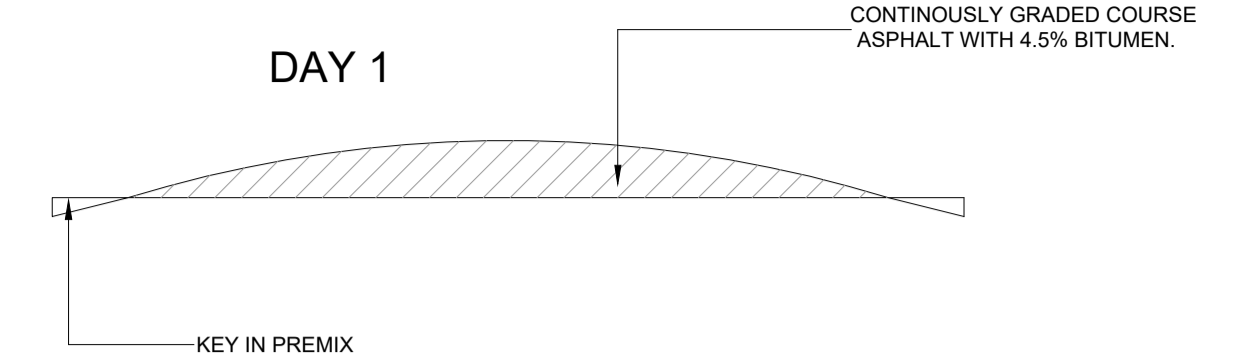


SPEED HUMP DETAILS
N.T.S

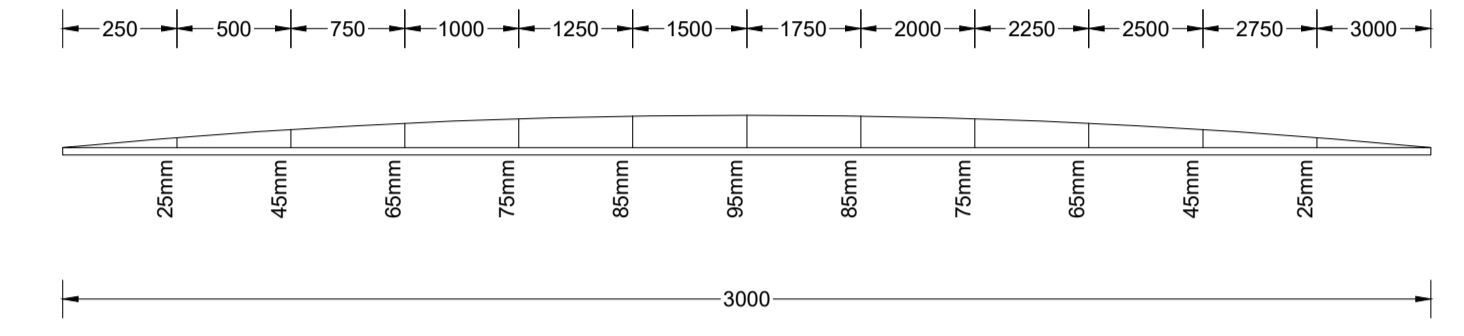


DETAIL OF SPEED HUMP ROAD MARKING
SCALE 1 : 20

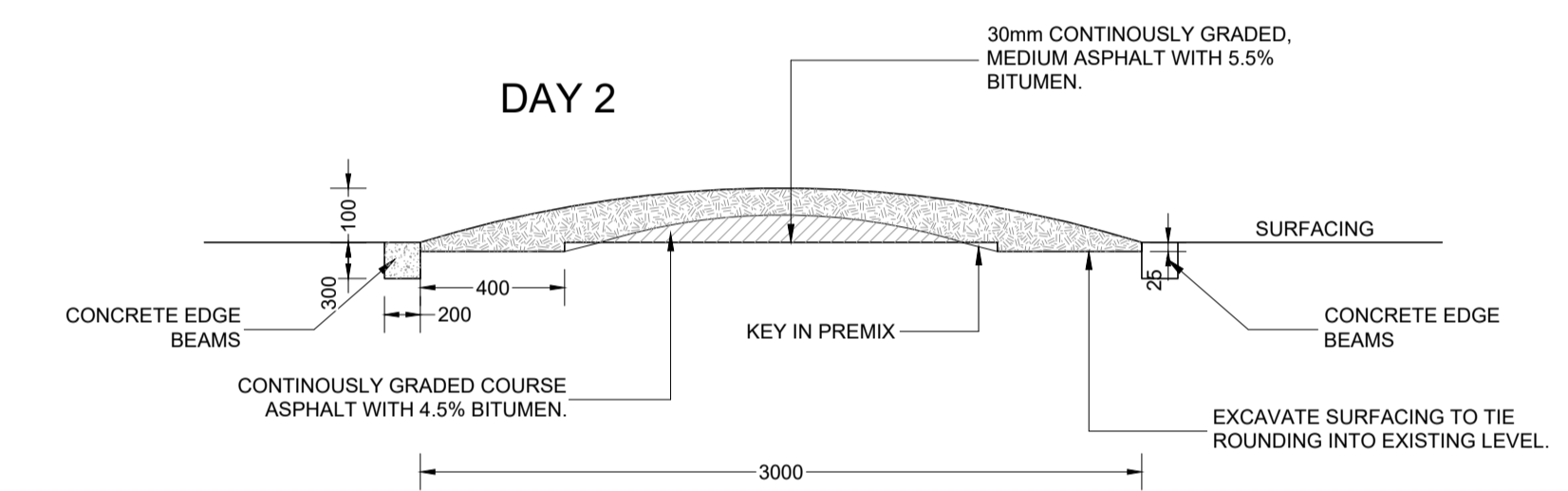
- NOTES:**
1. CONCRETE EDGE BEAMS - CLASS 25/19 (200 x 300mm).
 2. SHOULD THE ASPHALT COOL-OFF BEFORE SECOND LAYER IS PLACED. A SECOND LAYER OF TACK COAT SHOULD BE APPLIED.
 3. PRIME COAT - 60/70 PEN BITUMEN.
 4. TACK COAT - 30% CAT. EMULSION
 5. ALL SIGNAGE TO BE IN ACCORDANCE WITH THE ROAD TRAFFIC SIGNS MANUAL.



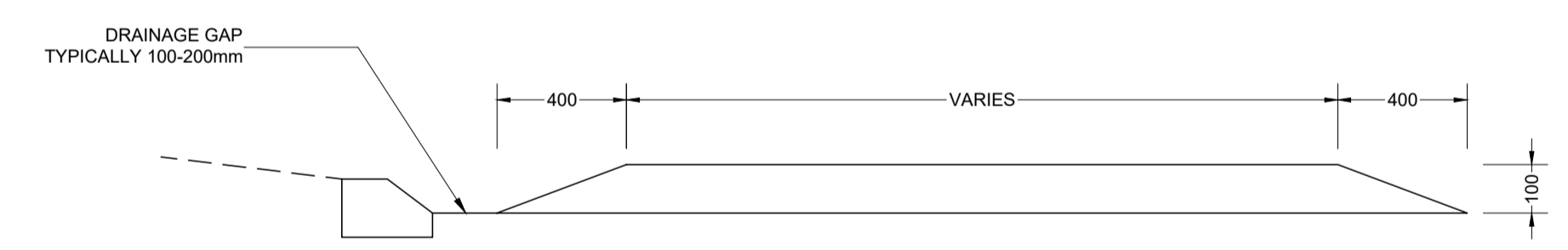
CONSTRUCTION DETAIL OF SPEED HUMP
SCALE 1 : 10



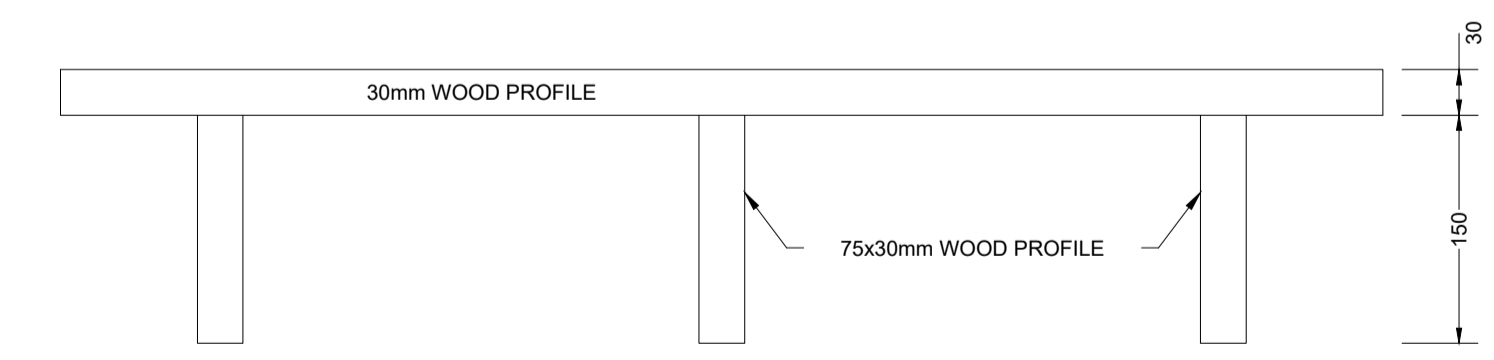
SIDE ELEVATION
SCALE 1 : 10



SECTION A - A
SCALE 1 : 20



**SECTION B - B
DETAIL OF SPEED HUMP**
SCALE 1 : 20



**PLAN
TEMPLATE DETAIL FOR CONSTRUCTION OF SPEED HUMP**
SCALE 1 : 20

A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		
No	DATE	REVISION	CONSULT	DIR

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APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 V1

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION

INTERSECTION TYPE AND SPEED HUMP DETAIL

DESIGN PLAN
(Full signature)

For MEM

For Consulting Engineer

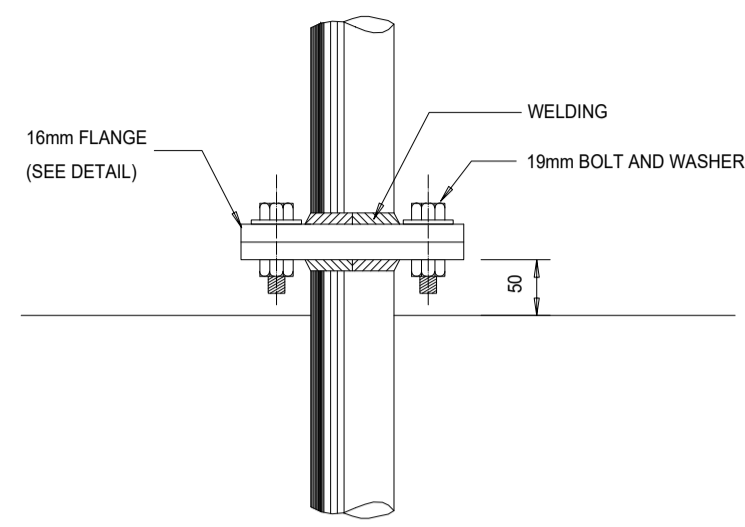
CONSULTANTS
DRAWING NUMBER
SH-1110-21-01-TD

SCALE
AS - SHOWN

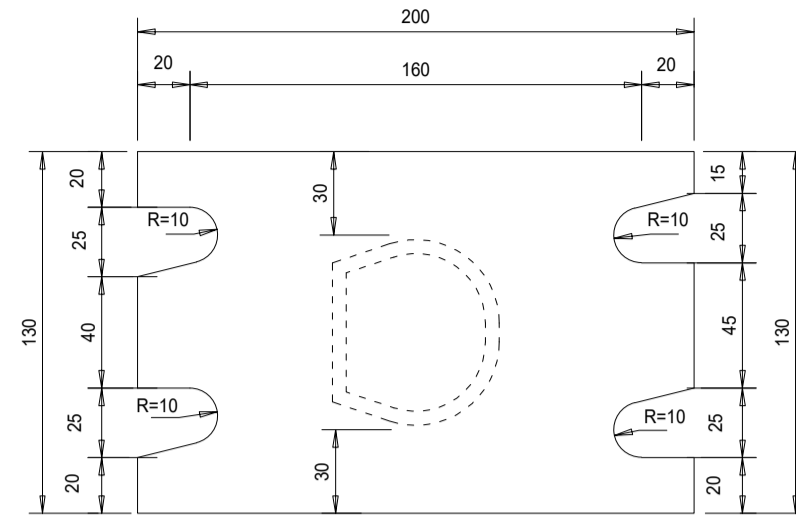
REVISION No.
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SHEET 1 of 1

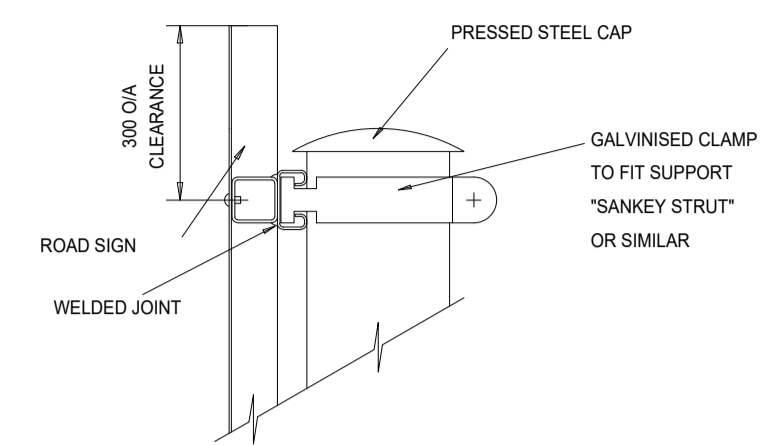
DATE
JUNE 2023



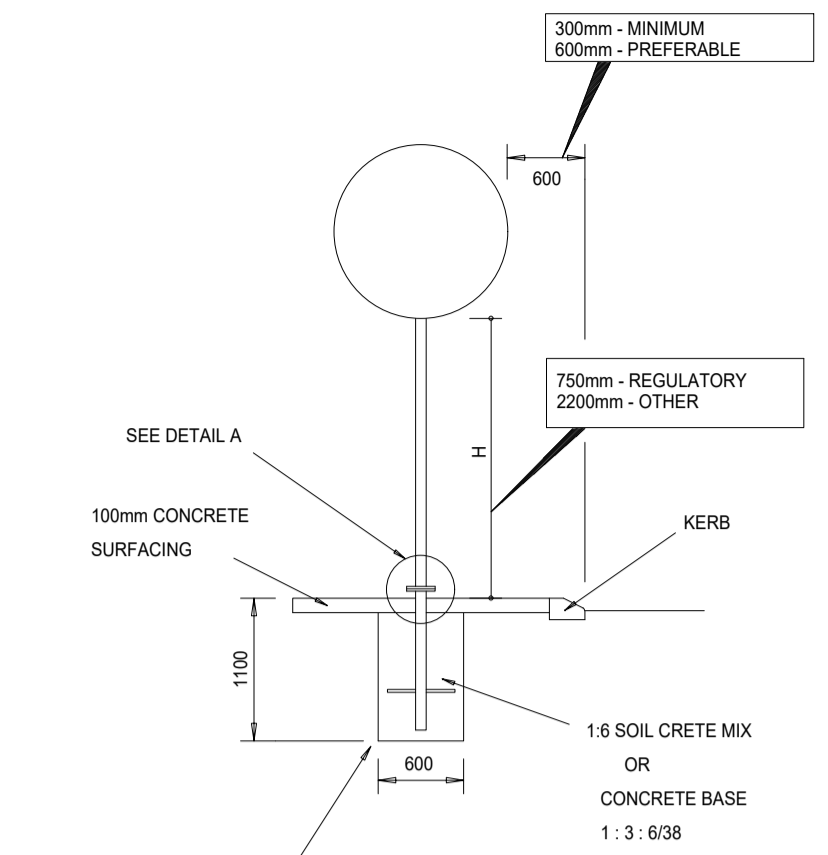
SIDE
SCALE 1:5



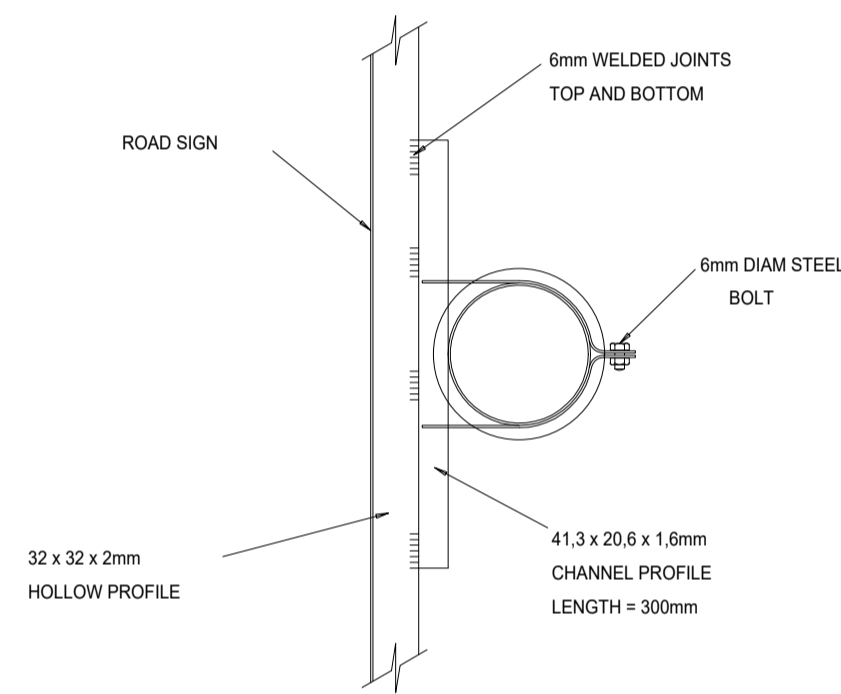
DETAIL OF FLANGE
SCALE 1:2



DETAIL C
SCALE 1:2

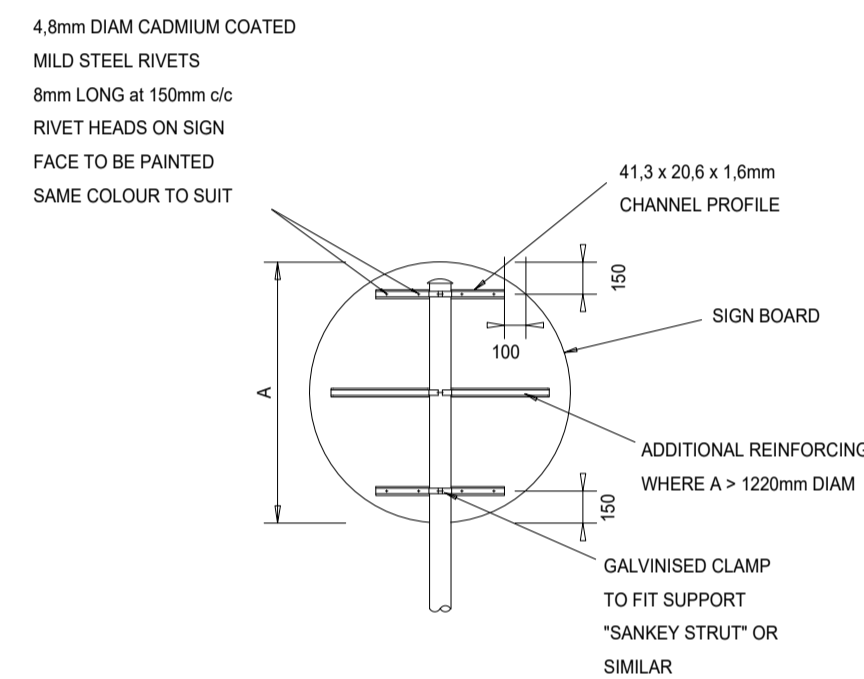


DETAIL A
SCALE 1:30

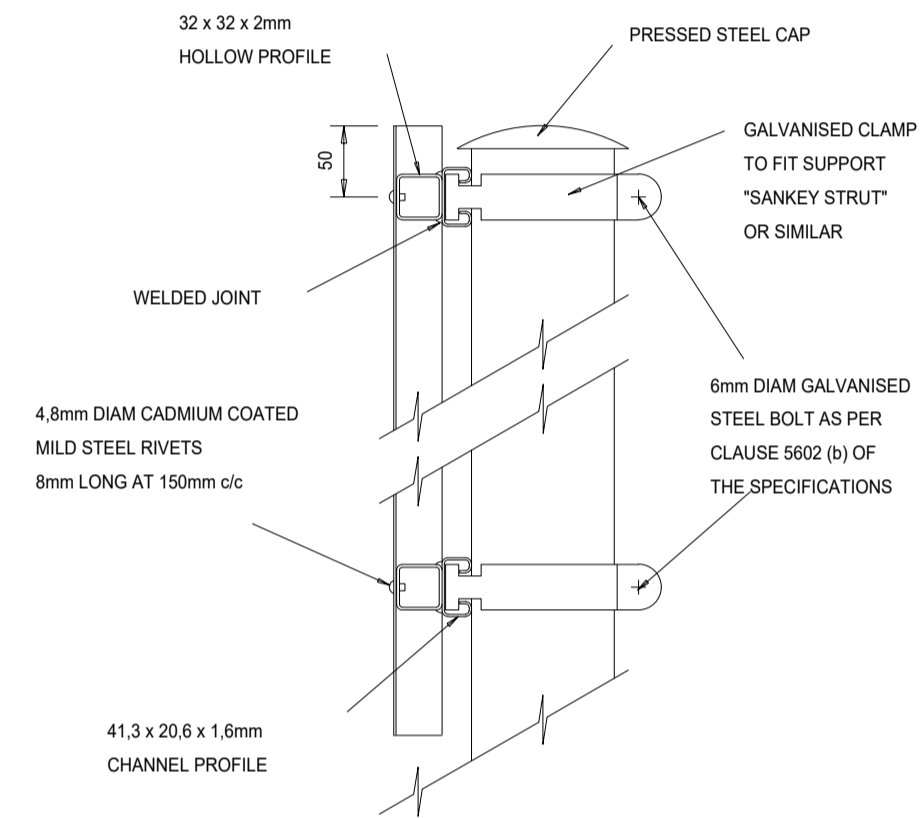


PLAN
SCALE 1:3

A	NUMBER REINFORCEMENTS	B	C
914	2	514	200
1220	3	460	150

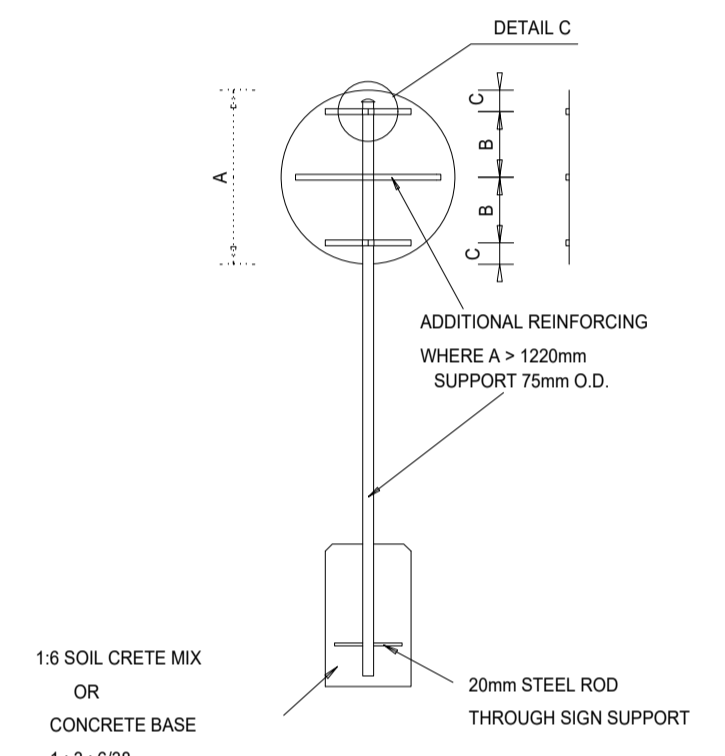


BACK ELEVATION
SCALE 1:4

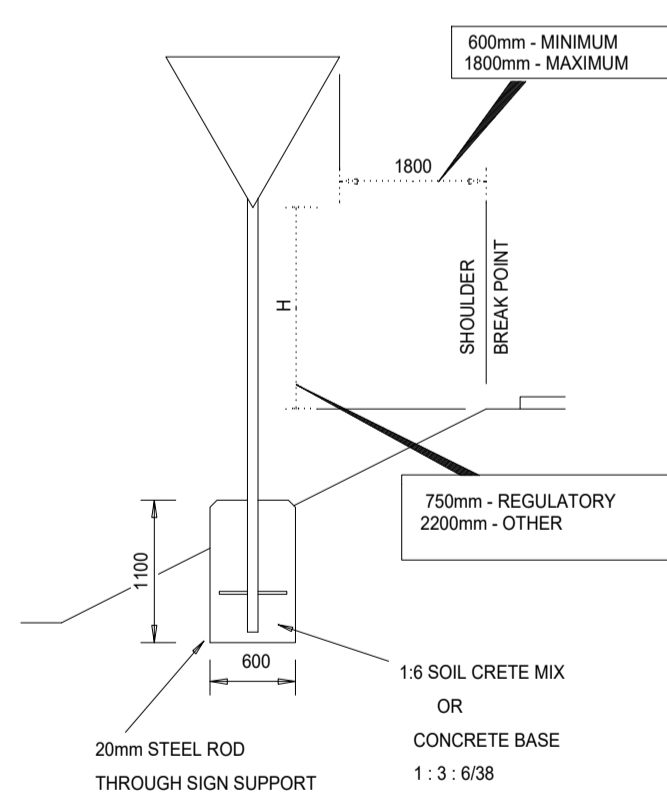


SIDE ELEVATION
SCALE 1:3

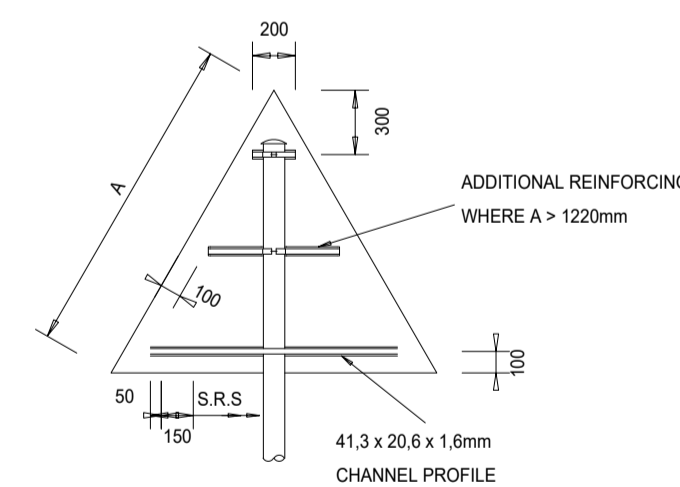
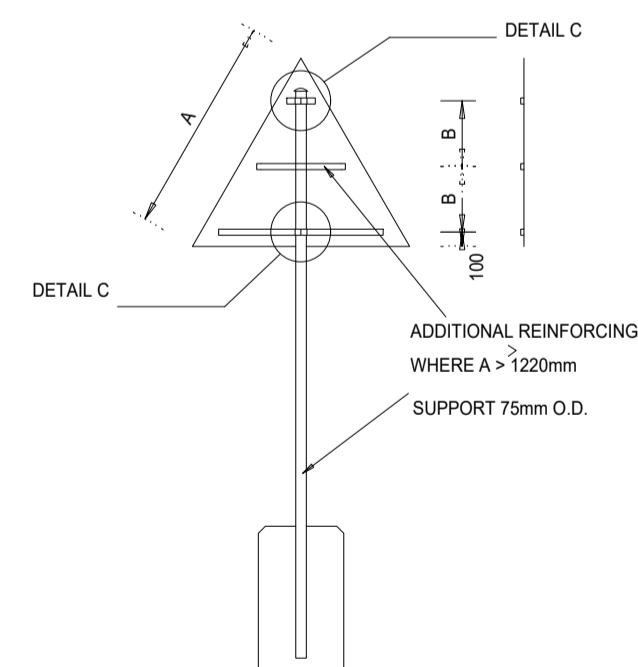
DETAIL B: MOUNTING OF INFORMATORY SIGNS G39 TO G44



REINFORCING OF REGULATORY SIGNS
SCALE 1:30

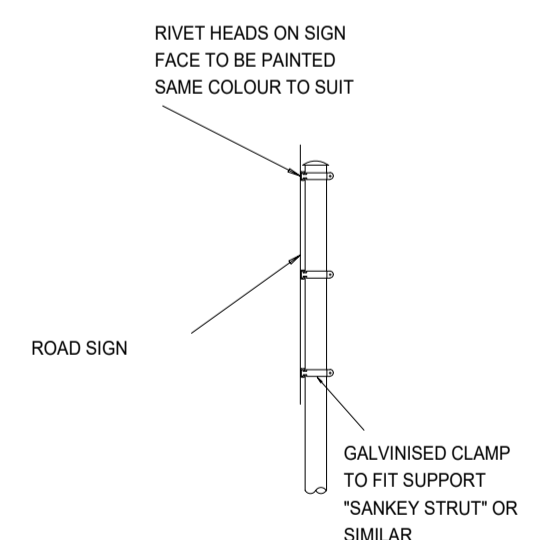


REINFORCING FOR WARNING SIGNS
SCALE 1:30



BACK ELEVATION
SCALE 1:4

A	NUMBER REINFORCEMENTS	B
914	2	572
1220	3	420
1524	3	550



SIDE ELEVATION
SCALE 1:4

TENDER

No	DATE	REVISION	CONSULT	DIR
A	MARCH 23	CONCEPT & VIABILITY		
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00	JUNE 23	TENDER		

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APPROVED

MBOMBELA _____ DATE _____

CONSULTING ENGINEER _____ DATE _____

CONTRACT NUMBER : BID 213/2020 VI

PROJECT
UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION
ROAD SIGNS ERECTION

DESIGN PLAN
(Full signature)

For: M.M.

For: Consulting Engineer

CONSULTANTS
DRAWING NUMBER
SH-1110-21-03-TD

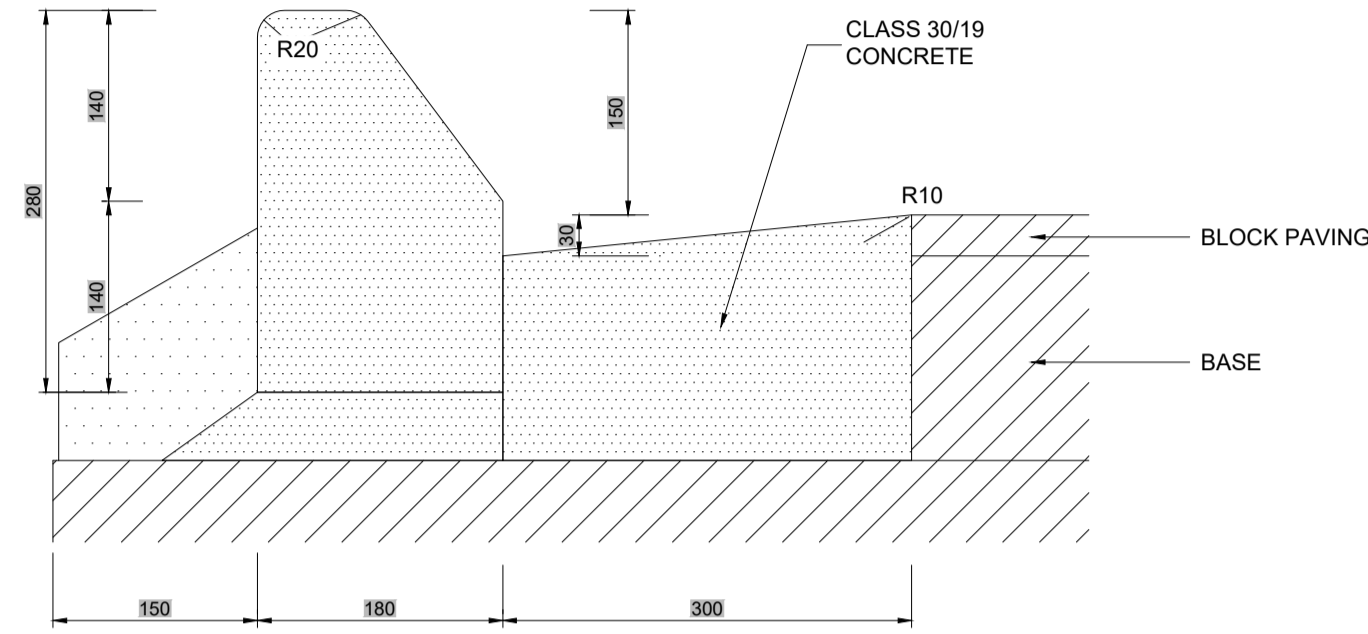
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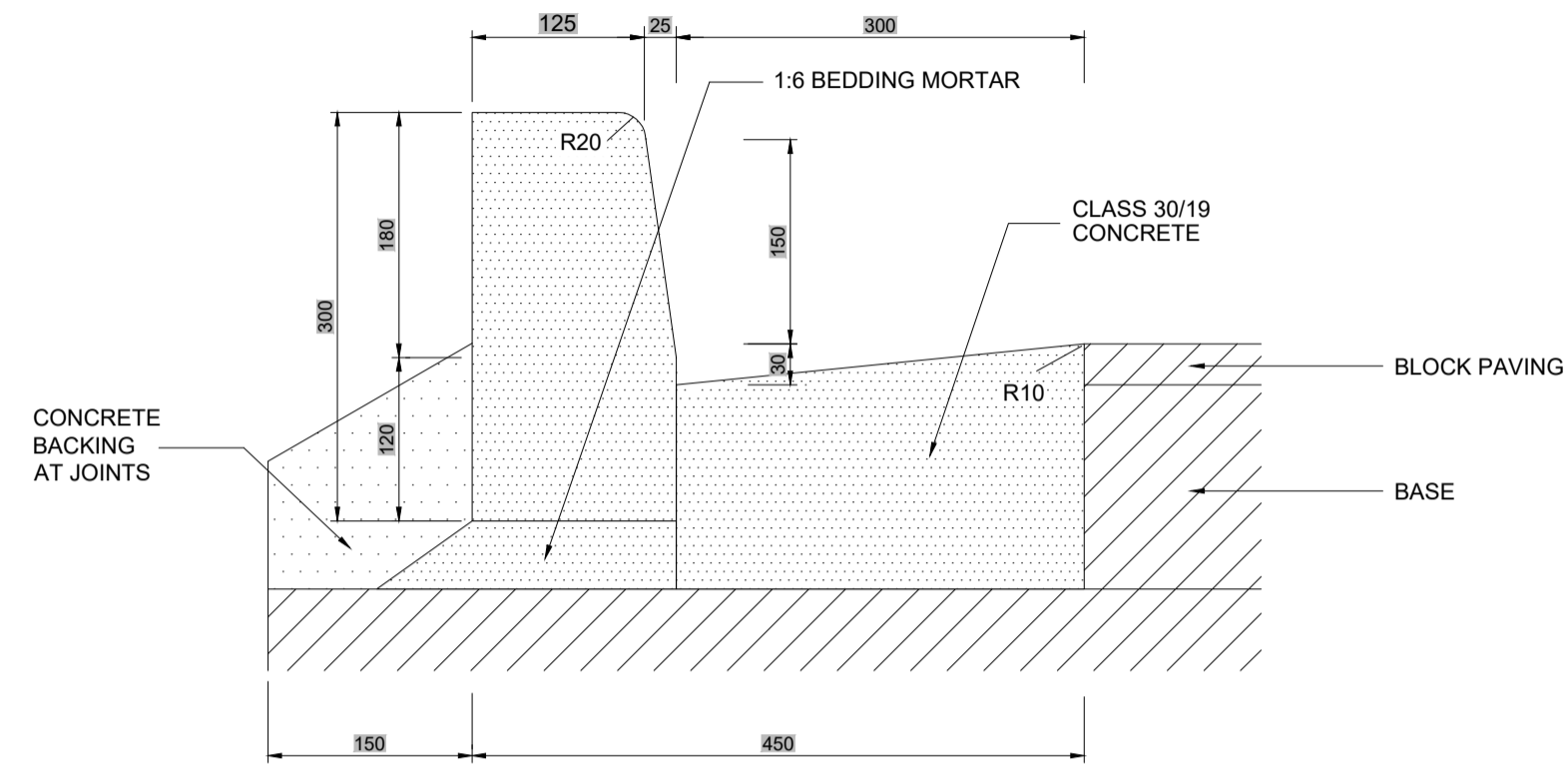
SHEET 2 of 2

DATE
MAY 2023

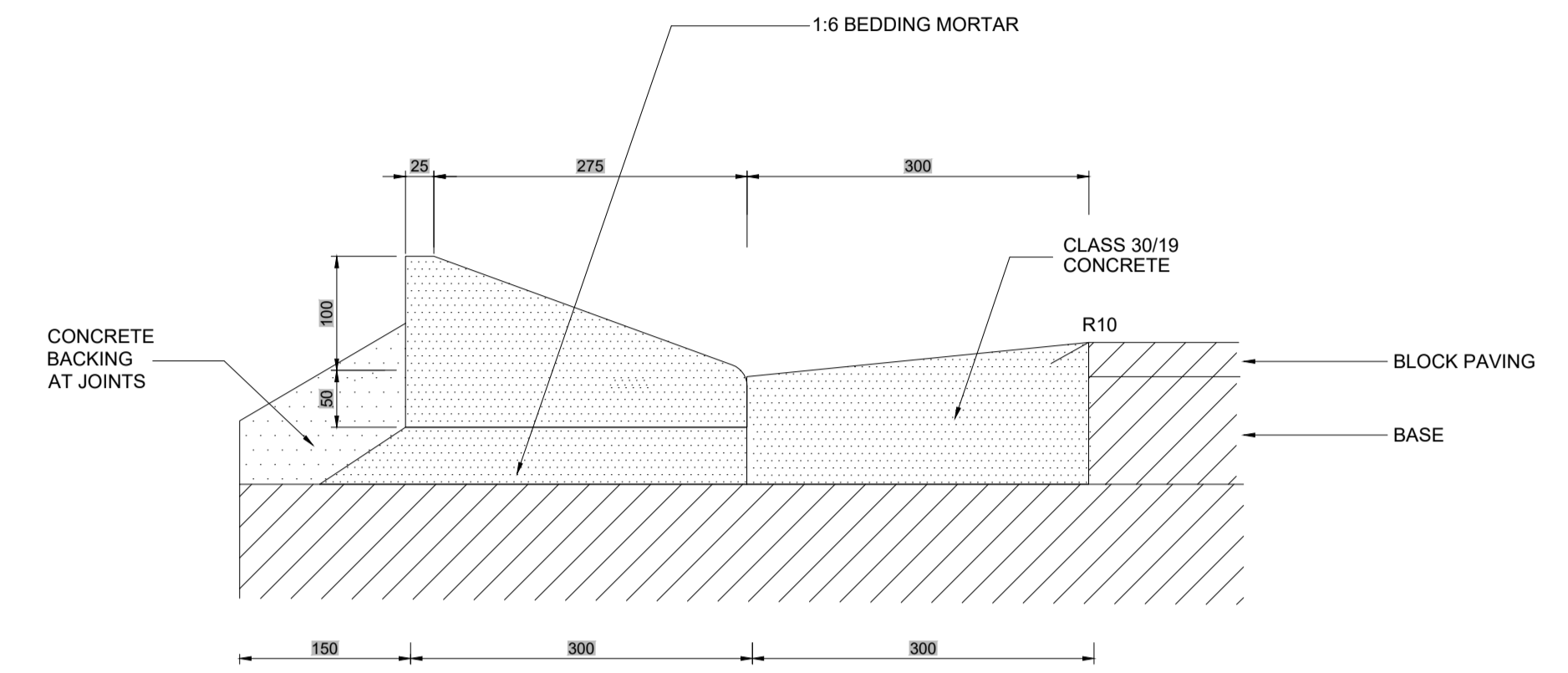
NOTE
 EXPANSION JOINTS OF 12mm WIDTH AT 20m INTERVALS AS PER CLAUSE 5.7 OF SANS 1200 M/C. MASS CONCRETE BACKING AT ALL JOINTS.



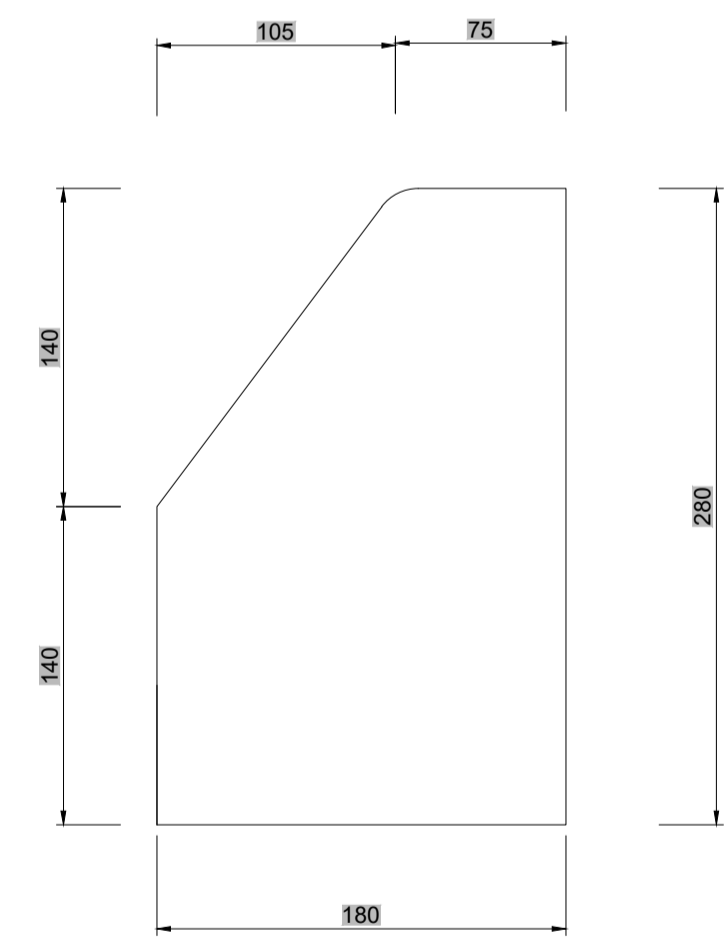
280mm HIGH SEMI-BARRIER KERB (FIG 7)



300mm HIGH BARRIER KERB (FIG 3)

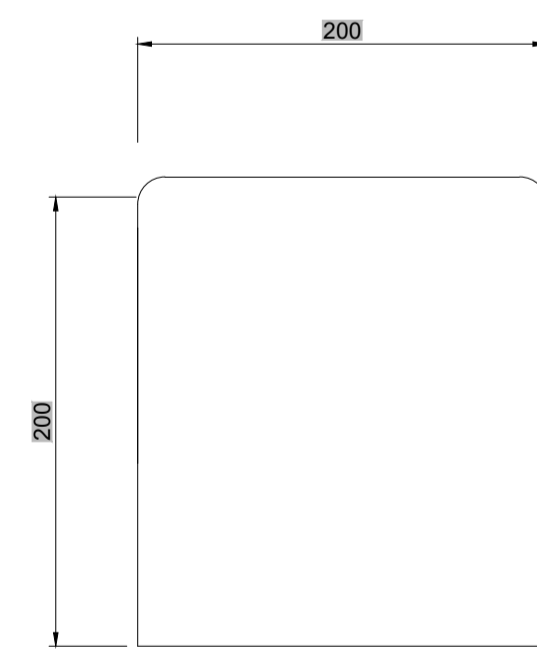


150mm HIGH MOUNTABLE KERB (FIG 8)



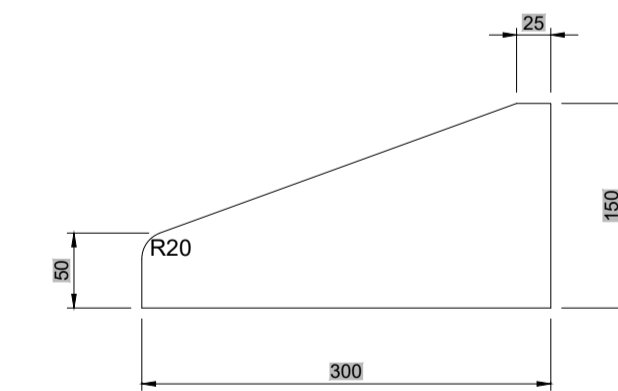
PRECAST BARRIER KERB (FIG 7)

N.T.S



CAST IN-SITU EDGE BEAM

N.T.S



MOUNTABLE KERB (FIG 8)

N.T.S

TENDER

No	DATE	REVISION	CONSULT	DIR
A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		

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 Pr Tech Eng: 2019300534
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 MBOMBELA
 CONSULTING ENGINEER
 DATE

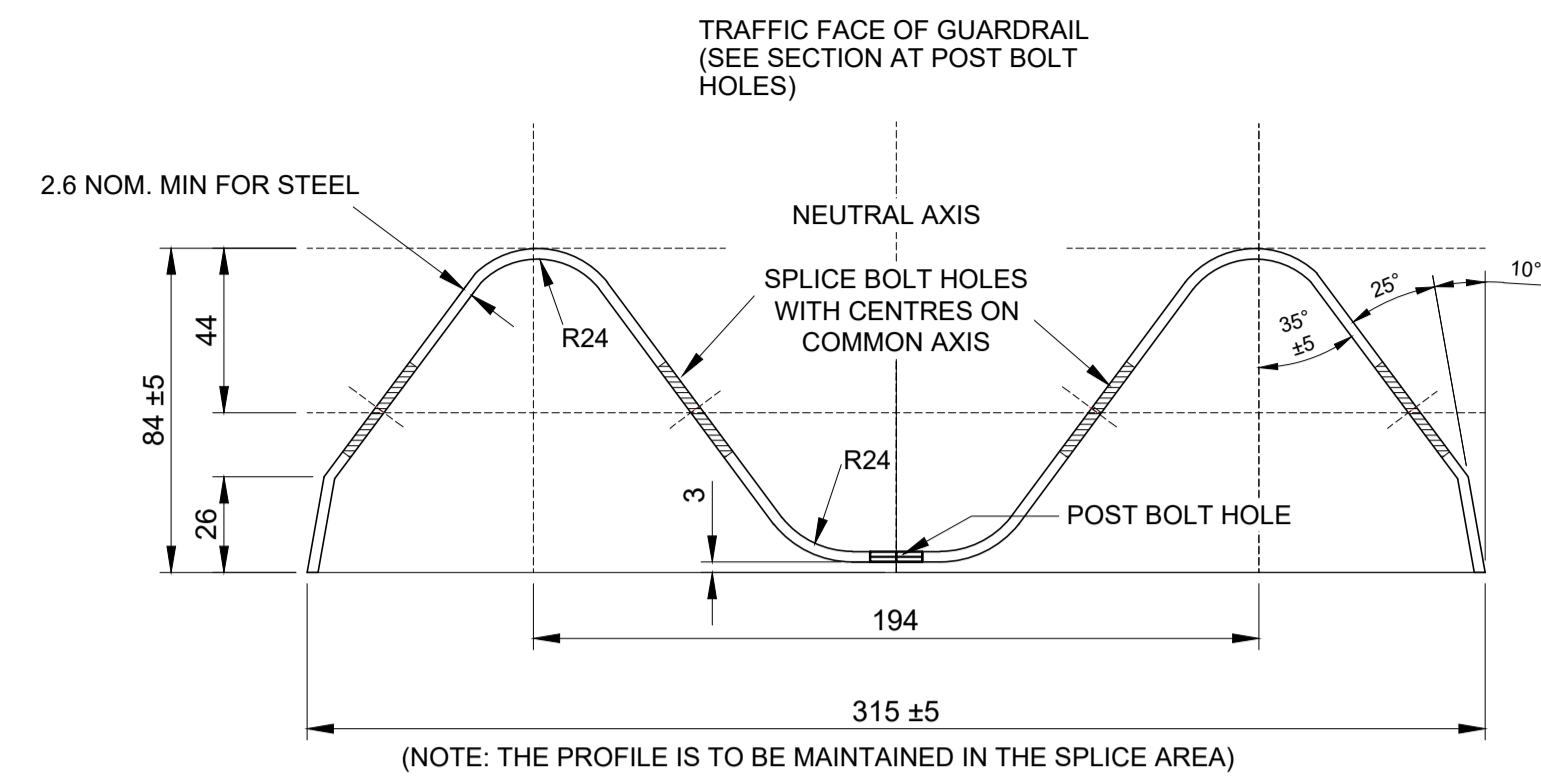
CONTRACT NUMBER : BID 213/2020 V1
 PROJECT
 UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)
 DESCRIPTION
 TYPICAL DETAILS : KERBS

DESIGN PLAN
 (Full signature)
 For MEM
 For Consulting Engineer
 CONSULTANTS
 DRAWING NUMBER
 SH-1110-21-04-TD

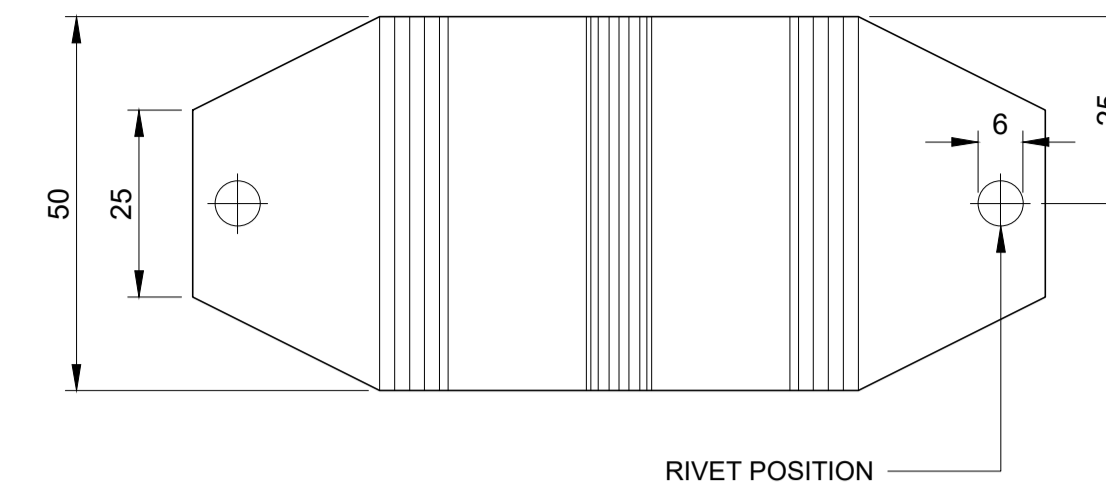
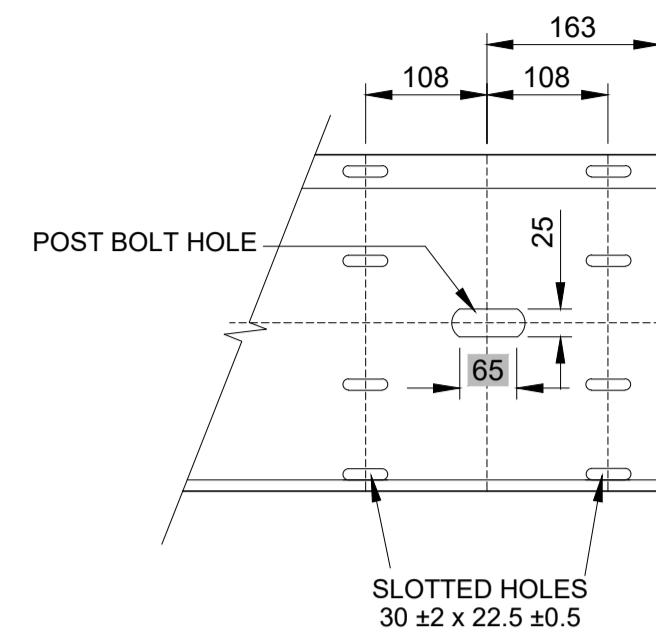
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REVISION No.
 00
SHEET 1 of 1
DATE
 JUNE 2023

NOTES

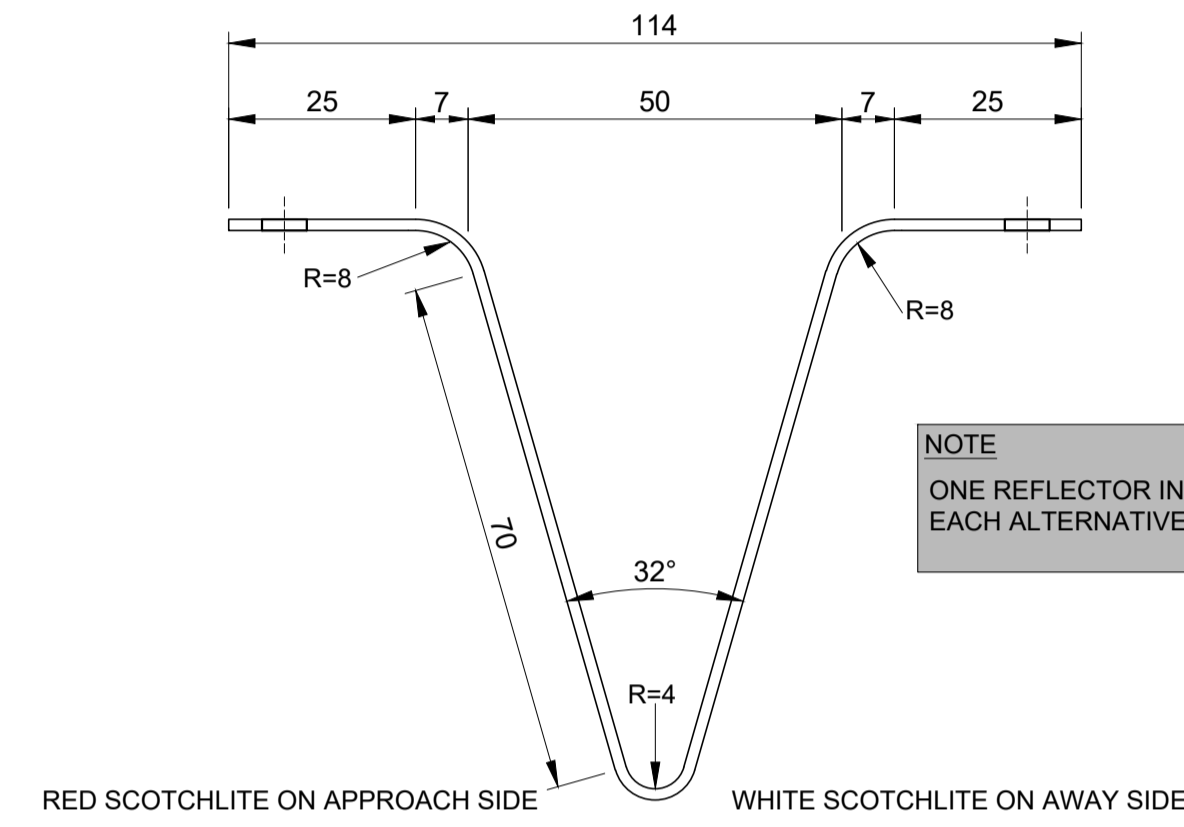
- GUARDRAILS ARE REQUIRED IN THE FOLLOWING CASES:
 - WHERE THE FILL IS MORE THAN 4m WITH NO RECOVERY AREA.
 - WHERE WATER NEXT TO THE ROAD FORMATION IS DEEPER THAN 1.5m.
 - AT ALL BRIDGES.
 - ON THE OUTSIDE OF CURVES WITH RADII LESS THAN 300m WITHOUT RECOVERY AREAS.
 - WHERE OBSTRUCTIONS ARE LESS THAN 1m FROM THE SHOULDER BREAKPOINT.
 - WHERE AN OBSTRUCTION APPEARS TO BE MORE DANGEROUS THAN WHAT A GUARDRAIL WOULD BE.
- BEFORE GUARDRAILS ARE ERECTED APPROVAL MUST BE OBTAINED FROM THE GENERAL MANAGER: ROADS AND STORMWATER.
- SPECIFICATIONS:
 - BOLT : HIGH TENSILE STEEL 16mm
 - WASHER : STEEL SPRING 10mm THICK.
 - SPACERBLOCK : GUM OR PINE. TREATED WITH CREOSOTE ACCORDING TO ANY METHOD IN SANS 10005.
 - POLE : 150mm TO 230mm GUM OR PINE TREATED WITH CREOSOTE ACCORDING TO ANY METHOD IN SANS 10005.
 - ALL GUARDRAILS SHALL BE GALVANIZED AS SPECIFIED (NOT PAINTED).
- ALSO REFER TO SECTION 611 OF THE STANDARD SPECIFICATION FOR MUNICIPAL CIVIL ENGINEERING WORKS, 3rd EDITION, 2005.



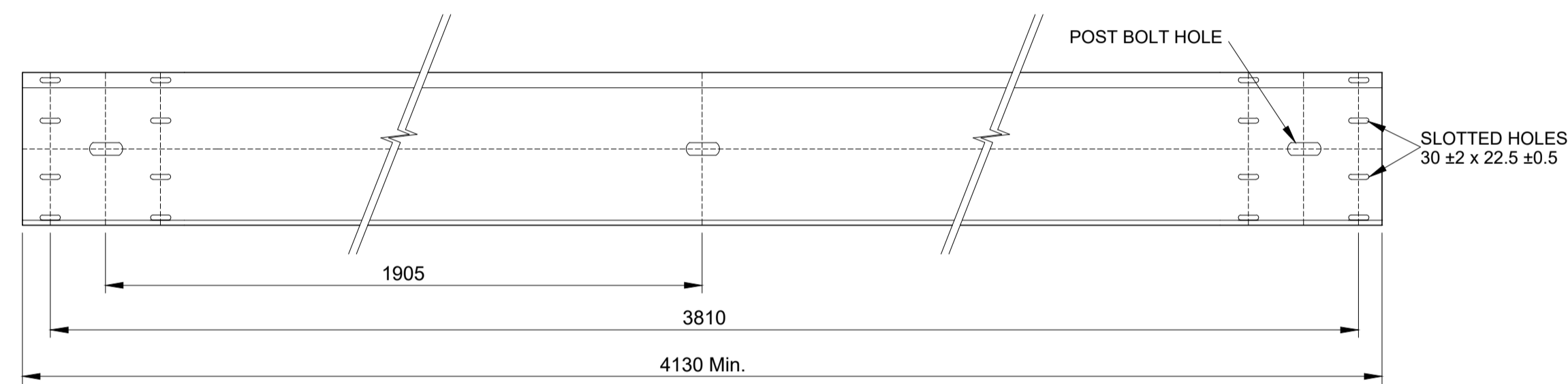
CROSS-SECTION OF GUARDRAIL
SCALE 1:2



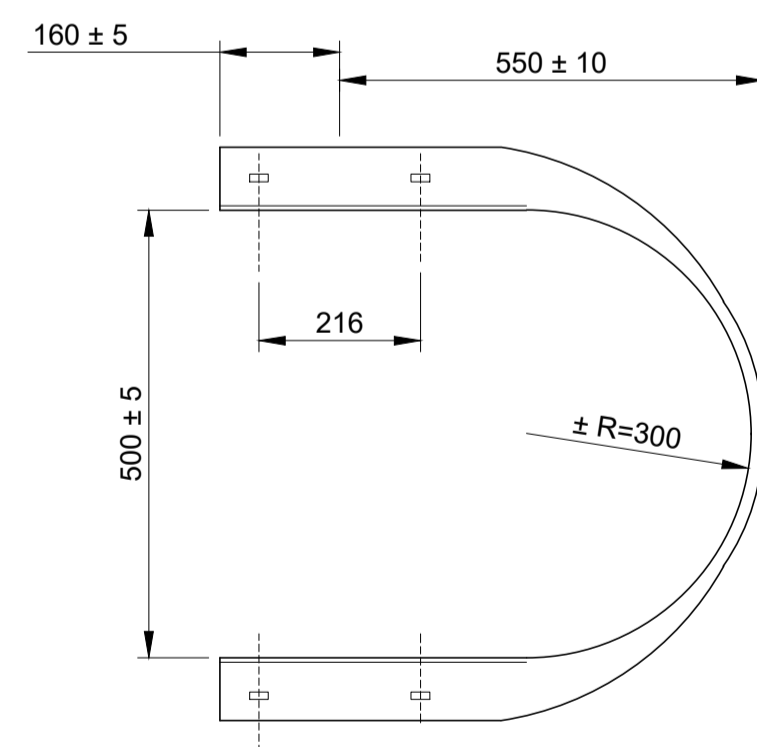
FRONT ELEVATION
SCALE 1:25



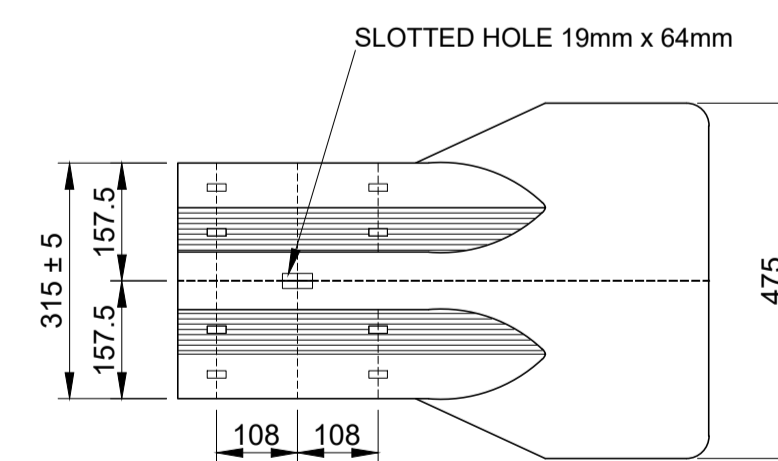
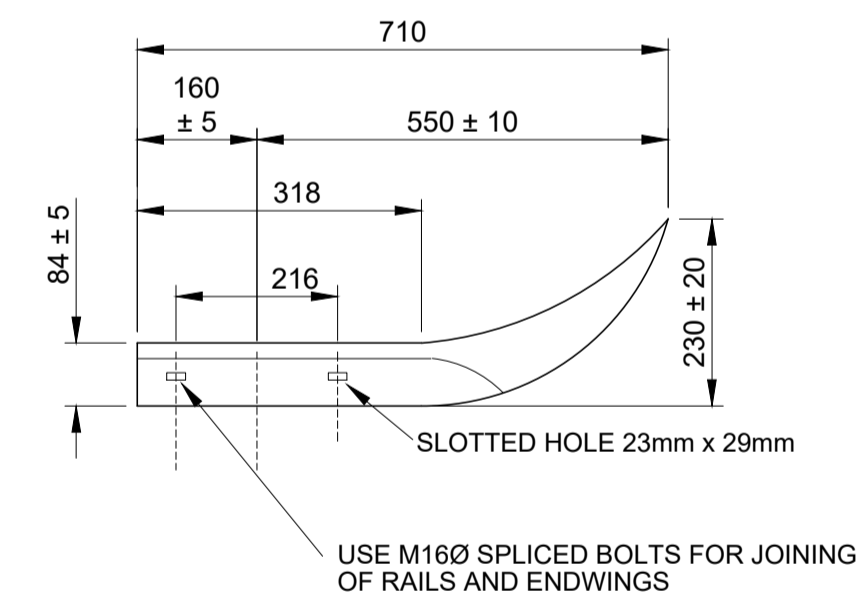
SECTIONAL PLAN : DETAIL OF REFLECTOR PLATE
SCALE 1:1



GUARDRAIL
SCALE 1:10



BULLNOSE ENDWING - PLAN
SCALE 1:10



STANDARD TYPICAL FLARED ENDWING
SCALE 1:10

TENDER

No	DATE	REVISION	CONSULT	DIR
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00	JUNE 23	TENDER		

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APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 V1

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION

**GUARDRAILS: CROSS SECTION,
REFLECTOR PLATES AND ENDWINGS**

DESIGN PLAN
(Full signature)

For MLM

For Consulting Engineer

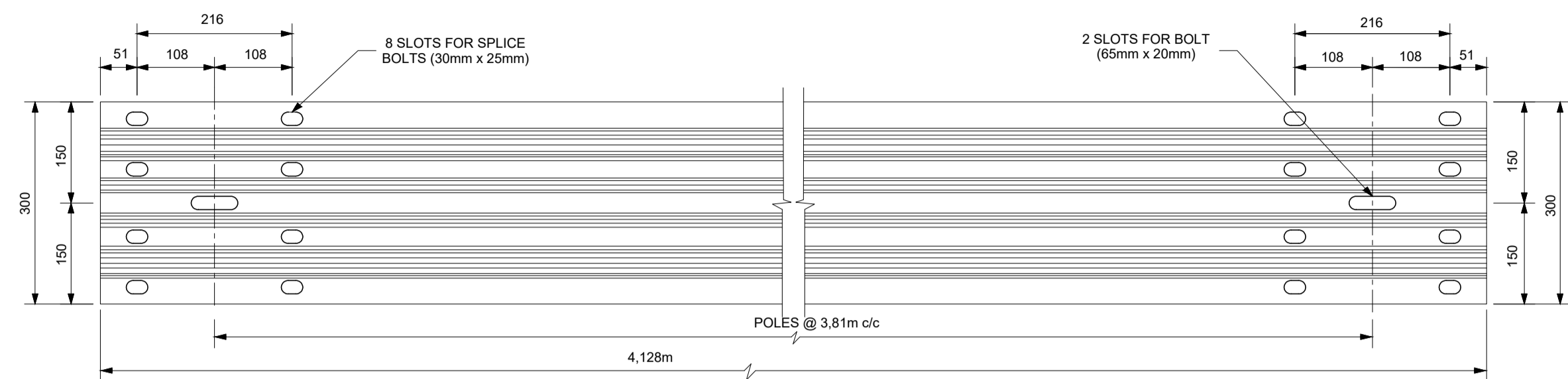
CONSULTANTS
DRAWING NUMBER
SH-1110-21-06-TD

SCALE
AS - SHOWN

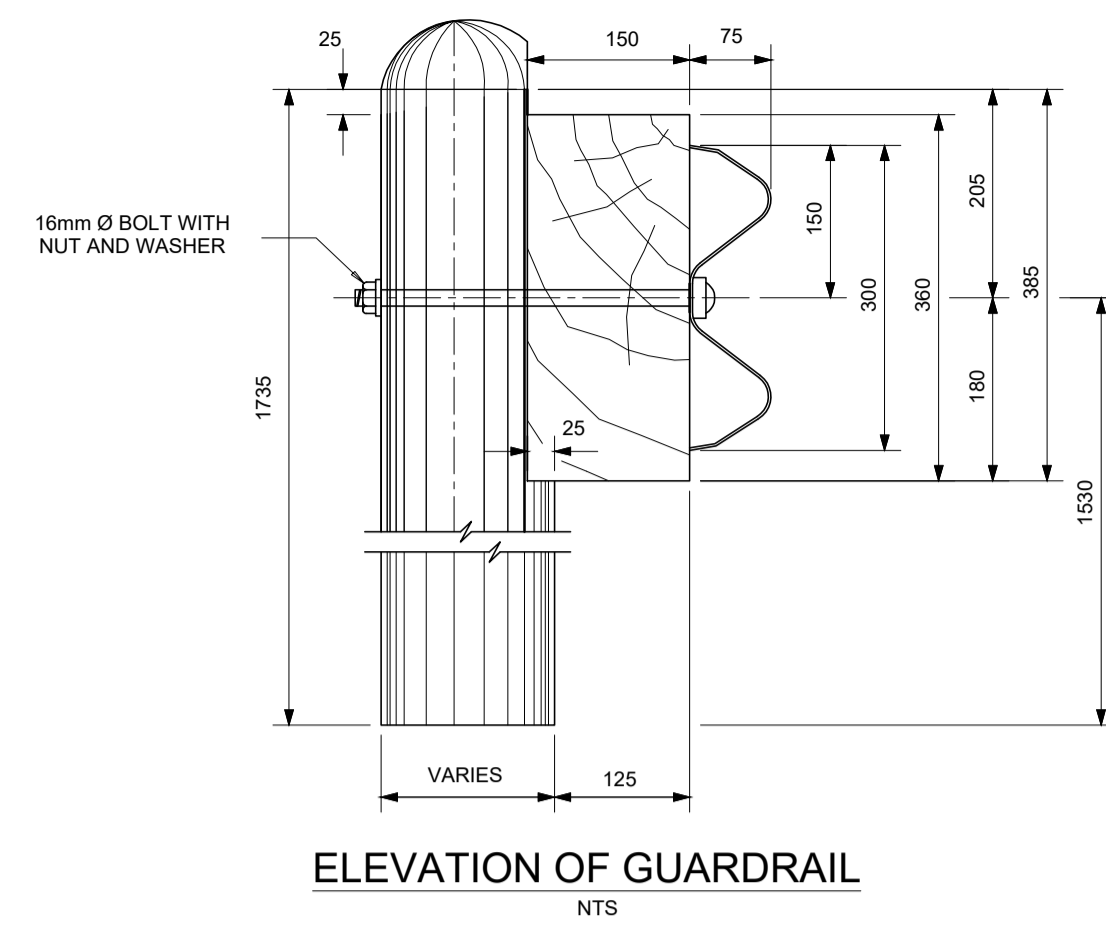
REVISION No.
00

SHEET 1 of 1

DATE
JUNE 2023

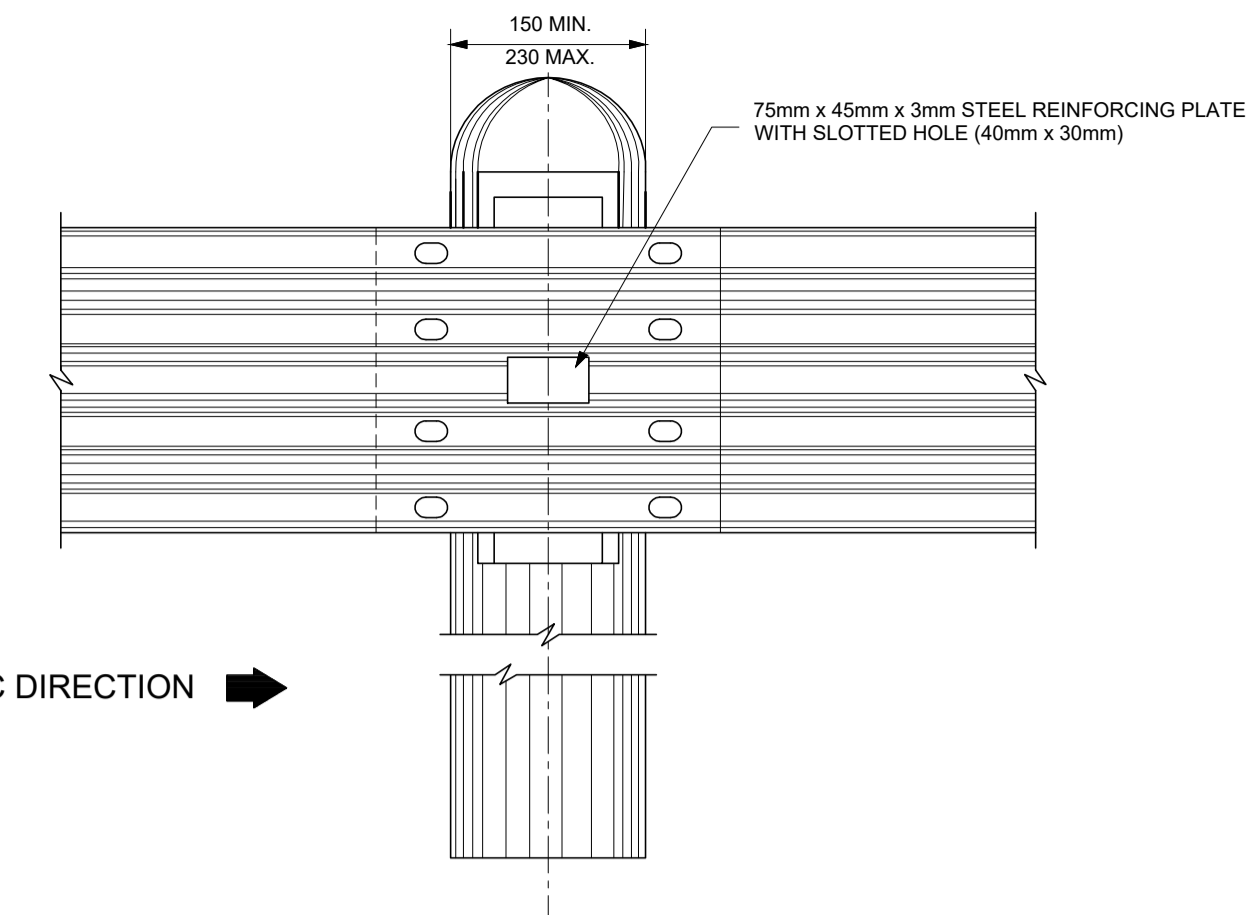


TYPICAL GUARDRAIL SECTION
NTS



ELEVATION OF GUARDRAIL
NTS

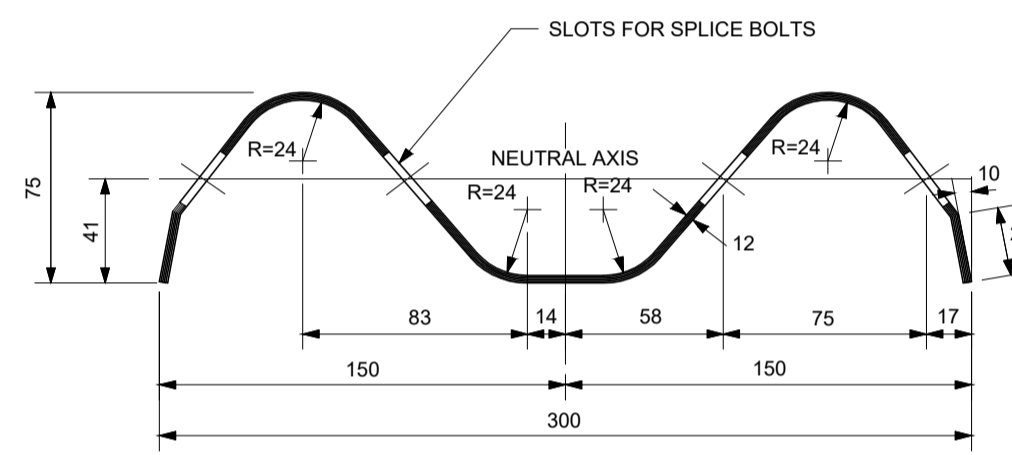
NOTE:
1. GUARDRAILS WILL ONLY BE PLACED WHERE REQUIRED BY THE ENGINEER.
2. ALL GUARDRAILS MUST BE GALVANIZED AS SPECIFIED (NOT PAINTED).



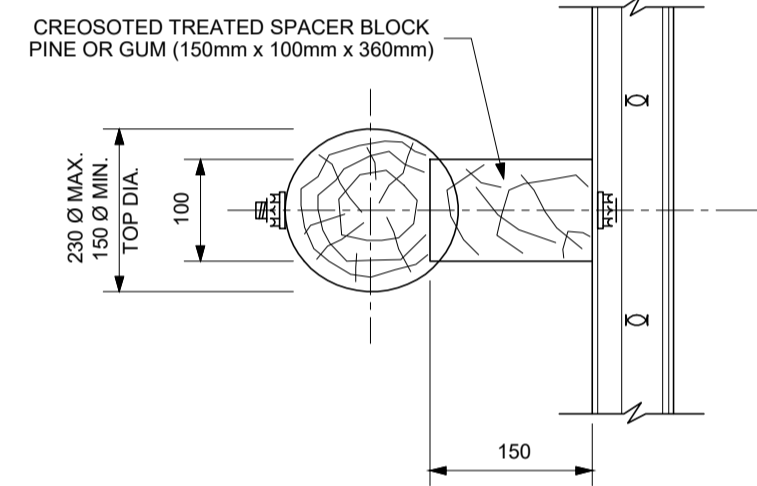
DETAIL A: FRONT ELEVATION
NORMAL SPACING OF POSTS
NTS

SPECIFICATIONS

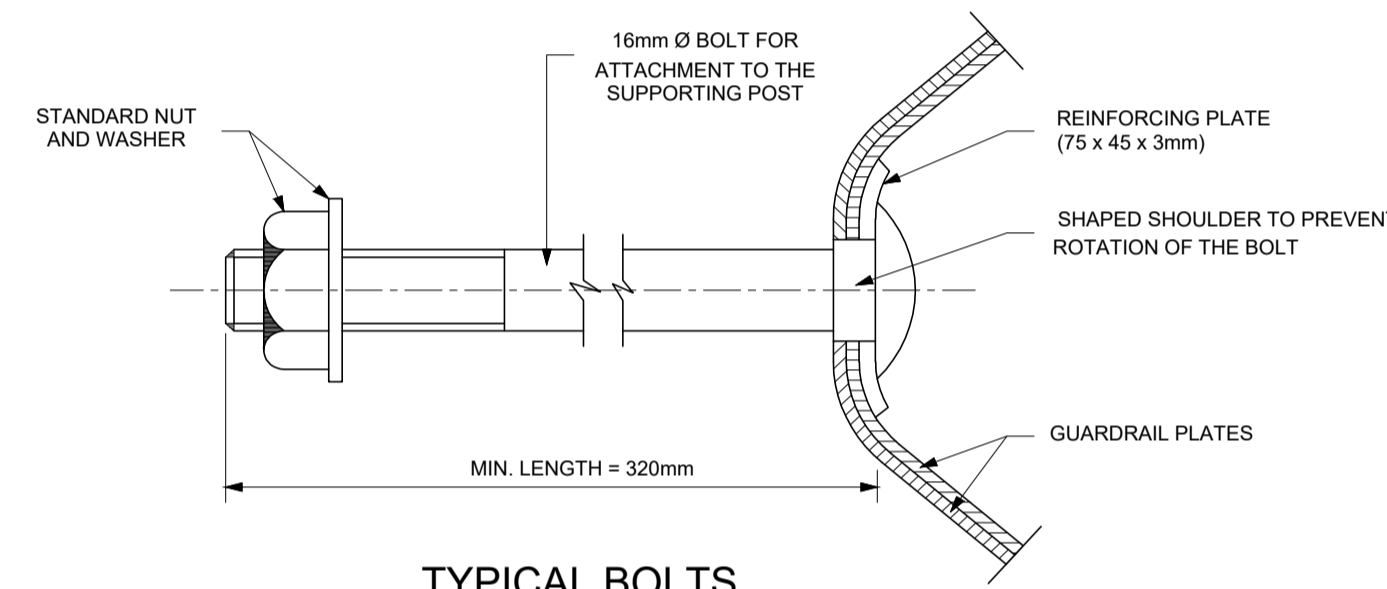
- BOLT: HIGH TENSILE STEEL 16mm Ø
- WASHERS: 3mm THICK
- SPACER BLOCK: PINE OR GUM, PRESSURE IMPREGNATED WITH CREOSOTE WHICH COMPLIES WITH SANS 616:2008
- POSTS: 150mm Ø MIN - 230mm Ø MAX, PINE OR GUM, PRESSURE IMPREGNATED WITH CREOSOTE WHICH COMPLIES WITH SANS 616:2008
- GALVANIZING: GUARDRAILS: SANS 121:2011-TYPE A1 ARTICLES. BOLTS AND WASHERS: SABS 763 TYPE C1 ARTICLES
- TIMBER POSTS: POSTS SHALL COMPLY WITH THE REQUIREMENTS OF SABS AND SHALL CARRY THE SABS MARK.
- CREOSOTE TREATMENT: TIMBER POSTS AND SPACER BLOCKS SHALL BE TREATED IN ACCORDANCE WITH SANS 05 WITH CREOSOTE WHICH COMPLIES WITH SANS 616:2008
- REFLECTIVE PLATES: THE OUTER SURFACES SHALL BE COATED WITH ENGINEERING GRADE RETRO-REFLECTIVE MATERIAL WHICH COMPLIES WITH THE PROVISIONS OF CKS 191 IN THE COLOURS SHOWN ON THIS DRAWING.



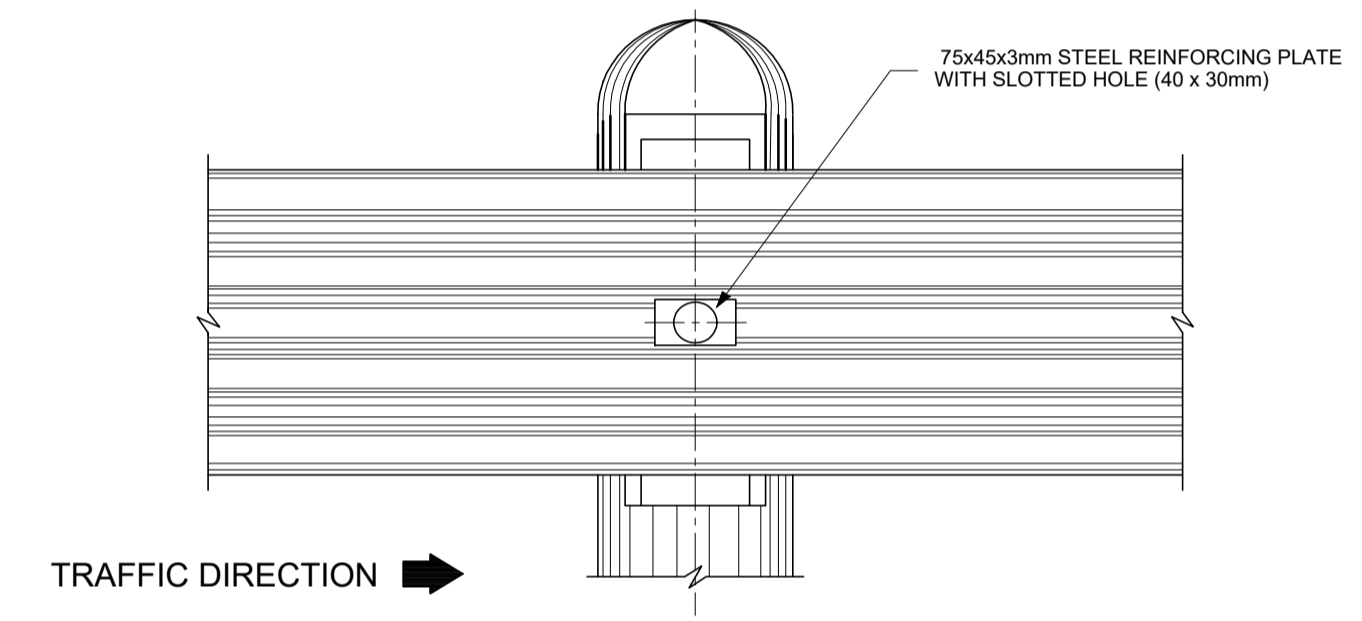
SECTION THROUGH GUARDRAIL
NTS



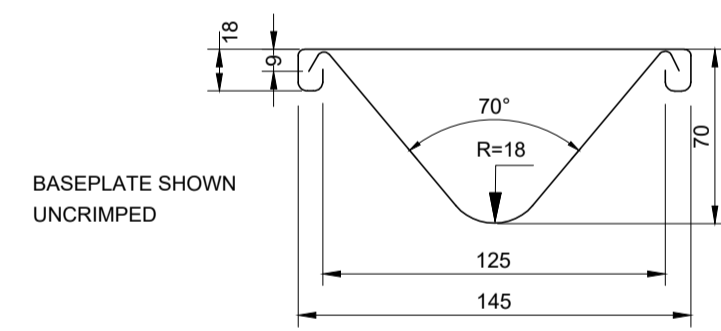
PLAN
NTS



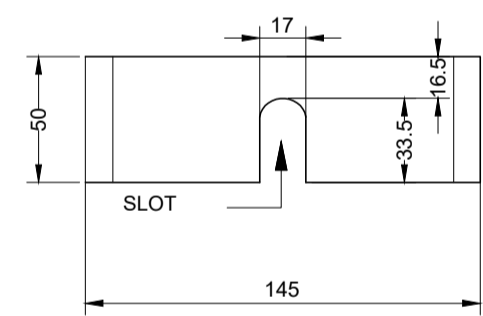
TYPICAL BOLTS
NTS



DETAIL B: FRONT ELEVATION
HALF SPACING OF POSTS
NTS

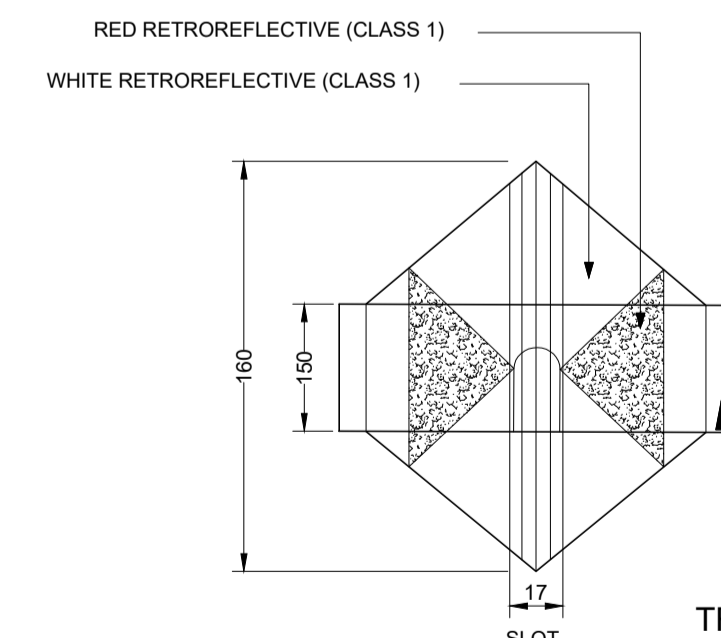


SECTION PLAN

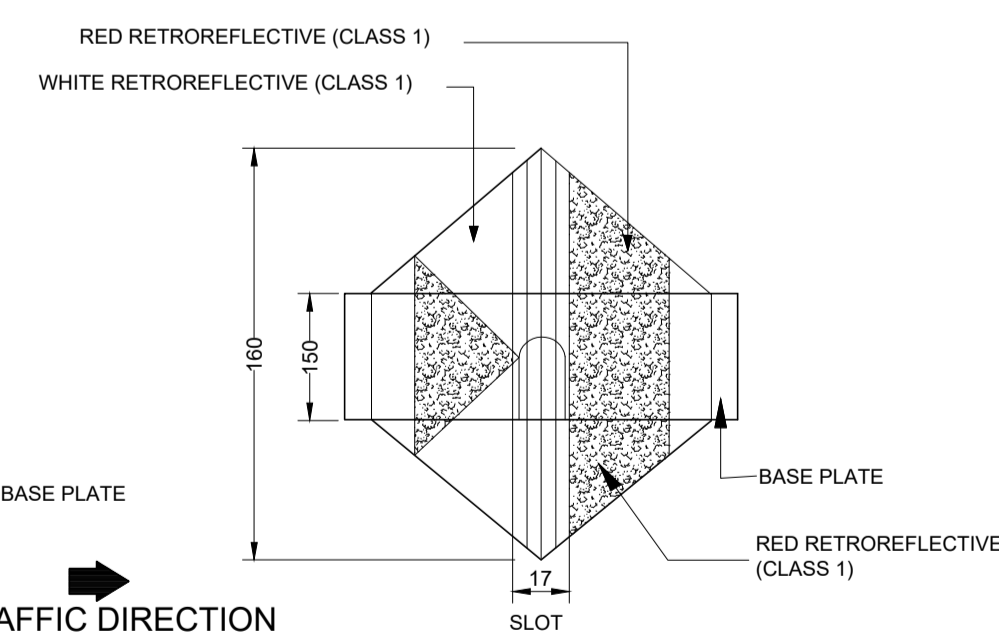


DETAIL OF BASEPLATE

NOTE:
V-SHAPED REFLECTIVE PLATES ATTACHED TO EACH ALTERNATIVE POST-7.62m c/c

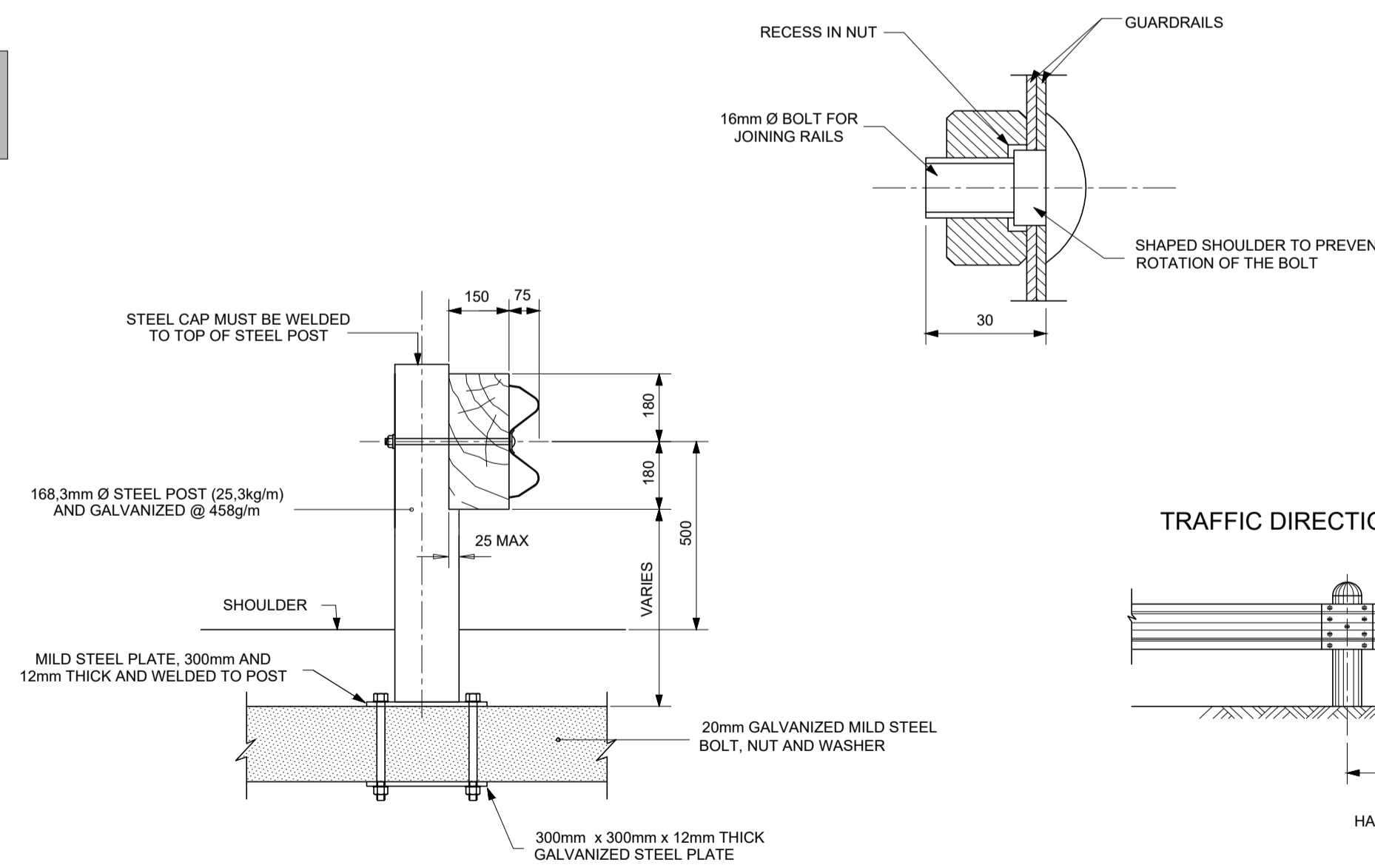


FRONT ELEVATION : TYPE D1 (A)

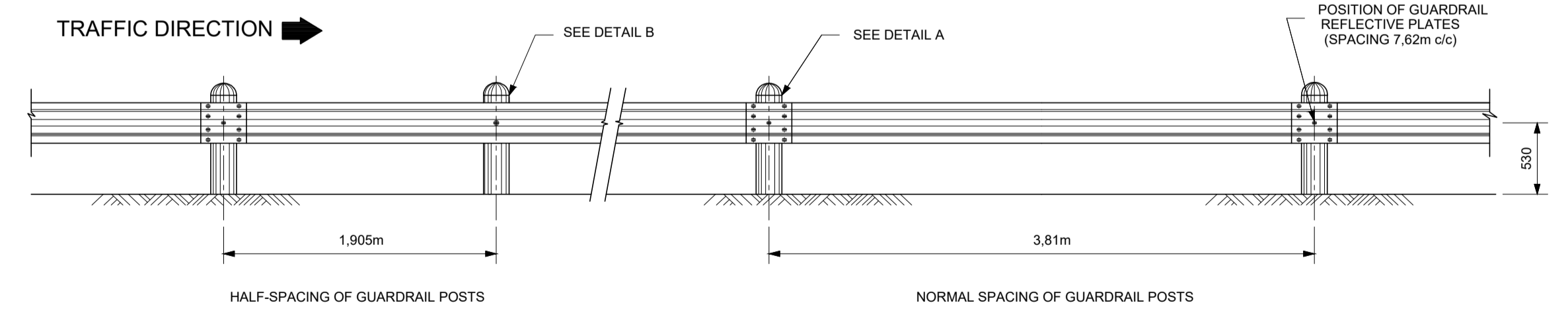


FRONT ELEVATION : TYPE D1 (B)

DETAIL OF GUARDRAIL REFLECTIVE PLATES
NTS



DETAIL OF STEEL GUARDRAIL POST
NTS



SPACING OF POSTS AND POSITION OF REFLECTIVE PLATES
NTS

TENDER

No	DATE	REVISION	CONSULT	DIR
A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		

CLIENT		CITY OF MBOMBELA	
		P. O. BOX 45 NELSPRUIT 1200 Tel.: (013) 759 9111 Fax.: (013) 759 2070	

DESIGNED BY	
DRAWN BY	L.N. MHLANGA
CHECKED BY	R. MAMUREMI Pr Tech Eng: 2019300534
APPROVED BY	R. MAMUREMI Pr Tech Eng: 2019300534

CONSULTANT	SHUMA AFRICA (PTY) LTD
UNIT 75, BUILDING 11, SONPARK SHOPPING CENTRE, CNR. MADIBA DRIVE AND PIET RETIEF STREET NELSPRUIT Tel.: (013) 752 3658	P O BOX 1644 NELSPRUIT 1200 Fax.: (086) 545 7391

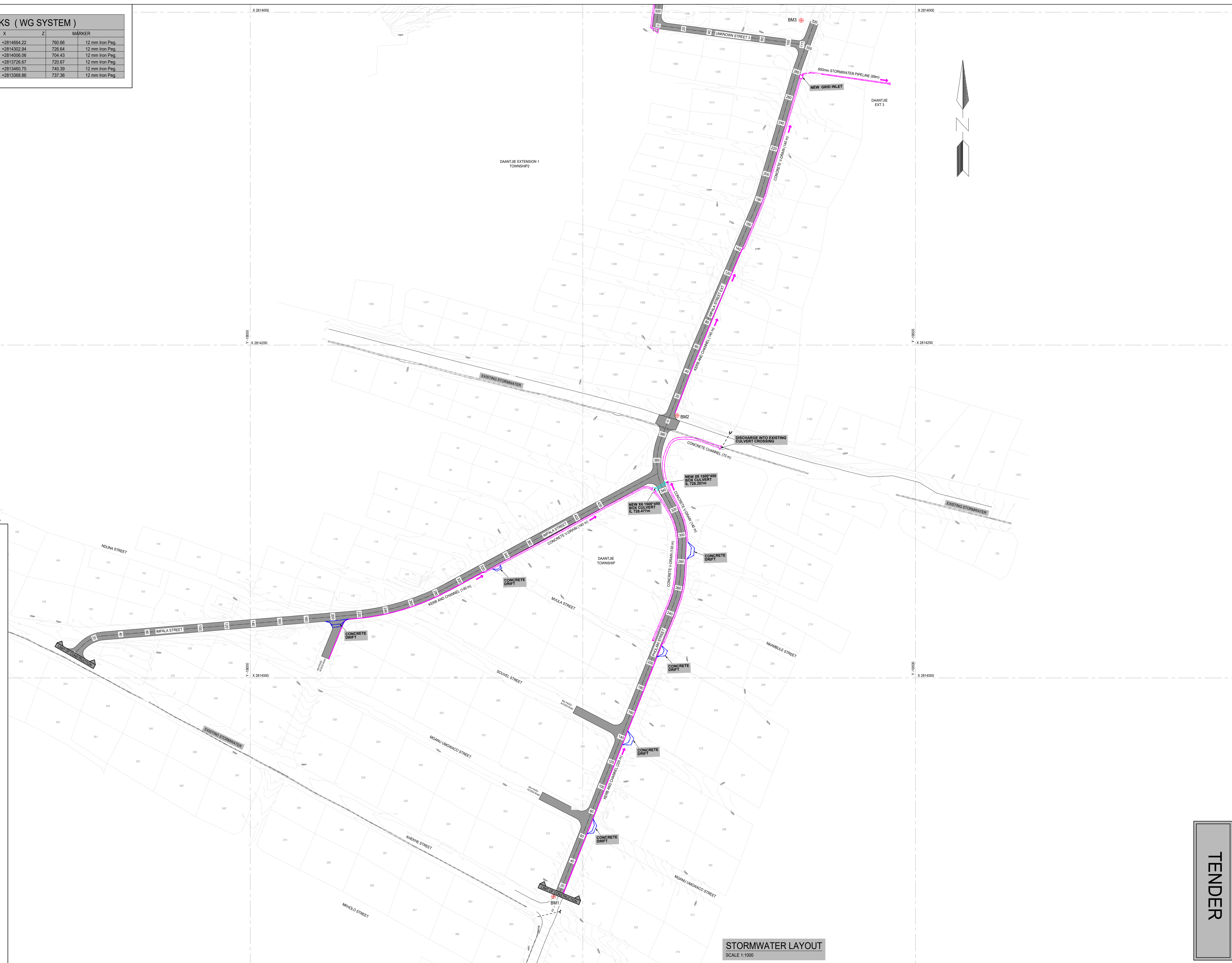
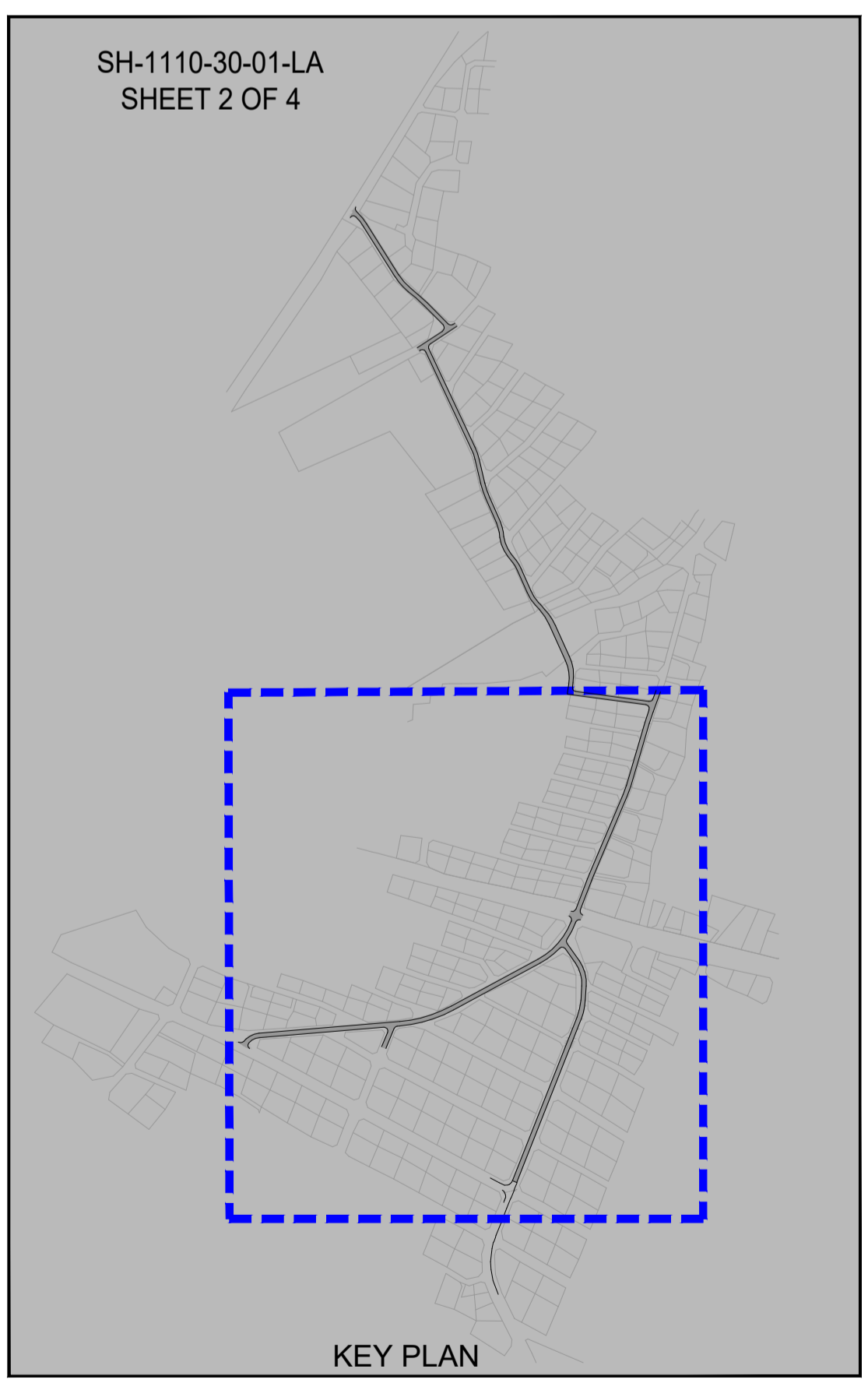
APPROVED	
MBOMBELA	DATE
CONSULTING ENGINEER	DATE

CONTRACT NUMBER : BID 213/2020 VI
PROJECT
UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)
DESCRIPTION
TYPICAL DETAILS : GUARDRAIL ELEMENTS

DESIGN PLAN (Full signature)	SCALE AS - SHOWN
For: MLM	REVISION No. 00
For: Consulting Engineer	SHEET 1 of 1
CONSULTANTS DRAWING NUMBER SH-1110-21-07-TD	DATE JUNE 2023

LEGEND	
CONTOUR INTERVAL = 0.5	
PROPOSED ROAD SURFACE	
PROPOSED STORMWATER / V-DRAIN	
EXISTING STORMWATER	
BENCHMARKS	
EXISTING BUILDINGS	
EXISTING CULVERTS	
PROPOSED CULVERT/ BRIDGE	
DIRECTION OF FLOW	
CONCRETE DRIFT CHANNEL	

BENCH MARKS (WG SYSTEM)				
POINT	Y	X	Z	MARKER
BM1	-19227.89	+2814664.22	780.66	12 mm Iron Peg
BM2	-19220.80	+2814322.94	728.64	12 mm Iron Peg
BM3	-19144.12	+2814006.06	704.43	12 mm Iron Peg
BM4	-19196.29	+2813726.67	720.67	12 mm Iron Peg
BM5	-19084.63	+2813460.75	740.39	12 mm Iron Peg
BM6	-19025.22	+2813568.86	737.36	12 mm Iron Peg



TENDER

No	DATE	REVISION	CONSULT	DIR
A	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		

CLIENT

CITY OF MBOMBELA

P. O. BOX 45
NELSPRUIT
1200

1 NEL STREET
NELSPRUIT
1200

Tel.: (013) 759 9111 Fax.: (013) 759 2070

DESIGNED BY: T. MULAUDZI

DRAWN BY: L.N. MHLANGA

CHECKED BY: R. MAMUREMI
Pr Tech Eng: 2019300534

APPROVED BY: R. MAMUREMI
Pr Tech Eng: 2019300534

CONSULTANT

SHUMA AFRICA (PTY) LTD

UNIT 75, BUILDING 11,
SONPARK SHOPPING CENTRE,
CIVIC MADIBA DRIVE AND
PIET RETEF STREET
NELSPRUIT

P O BOX 1644
NELSPRUIT
1200

Tel.: (013) 752 3658 Fax.: (086) 545 7391

APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 VI

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION

STORMWATER LAYOUT
SHEET 2 OF 2

DESIGN PLAN (Full signature)

For: M.M.

For: Consulting Engineer

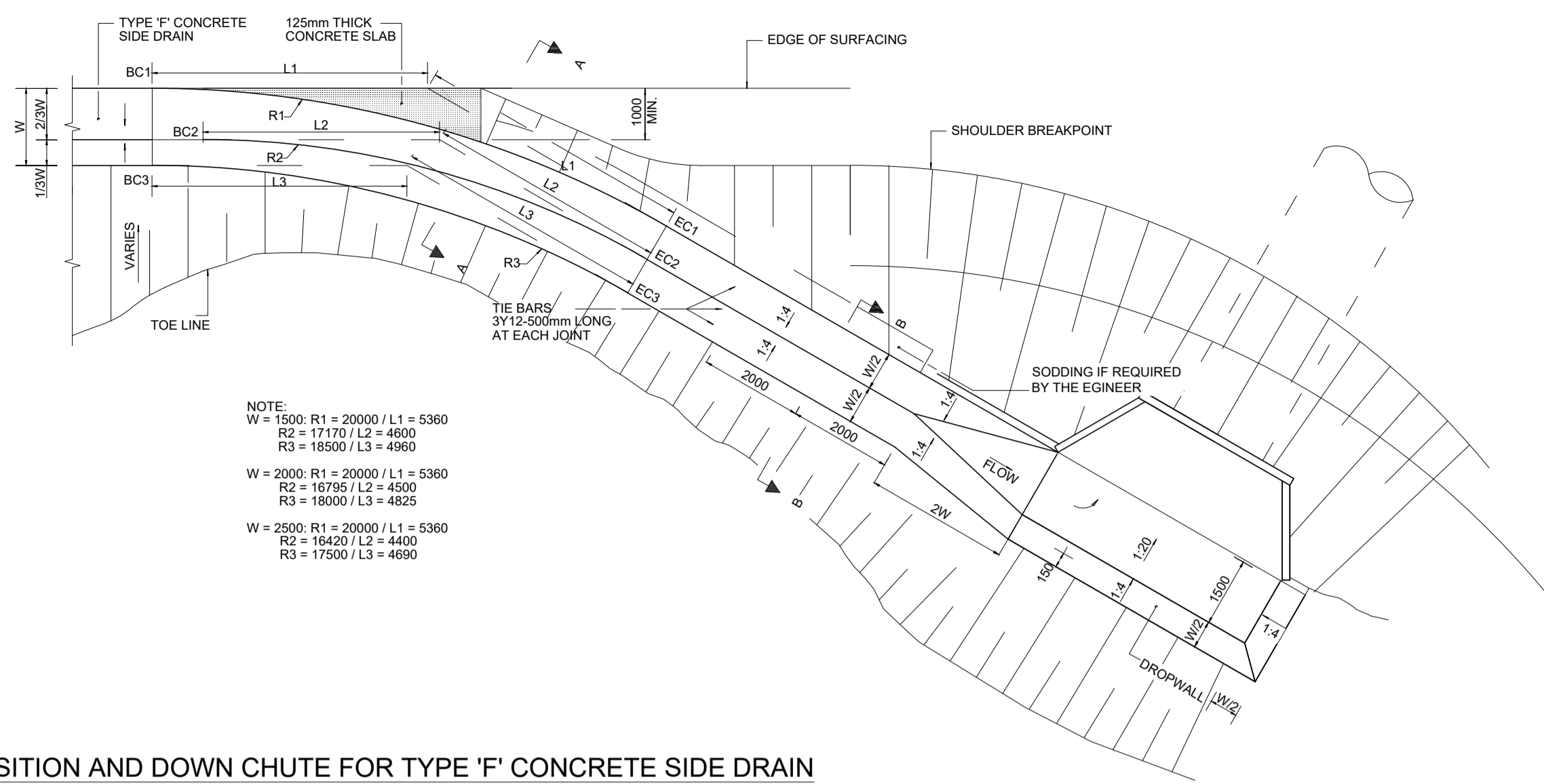
CONSULTANTS DRAWING NUMBER
SH-1110-30-01-LA

SCALE AS - SHOWN

REVISION No. 00

SHEET 2 of 2

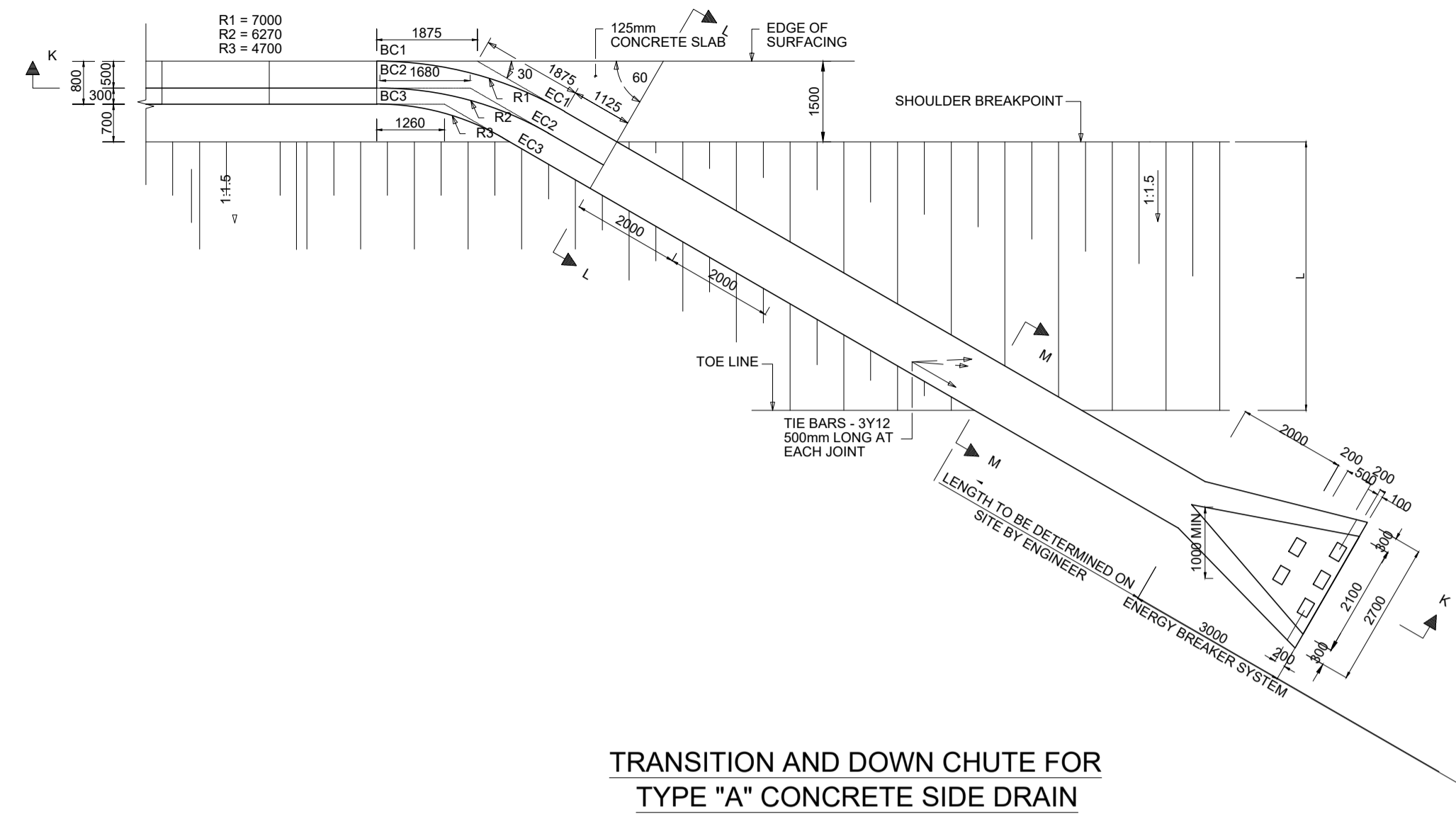
DATE JUNE 2023



TRANSITION AND DOWN CHUTE FOR TYPE 'F' CONCRETE SIDE DRAIN

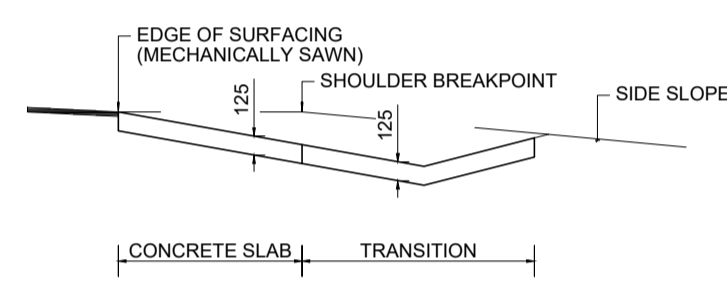
SCALE 1:50

NOTE:
W = 1500: R1 = 20000 / L1 = 5360
R2 = 17170 / L2 = 4600
R3 = 18500 / L3 = 4960
W = 2000: R1 = 20000 / L1 = 5360
R2 = 16795 / L2 = 4500
R3 = 18000 / L3 = 4825
W = 2500: R1 = 20000 / L1 = 5360
R2 = 16420 / L2 = 4400
R3 = 17500 / L3 = 4690

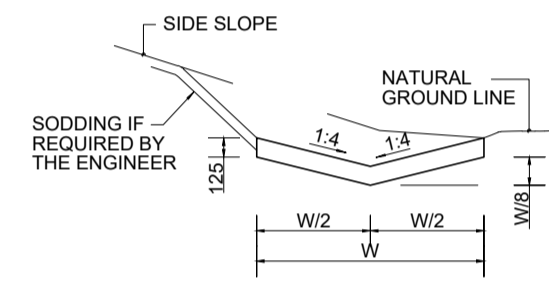


TRANSITION AND DOWN CHUTE FOR TYPE 'A' CONCRETE SIDE DRAIN

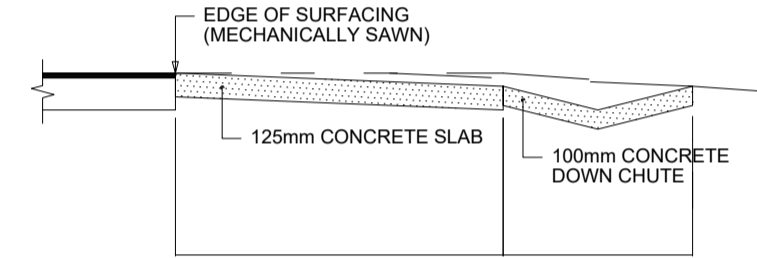
SCALE 1:50



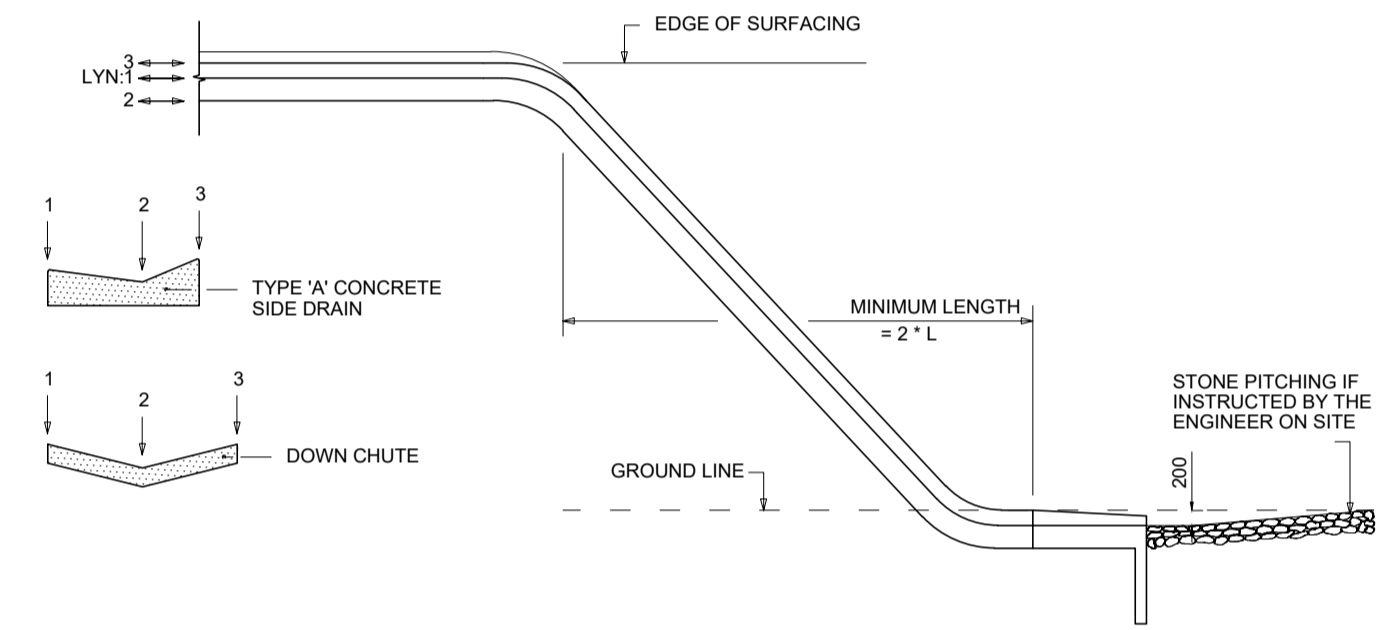
SECTION A-A
SCALE 1:25



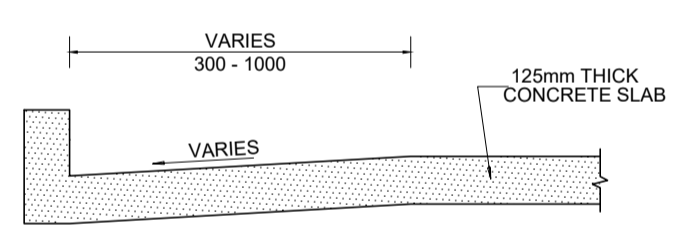
SECTION B-B
SCALE 1:25



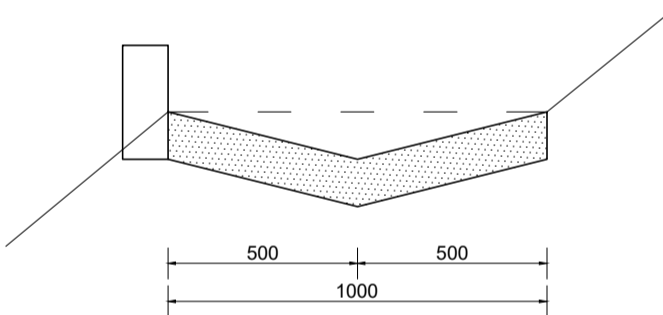
SECTION L-L
SCALE 1:20



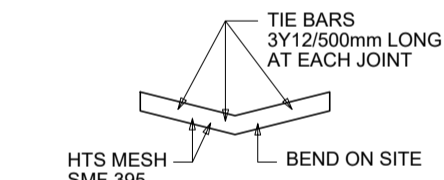
SECTION K-K
SCALE: SCHEMATIC



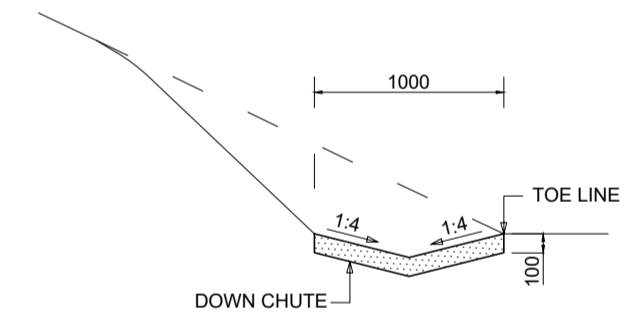
SECTION E-E
SCALE 1:10



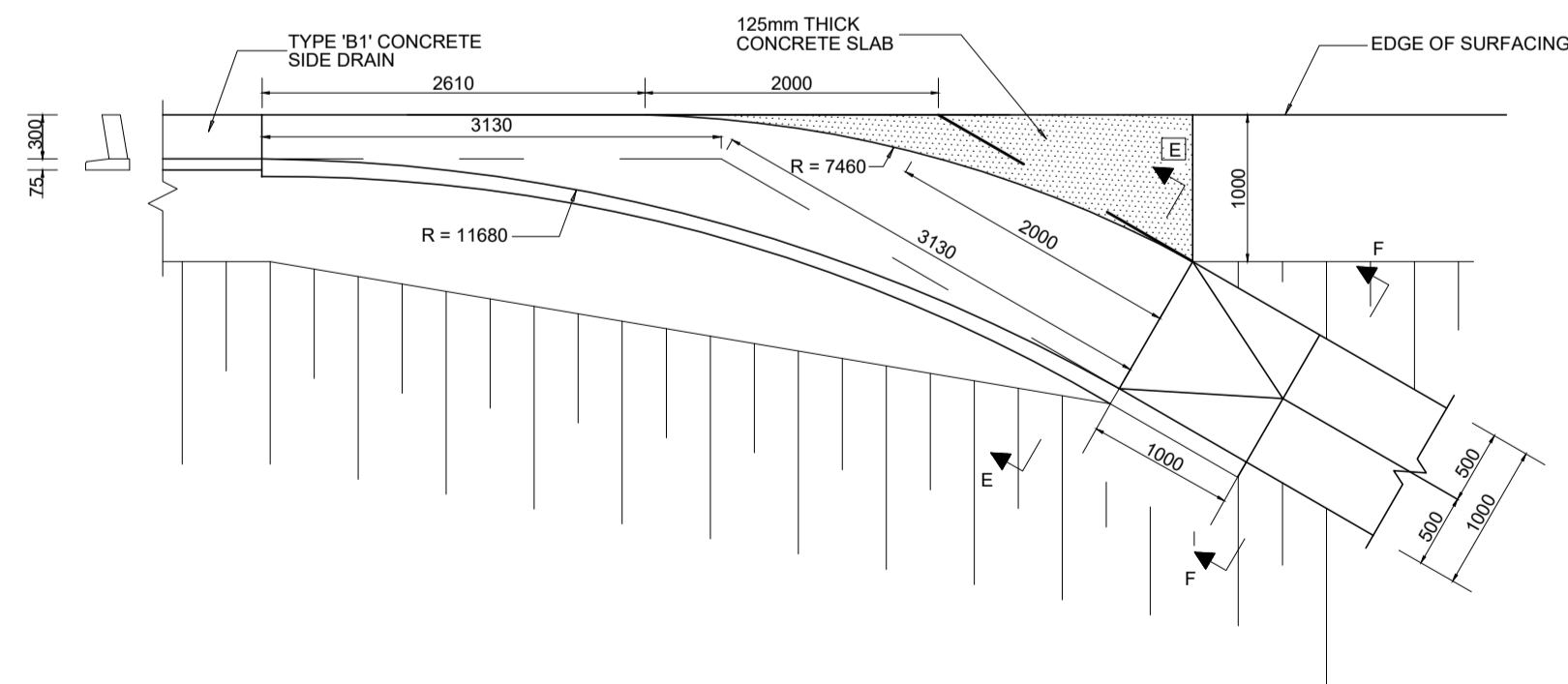
SECTION F-F
SCALE 1:10



SECTION M-M (REINFORCEMENT)
SCALE 1:20

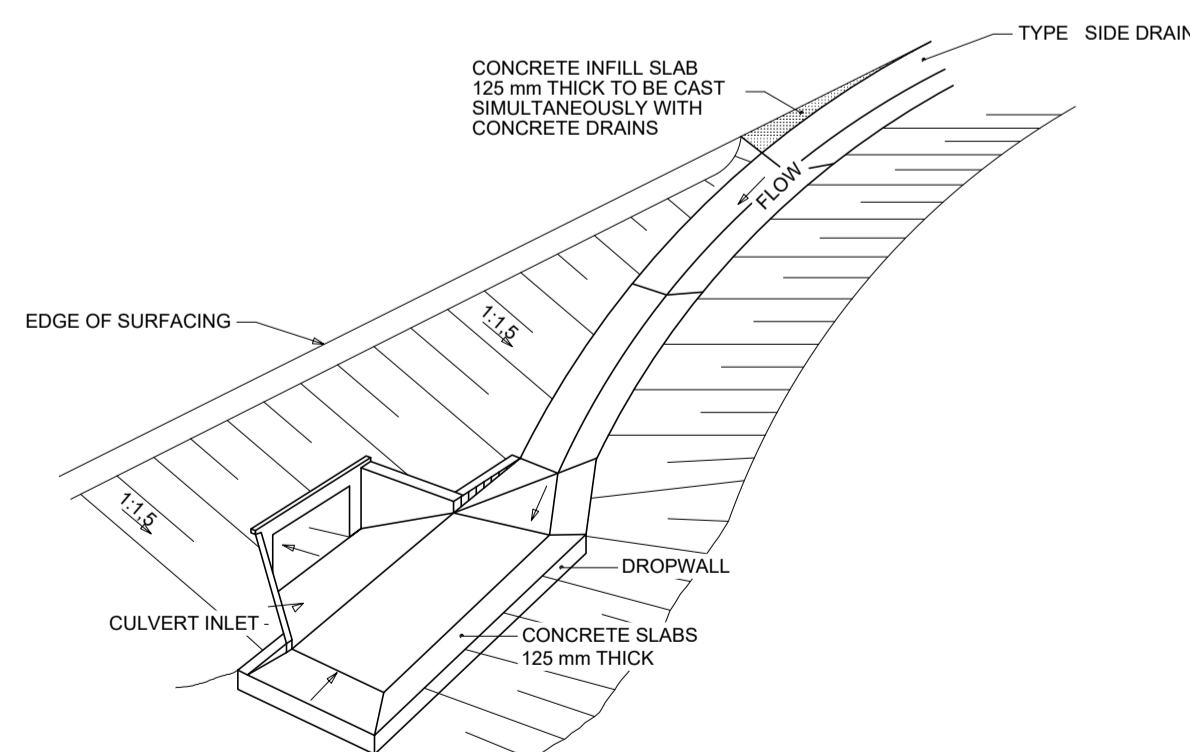


SECTION M-M
SCALE 1:20



TRANSITION AND DOWN CHUTE FOR TYPE 'B1' CONCRETE SIDE DRAIN

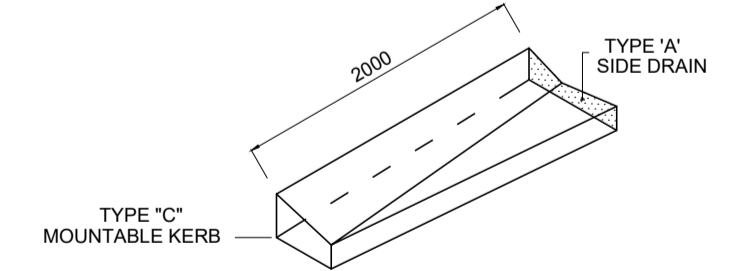
SCALE 1:25



DETAIL OF CONCRETE DRAIN AT DISH INLET

SCHEMATIC

NOTE:
1. ALL CAST IN-SITU SIDE DRAINS TRANSITIONS AND DOWN CHUTES SHOWN ON THIS PLAN MUST BE OF CLASS 30/19 CONCRETE.
2. SIDE DRAINS AND DOWN CHUTES MUST BE CAST IN ALTERNATIVE LENGTHS OF 2.0m MAX. WITH EXPANSION JOINTS EVERY 10m.
3. SIDE DRAINS MUST ONLY BE CAST AFTER THE SURFACING HAS BEEN COMPLETED AND THE EDGES HAVE BEEN MECHANICALLY SAWN.
4. ALL EXPOSED CORNERS MUST BE ROUNDED OFF TO A RADIUS OF 10mm.
5. THE CLASS OF SURFACE FINISH IS INDICATED AS (E1) - (E2) - (U2) -> F: FORMED SURFACES U: UNFORMED SURFACES
6. LENGTH OF DOWN CHUTE TO BE DETERMINED ON SITE, BY THE ENGINEER.



TRANSITION - TYPE 'A' CONCRETE SIDE DRAIN TO TYPE 'C' MOUNTABLE KERB

SCALE: SCHEMATIC

TENDER

A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		
No	DATE	REVISION	CONSULT	DIR

CLIENT	
CITY OF MBOMBELA	
P. O. BOX 45 NELSPRUIT 1200	1 NEL STREET NELSPRUIT 1200
Tel.: (013) 759 9111	Fax: (013) 759 2070

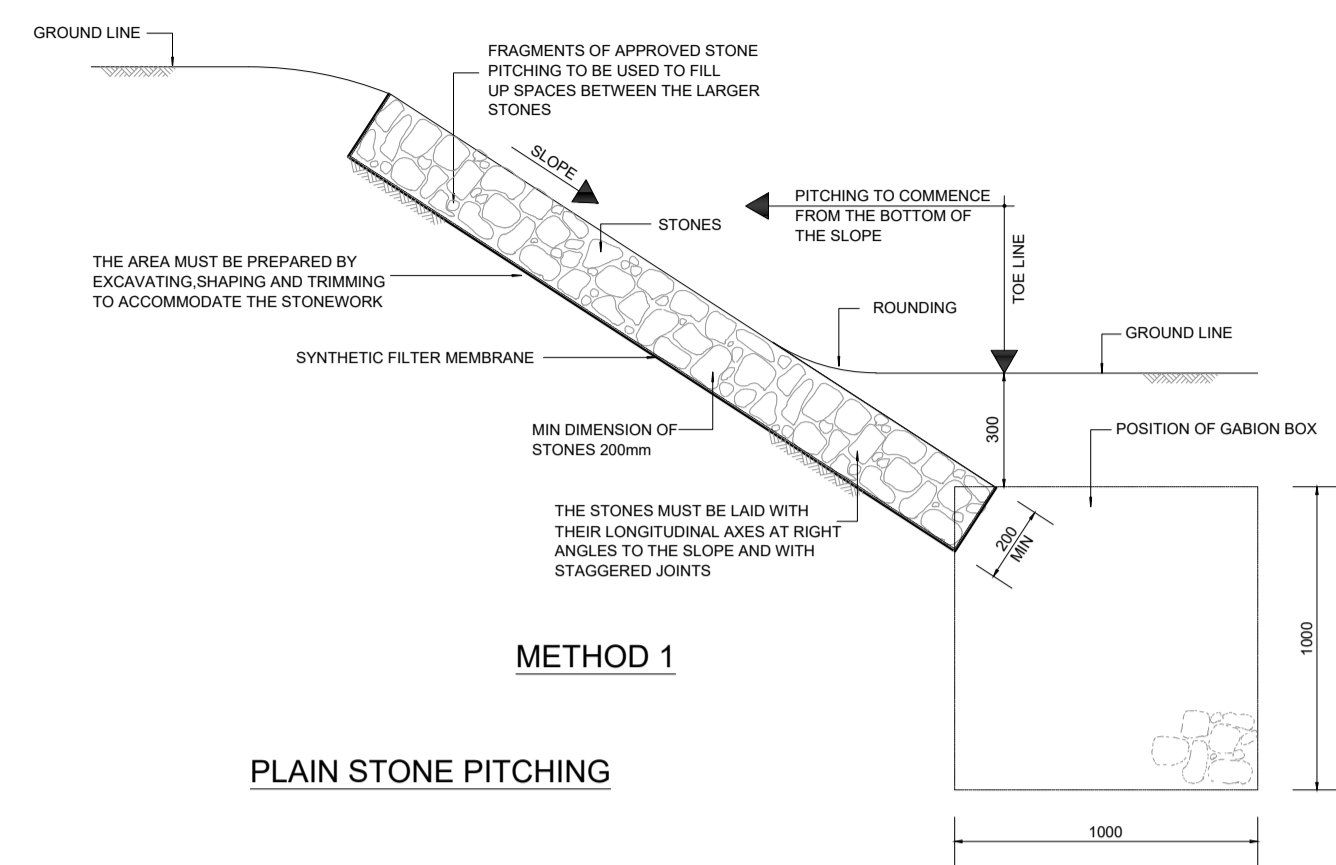
DESIGNED BY	
DRAWN BY	L.N MHLANGA
CHECKED BY	R. MAMUREMI Pr Tech Eng: 2019300534
APPROVED BY	R. MAMUREMI Pr Tech Eng: 2019300534

CONSULTANT	SHUMA AFRICA (PTY) LTD	UNIT 75, BUILDING 11, SONPARK SHOPPING CENTRE, CNR. MADIBA DRIVE AND PIET RETIEF STREET NELSPRUIT	P O BOX 1644 NELSPRUIT 1200	Fax: (086) 545 7391
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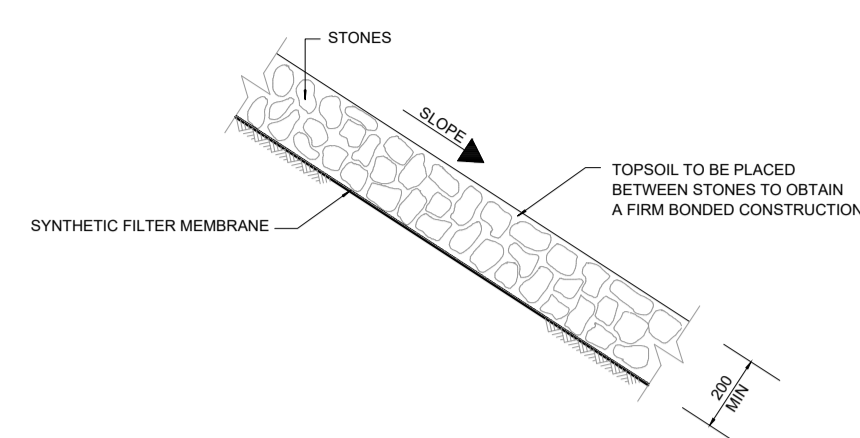
APPROVED	
MBOMBELA	DATE
CONSULTING ENGINEER	DATE

CONTRACT NUMBER : BID 213/2020 VI
PROJECT
UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)
DESCRIPTION
CONCRETE SIDE DRAINS DETAILS

DESIGN PLAN (Full signature)	SCALE AS - SHOWN
For M&M	REVISION No. 00
For Consulting Engineer	SHEET 1 of 1
CONSULTANTS DRAWING NUMBER SH-1110-31-01-TD	DATE JUNE 2023

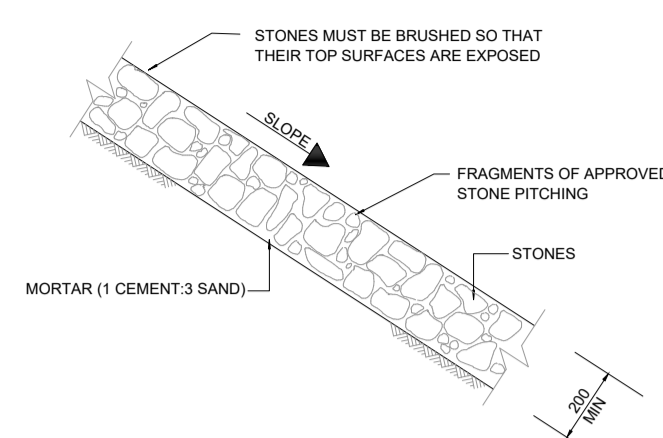


METHOD 1
PLAIN STONE PITCHING



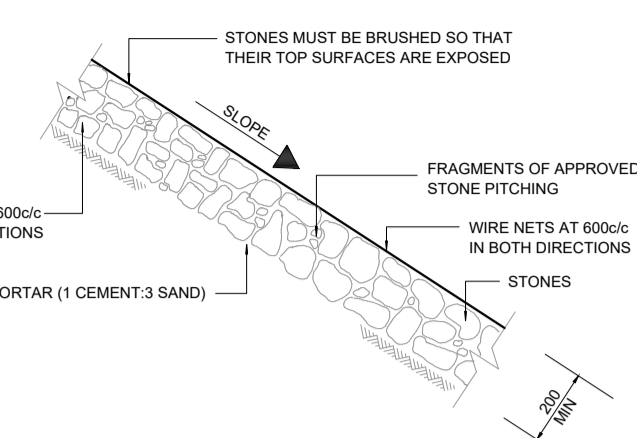
METHOD 2

NOTES:
THE TECHNIQUE AND REQUIREMENTS LAID DOWN IN METHOD 1 SHALL APPLY WITH THE FOLLOWING EXCEPTIONS:
1. NO SMALL STONES SHALL BE USED TO FILL THE SPACES BETWEEN THE LARGER STONES.
2. TOPSOIL SHALL BE INTRODUCED BETWEEN INDIVIDUAL STONES SIMULTANEOUSLY WITH PLACING OF STONES.
3. ROOTED GRASS OR GRASS TUFTS SHALL THEN BE PLACED IN THE TOPSOIL.



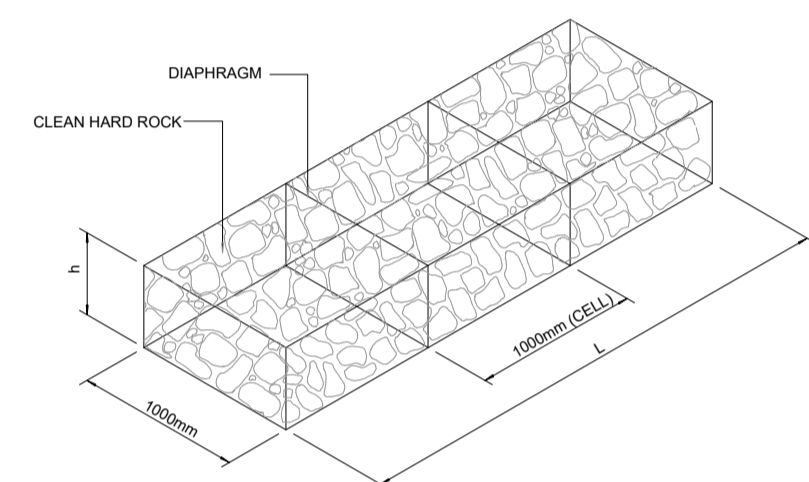
ROUTED STONE PITCHING

NOTES:
THE TECHNIQUE AND REQUIREMENTS LAID DOWN IN METHOD 1 SHALL APPLY WITH THE FOLLOWING EXCEPTION:
1. THE SPACES BETWEEN THE STONES SHALL BE FILLED WITH MORTAR.

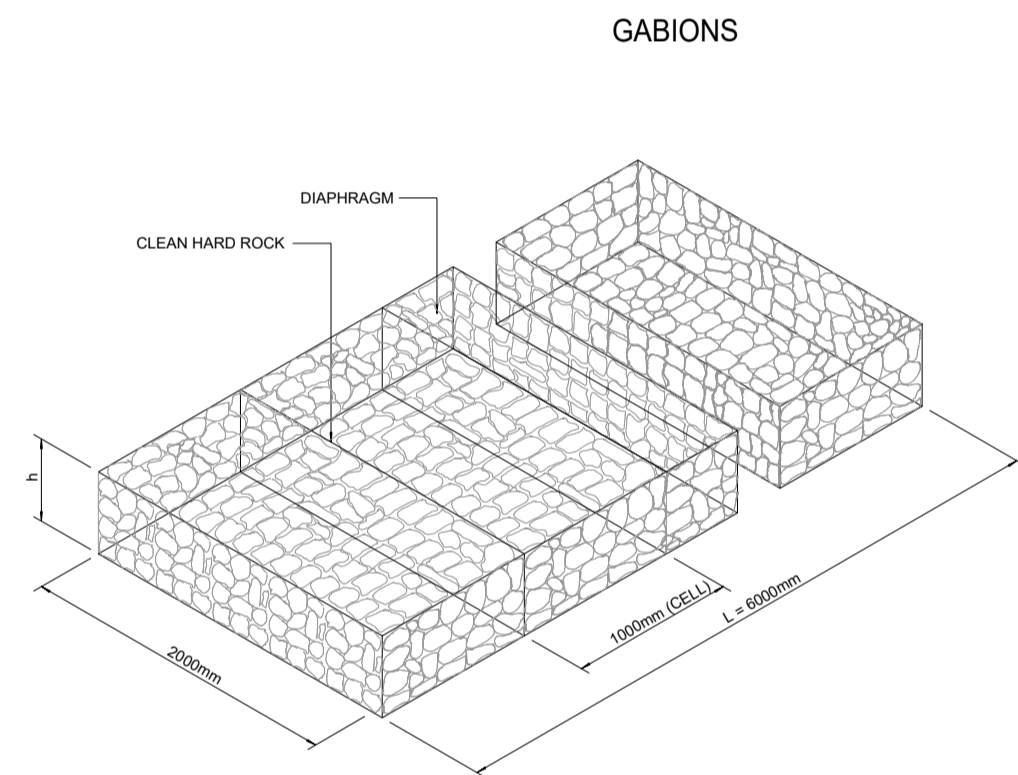
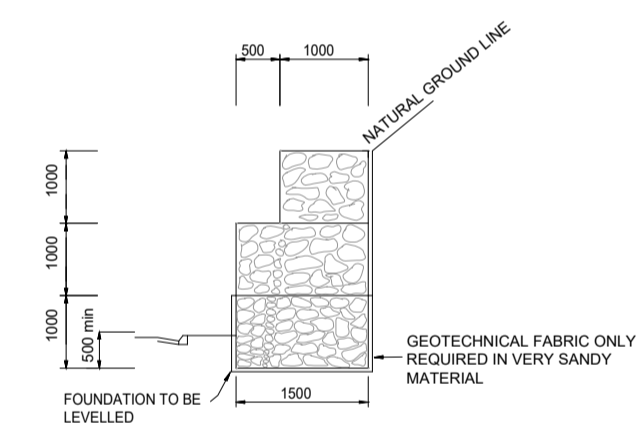


WIRE AND GROUTED STONE PITCHING

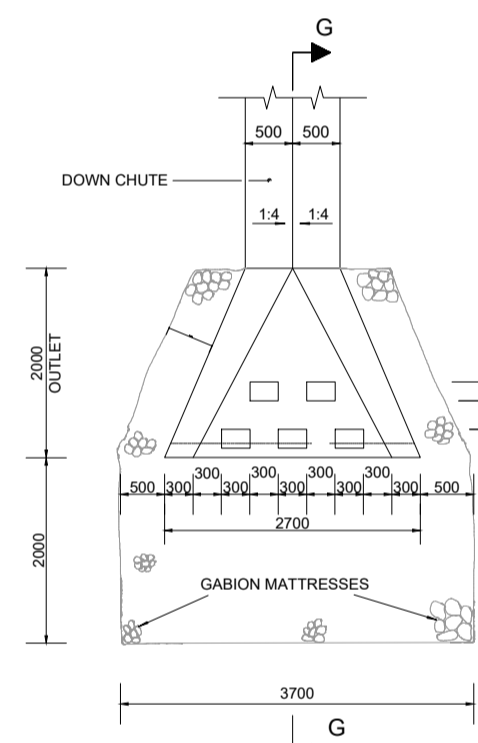
NOTES:
THE TECHNIQUE AND REQUIREMENTS LAID DOWN IN METHOD 1 SHALL APPLY WITH THE FOLLOWING EXCEPTIONS:
1. PITCHING IN ACCORDANCE WITH GROUTED STONE PITCHING.
2. CONSTRUCTION SHALL BE AS FOLLOWS:
a) PLACING OF BOTTOM WIRE NET.
b) ATTACHING OF WIRE TIES TO BOTTOM MESH.
c) PITCHING.
d) PLACING THE TOP WIRE NET AND FASTENING WIRE TIES.
e) GROUTING.



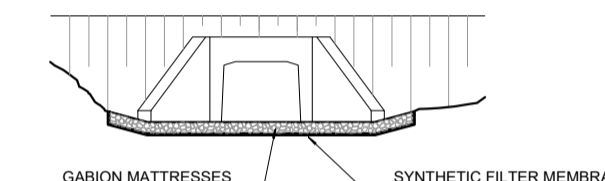
3m GABION RETAINING WALL



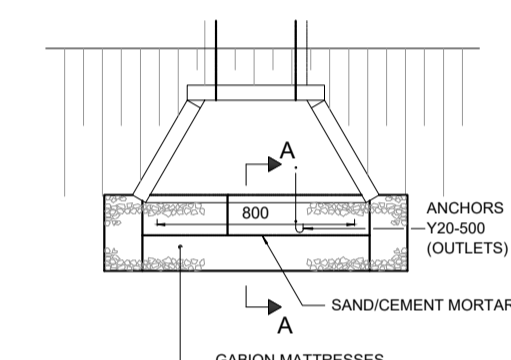
MATTRESSES



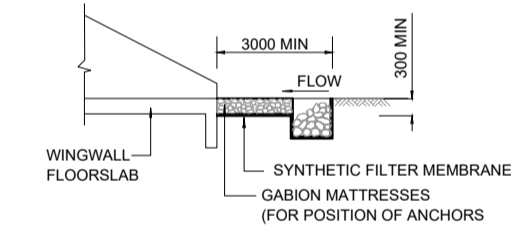
PLAN OF DOWN CHUTE AND ENERGY BREAKER



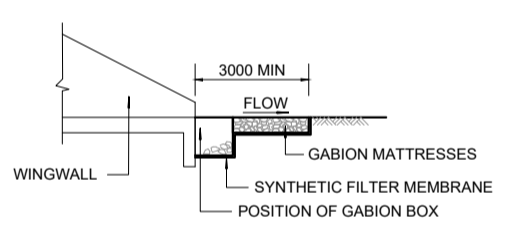
ELEVATION OF INLET/OUTLET



PLAN OF INLET/OUTLET



SECTION A-A (INLET)



SECTION A-A (OUTLET)

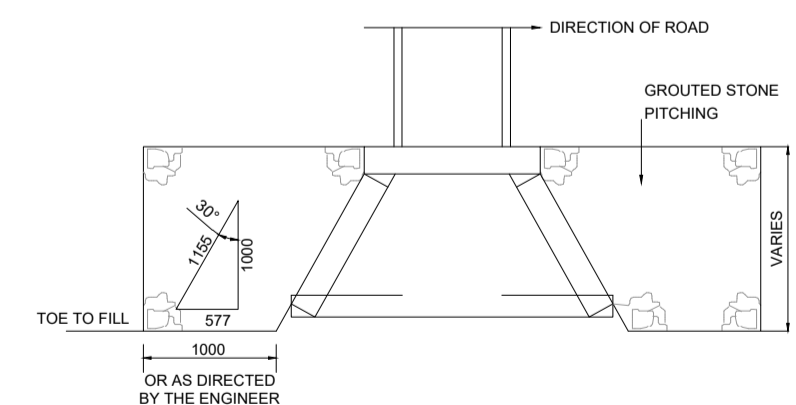
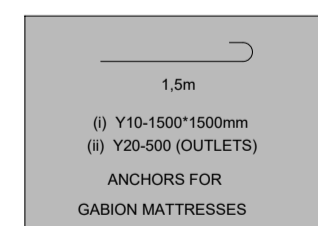
DETAIL OF GABION MATTRESSES AND BOXES AT INLETS AND OUTLETS

STANDARD SIZES OF BOXES	
LENGTH	1000mm, 2000mm, 3000mm, 4000mm
WIDTH	1000mm
DEPTH	500mm, 1000mm
DIAPHRAGM SPACING	1000mm

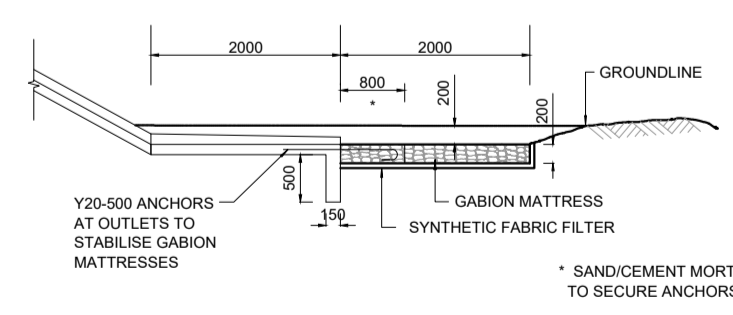
BOXES		
MESH SIZE AND WIRE		
DIAPHRAGM	MESH SIZE (mm)	WIRE DIA. (mm)
500mm AND OVER	80 x 100	2.7
200mm TO 300mm	80 x 100	2.5

STANDARD SIZES	
LENGTH	6000mm
WIDTH	2000mm
DEPTH	170mm, 230mm, 300mm

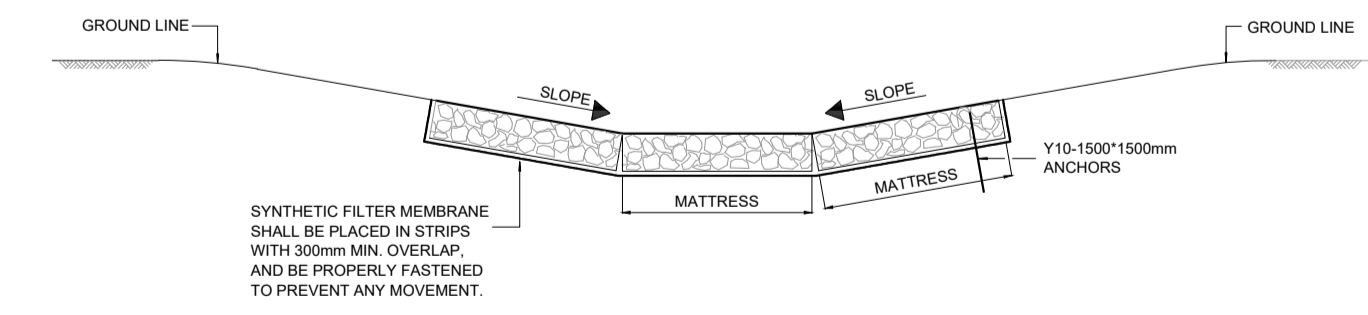
ROCK USED FOR THE FILLING OF CAGES		
DEPTH OF CAGES	ROCK SIZE (DIMENSIONS)	MARKS (mm)
230	100	125
300	100	200
500	100	250
1000	100	300



TYPICAL DETAIL OF GROUTED STONE PITCHING ADJACENT TO WINGWALLS



SECTION G-G



SECTION OF MATTRESS IN CANAL

TENDER

No	DATE	REVISION	CONSULT	DIR
A	MARCH 23	CONCEPT & VIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		

CLIENT
CITY OF MBOMBELA
P. O. BOX 45 NELSPRUIT 1200
1 NEL STREET NELSPRUIT 1200
Tel.: (013) 759 9111 Fax.: (013) 759 2070

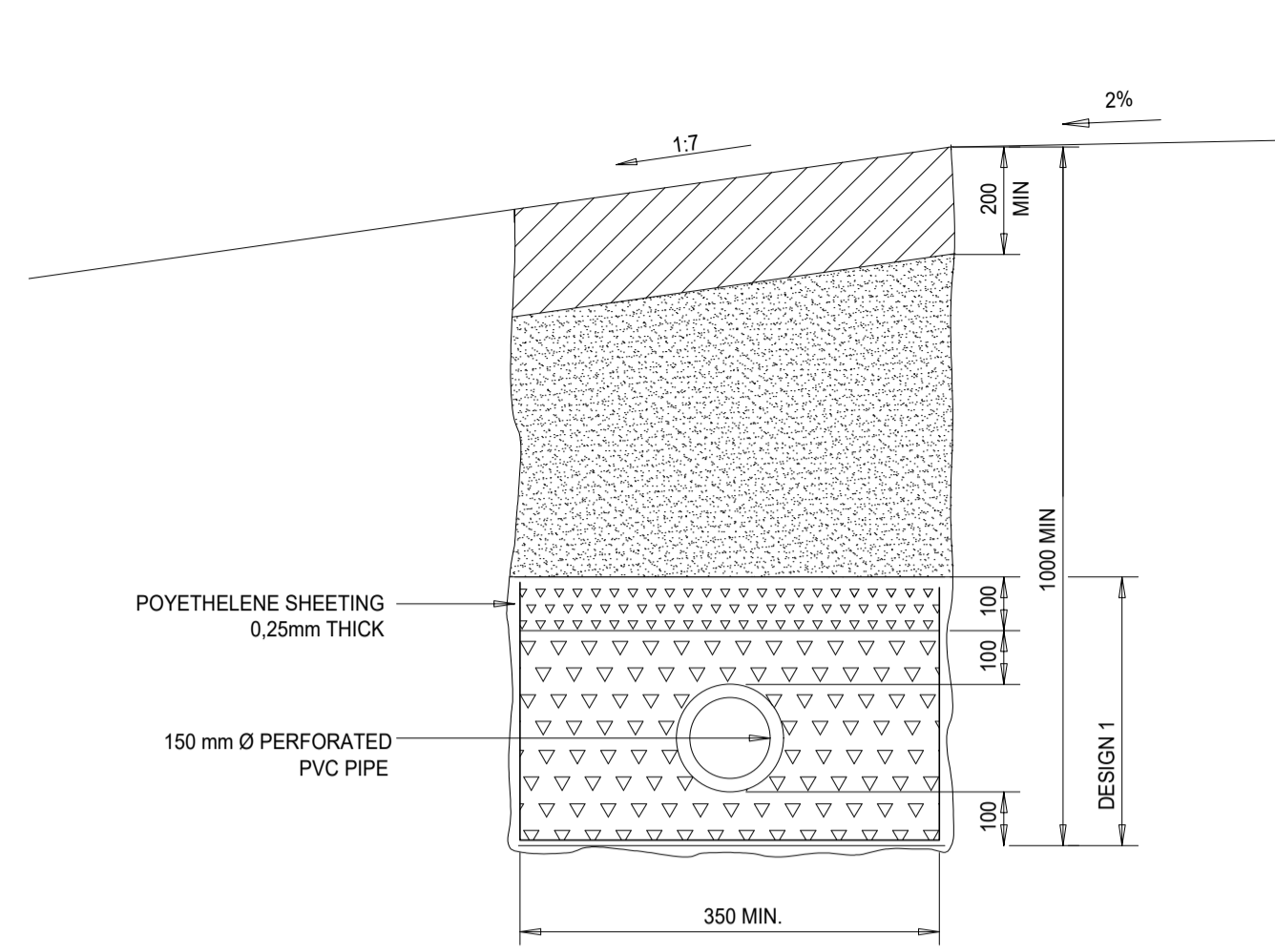
DESIGNED BY
DRAWN BY: L.N. MHLANGA
CHECKED BY: R. MAMUREMI
APPROVED BY: R. MAMUREMI
Pr Tech Eng: 2019300534

CONSULTANT
SHUMA AFRICA (PTY) LTD
UNIT 75, BUILDING 11, SONPARK SHOPPING CENTRE, CNR. MADIBA DRIVE AND PIET RETIEF STREET NELSPRUIT
P O BOX 1644 NELSPRUIT 1200
Tel.: (013) 752 3658 Fax.: (086) 545 7391

APPROVED
MBOMBELA DATE
CONSULTING ENGINEER DATE

CONTRACT NUMBER : REG 59/2019
PROJECT
UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)
DESCRIPTION
GABIONS AND STONE PITCHING DETAILS

DESIGN PLAN (Full signature)
For: M.M.
For: Consulting Engineer
CONSULTANTS DRAWING NUMBER SH-1110-31-02-TD
SCALE AS - SHOWN
REVISION No. 00
SHEET 1 of 1
DATE JUNE 2023

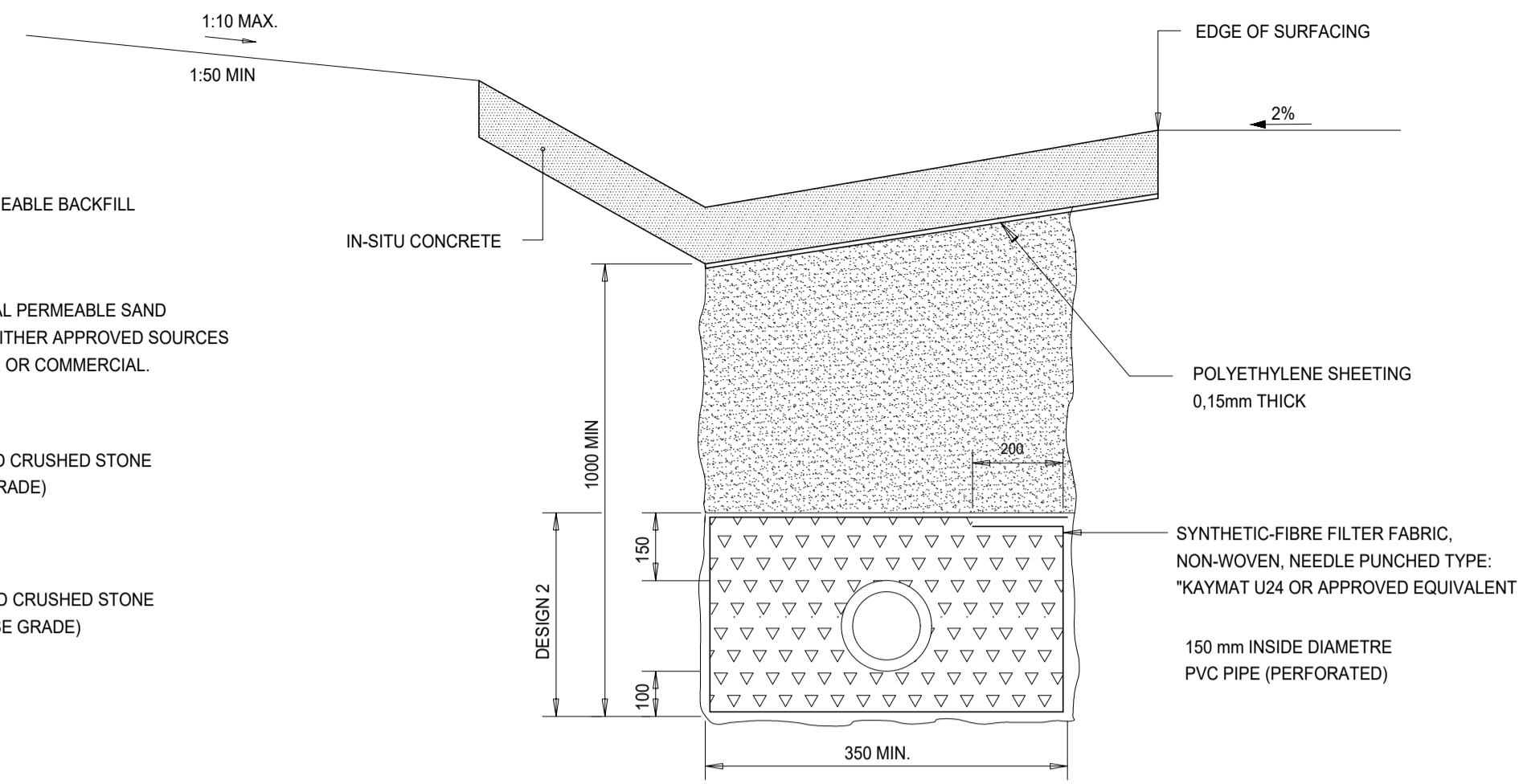


**SHALLOW CUT CONDITION
TYPE "A" SUBSURFACE DRAIN**
N.T.S.

LEGEND

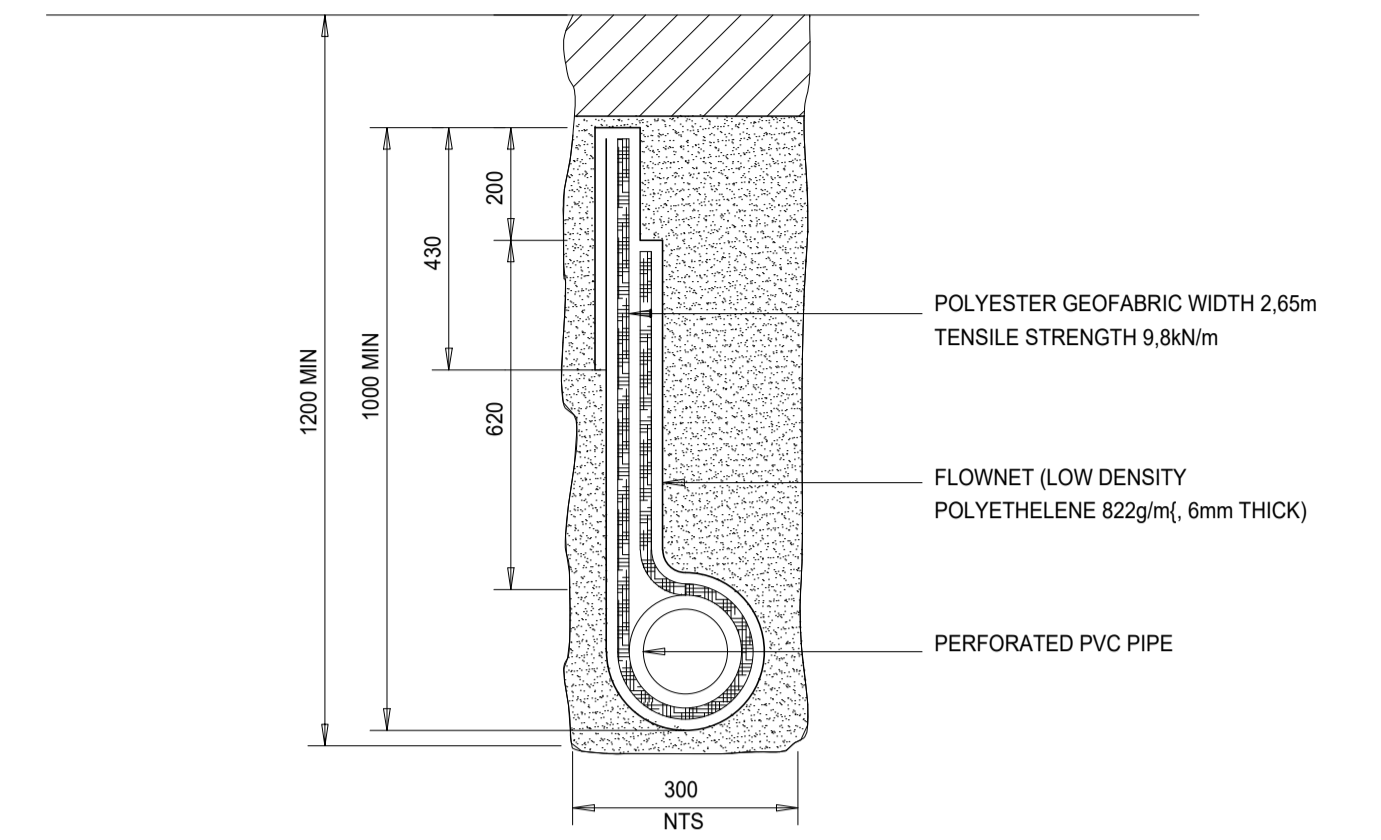
- IMPERMEABLE BACKFILL
- NATURAL PERMEABLE SAND FROM EITHER APPROVED SOURCES ON SITE OR COMMERCIAL.
- GRADED CRUSHED STONE (FINE GRADE)
- GRADED CRUSHED STONE (COARSE GRADE)

NOTE:
DESIGNS 1 AND 2 CAN BE EXCHANGED WHEN INSTRUCTED BY THE ENGINEER

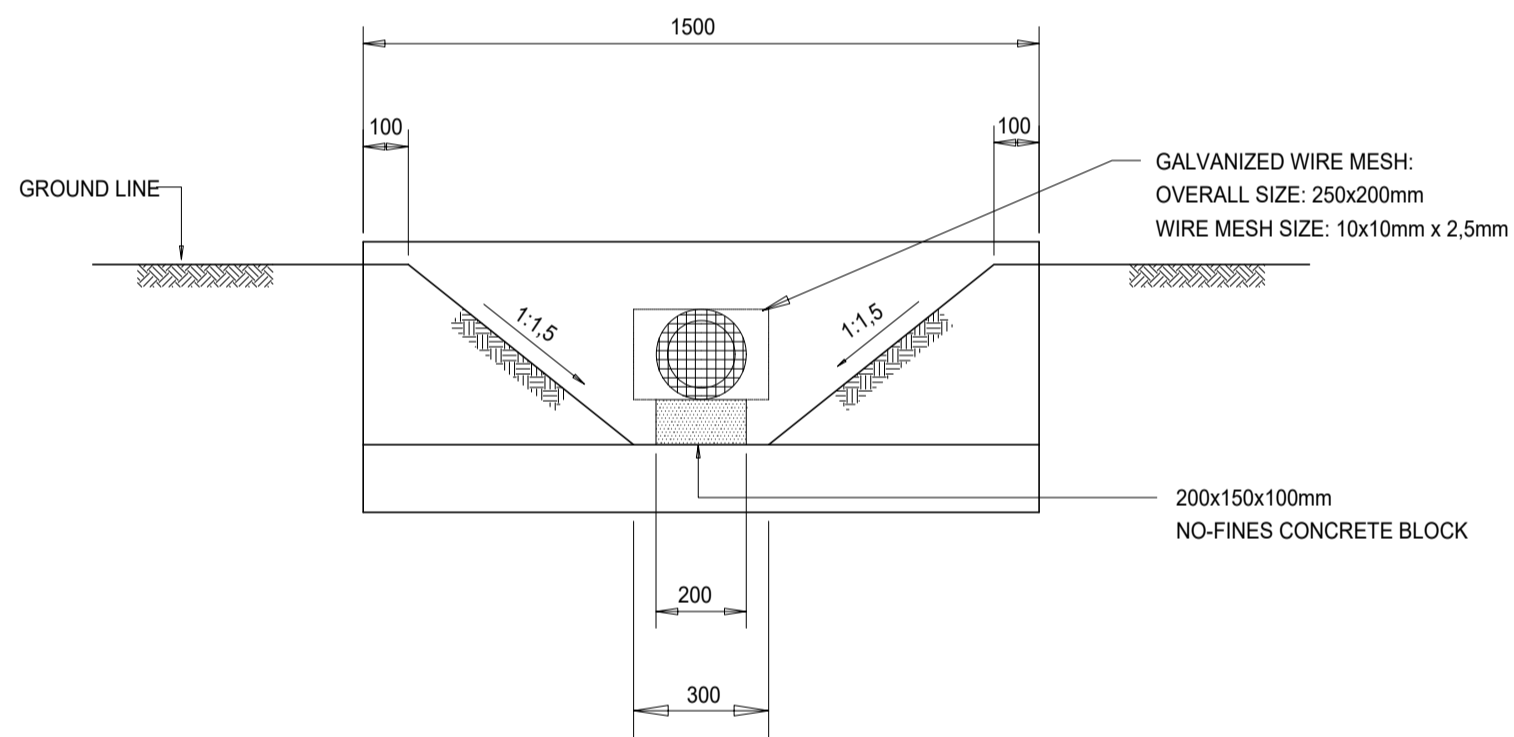


**DEEP CUT CONDITION
TYPE "B" SUBSURFACE DRAIN**
N.T.S.

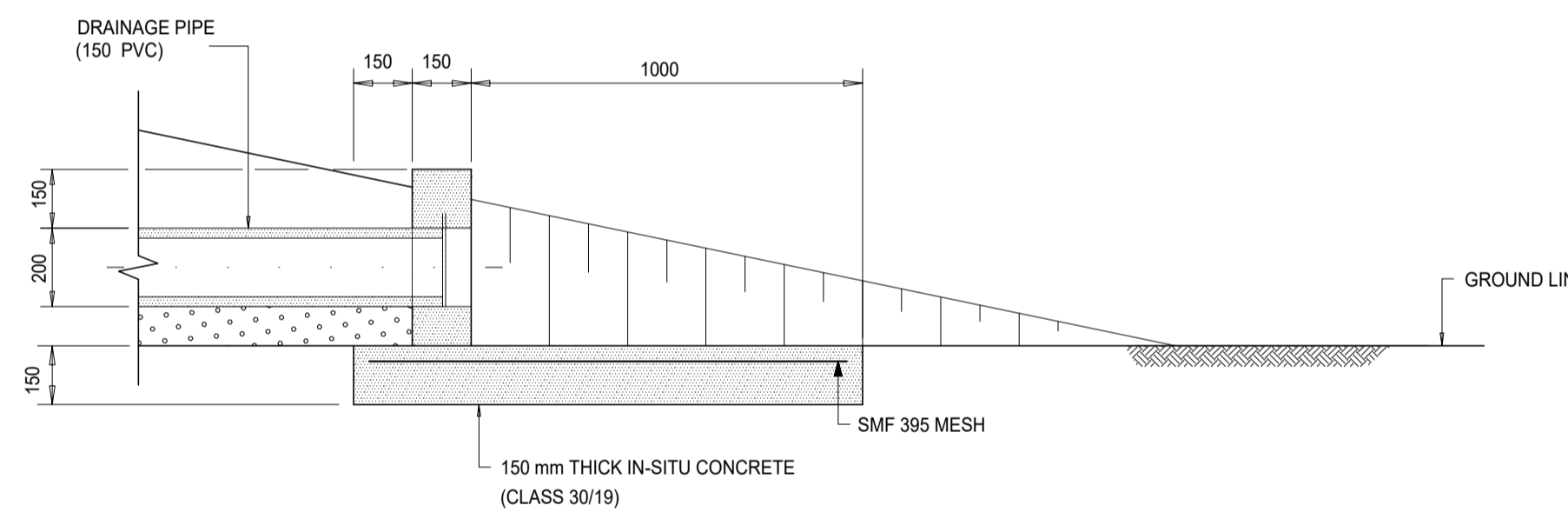
NOTE:
FLOWNET AND PVC PIPE ONLY TO BE INSTALLED AT THE ENGINEER'S REQUEST



**SANDY CONDITION
TYPE "C" SUBSURFACE DRAIN**
SCALE 1:10



FRONT ELEVATION



SECTION B-B

GRADING REQUIREMENTS OF CRUSHED STONE

CRUSHED STONE SHALL BE GRADED CRUSHED STONE, WHICH CONFORMS TO THE FOLLOWING REQUIREMENTS:

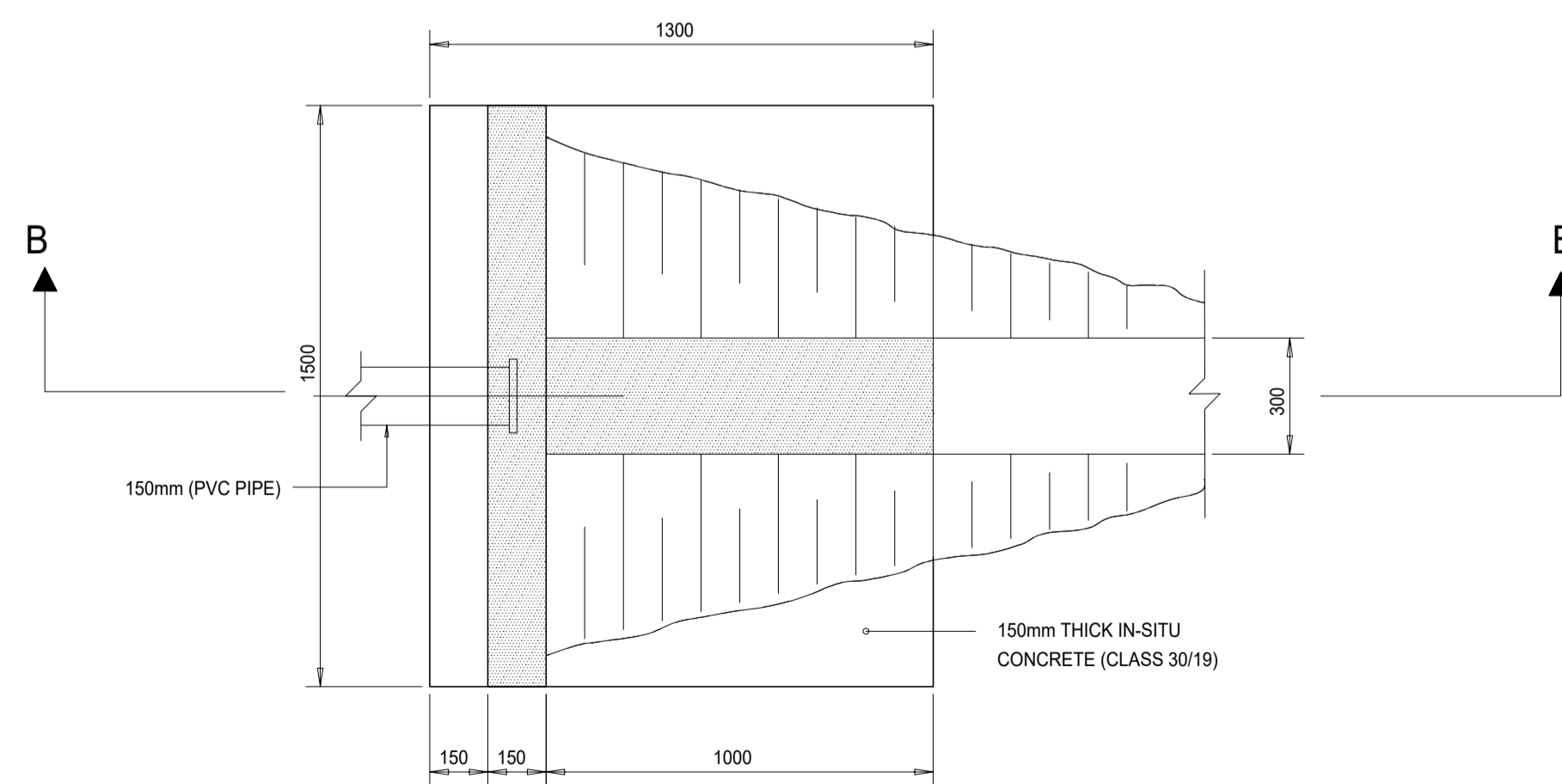
PERCENTAGE PASSING THROUGH A -

26.6mm SIEVE 100
13.2mm SIEVE 60-85

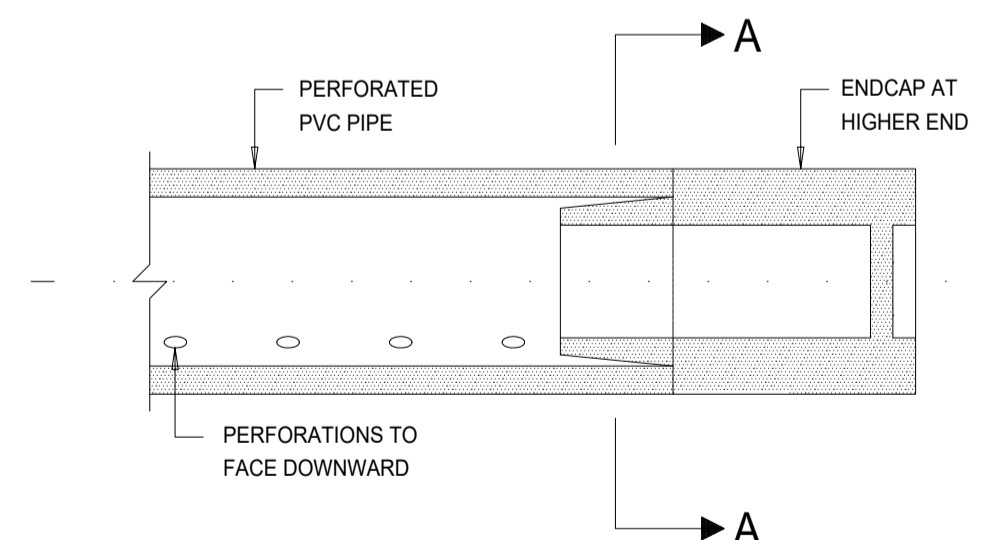
FINE GRADE STONE:
A MINIMUM OF 15% PASSING THROUGH A 3.35mm SIEVE.
A MAXIMUM OF 15% PASSING THROUGH A 1.18mm SIEVE.

COARSE GRADE STONE:
A MINIMUM OF 15% PASSING THROUGH A 6.70mm SIEVE.
A MAXIMUM OF 15% PASSING THROUGH A 2.36mm SIEVE.

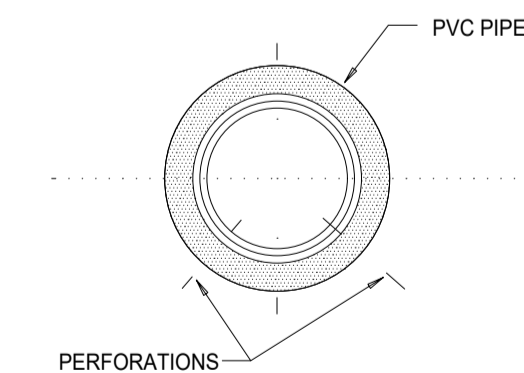
IN THE CASE OF ANY CRUSHED STONE NOT MORE THAN 5% OF THE MATERIAL SHALL PASS THROUGH THE 0.075mm SIEVE.



**PLAN
DETAIL OF OUTLET STRUCTURE**



**SECTION THROUGH PIPE CENTRE LINE
ENDCAP DETAIL**
SCALE 1:5



SECTION A-A

TENDER

No	DATE	REVISION	CONSULT	DIR
A	MARCH 23	CONCEPT & LIABILITY		
B	APRIL 23	DESIGN DEVELOPMENT		
C	MAY 23	DESIGN DEVELOPMENT		
00	JUNE 23	TENDER		

CLIENT

CITY OF MBOMBELA

P. O. BOX 45
NELSPRUIT
1200

1 NEL STREET
NELSPRUIT
1200

Tel.: (013) 759 9111 Fax.: (013) 759 2070

DESIGNED BY

DRAWN BY L.N. MHLANGA

CHECKED BY R. MAMUREMI
Pr Tech Eng: 2019300534

APPROVED BY R. MAMUREMI
Pr Tech Eng: 2019300534

CONSULTANT

SHUMA AFRICA (PTY) LTD

UNIT 75, BUILDING 11,
SONPARK SHOPPING CENTRE,
GNR, MADIBA DRIVE AND
PIET RETIEF STREET
NELSPRUIT

P O BOX 1644
NELSPRUIT
1200

Tel.: (013) 752 3658 Fax.: (086) 545 7391

APPROVED

MBOMBELA _____ DATE _____

CONSULTING ENGINEER _____ DATE _____

CONTRACT NUMBER : BID 213/2020 VI

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION

SUB - SURFACE DRAINS

DESIGN PLAN
(Full signature)

For: M.M.

For: Consulting Engineer

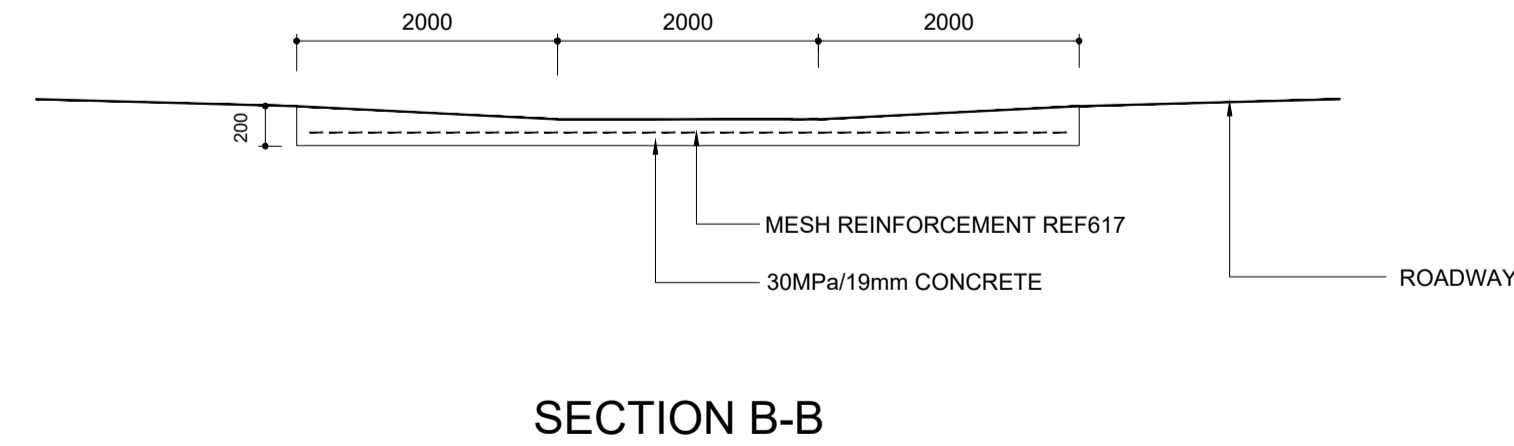
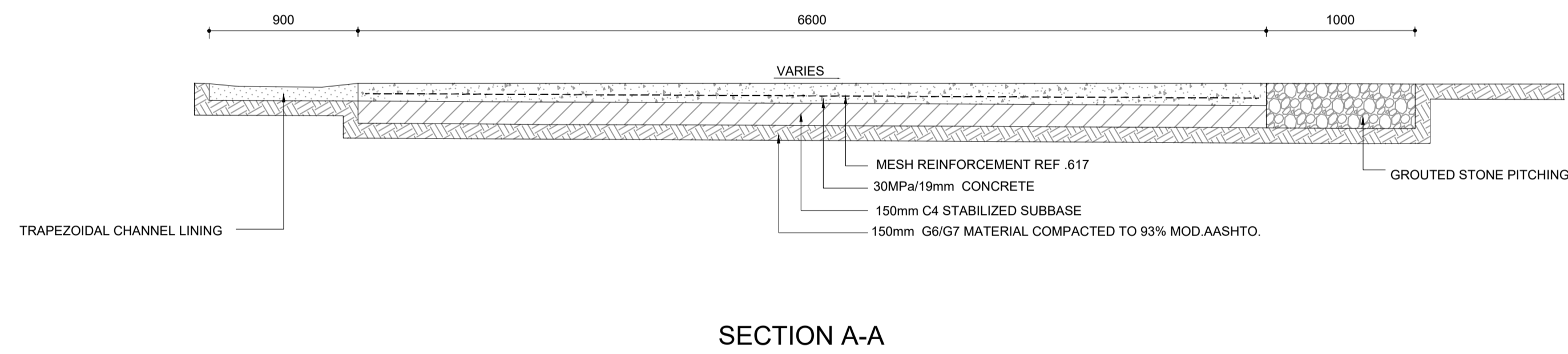
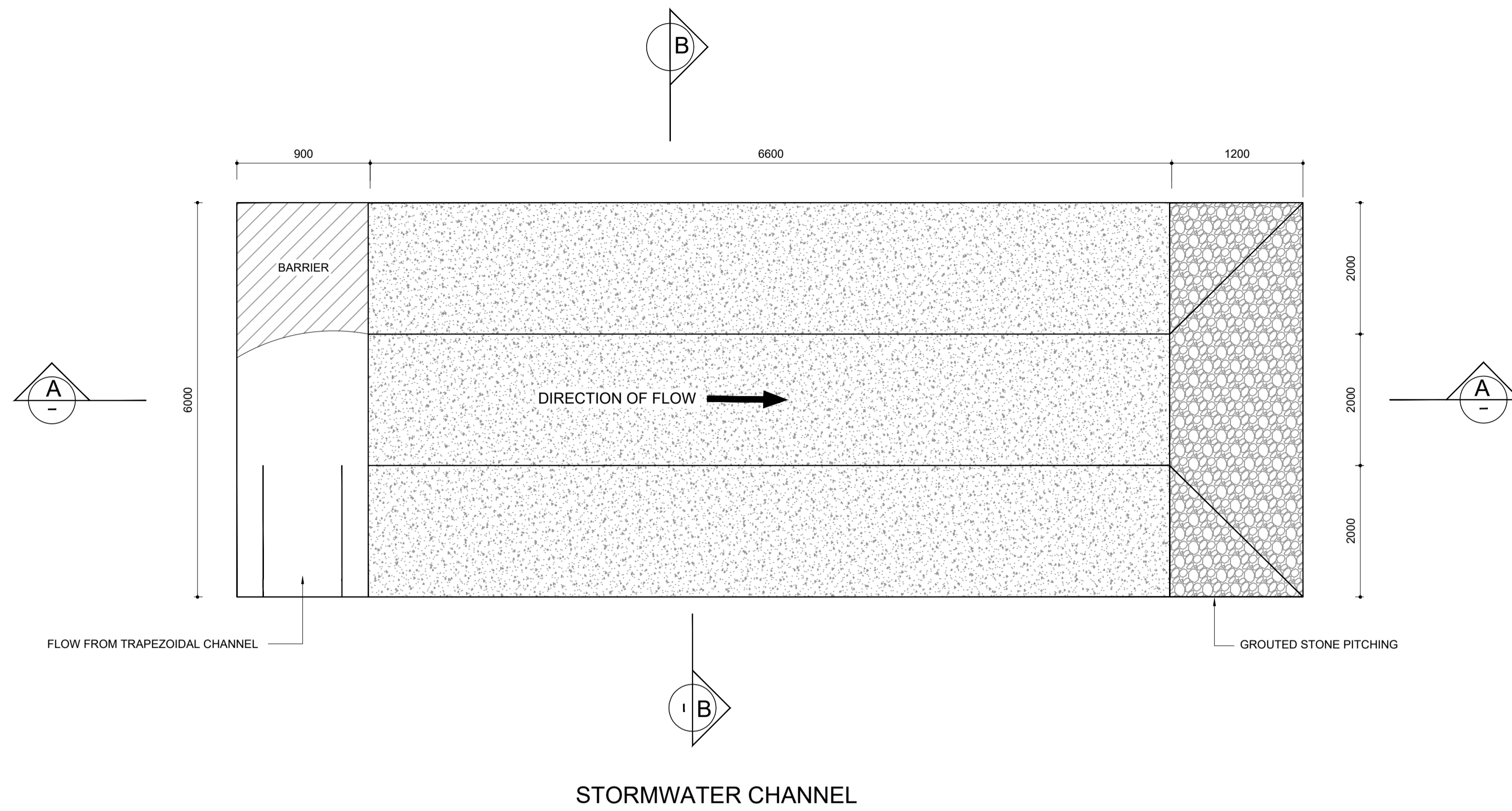
CONSULTANTS
DRAWING NUMBER
SH-1110-31-03-TD

SCALE
AS - SHOWN

REVISION No.
00

SHEET 1 of 1

DATE
JUNE 2023



TENDER

No	DATE	REVISION	CONSULT	DIR
00	JUNE 23	TENDER		

CLIENT

CITY OF MBOMBELA

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Tel.: (013) 752 3658 Fax.: (086) 545 7391

APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 VI

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION

TYPICAL DETAILS FOR STORMWATER CHANNEL FOR ROAD CROSSINGS

DESIGN PLAN (Full signature)

For: M.E.M.

For: Consulting Engineer

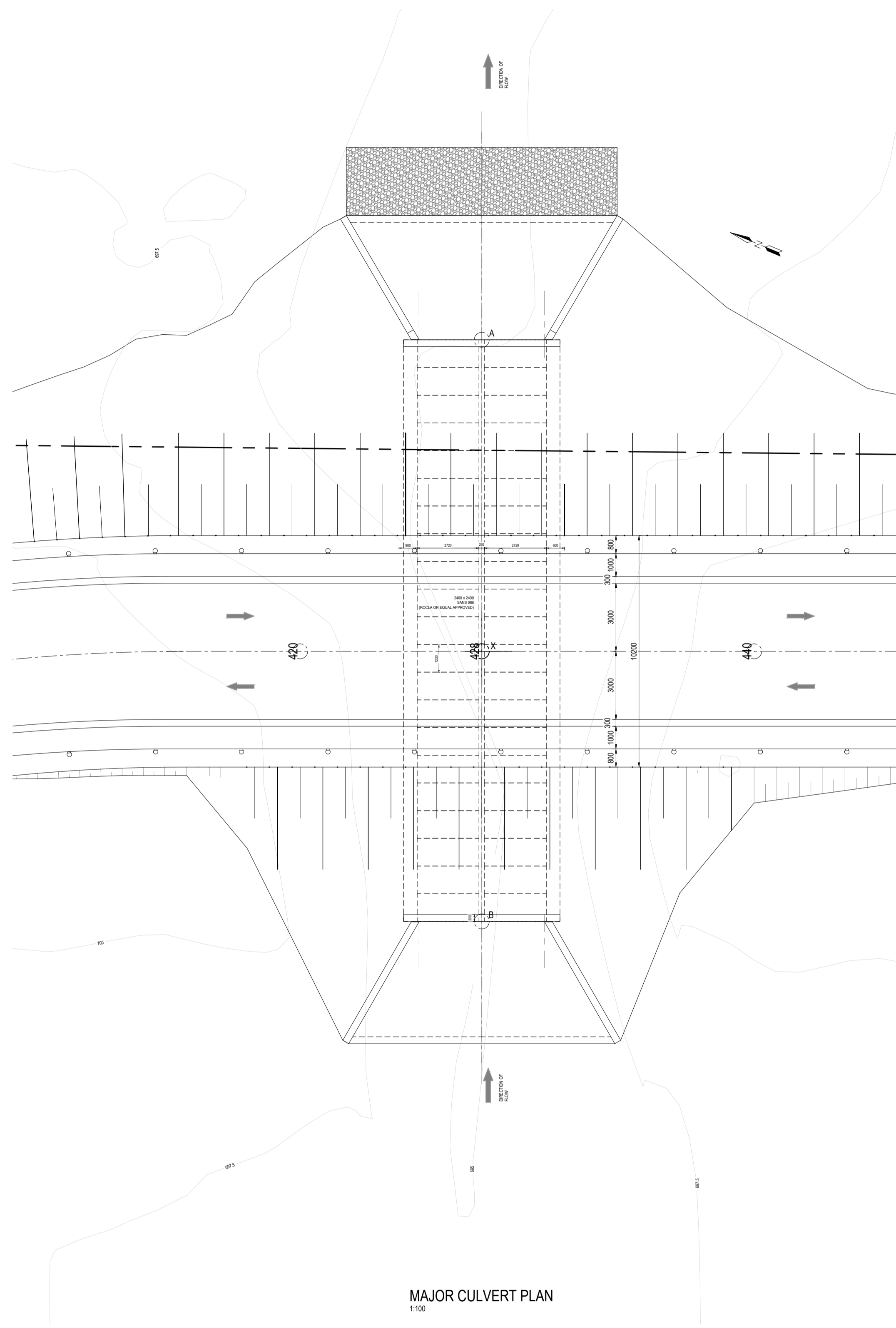
CONSULTANTS DRAWING NUMBER SH-1110-31-04-TD

SCALE AS - SHOWN

REVISION No. 00

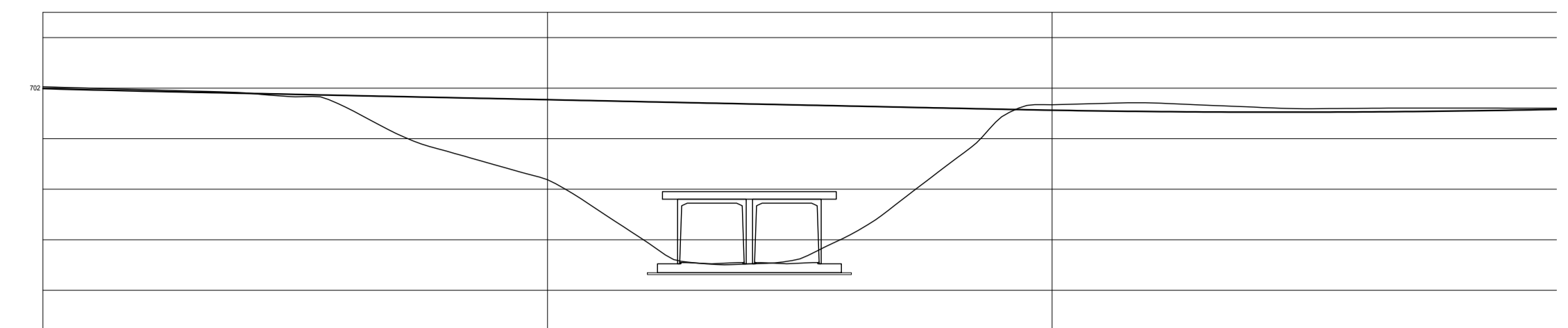
SHEET 1 of 1

DATE JUNE 2023



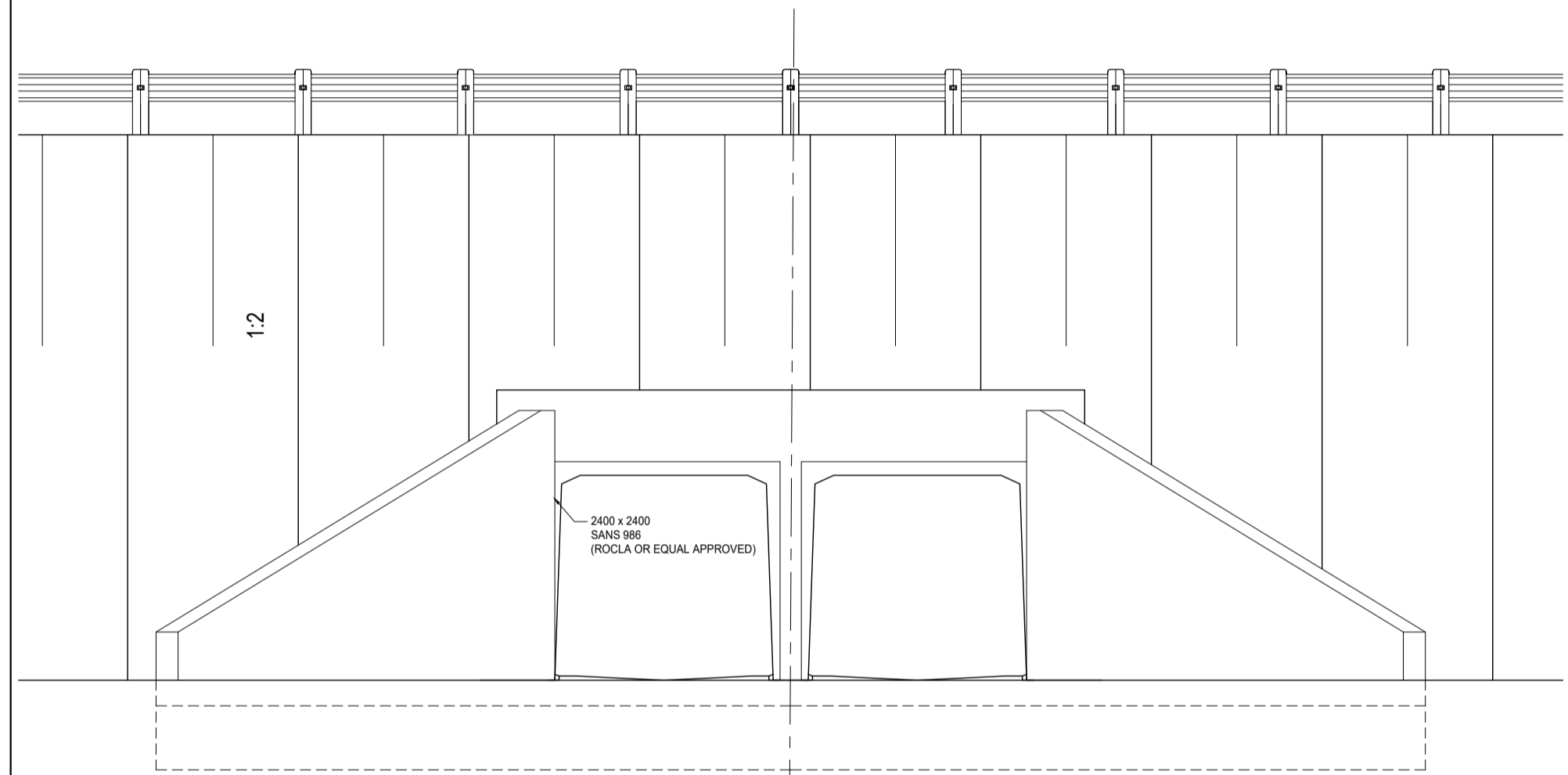
MAJOR CULVERT PLAN
1:100

POINT	CO-ORDINATES WGS84	Lo 29
	Y-COORD	X-COORD
A	-19299.895	2813925.344
X	-19287.406	2813931.023
B	-19278.573	2813935.949

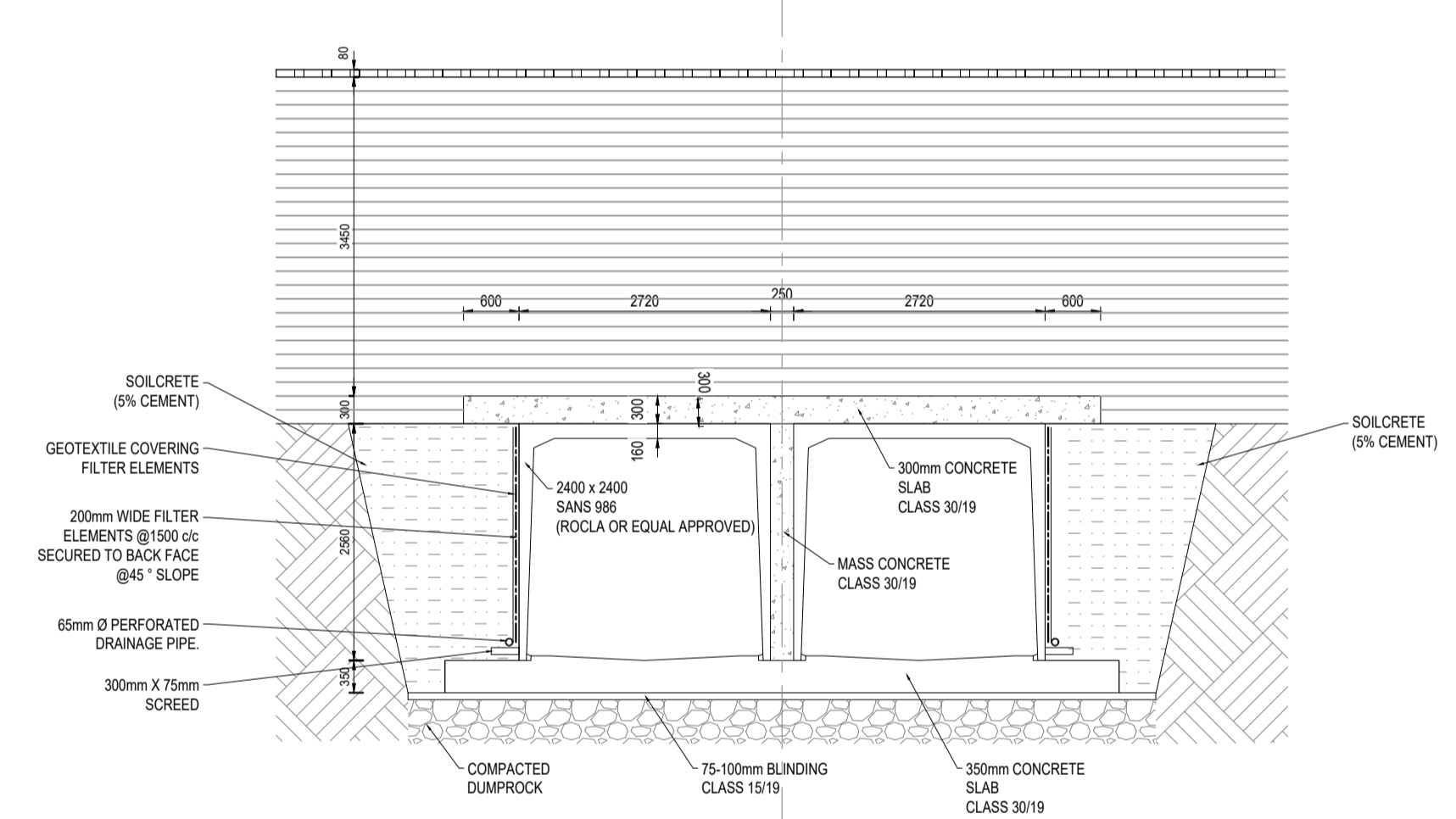


LONGITUDINAL SECTION AT BRIDGE LOCATION
1:50

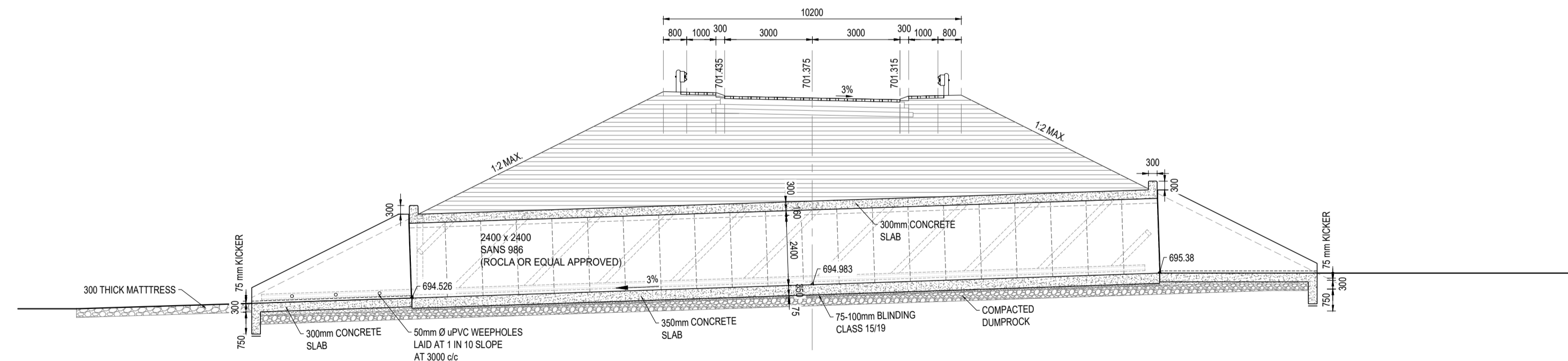
CL/ Peg Levels		Station	Level
Vertical Alignment	Design Road Levels	0+00	29.150
	Left Edge	0+00	29.150
	Centre Line	0+00	29.150
Grades	Vertical Curves	0+00	29.150
	Superelevation	0+00	29.150
Horizontal Curves	Horizontal Curves	0+00	29.150
	Chauges	0+00	29.150



INLET AND OUTLET ELEVATION
1:50



CROSS SECTION OF CULVERT
1:50



LONGITUDINAL SECTION ON C/L OF CULVERTS
1:100

NOTES:

CONSTRUCTION

- ALL EXPOSED CORNERS SHALL BE CHAMFERED 25 x 25
- CONCRETE COVER TO REINFORCEMENT - FLOOR SLAB & FOOTINGS = 50mm WINGWALLS = 40mm
- CONCRETE FINISH: CONCEALED SURFACES = F1 EXPOSED SURFACES = F2
- THIS DRAWING TO BE READ IN CONJUNCTION WITH THE COLTO STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS FOR STATE ROAD AUTHORITIES AS AMENDED TO DATE
- THE MAXIMUM SLOPE OF EARTHWORKS SURROUNDING A CULVERT INLET OR OUTLET SHALL BE 1:2

MATERIAL SPECIFICATION:

- INLET/OUTLET CONCRETE SLABS AND WINGWALLS - CLASS 25/19 FOUNDATION AND ROOF SLAB - CLASS 30/19 BLINDINGS - CLASS 15/19
- REINFORCEMENT (SABS 920 - 1985) YIELD STRENGTH TYPE: MILD STEEL BARS 250 MPa HIGH TENSILE STEEL BARS 450 MPa WELDED STEEL FABRIC 450 MPa

FOUNDING MATERIAL:

- FOUNDING LEVEL TO BE APPROVED BY THE ENGINEER ON SITE.

CONSTRUCTION

No	DATE	REVISION	CONSULT	DIR
0	JUNE 23	CONSTRUCTION		
A	MAY 23	DESIGN DEVELOPMENT		

CLIENT

CITY OF MBOMBELA

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DESIGNED BY
N R MATODZI
Pr Tech Eng: 2019300608

DRAWN BY
N R MATODZI
Pr Tech Eng: 2019300608

CHECKED BY
R. HALSTEAD
Pr Eng: 830202

APPROVED BY
R. HALSTEAD
Pr Eng: 830202

CONSULTANT

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APPROVED

MBOMBELA DATE

CONSULTING ENGINEER DATE

CONTRACT NUMBER : BID 213/2020 VI

PROJECT

UPGRADING OF KHEKHE TO PROVINCIAL ROAD (DANTJIE WARD 23)

DESCRIPTION

MAJOR CULVERT AT CH-428
CULVERTS LAYOUT AND DETAILS

DESIGN PLAN
(Full signature)

For: M.M.

CONSULTANTS
DRAWING NUMBER
SH-1110-100-02

SCALE
AS - SHOWN

REVISION No.
0

SHEET 1 of 1

DATE
JUNE 2023