

VOLUME 1



SENQU LOCAL MUNICIPALITY

PROJECT MANAGEMENT OFFICE

PROJECT NO. 30/2023-2024T

**FOR REHABILITATION OF ROADS & STORMWATER IN
MOKHESI WARD 8**

VOLUME 1

TENDER DRAWINGS

MARCH 2024

DRAWINGS COMPILED FOR:

THE MUNICIPAL MANAGER

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19 Murray Street
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DRAWINGS COMPILED BY:

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DRAWING LIST

<u>NO.</u>	<u>DESCRIPTION</u>	<u>DRAWING NO.</u>
<u>GENERAL PLANS</u>		
1.	COVER PAGE	
2.	DRAWING LIST	P-SM01-PMO-CE-M-00
3.	ROAD 9 & 10 GENERAL LAYOUT PLAN	P-SM01-PMO-CE-M-01
<u>ROAD LAYOUT PLAN AND LONGITUDINAL SECTIONS</u>		
4.	ROAD 9 LAYOUT AND LONGITUDINAL SECTION (SHEET 1 OF 2)	P-SM01-PMO-CE-M-02
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6.	ROAD 10 LAYOUT AND LONGITUDINAL SECTION (SHEET 1 OF 2)	P-SM01-PMO-CE-M-04
7.	ROAD 10 LAYOUT AND LONGITUDINAL SECTION (SHEET 2 OF 2)	P-SM01-PMO-CE-M-05
8.	ROAD 9 & 10 STORMWATER LAYOUT (SHEET 1 OF 2).....	P-SM01-PMO-CE-M-06
9.	ROAD 9 & 10 STORMWATER LAYOUT (SHEET 2 OF 2)	P-SM01-PMO-CE-M-07
10.	ROAD 9 STORMWATER LONGSECTION (SHEET 1 OF 3)	P-SM01-PMO-CE-M-08
11.	ROAD 9 STORMWATER LONGSECTION (SHEET 2 OF 3)	P-SM01-PMO-CE-M-09
12.	ROAD 9 STORMWATER LONGSECTION (SHEET 3 OF 3)	P-SM01-PMO-CE-M-10
<u>TYPICAL DRAWINGS</u>		
13.	KERB INLET SECTION	P-SM01-PMO-CE-M-100
14.	FIELD INLET DETAIL	P-SM01-PMO-CE-M-101
15.	KERB INLET TYPES	P-SM01-PMO-CE-M-102
16.	SLAB REINFORCEMENT.....	P-SM01-PMO-CE-M-103
17.	PIPE BEDDING	P-SM01-PMO-CE-M-104
18.	KERB APRON & SUPPORT DETAILS	P-SM01-PMO-CE-M-105
19.	JUNCTION BOX DETAIL	P-SM01-PMO-CE-M-106
20.	HEADWALL OR OUTLET DETAIL	P-SM01-PMO-CE-M-107
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21.	TYPICAL CROSS SECTION AND PAVEMENT DESIGN	P-SM01-PMO-CE-M-108
22.	STORMWATER CHANNEL SECTIONS	P-SM01-PMO-CE-M-109

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PROFESSIONAL ENGINEER:

L. MARAH
.....
PROF. Reg.No:
920281
.....
DATE:
2024-03-25
.....
SIGNATURE:
.....

DESIGN BY:

D. RWAZEMBA
.....
DRAWN BY:
D. RWAZEMBA
.....
CHECKED BY:
C. MARAH
.....
APPROVED BY:
L. MARAH
.....

REVISIONS

REV	DATE	DESCRIPTION	BY
0	2024-03-25	ISSUED FOR TENDER	L.M.

PROJECT NAME

**REHABILITATION OF ROADS & STORMWATER IN
MOKHESI WARD 8**

TITLE

DRAWING LIST

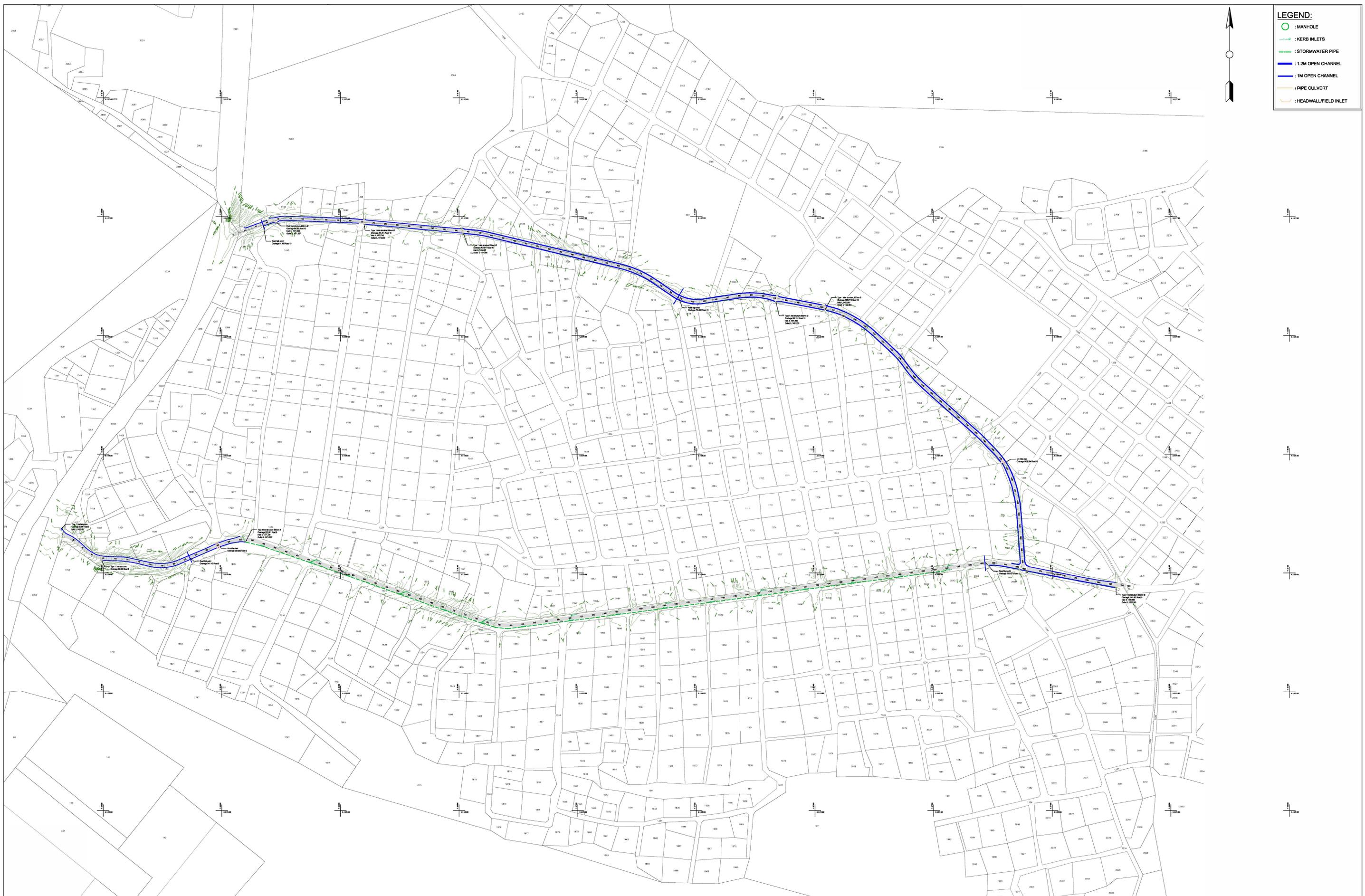
PROJECT STATUS:

TENDER

DATE	SCALE	SHEET	REV	A1
2024-03-25	N.T.S.	1 OF 1	0	A1

DWG NO

P-SM01-PMO-CE-M-00



LEGEND:

- : MANHOLE
- : KERB INLETS
- : STORMWATER PIPE
- : 1.2M OPEN CHANNEL
- : 1M OPEN CHANNEL
- : PIPE CULVERT
- : HEADWALL/FIELD INLET



CLIENT:



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PROFESSIONAL ENGINEER:
L. MARAH
PROF. Reg.No:
920281
DATE:
SIGNATURE:

DESIGN BY:
D. RWAZEMBA
DRAWN BY:
D. RWAZEMBA
CHECKED BY:
L. MARAH
APPROVED BY:
L. MARAH

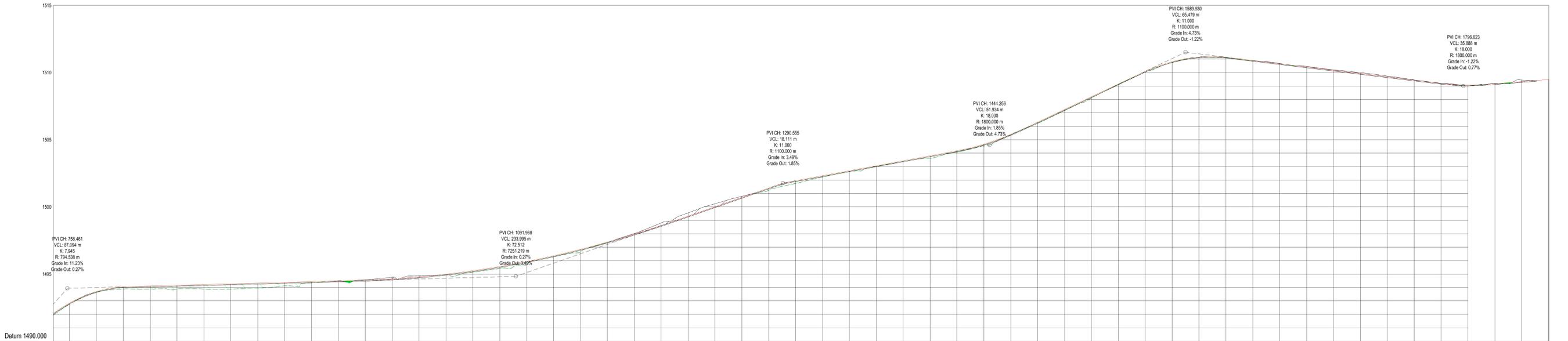
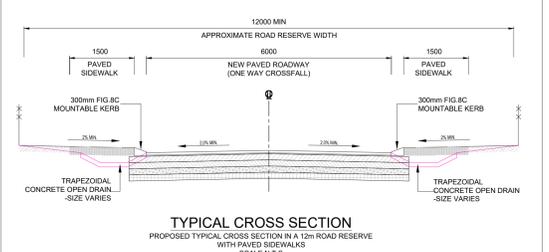
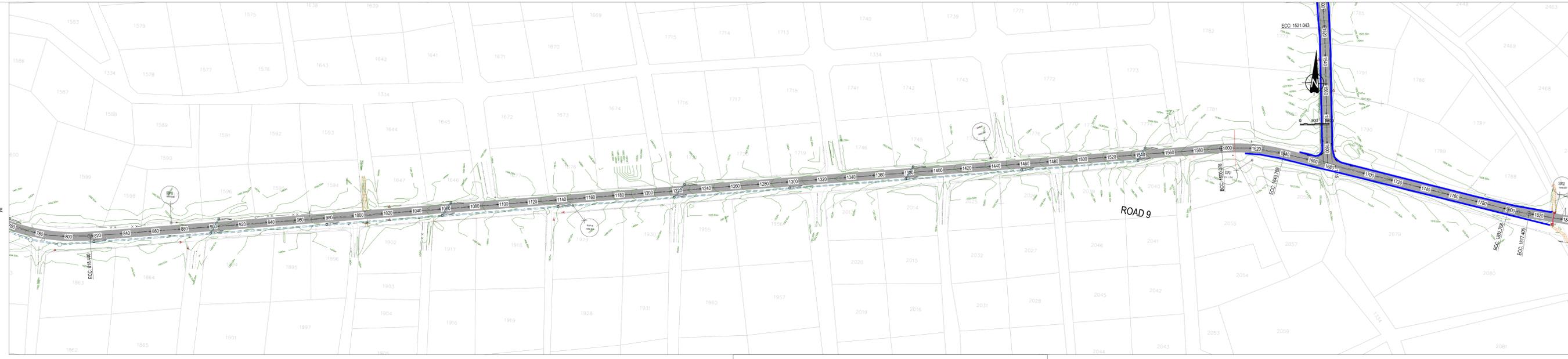
REVISIONS			
REV	DATE	DESCRIPTION	BY

PROJECT NAME:
REHABILITATION OF ROADS AND STORMWATER IN MOKHESI -
WARD 8
TITLE:
ROAD 9 & 10 GENERAL LAYOUT

PROJECT STATUS:
TENDER
DATE: 2024-03-25
SCALE: N.T.S.
SHEET: 1 OF 1
REV: A
A1
DWG NO: P-SM01-PMO-CE-M-01

- LEGEND**
- CENTRELINE
 - ⊙ ESKOMTELKOM POLE
 - EXISTING POWER LINE
 - 2% ROAD CROSS FALL
 - STORMWATER CHANNEL
 - MAN-HOLE
 - ⊙ EXISTING TREE
 - CULVERT
 - EXISTING TARMAC SURFACE

- ABBREVIATIONS**
- N.G.L. NATURAL GROUND LEVEL
 - CL CENTRELINE
 - m METERS (UNIT)
 - HL LEFT HAND
 - HR RIGHT HAND
 - BCC BEGINNING OF CURVE CENTRELINE
 - ECC END OF CURVE CENTRELINE
 - BVC BEGINNING OF VERTICAL CURVE
 - EVC END OF VERTICAL CURVE
 - R RADIUS
 - CH CHAINAGE
 - PI POINT OF INTERSECTION



VERTICAL PROFILE GRADES		FINAL DESIGN ROAD LEVELS		GROUND LEVELS ON CL		CUT / FILL		HORIZONTAL ALIGNMENT		DISTANCE (m)	
LEFT EDGE (HL)	CENTRE LINE (CL)	RIGHT EDGE (HR)									
1492.017	1492.017	1492.017	0.13%	1492.017	1492.017	0.107	1492.017	1492.017	287.190	1492.017	780
1492.775	1492.775	1492.775	0.07%	1492.775	1492.775	0.107	1492.775	1492.775	1492.775	1492.775	780
1493.534	1493.534	1493.534	0.03%	1493.534	1493.534	0.074	1493.534	1493.534	1493.534	1493.534	800
1493.990	1493.990	1493.990	0.03%	1493.990	1493.990	0.163	1493.990	1493.990	1493.990	1493.990	800
1494.048	1494.048	1494.048	0.21%	1494.048	1494.048	0.21%	1494.048	1494.048	1494.048	1494.048	820
1494.100	1494.100	1494.100	0.27%	1494.100	1494.100	0.27%	1494.100	1494.100	1494.100	1494.100	840
1494.153	1494.153	1494.153	0.32%	1494.153	1494.153	0.32%	1494.153	1494.153	1494.153	1494.153	860
1494.207	1494.207	1494.207	0.38%	1494.207	1494.207	0.38%	1494.207	1494.207	1494.207	1494.207	880
1494.260	1494.260	1494.260	0.38%	1494.260	1494.260	0.38%	1494.260	1494.260	1494.260	1494.260	900
1494.314	1494.314	1494.314	0.39%	1494.314	1494.314	0.39%	1494.314	1494.314	1494.314	1494.314	920
1494.367	1494.367	1494.367	0.07%	1494.367	1494.367	0.07%	1494.367	1494.367	1494.367	1494.367	940
1494.420	1494.420	1494.420	-0.01%	1494.420	1494.420	-0.01%	1494.420	1494.420	1494.420	1494.420	960
1494.473	1494.473	1494.473	-0.08%	1494.473	1494.473	-0.08%	1494.473	1494.473	1494.473	1494.473	980
1494.526	1494.526	1494.526	-0.13%	1494.526	1494.526	-0.13%	1494.526	1494.526	1494.526	1494.526	1000
1494.579	1494.579	1494.579	-0.10%	1494.579	1494.579	-0.10%	1494.579	1494.579	1494.579	1494.579	1020
1494.632	1494.632	1494.632	-0.10%	1494.632	1494.632	-0.10%	1494.632	1494.632	1494.632	1494.632	1040
1494.685	1494.685	1494.685	0.04%	1494.685	1494.685	0.04%	1494.685	1494.685	1494.685	1494.685	1060
1494.738	1494.738	1494.738	0.10%	1494.738	1494.738	0.10%	1494.738	1494.738	1494.738	1494.738	1080
1494.791	1494.791	1494.791	0.17%	1494.791	1494.791	0.17%	1494.791	1494.791	1494.791	1494.791	1100
1494.844	1494.844	1494.844	0.25%	1494.844	1494.844	0.25%	1494.844	1494.844	1494.844	1494.844	1120
1494.897	1494.897	1494.897	0.16%	1494.897	1494.897	0.16%	1494.897	1494.897	1494.897	1494.897	1140
1494.950	1494.950	1494.950	-0.09%	1494.950	1494.950	-0.09%	1494.950	1494.950	1494.950	1494.950	1160
1495.003	1495.003	1495.003	-0.19%	1495.003	1495.003	-0.19%	1495.003	1495.003	1495.003	1495.003	1180
1495.056	1495.056	1495.056	-0.24%	1495.056	1495.056	-0.24%	1495.056	1495.056	1495.056	1495.056	1200
1495.109	1495.109	1495.109	-0.22%	1495.109	1495.109	-0.22%	1495.109	1495.109	1495.109	1495.109	1220
1495.162	1495.162	1495.162	-0.81%	1495.162	1495.162	-0.81%	1495.162	1495.162	1495.162	1495.162	1240
1495.215	1495.215	1495.215	0.16%	1495.215	1495.215	0.16%	1495.215	1495.215	1495.215	1495.215	1260
1495.268	1495.268	1495.268	0.20%	1495.268	1495.268	0.20%	1495.268	1495.268	1495.268	1495.268	1280
1495.321	1495.321	1495.321	0.25%	1495.321	1495.321	0.25%	1495.321	1495.321	1495.321	1495.321	1300
1495.374	1495.374	1495.374	0.09%	1495.374	1495.374	0.09%	1495.374	1495.374	1495.374	1495.374	1320
1495.427	1495.427	1495.427	0.05%	1495.427	1495.427	0.05%	1495.427	1495.427	1495.427	1495.427	1340
1495.480	1495.480	1495.480	0.09%	1495.480	1495.480	0.09%	1495.480	1495.480	1495.480	1495.480	1360
1495.533	1495.533	1495.533	0.02%	1495.533	1495.533	0.02%	1495.533	1495.533	1495.533	1495.533	1380
1495.586	1495.586	1495.586	0.02%	1495.586	1495.586	0.02%	1495.586	1495.586	1495.586	1495.586	1400
1495.639	1495.639	1495.639	0.17%	1495.639	1495.639	0.17%	1495.639	1495.639	1495.639	1495.639	1420
1495.692	1495.692	1495.692	0.08%	1495.692	1495.692	0.08%	1495.692	1495.692	1495.692	1495.692	1440
1495.745	1495.745	1495.745	0.07%	1495.745	1495.745	0.07%	1495.745	1495.745	1495.745	1495.745	1460
1495.798	1495.798	1495.798	0.02%	1495.798	1495.798	0.02%	1495.798	1495.798	1495.798	1495.798	1480
1495.851	1495.851	1495.851	0.07%	1495.851	1495.851	0.07%	1495.851	1495.851	1495.851	1495.851	1500
1495.904	1495.904	1495.904	0.08%	1495.904	1495.904	0.08%	1495.904	1495.904	1495.904	1495.904	1520
1495.957	1495.957	1495.957	0.09%	1495.957	1495.957	0.09%	1495.957	1495.957	1495.957	1495.957	1540
1496.010	1496.010	1496.010	0.09%	1496.010	1496.010	0.09%	1496.010	1496.010	1496.010	1496.010	1560
1496.063	1496.063	1496.063	0.05%	1496.063	1496.063	0.05%	1496.063	1496.063	1496.063	1496.063	1580
1496.116	1496.116	1496.116	0.05%	1496.116	1496.116	0.05%	1496.116	1496.116	1496.116	1496.116	1600
1496.169	1496.169	1496.169	0.00%	1496.169	1496.169	0.00%	1496.169	1496.169	1496.169	1496.169	1620
1496.222	1496.222	1496.222	0.01%	1496.222	1496.222	0.01%	1496.222	1496.222	1496.222	1496.222	1640
1496.275	1496.275	1496.275	-0.01%	1496.275	1496.275	-0.01%	1496.275	1496.275	1496.275	1496.275	1660
1496.328	1496.328	1496.328	-0.01%	1496.328	1496.328	-0.01%	1496.328	1496.328	1496.328	1496.328	1680
1496.381	1496.381	1496.381	-0.01%	1496.381	1496.381	-0.01%	1496.381	1496.381	1496.381	1496.381	1700
1496.434	1496.434	1496.434	-0.04%	1496.434	1496.434	-0.04%	1496.434	1496.434	1496.434	1496.434	1720
1496.487	1496.487	1496.487	-0.06%	1496.487	1496.487	-0.06%	1496.487	1496.487	1496.487	1496.487	1740
1496.540	1496.540	1496.540	-0.05%	1496.540	1496.540	-0.05%	1496.540	1496.540	1496.540	1496.540	1760
1496.593	1496.593	1496.593	-0.01%	1496.593	1496.593	-0.01%	1496.593	1496.593	1496.593	1496.593	1780
1496.646	1496.646	1496.646	-0.01%	1496.646	1496.646	-0.01%	1496.646	1496.646	1496.646	1496.646	1800
1496.699	1496.699	1496.699	-0.11%	1496.699	1496.699	-0.11%	1496.699	1496.699	1496.699	1496.699	1820
1496.752	1496.752	1496.752	0.01%	1496.752	1496.752	0.01%	1496.752	1496.752	1496.752	1496.752	1840
1496.805	1496.805	1496.805	0.01%	1496.805	1496.805	0.01%	1496.805	1496.805	1496.805	1496.805	1860
1496.858	1496.858	1496.858	0.01%	1496.858	1496.858	0.01%	1496.858	1496.858	1496.858	1496.858	1880
1496.911	1496.911	1496.911	0.01%	1496.911	1496.911	0.01%	1496.911	1496.911	1496.911	1496.911	1900
1496.964	1496.964	1496.964	0.01%	1496.964	1496.964	0.01%	1496.964	1496.964	1496.964	1496.964	1920
1497.017	1497.017	1497.017	0.01%	1497.017	1497.017	0.01%	1497.017	1497.017	1497.017	1497.017	1940
1497.070	1497.070	1497.070	0.01%	1497.070	1497.070	0.01%	1497.070	1497.070	1497.070	1497.070	1960
1497.123	1497.123	1497.123	0.01%	1497.123	1497.123	0.01%	1497.123	1497.123	1497.123	1497.123	1980
1497.176	1497.176	1497.176	0.01%	1497.176	1497.176	0.01%	1497.176	1497.176	1497.176	1497.176	2000

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Blenfontein
9301

PROFESSIONAL ENGINEER:
L. MARAH
PROF. Reg No: 920281
DATE: _____
SIGNATURE: _____

DESIGN BY: R. DHLIWAYO
DRAWN BY: R. DHLIWAYO
CHECKED BY: L. MARAH
APPROVED BY: L. MARAH

PROJECT NAME: REHABILITATION OF ROADS AND STORMWATER IN MOKHESI WARD 8
TITLE: ROAD 9 LONGSECTION

PROJECT STATUS: TENDER
DATE: 2024-03-25
SCALE: N.T.S
SHEET: 2 OF 2
REV: A
DWG NO: P-SM01-PMO-CE-M-03

LEGEND

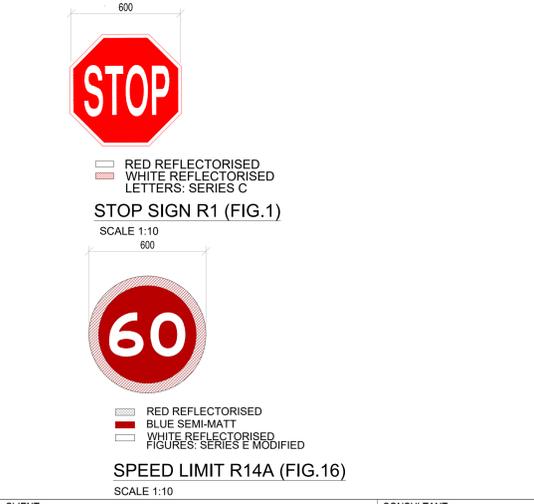
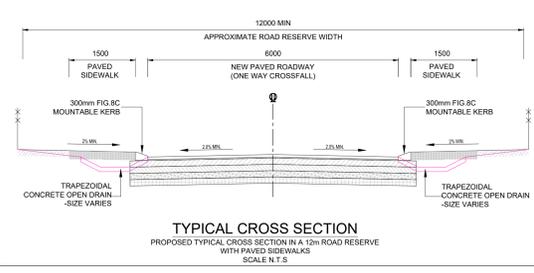
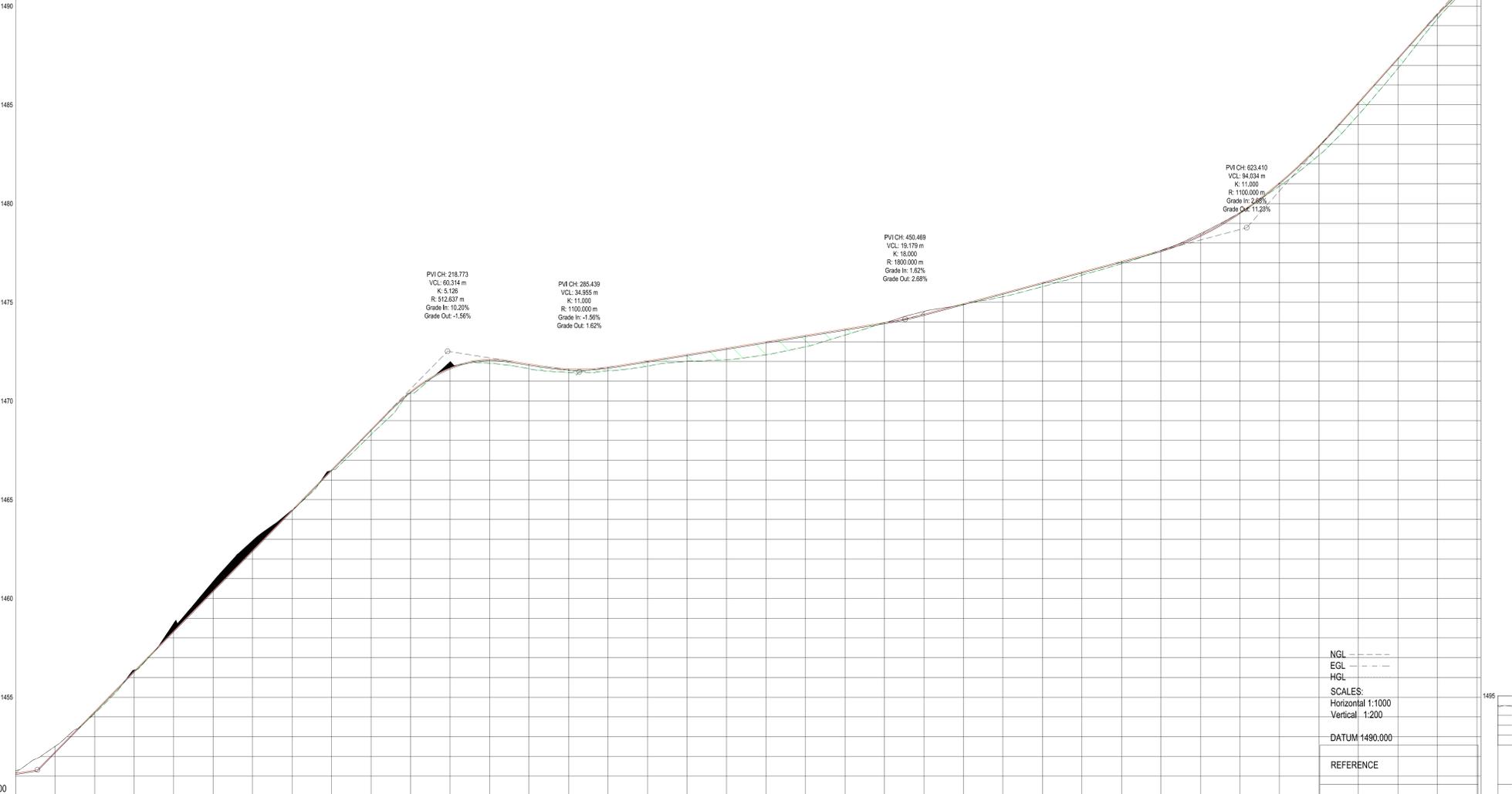
- CENTRELINE
- ESKOMTELKOM POLE
- EXISTING POWER LINE
- ROAD CROSS FALL
- STORMWATER CHANNEL
- MANHOLE
- EXISTING TREE
- CULVERT
- EXISTING TARMAC SURFACE

ABBREVIATIONS

- N.G.L. NATURAL GROUND LEVEL
- CL CENTRELINE
- m METERS (UNIT)
- L LEFT HAND
- R RIGHT HAND
- BCC BEGINNING OF CURVE CENTRELINE
- ECC END OF CURVE CENTRELINE
- BVC BEGINNING OF VERTICAL CURVE
- EVC END OF VERTICAL CURVE
- R RADIUS
- CH CHAINAGE
- PI POINT OF INTERSECTION

COORDINATE LIST

HARTEBEESSHOEK		WG27		
Name	Y Coord	X Coord	Z Coord	DESC.
SSP1	-35435.594	3378604.370	1457.668	12MMPAVE
SSP2	-35389.339	3378555.412	1457.812	12MMMC
SSP3	-35236.481	3378458.679	1461.556	12MMMC
SSP4	-35342.052	3378354.777	1448.761	12MMSTN
SSP5	-35159.407	3378214.416	1448.177	12MMSTN
SSP6	-35034.270	3378002.282	1450.713	12MMRS
SSP7	-34888.276	3377817.680	1476.458	HOLEC
SSP8	-35008.420	3378294.231	1475.151	10MM
SSP9	-34801.976	3378421.786	1479.384	12MMC
SSP10	-35553.802	3378547.790	1451.133	12MMRSB
SSP11	-35577.944	3378474.700	1445.550	12MMPAVE
SSP12	-35689.287	3378559.145	1436.743	12MMC
SSP13	-35773.249	3378344.171	1447.402	12MMC
SSP14	-35838.506	3378094.023	1461.586	12MMTAR
SSP15	-35722.022	3379232.822	1457.384	12MMTAR
SSP16	-36447.989	3378349.098	1472.239	HOLEC
SSP17	-36675.780	3378434.899	1478.598	12MMC
SSP18	-36657.789	3378474.986	1493.638	12MMC
SSP19	-37233.284	3378447.783	1496.879	12MMC
SSP20	-37518.953	3378399.642	1505.001	12MMC
SSP21	-37888.884	3378381.237	1511.792	HYPSTN
SSP22	-37888.983	3378416.255	1509.601	HOLEC
SSP23	-37867.372	3378169.029	1502.641	12MMC
SSP24	-37486.881	3377982.656	1496.488	12MMC
SSP25	-37243.989	3377941.633	1495.738	12MMC
SSP26	-37000.224	3377871.184	1488.137	12MMC
SSP27	-36782.329	3377823.322	1475.157	HOLEC
SSP28	-36486.211	3377804.635	1472.742	12MMC



FINAL DESIGN ROAD LEVELS	LEFT EDGE (HL)		CENTRE LINE (CL)	RIGHT EDGE (HR)	
	Level	Distance (m)		Level	Distance (m)
GROUND LEVELS ON CL	1451.288	0	1451.288	0	1451.288
CUT / FILL	-0.144	0	-0.144	0	-0.144
HORIZONTAL ALIGNMENT	CURVE 1: R=80.0m, I=304°39'30" CURVE 2: R=64.7m, I=292°31'10" CURVE 3: R=180.0m, I=278°37'50" CURVE 4: R=180.0m, I=265°04'40" CURVE 5: R=80.0m, I=257°42'50" CURVE 6: R=80.0m, I=273°24'20"				
DISTANCE (m)	20	40	60	80	100

CLIENT: 19 Murray Street, Lady Grey 9755. Tel: (051) 603 1449. Email: vanzyll@senqu.gov.za

CONSULTANT: THEWO & SMMS - JV. 58 Brebner Road, Westdene, Bloemfontein 9301.

PROFESSIONAL ENGINEER: L. MARAH. PROF. Reg.No: 920281. DATE: SIGNATURE:

DESIGN BY: R DHLIWAYO
DRAWN BY: R DHLIWAYO
CHECKED BY: L. MARAH
APPROVED BY: L. MARAH

REVISIONS

REV	DATE	DESCRIPTION	BY

PROJECT NAME: REHABILITATION OF ROADS AND STORMWATER IN MOKHESI WARD 8
TITLE: ROAD 10 LONGSECTION

PROJECT STATUS: TENDER

DATE: 2024-03-25
DWG NO: P-SM01-PMO-CE-M-04

SCALE: N.T.S. **SHEET:** 1 OF 2 **REV:** A **A1**

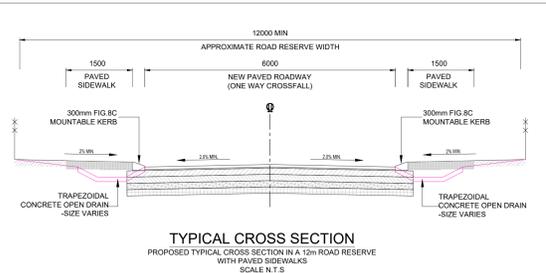
LEGEND

- CENTRELINE
- ⊙ ESKOMTELKOM POLE
- EXISTING POWER LINE
- ROAD CROSS FALL
- STORMWATER CHANNEL
- ⊙ MANHOLE
- ⊙ EXISTING TREE
- CULVERT
- EXISTING TARMAc SURFACE

ABBREVIATIONS

- N.G.L. NATURAL GROUND LEVEL
- CL CENTRELINE
- m METERS (UNIT)
- HL LEFT HAND
- HR RIGHT HAND
- BCC BEGINNING OF CURVE CENTRELINE
- EVC END OF CURVE CENTRELINE
- BVC BEGINNING OF VERTICAL CURVE
- EVC END OF VERTICAL CURVE
- R RADIUS
- CH CHAINAGE
- PI POINT OF INTERSECTION

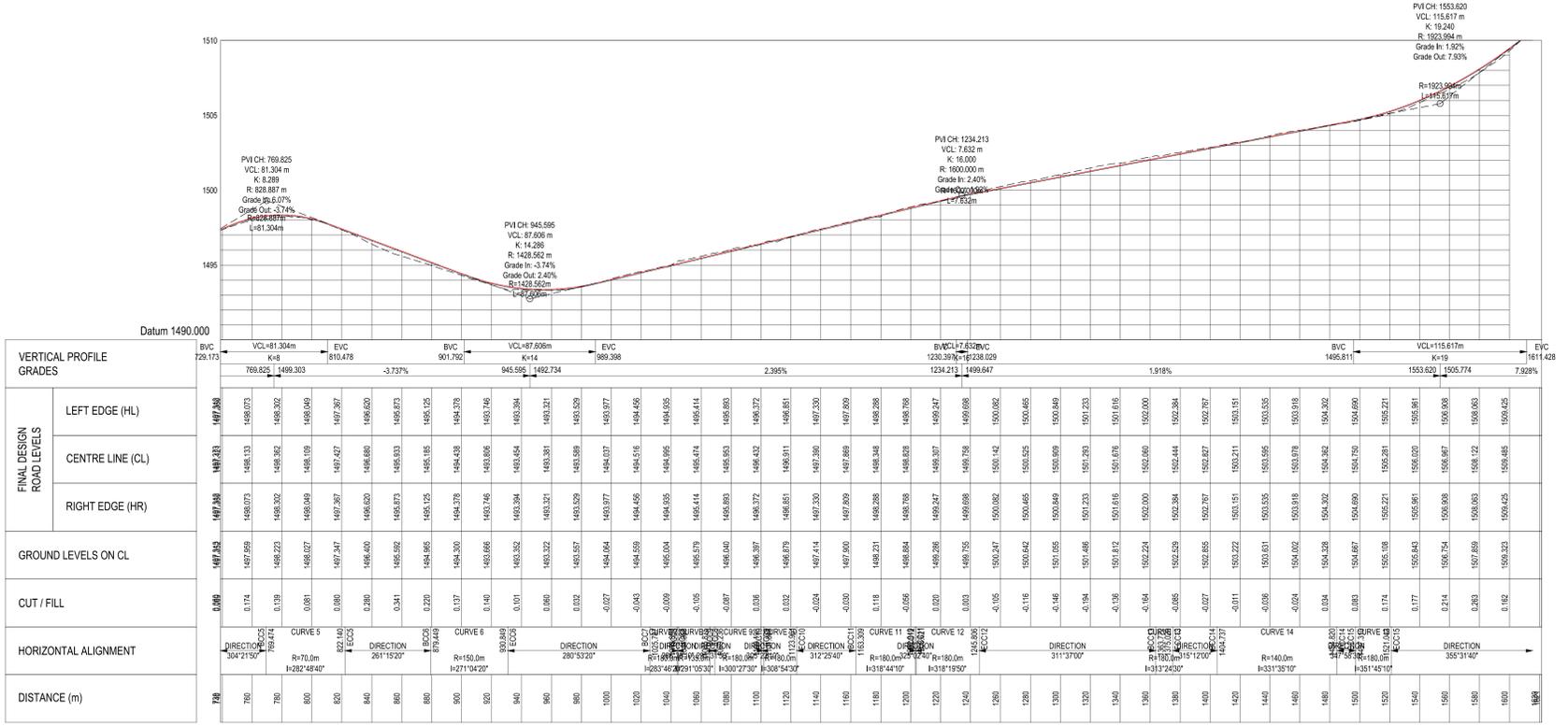
COORDINATE LIST				WG27
Name	Y Coord	X Coord	Z Coord	DESC.
SSP1	-35435.594	337864.370	1457.668	12MMPAVE
SSP2	-35388.328	3378555.412	1457.612	12MMC
SSP3	-35226.481	3378458.879	1461.556	12MMC
SSP4	-35142.052	3378354.777	1448.701	12MMBTN
SSP5	-35159.407	3378214.416	1448.777	12MMBTN
SSP6	-35034.270	3378002.282	1450.713	12MMRS
SSP7	-34986.276	3378177.680	1476.458	HOLEC
SSP8	-35008.420	3378564.231	1475.151	10MM
SSP9	-34811.976	3378421.786	1479.304	12MMC
SSP10	-35553.932	3378471.750	1451.133	12MMPAVE
SSP11	-35577.944	3378474.700	1445.550	12MMPAVE
SSP12	-35969.297	3378559.145	1436.743	12MMC
SSP13	-35773.248	3378344.171	1447.402	12MMC
SSP14	-35939.506	3378094.023	1461.586	12MMTAR
SSP15	-35722.022	3377823.822	1457.384	12MMTAR
SSP16	-36447.889	3378349.088	1472.239	HOLEC
SSP17	-36675.760	3378454.889	1478.588	12MMC
SSP18	-36957.798	3378471.986	1493.638	12MMC
SSP19	-37233.294	3378447.763	1498.879	12MMC
SSP20	-37518.853	3378398.642	1505.031	12MMC
SSP21	-37688.894	3378391.237	1511.792	HYPB7N
SSP22	-37908.893	3378418.255	1509.601	HOLEC
SSP23	-37667.372	3378168.929	1502.641	12MMC
SSP24	-37486.881	3377992.666	1496.488	12MMC
SSP25	-37243.988	3377941.633	1485.738	12MMC
SSP26	-37000.224	3377871.184	1488.137	12MMC
SSP27	-36762.329	3377823.322	1475.157	HOLEC
SSP28	-36468.211	3377804.835	1472.742	12MMC



STOP SIGN R1 (FIG.1)
SCALE 1:10

SPEED LIMIT R14A (FIG.16)
SCALE 1:10

- RED REFLECTORISED
- BLUE SEMI-MATT
- WHITE REFLECTORISED
- FIGURES: SERIES E MODIFIED



FINAL DESIGN ROAD LEVELS	VERTICAL PROFILE GRADES		
	LEFT EDGE (HL)	CENTRE LINE (CL)	RIGHT EDGE (HR)
1498.073	1498.073	1498.073	1498.073
1498.133	1498.133	1498.133	1498.133
1498.302	1498.302	1498.302	1498.302
1498.049	1498.049	1498.049	1498.049
1497.367	1497.367	1497.367	1497.367
1498.620	1498.620	1498.620	1498.620
1498.673	1498.673	1498.673	1498.673
1495.125	1495.125	1495.125	1495.125
1494.378	1494.378	1494.378	1494.378
1493.746	1493.746	1493.746	1493.746
1493.394	1493.394	1493.394	1493.394
1493.321	1493.321	1493.321	1493.321
1493.329	1493.329	1493.329	1493.329
1493.977	1493.977	1493.977	1493.977
1494.456	1494.456	1494.456	1494.456
1494.505	1494.505	1494.505	1494.505
1496.474	1496.474	1496.474	1496.474
1496.893	1496.893	1496.893	1496.893
1498.372	1498.372	1498.372	1498.372
1498.851	1498.851	1498.851	1498.851
1497.330	1497.330	1497.330	1497.330
1497.899	1497.899	1497.899	1497.899
1498.288	1498.288	1498.288	1498.288
1498.768	1498.768	1498.768	1498.768
1499.247	1499.247	1499.247	1499.247
1499.698	1499.698	1499.698	1499.698
1500.142	1500.142	1500.142	1500.142
1500.465	1500.465	1500.465	1500.465
1500.849	1500.849	1500.849	1500.849
1501.233	1501.233	1501.233	1501.233
1501.616	1501.616	1501.616	1501.616
1502.000	1502.000	1502.000	1502.000
1502.384	1502.384	1502.384	1502.384
1502.767	1502.767	1502.767	1502.767
1503.151	1503.151	1503.151	1503.151
1503.535	1503.535	1503.535	1503.535
1503.918	1503.918	1503.918	1503.918
1504.302	1504.302	1504.302	1504.302
1504.686	1504.686	1504.686	1504.686
1505.069	1505.069	1505.069	1505.069
1505.453	1505.453	1505.453	1505.453
1505.837	1505.837	1505.837	1505.837
1506.221	1506.221	1506.221	1506.221
1506.605	1506.605	1506.605	1506.605
1506.989	1506.989	1506.989	1506.989
1507.373	1507.373	1507.373	1507.373
1507.757	1507.757	1507.757	1507.757
1508.141	1508.141	1508.141	1508.141
1508.525	1508.525	1508.525	1508.525

<p>CLIENT:</p> <p>19 Murray Street Lady Grey 9755</p> <p>Tel: (051) 603 1449 Email: vanzyl@senqu.gov.za</p>	<p>CONSULTANT:</p> <p>THEWO & SMMS - JV</p> <p>58 Brebner Road Westdene Bloemfontein 9301</p>	<p>PROFESSIONAL ENGINEER:</p> <p>L. MARAH</p> <p>PROF. Reg.No: 920281</p> <p>DATE:</p> <p>SIGNATURE:</p>	<p>DESIGN BY:</p> <p>R.DHLIWAYO</p> <p>DRAWN BY:</p> <p>R.DHLIWAYO</p> <p>CHECKED BY:</p> <p>L. MARAH</p> <p>APPROVED BY:</p> <p>L. MARAH</p>	<p>REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	REV	DATE	DESCRIPTION	BY													<p>PROJECT NAME:</p> <p>REHABILITATION OF ROADS AND STORMWATER IN MOKHESI WARD</p> <p>8</p> <p>TITLE:</p> <p>ROAD 10 LONGSECTION</p>	<p>PROJECT STATUS:</p> <p>TENDER</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DATE</th> <th>SCALE</th> <th>SHEET</th> <th>REV</th> <th>A1</th> </tr> </thead> <tbody> <tr> <td>2024-03-25</td> <td>N.T.S</td> <td>2 OF 2</td> <td>A</td> <td>A1</td> </tr> </tbody> </table> <p>DWG NO</p> <p>P-SM01-PMO-CE-M-05</p>	DATE	SCALE	SHEET	REV	A1	2024-03-25	N.T.S	2 OF 2	A	A1
REV	DATE	DESCRIPTION	BY																													
DATE	SCALE	SHEET	REV	A1																												
2024-03-25	N.T.S	2 OF 2	A	A1																												

LEGEND:

-  : MANHOLE
-  : KERB INLETS
-  : STORMWATER PIPE
-  : 1.2M OPEN CHANNEL
-  : 1M OPEN CHANNEL
-  : PIPE CULVERT
-  : HEADWALL INLET



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Sigodi Marah Martin
Management Support
Development & Engineering Consultants

PROFESSIONAL ENGINEER:
L. MARAH
Prof. Reg.No:
920281

DATE:

SIGNATURE:

DESIGN BY:
D RWAZEMBA

DRAWN BY:
D RWAZEMBA

CHECKED BY:
L. MARAH

APPROVED BY:
L. MARAH

REVISIONS			
REV	DATE	DESCRIPTION	BY

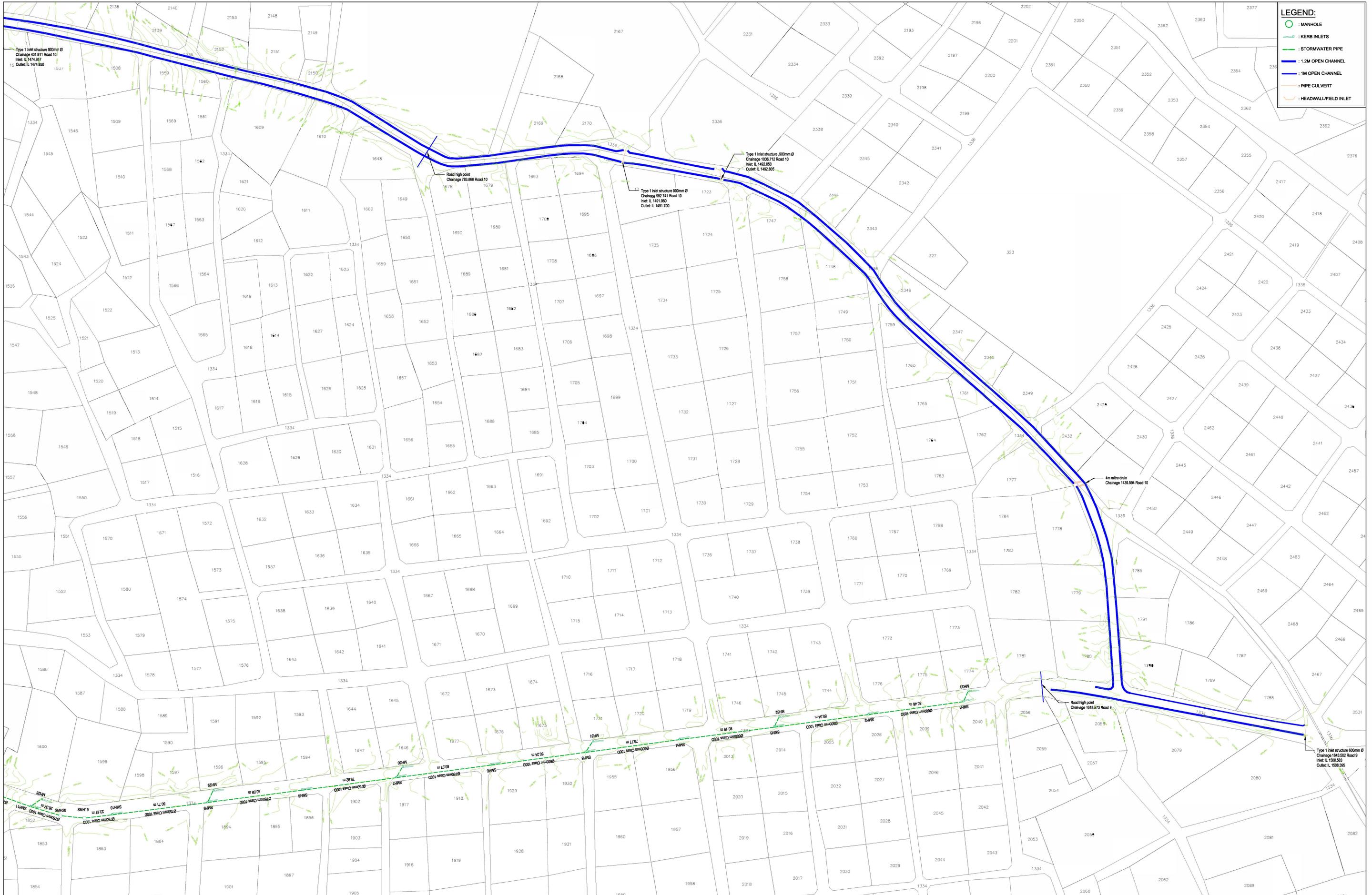
PROJECT NAME:
REHABILITATION OF ROADS AND STORMWATER IN MOKHESI - WARD 8

TITLE:
ROAD 9 & 10 STORMWATER LAYOUT

PROJECT STATUS:
TENDER

DATE 2024-03-25	SCALE N.T.S	SHEET 1 OF 2	REV A	A0
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DWG NO
P-SM01-PMO-CE-M-06



LEGEND:

- : MANHOLE
- : KERB INLETS
- : STORMWATER PIPE
- : 1.2M OPEN CHANNEL
- : 1M OPEN CHANNEL
- : PIPE CULVERT
- : HEADWALL/FIELD INLET

CLIENT:
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PROFESSIONAL ENGINEER:
 L. MARAH
 PROF. Reg.No:
 920281
 DATE:
 SIGNATURE:

DESIGN BY:
 D. RWAZEMBA
DRAWN BY:
 D. RWAZEMBA
CHECKED BY:
 L. MARAH
APPROVED BY:
 L. MARAH

REVISIONS			
REV	DATE	DESCRIPTION	BY

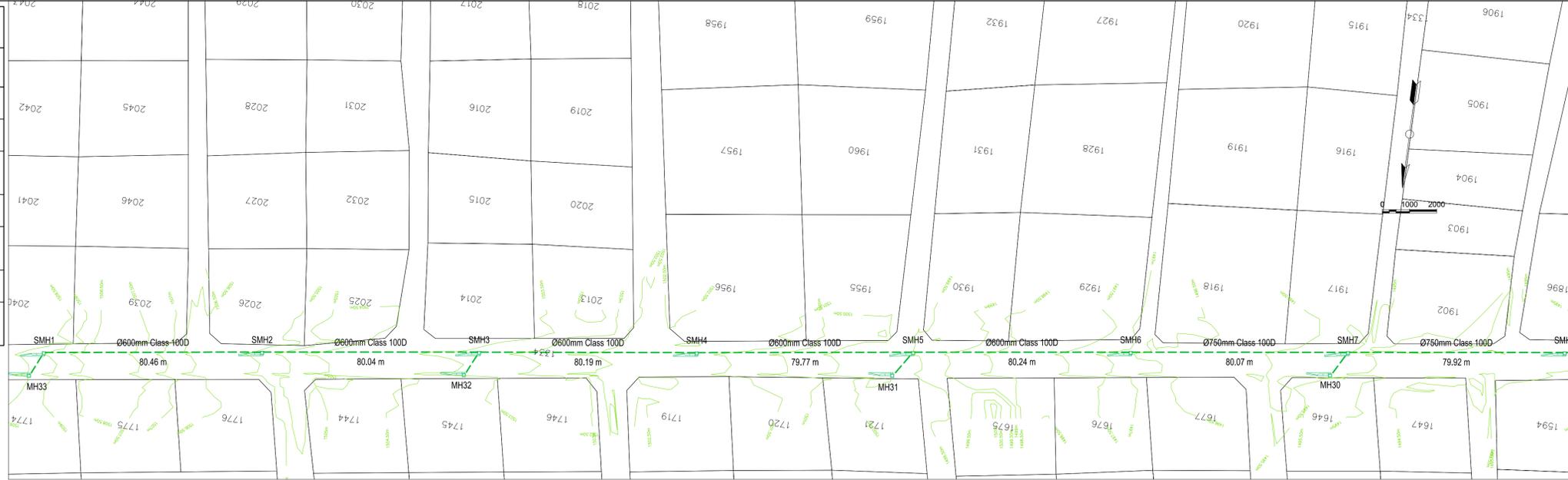
PROJECT NAME:
 REHABILITATION OF ROADS AND STORMWATER IN MOKHESI -
 WARD 8
TITLE:
 ROAD 9 & 10 STORMWATER LAYOUT

PROJECT STATUS:
TENDER

DATE	SCALE	SHEET	REV
2024-03-25	N.T.S	2 OF 2	A

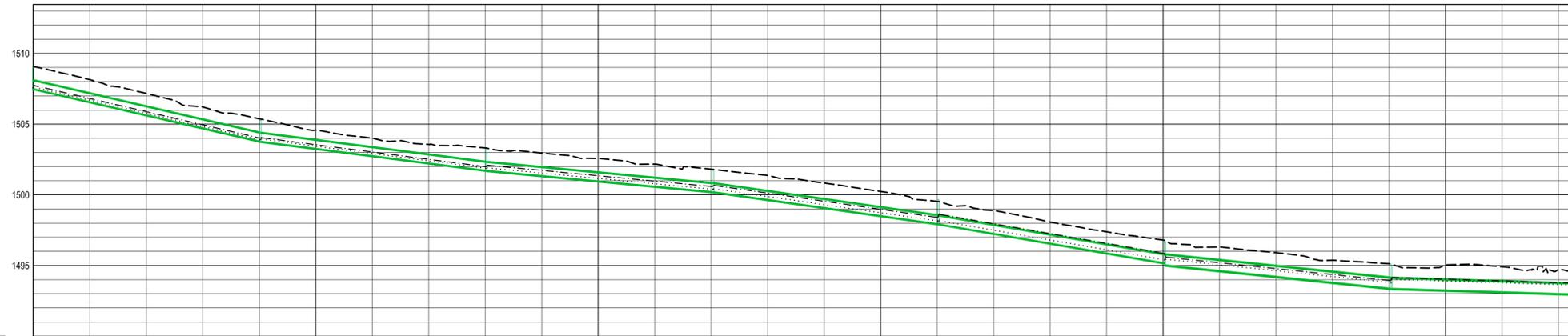
DWG NO: P-SM01-PMO-CE-M-07

STRUCTURE LIST-Network1				
STRUCTURE NAME	Y	X	INVERT ELEVATION	MATERIAL
SMH1	-37 620.473	3 378 396.086	P21-INV IN 1507.502 SWP10-INV OUT 1507.502	Concrete Concrete
SMH2	-37 540.749	3 378 406.921	SWP10-INV IN 1503.777 SWP13-INV OUT 1503.777	Concrete Concrete
SMH3	-37 461.411	3 378 417.508	SWP13-INV IN 1501.719 P20-INV IN 1501.719 SWP4-INV OUT 1501.719	Concrete Concrete Concrete
SMH4	-37 381.907	3 378 427.959	SWP4-INV IN 1500.212 SWP14-INV OUT 1500.212	Concrete Concrete
SMH5	-37 302.865	3 378 438.701	SWP14-INV IN 1497.941 P19-INV IN 1497.941 SWP15-INV OUT 1497.941	Concrete Concrete Concrete
SMH6	-37 223.339	3 378 449.367	SWP15-INV IN 1495.170 SWP5-INV OUT 1495.036	Concrete Concrete
SMH7	-37 143.963	3 378 459.916	SWP5-INV IN 1493.378 P18-INV IN 1493.512 SWP6-INV OUT 1493.378	Concrete Concrete Concrete



LEGEND:	
	: MANHOLE
	: KERB INLETS
	: STORMWATER PIPE
	: 1.2M OPEN CHANNEL
	: 1M OPEN CHANNEL
	: PIPE CULVERT
	: HEADWALL/FIELD INLET

NGL - - - - -
 EGL - - - - -
 HGL - - - - -
 SCALES:
 Horizontal 1:1000
 Vertical 1:200
 DATUM 1490.000



REFERENCE	DISTANCE (m)	GROUND LEVEL	PIPE INVERT LEVEL	SLOPE / LENGTH	DESIGN Q(m ³ /s)	MAX. (0.8D) Q(m ³ /s)
SMH1	0.000	1509.086	1507.502	4.63%	0.05	1.6
Ø600 100D				1.21%	1.6	4.5
SMH2	80.467	1505.361	1503.777	2.57%	0.09	3.4
Ø600 100D				1.38%	1.5	4.5
SMH3	160.488	1503.303	1501.719	1.88%	0.14	2.9
Ø600 100D				1.53%	1.9	4.5
SMH4	240.686	1501.736	1500.212	2.85%	0.20	3.6
Ø600 100D				1.35%	2.2	4.5
SMH5	320.454	1499.525	1497.941	3.45%	0.30	3.9
Ø600 100D				1.29%	3.0	4.5
SMH6	400.693	1496.754	1495.170	2.07%	0.40	3.5
Ø750 100D				1.48%	1.7	4.5
SMH7	480.767	1495.096	1493.378	0.62%	0.56	1.9
Ø750 100D				1.16%	1.6	4.5
SMH8	560.883	1492.883	1492.883			

LONGSECTION ALIGNMENT 01
FROM 0.000 TO 544.171

CLIENT:

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PROFESSIONAL ENGINEER:

L. MARAH
 PROF. Reg.No:
 920281
 DATE:
 SIGNATURE:

DESIGN BY: D. RWAZEMBA
 DRAWN BY: D. RWAZEMBA
 CHECKED BY: L. MARAH
 APPROVED BY: L. MARAH

REVISIONS		
REV	DATE	DESCRIPTION

PROJECT NAME: REHABILITATION OF ROADS AND STORMWATER IN MOKHESI - WARD 8

TITLE: ROAD 9 STORMWATER LONGSECTION

PROJECT STATUS: TENDER

DATE	SCALE	SHEET	REV	A1
2024-03-25	N.T.S	1 OF 3	A	

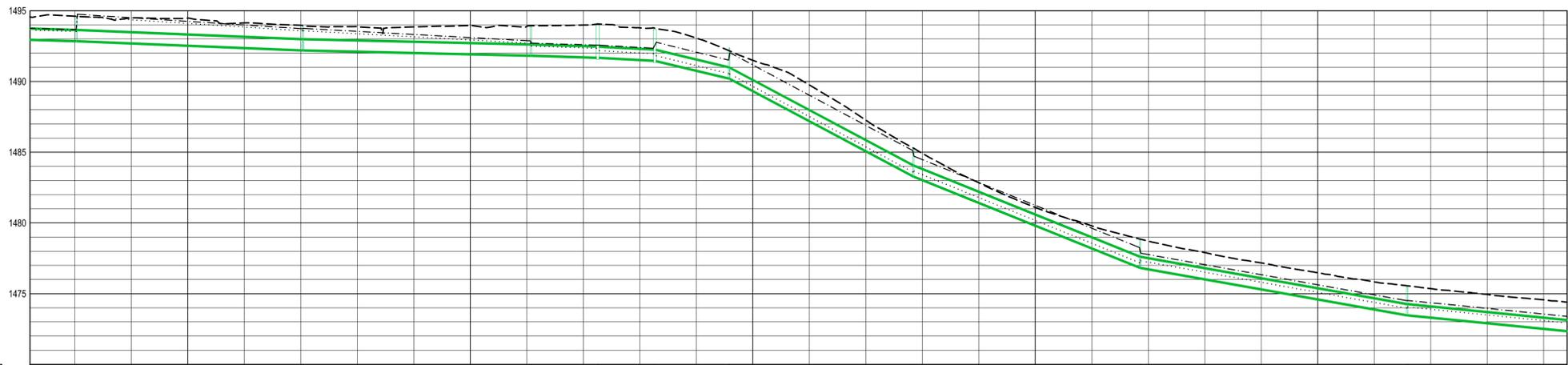
DWG NO: P-SM01-PMO-CE-M-08

STRUCTURE LIST-Network1				
STRUCTURE NAME	Y	X	INVERT ELEVATION	MATERIAL
SMH8	-37 064.745	3 378 470.457	SWP6-INV IN 1492.883 SWP7-INV OUT 1492.883	Concrete Concrete
SMH9	-36 985.329	3 378 480.768	SWP7-INV IN 1492.230 P17-INV IN 1492.237 SWP17-INV OUT 1492.230	Concrete Concrete Concrete
SMH10	-36 905.265	3 378 490.982	SWP17-INV IN 1491.856 SWP1-INV OUT 1491.856	Concrete Concrete
SMH11	-36 836.460	3 378 484.096	SWP11-INV IN 1490.235 P16-INV IN 1490.235 SWP12-INV OUT 1490.235	Concrete Concrete Concrete
SMH12	-36 774.905	3 378 462.577	SWP12-INV IN 1483.312 SWP18-INV OUT 1483.312	Concrete Concrete
SMH13	-36 699.340	3 378 435.554	SWP18-INV IN 1476.859 P15-INV IN 1476.859 SWP16-INV OUT 1476.859	Concrete Concrete Concrete
SMH14	-36 610.179	3 378 404.105	SWP16-INV IN 1473.507 SWP8-INV OUT 1473.507	Concrete Concrete
SMH19	-36 881.759	3 378 493.791	SWP1-INV IN 1491.706 SWP2-INV OUT 1491.706	Concrete Concrete
SMH20	-36 861.694	3 378 491.744	SWP2-INV IN 1491.493 SWP11-INV OUT 1491.493	Concrete Concrete



LEGEND:	
	: MANHOLE
	: KERB INLETS
	: STORMWATER PIPE
	: 1.2M OPEN CHANNEL
	: 1M OPEN CHANNEL
	: PIPE CULVERT
	: HEADWALL/FIELD INLET

NGL -----
 EGL -----
 HGL -----
 SCALES:
 Horizontal 1:1000
 Vertical 1:200
 DATUM 1470.000



REFERENCE	Ø750 100D SMH8	Ø750 100D SMH9	Ø750 100D SMH10	Ø750 100D SMH11	Ø750 100D SMH12	Ø750 100D SMH13	Ø750 100D SMH14	Ø750 100D SMH15	
DISTANCE (m)	560.683	640.765	721.479	745.152	765.921	777	836.960	1031.676	
GROUND LEVEL	1494.601	1493.948	1493.936	1494.058	1493.769	1492.392	1485.289	1475.560	
PIPE INVERT LEVEL	1492.883 1492.883	1492.230 1492.230	1491.856 1491.856	1491.706 1491.706	1491.493 1491.493	1490.235 1490.235	1485.312 1483.312	1476.859 1473.507	
SLOPE / LENGTH	0.62% 1:161.4 79.92m	0.81% 1:122.8 80.08m	0.46% 1:215.7 80.71m	0.63% 1:158.3 23.67m	1.06% 1:94.4 20.17m	4.77% 1:21.0 26.37m	10.62% 1:9.4 65.21m	8.04% 1:12.4 80.25m	3.55% 1:28.2 94.55m
HYDRAULICS	DESIGN Q(m ³ /s) V(m/s)	0.56 1.6	0.64 1.7	0.72 1.8	0.78 2.1	0.77 2.8	0.76 4.3	0.82 5.4	0.86 4.6
	MAX. (0.8D) Q(m ³ /s) V(m/s)	0.66 1.9	0.76 2.2	0.57 1.6	0.67 1.9	0.86 2.5	1.83 5.3	2.74 7.9	3.2 6.9

LONGSECTION ALIGNMENT 01
 FROM 544.171 TO 1088.342

CLIENT:

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PROFESSIONAL ENGINEER:
 L. MARAH
 PROF. Reg.No:
 920291
 DATE:
 SIGNATURE:

DESIGN BY:
 D. RWAZEMBA
 DRAWN BY:
 D. RWAZEMBA
 CHECKED BY:
 L. MARAH
 APPROVED BY:
 L. MARAH

REVISIONS

REV	DATE	DESCRIPTION	BY

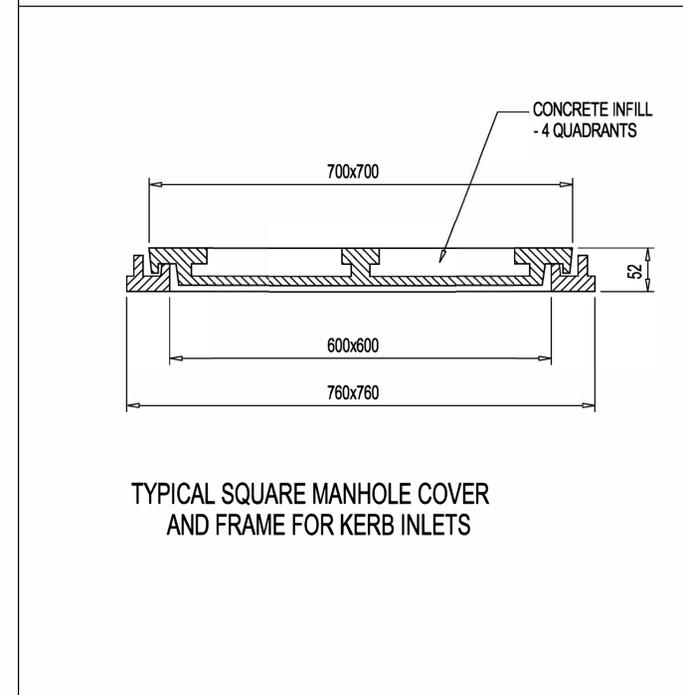
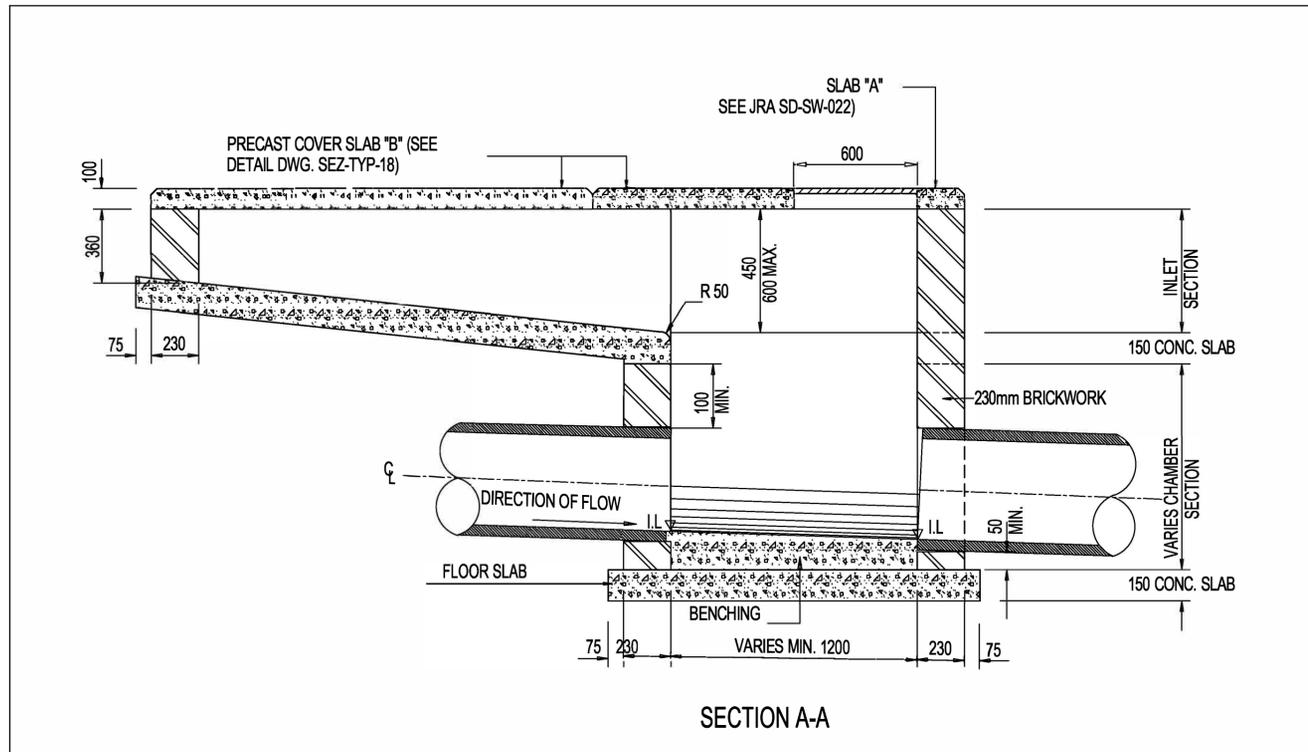
PROJECT NAME
REHABILITATION OF ROADS AND STORMWATER IN MOKHESI - WARD 8

TITLE
ROAD 9 STORMWATER LONGSECTION

PROJECT STATUS:
TENDER

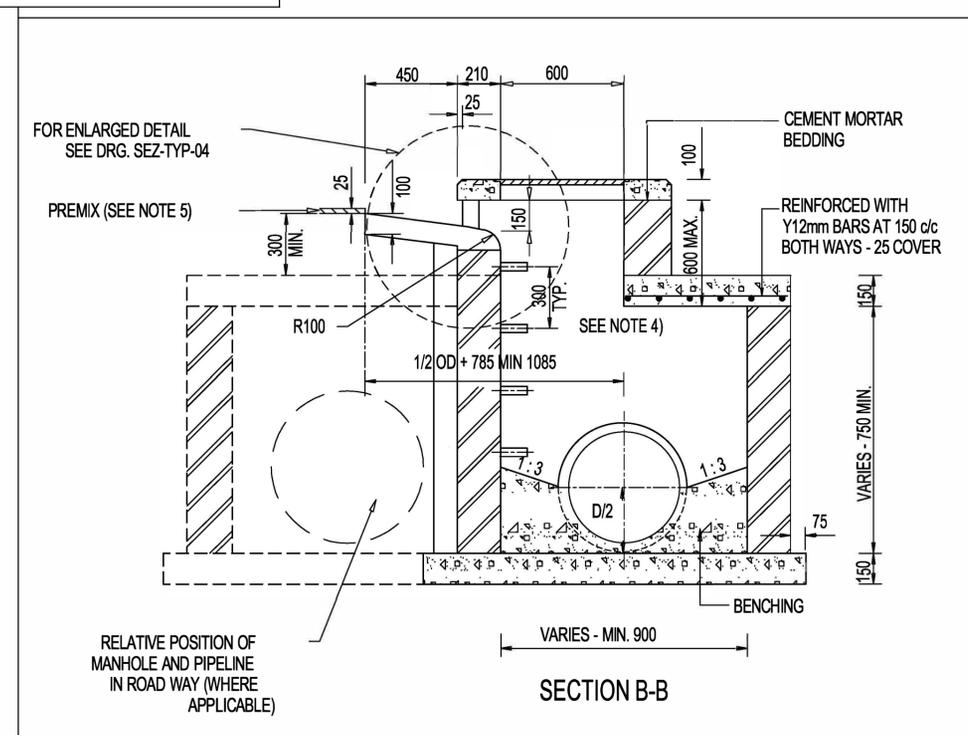
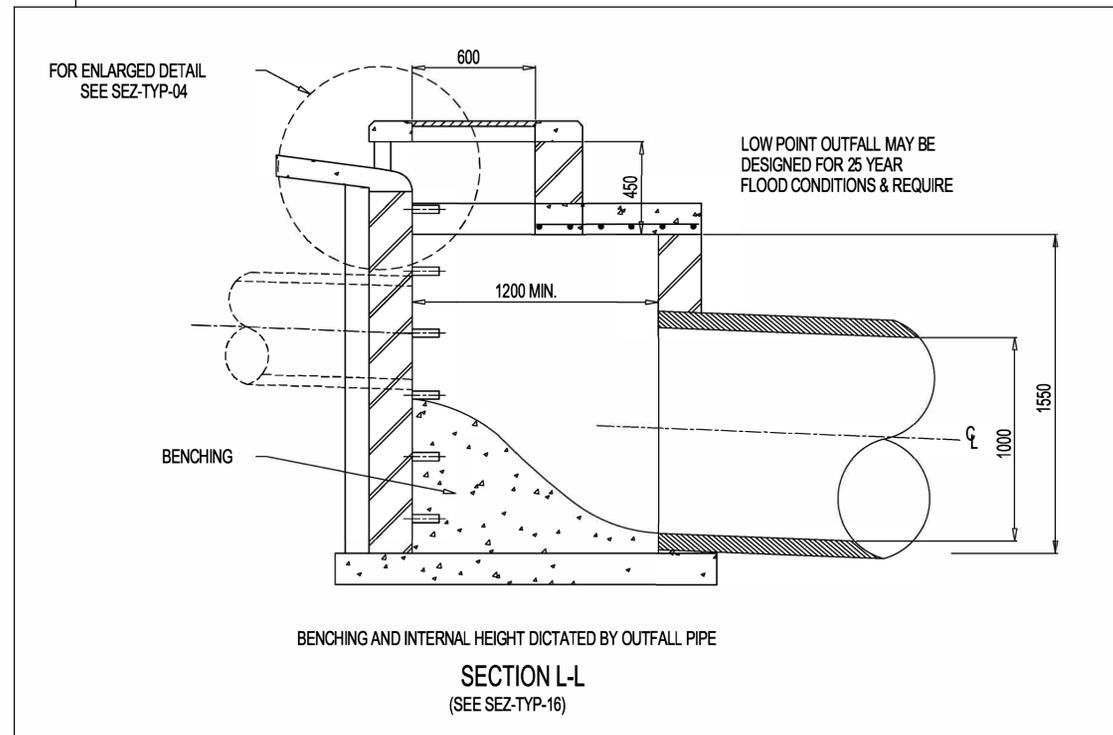
DATE 2024-03-25	SCALE N.T.S	SHEET 2 OF 3	REV A	A1
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DWG NO
P-SM01-PMO-CE-M-09

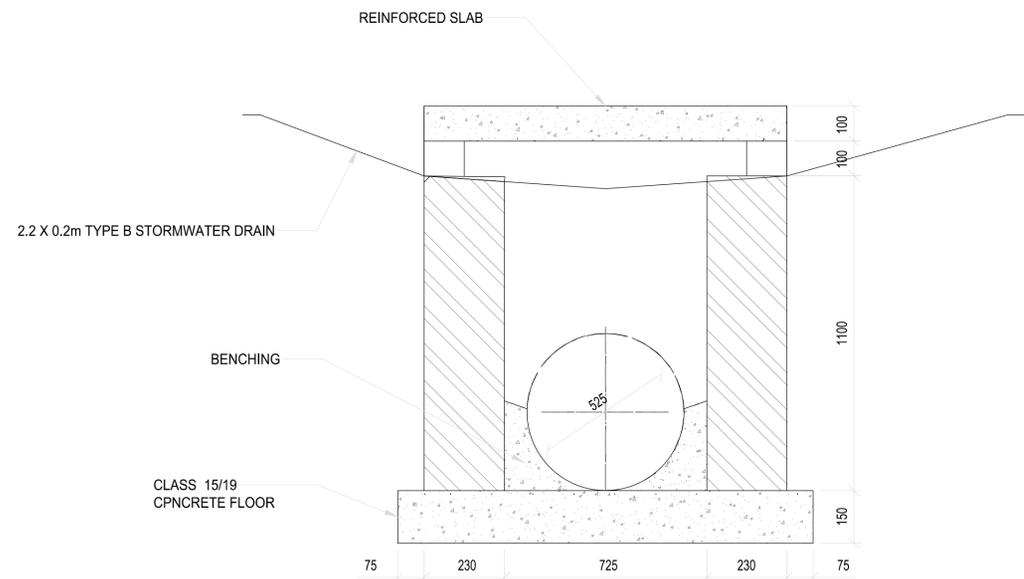


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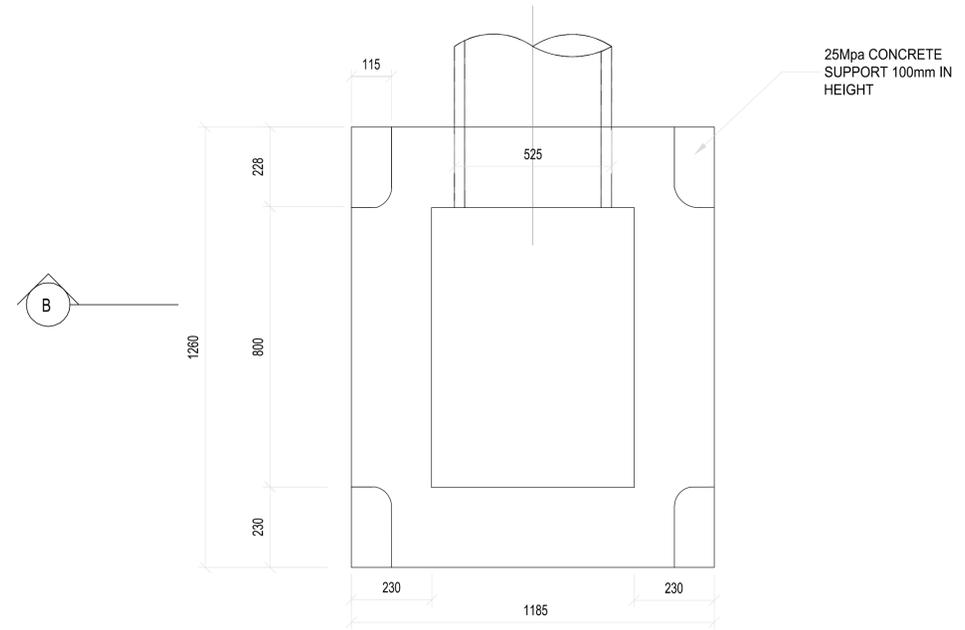
- SEE DRG SEZ-TYP-15 FOR PLAN AND SECTION POSITIONS OF KERB INLET.
- CONCRETE STRENGTH TO BE AS FOLLOWS:
 - MANHOLE SURROUNDS AND BENCHING: CLASS 15/19
 - CAST IN-SITU DECK SLABS & FOUNDATIONS: CLASS 20/19
 - PRECAST COVER SLABS & OTHER ITEMS: CLASS 25/19.
 - CAST IN-SITU KERBS, APRONS ETC: CLASS 25/19
- ALL FLOORS AND BENCHING TO BE STEEL TROWELLED WITH A SMOOTH RADIUS.
- MANHOLE & KERB INLET INTERNAL WIDTHS AND DEPTHS:
 - WIDTH
 - 750mm PIPES AND LESS - 900mm
 - 825mm PIPES AND MORE - 1200mm
 - SOME MANHOLE SIZES TO BE DETERMINED ON SITE
 - DEPTH - THE DEPTH INDICATED SHOULD BE INCREASED IF NECESSARY FOR MANHOLES TO PERMIT SUFFICIENT DISCHARGE HEAD TO DEVELOP.
 - MANHOLE DEPTH > 1.75m WIDTH OF BRICKWORK TO BE INCREASED TO 345mm
 - BELOW 3m SPECIAL ENGINEERING DESIGN REQUIRED FOR BRICKWORK
- NO BACKFILL TO BE DONE UNTIL MORTAR IS SEVEN DAYS OLD.
- PROVIDE STEP IRONS WHEN DEPTH > 1,2m
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- SHOULD THERE BE A CHANGE IN PIPE DIAMETER, THE GREATER OF THE TWO SHOULD BE USED TO DETERMINE THE POSITIONING OF THE PIPES.
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- SECTION L-L ILLUSTRATES VARIATIONS TO SECTION B-B REQUIRED AT A LOW POINT KERB INLET.



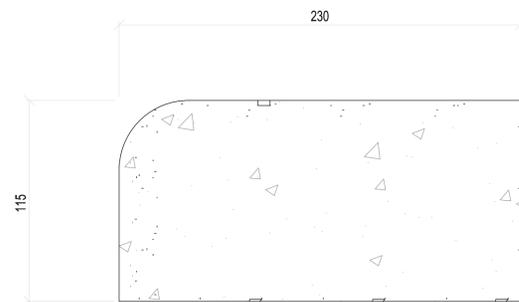
CLIENT:  19 Murray Street Lady Grey 9735 Tel: (051) 803 1449 Email: vany@senqu.gov.za	CONSULTANT: THEWO & SMMS - JV  58 Breiner Road Westdene Bloemfontein 9301 Tel: +27 (051) 430 1321 Email: pmo@thewo.co.za	PROFESSIONAL ENGINEER: L. MARAH PROF. Reg.No: 920281 DATE: SIGNATURE:	DESIGN BY: D. RWAZEMBA DRAWN BY: D. RWAZEMBA CHECKED BY: L. MARAH APPROVED BY: L. MARAH	REVISIONS <table border="1"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			REV	DATE	DESCRIPTION	BY													PROJECT NAME REHABILITATION OF ROADS AND STORMWATER IN MOKHESI - WARD 8 TITLE KERB INLET SECTION			PROJECT STATUS: TENDER DATE: 2024-03-25 SCALE: N.T.S SHEET: 1 OF 1 REV: A A1 DWG NO: P-SM01-PMO-CE-M-100				
				REV	DATE	DESCRIPTION	BY																							



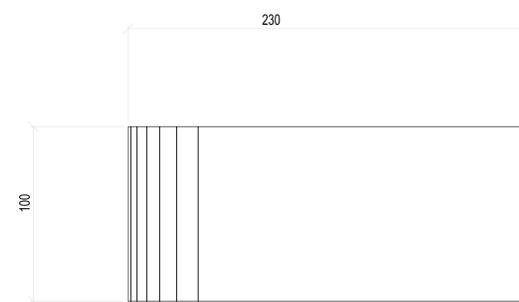
SECTION B-B
SCALE 1:10



FIELD INLET PLAN
SCALE 1:10



PLAN :SECTIONS OF SUPPORT
SCALE 1:2



ELEVATION :SECTIONS OF SUPPORT
SCALE 1:2

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PROFESSIONAL ENGINEER:
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PROF. Reg.No:
920281
DATE:
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DESIGN BY:
D.RWAZEMBA
DRAWN BY:
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REVISIONS			
REV	DATE	DESCRIPTION	BY

PROJECT NAME

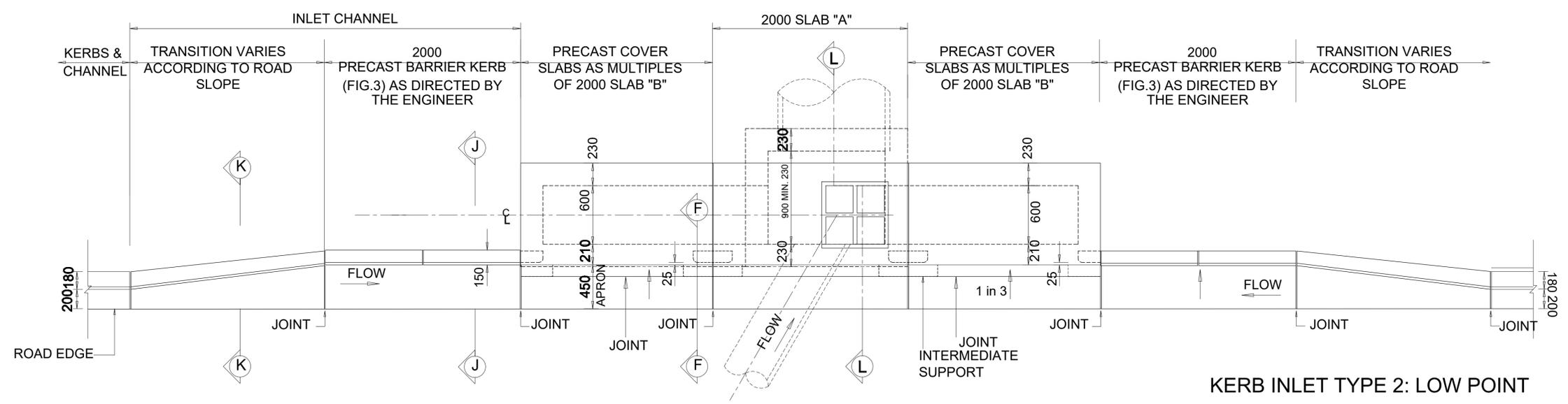
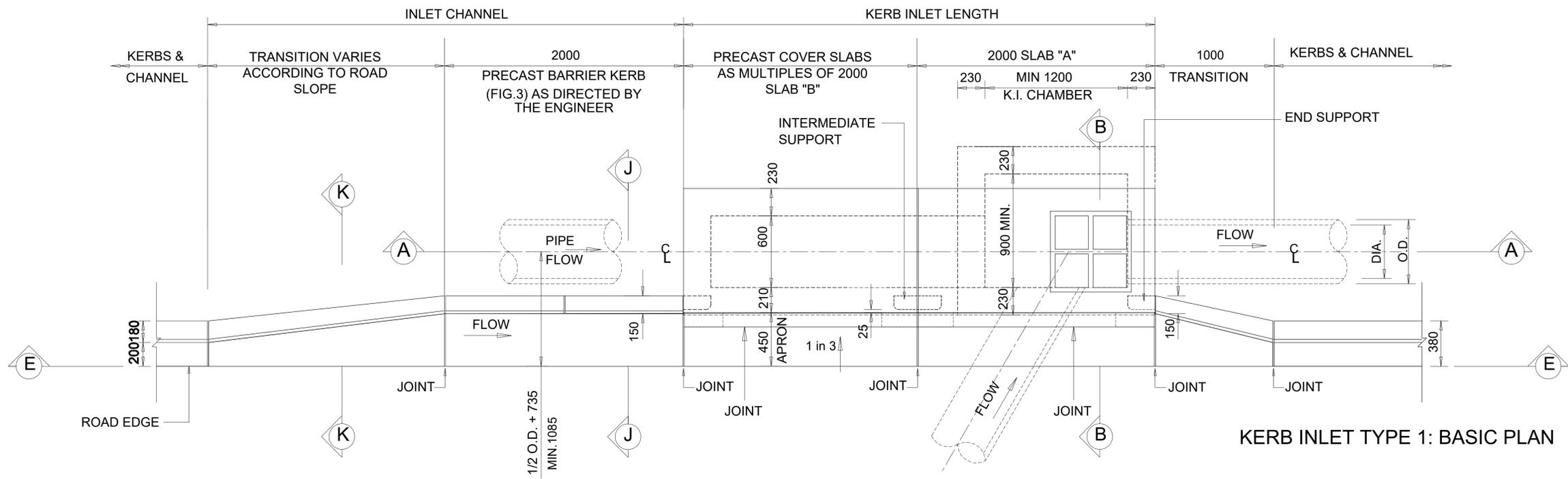
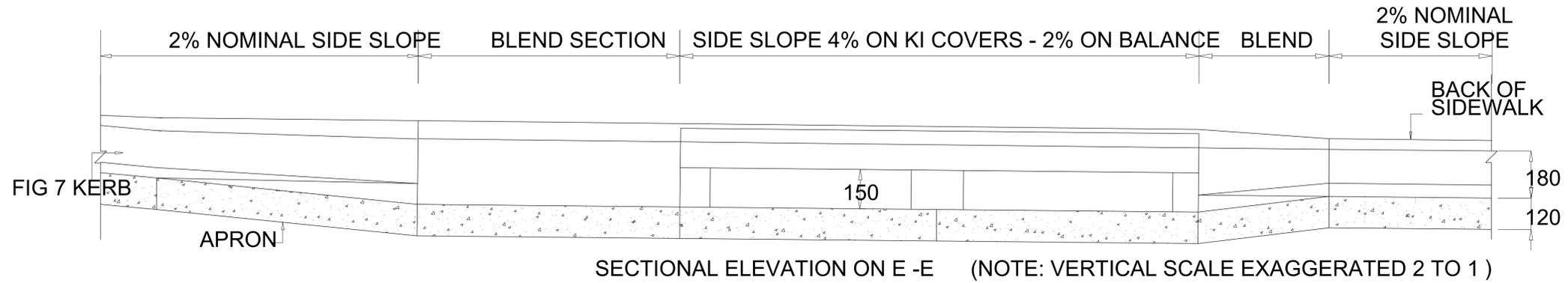
REHABILITATION OF ROADS AND STORMWATER IN MOKHESI - WARD 8

TITLE

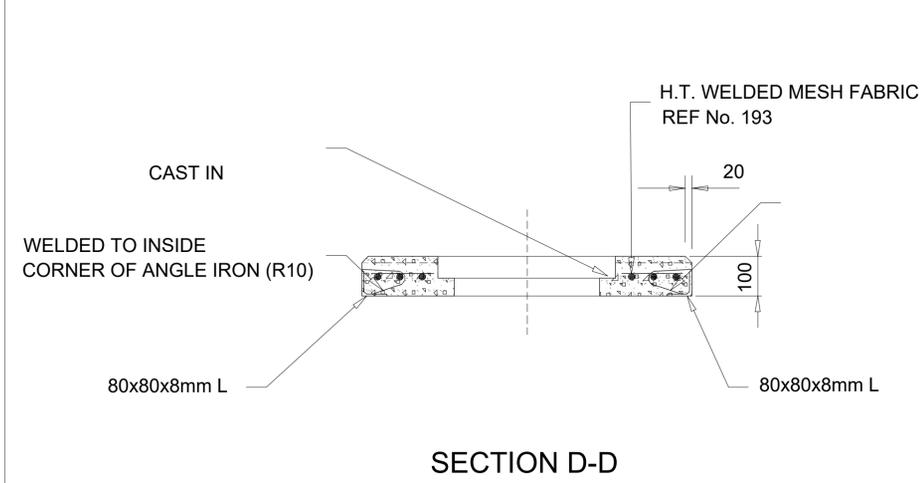
FIELD INLET DETAIL

PROJECT STATUS: **TENDER**

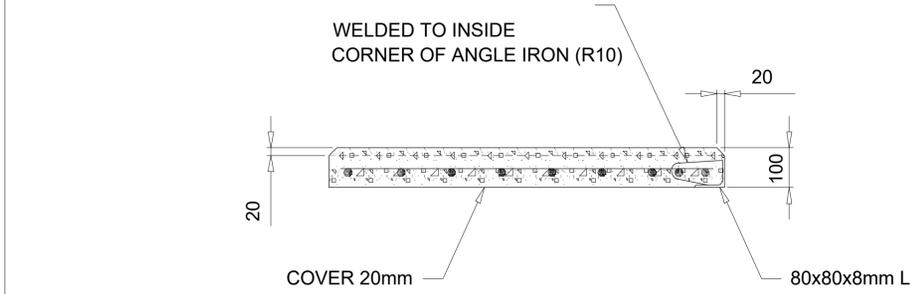
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2024-03-25	N.T.S	1 OF 1	A	A1
DWG NO		P-SM01-PMO-CE-M-101		



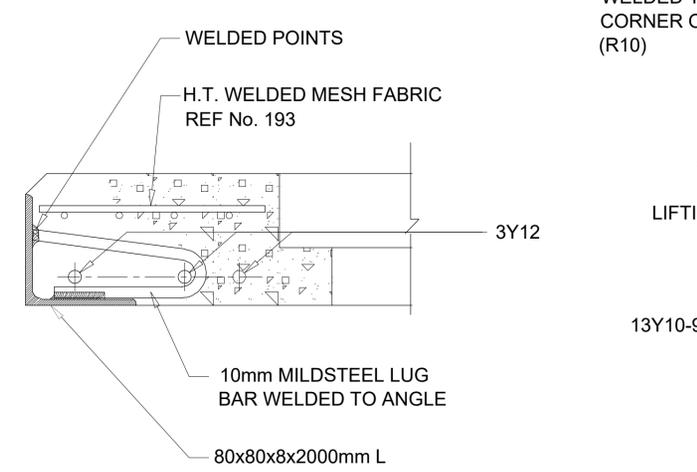
 <p>CLIENT: 19 Murray Street Lady Grey 9755 Tel: (051) 603 1449 Email: vanzyli@senqu.gov.za</p>	<p>CONSULTANT:</p> <p>THEWO & SMMS - JV</p>  <p>58 Bretners Road Westdene Bloubaai 9301 Tel: +27 (051) 430 1321 Email: pmo@thewo.co.za</p>	<p>PROFESSIONAL ENGINEER:</p> <p>L. MARAH PROF. Reg.No: 920281 DATE: SIGNATURE:</p>	<p>DESIGN BY:</p> <p>D. RWAZEMBA DRAWN BY: D. RWAZEMBA CHECKED BY: L. MARAH APPROVED BY: L. MARAH</p>	<p>REVISIONS</p> <table border="1"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	REV	DATE	DESCRIPTION	BY																																					<p>PROJECT NAME</p> <p>REHABILITATION OF ROADS AND STORMWATER IN MOKHESI - WARD 8</p> <p>TITLE</p> <p>KERB INLET TYPES</p>	<p>PROJECT STATUS:</p> <p>TENDER</p> <table border="1"> <thead> <tr> <th>DATE</th> <th>SCALE</th> <th>SHEET</th> <th>REV</th> <th>REV</th> </tr> </thead> <tbody> <tr> <td>2024-03-25</td> <td>N.T.S</td> <td>1 OF 1</td> <td>A</td> <td>A1</td> </tr> </tbody> </table> <p>DWG NO</p> <p>P-SM01-PMO-CE-M-102</p>	DATE	SCALE	SHEET	REV	REV	2024-03-25	N.T.S	1 OF 1	A	A1
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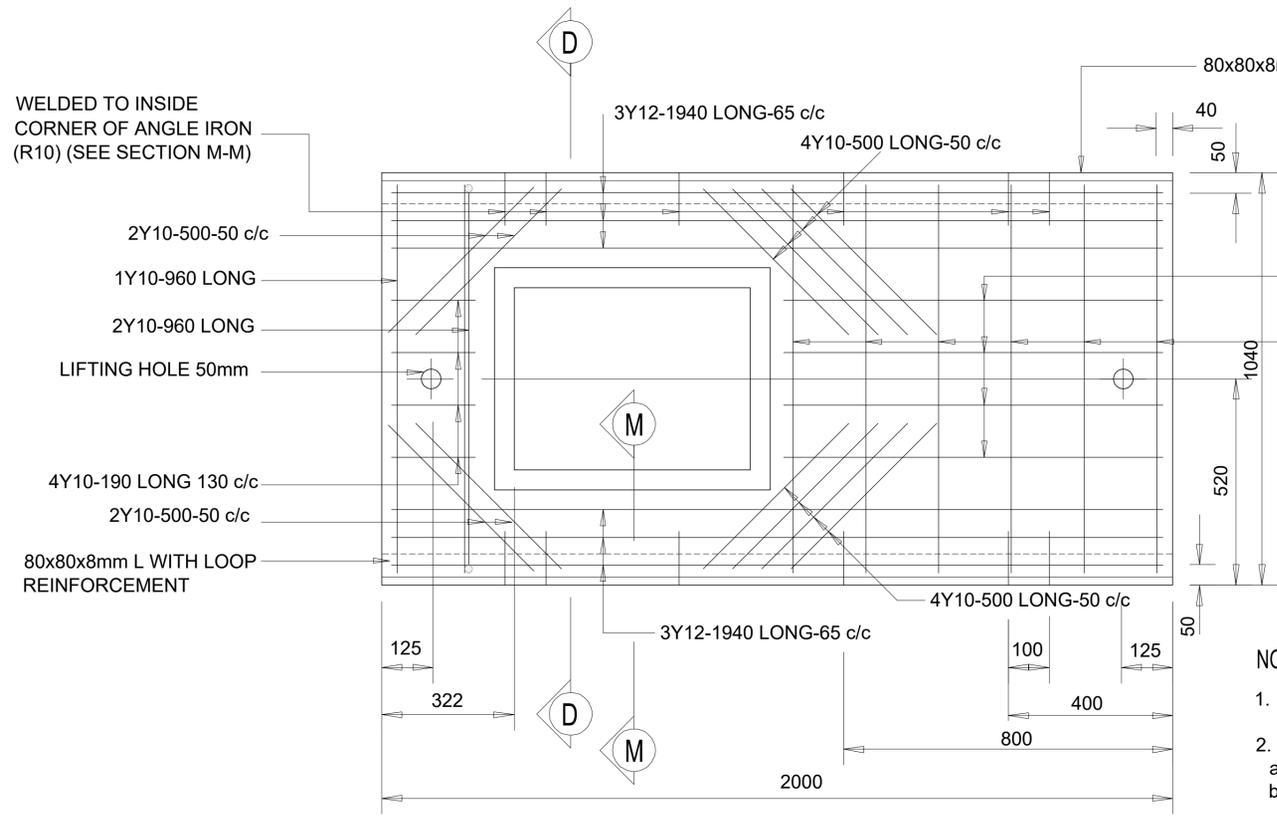
SECTION D-D



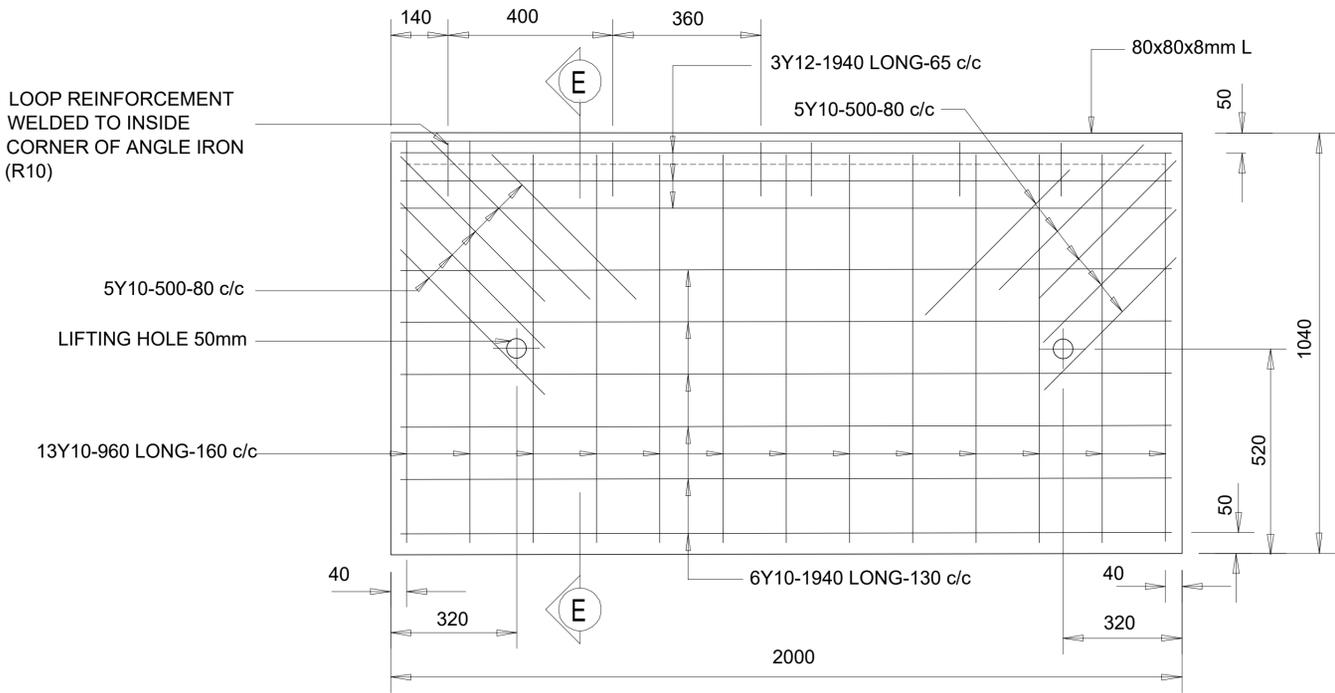
SECTION E-E



SECTION M-M



SLAB "A"



SLAB "B"

- NOTES**
- SEE DRG SEZ-TYP-15 FOR PLAN AND SECTION POSITIONS OF KERB INLET.
 - CONCRETE STRENGTH TO BE AS FOLLOWS:
 - MANHOLE SURROUNDS AND BENCHING: CLASS 15/19
 - CAST IN-SITU DECK SLABS & FOUNDATIONS: CLASS 20/19
 - PRECAST COVER SLABS & OTHER ITEMS: CLASS 25/19.
 - CAST IN-SITU KERBS, APRONS ETC: CLASS 25/19
 - ALL FLOORS AND BENCHING TO BE STEEL TROWELLED WITH A SMOOTH RADIUS.
 - MANHOLE & KERB INLET INTERNAL WIDTHS AND DEPTHS:
 - WIDTH
 - 750mm PIPES AND LESS - 900mm
 - 825mm PIPES AND MORE - 1200mm
 SOME MANHOLE SIZES TO BE DETERMINED ON SITE
 - DEPTH - THE DEPTH INDICATED SHOULD BE INCREASED IF NECESSARY FOR MANHOLES TO PERMIT SUFFICIENT DISCHARGE HEAD TO DEVELOP.
 - MANHOLE DEPTH > 1.75m WIDTH OF BRICKWORK TO BE INCREASED TO 345mm
 - BELOW 3m SPECIAL ENGINEERING DESIGN REQUIRED FOR BRICKWORK
 - NO BACKFILL TO BE DONE UNTIL MORTAR IS SEVEN DAYS OLD.
 - PROVIDE STEP IRONS WHEN DEPTH > 1,2m
 - PIPES AT INLET AND OUTLET TO BE LAID SOFFIT TO SOFFIT.
 - SHOULD THERE BE A CHANGE IN PIPE DIAMETER, THE GREATER OF THE TWO SHOULD BE USED TO DETERMINE THE POSITIONING OF THE PIPES.
 - ALL ROADWORKS TO COMPLY WITH THA SANS 1200 SPECIFICATIONS.
 - ALL BRICKS TO BE OF QUALITY FBSE30 TO SANS 227-2007 WITH WATER ABSORPTION <14% AND EFFLORESCENCE <10.
 - ALL BRICKWORK TO BE IN ENGLISH BOND.
 - SECTION L-L ILLUSTRATES VARIATIONS TO SECTION B-B REQUIRED AT A LOW POINT KERB INLET.

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PROFESSIONAL ENGINEER:

L. MARAH
PROF. Reg.No: 920281
DATE: _____
SIGNATURE: _____

DESIGN BY:

D. RWAZEMBA
DRAWN BY:
D. RWAZEMBA
CHECKED BY:
L. MARAH
APPROVED BY:
L. MARAH

REV	DATE	DESCRIPTION	BY

PROJECT NAME

REHABILITATION OF ROADS AND STORMWATER IN MOKHESI - WARD 8

TITLE

SLAB REINFORCEMENT

PROJECT STATUS:

TENDER

DATE	SCALE	SHEET	REV	
2024-03-25	N.T.S	1 OF 1	A	A1
DWG NO		P-SM01-PMO-CE-M-103		

NOTES

ALL PIPES BELOW SIDEWALKS & OPEN AREAS TO BE CLASS 100 'D'

THE CONTRACTOR SHALL AT ALL TIMES ADHERE TO THE SAFETY PRECAUTIONS AS SET OUT IN SANS 1200 D-1988.

BEDDING:

- a. **NORMAL BEDDING** ACCORDING TO DETAIL 1.
- b. **BEDDING ACCORDING TO DETAIL 2.**
- c. **CONCRETE SLAB OVER PIPE** ACCORDING TO DETAIL 3.
- d. **CONCRETE BEDDING** ACCORDING TO DETAIL 4.

BEDDING MATERIAL:

THE MATERIAL USED CONSISTS OF SELECTED GRAVEL WITH $P_1 \leq 6$, MUST BE FREE OF STONES LARGER THAN 20mm, ORGANIC MATERIAL AND CLAY LUMPS. THE BEDDING MATERIAL AT THE SIDES OF THE PIPE MUST BE COMPACTED TO 90% MOD. AASHTO DENSITY AFTER THE PIPE HAS BEEN LAID.

BACKFILL TYPE A:

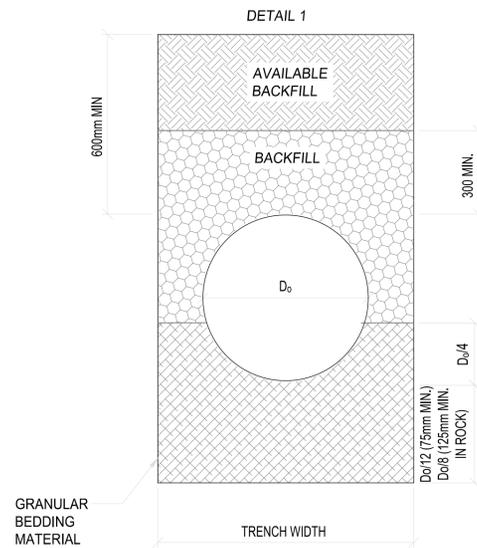
THE MATERIAL USED MUST BE UNIFORM AND MUST BE COMPACTED TO 90% MOD. AASHTO DENSITY IN LAYERS NOT MORE THAN 100mm AND MUST BE FREE OF:

- a. **ROOTS OF TREES, BUILDING RUBBLE AND ORGANIC MATERIAL.**
- b. **CLAY LUMPS LARGER THAN 75mm.**
- c. **STONES LARGER THAN 20mm.**

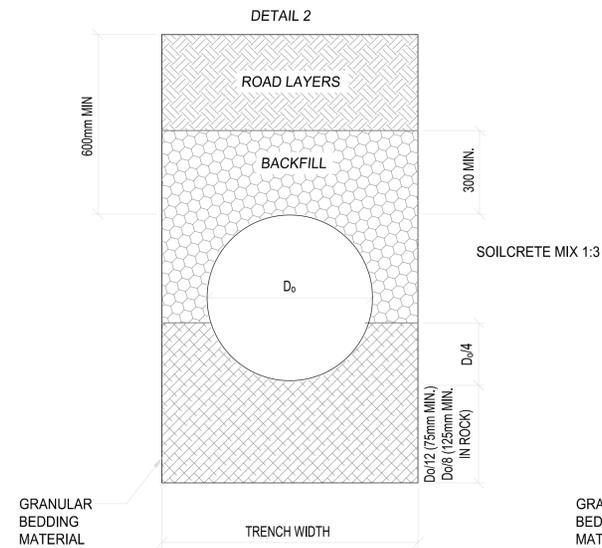
BACKFILL TYPE B:

MINIMUM G9 MATERIAL ACCORDING TO TRH14 CLASSIFICATION COMPACTED TO A MIN. OF 90% MOD. AASHTO DENSITY IN LAYERS NOT MORE THAN 150mm.

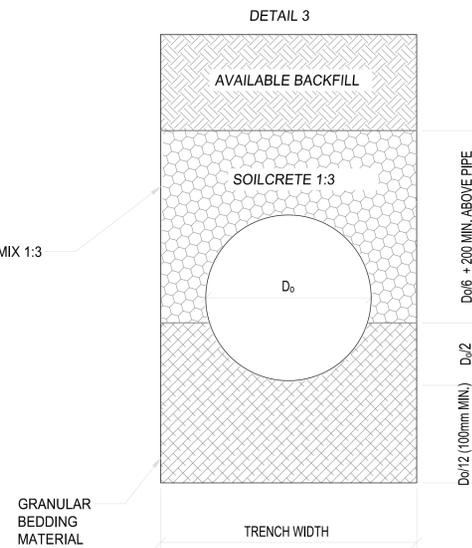
MINIMUM PIPE SIZE TO BE 450mm DIAMETER.



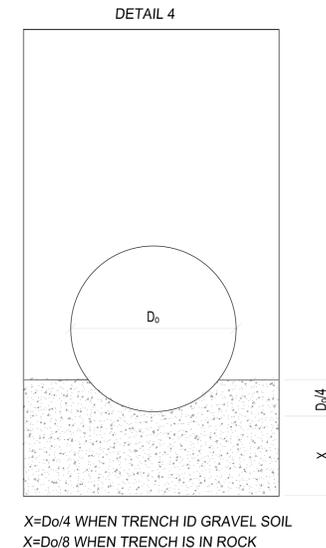
STORMWATER PIPES UNDER SIDEWALK
SCALE 1:25



STORMWATER PIPES UNDER ROAD
SCALE 1:25



STORMWATER PIPES WHERE SOILCRETE IS REQUIRED
SCALE 1:25



STORMWATER PIPES WITH CONCRETE BEDDING
SCALE 1:25

X=D_o/4 WHEN TRENCH IS IN GRAVEL SOIL
X=D_o/8 WHEN TRENCH IS IN ROCK

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PROF. Reg.No:
920281
DATE:
SIGNATURE:

DESIGN BY:
D. RWAZEMBA
DRAWN BY:
D. RWAZEMBA
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L. MARAH
APPROVED BY:
L. MARAH

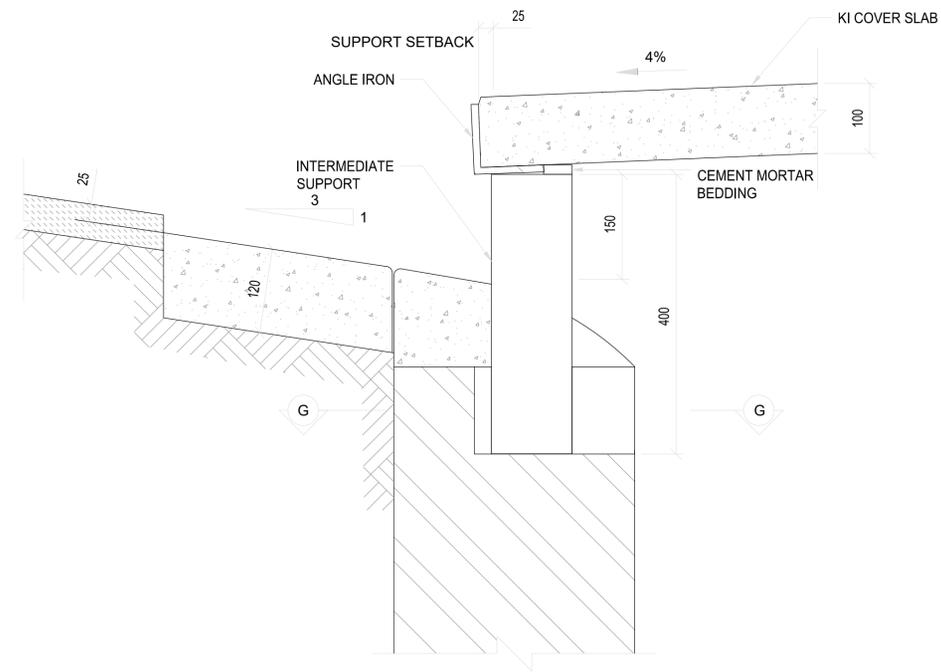
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REV	DATE	DESCRIPTION	BY

PROJECT NAME:
REHABILITATION OF ROADS AND STORMWATER IN MOKHESI - WARD 8

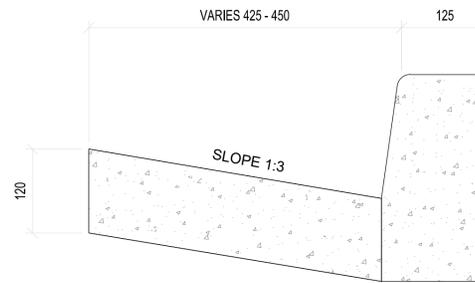
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PIPE BEDDING

PROJECT STATUS:
TENDER

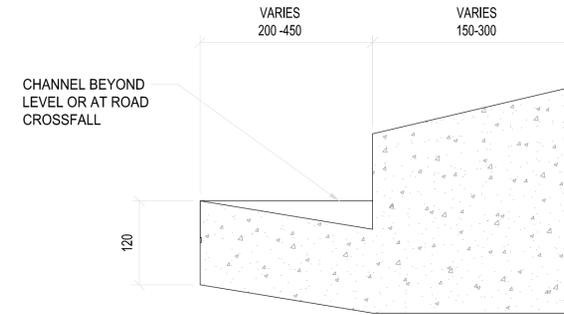
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DWG NO P-SM01-PMO-CE-M-104				



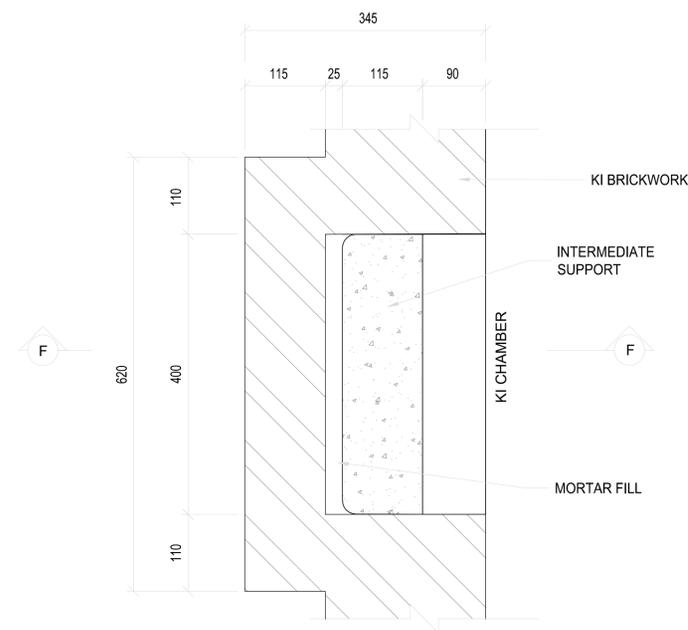
SECTION F-F THROUGH KI APRON & SUPPORT
SCALE 1:5



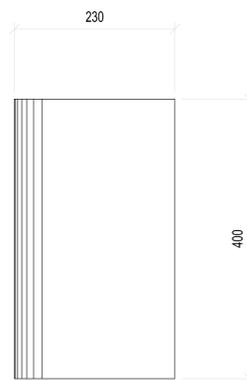
SECTION J-J
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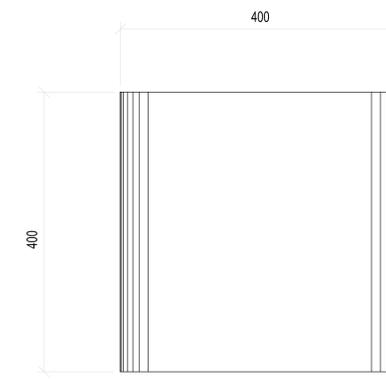
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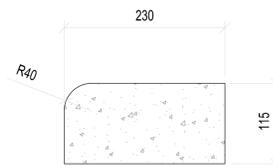
SECTION G-G THROUGH KI SUPPORT
SCALE 1:5



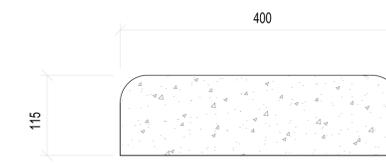
END SUPPORT FOR COVER SLAB
SCALE 1:5



INTERMEDIATE SUPPORT FOR COVER SLAB
SCALE 1:5



DETAIL OF JOINT IN APRON
SCALE 1:5



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PROF. Reg.No:
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SIGNATURE:

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DRAWN BY:
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CHECKED BY:
L. MARAH

APPROVED BY:
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REVISIONS			
REV	DATE	DESCRIPTION	BY

PROJECT NAME

REHABILITATION OF ROADS AND STORMWATER IN MOKHESI - WARD 8

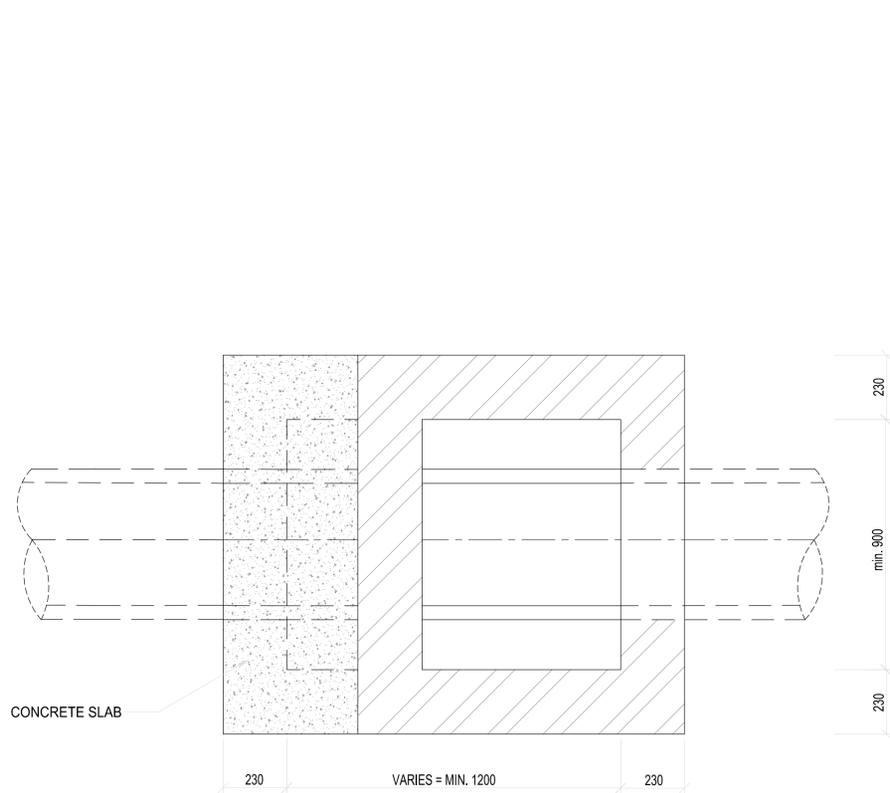
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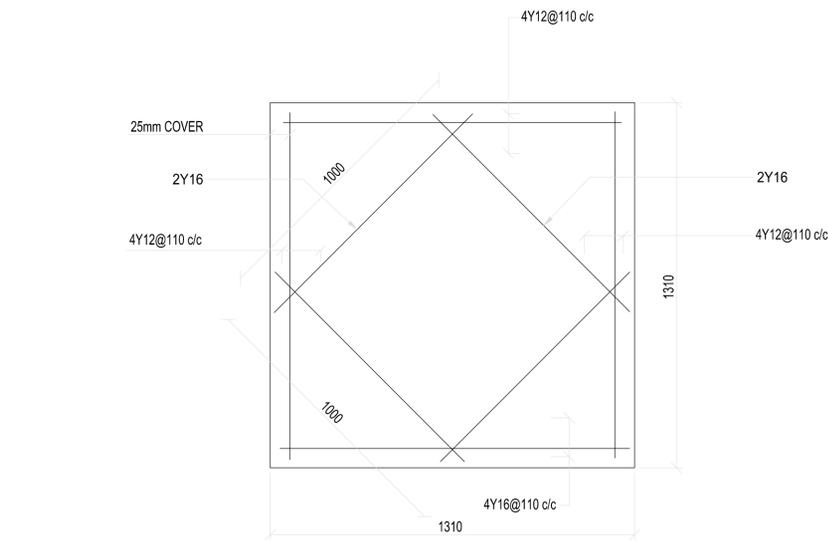
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DATE 2024-03-25	SCALE N.T.S	SHEET 1 OF 1	REV A	A1
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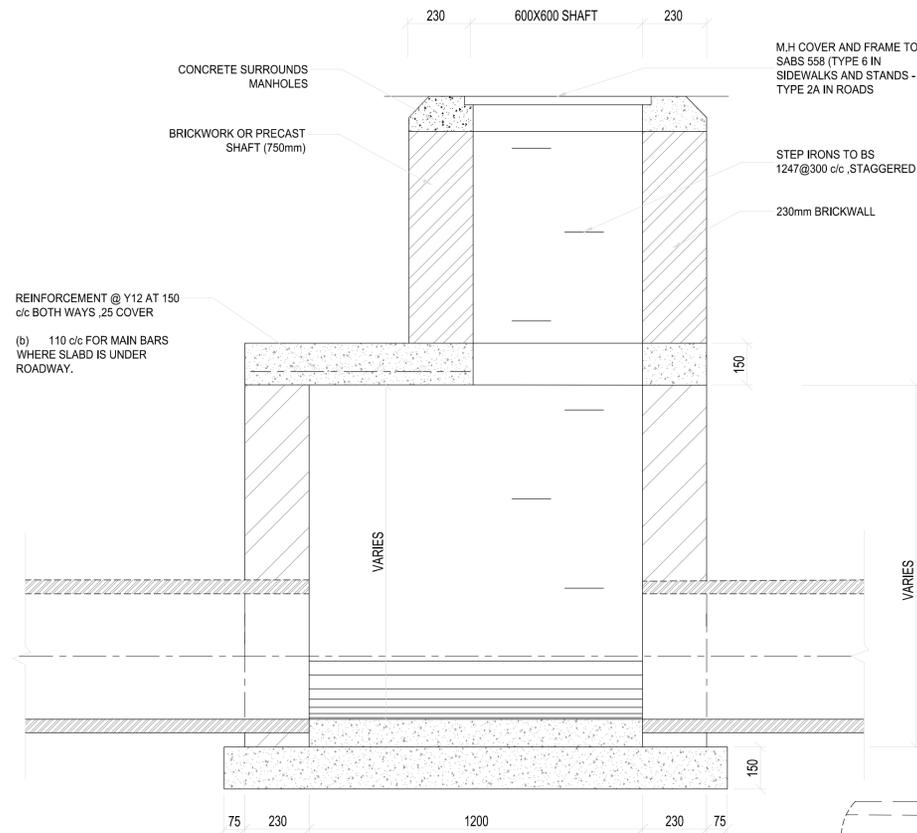
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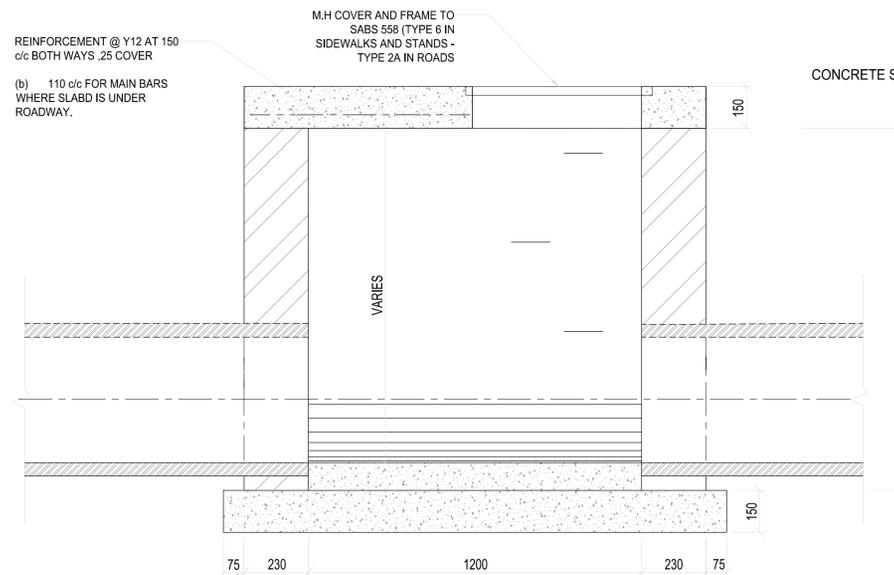
TYPE A SECTIONAL PLAN
SCALE 1:10



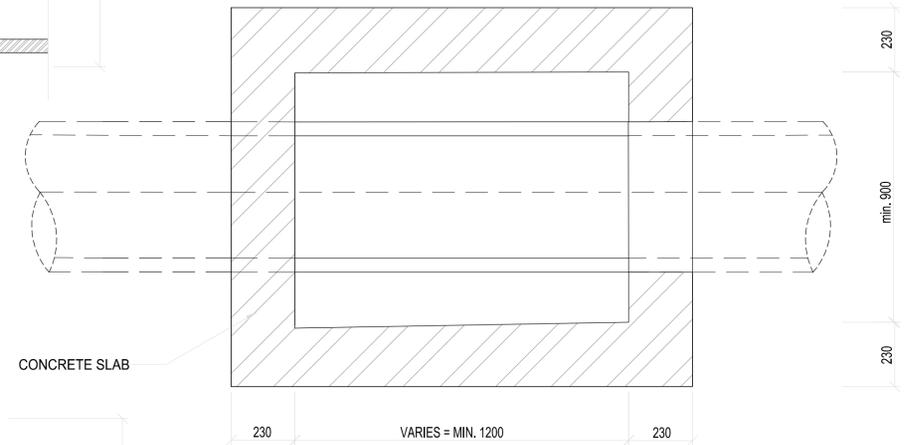
COVER SLAB REINFORCEMENT
SCALE 1:10



TYPE A JUNCTION FOR 1.5m - 2m Depth
SCALE 1:10



TYPE B JUNCTION FOR 0m - 1.5m Depth
SCALE 1:10



TYPE B SECTIONAL PLAN
SCALE 1:10

NOTES

- CONCRETE STRENGTH TO BE AS FOLLOWS:
 - MANHOLE SURROUNDS AND BENCHING: CLASS 15/19
 - CAST IN-SITU DECK SLABS & FOUNDATION: CLASS 20/19
 - PRECAST COVER SLABS & OTHER ITEMS: CLASS 25/19
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- ALL BRICKS TO BE OF QUALITY FBSE30 TO SANS 227-1986 WITH WATER ABSORPTION <14% AND EFFLORESCENCE < 10.1
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 - SOME JUNCTION MANHOLE SIZES TO BE DETERMINED ON SITE
 - SOME JUNCTION MANHOLE SIZES TO BE DETERMINED ON SITE
 - DEPTH - THE DEPTH INDICATED SHOULD BE INCREASED IF NECESSARY FOR MANHOLES TO PERMIT SUFFICIENT DISCHARGED HEAD TO DEVELOP
 - MANHOLE DEPTH > 1.75m, WIDTH OF BRICKWORK TO BE INCREASED TO 330mm.

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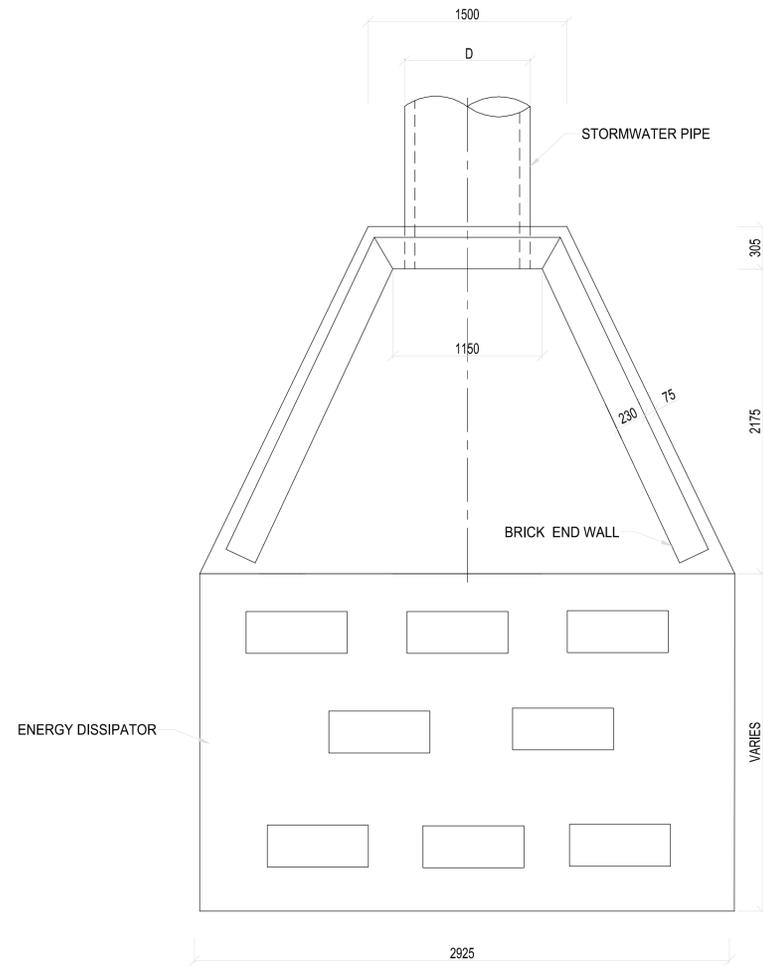
PROFESSIONAL ENGINEER:
L. MARAH
PROF. Reg.No:
920281
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DESIGN BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

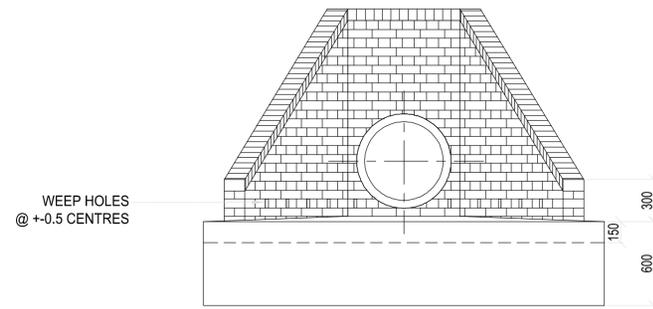
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PROJECT NAME
REHABILITATION OF ROADS AND STORMWATER IN MOKHESI - WARD 8
TITLE
JUNCTION BOX DETAIL

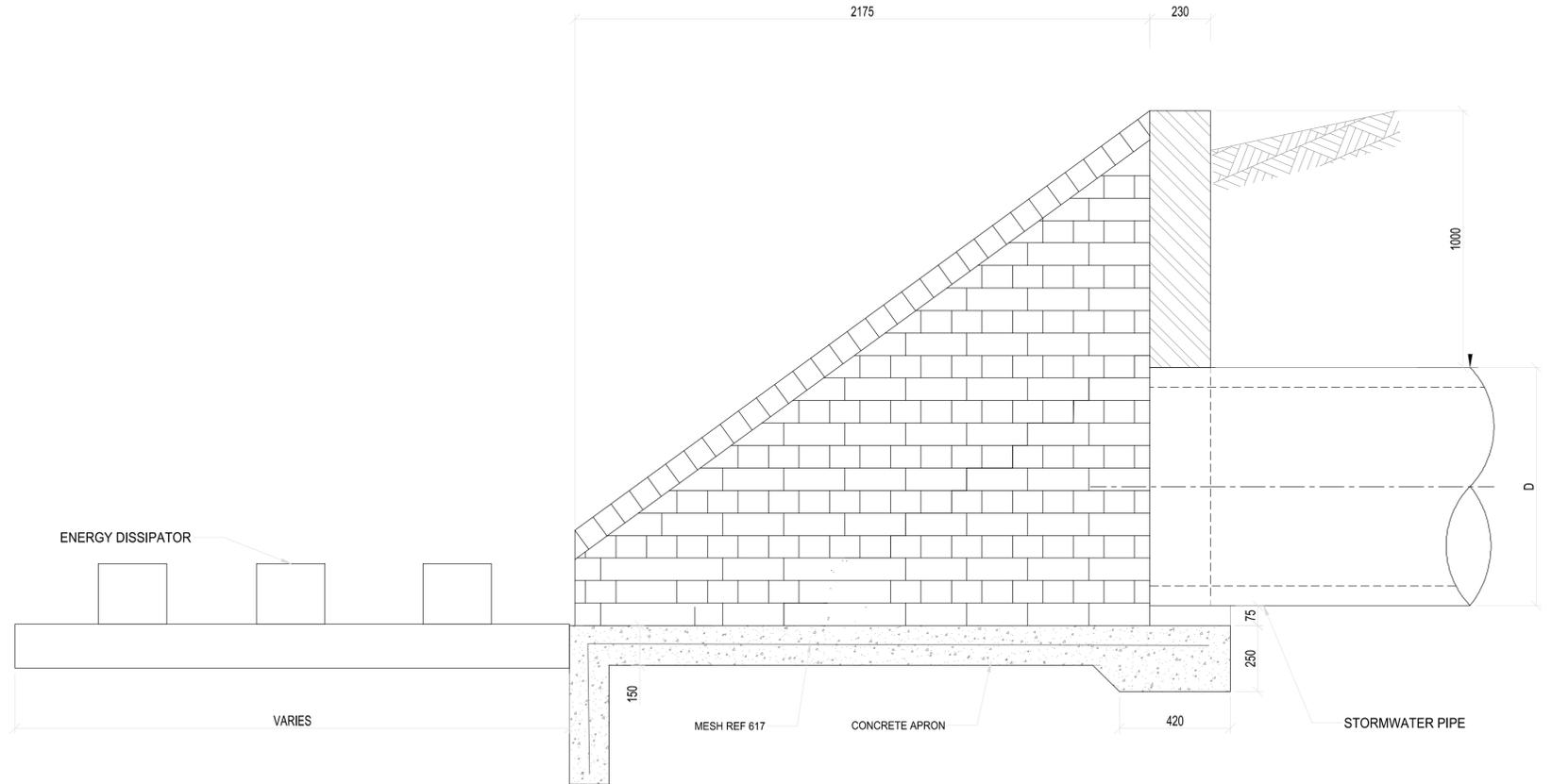
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DATE: 2024-03-25
SCALE: N.T.S
SHEET: 1 OF 1
REV: A
A1
DWG NO: P-SM01-PMO-CE-M-106



OUTLET PLAN
SCALE 1:25



FRONT ELEVATION
SCALE 1:25



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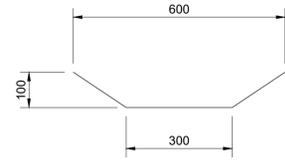
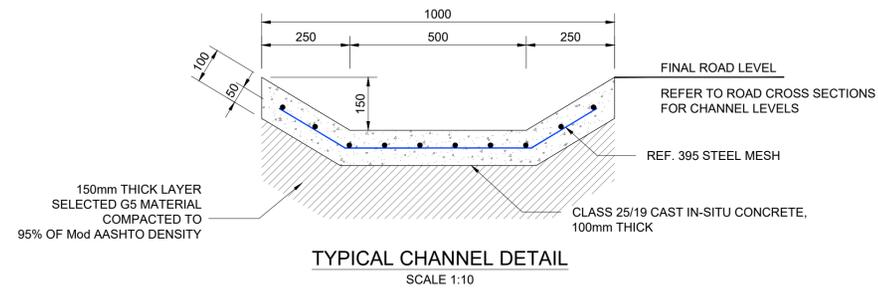
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TITLE

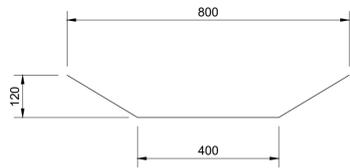
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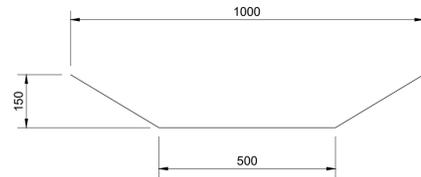
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2024-03-25	N.T.S	1 OF 1	A	A1
DWG NO		P-SM01-PMO-CE-M-107		



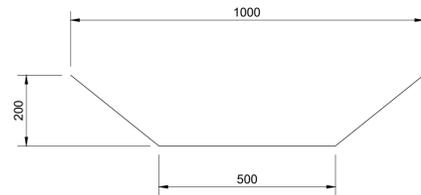
CHANNEL TYPE A



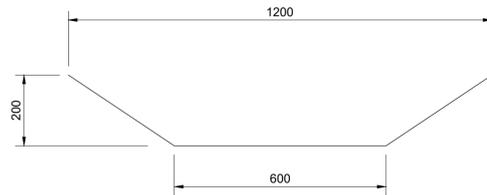
CHANNEL TYPE B



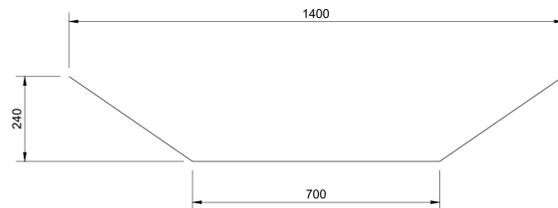
CHANNEL TYPE C



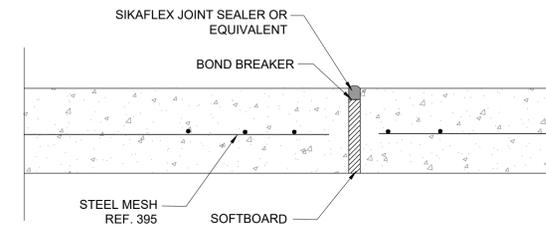
CHANNEL TYPE D



CHANNEL TYPE E



CHANNEL TYPE F



CHANNEL CONSTRUCTION JOINT DETAIL @ 2500mm INTERVALS
SCALE 1:5

CLIENT:



19 Murray Street
Lady Grey
9755
Tel: (051) 603 1449
Email: vanzyt@eenqu.gov.za

CONSULTANT:



58 Brebner Road
Westdene
Bloemfontein
9301
Tel: +27 (051) 430 1321
Email: pmo@thewo.co.za

PROFESSIONAL ENGINEER:

L. MARAH
PROF. Reg.No:
920281

DATE:
2024-03-25

SIGNATURE:

DESIGN BY:

DRAWN BY:

CHECKED BY:
L. MARAH

APPROVED BY:
L. MARAH

REVISIONS

REV	DATE	DESCRIPTION	BY
a	2024-03-25	ISSUED FOR TENDER	LM

PROJECT NAME

REHABILITATION OF ROADS AND STORMWATER IN
MOKHESI WARD 8

TITLE

TRAPEZOIDAL CONCRETE DRAIN DETAILS

PROJECT STATUS:

TENDER

DATE	SCALE	SHEET	REV	A1
2024-03-25	N.T.S	1 OF 1	a	A1

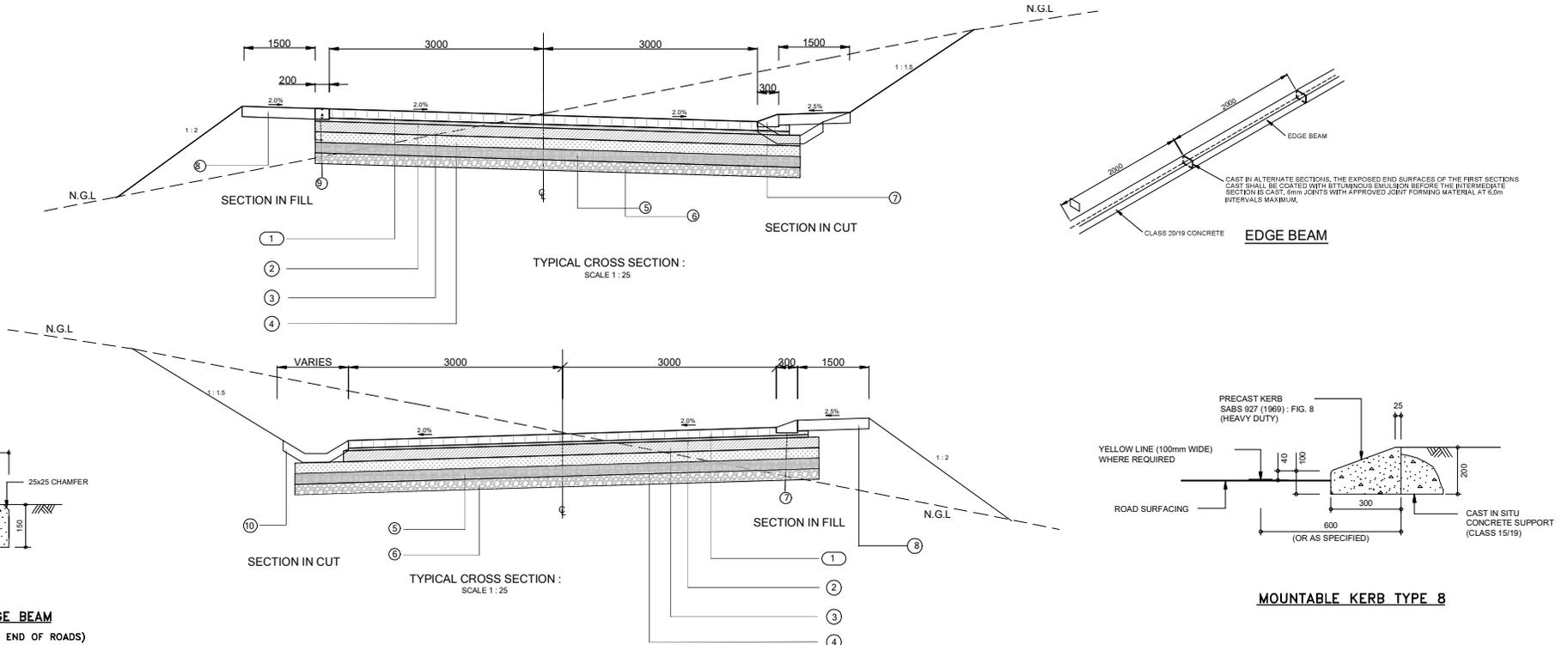
DWG NO

P-SM01-PMO-CE-M-109

MATERIAL REQUIREMENTS

LAYER	LAYER No	THICKNESS (mm)	DESCRIPTION	TRH 14 MATERIAL AND/OR COLTO CLASSIFICATION	COLTO SPECIFICATION	Min COMPACTION REQUIREMENT	PLASTICITY INDEX	GRADING MODULUS (MIN)	CBR @ % OF Mod AASHTO Density	UCS @ 100% Mod AASHTO DENSITY (Mpa)	ITS @ 100% Mod AASHTO DENSITY (kPa)	MAX CBR SWELL @ 100 Mod AASHTO
SURFACING	①	80	INTERLOCKING CONCRETE BLOCKS	S-A	7300	--	--	--	--	--	--	--
BEDDING SAND	②	25	BEDDING SAND LAYER	SND	7300	--	--	--	--	--	--	--
BASE	③	150	CEMENTED NATURAL GRAVEL (G5)	C3	3400 & 3500	97%	6 MAX	1.2	25 @ 95%	1.5 MIN	250 MIN	0.5%
SUB BASE	④	150	NATURAL GRAVEL	G6	3400	96%	12 MAX	1.2	25 @ 93%	--	--	1.0%
SELECTED FILL	⑤	150	IMPORTED SELECTED LAYER	G7/G8/G9	3400	93%	--	--	15/10/7 @ 93%	--	--	1.5%
ROCKFILL	⑥	150	ROCKFILL LAYER	--	3200	--	--	--	--	--	--	--
KERB	⑦	1000 X 300 X 200	FIGURE 8C MOUNTABLE KERB	--	2300	--	--	--	--	--	--	--
PAVED SIDEWALK	⑧	150	PAVED SIDEWALK	G6	3400	90%	12 MAX	1.2	25 @ 93%	--	--	1.0%
EDGE BEAM	⑨	200 X 150	CONCRETE EDGE BEAM	--	2300	--	--	--	--	--	--	--
OPEN DRAIN	⑩	SIZE VARIES	CLASS 30/19 CONCRETE V-DRAIN	--	2300	--	--	--	--	--	--	--

NOTES: VIM - DESIGN VOIDS IN MIX
ARD - APPARENT RELATIVE DENSITY



CONCRETE EDGE BEAM
(AT ROAD JUNCTIONS AND END OF ROADS)

MOUNTABLE KERB TYPE 8

CLIENT: 19 Murray Street Lady Grey 7955 Tel: (051) 603 1449 Email: varcyh@senqu.gov.za	CONSULTANT: THEWO & SMIMS - JV 58 Diebener Road Westdene Bloemfontein 9501 Sigodi Marah Martin P.O. Box 1144, Paarl Mechanical & Engineering Services	PROFESSIONAL ENGINEER: L. MARAH PROF. Reg No: 520281 DATE: 2024-03-25 SIGNATURE:	DESIGN BY: DRAWN BY: CHECKED BY: L. MARAH APPROVED BY: L. MARAH	REVISIONS REV DATE DESCRIPTION BY 0 2024-03-25 ISSUED FOR TENDER L.M.	PROJECT NAME REHABILITATION OF ROADS & STORMWATER IN MOKHESI WARD 8 TITLE TYPICAL CROSS SECTION AND PAVEMENT DESIGN	PROJECT STATUS: TENDER DATE: 2024-03-25 SCALE: AS SHOWN SHEET: 1 OF 1 REV: 0 DWG NO: P-SM01-PMO-CE-M-108
				A1		