

VOLUME 1



SENQU LOCAL MUNICIPALITY

PROJECT MANAGEMENT OFFICE

PROJECT NO. 31/2023-2024T

**FOR REHABILITATION OF ROADS & STORMWATER IN
STERKSPRUIT WARD 10**

VOLUME 1

TENDER DRAWINGS

MARCH 2024

DRAWINGS COMPILED FOR:

THE MUNICIPAL MANAGER

SENQU LOCAL MUNICIPALITY
19 Murray Street
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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-S-00
3.	ROAD 9 & 10 GENERAL LAYOUT PLAN	P-SM01-PMO-CE-S-01
<u>ROAD LAYOUT PLAN AND LONGITUDINAL SECTIONS</u>		
4.	ROAD 1 LAYOUT AND LONGITUDINAL SECTION (SHEET 1 OF 1)	P-SM01-PMO-CE-S-02
5.	ROAD 2 LAYOUT AND LONGITUDINAL SECTION (SHEET 1 OF 1)	P-SM01-PMO-CE-S-03
6.	ROAD 3 LAYOUT AND LONGITUDINAL SECTION (SHEET 1 OF 1)	P-SM01-PMO-CE-S-04
7.	ROAD 4 LAYOUT AND LONGITUDINAL SECTION (SHEET 1 OF 2)	P-SM01-PMO-CE-S-05
8.	ROAD 4 LAYOUT AND LONGITUDINAL SECTION (SHEET 2 OF 2).....	P-SM01-PMO-CE-S-06
9.	ROAD 5 LAYOUT AND LONGITUDINAL SECTION (SHEET 1 OF 1)	P-SM01-PMO-CE-S-07
10.	ROAD 6 LAYOUT AND LONGITUDINAL SECTION (SHEET 1 OF 1)	P-SM01-PMO-CE-S-08
11.	ROAD 7 LAYOUT AND LONGITUDINAL SECTION (SHEET 1 OF 1)	P-SM01-PMO-CE-S-09
12.	ROAD 8 LAYOUT AND LONGITUDINAL SECTION (SHEET 1 OF 1)	P-SM01-PMO-CE-S-10
13.	ROAD 1-5 STORMWATER LAYOUT (SHEET 1 OF 1)	P-SM01-PMO-CE-S-11
14.	ROAD 6-8 STORMWATER LAYOUT (SHEET 1 OF 1)	P-SM01-PMO-CE-S-12
<u>TYPICAL DRAWINGS</u>		
15.	KERB INLET SECTION	P-SM01-PMO-CE-S-100
16.	FIELD INLET DETAIL	P-SM01-PMO-CE-S-101
17.	KERB INLET TYPES	P-SM01-PMO-CE-S-102
18.	SLAB REINFORCEMENT.....	P-SM01-PMO-CE-S-103
19.	PIPE BEDDING	P-SM01-PMO-CE-S-104
20.	KERB APRON & SUPPORT DETAILS	P-SM01-PMO-CE-S-105
21.	JUNCTION BOX DETAIL	P-SM01-PMO-CE-S-106
22.	HEADWALL OR OUTLET DETAIL	P-SM01-PMO-CE-S-107
<u>OTHER DRAWINGS</u>		
23.	TYPICAL CROSS SECTION AND PAVEMENT DESIGN	P-SM01-PMO-CE-S-108
24.	STORMWATER CHANNEL SECTIONS	P-SM01-PMO-CE-S-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:
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 AND STORMWATER IN
STERKSPRUIT WARD 10**

TITLE

DRAWING LIST

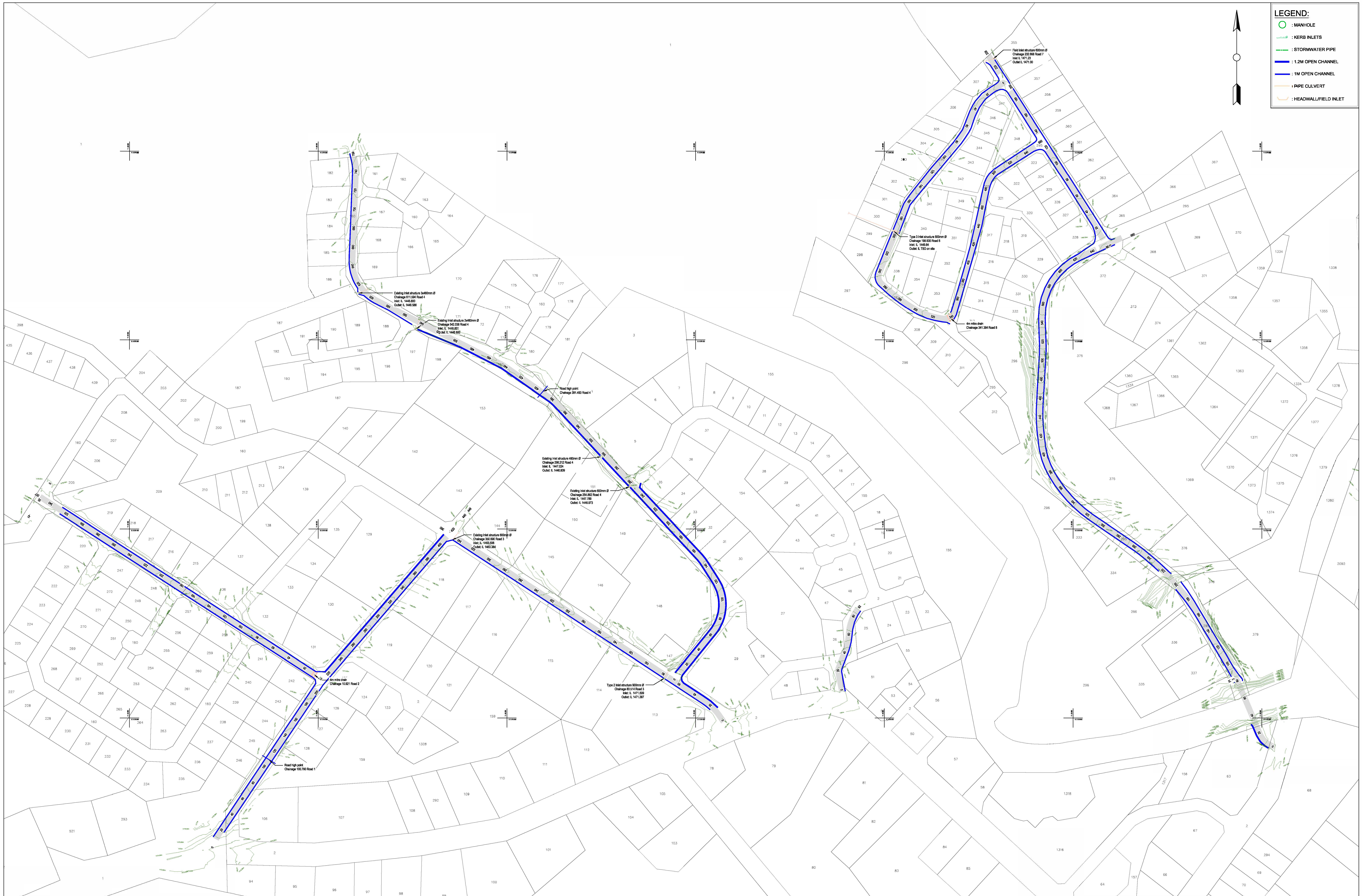
PROJECT STATUS:

TENDER

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

DWG NO

P-SM01-PMO-CE-S-00



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PROFESSIONAL ENGINEER:

L. MARAH

PROF. Reg.No:
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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 STERKSPRUIT - WARD 10

TITLE

ROAD 1 - 8 GENERAL LAYOUT

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-S-01

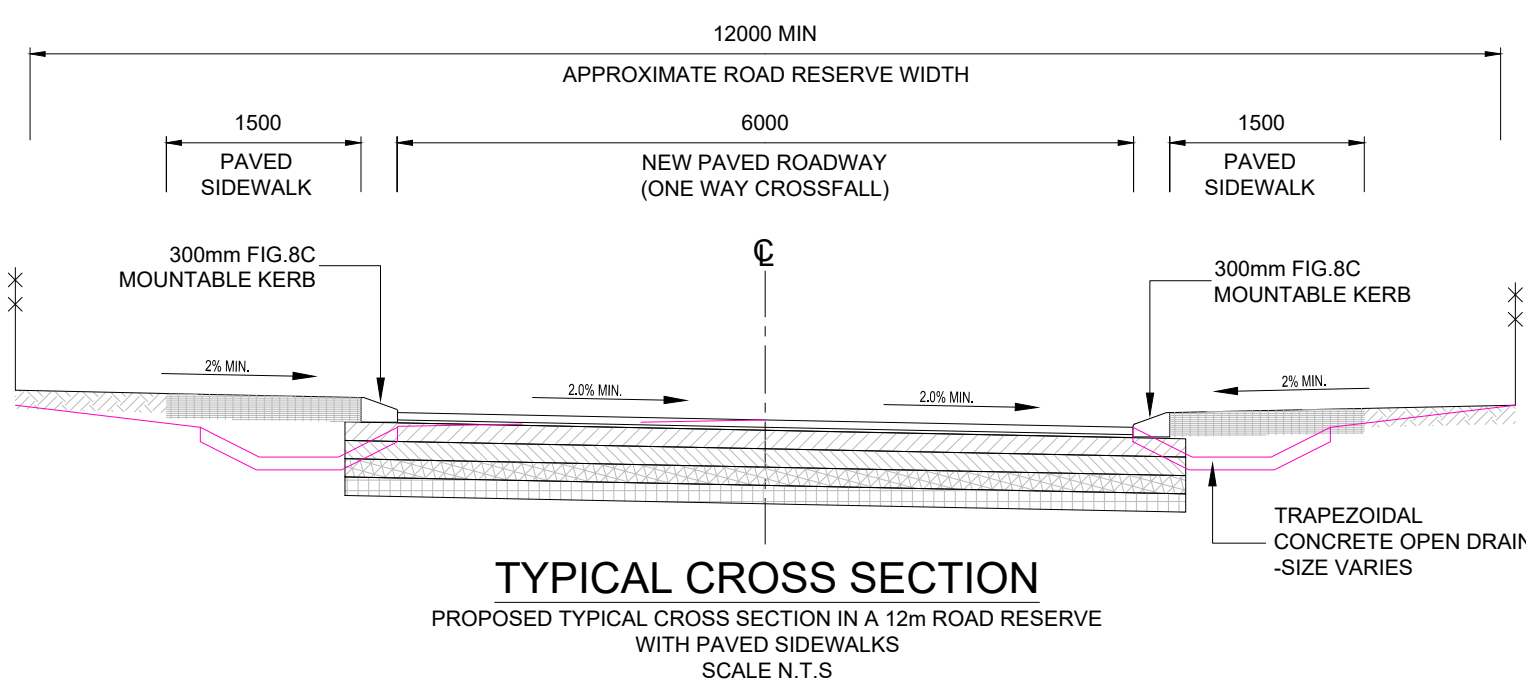
LEGEND

- CENTRELINE
- ⊙ ESKOM/TELEKOM POLE
- EXISTING POWER LINE
- 2% ROAD CROSS FALL
- STORMWATER CHANNEL
- MANHOLE
- EXISTING TREE
- CULVERT
- EXISTING TARMAK SURFACE

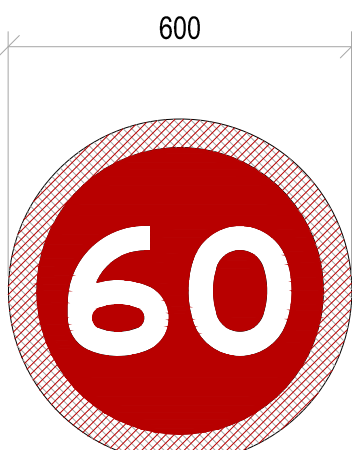
ABBREVIATIONS

- 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

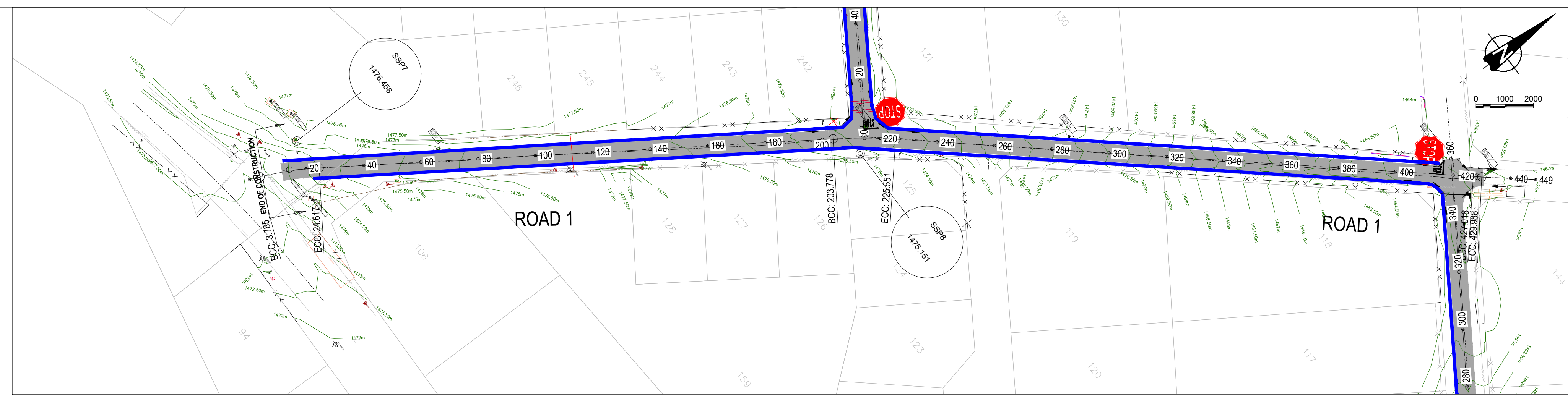
COORDINATE LIST				
HARTEBEE SHOEK				WG27
Name	Y Coord	X Coord	Z Coord	DESC.
SSP1	-35435.594	3378604.370	1457.668	12MMPAVE
SSP2	-35389.339	3378655.412	1457.612	12MMC
SSP3	-35236.461	3378456.679	1461.556	12MMC
SSP4	-35342.052	3378354.777	1448.761	12MMBTN
SSP5	-35159.407	3378214.416	1448.177	12MMBTN
SSP6	-35034.270	3378002.262	1450.713	12MMRS
SSP7	-34886.276	3378117.680	1476.458	HOLEC
SSP8	-35008.420	3378564.231	1475.151	10MM
SSP9	-34801.976	3378421.786	1479.364	12MMC
SSP10	-35553.902	3378547.750	1451.133	12MMRSB
SSP11	-35577.944	3378474.700	1445.550	12MMPAVE
SSP12	-35969.297	3378559.145	1436.743	12MMC
SSP13	-35773.249	3378344.171	1447.402	12MMC
SSP14	-35839.506	3378094.023	1461.586	12MMTAR
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SSP26	-37000.224	3377871.184	1488.137	12MMC
SSP27	-36762.329	3377823.322	1475.157	HOLEC
SSP28	-36466.211	3377804.835	1472.742	12MMC



RED REFLECTORISED
WHITE REFLECTORISED
LETTERS: SERIES C
STOP SIGN R1 (FIG.1)
SCALE 1:10



RED REFLECTORISED
BLUE SEMI-MATT
WHITE REFLECTORISED
FIGURES: SERIES E MODIFIED
SPEED LIMIT R14A (FIG.16)
SCALE 1:10



VERTICAL PROFILE GRADES		Datum 1460.000		
BVC	4.063	VCL=58.369m	EVC BVC	62.4328.991
6.850%	33.248	1475.873	1.652%	116.095
				1477.241
				2.069%
				136.928m
				234.989
				1474.781
				303.453
				-6.466%
				-2.200%

FINAL DESIGN ROAD LEVELS	LEFT EDGE (HL)	CENTRE LINE (CL)	RIGHT EDGE (HR)
1474.792	1474.792	1474.792	1474.792
1475.700	1475.700	1475.700	1475.700
1476.252	1476.252	1476.252	1476.252
1476.584	1476.584	1476.584	1476.584
1476.805	1476.805	1476.805	1476.805
1476.824	1476.824	1476.824	1476.824
1476.643	1476.643	1476.643	1476.643
1476.273	1476.273	1476.273	1476.273
1475.829	1475.829	1475.829	1475.829
1475.265	1475.265	1475.265	1475.265
1474.572	1474.572	1474.572	1474.572
1473.751	1473.751	1473.751	1473.751
1472.801	1472.801	1472.801	1472.801
1471.722	1471.722	1471.722	1471.722
1470.515	1470.515	1470.515	1470.515
1469.225	1469.225	1469.225	1469.225
1467.931	1467.931	1467.931	1467.931
1466.538	1466.538	1466.538	1466.538
1465.345	1465.345	1465.345	1465.345
1464.330	1464.330	1464.330	1464.330
1464.192	1464.192	1464.192	1464.192
1464.063	1464.063	1464.063	1464.063
1463.433	1463.433	1463.433	1463.433

CUT / FILL	HORIZONTAL ALIGNMENT
0.122	BCC1
0.200	7.95 CURVE 1
-0.051	24.617
-0.035	ECC1
0.102	147.658
0.147	1476.165
0.155	1476.542
0.049	1476.654
0.032	1476.833
0.056	1476.805
0.074	1476.804
0.080	1476.824
0.041	1476.654
0.004	1476.273
-0.002	1475.335
0.010	1475.829
0.041	1475.829
0.079	1475.265
0.096	1474.572
0.087	1473.751
-0.054	1472.801
-0.062	1471.722
0.144	1470.515
0.139	1469.225
0.096	1467.931
0.087	1466.538
-0.146	1465.345
0.162	1464.330
0.016	1464.192
	1464.063
	1463.433

DISTANCE (m)	DIRECTION
20	203°39'00"
40	214°00'10"
60	214°00'10"
80	214°00'10"
100	214°00'10"
120	214°00'10"
140	214°00'10"
160	214°00'10"
180	214°00'10"
200	214°00'10"
220	220°56'00"
240	220°56'00"
260	220°56'00"
280	220°56'00"
300	220°56'00"
320	220°56'00"
340	220°56'00"
360	220°56'00"
380	220°56'00"
400	220°56'00"
420	220°56'00"
440	220°56'00"

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PROFESSIONAL ENGINEER: L. MARAH. PROF. Reg.No: 920261. DATE: SIGNATURE:

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

REV	DATE	DESCRIPTION	BY

PROJECT NAME: REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT WARD 10. TITLE: ROAD 1 LONGSECTION.

PROJECT STATUS: TENDER. DATE: 2024-03-25. SCALE: N.T.S. SHEET: 1 OF 1. REV: A. DWG NO: P-SM01-PMO-CE-S-02.

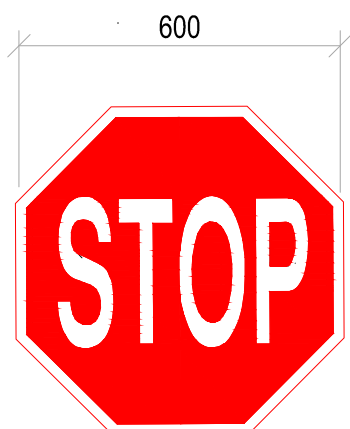
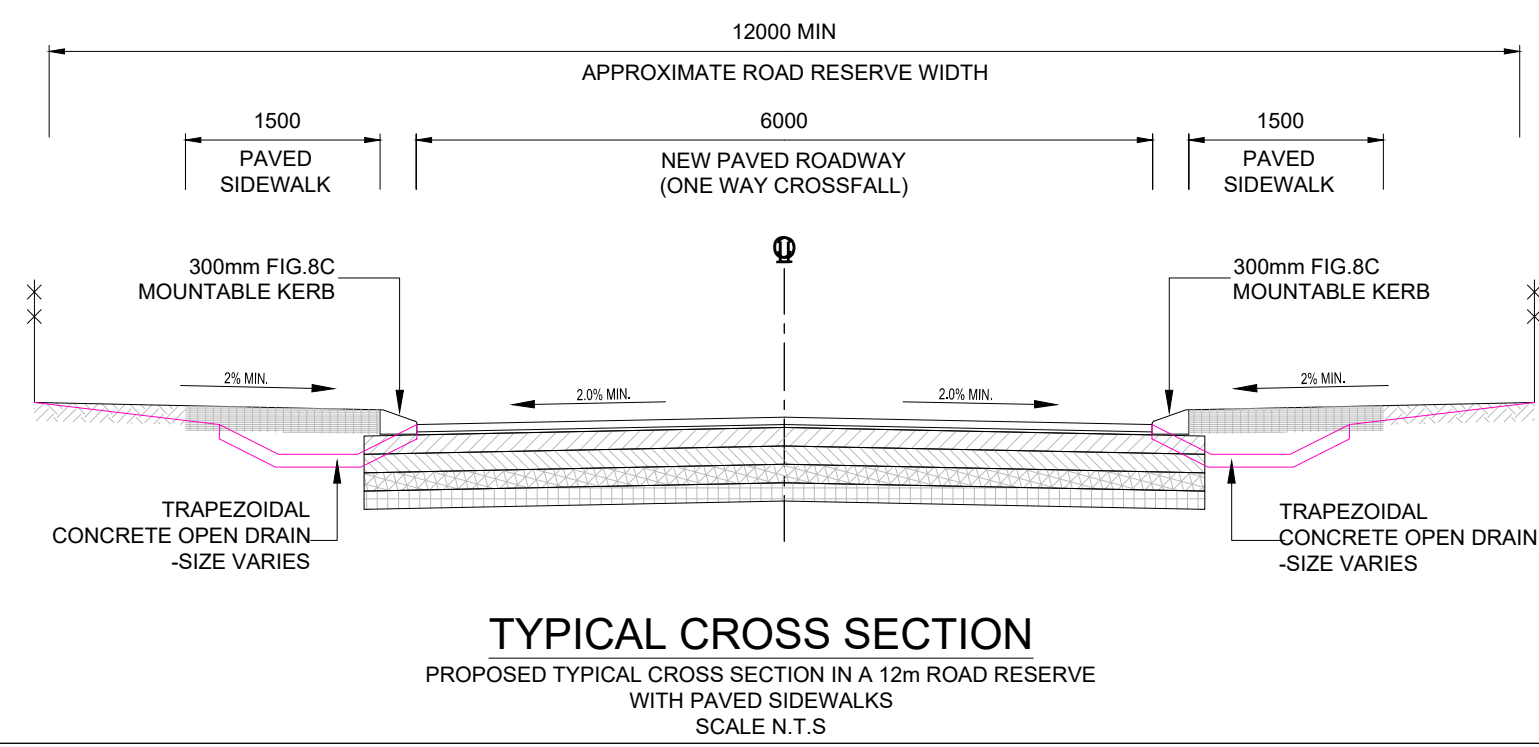
LEGEND

- CENTRELINES
- ESKOM/TELEKOM POLE
- EXISTING POWER LINE
- ROAD CROSS FALL
- STORMWATER CHANNEL
- MANHOLE
- EXISTING TREE
- CULVERT
- EXISTING TARMAC SURFACE

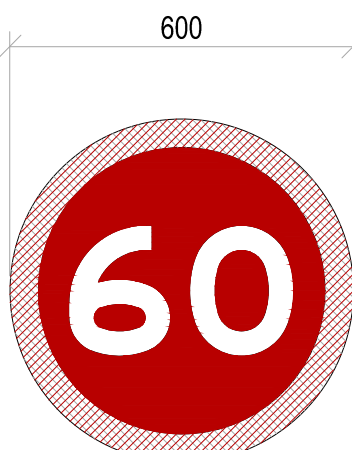
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- PI POINT OF INTERSECTION

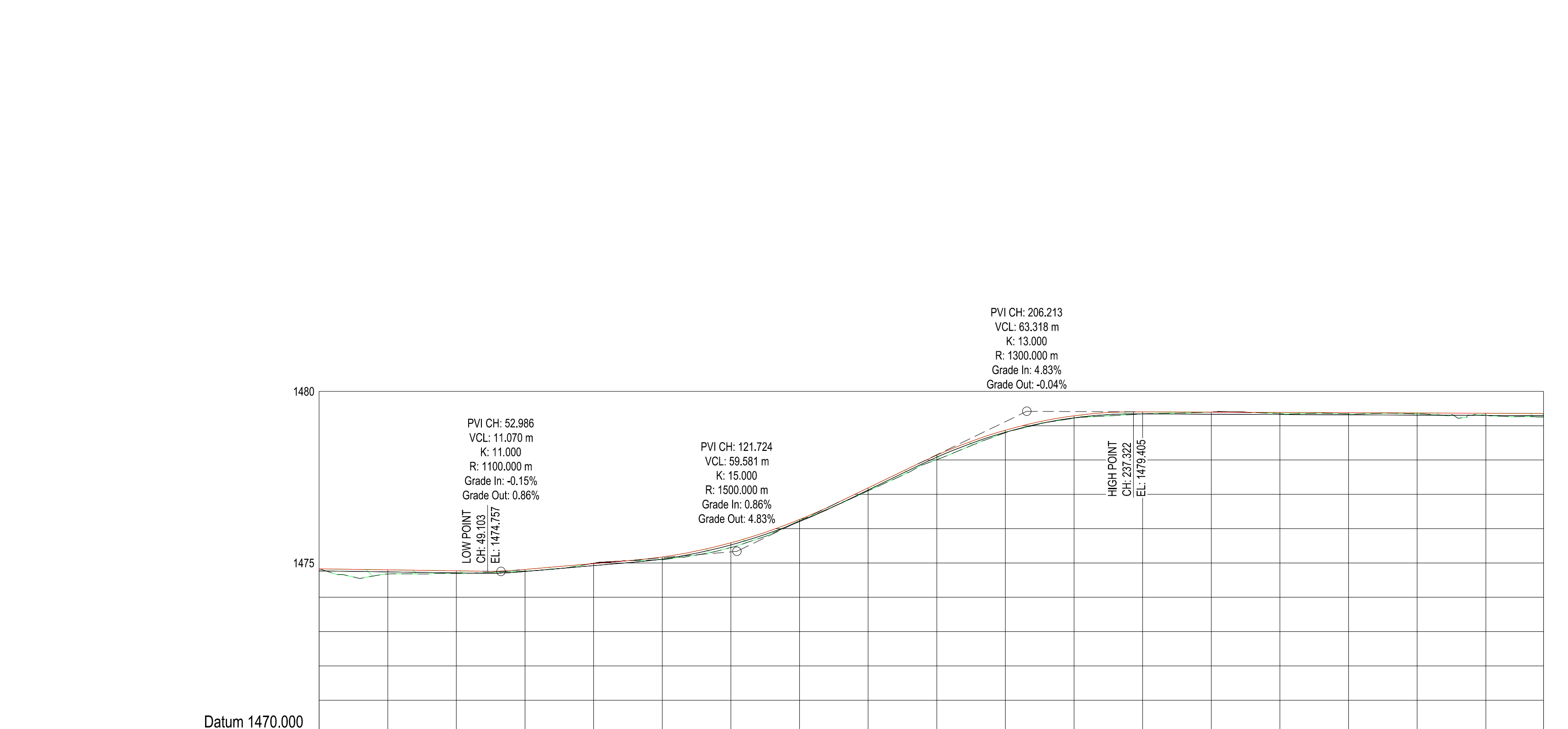
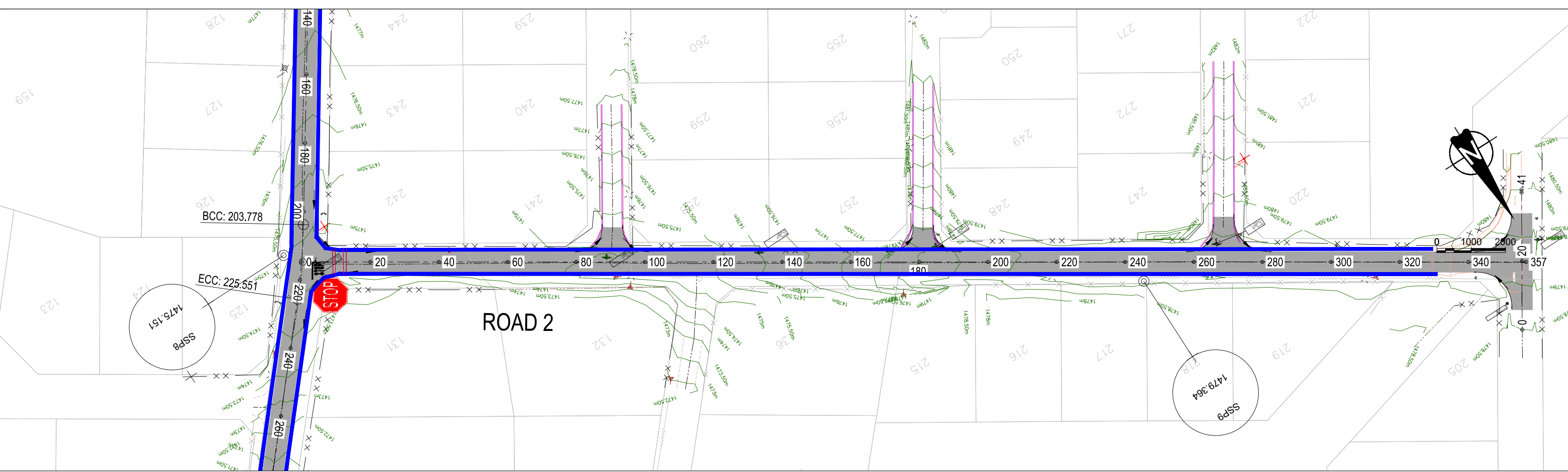
COORDINATE LIST				
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RED REFLECTORISED
WHITE REFLECTORISED
LETTERS: SERIES C
STOP SIGN R1 (FIG.1)
SCALE 1:10



RED REFLECTORISED
BLUE SEMI-MATT
WHITE REFLECTORISED
FIGURES: SERIES E MODIFIED
SPEED LIMIT R14A (FIG.16)
SCALE 1:10



FINAL DESIGN ROAD LEVELS	LEFT EDGE (HL)			CENTRE LINE (CL)			RIGHT EDGE (HR)			
	20	40	60	80	100	120	140	160	180	
LEFT EDGE (HL)	1474.740	1474.710	1474.750	1474.921	1475.114	1475.526	1476.205	1477.127	1478.081	
CENTRE LINE (CL)	1474.830	1474.770	1474.810	1474.981	1475.174	1475.586	1476.265	1477.187	1478.141	
RIGHT EDGE (HR)	1474.770	1474.710	1474.750	1474.921	1475.114	1475.526	1476.205	1477.127	1478.081	
GROUND LEVELS ON CL	1474.677	1474.697	1474.763	1474.991	1475.084	1475.450	1476.231	1477.100	1478.011	
CUT / FILL	0.122	0.073	0.047	-0.010	0.081	0.136	0.034	0.086	0.130	
HORIZONTAL ALIGNMENT	DIRECTION 122°52'50"									
DISTANCE (m)	20	40	60	80	100	120	140	160	180	

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CONSULTANT: THEWO & SMMS - JV. 58 Brebner Road, Westdene, Bloemfontein 9301. Sigodi Marah Martin Management Support.

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

REV	DATE	DESCRIPTION	BY

PROJECT NAME: REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT WARD 10. TITLE: ROAD 2 LONGSECTION.

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

LEGEND

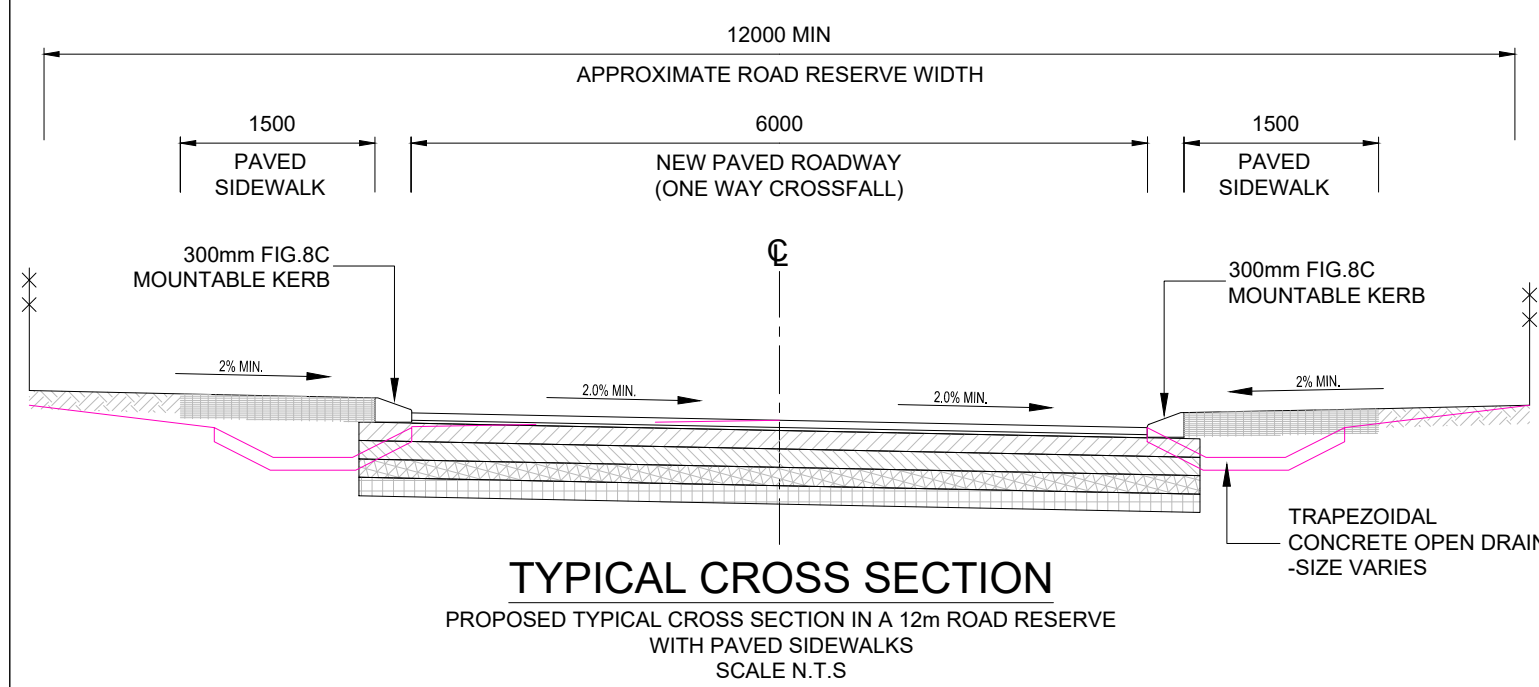
- CENTRELINE
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- CH. CHAINAGE
- PI POINT OF INTERSECTION

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HARTEBEE SHOEK				WG27
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SSP28	-36466.211	3377804.835	1472.742	12MMC



RED REFLECTORISED
WHITE REFLECTORISED
LETTERS: SERIES C

STOP SIGN R1 (FIG.1)

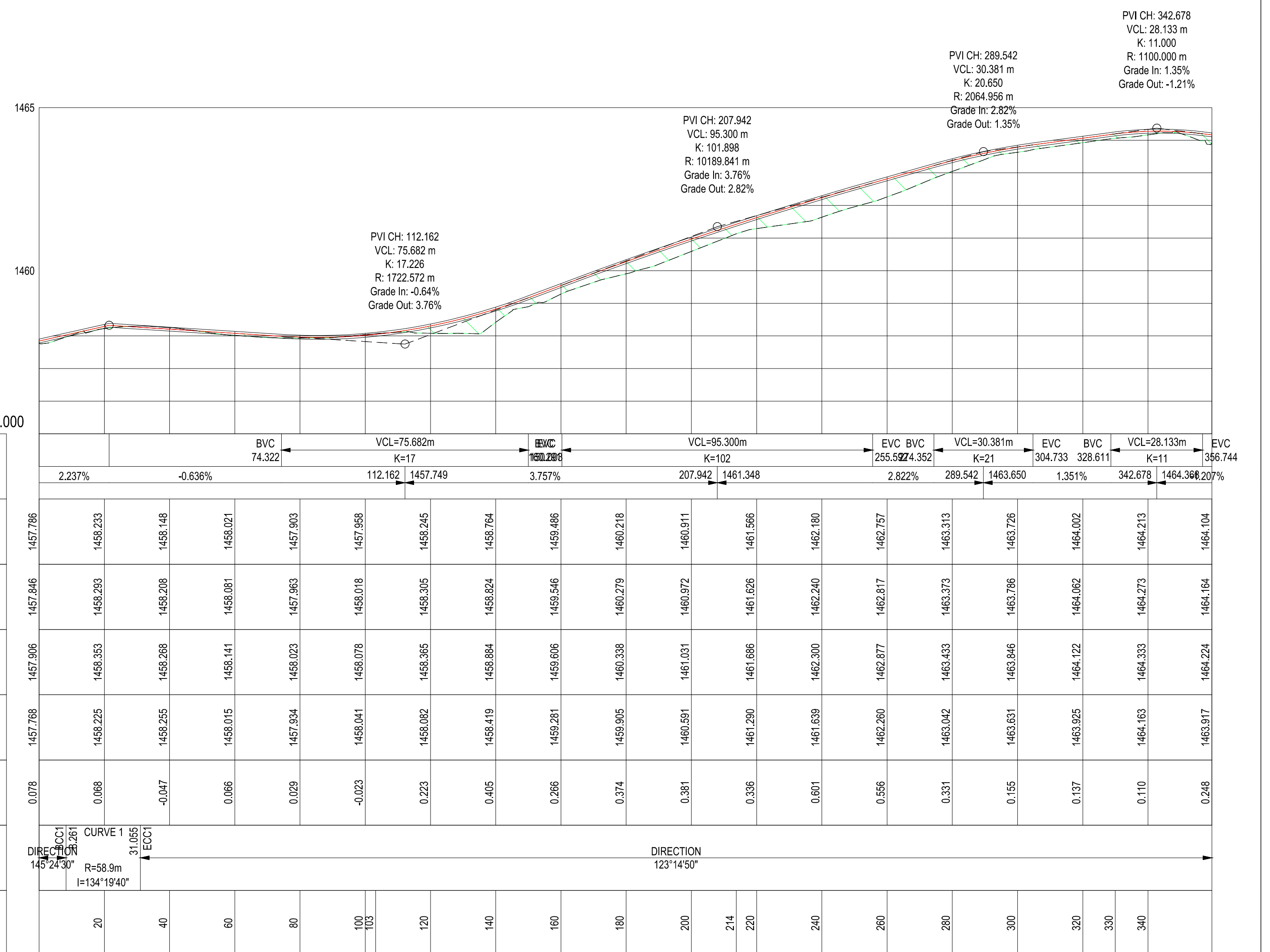
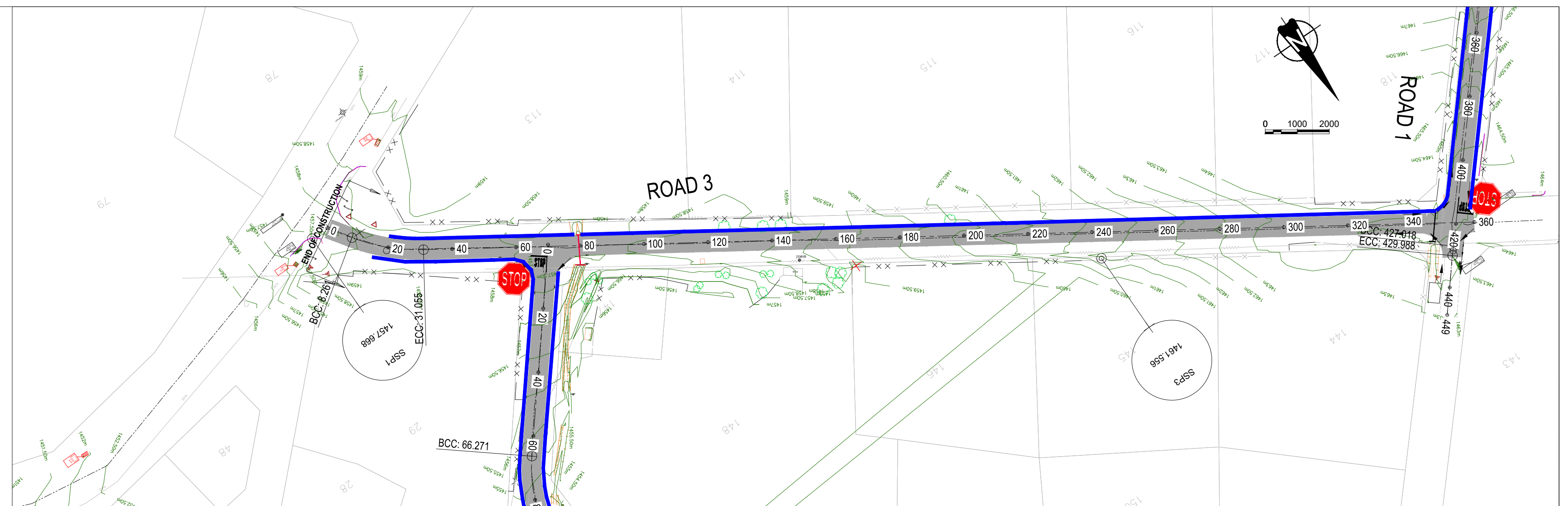
SCALE 1:10



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

SPEED LIMIT R14A (FIG.16)

SCALE 1:10



VERTICAL PROFILE GRADES	
FINAL DESIGN ROAD LEVELS	GROUND LEVELS ON CL
LEFT EDGE (HL)	
CENTRE LINE (CL)	
RIGHT EDGE (HR)	
CUT / FILL	
HORIZONTAL ALIGNMENT	
DISTANCE (m)	

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

CONSULTANT: THEWO & SMMMS - JV. 58 Bredner Road, Westdene, Bloemfontein 9301. Sigodi Marah Martin, Management Support, Technical & Engineering Consultant.

PROFESSIONAL ENGINEER: L. MARAH. 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 STERKSPRUIT WARD 10. TITLE: ROAD 3 LONGSECTION

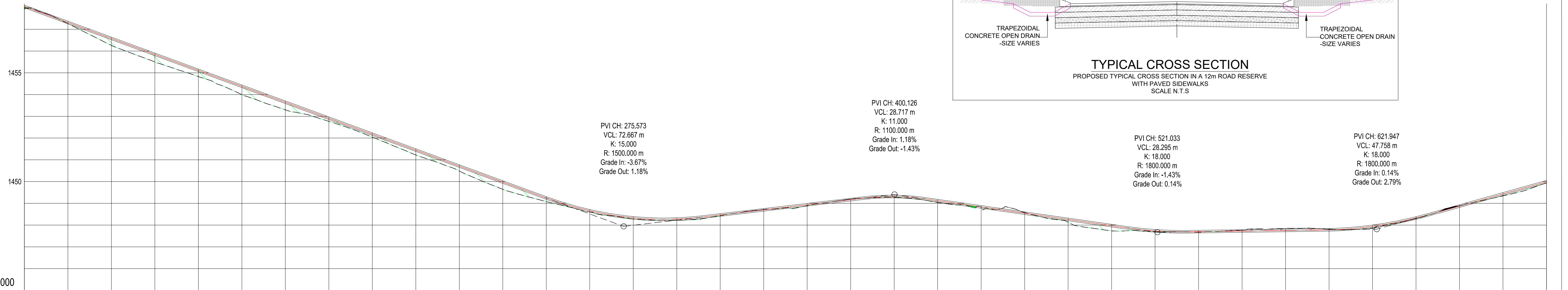
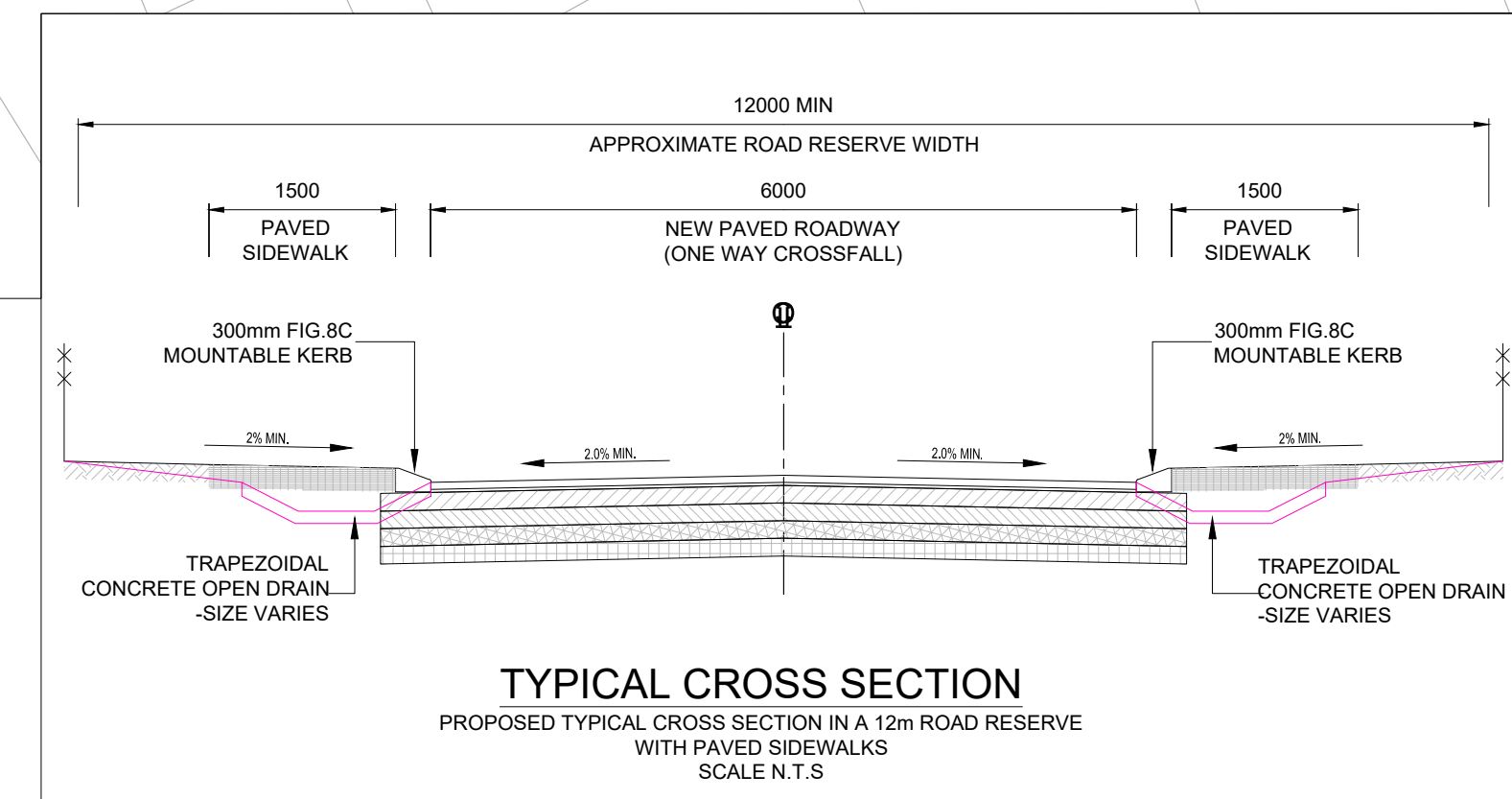
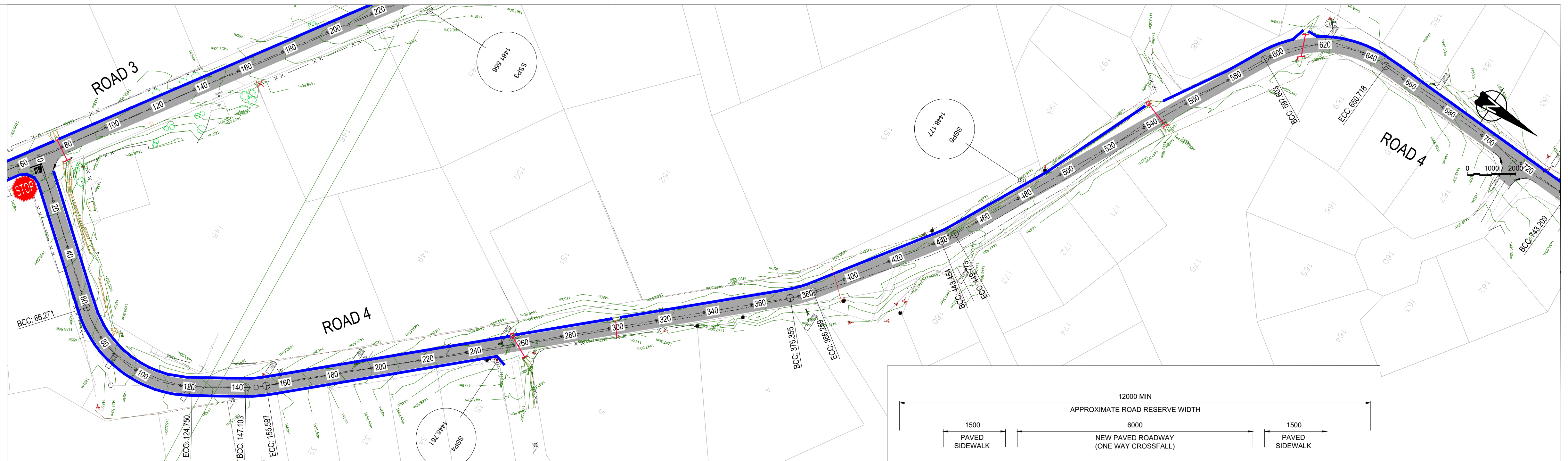
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LEGEND

- CENTRELINE
- ⊙ ESKOM/TEKON POLE
- EXISTING POWER LINE
- 2% ROAD CROSS FALL
- STORMWATER CHANNEL
- MANHOLE
- EXISTING TREE
- CULVERT
- EXISTING TARMAK 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

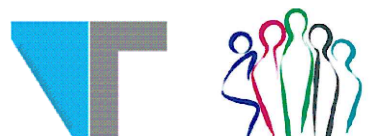


VERTICAL PROFILE GRADES		DISTANCE (m)
FINAL DESIGN ROAD LEVELS	LEFT EDGE (HL)	1458.108
	CENTRE LINE (CL)	1458.048
	RIGHT EDGE (HR)	1457.988
GROUND LEVELS ON CL		1457.935
CUT / FILL		0.113
HORIZONTAL ALIGNMENT		DIRECTION 219°07'00"
DISTANCE (m)		20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400, 420, 440, 460, 480, 500, 510, 520, 540, 560, 580, 600, 610, 620, 640, 660, 680

BVC	VCL	EVC	GRADE	BVC	VCL	EVC	GRADE	BVC	VCL	EVC	GRADE
239.239	275.573	311.906	-3.668%	385.786	400.126	414.495	1.177%	506.886	521.033	535.180	-1.434%
	1447.941			1449.406				1447.672			0.138%
											621.947
											1447.811
											2.791%
											1450.050

CLIENT:

 19 Murray Street
 Lady Grey
 9755
 Tel: (051) 803 1449
 Email: vanrensburg@senqu.gov.za

CONSULTANT:
 THEWO & SMMS - JV

 Thewo Engineering
 58 Brubner 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

REV	DATE	DESCRIPTION	BY

PROJECT NAME:
REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT WARD 10
 TITLE:
ROAD 4 LONGSECTION

PROJECT STATUS:
TENDER
 DATE: 2024-03-25
 SCALE: N.T.S.
 SHEET: 1 OF 2
 REV: A
 DWG NO: P-SM01-PMO-CE-S-04

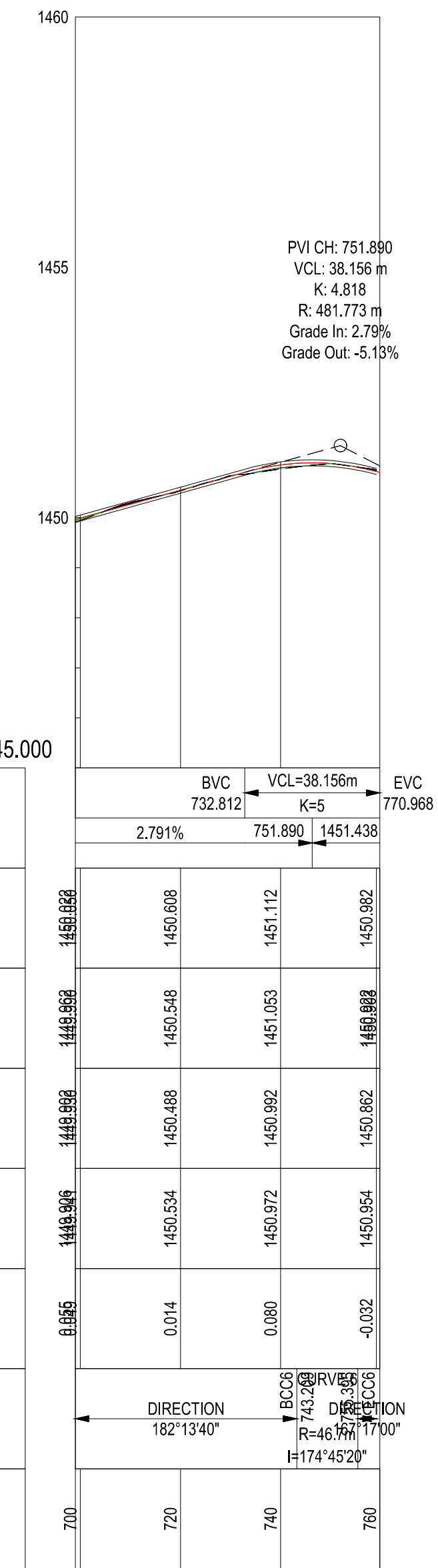
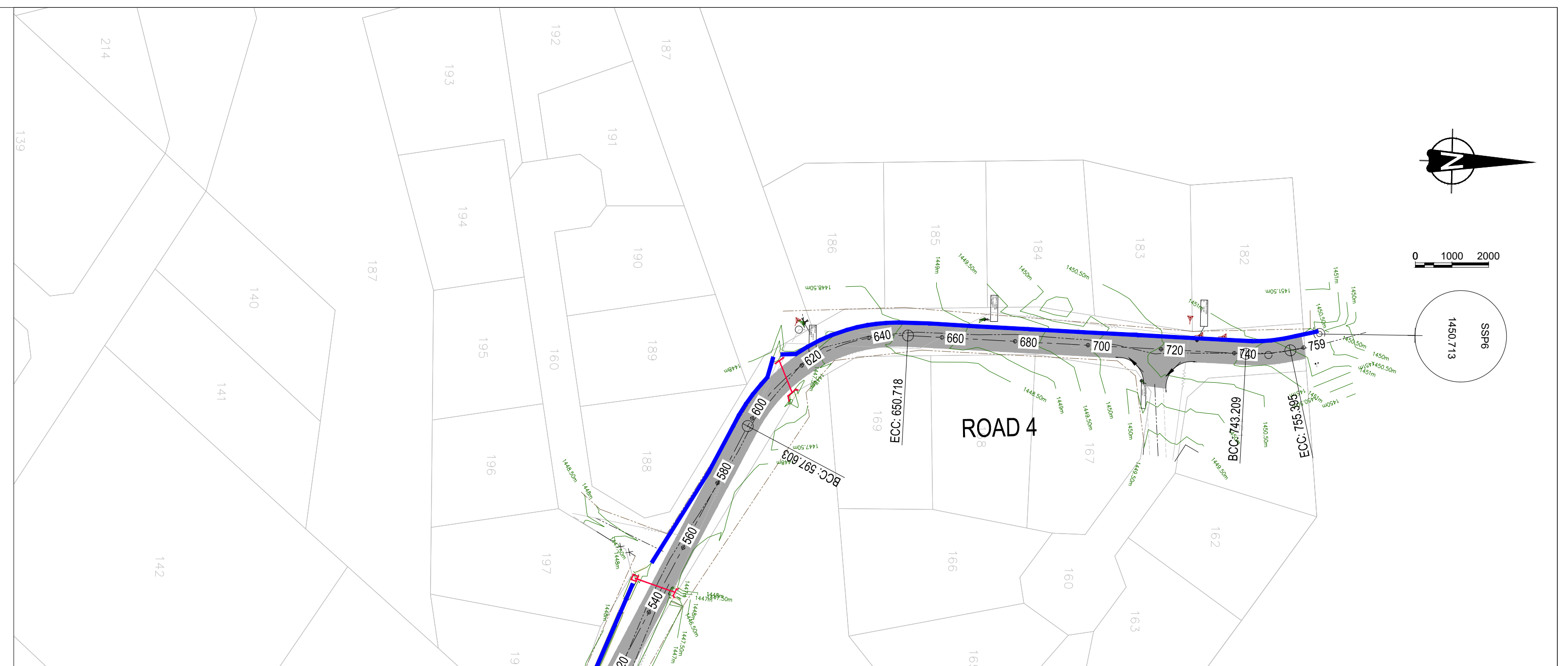
LEGEND

- +— CENTRELINE
- ⊙ ESKOM/TELEKOM POLE
- Existing POWER LINE
- 2% → ROAD CROSS FALL
- STORMWATER CHANNEL
- MANHOLE
- ⊕ EXISTING TREE
- ⊖ CULVERT
- EXISTING TARMAC SURFACE

ABBREVIATIONS

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

COORDINATE LIST				
HARTEBEESSHOEK			WC27	
Name	Y Coord	X Coord	Z Coord	DESC.
SSP1	-35435.594	3378604.370	1457.668	12MMPAVE
SSP2	-35389.339	3378555.412	1457.612	12MMC
SSP3	-35236.481	3378458.679	1461.556	12MMC
SSP4	-35342.052	3378354.777	1448.761	12MM/BTN
SSP5	-35159.407	3378214.416	1448.177	12MM/BTN
SSP6	-35034.270	3378002.262	1450.713	12MMRS
SSP7	-34886.276	3378717.680	1476.458	HOLEC
SSP8	-35008.420	3378564.231	1475.151	10MM
SSP9	-34801.976	3378421.786	1479.364	12MMC
SSP10	-35553.902	3378547.750	1451.133	12MMRSB
SSP11	-35577.944	3378474.700	1445.550	12MMPAVE
SSP12	-35969.297	3378559.145	1436.743	12MMC
SSP13	-35773.249	3378344.171	1447.402	12MMC
SSP14	-35839.506	3378094.023	1461.586	12MMTAR
SSP15	-35722.022	3377923.822	1457.384	12MMTAR
SSP16	-36447.989	3378349.098	1472.239	HOLEC
SSP17	-36675.760	3378434.899	1478.598	12MMC
SSP18	-36957.799	3378474.986	1493.638	12MMC
SSP19	-37233.294	3378447.763	1496.879	12MMC
SSP20	-37518.953	3378399.642	1505.031	12MMC
SSP21	-37698.894	3378391.237	1511.792	HYP/BTN
SSP22	-37908.993	3378416.255	1509.601	HOLEC
SSP23	-37667.372	3378169.929	1502.641	12MMC
SSP24	-37486.881	3377992.656	1496.498	12MMC
SSP25	-37243.989	3377941.633	1495.738	12MMC
SSP26	-37000.224	3377871.184	1488.137	12MMC
SSP27	-36762.329	3377823.322	1475.157	HOLEC
SSP28	-36466.211	3377804.835	1472.742	12MMC



VERTICAL PROFILE GRADES	
FINAL DESIGN ROAD LEVELS	LEFT EDGE (HL)
	CENTRE LINE (CL)
	RIGHT EDGE (HR)
GROUND LEVELS ON CL	
CUT / FILL	
HORIZONTAL ALIGNMENT	
DISTANCE (m)	



- RED REFLECTORISED
- WHITE REFLECTORISED
- LETTERS: SERIES C

STOP SIGN R1 (FIG.1)

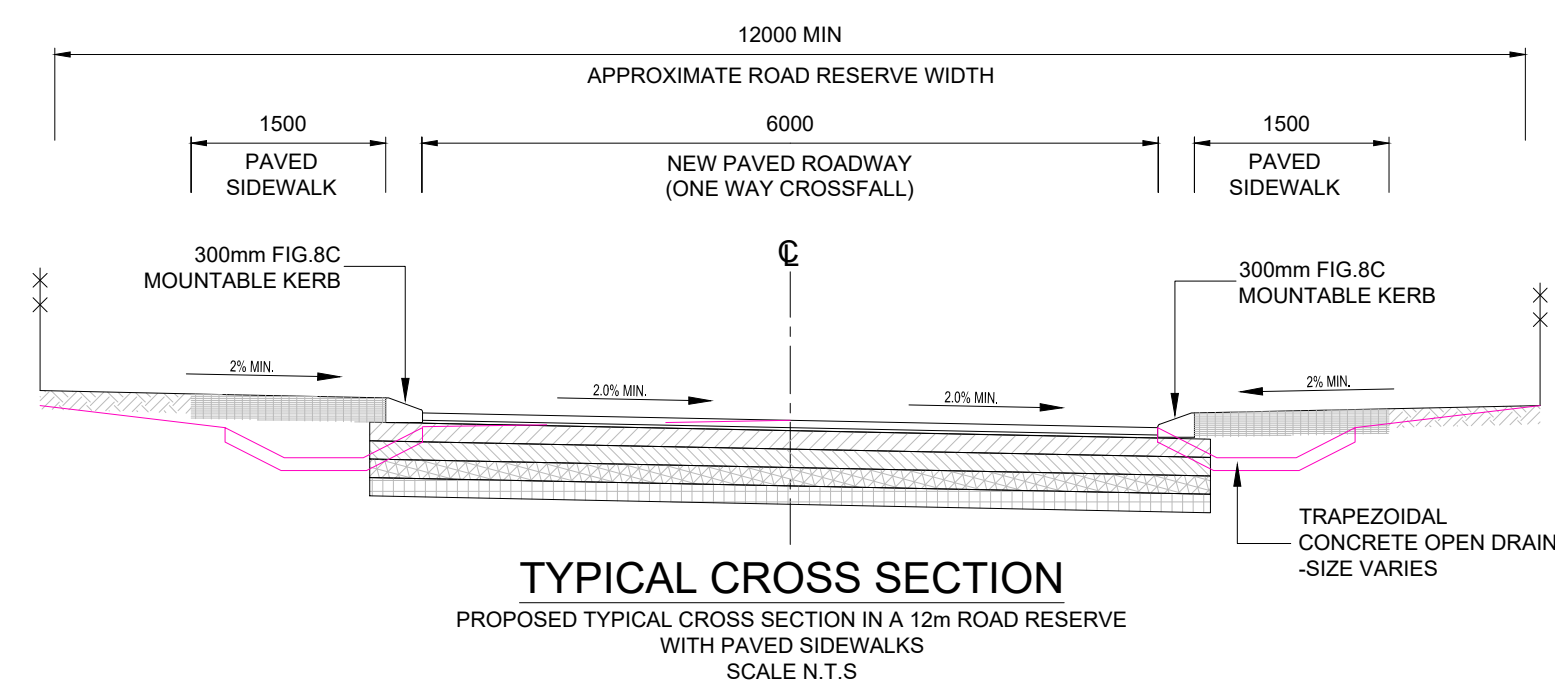
SCALE 1:10



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

SPEED LIMIT R14A (FIG.16)

SCALE 1:10



CLIENT:

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Tel: (051) 603 1449
Email:
vanzyl@senqu.gov.za

CONSULTANT:

THEWO & SMMMS - JV

58 Brehner Road
Westdene
Bloemfontein
9301

PROFESSIONAL ENGINEER:
L. MARAH
PROF. Reg.No:
920261
DATE:
SIGNATURE:

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

REV	DATE	DESCRIPTION	BY

PROJECT NAME
REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT WARD 10

TITLE
ROAD 4 LONGSECTION

PROJECT STATUS:
TENDER

DATE 2024-03-25	SCALE N.T.S	SHEET 2 OF 2	REV A	A1
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DWG NO
P-SM01-PMO-CE-S-06

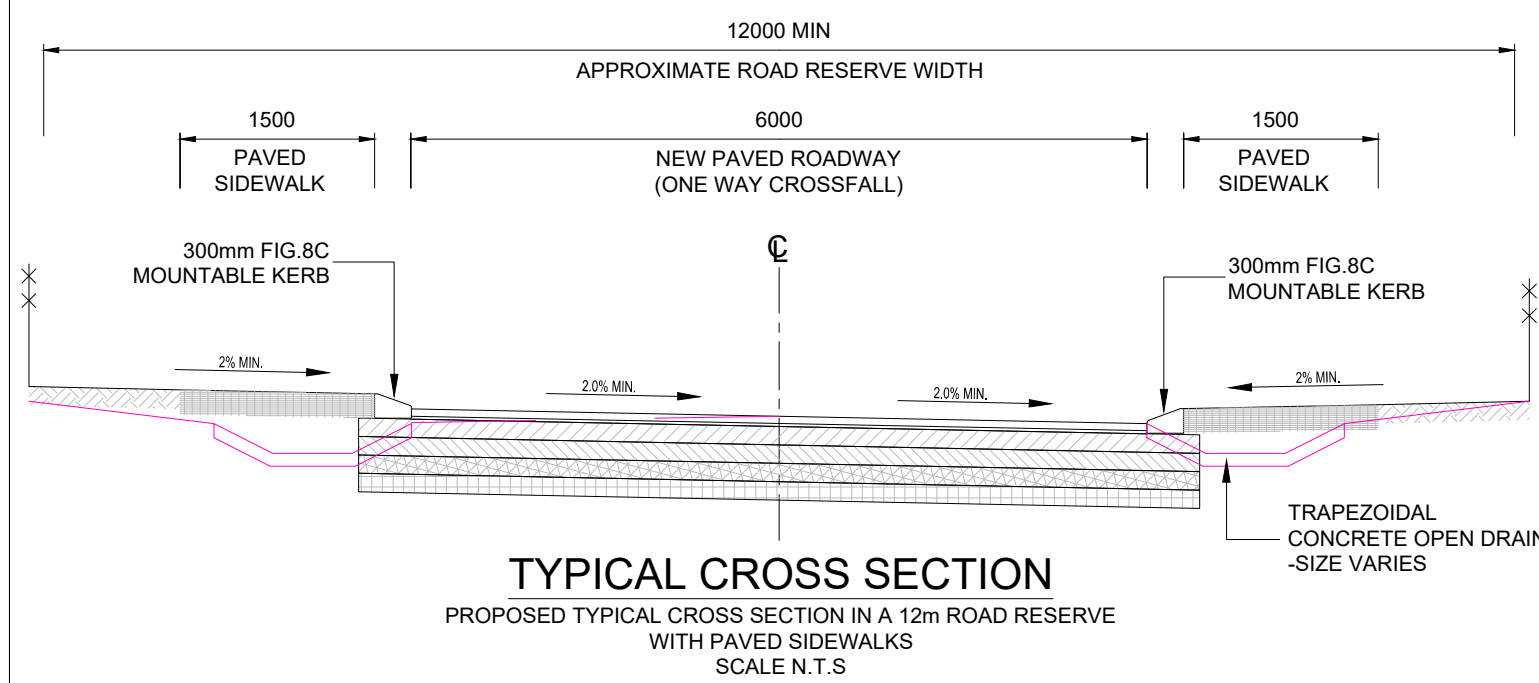
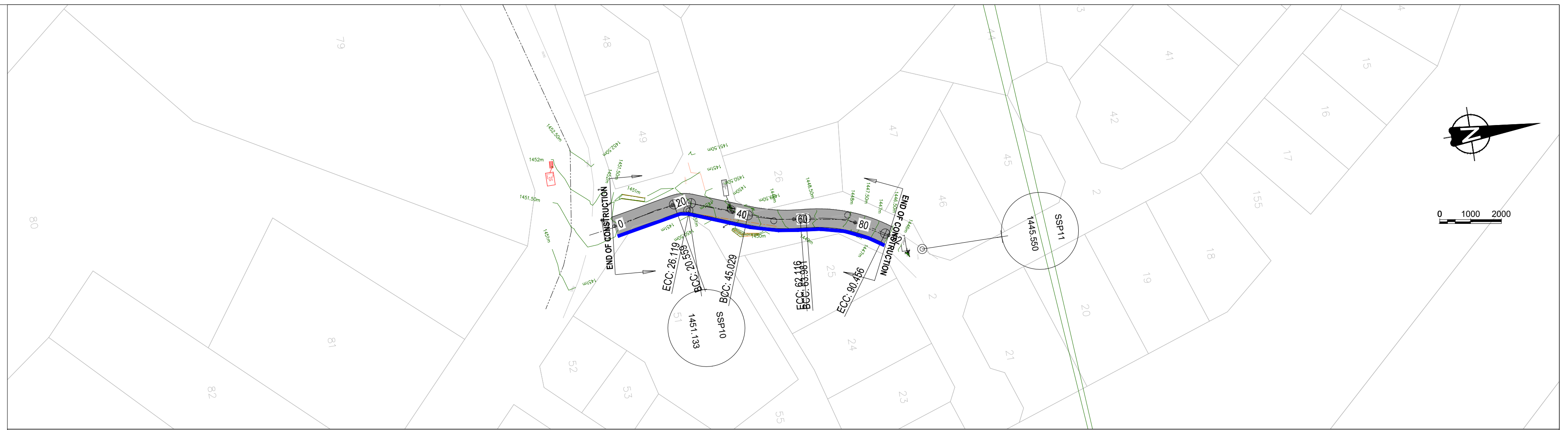
LEGEND

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

ABBREVIATIONS

- N.G.L. NATURAL GROUND LEVEL
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- CH. CHAINAGE
- PI POINT OF INTERSECTION

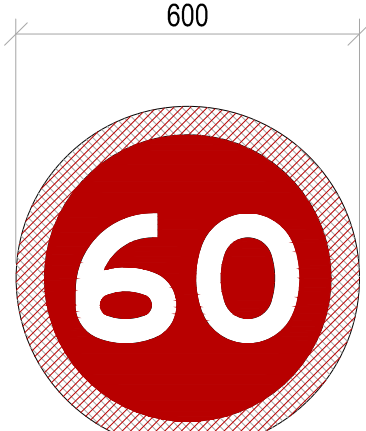
COORDINATE LIST				
HARTEBEE SHOEK		WG27		
Name	Y Coord	X Coord	Z Coord	DESC.
SSP1	-35435.594	3378604.370	1457.668	12MMPAVE
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SSP28	-36466.211	3377804.835	1472.742	12MMC



RED REFLECTORISED
WHITE REFLECTORISED
LETTERS: SERIES C

STOP SIGN R1 (FIG.1)

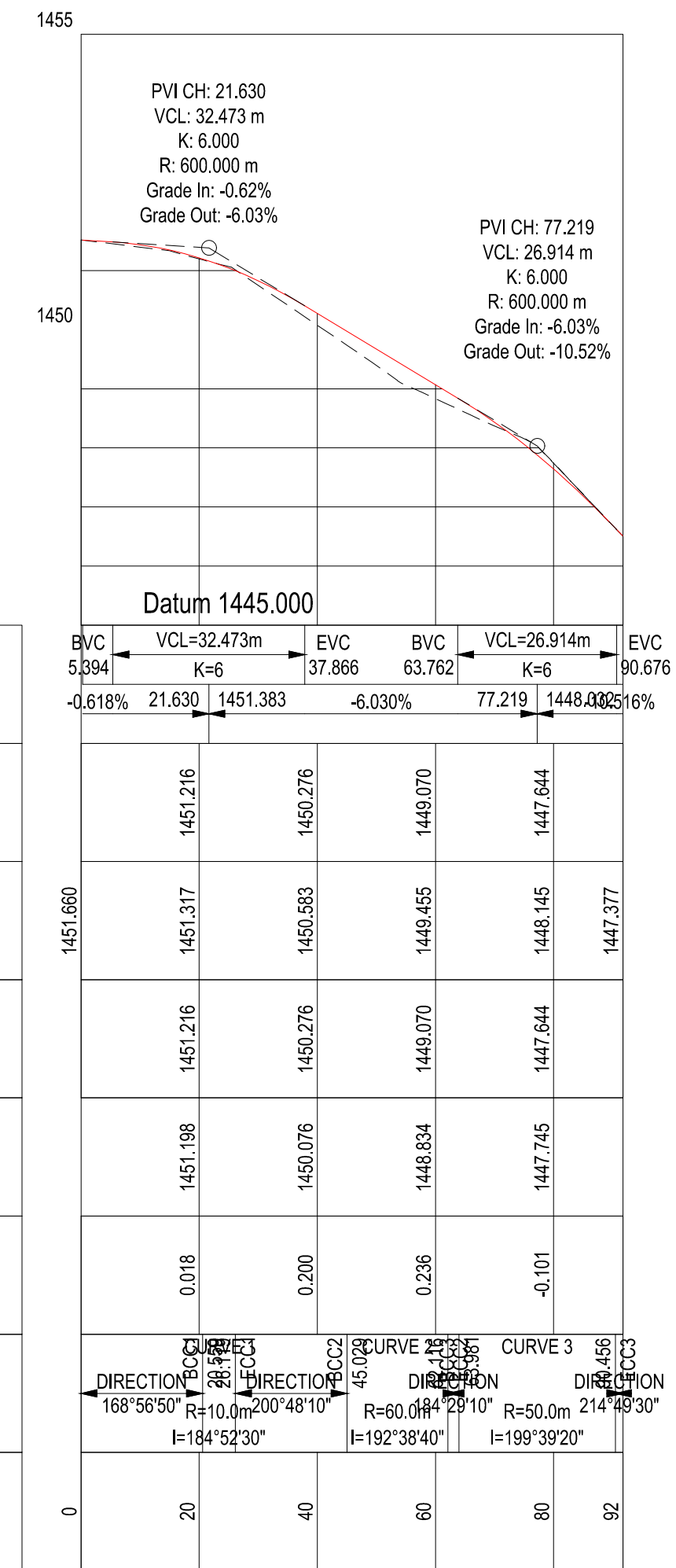
SCALE 1:10



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

SPEED LIMIT R14A (FIG.16)

SCALE 1:10



FINAL DESIGN ROAD LEVELS	VERTICAL PROFILE GRADES				
	LEFT EDGE (HL)	CENTRE LINE (CL)	RIGHT EDGE (HR)	GROUND LEVELS ON CL	
	LEFT EDGE (HL)	CENTRE LINE (CL)	RIGHT EDGE (HR)	CUT / FILL	
	1451.216	1451.317	1451.216	1451.198	0.018
	1450.276	1450.583	1450.276	1450.076	0.200
	1449.070	1449.455	1449.070	1448.834	0.238
	1447.644	1448.145	1447.644	1447.745	-0.101
	1447.377	1448.025	1448.025	1448.025	0.648

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

CONSULTANT: THEWO & SMMMS - JV. 58 Brebner Road, Westdene, Bloemfontein 9301. Sigodi Marah Martin Management Support.

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.

REV	DATE	DESCRIPTION	BY

PROJECT NAME: REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT WARD 10. TITLE: ROAD 5 LONGSECTION

PROJECT STATUS: TENDER. DATE: 2024-03-25. SCALE: N.T.S. SHEET: 01 OF 01. REV: A. DWG NO: P-SM01-PMO-CE-S-07.

LEGEND

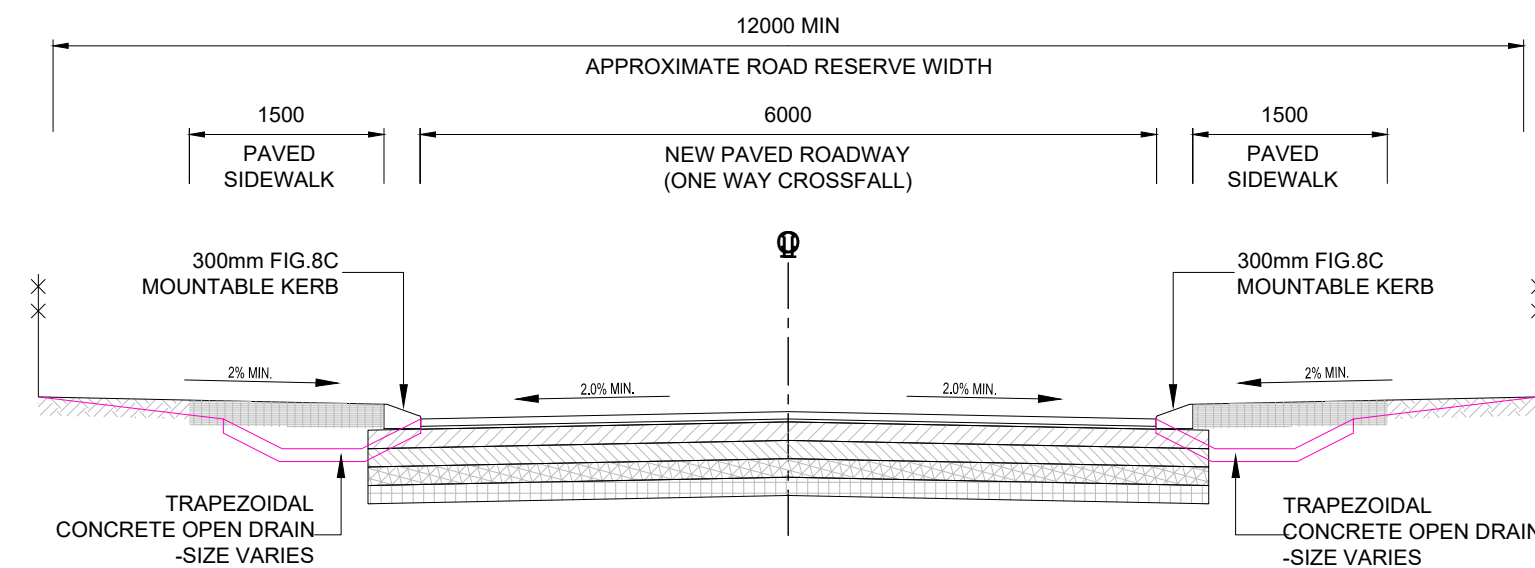
- CENTRELINE
- ESKOM/TELEKOM POLE
- EXISTING POWER LINE
- 2% → ROAD CROSS FALL
- STORMWATER CHANNEL
- MANHOLE
- EXISTING TREE
- CULVERT
- EXISTING TARMAC SURFACE

ABBREVIATIONS

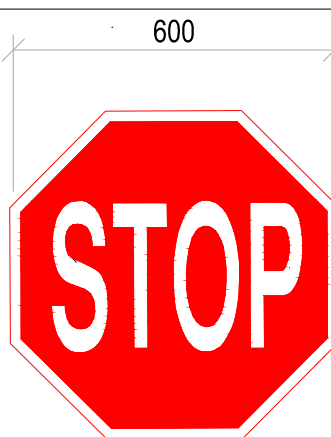
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COORDINATE LIST

HARTEBEE SHOEK				WG27
Name	Y Coord	X Coord	Z Coord	DESC.
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SSP28	-36466.211	3377804.835	1472.742	12MMC



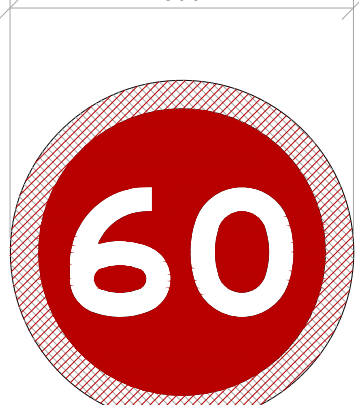
TYPICAL CROSS SECTION
PROPOSED TYPICAL CROSS SECTION IN A 12m ROAD RESERVE WITH PAVED SIDEWALKS
SCALE N.T.S



RED REFLECTORISED
WHITE REFLECTORISED
LETTERS: SERIES C

STOP SIGN R1 (FIG.1)

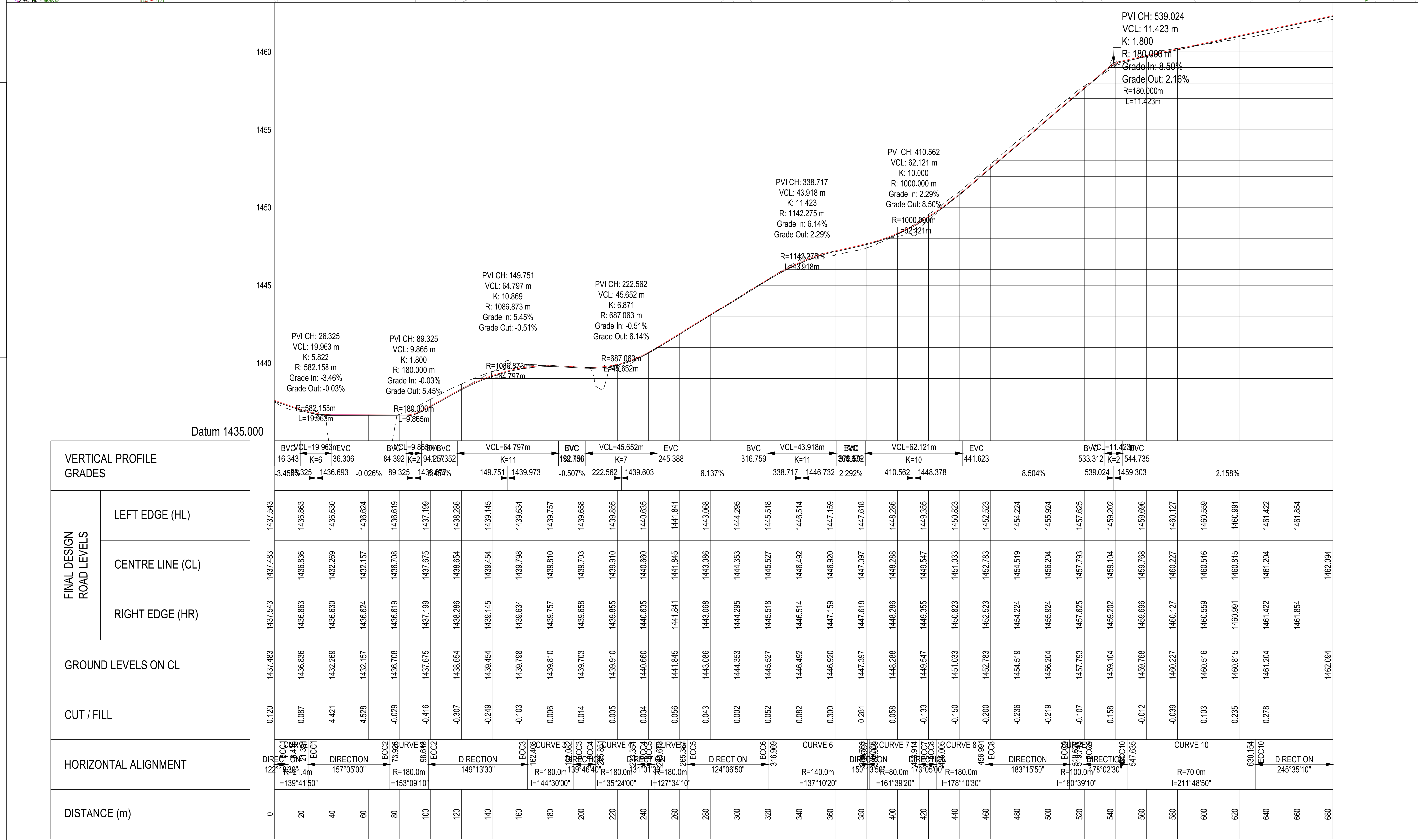
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600



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

SPEED LIMIT R14A (FIG.16)

SCALE 1:10



VERTICAL PROFILE GRADES	
FINAL DESIGN ROAD LEVELS	GROUND LEVELS ON CL
LEFT EDGE (HL)	
CENTRE LINE (CL)	
RIGHT EDGE (HR)	
CUT / FILL	
HORIZONTAL ALIGNMENT	
DISTANCE (m)	

<p>CLIENT:</p> <p>19 Murray Street Lady Grey 9755 Tel: (051) 603 1449 Email: vanzyfi@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 PROF. Reg.No: 920281 DATE: SIGNATURE:</p>	<p>DESIGN BY:</p> <p>R. DHLIWAYO DRAWN BY: R. DHLIWAYO 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> </tbody> </table>	REV	DATE	DESCRIPTION	BY													<p>PROJECT NAME</p> <p>REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT WARD 10</p> <p>TITLE</p> <p>ROAD 6 LONGSECTION</p>	<p>PROJECT STATUS:</p> <p>TENDER</p> <table border="1"> <tr> <td>DATE</td> <td>SCALE</td> <td>SHEET</td> <td>REV</td> </tr> <tr> <td>2024-03-25</td> <td>N.T.S</td> <td>1 OF 1</td> <td>A</td> </tr> </table> <p>DWG NO</p> <p>P-SM01-PMO-CE-S-07</p>	DATE	SCALE	SHEET	REV	2024-03-25	N.T.S	1 OF 1	A
REV	DATE	DESCRIPTION	BY																											
DATE	SCALE	SHEET	REV																											
2024-03-25	N.T.S	1 OF 1	A																											

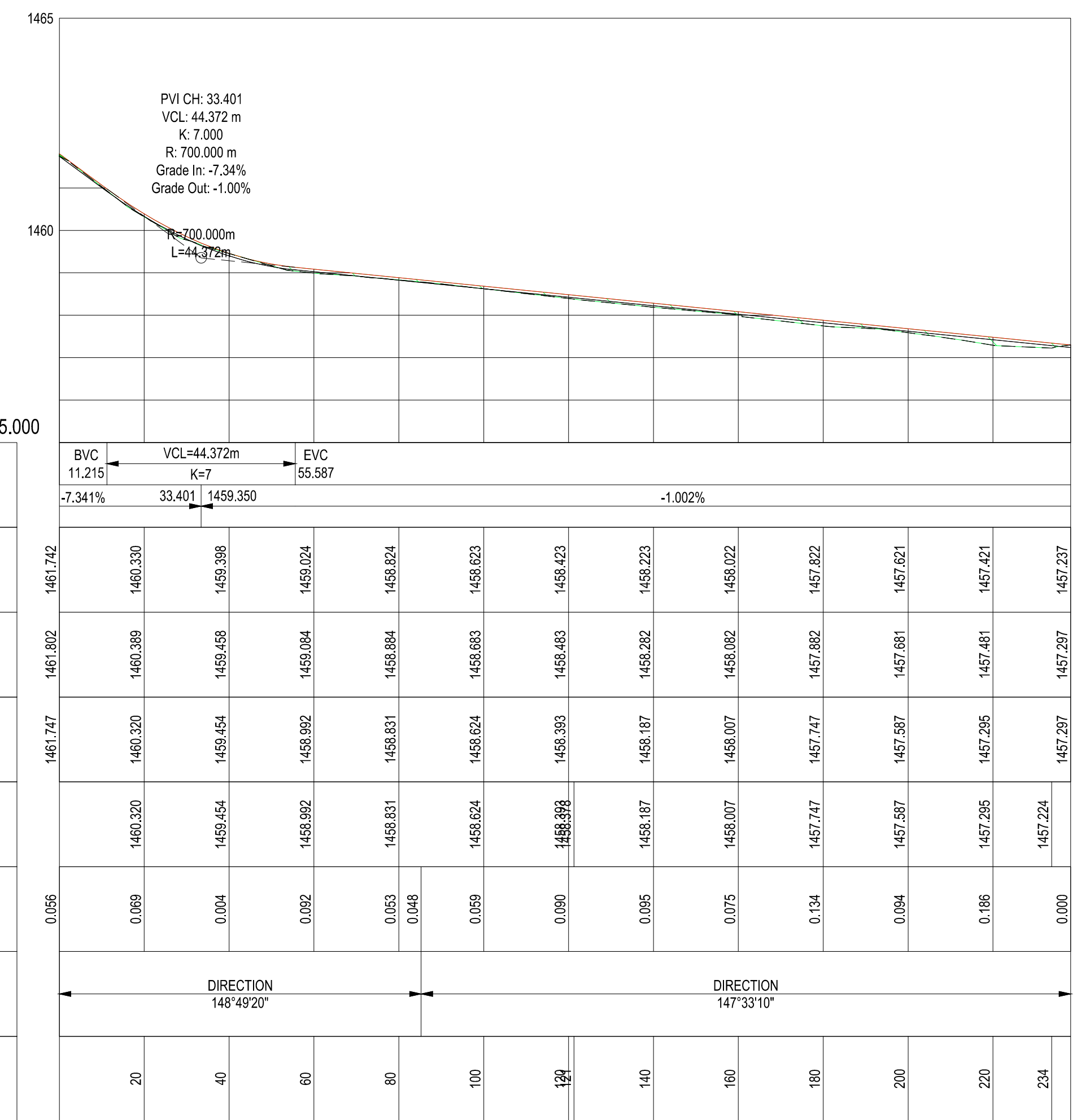
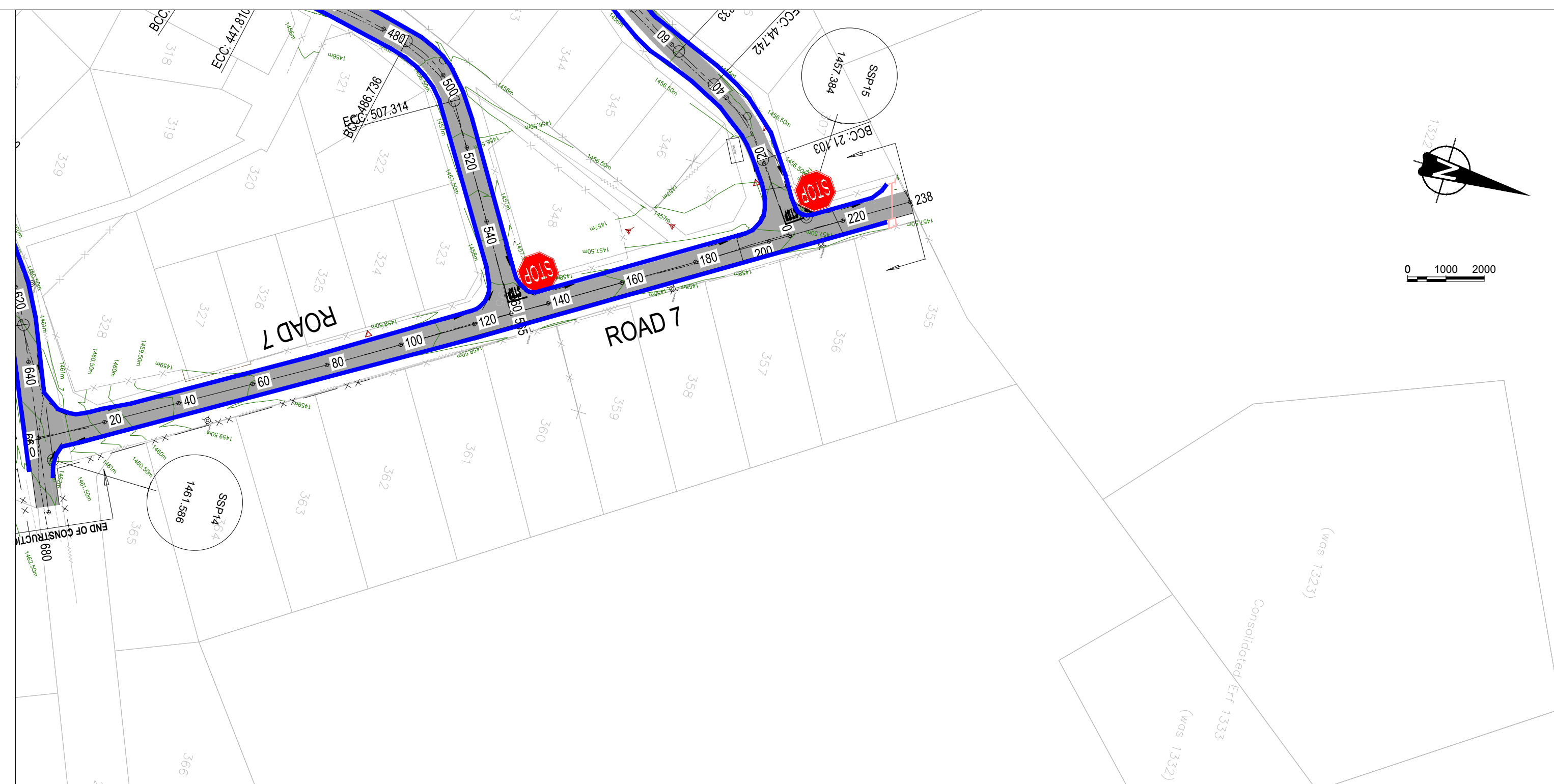
LEGEND

- CENTRELINE
- ⊙ ESKOM/TELEKOM POLE
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- 2% → ROAD CROSS FALL
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- CULVERT
- EXISTING TARMAC SURFACE

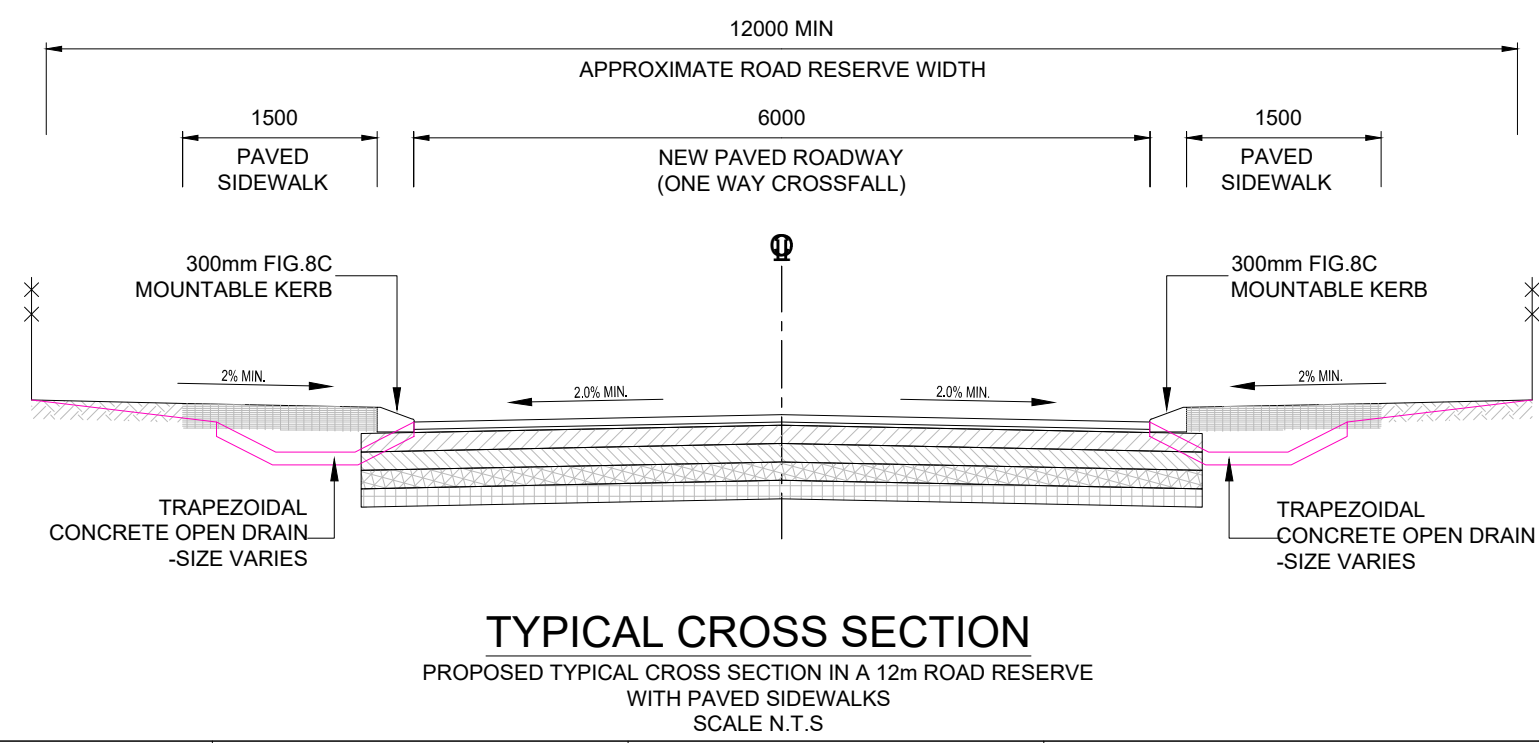
ABBREVIATIONS

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- CH. CHAINAGE
- PI POINT OF INTERSECTION

COORDINATE LIST				
HARTEBEESSHOEK			WG27	
Name	Y Coord	X Coord	Z Coord	DESC.
SSP1	-35435.594	3378604.370	1457.688	12MMPAVE
SSP2	-35389.339	3378555.412	1457.612	12MIMC
SSP3	-35236.481	3378458.679	1461.556	12MIMC
SSP4	-35342.052	3378354.777	1448.761	12MIMBTN
SSP5	-35159.407	3378214.416	1448.177	12MIMBTN
SSP6	-35034.270	3378002.262	1450.713	12MIMRS
SSP7	-34896.276	337817.680	1476.458	HOLEC
SSP8	-35008.420	3378564.231	1475.151	10MM
SSP9	-34801.976	3378421.786	1479.364	12MIMC
SSP10	-35553.902	3378547.750	1451.133	12MIMRSB
SSP11	-35577.944	3378474.700	1445.550	12MIMPAVE
SSP12	-35699.297	3378559.145	1436.743	12MIMC
SSP13	-35773.249	3378344.171	1447.402	12MIMC
SSP14	-35839.506	3378094.023	1461.586	12MIMTAR
SSP15	-35722.022	3377923.822	1457.384	12MIMTAR
SSP16	-36447.989	3378349.098	1472.239	HOLEC
SSP17	-36675.760	3378434.899	1478.598	12MIMC
SSP18	-36857.799	3378474.986	1493.638	12MIMC
SSP19	-37233.294	3378447.763	1496.879	12MIMC
SSP20	-37518.953	3378399.642	1505.031	12MIMC
SSP21	-37698.894	3378391.237	1511.792	HYP/BTN
SSP22	-37908.993	3378416.255	1509.601	HOLEC
SSP23	-37667.372	3378169.929	1502.641	12MIMC
SSP24	-37486.881	3377992.656	1496.498	12MIMC
SSP25	-37243.989	3377941.633	1495.738	12MIMC
SSP26	-37000.224	3377871.184	1488.137	12MIMC
SSP27	-36762.329	3377823.322	1475.157	HOLEC
SSP28	-36466.211	3377804.835	1472.742	12MIMC



VERTICAL PROFILE GRADES	
BVC	11.215
VCL	33.401
EVC	55.587
-7.341% K=7 -1.002%	



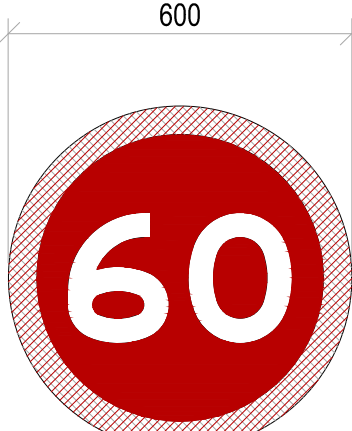
TYPICAL CROSS SECTION
PROPOSED TYPICAL CROSS SECTION IN A 12m ROAD RESERVE WITH PAVED SIDEWALKS
SCALE N.T.S.



RED REFLECTORISED
WHITE REFLECTORISED
LETTERS: SERIES C

STOP SIGN R1 (FIG.1)

SCALE 1:10



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

SPEED LIMIT R14A (FIG.16)

SCALE 1:10

CLIENT:



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Lady Grey
9755
Tel: (051) 603 1449
Email:
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CONSULTANT:



58 Brebner Road
Westdene
Bloemfontein
9301

PROFESSIONAL ENGINEER:

L. MARAH
PROF. Reg.No:
920261
DATE:
SIGNATURE:

DESIGN BY:

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

REV	DATE	DESCRIPTION	BY

REVISIONS

PROJECT NAME

REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT
WARD 10

TITLE

ROAD 7 LONGSECTION

PROJECT STATUS:

TENDER

DATE	SCALE	SHEET	REV	A1
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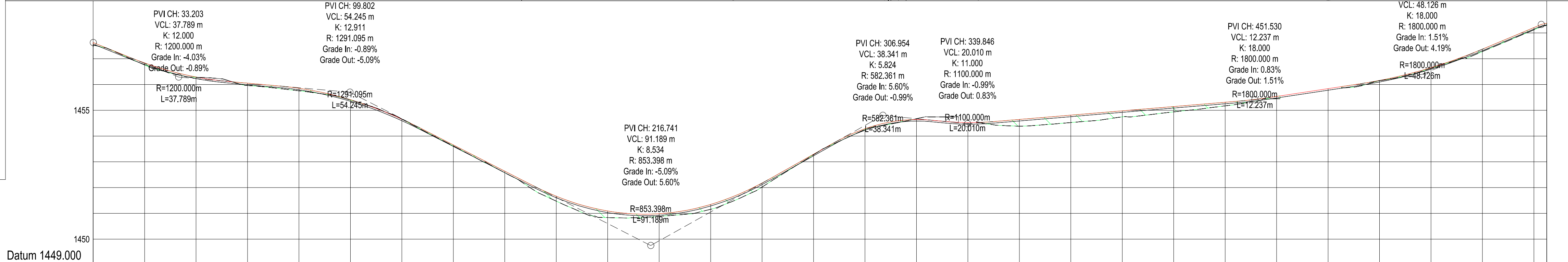
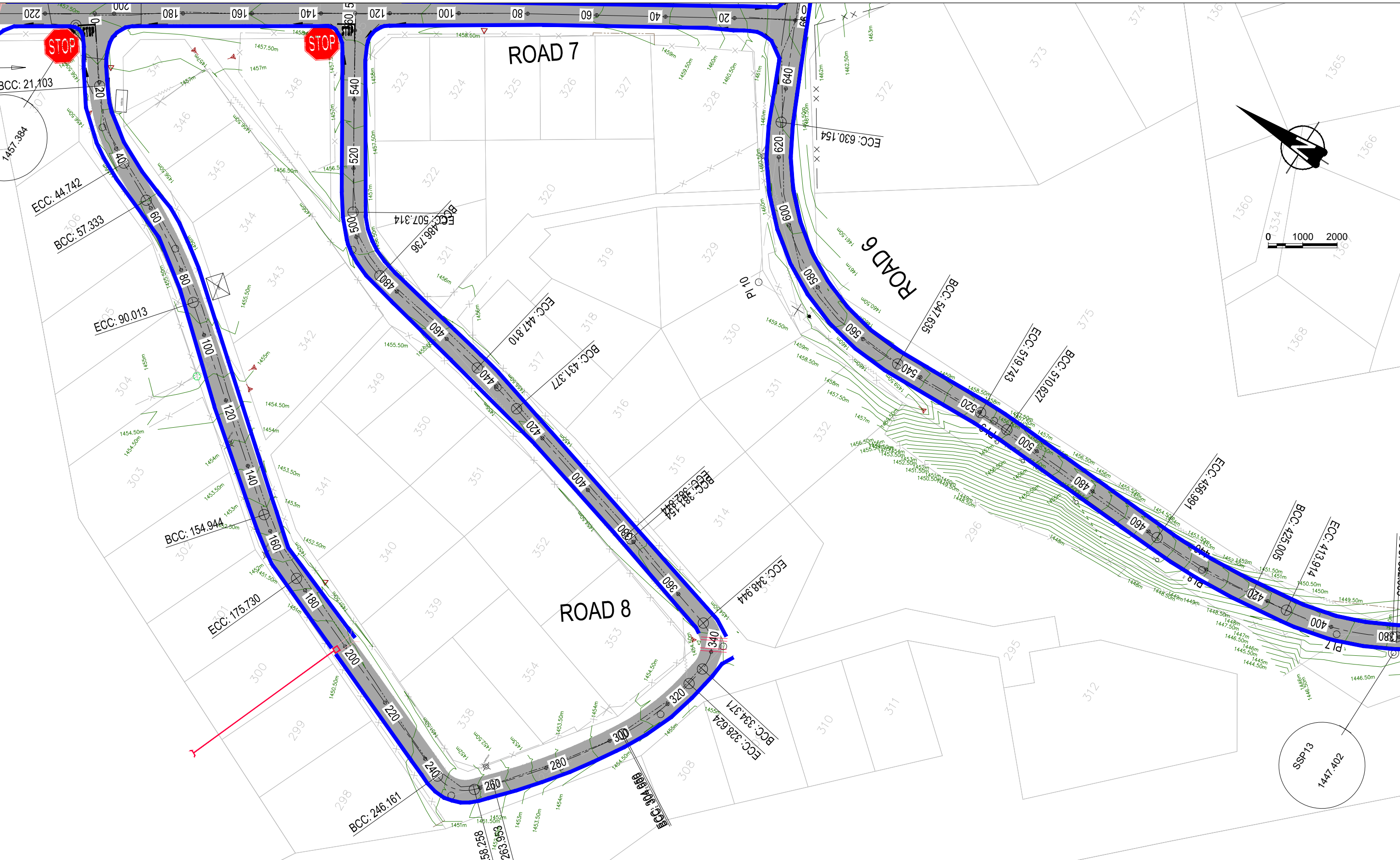
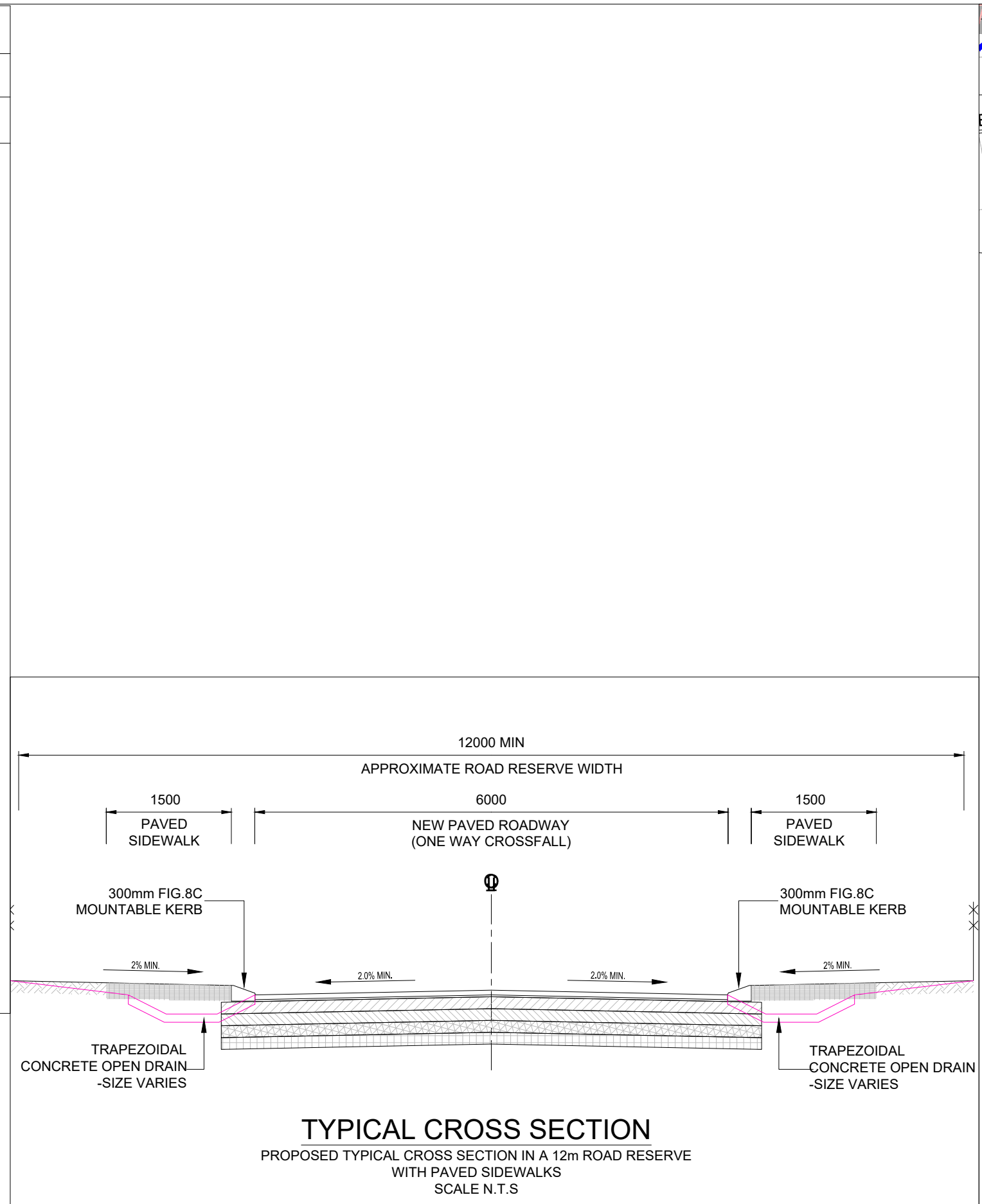
DWG NO

P-SM01-PMO-CE-S-08

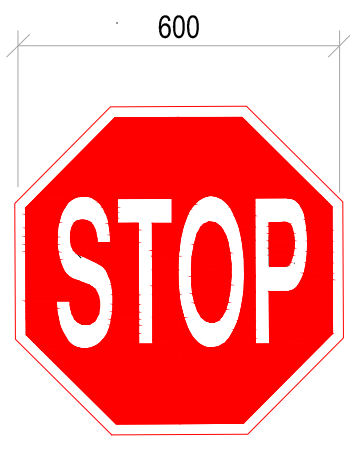
- LEGEND**
- CENTRELINE
 - ESKOM/TELEKOM POLE
 - EXISTING POWER LINE
 - ROAD CROSS FALL
 - STORMWATER CHANNEL
 - MANHOLE
 - EXISTING TREE
 - CULVERT
 - EXISTING TARMAC SURFACE

- ABBREVIATIONS**
- N.G.L. NATURAL GROUND LEVEL
 - CL CENTRELINE
 - m METERS (UNIT)
 - HL LEFT HAND
 - HR RIGHT HAND
 - BCC BEGINNING OF CURVE CENTRELINE
 - 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				
HARTEBEE SHOEK		WG27		
Name	Y Coord	X Coord	Z Coord	DESC.
SSP1	-35435.594	3378604.370	1457.688	12MMPAVE
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SSP23	-37667.372	3378169.929	1502.641	12MIMC
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SSP25	-37243.989	3377941.633	1495.738	12MIMC
SSP26	-37000.224	3377871.184	1488.137	12MIMC
SSP27	-36762.329	3377823.322	1475.157	HOLEC
SSP28	-36486.211	3377804.835	1472.742	12MIMC

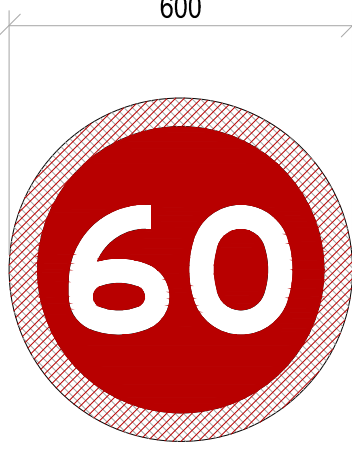


FINAL DESIGN ROAD LEVELS	VERTICAL PROFILE GRADES		GROUND LEVELS ON CL	CUT / FILL	HORIZONTAL ALIGNMENT	DISTANCE (m)
	LEFT EDGE (HL)	CENTRE LINE (CL)				
1457.462	1457.462	1457.462	1457.462	0.009	DIRECTION 53°42'40"	20
1456.777	1456.777	1456.777	1456.777	0.078	BVC1 21.103 CURVE 1 R=50.0m I=40°10'00"	40
1456.231	1456.231	1456.231	1456.231	0.012	BCC1 44.742 CURVE 2 R=150.0m I=32°6'15"	60
1455.993	1455.993	1455.993	1455.993	0.091	ECC1 67.333	80
1455.855	1455.855	1455.855	1455.855	0.098	90.013	100
1455.349	1455.349	1455.349	1455.349	0.012	DIRECTION 39°06'20"	110
1454.994	1454.994	1454.994	1454.994	-0.005	BVC3 154.344 CURVE 3 R=70.0m I=30°36'00"	120
1453.596	1453.596	1453.596	1453.596	0.038	ECC3 175.730	140
1452.578	1452.578	1452.578	1452.578	0.061	BCC4 246.161 CURVE 4 R=180.0m I=238°34'40"	160
1451.607	1451.607	1451.607	1451.607	0.191	ECC4 266.964	180
1451.031	1451.031	1451.031	1451.031	0.255	DIRECTION 22°05'30"	200
1450.925	1450.925	1450.925	1450.925	0.102	BVC5 300.811 CURVE 5 R=180.0m I=306°24'00"	213
1451.287	1451.287	1451.287	1451.287	0.188	ECC5 317.910	220
1452.117	1452.117	1452.117	1452.117	0.153	BVC6 325.946 CURVE 6 R=180.0m I=290°10'20"	240
1453.233	1453.233	1453.233	1453.233	0.017	ECC6 342.944	260
1454.225	1454.225	1454.225	1454.225	0.028	BVC7 358.341 CURVE 7 R=180.0m I=196°49'40"	280
1454.581	1454.581	1454.581	1454.581	-0.031	ECC7 375.340	300
1454.464	1454.464	1454.464	1454.464	0.261	BVC8 391.340 CURVE 8 R=180.0m I=196°17'20"	313
1454.642	1454.642	1454.642	1454.642	0.288	ECC8 408.340	320
1454.524	1454.524	1454.524	1454.524	0.234	BVC9 423.340 CURVE 9 R=180.0m I=193°40'30"	340
1454.646	1454.646	1454.646	1454.646	0.089	ECC9 440.340	360
1454.753	1454.753	1454.753	1454.753	0.209	BVC10 455.340 CURVE 10 R=180.0m I=214°38'20"	380
1454.920	1454.920	1454.920	1454.920	0.141	ECC10 472.340	400
1455.087	1455.087	1455.087	1455.087	0.066	BVC11 487.340	414
1455.253	1455.253	1455.253	1455.253	0.026	ECC11 502.340	420
1455.478	1455.478	1455.478	1455.478	0.094	BVC12 517.340	440
1455.640	1455.640	1455.640	1455.640	0.088	ECC12 532.340	460
1455.659	1455.659	1455.659	1455.659	0.026	BVC13 547.340	480
1456.099	1456.099	1456.099	1456.099	0.066	ECC13 562.340	500
1456.655	1456.655	1456.655	1456.655	0.026	BVC14 577.340	520
1457.074	1457.074	1457.074	1457.074	0.094	ECC14 592.340	531
1458.152	1458.152	1458.152	1458.152	0.088	BVC15 607.340	540
1458.322	1458.322	1458.322	1458.322	0.093	ECC15 622.340	560



RED REFLECTORISED
WHITE REFLECTORISED
LETTERS: SERIES C

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



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

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

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Management Support
Infrastructure & Construction

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PROF. Reg.No:
920261

DESIGN BY:
R. DHLIWAYO

DRAWN BY:
R. DHLIWAYO

CHECKED BY:
L. MARAH

APPROVED BY:
L. MARAH

REV	DATE	DESCRIPTION	BY

PROJECT NAME
REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT WARD 10

TITLE
ROAD 8 LONGSECTION

PROJECT STATUS:
TENDER

DATE
2024-03-25

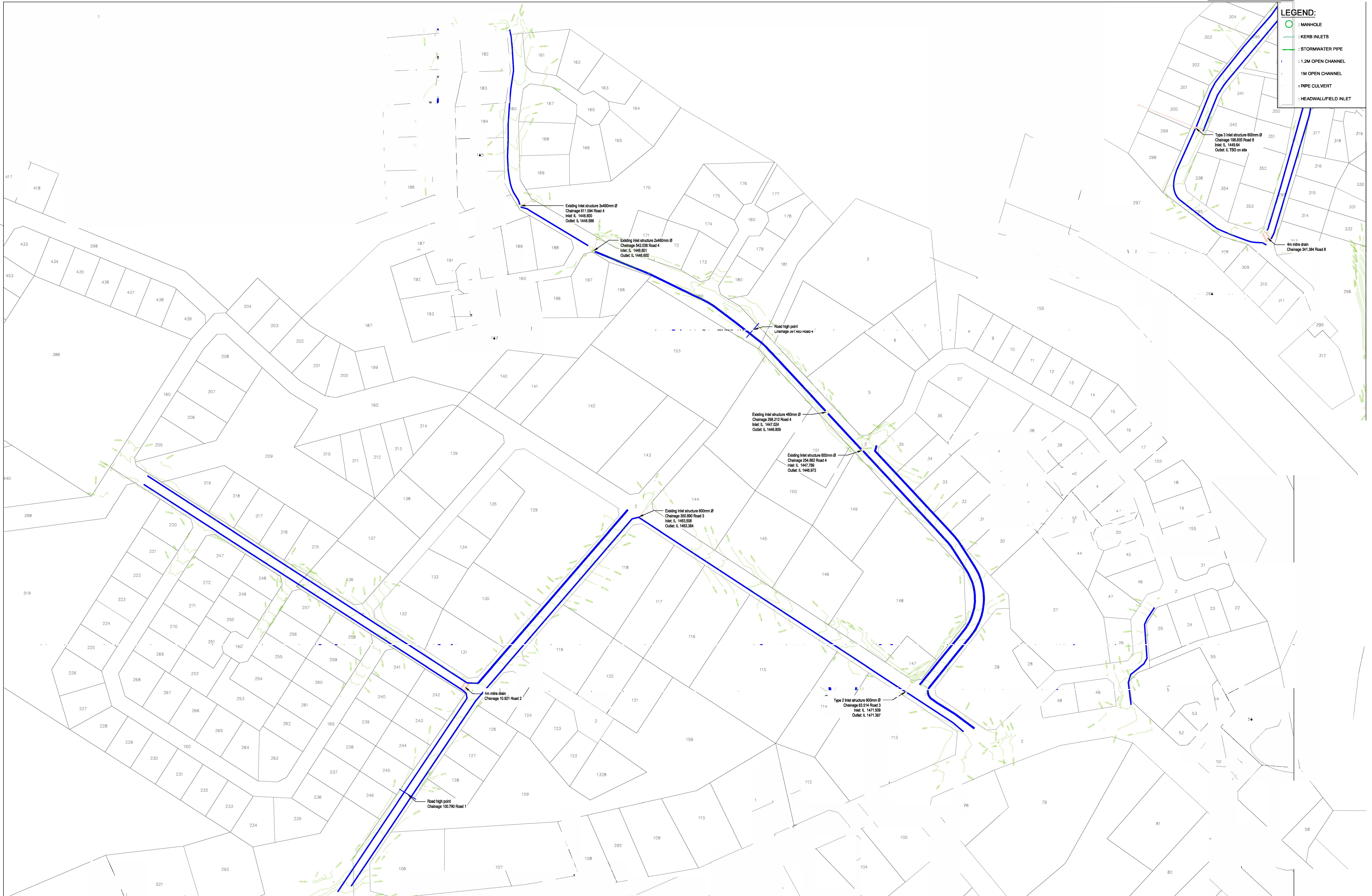
SCALE
N.T.S

SHEET
1 OF 1

REV
A

A1

DWG NO
P-SM01-PMO-CE-S-09




LEGEND:

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

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PROFESSIONAL ENGINEER:
L. MARAH
 PROF. Reg.No:
 S20281
 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 STERKSPRUIT - WARD 10
TITLE:
ROAD 9 STORMWATER LAYOUT

PROJECT STATUS:
TENDER

DATE 2024-03-25	SCALE N.T.S	SHEET 1 OF 2	REV A	A1
DWG NO P-SM01-PMO-CE-S-06				



LEGEND:

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

CLIENT:



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Sigodi Marah Martin
Management Support
Engineering & 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

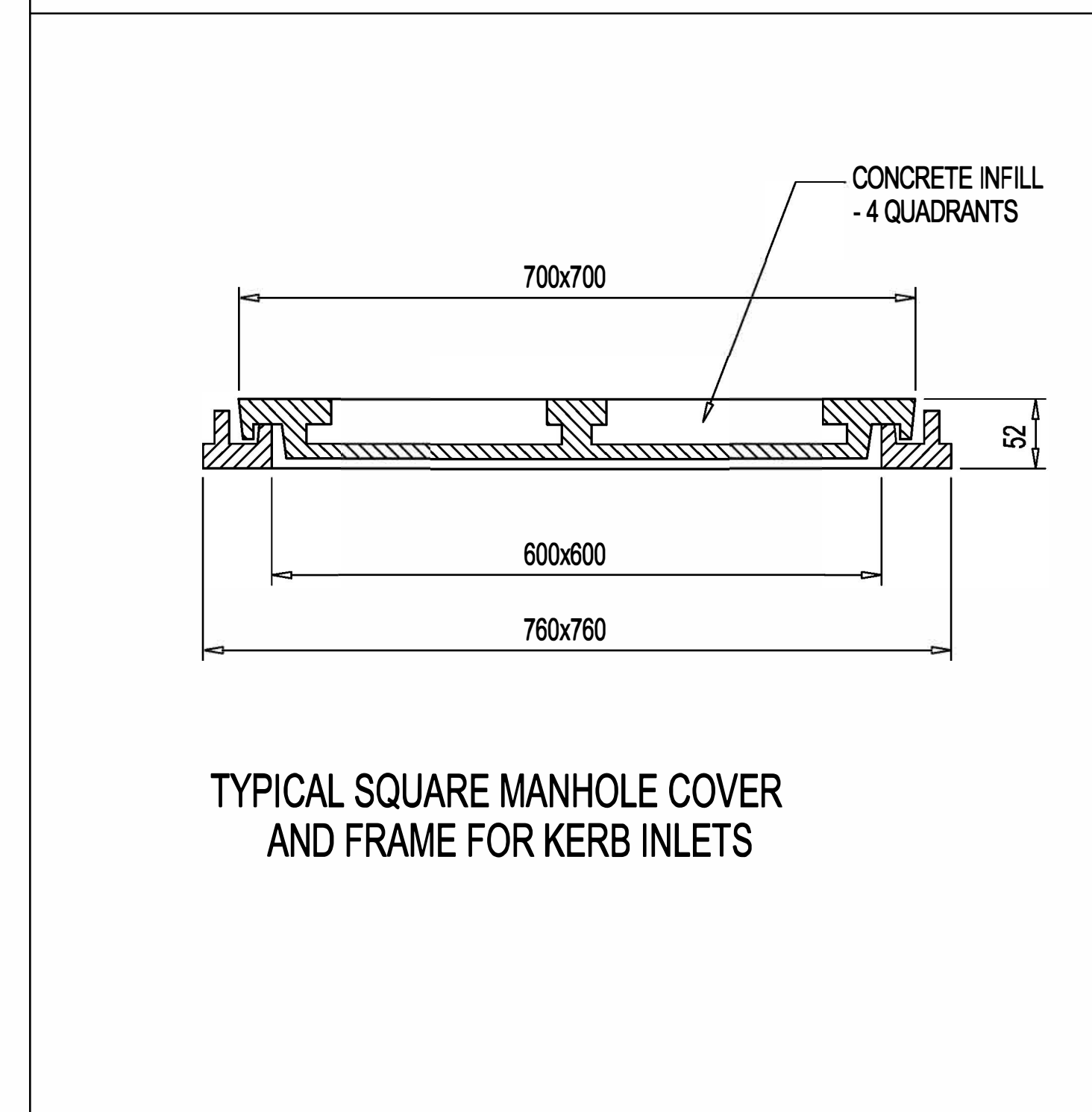
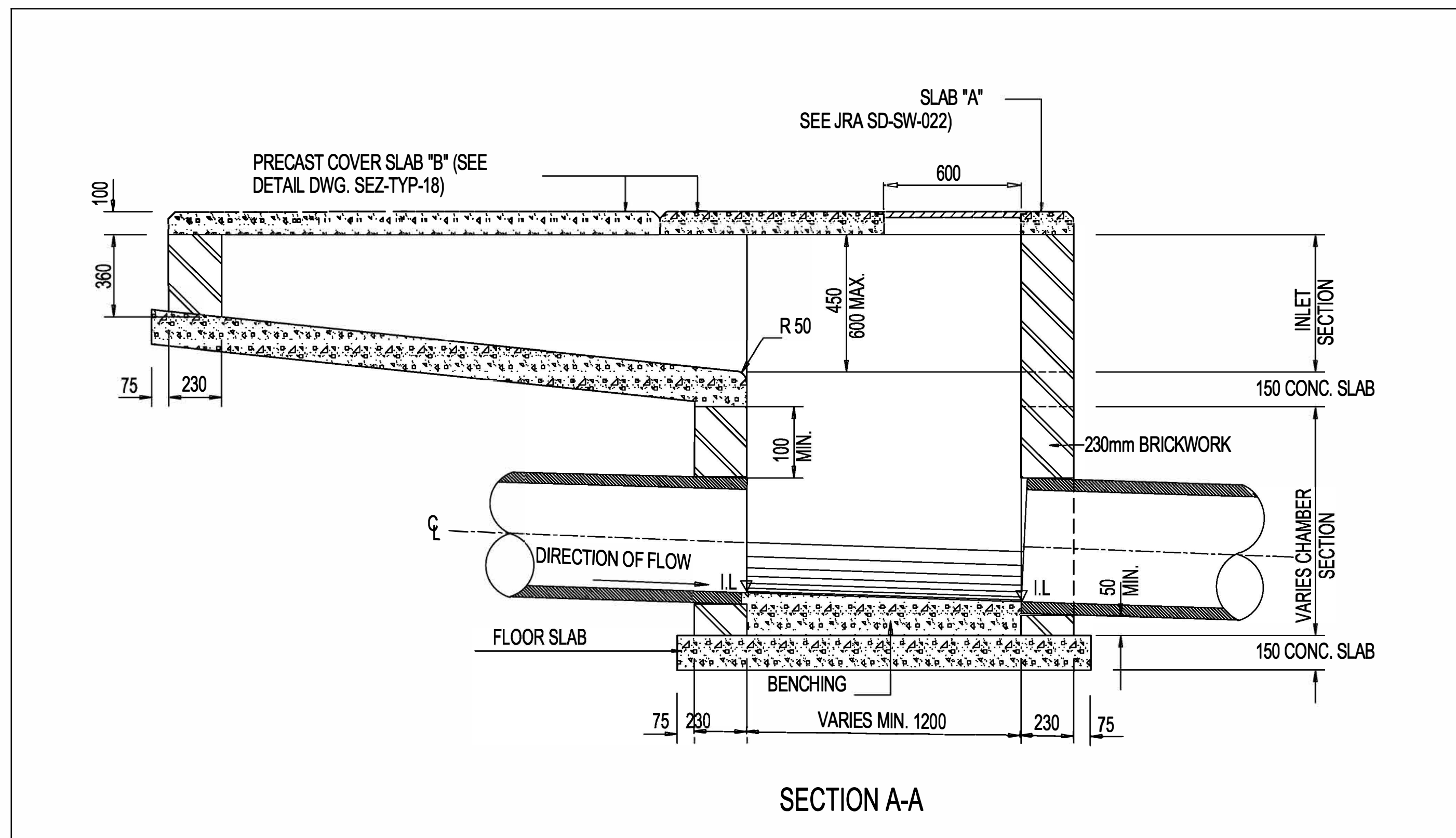
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REV	DATE	DESCRIPTION	BY

PROJECT NAME:
REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT - WARD 10

TITLE:
ROAD 6, 7 & 8 STORMWATER LAYOUT

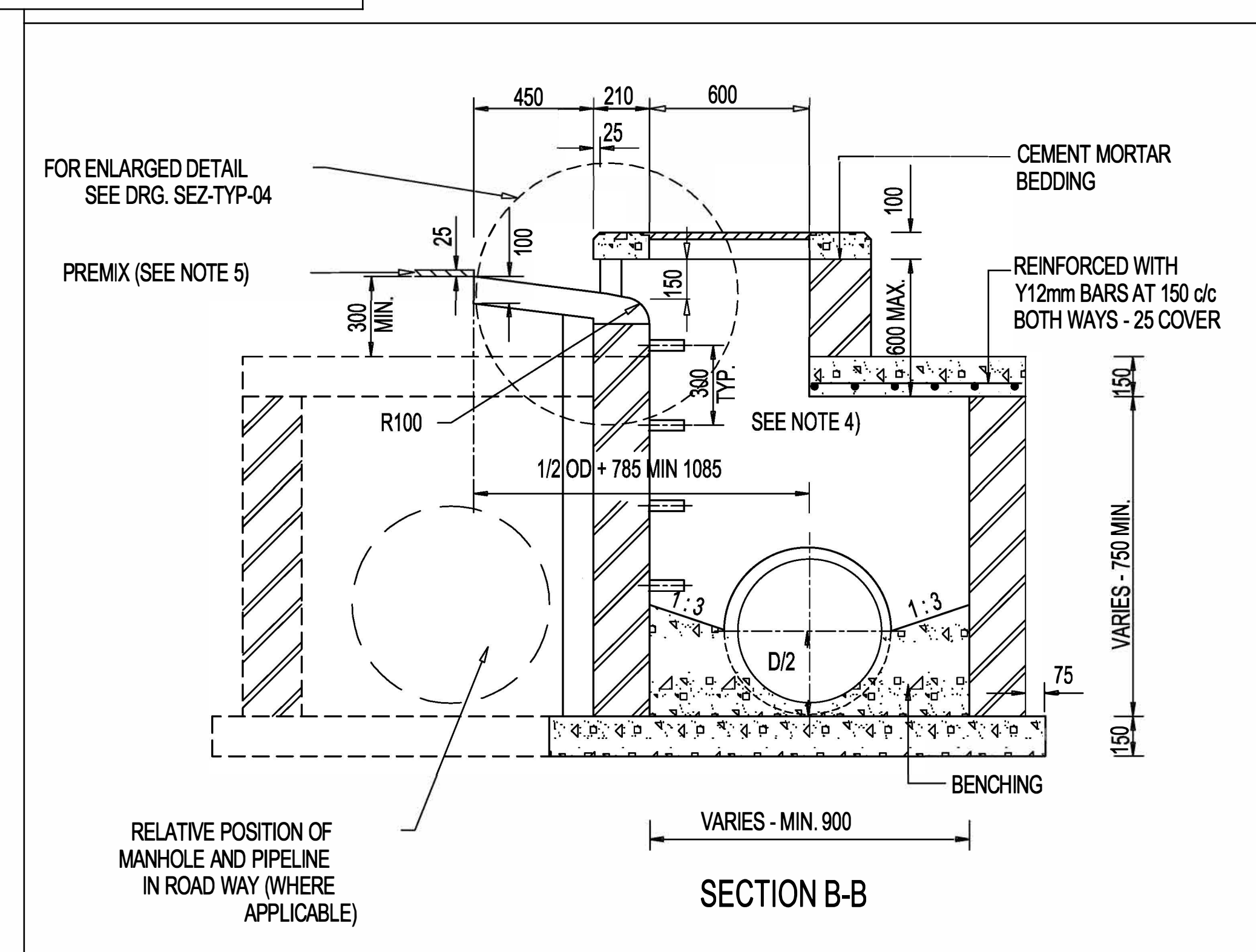
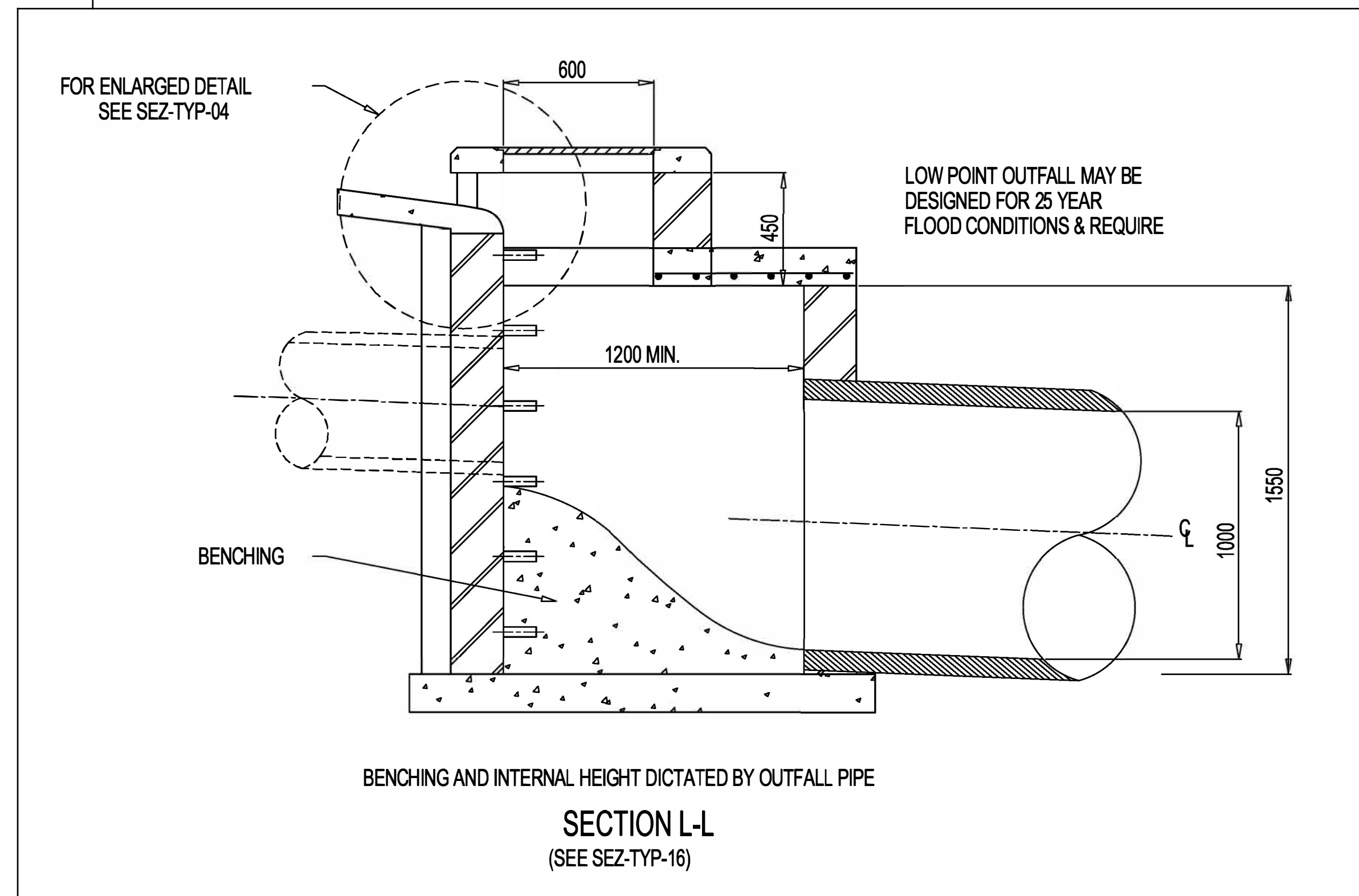
PROJECT STATUS: TENDER



DATE 2024-03-25	SCALE N.T.S	SHEET 2 OF 2	REV A	A1
DWG NO P-SM01-PMO-CE-S-06				

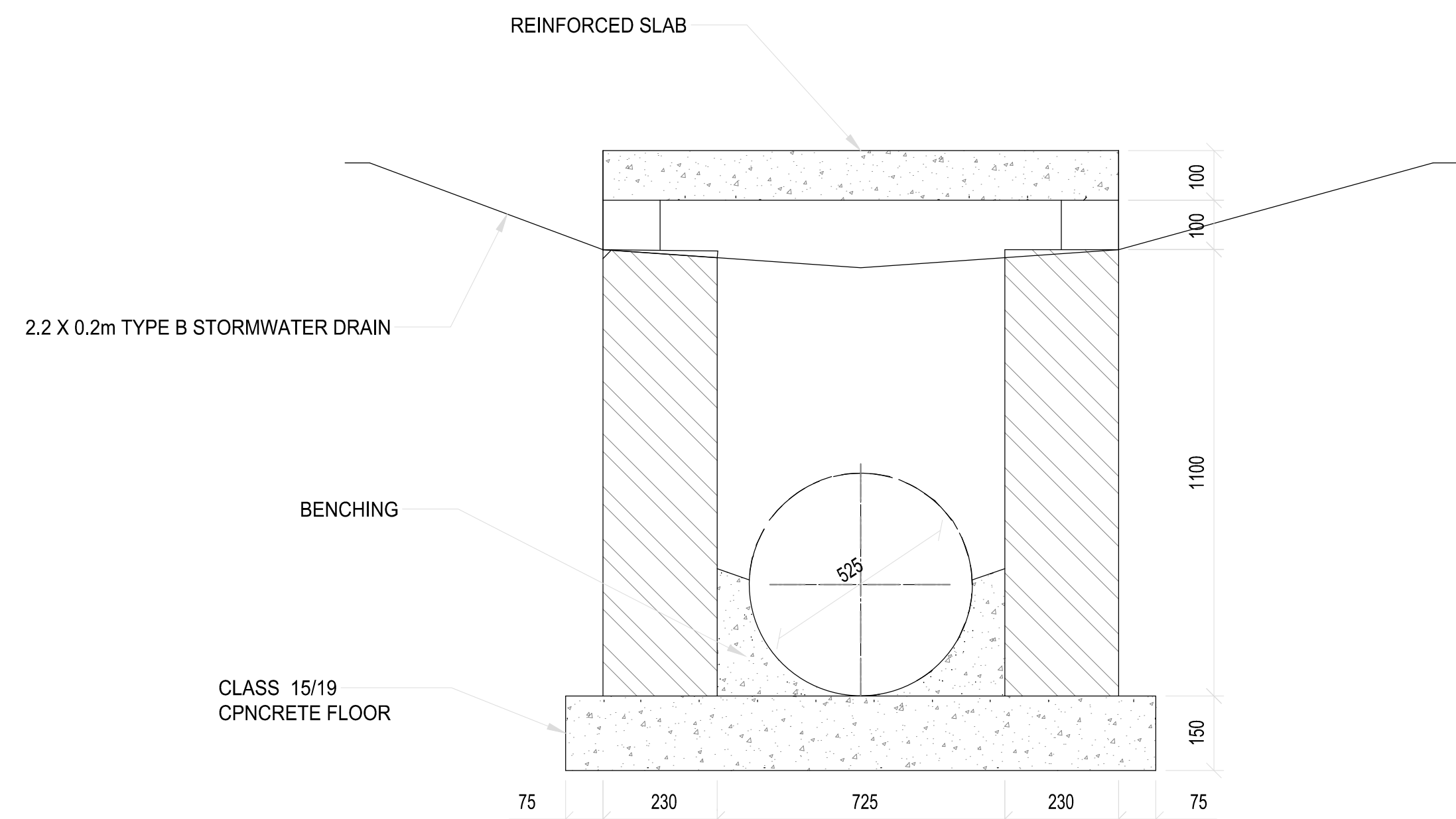


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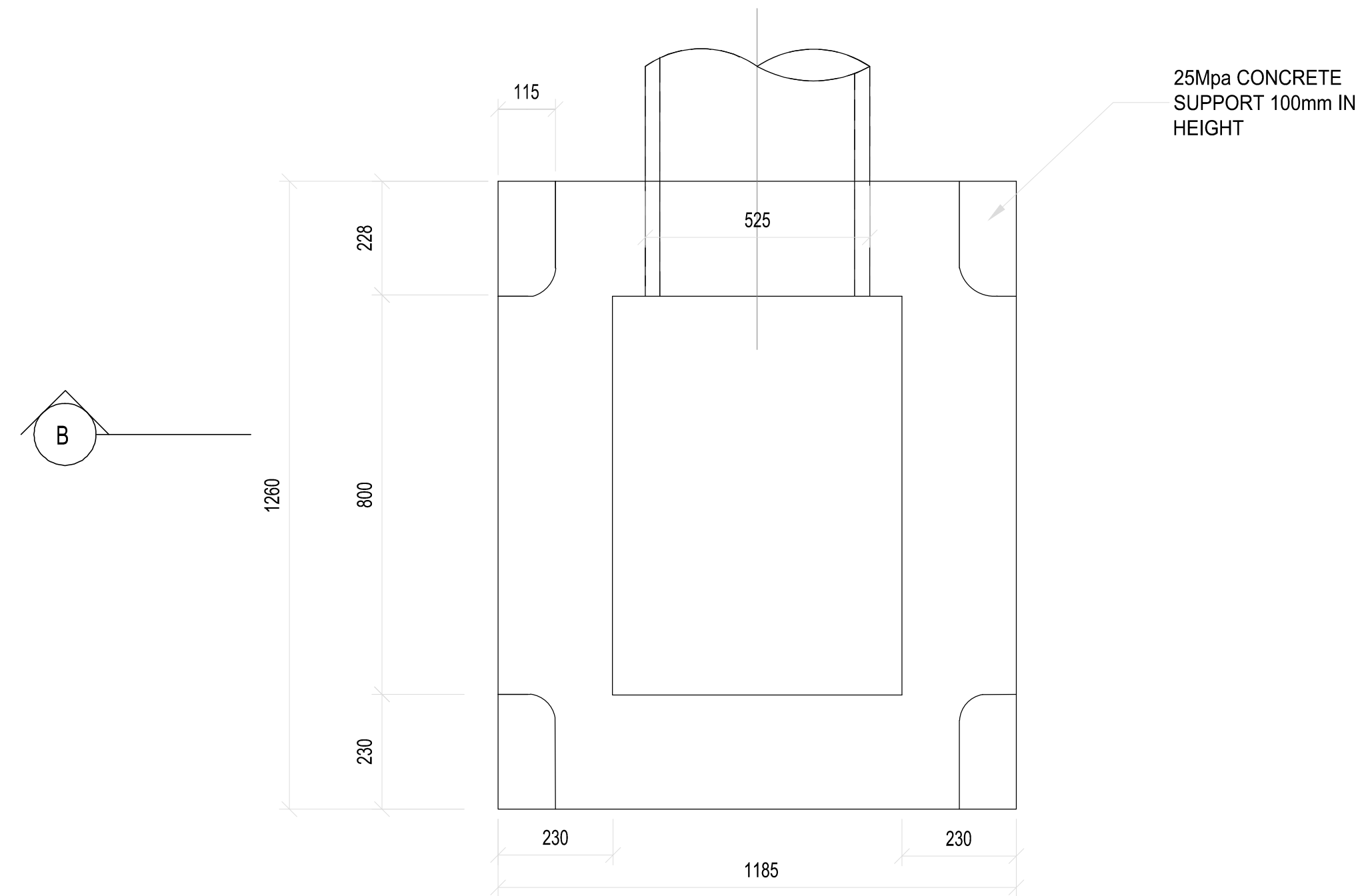
- SEE DRG SEZ-TYP-15 FOR PLAN AND SECTION POSITIONS OF KERB INLET.
- CONCRETE STRENGTH TO BE AS FOLLOWS:
 - MANHOLE SURROUNDS AND BENCHING: CLASS 15/19
 - CAST IN-SITU DECK SLABS & FOUNDATIONS: CLASS 20/19
 - PRECAST COVER SLABS & OTHER ITEMS: CLASS 25/19.
 - CAST IN-SITU KERBS, APRONS ETC: CLASS 25/19
- 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
- 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.



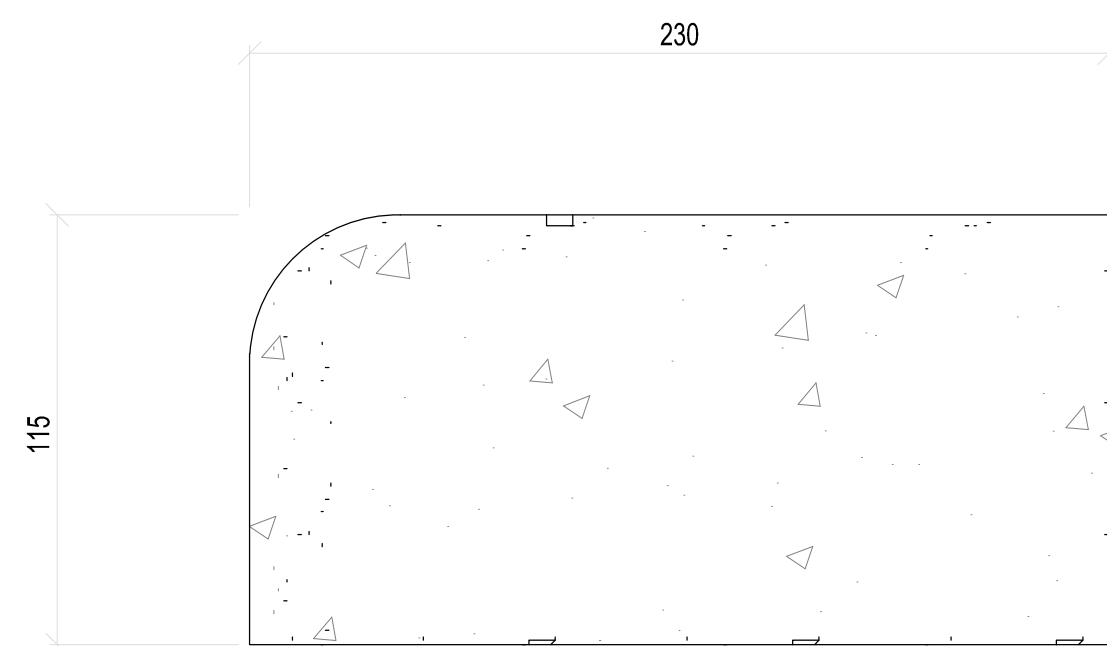
CLIENT:  19 Murray Street Lady Grey 9735 Tel: (051) 603 1449 Email: vanzyt@senqu.gov.za	CONSULTANT: THEWO & SMMS - JV  58 Breiner Road Westdene Bloemfontein 9301 Tel: +27 (051) 430 1321 Email: pmo@thewo.co.za	PROFESSIONAL ENGINEER: L. MARAH PROF. Reg.No: 920281 DATE: SIGNATURE:	DESIGN BY: D. RWAZEMBA 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 STERKSPRUIT - WARD 10 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-S-100
				REV	DATE	DESCRIPTION	BY															



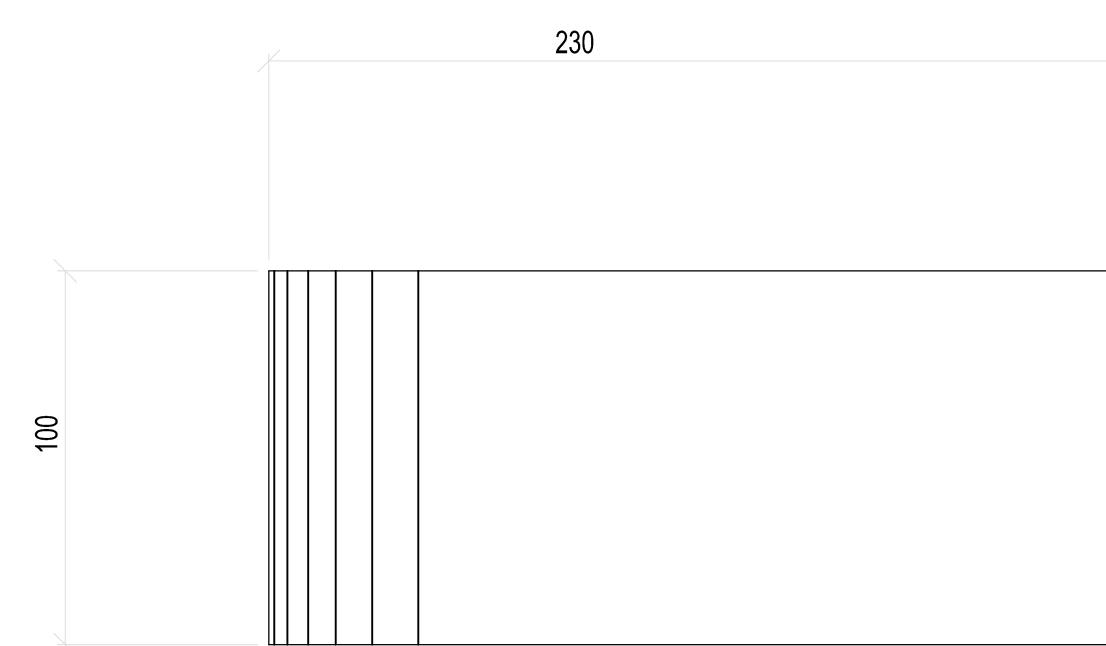
SECTION B-B
SCALE 1:10



FIELD INLET PLAN
SCALE 1:10



PLAN :SECTIONS OF SUPPORT
SCALE 1:2



ELEVATION :SECTIONS OF SUPPORT
SCALE 1:2

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PROF. Reg.No:
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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 STERKSPRUIT - WARD 10

TITLE

FIELD INLET DETAIL

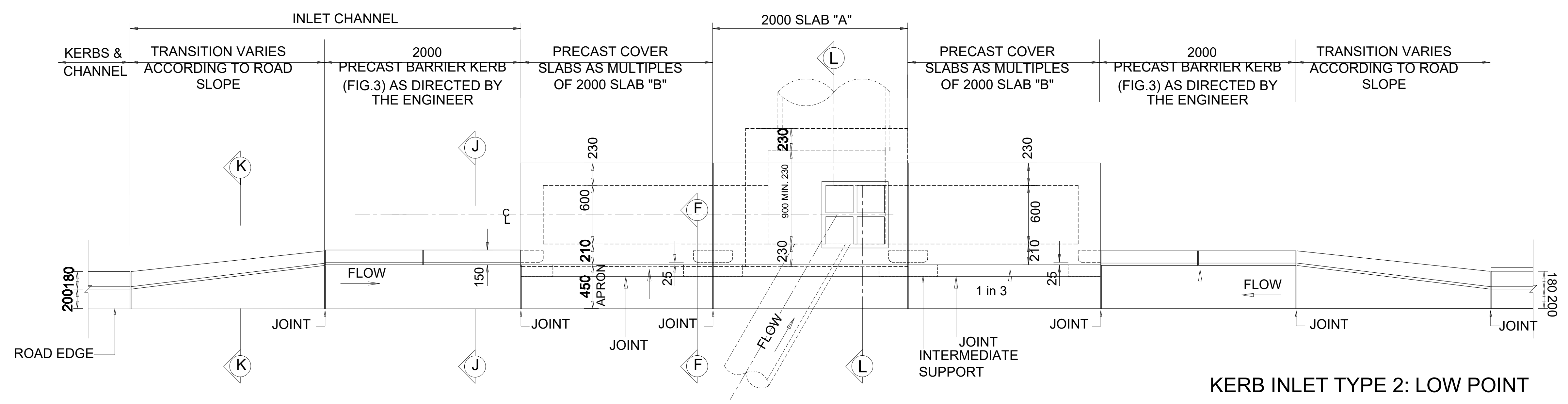
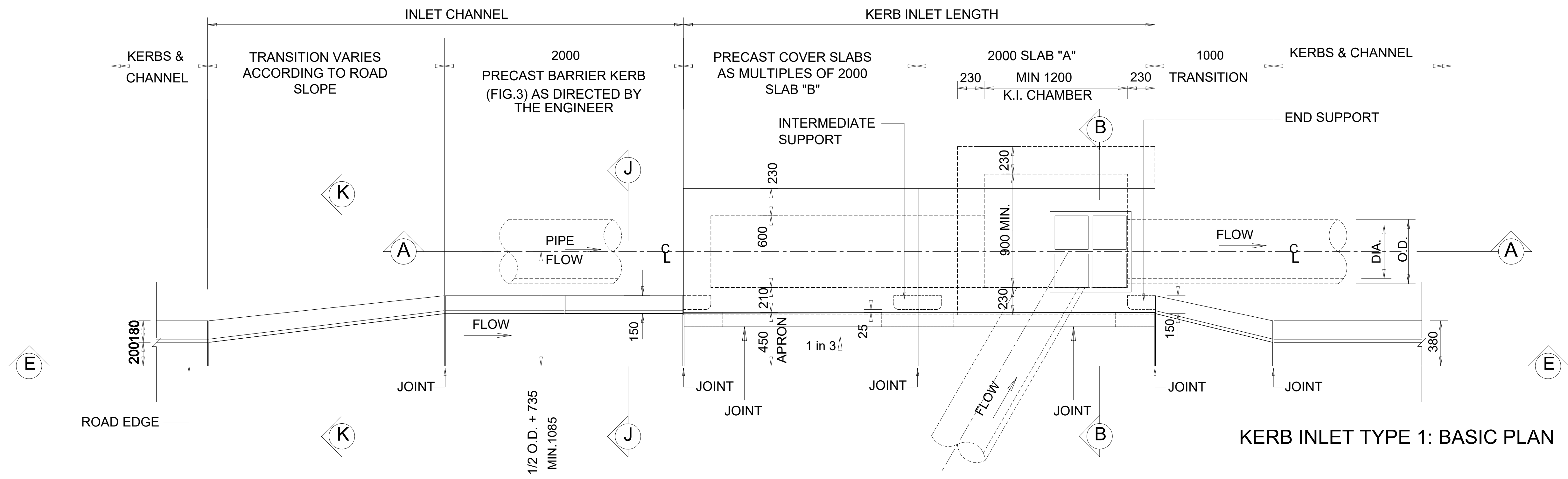
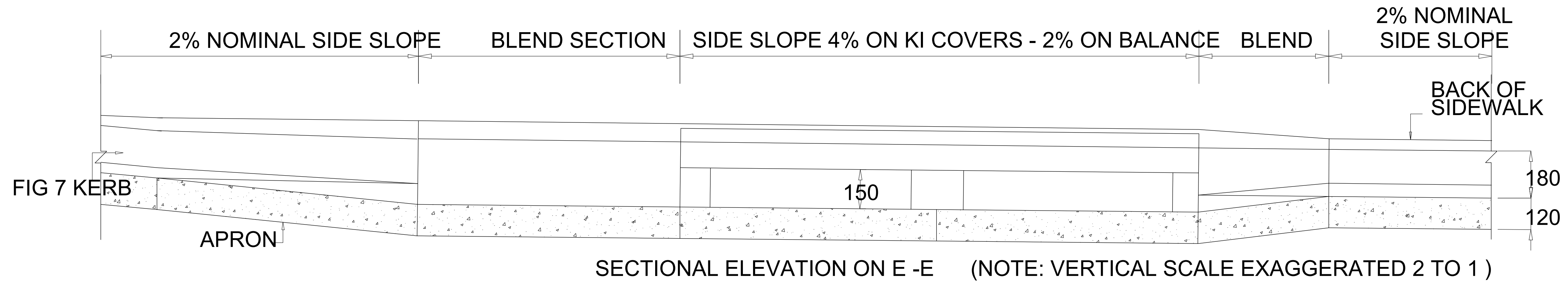
PROJECT STATUS:

TENDER

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

DWG NO

P-SM01-PMO-CE-S-101



CLIENT:

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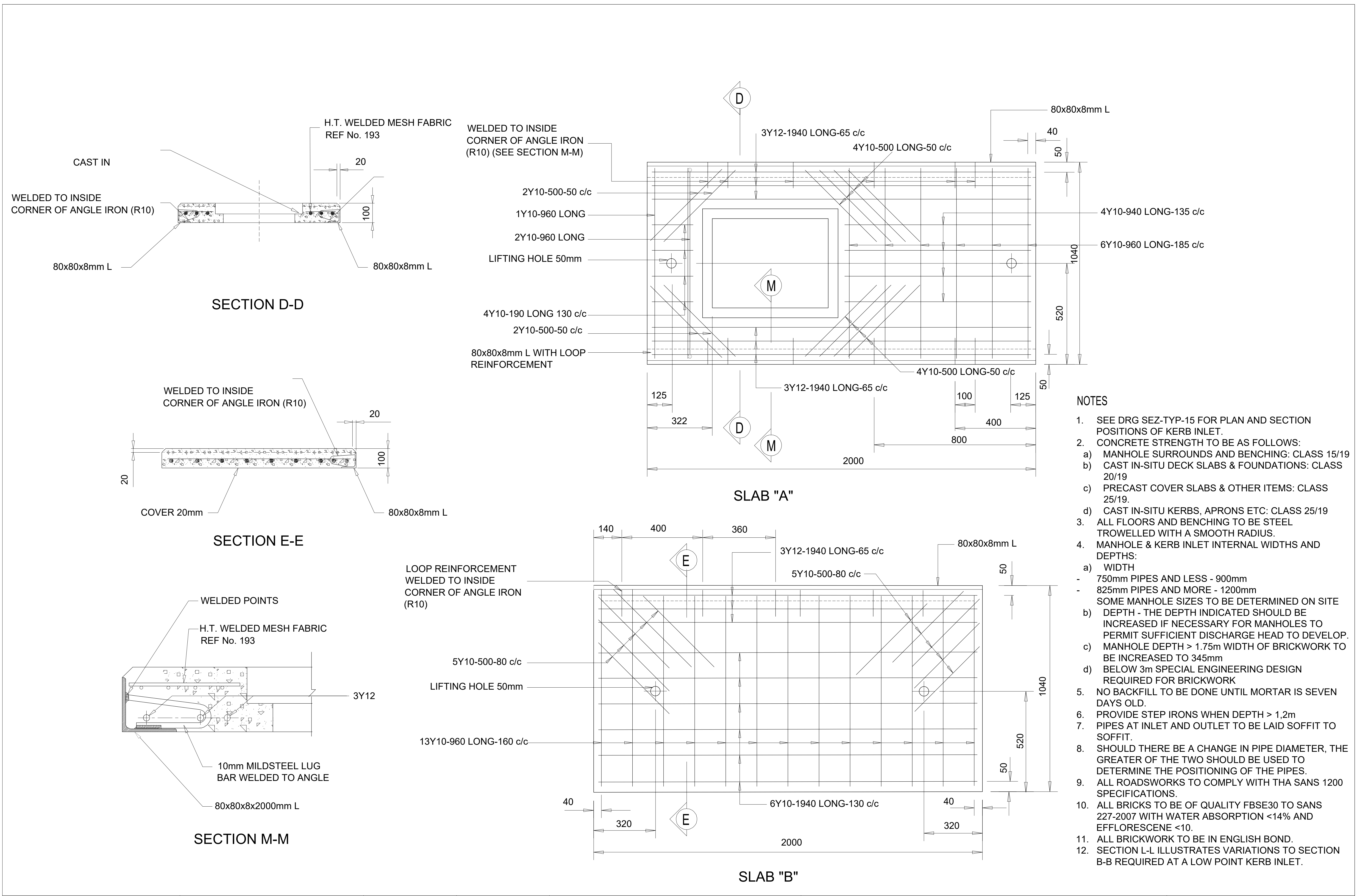
PROFESSIONAL ENGINEER:
 L. MARAH
 PROF. Reg.No:
 920281
 DATE:
 SIGNATURE:



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 STERKSPRUIT -
 WARD 10
 TITLE
 KERB INLET TYPES

PROJECT STATUS:
TENDER
 DATE: 2024-03-25
 SCALE: N.T.S.
 SHEET: 1 OF 1
 REV: A
 A1
 DWG NO:
 P-SM01-PMO-CE-S-102



CLIENT:  19 Murray Street Lady Grey 9755 Tel: (051) 603 1449 Email: vanzyli@senqu.gov.za	CONSULTANT: THEWO & SMMS - JV  59 Boshuier Road Weststone 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> <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																																					PROJECT NAME REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT - WARD 10 TITLE SLAB REINFORCEMENT	PROJECT STATUS: TENDER DATE 2024-03-25 SCALE N.T.S SHEET 1 OF 1 REV A A1 DWG NO P-SM01-PMO-CE-S-103
		REV	DATE	DESCRIPTION	BY																																									
PROJECT STATUS: TENDER																																														

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.

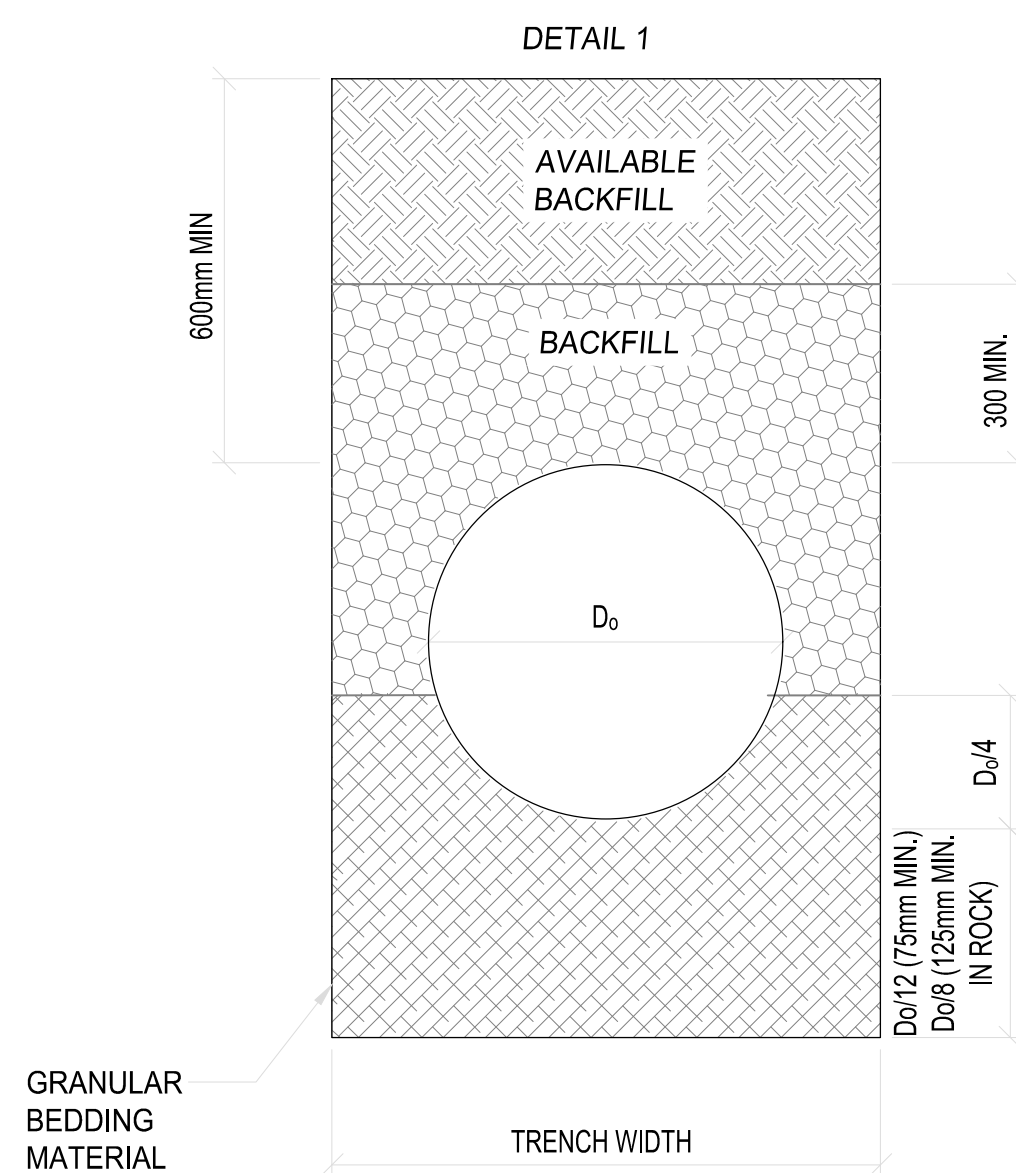
BEDDING MATERIAL:
THE MATERIAL USED CONSISTS OF SELECTED GRAVEL WITH $P_i \leq 6$, MUST BE FREE OF STONES LARGER THAN 20mm, ORGANIC MATERIAL AND CLAY LUMPS. THE BEDDING MATERIAL AT THE SIDES OF THE PIPE MUST BE COMPACTED TO 90% MOD. AASHTO DENSITY AFTER THE PIPE HAS BEEN LAID.

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:

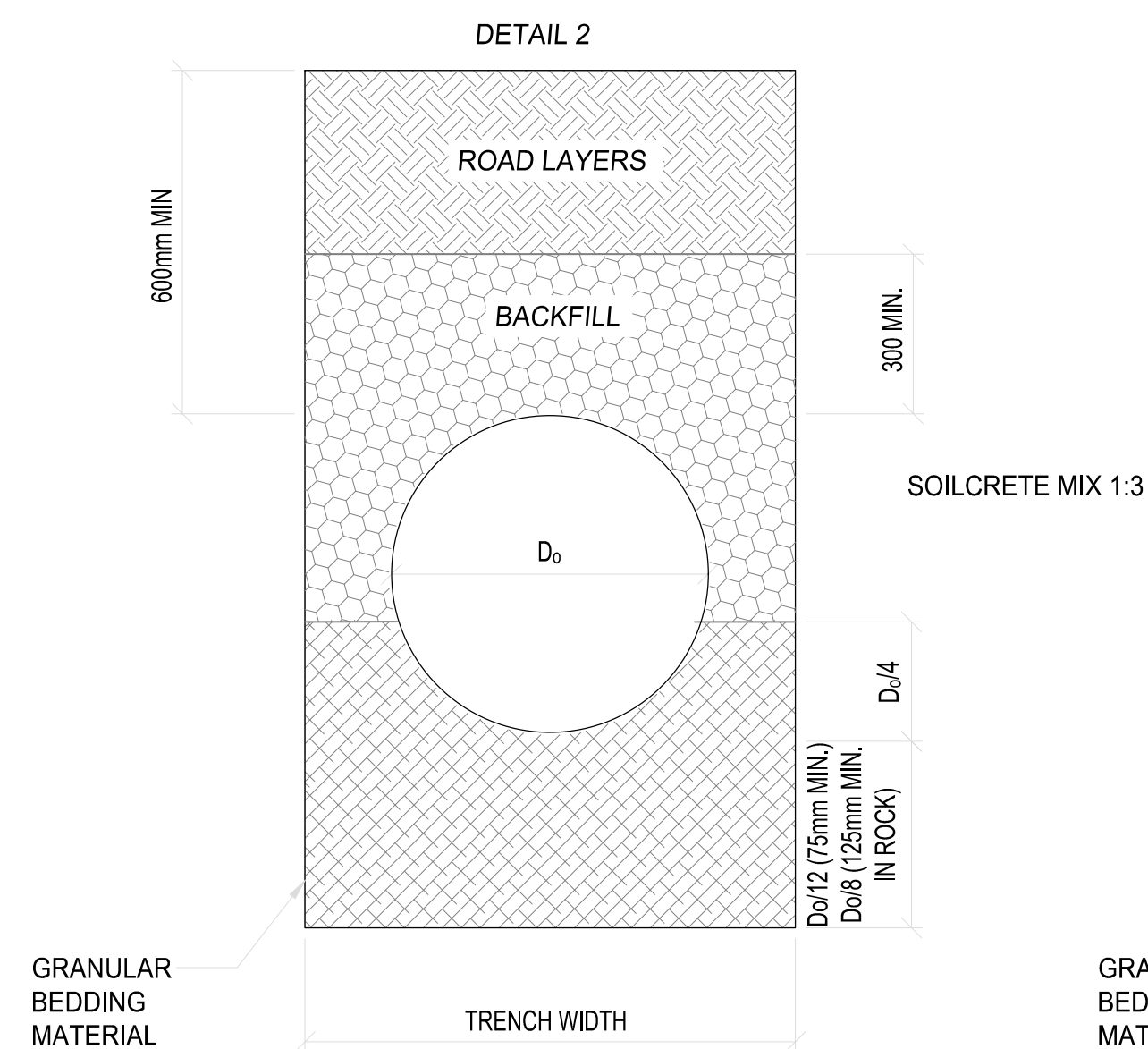
- a. **ROOTS OF TREES, BUILDING RUBBLE AND ORGANIC MATERIAL.**
- b. **CLAY LUMPS LARGER THAN 75mm.**
- c. **STONES LARGER THAN 20mm.**

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.

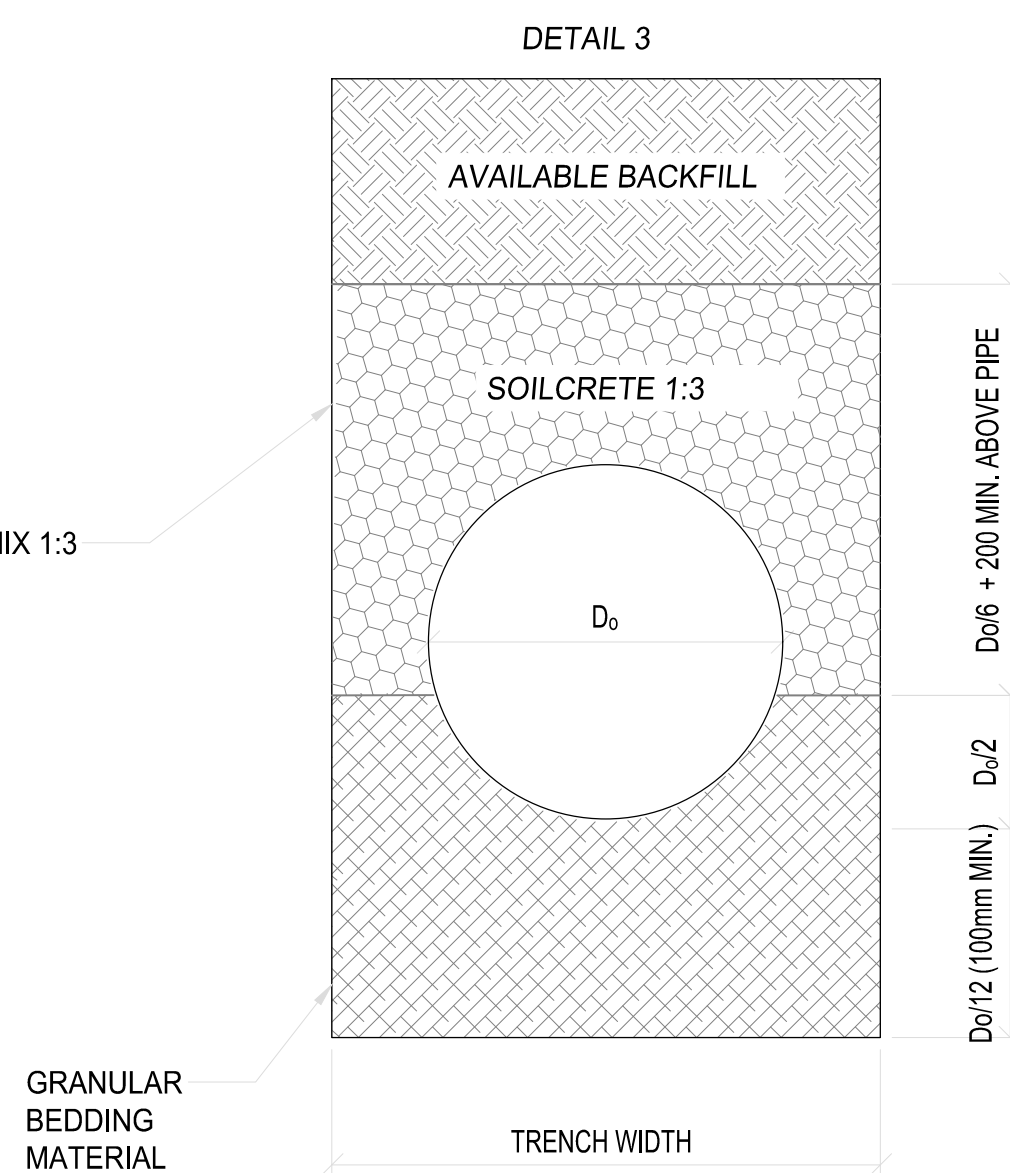
MINIMUM PIPE SIZE TO BE 450mm DIAMETER.



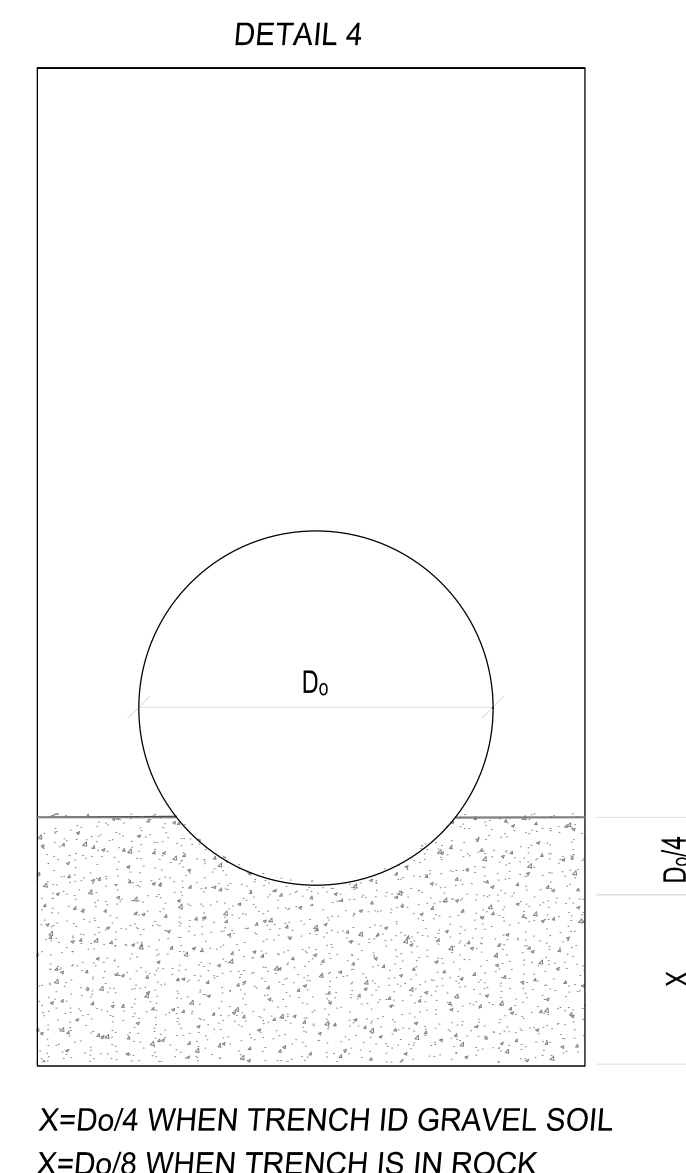
STORMWATER PIPES UNDER SIDEWALK
SCALE 1:25



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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THEWO ENGINEERING
Sigodi Marah Martin
Management Support
Infrastructure & Engineering Consultants

PROFESSIONAL ENGINEER:
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920281
DATE:
SIGNATURE:
L. MARAH

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

REVISIONS			
REV	DATE	DESCRIPTION	BY

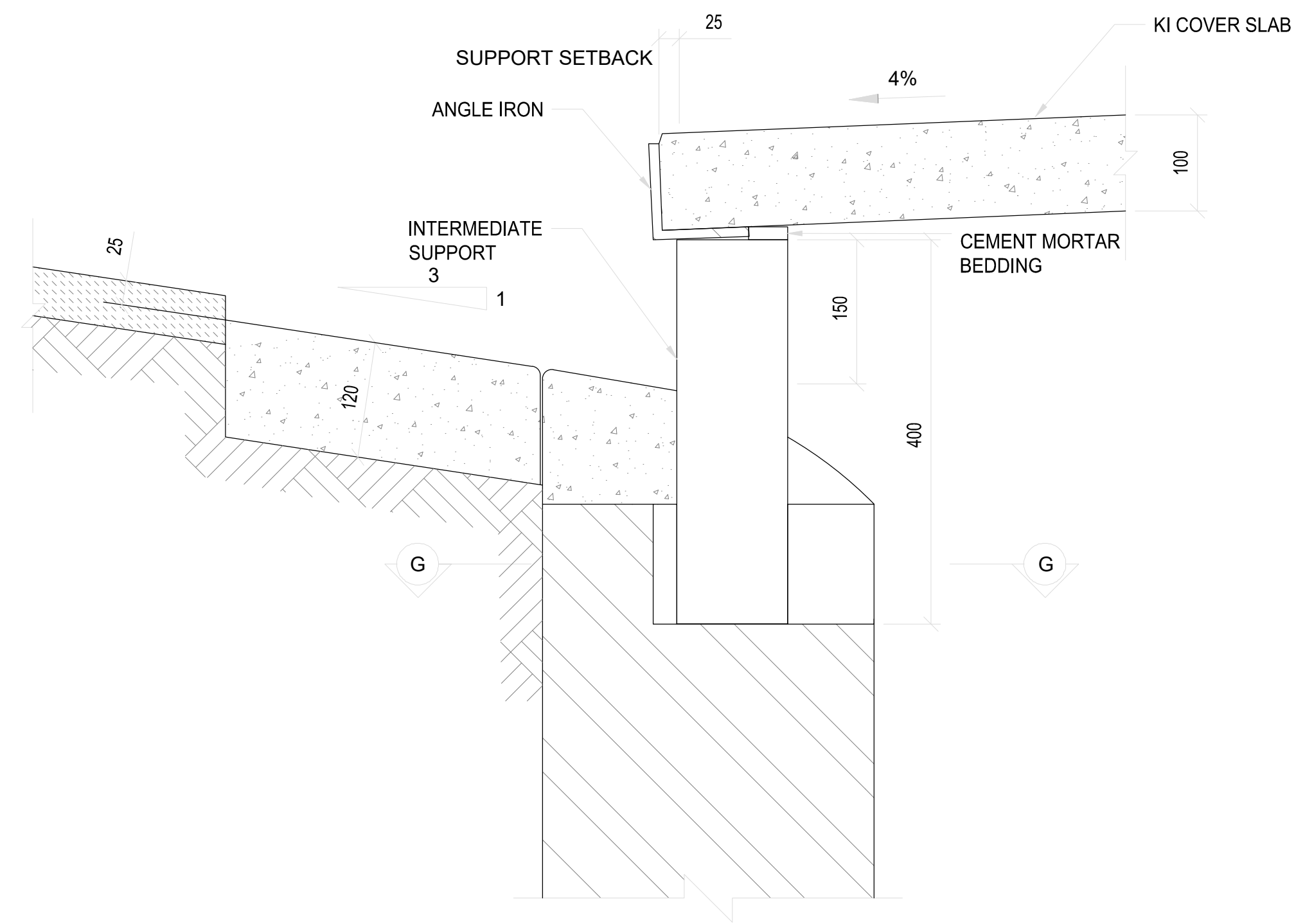
PROJECT NAME
REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT - WARD 10

TITLE
PIPE BEDDING

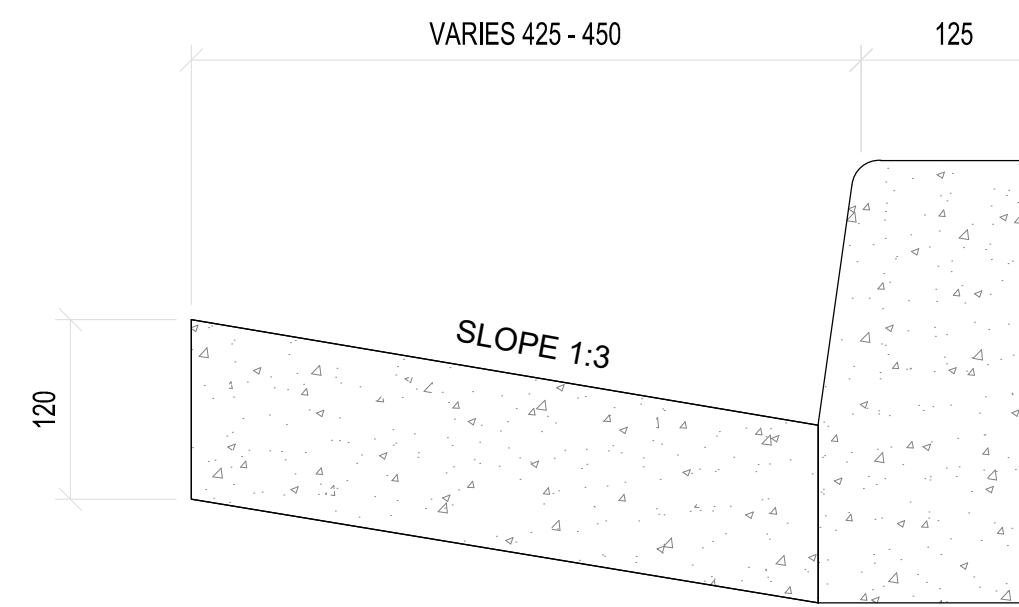
PROJECT STATUS:
TENDER

DATE 2024-03-25	SCALE N.T.S	SHEET 1 OF 1	REV A	REV A1
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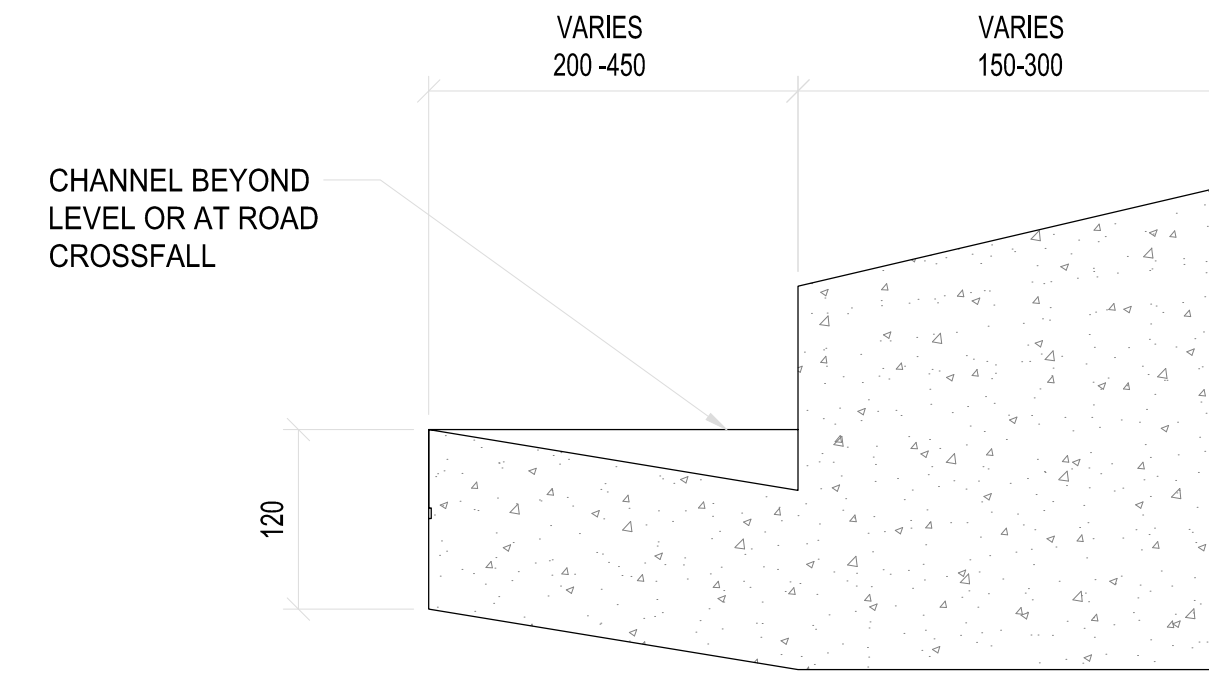
DWG NO
P-SM01-PMO-CE-S-104



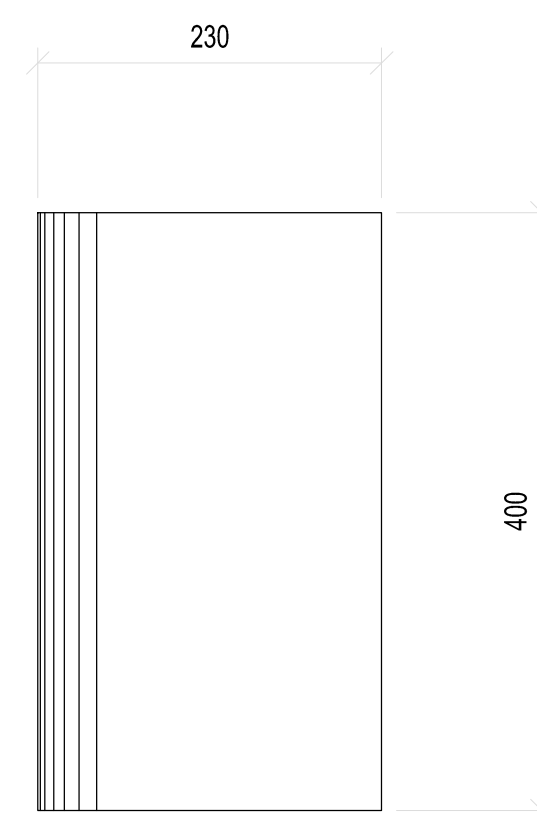
SECTION F-F THROUGH KI APRON & SUPPORT
SCALE 1:5



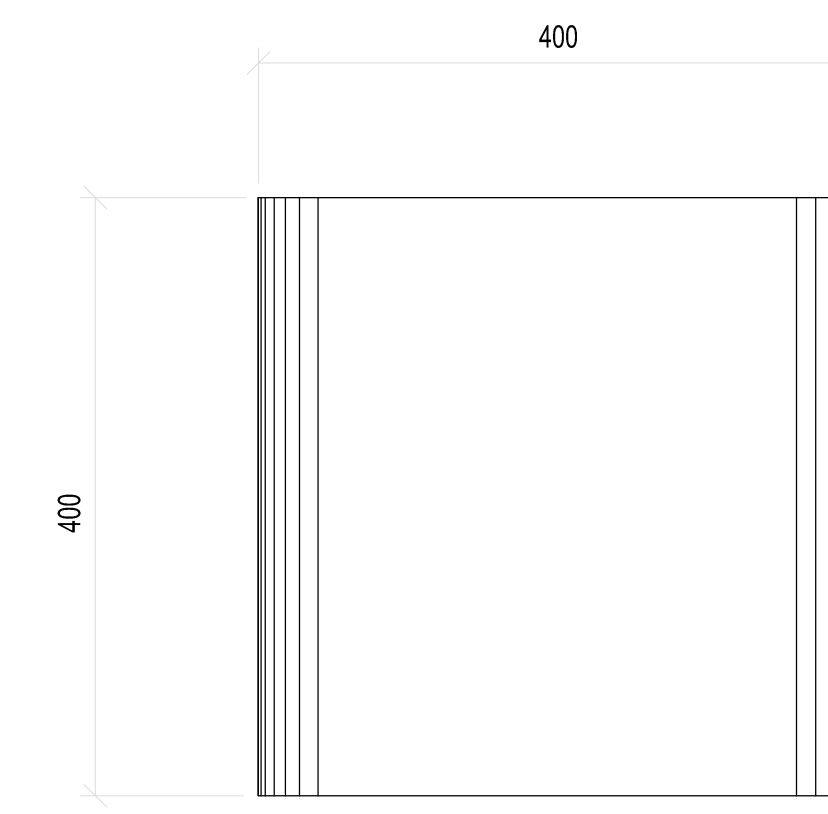
SECTION J-J
SCALE 1:5



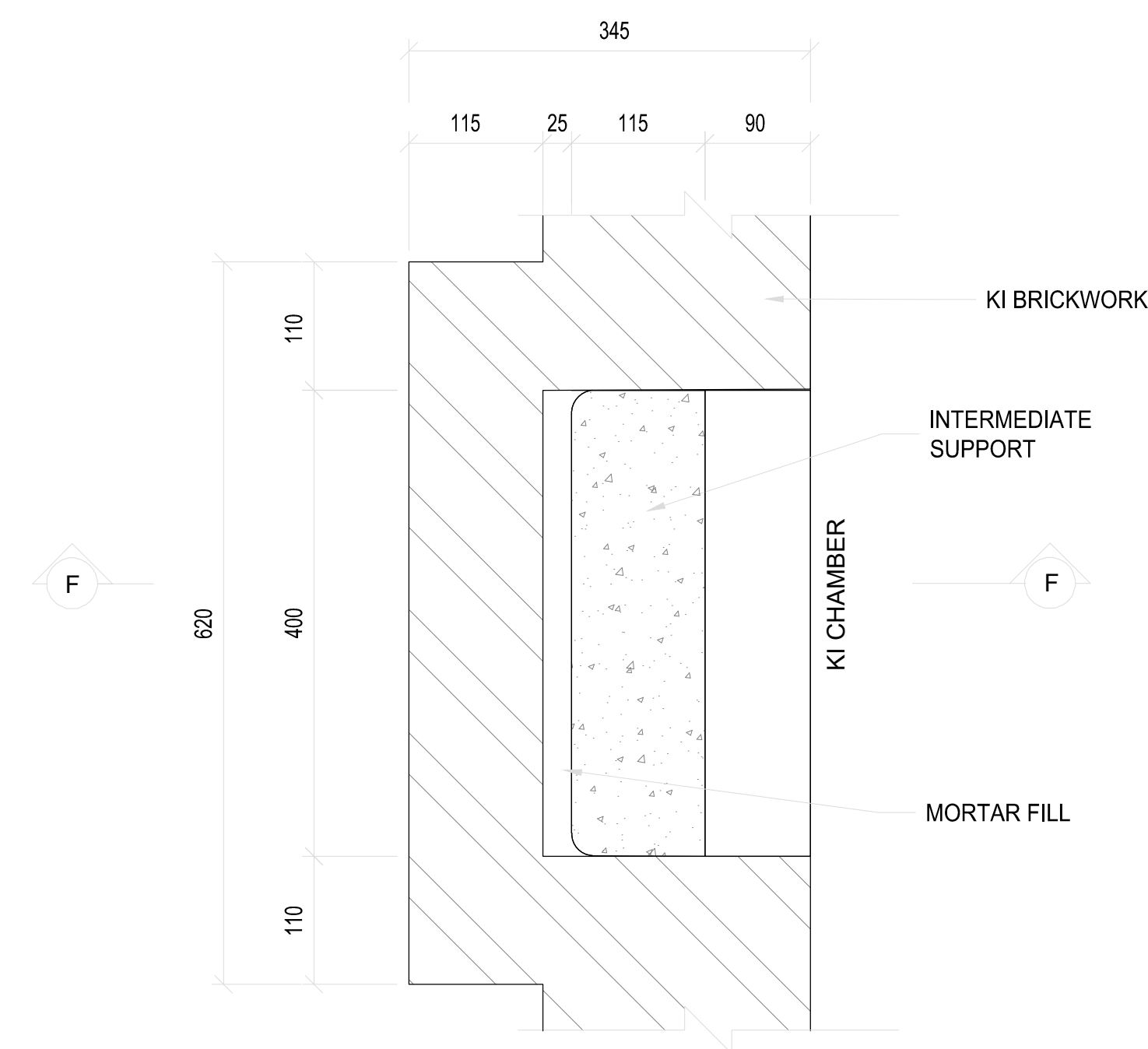
SECTION K-K
SCALE 1:5



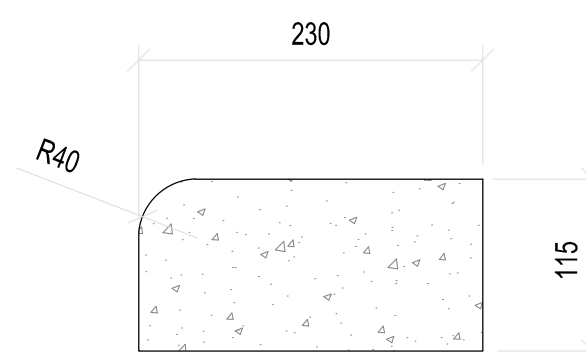
END SUPPORT FOR COVER SLAB
SCALE 1:5



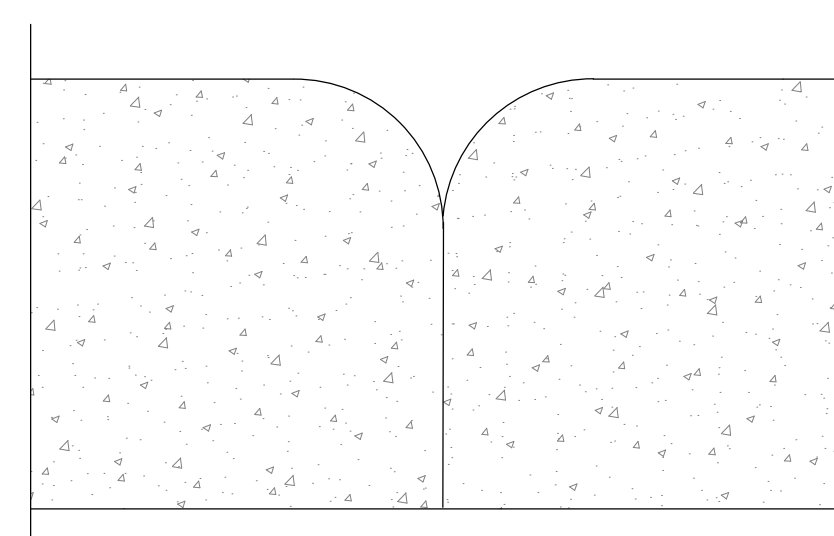
INTERMEDIATE SUPPORT FOR COVER SLAB
SCALE 1:5



SECTION G-G THROUGH KI SUPPORT
SCALE 1:5



DETAIL OF JOINT IN APRON
SCALE 1:5



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SIGNATURE:

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

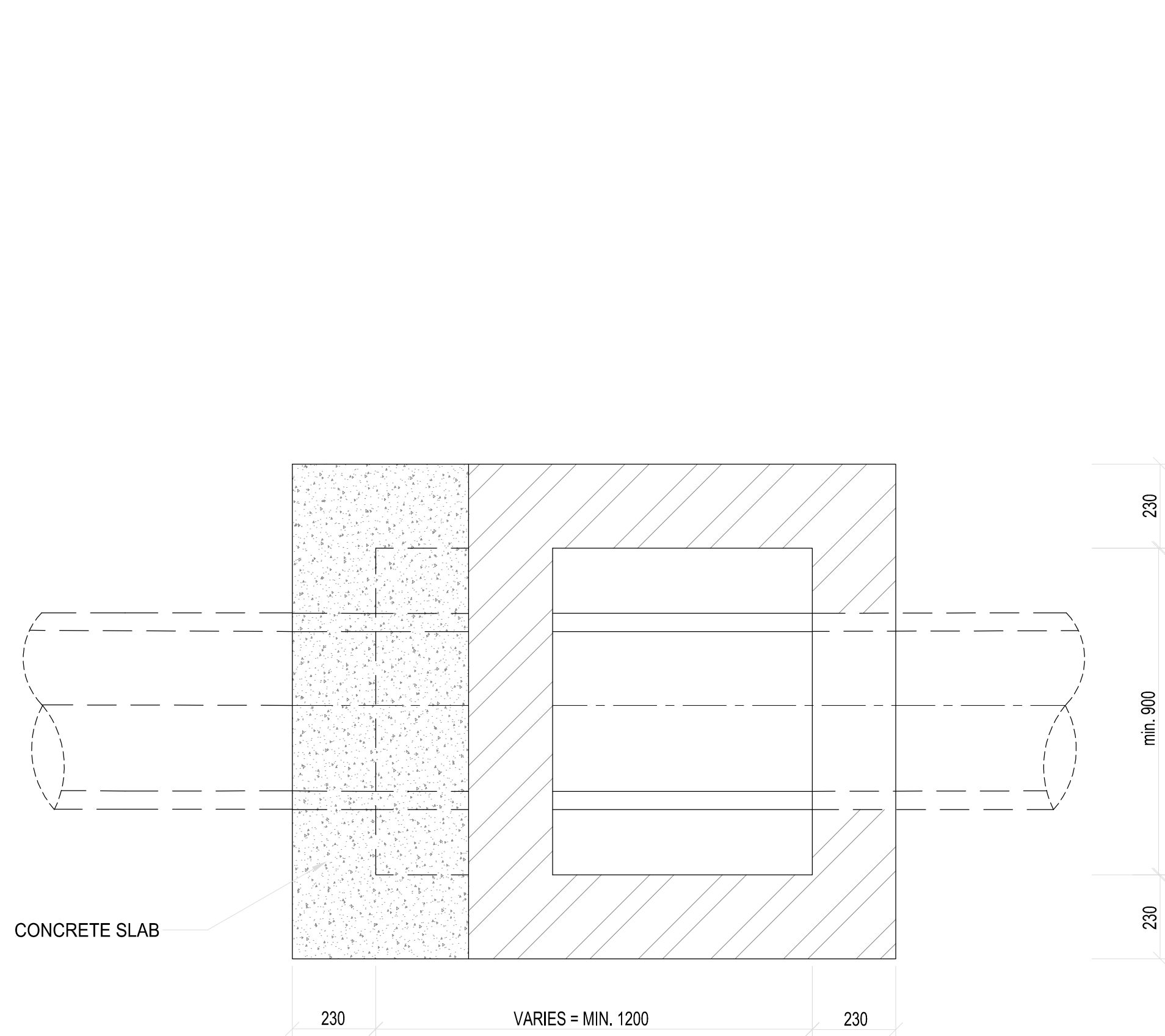
REVISIONS			
REV	DATE	DESCRIPTION	BY

PROJECT NAME: **REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT - WARD 10**

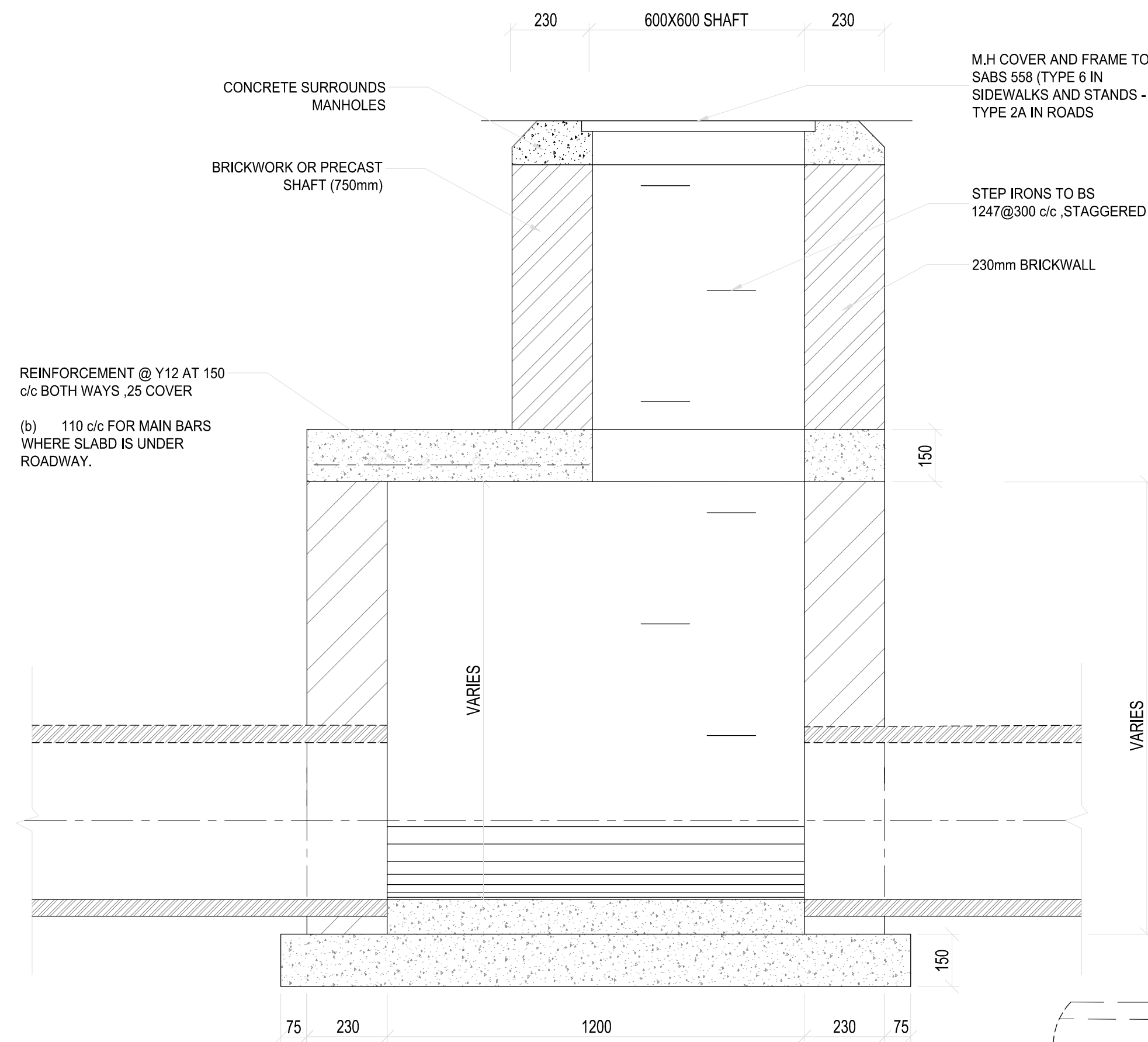
TITLE: **KERB APRON & SUPPORT DETAILS**

PROJECT STATUS: **TENDER**

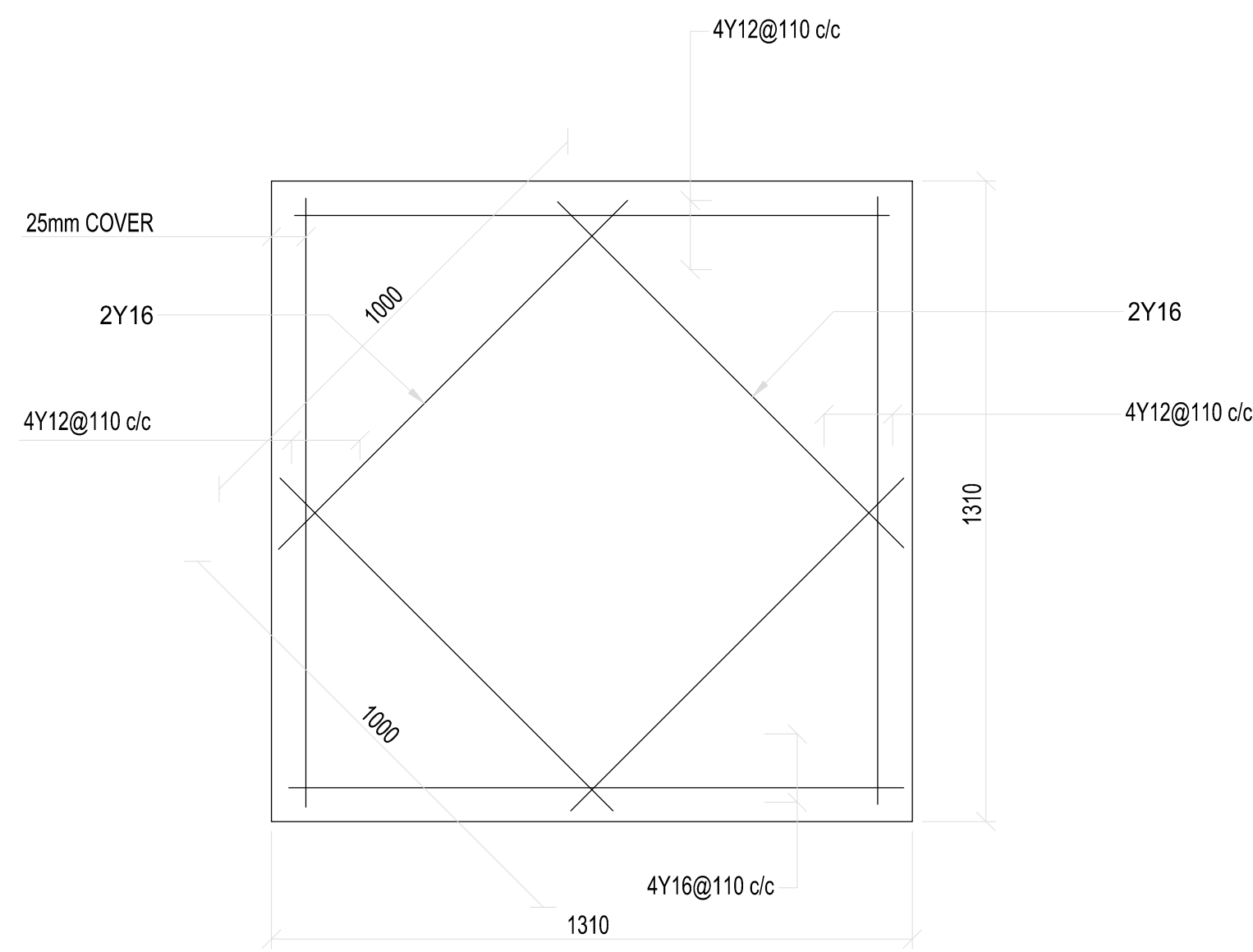
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DWG NO: P-SM01-PMO-CE-S-105				



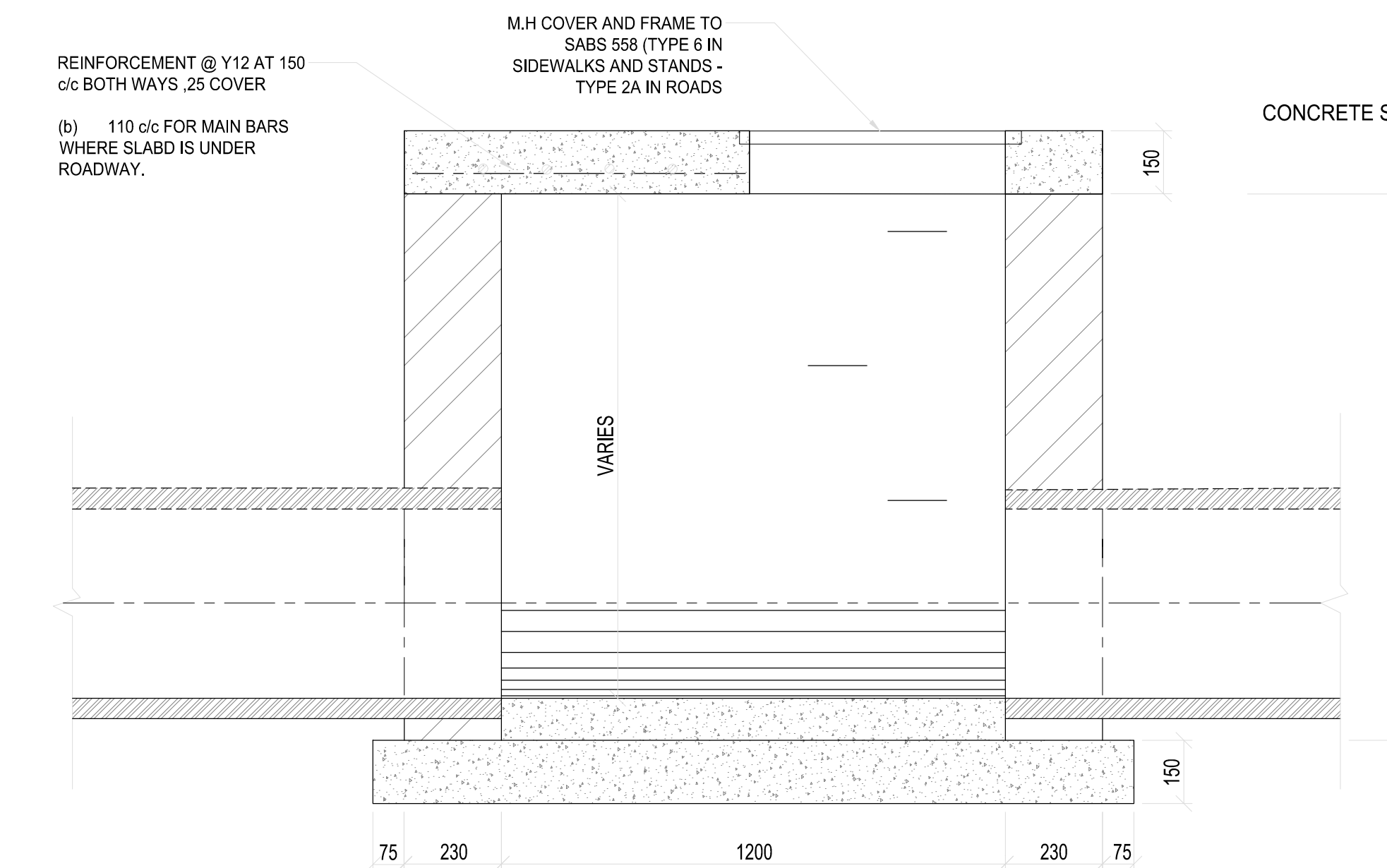
TYPE A SECTIONAL PLAN
SCALE 1:10



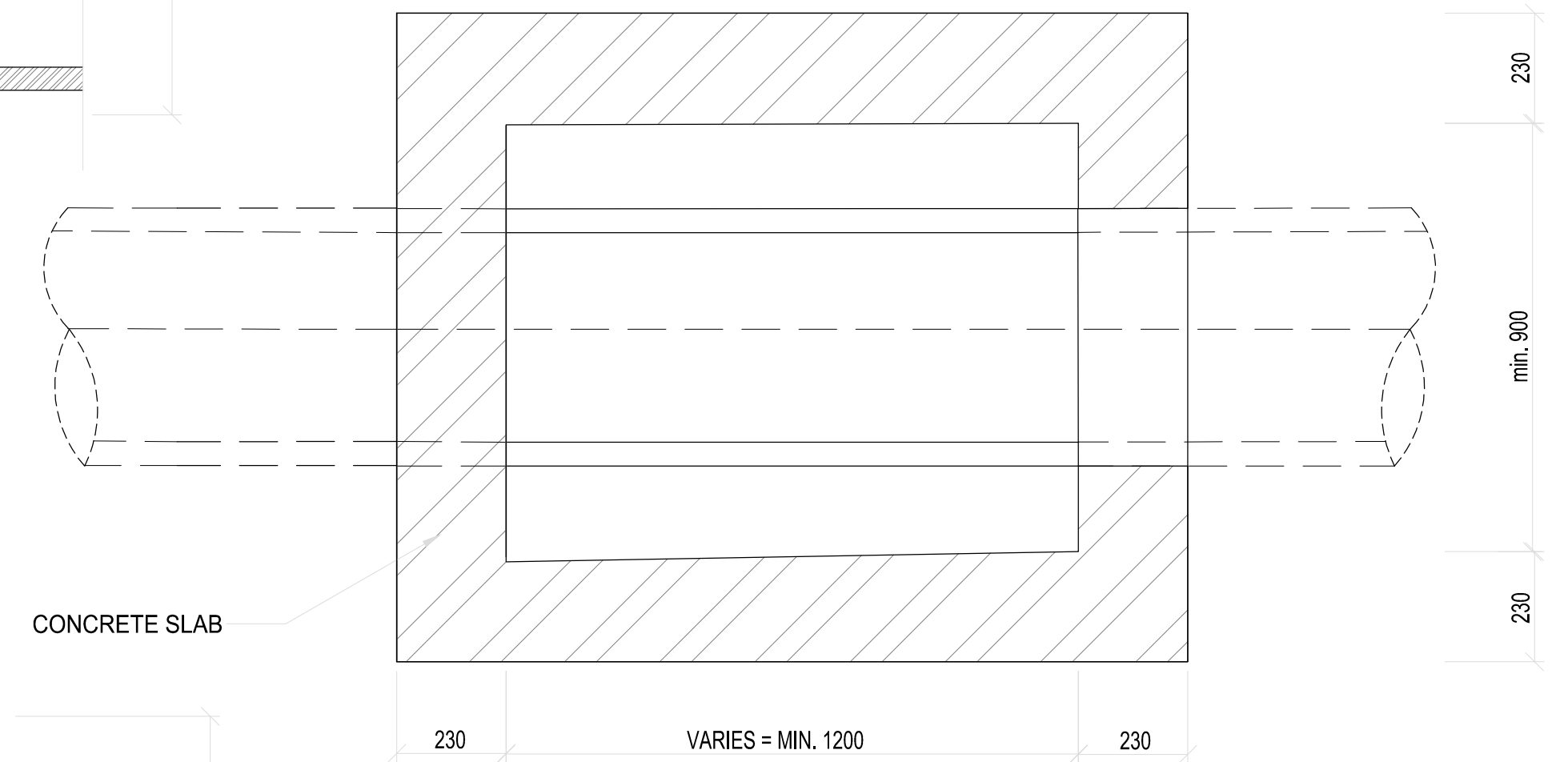
TYPE A JUNCTION FOR 1.5m - 2m Depth
SCALE 1:10



COVER SLAB REINFORCEMENT
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
 - CAST IN-SITU KERBS, APRONS ETC.: CLASS 25/19
 - ALL FLOORS AND BENCHING TO BE STEEL TROWELLED WITH A SMOOTH RADIUS
 - ALL BRICKS TO BE OF QUALITY FBSE30 TO SANS 227-1986 WITH WATER ABSORPTION <14% AND EFFLORESCENCE < 10.1
 - ALL BRICKWORK TO BE IN ENGLISH BOND.
 - MANHOLE & KERB INLET WIDTHS AND DEPTHS:
 - WIDTH-750mm PIPES AND LESS - 900mm
 - 825mm PIPES AND MORE - 1200mm
 - 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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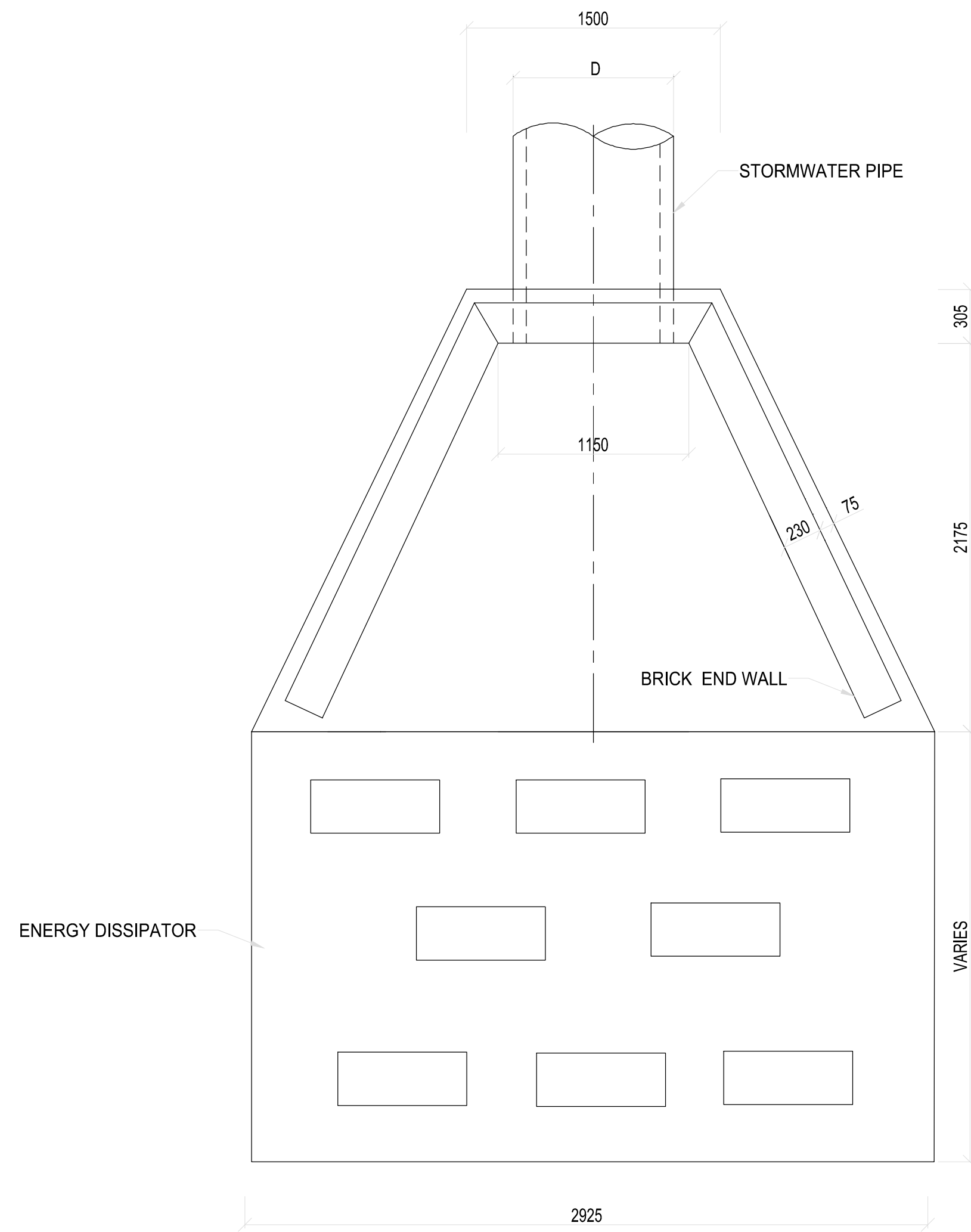
PROFESSIONAL ENGINEER:
L. MARAH
PROF. Reg.No:
920281
DATE:
SIGNATURE:

DESIGN BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

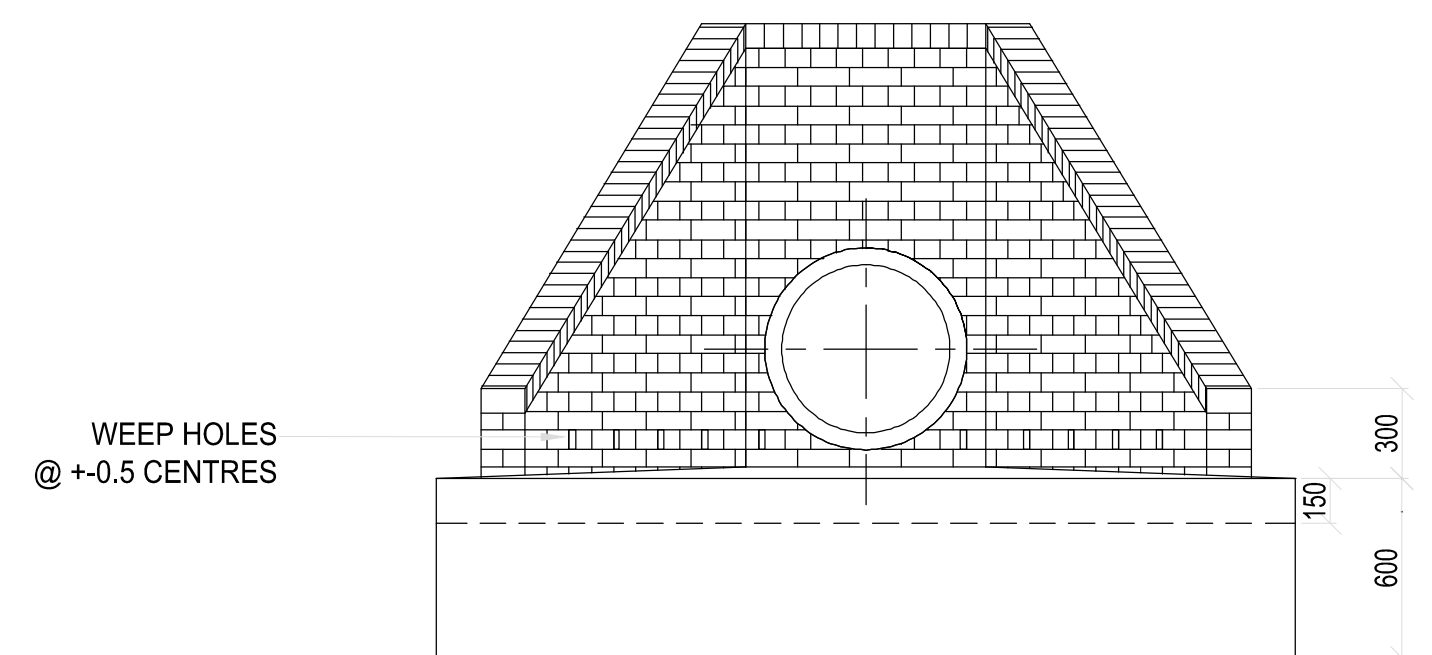
REV	DATE	DESCRIPTION	BY

PROJECT NAME: REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT - WARD 10
TITLE: JUNCTION BOX DETAIL

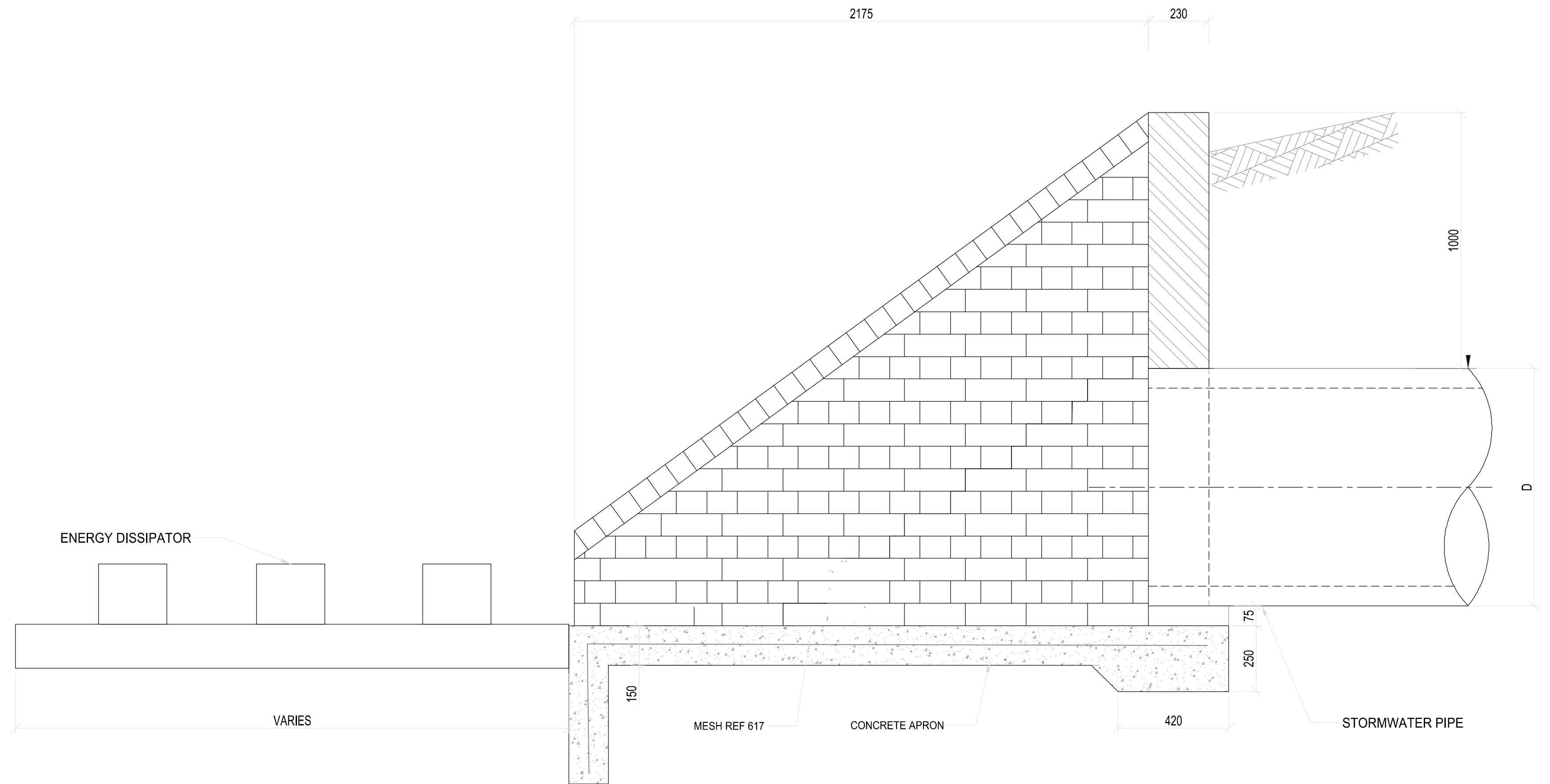
PROJECT STATUS: TENDER
DATE: 2024-03-25
SCALE: N.T.S
SHEET: 1 OF 1
REV: A
A1
DWG NO: P-SM01-PMO-CE-S-106



OUTLET PLAN
SCALE 1:25



FRONT ELEVATION
SCALE 1:25



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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 STERKSPRUIT - WARD 10

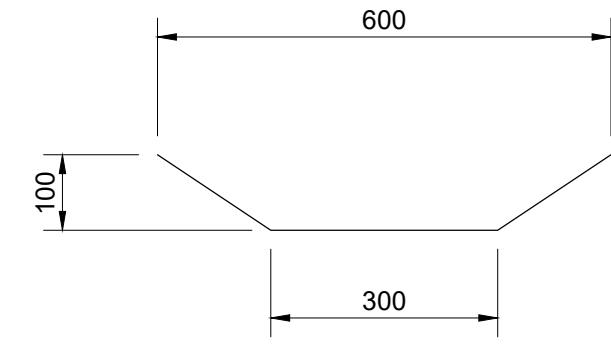
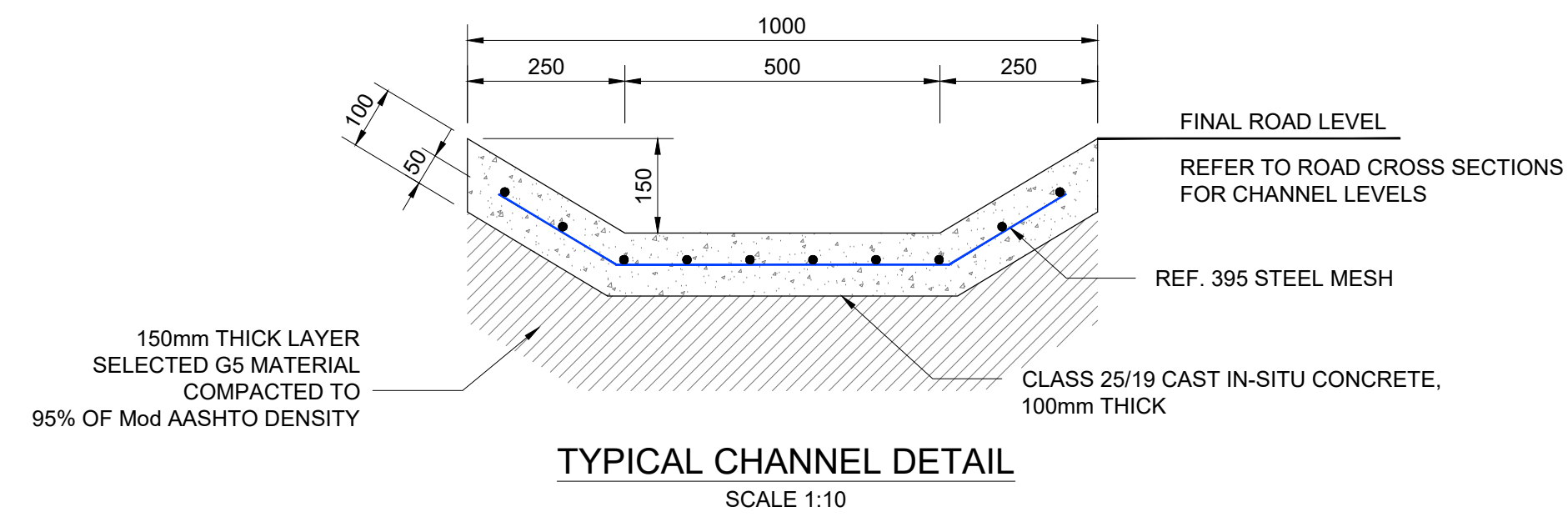
TITLE

HEADWALL OR OUTLET DETAIL

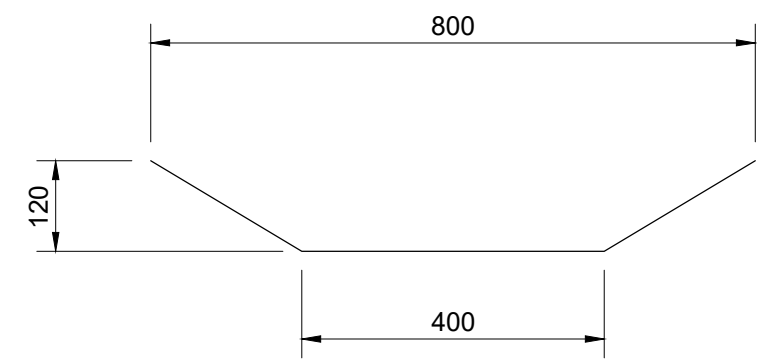
PROJECT STATUS:

TENDER

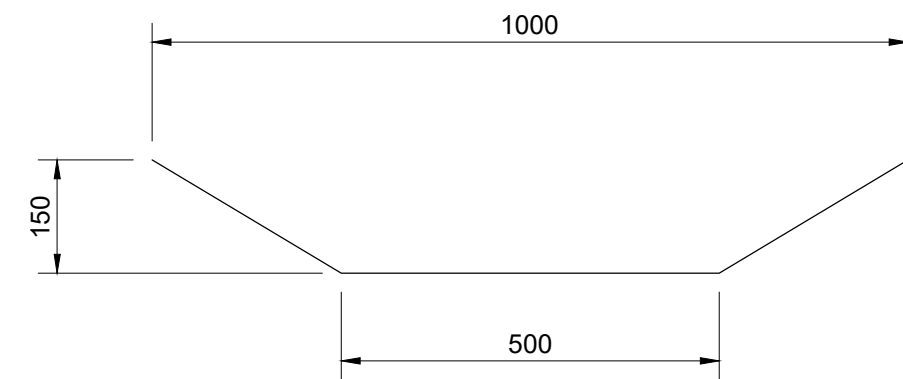
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2024-03-25	N.T.S	1 OF 1	A	A1
DWG NO		P-SM01-PMO-CE-S-107		



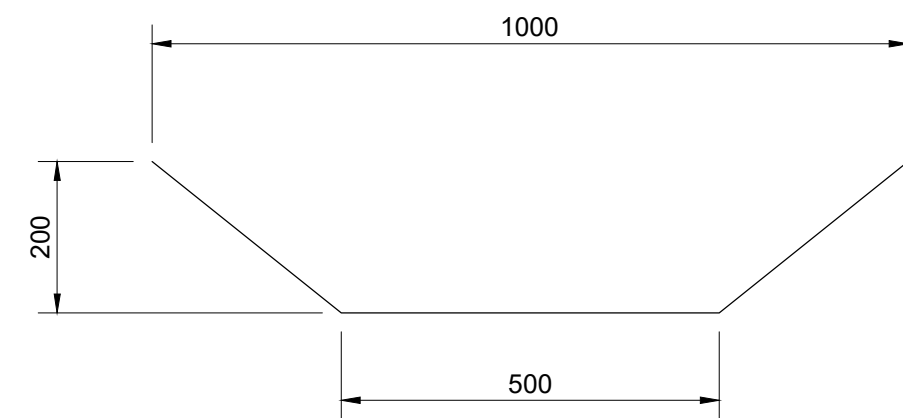
CHANNEL TYPE A



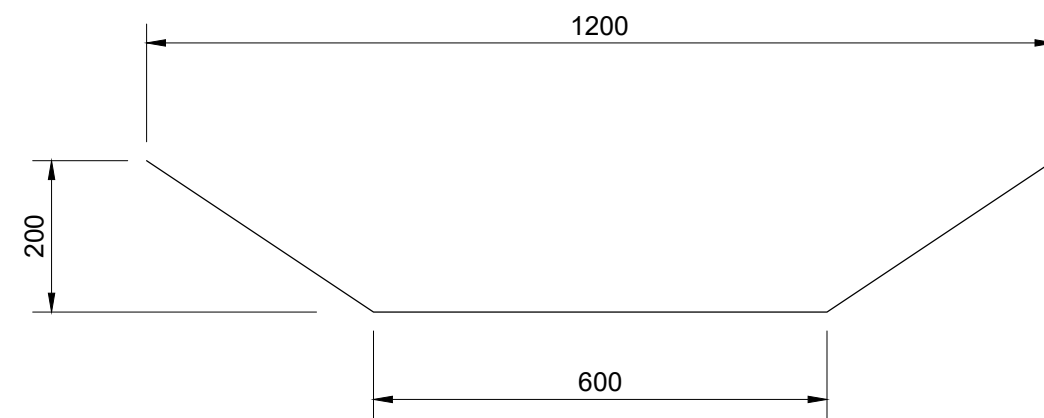
CHANNEL TYPE B



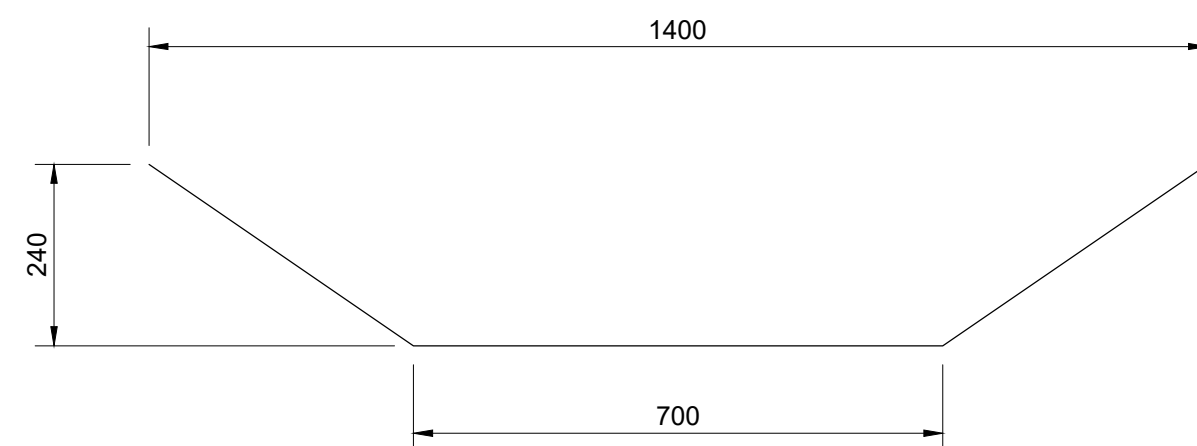
CHANNEL TYPE C



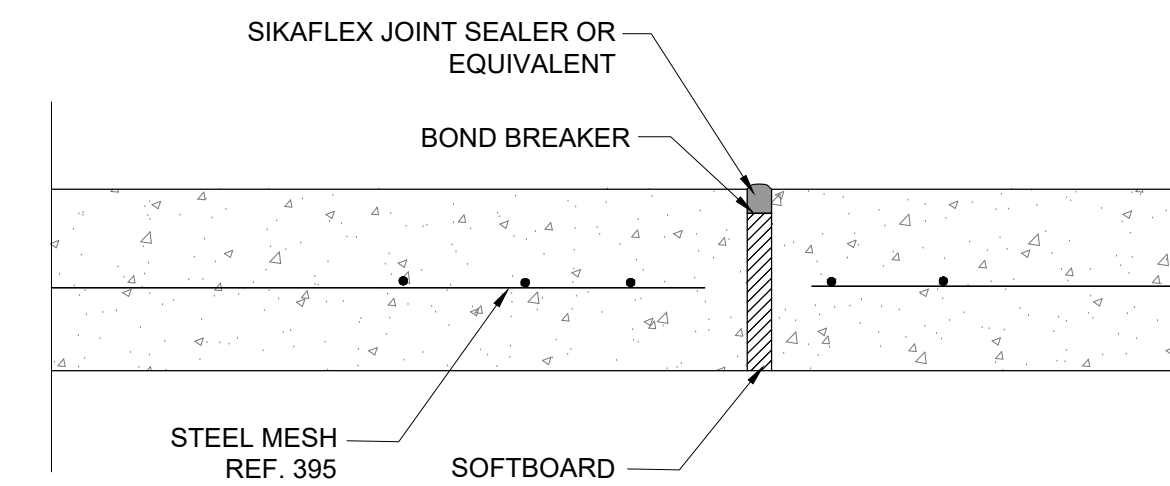
CHANNEL TYPE D



CHANNEL TYPE E



CHANNEL TYPE F



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

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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

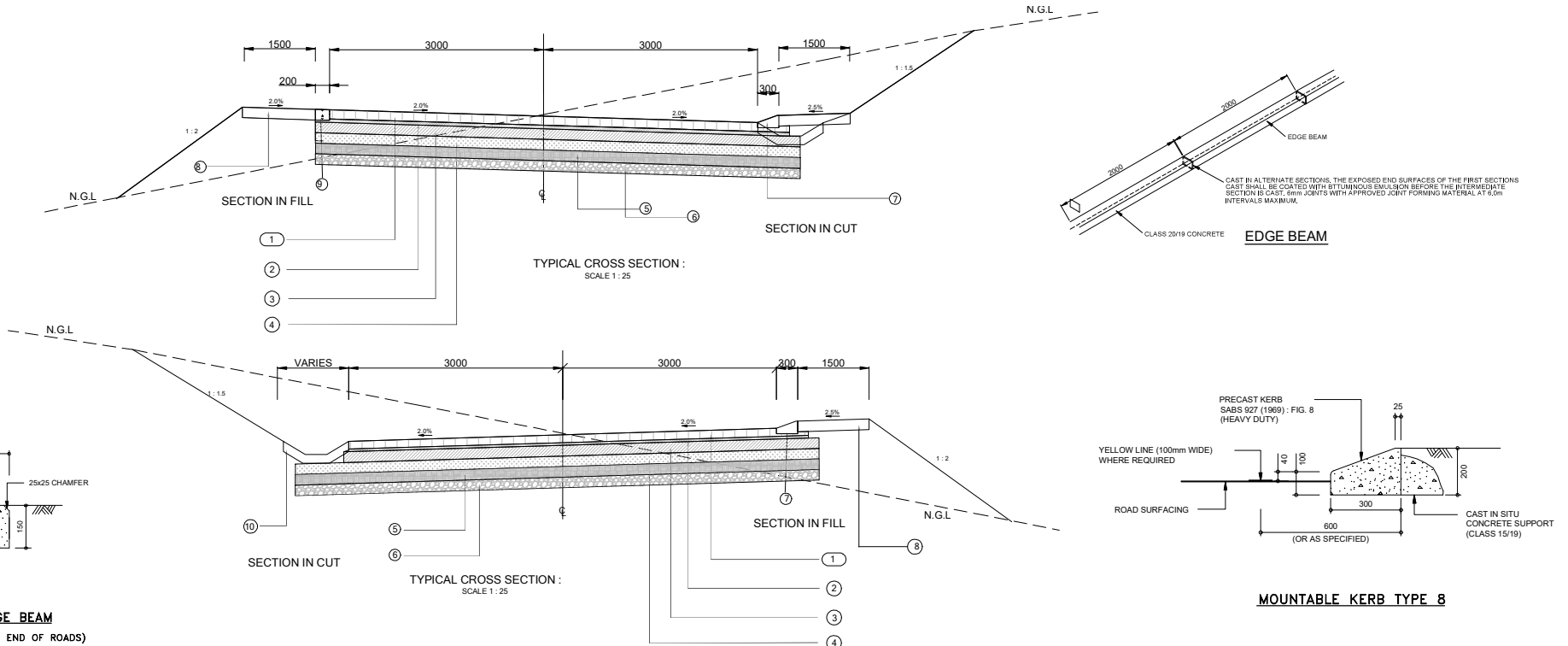
PROJECT NAME
REHABILITATION OF ROADS AND STORMWATER IN STERKSPRUIT WARD 10
TITLE
TRAPEZOIDAL CONCRETE DRAIN DETAILS

PROJECT STATUS:
TENDER
DATE: 2024-03-25
SCALE: N.T.S
SHEET: 1 OF 1
REV: a
A1
DWG NO:
P-SM01-PMO-CE-S-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 Sigrid Marah Martin M.B.A. & P.E. (SA) Mechanical & Engineering Consultant	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 0 DATE 2024-03-25 DESCRIPTION ISSUED FOR TENDER	PROJECT NAME REHABILITATION OF ROADS & STORMWATER IN STERKSPRUIT WARD 10 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-S-108	BY: L.M. DATE: 2024-03-25	DATE: 2024-03-25 SCALE: AS SHOWN SHEET: 1 OF 1 REV: 0 DWG NO: P-SM01-PMO-CE-S-108