

VOLUME 2



BLOUBERG MUNICIPALITY

CONTRACT NO . BM22/22/23

FOR

**CONSTRUCTION OF KWARUNG INTERNAL STREETS AND
STOMRWATER CONTROL**

VOLUME 2

TENDER DRAWINGS

JULY 2024

ISSUED BY:

BLOUBERG MUNICIPALITY
2ND BUILDING
MOGWADI/SENWABARAWNA ROAD
SENWABARWANA
0790

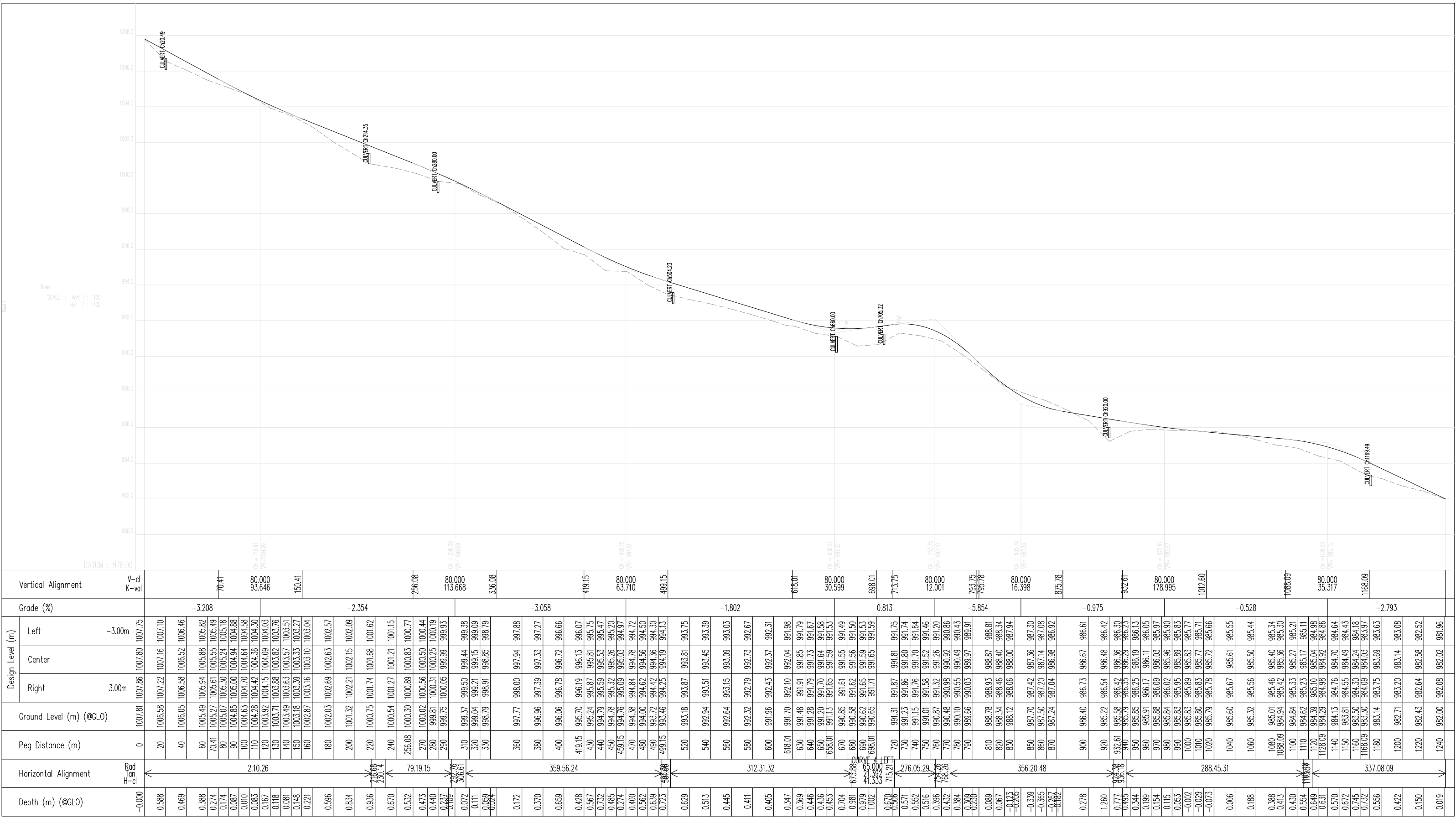
PREPARED BY:

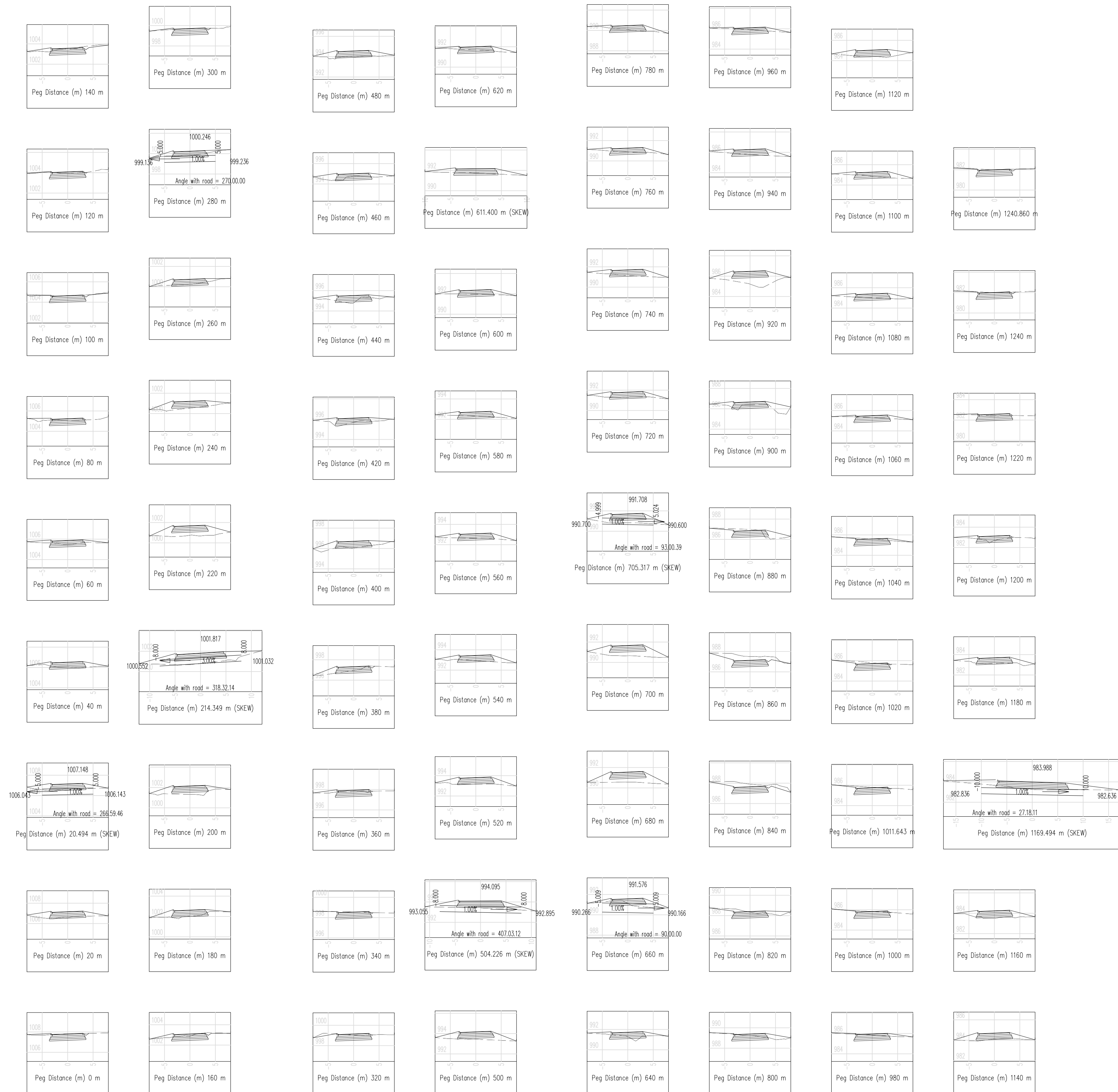


SIZEYA CONSULTING ENGINEERS
OFFICE NO. 14
PRIVATE BAG X9676, POSTNET SUITE 141
POLOKWANE, 0700
TEL : (015) 291-1020
EMAIL : info@sizeya.co.za



				DESIGNED BY	R.R. RAVELE	SIGNATURE		CLIENTS DETAILS		CONSULTANTS DETAILS		CONTRACT No.:	T.B.C.	SHEET 1 OF 1
				DRAWN BY	T.T. MPHOLANE			BLOUBERG MUNICIPALITY		SIZEYA		PROJECT TITLE:	UPGRADING OF GRAVEL TOAD TO PAVED ROAD INCLUDING STORMWATER INTERVENTION FROM BOSTHLA VILLAGE TO THALANE VILLAGE & KWARUNG VILLAGE TO MAKGOTHLO PRIMARY SCHOOL	DRAWING SCALE
				CHECKED BY	H.L. THARAGA							DRAWING TITLE:	LOCALITY PLAN	NOT TO SCALE
				ISSUED BY										CONSULTANTS DRAWING No.:
No	DATE	DESCRIPTION	ISSUED BY											PROJECT No. DISCIPLINE SUB-DISCIPLINE DWG No. STAGE REV No.
00	12/2022	SCOPING REPORT - INITIAL ISSUE	TTM											S35.4 - GL - LAY -001-SP-00
														AP FOR APPROVAL / S SCOPING REPORT / PD PRELIMINARY DESIGN / DD DETAILED DESIGN / T TENDER
														C CONSTRUCTION / A AS-BUILT / I FOR INFORMATION ONLY





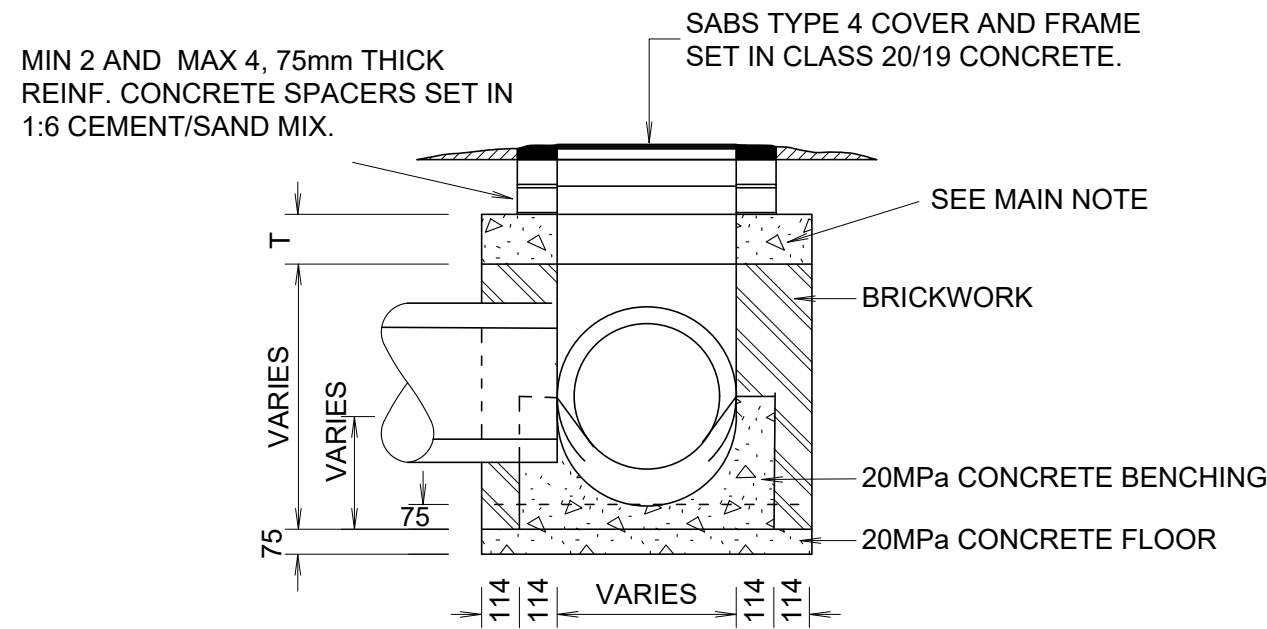
FOR TENDER

				DESIGNED BY	R.R RAVELE	SIGNATURE	 BLOURBERG MUNICIPALITY	 SIZEYA CONSULTING ENGINEERS civil engineers quantity surveyors structural engineers project managers	No. 6 Hans van Rensburg Street Office no. 14 Private Bag X9676, Postnet Suite 141 Polokwane 0700 Tel : (015) 291 1020 Email : info@sizeya.co.za	CONSULTANTS DETAILS		CONSULTING ENGINEER DATE PROFESSIONAL REGISTRATION No. EMPLOYER'S PROJECT MANAGER DATE	CONTRACT NO:	BM22/22/23	SHEET 1 OF 1										
				DRAWN BY	F.I MARAGENI					PROJECT TITLE:	CONSTRUCTION OF KWARUNG INTERNAL STREETS AND STORMWATER CONTROL		DRAWING SCALE AS SHOWN												
00	10/2023	INITIAL ISSUE	FIM	CHECKED BY	H.L THARAGA					DRAWING TITLE:	ROAD 1 CROSS SECTIONS		CONSULTANTS DRAWING No.: <table><tr><td>PROJECT No.</td><td>DISCIPLINE</td><td>SUB-DISCIPLINE</td><td>DWG No.</td><td>STAGE</td><td>REV No.</td></tr><tr><td>S35.4</td><td>RD 1</td><td>CS</td><td>004</td><td>DD</td><td>00</td></tr></table>	PROJECT No.		DISCIPLINE	SUB-DISCIPLINE	DWG No.	STAGE	REV No.	S35.4	RD 1	CS	004	DD
PROJECT No.	DISCIPLINE	SUB-DISCIPLINE	DWG No.	STAGE	REV No.																				
S35.4	RD 1	CS	004	DD	00																				
No	DATE	DESCRIPTION		ISSUED BY						PD: PRELIMINARY DESIGN / DD: DETAILED DESIGN / T: TENDER / C: CONSTRUCTION / A: ASBUILT / F: FOR INFORMATION ONLY															

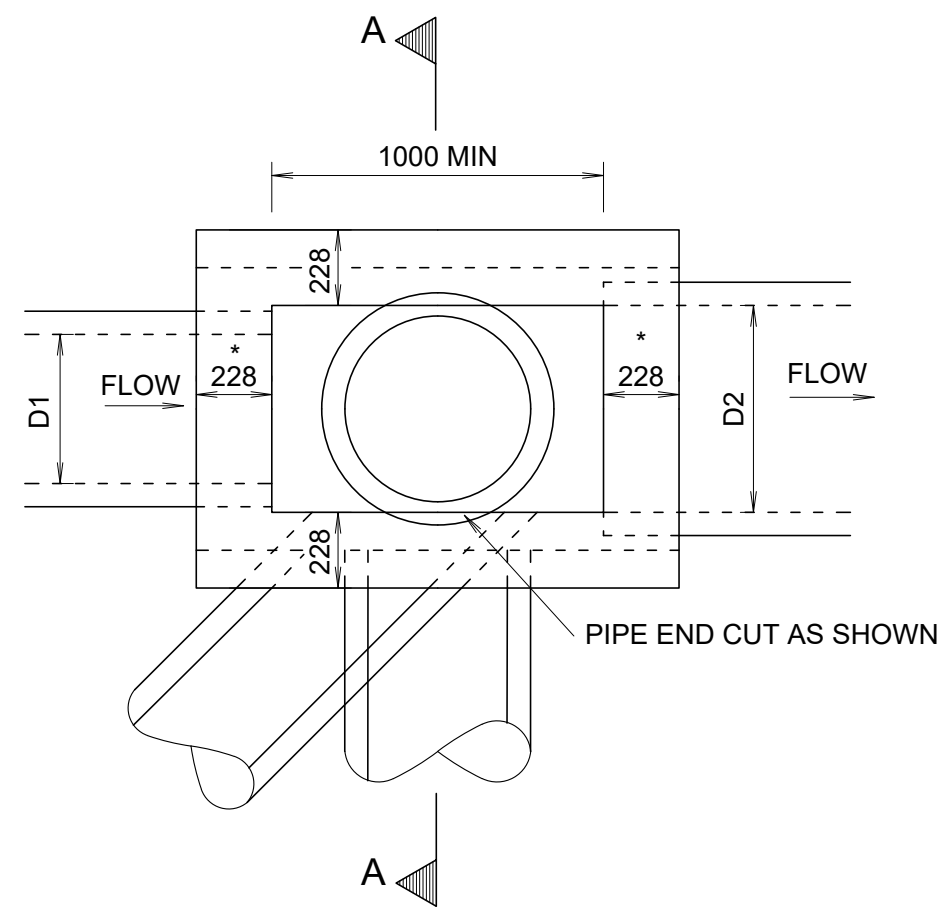


FOR TENDER

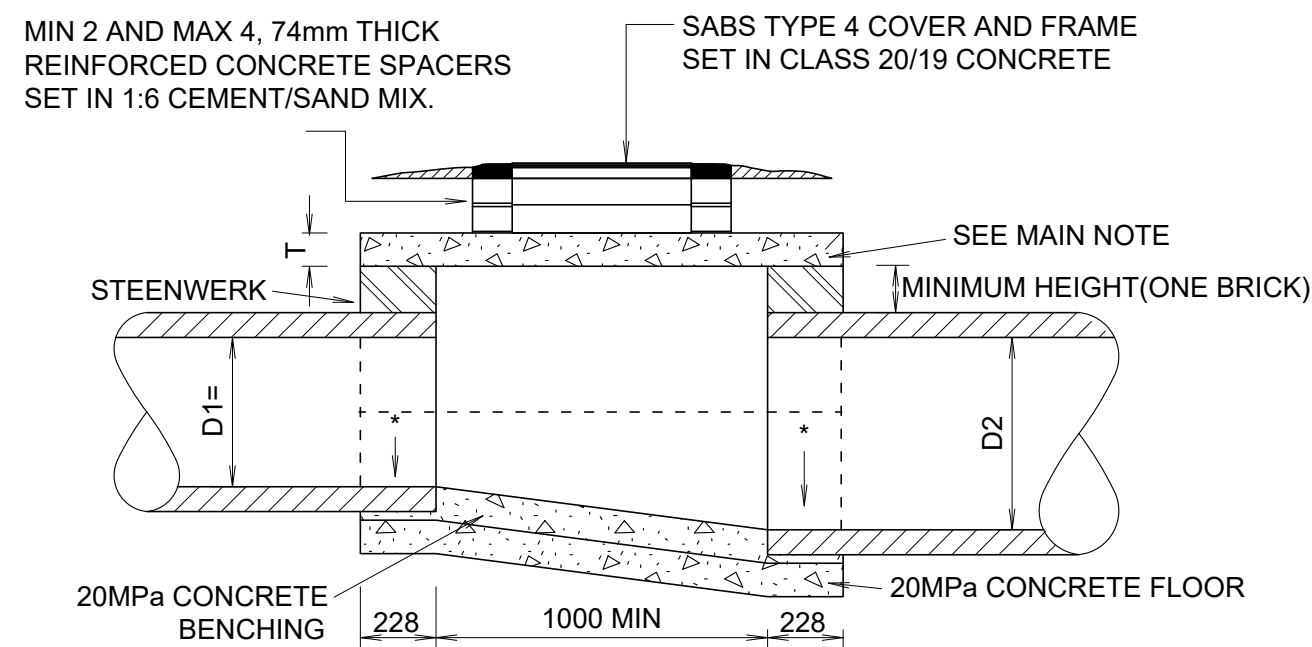
						DESIGNED BY:	R.R RAVELE	 MARULENG LOCAL MUNICIPALITY P.O.BOX 67 HOEDSPRUIT 1380 TEL : +27 15 793 249 FAX : + 27 15 793 2341	 No. 6 Hans Van Rensburg Street Office No. 14 Private Bag X9676, Postnet Suite 141 Polokwane, 0700 Tel : (015) 291 1020 Email : info@sizeya.co.za	CONSULTING ENGINEER	DATE	PROJECT NAME: CONSTRUCTION OF KWARUNG INTERNAL STREETS AND STORMWATER CONTROL	SHEET 1 OF 1
				DRAWN BY:	L MOJANAGA		DRAWING SCALE AS SHOWN						
0	03/2024	INITIAL ISSUE	FIM	CHECKED BY:	H.L. THARAGA		CONSULTANTS DRAWING No.: PROJECT No. DISCIPLINE SUB-DISCIPLINE DWG No. STAGE REV No. S35.4 - RD - STD - 001- C - 000						
No	DATE	REVISION	CONSULT	DIR						EMPLOYER'S PROJECT MANAGER	DATE	DRAWING TITLE: TYPICAL SECTION AND PAVEMENT DESIGN	PD PRELIMINARY DESIGN / DD DETAILED DESIGN / T TENDER / C CONSTRUCTION / A AS-BUILT / I FOR INFORMATION ONLY



SECTION A-A

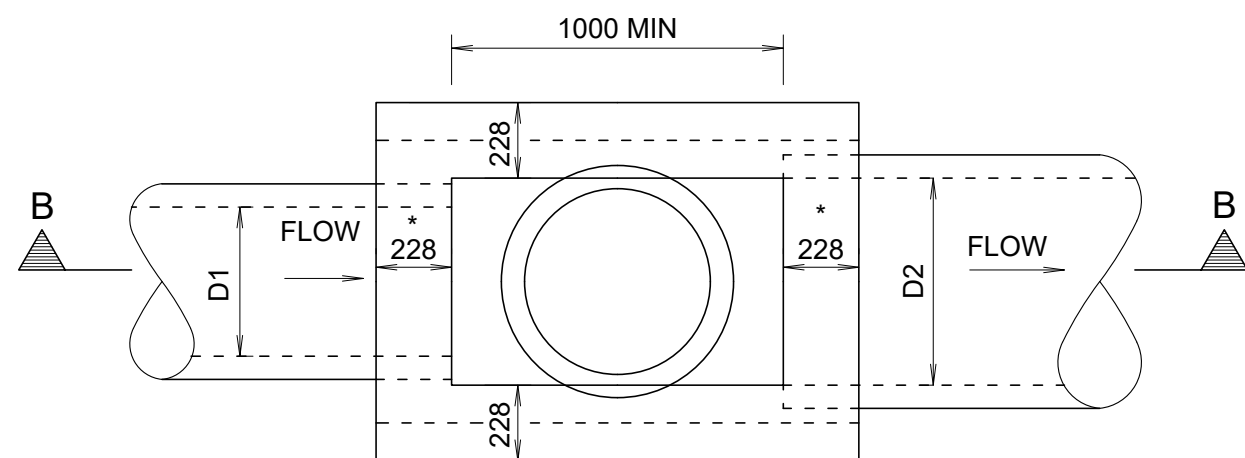


PLAN TYPE 1
MANHOLE/JUNCTION BOX TYPE 1

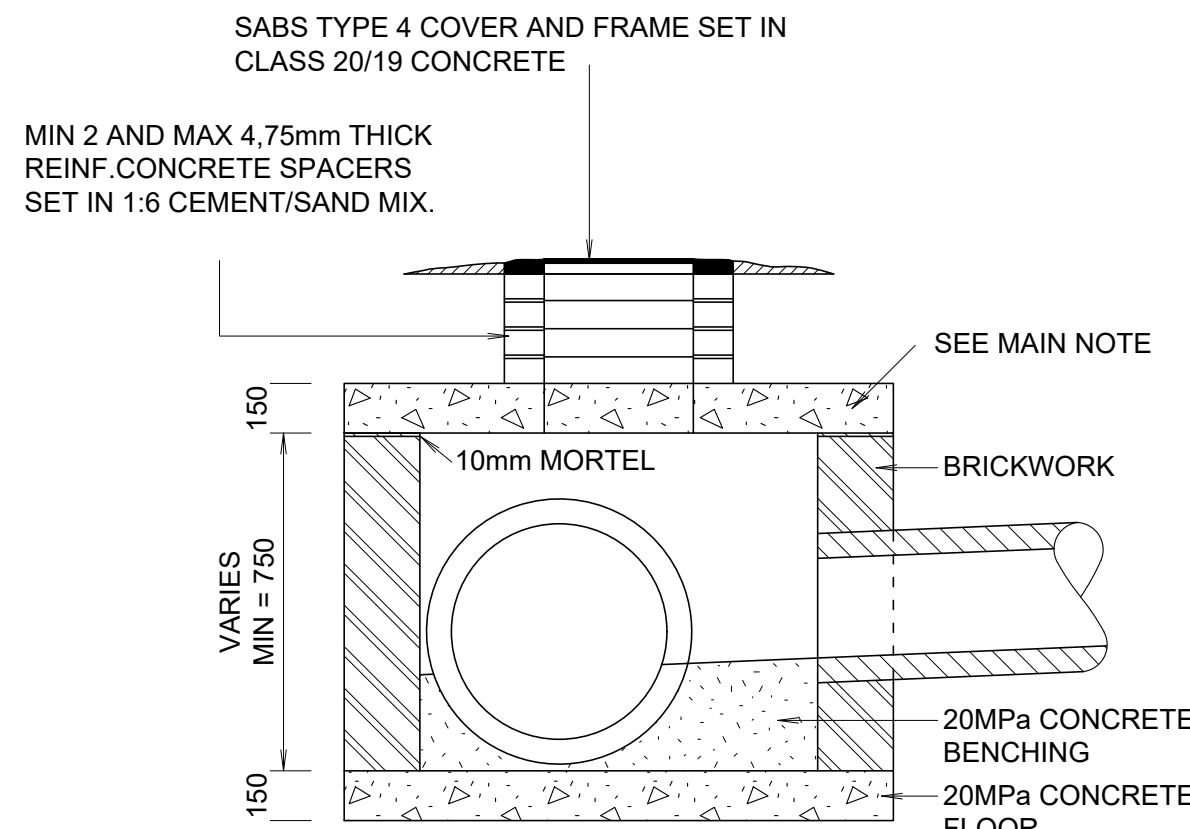


SECTION B-B

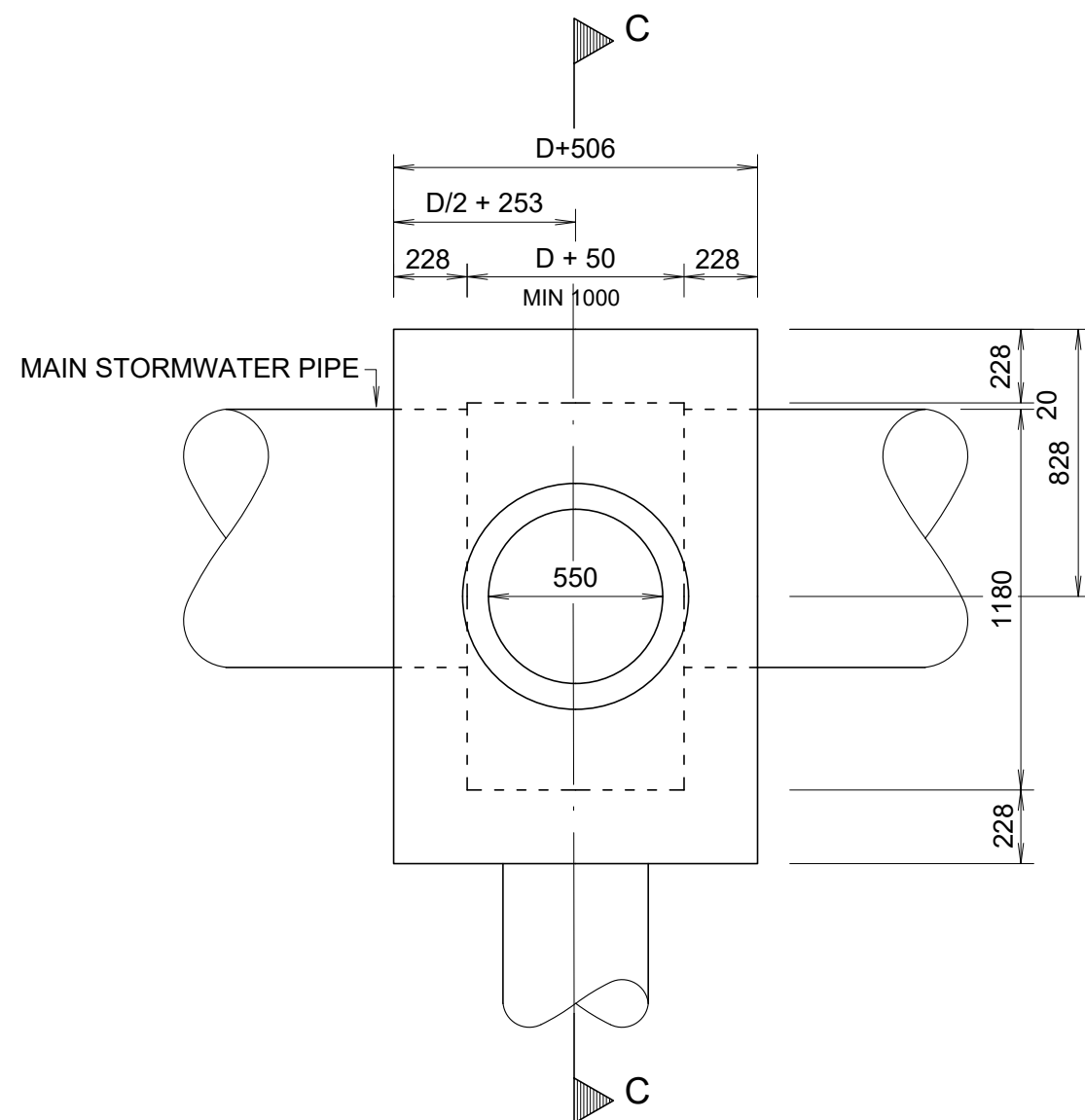
*NOTE:
INVERT LEVELS AS SPECIFIED
ON THE LONGITUDINAL SECTIONS.



PLAN TYPE 2
MANHOLE/JUNCTION BOX TYPE 2

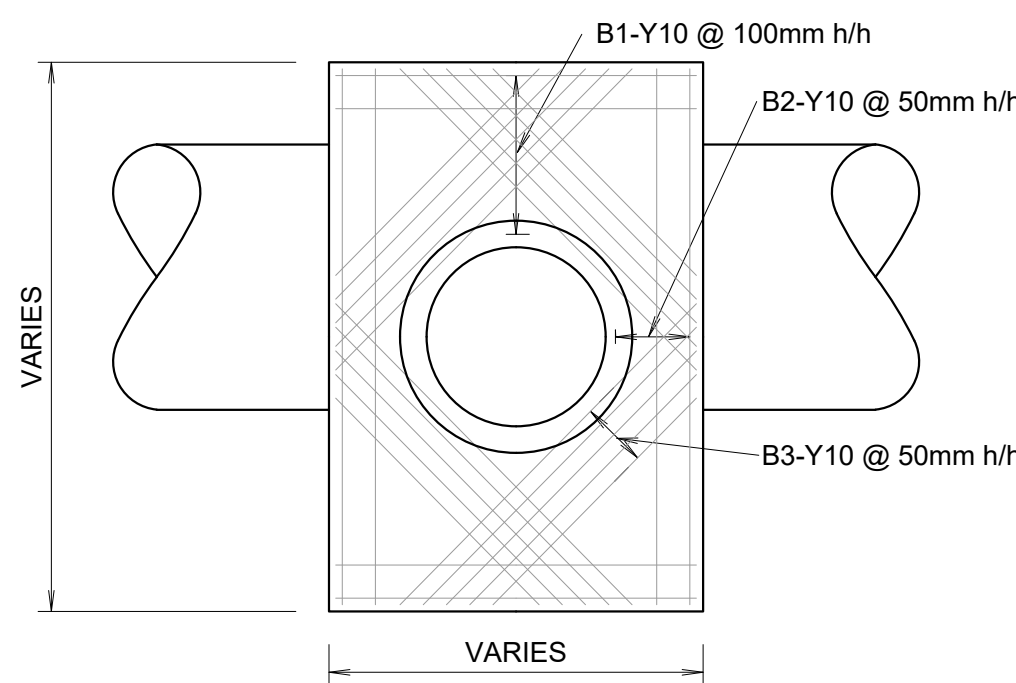


SECTION C-C



PLAN TYPE 3
MANHOLE/JUNCTION BOX TYPE 3

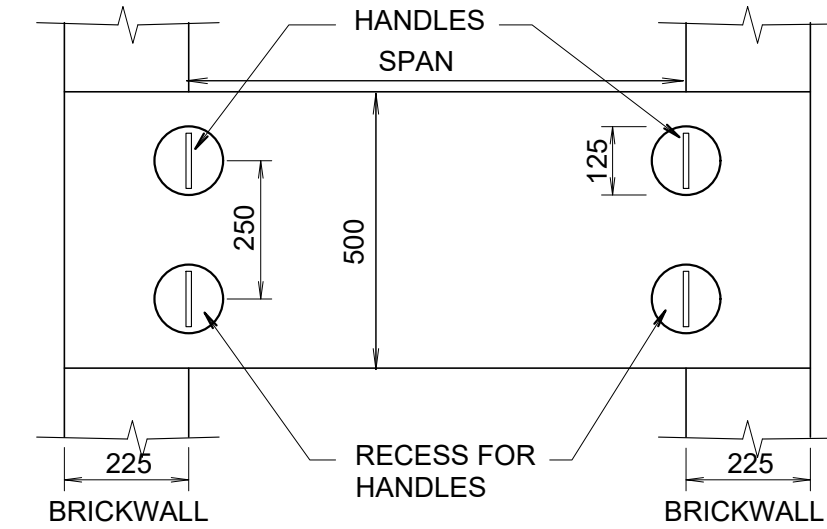
NOTE:
1. MIN. CONCRETE COVER 40mm.
2. ALL REINFORCEMENT IN CONCRETE BOTTOM OF SLAB.
3. B1, B2 AND B3 ARE STRAIGHT BARS.



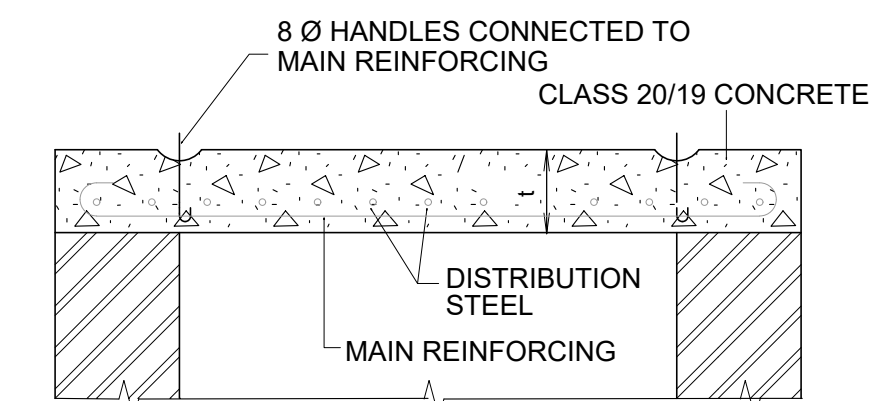
REINFORCEMENT DETAIL OF SLAB
FOR ALL TYPES OF MANHOLES

NOTES:

JUNCTION BOXES OF ALL TYPES ARE COVERED WITH THE PRECAST CONCRETE SLABS SHOWN IN DETAIL A. THIS REPLACES THE CONCRETE SLAB AND MANHOLE COVER PRESCRIBED FOR MANHOLES.



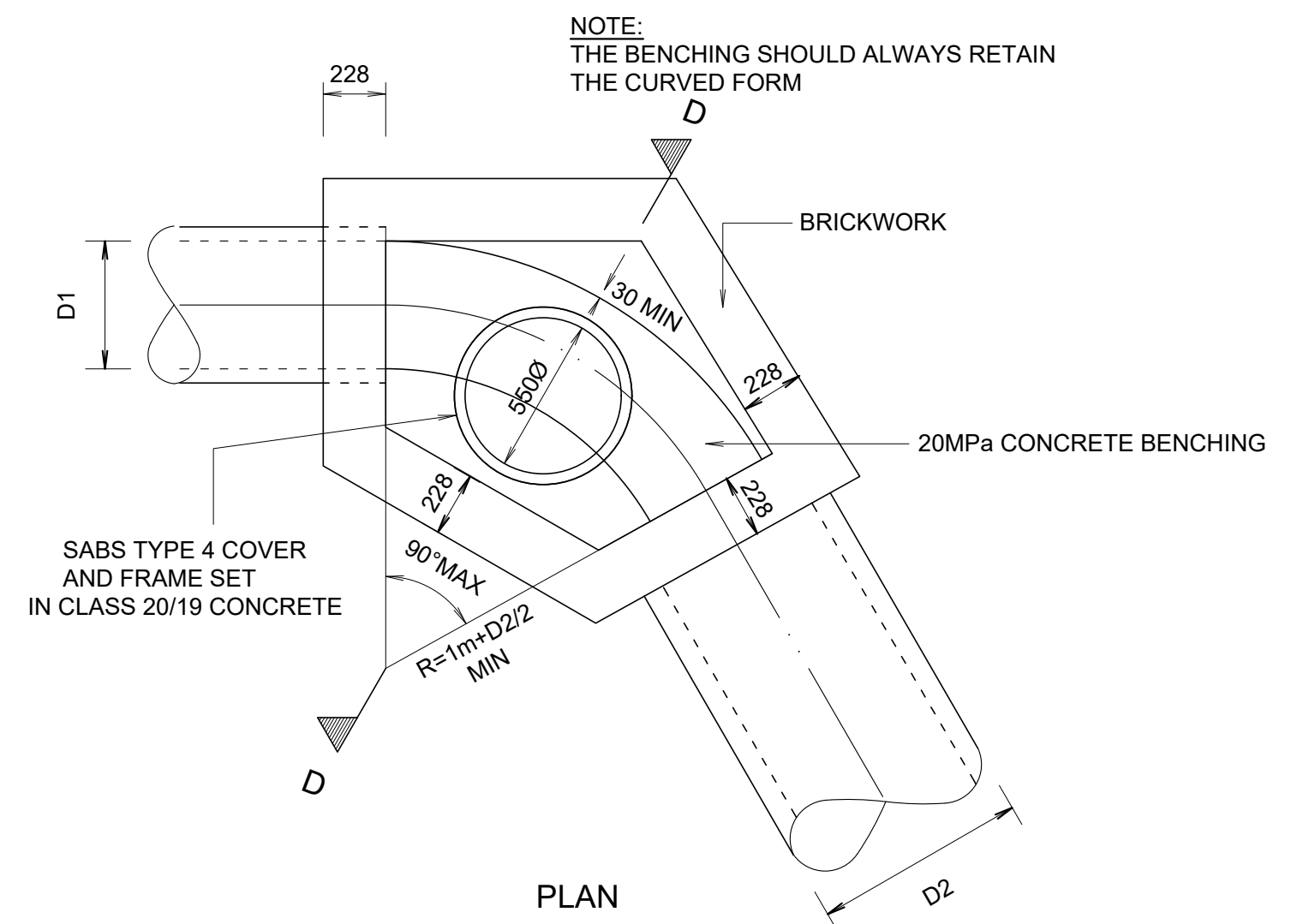
PLAN OF PRECAST COVER



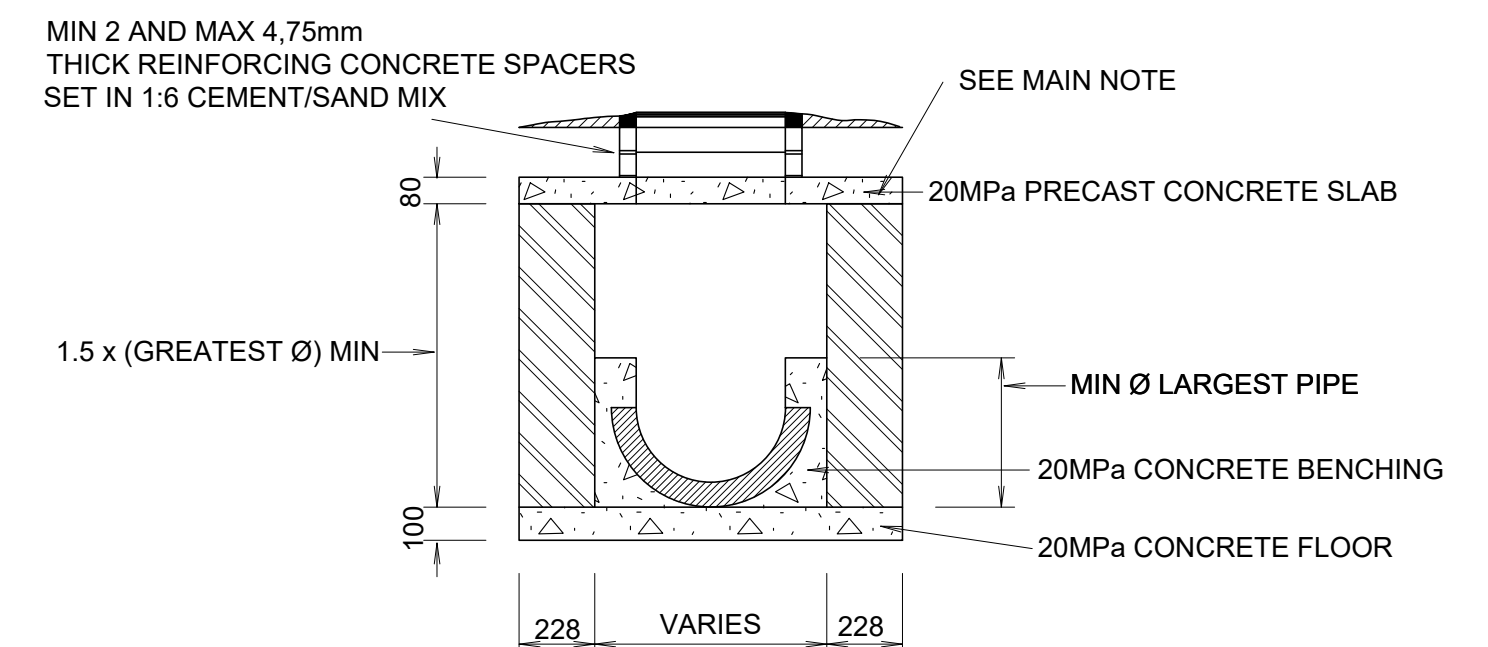
SECTION: PRECAST COVER

SLAB REINFORCING			
SPAN	t	MAIN REINFORCING	DISTR. STEEL
450	75	10 Ø @ 150	6 Ø @ 300
500	90	12 Ø @ 200	6 Ø @ 250
600	100	12 Ø @ 160	6 Ø @ 200
750	100	12 Ø @ 160	6 Ø @ 200
900	125	16 Ø @ 210	10 Ø @ 300
1 000	125	16 Ø @ 200	10 Ø @ 300
1 100	140	16 Ø @ 200	10 Ø @ 300
1 200	140	16 Ø @ 185	10 Ø @ 300
1 350	150	16 Ø @ 175	10 Ø @ 300
1 500	165	16 Ø @ 175	10 Ø @ 270
1 650	165	16 Ø @ 165	10 Ø @ 270
1 800	180	16 Ø @ 165	10 Ø @ 260
2 000	190	16 Ø @ 125	10 Ø @ 230
2 200	200	20 Ø @ 170	10 Ø @ 200
2 400	200	20 Ø @ 150	10 Ø @ 200
2 600	215	20 Ø @ 150	10 Ø @ 180

(20mm COVER FOR ALL REINFORCING)



PLAN

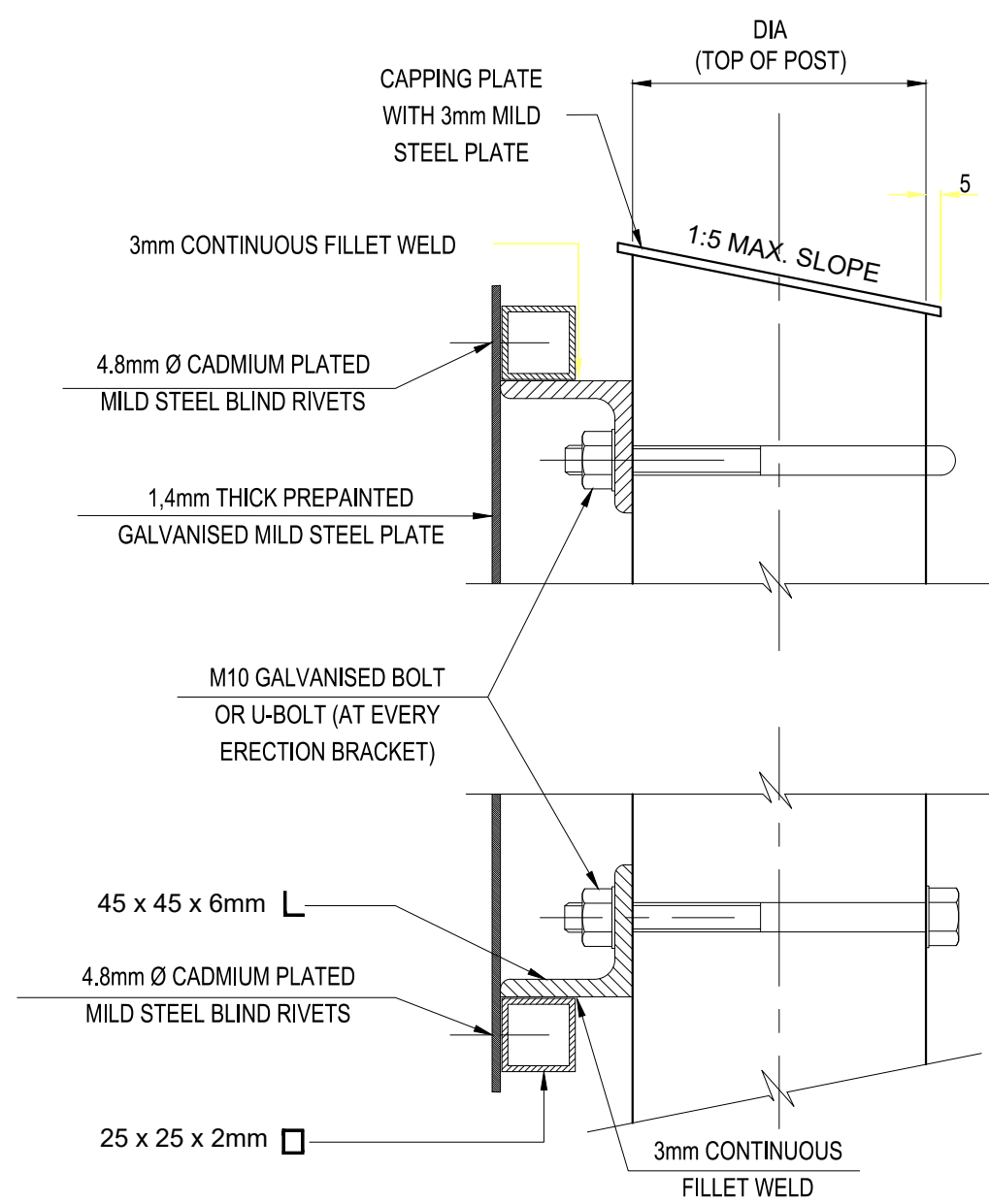


SECTION D-D

MANHOLE/JUNCTION BOX TYPE 4

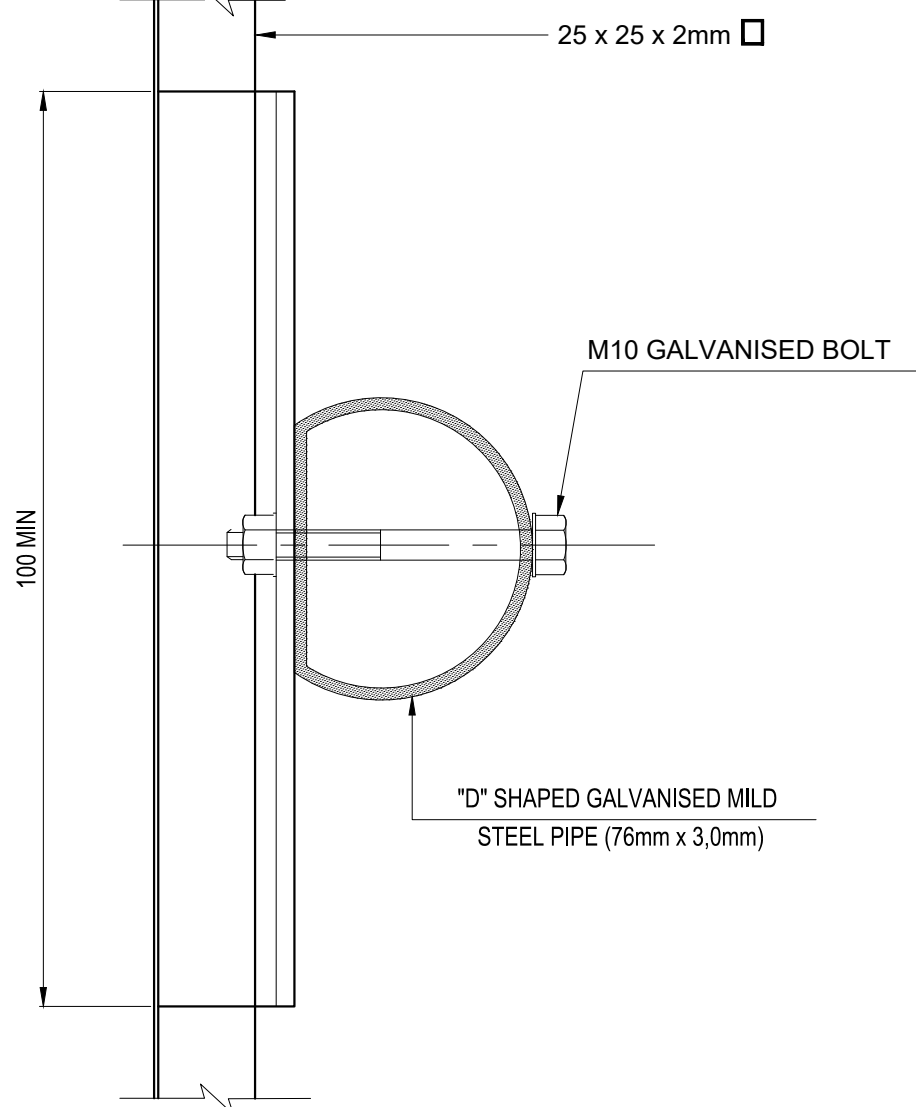
FOR TENDER

					DESIGNED BY:	R.R RAVELE	 MARULENG LOCAL MUNICIPALITY P.O.BOX 67 HOEDSPRUIT 1380 TEL : +27 15 793 249 FAX : + 27 15 793 2341	 SIZEYA CONSULTING ENGINEERS civil engineers quantity surveyors structural engineers project managers No. 6 Hans Van Rensburg Street Office No. 14 Private Bag X9676, Postnet Suite 141 Polokwane, 0700 Tel : (015) 291 1020 Email : info@sizeya.co.za	CONSULTING ENGINEER DATE	PROJECT NAME: CONSTRUCTION OF KWARUNG INTERNAL STREETS AND STORMWATER CONTROL	DRAWING TITLE: JUNCTION BOX DETAILS	SHEET 1 OF 1	
					DRAWN BY:	L. MOJANAGA						DRAWING SCALE AS SHOWN	
					CHECKED BY:	H.L. THARAGA						CONSULTANTS DRAWING No.:	
0	03/2024	INITIAL ISSUE		FIM								PROJECT No. DISCIPLINE SUB-DISCIPLINE DWG No. STAGE REV No. S35.4 - RD - STD - 003 - C - 000	
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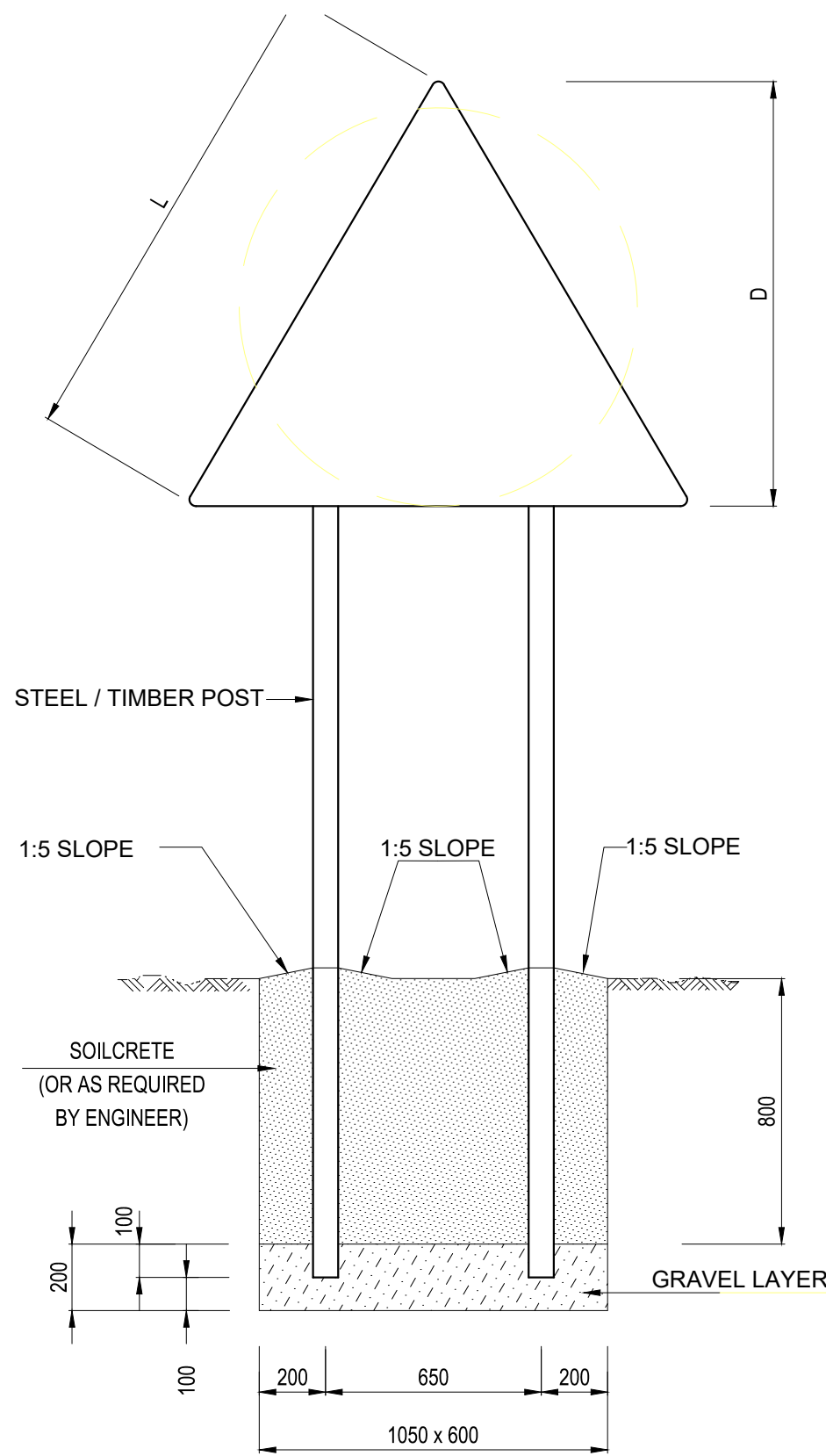
SIDE ELEVATION

SCALE 1 : 2,5



SIDE ELEVATION

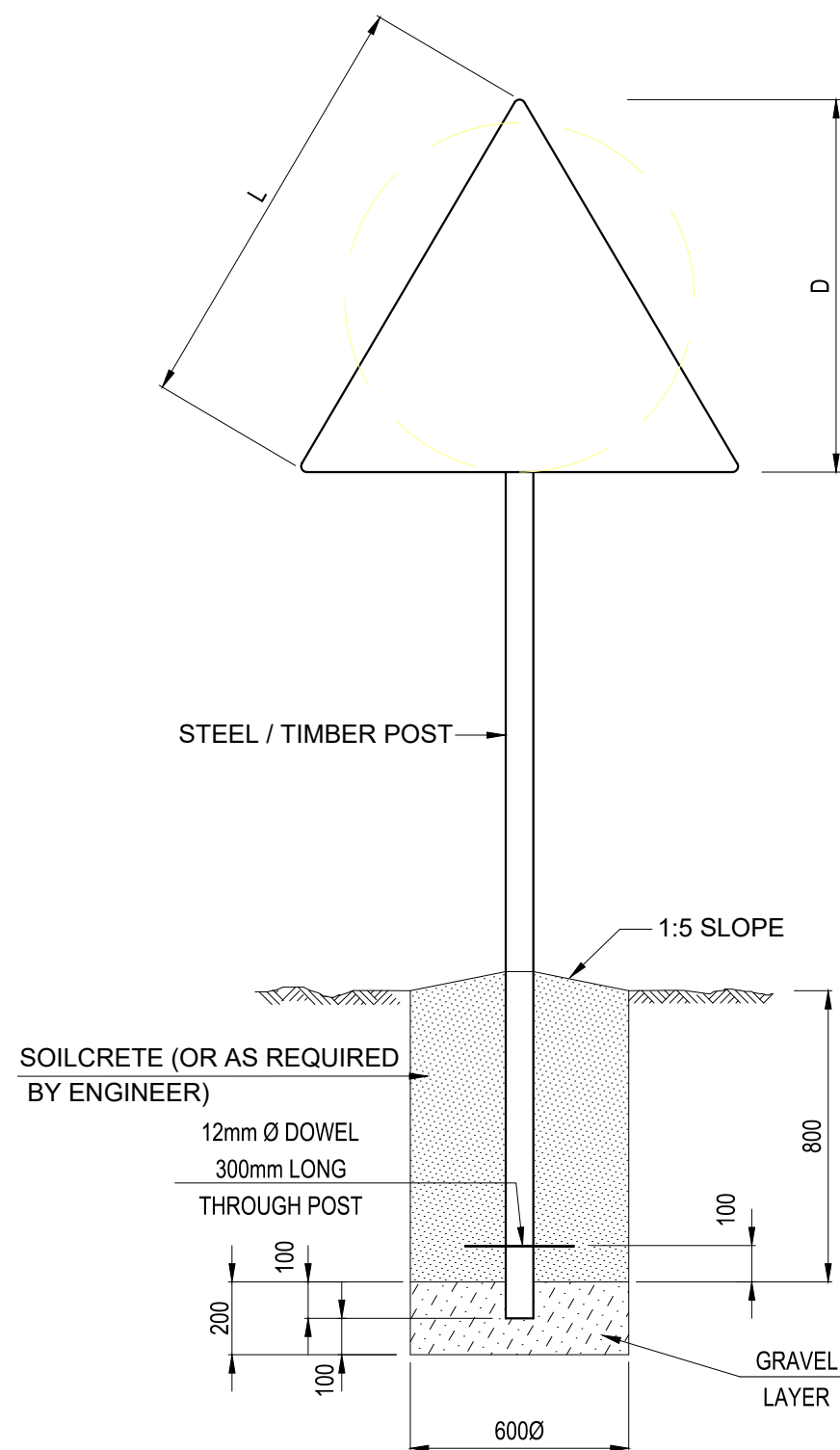
SCALE 1 : 2



FOUNDATION DETAIL

L = 1500 AND D = 1200

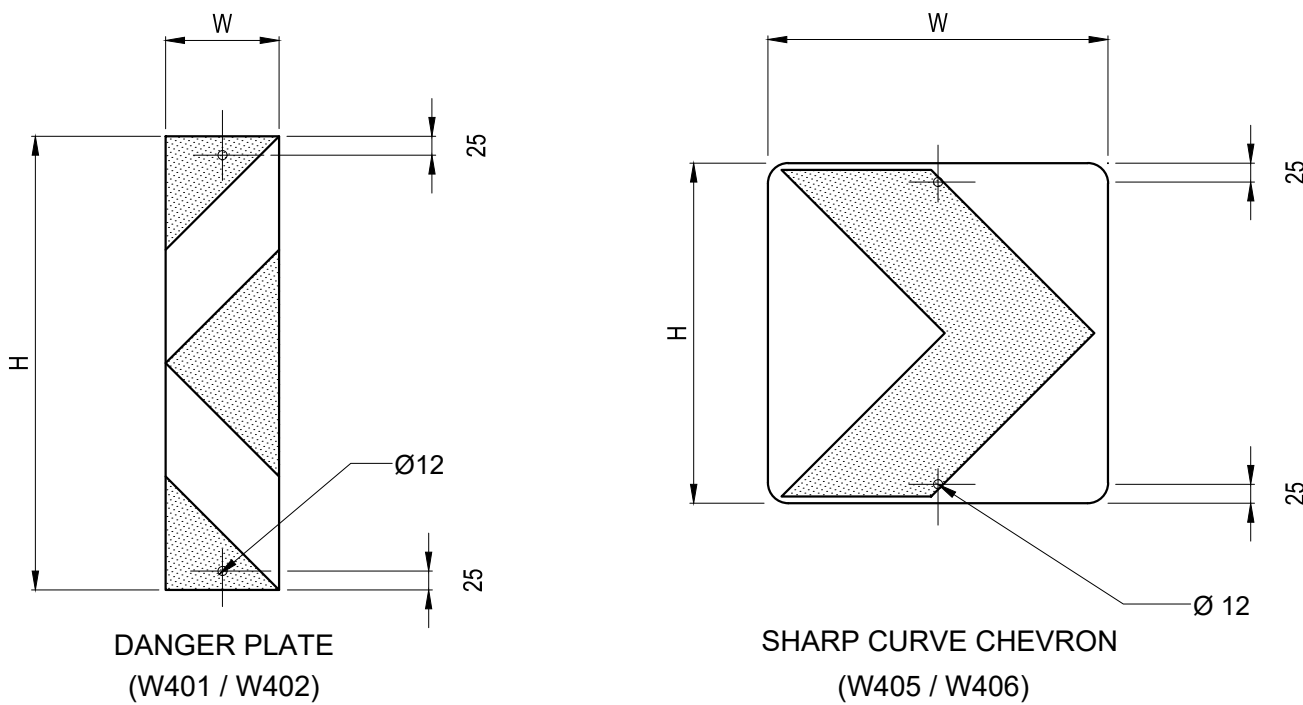
SCALE 1:20



FOUNDATION DETAIL

L < 1200 AND D < 900

SCALE 1:20



MOUNTING HOLES FOR HAZARD MARKER
SIGNS WITHOUT FRAMEWORK

HAZARD MARKER SIGNS		
	DANGER PLATE SIGN	SHARP CURVE CHEVRON
	W401-RIGHT W402-LEFT	W405-RIGHT W406-LEFT
OPERATING SPEED (km/h)	SIZE H x W (mm)	SIZE H x W (mm)
120	800 x 200	600 x 600
100	800 x 200	600 x 600
80	600 x 150	450 x 450
60	600 x 150	450 x 450

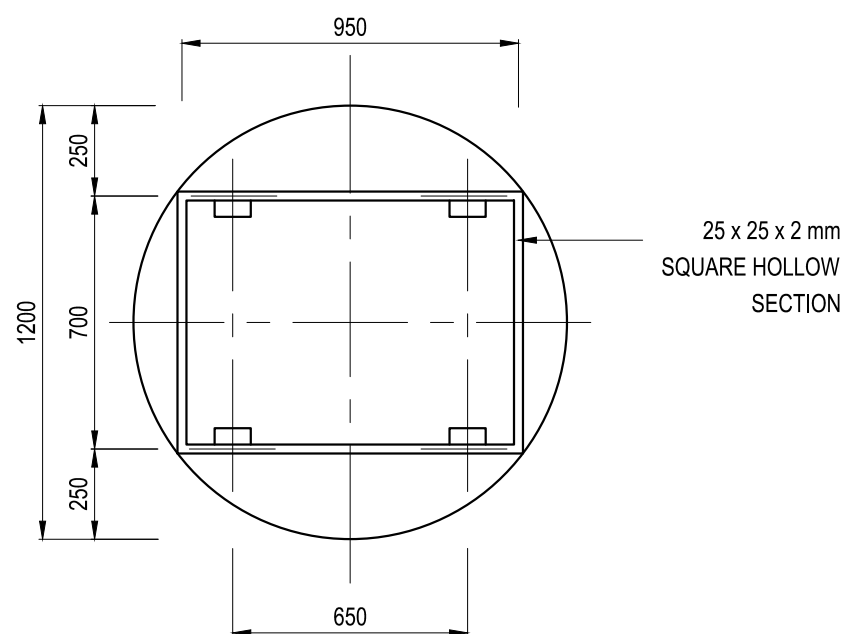
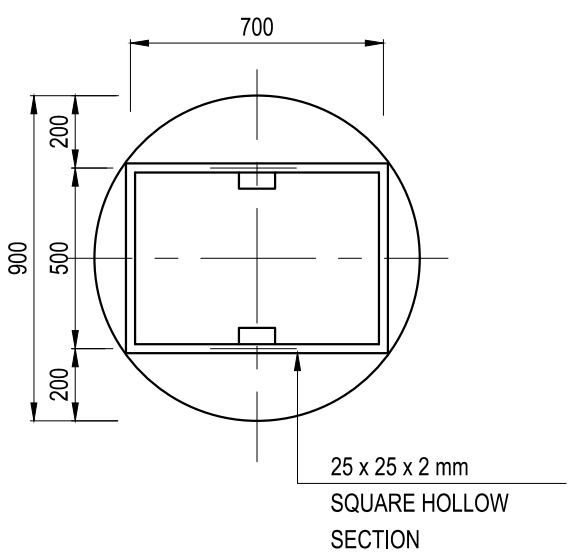
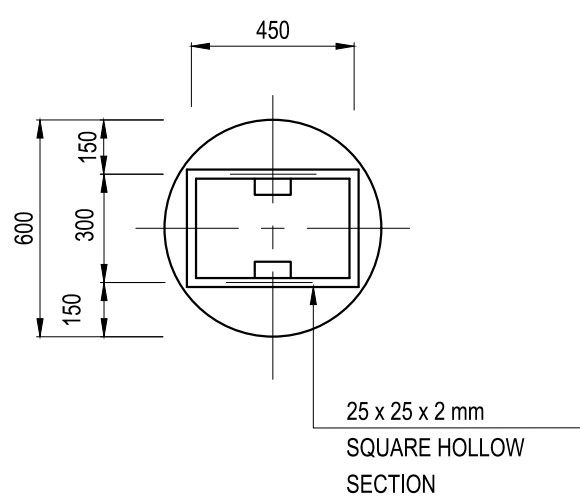
NOTES :

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

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

FOR TENDER

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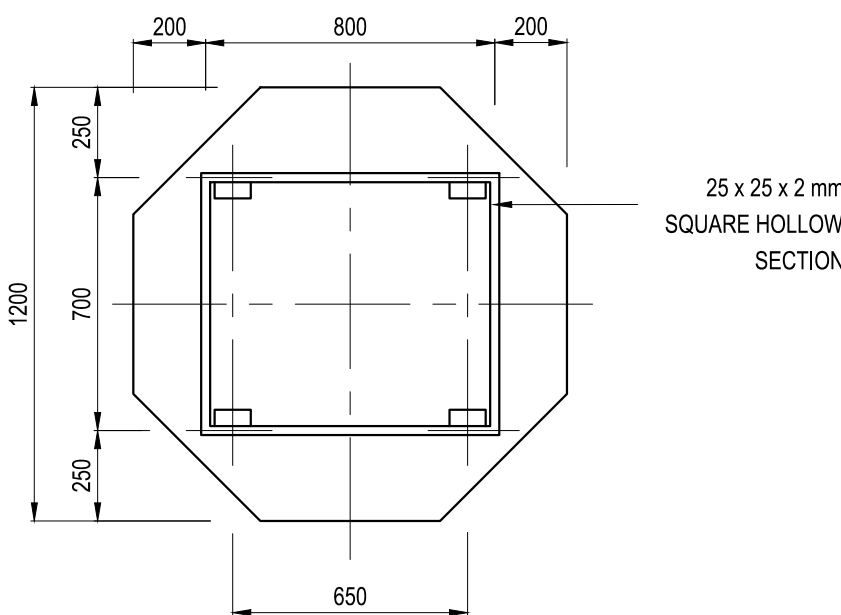
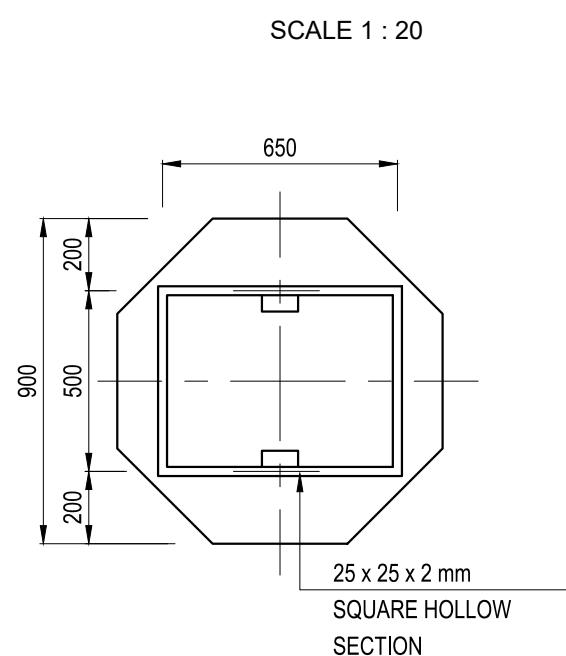
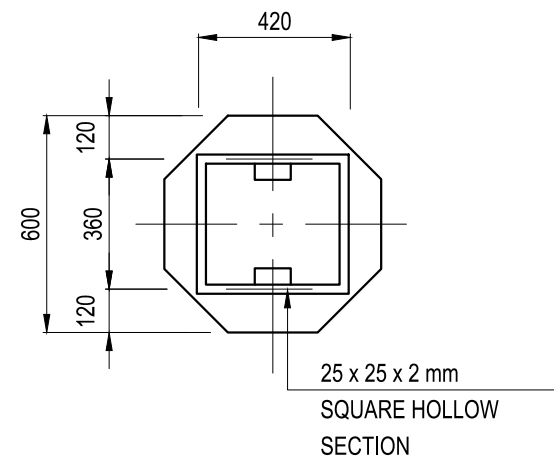


	MINIMUM REGULATORY SIGN SIZES		
	OPERATING SPEED (km/h)		
	100 - 120	70 - 90	60
CIRCULAR SIGN DIAMETER (mm)	1200	900	600
RECTANGULAR SIGN WxH (mm)	1200 x 900	900 x 675	600 x 450
TRIANGULAR SIGN SIDE LENGTH (mm)	1500	1200	900

SINGLE SUPPORT

SINGLE SUPPORT
REINFORCEMENT FOR CIRCULAR ROAD SIGNS

DOUBLE SUPPORT

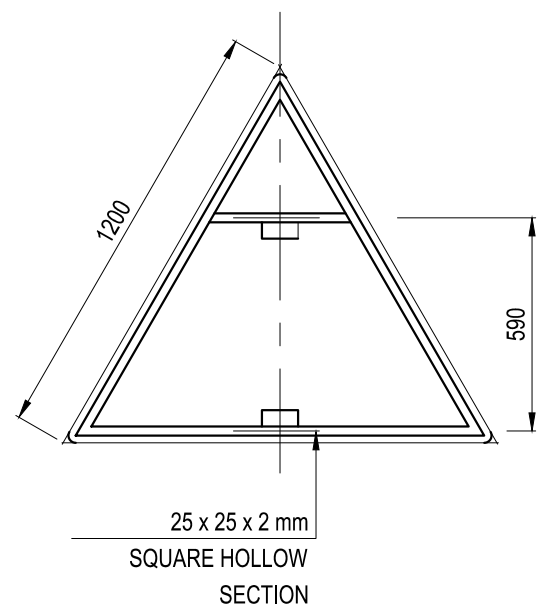
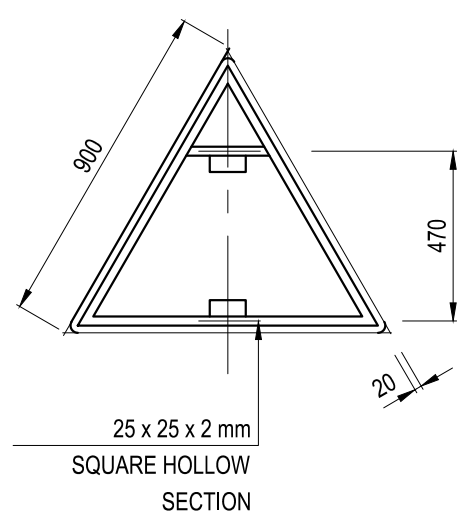


ADVANCE WARNING SIGN LOCATION AND SIZE		
OPERATING SPEED (km/h)	LOCATION (DISTANCE FROM HAZARD) (m)	SIZE (mm)
120	330	1500
100	240	1500
80	160	1200
60	120	900

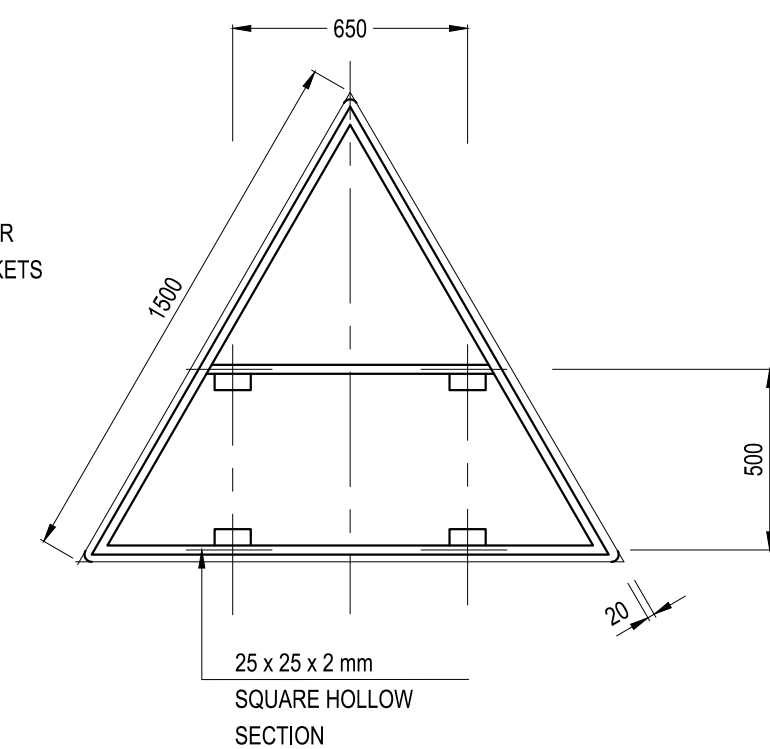
SINGLE SUPPORT

SINGLE SUPPORT
REINFORCEMENT FOR STOP SIGNS

DOUBLE SUPPORT



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



SINGLE SUPPORT

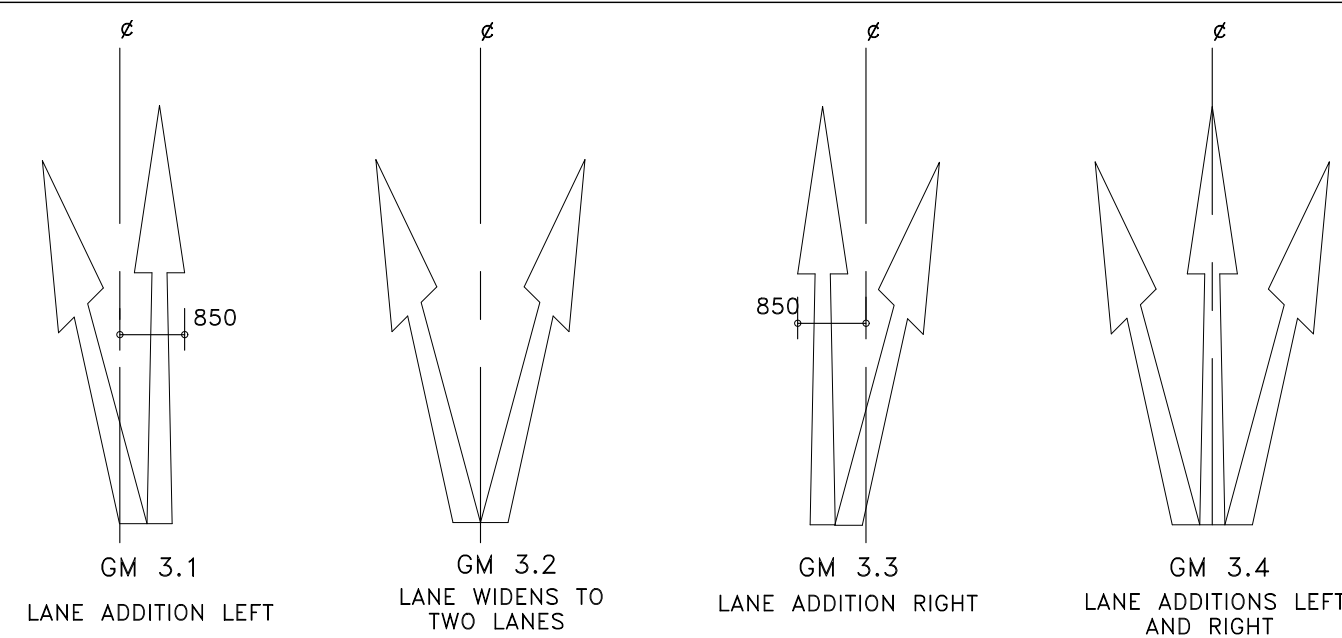
SINGLE SUPPORT
REINFORCEMENT FOR TRIANGULAR ROAD SIGNS

DOUBLE SUPPORT

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

FOR TENDER

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APPLICATIONS
SCALE 1 : 50

DIMENSIONS (mm)											
Operating Speed km/h	Typical Applications	a	b	c	d	e	f	g	h	i	j
30 – 40	City Centre	2500	1500	1000	2170	1141	268	761	1235	81	855
50 – 60	Urban Roads	4000	2400	1600	3472	1826	429	1218	1976	129	1307
70 – 90	Urban Arterial Roads/ Rural Expressways	5000	3000	2000	4340	2282	536	1522	2470	161	1761
100 – 120	Rural Roads and Freeways	7500	4500	3000	6510	3425	804	2283	3705	242	2566

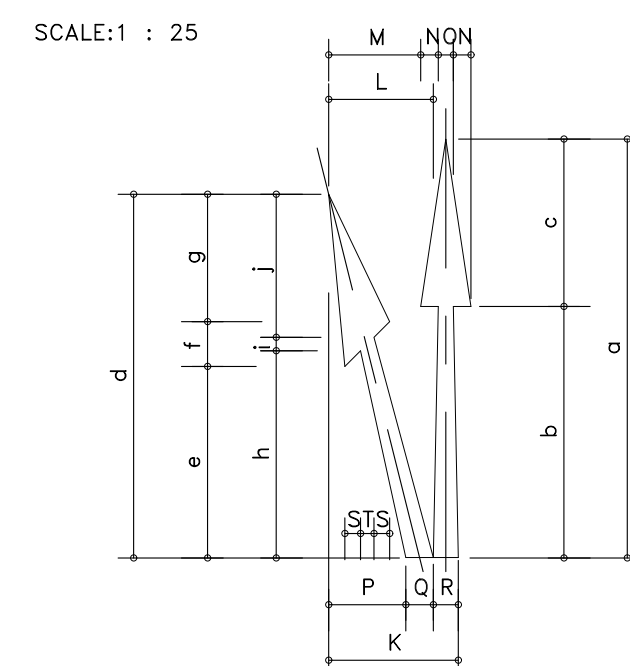
All Operating Speeds and Applications	K	L	M	N	O	P	Q	R	S	T
	1700	1250	1100	210	180	921	329	300	188	161

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

ARROW AREA / (m ²)					
α	RM8.1/RM8.5 WM7.1/WM7.5	RM8.2/RM8.6 WM7.2/WM7.6	RM8.3/RM8.7 WM7.3/WM7.7	RM8.4/RM8.8 WM7.4/WM7.8	RM8.6/RM8.9 WM7.6/WM7.9
2500	0.67	0.89	0.66		1.03
4000	1.14	1.43	1.06		1.68
5000	1.45	1.78	1.32		2.12
7500	2.23	2.66	1.98		3.20

NOTES: (MANDATORY DIRECTION ARROWS)

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

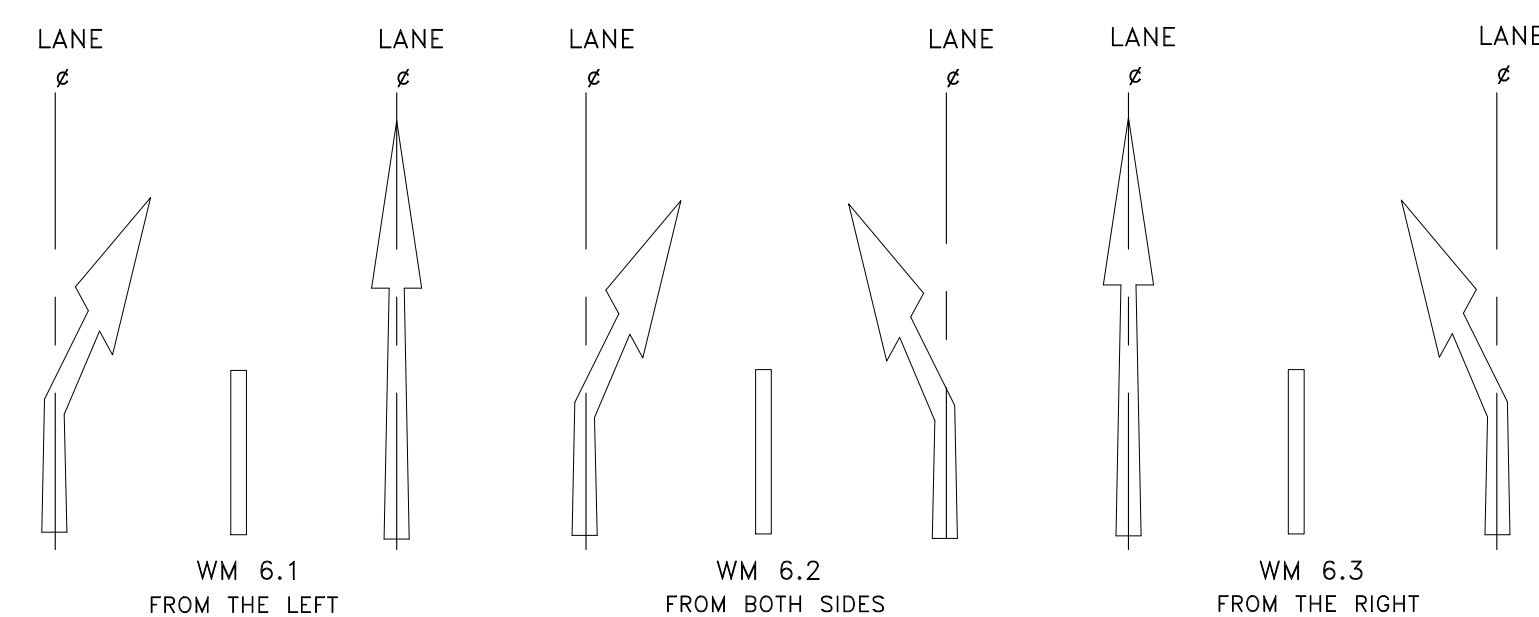


NOTES: (FURCATION ARROWS)

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

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

FURCATION ARROWS



APPLICATIONS
SCALE 1 : 50

DIMENSIONS (mm)												
Operating Speed km/h	Typical Applications	a	b	c	d	e	f	g	h	i	j	k
30 – 40	City Centre	4000	2400	1600	3200	1271	847	227	855	1696	1277	1120
50 – 60	Urban Roads	5000	3000	2000	4000	1589	1058	284	1069	2120	1596	1401
70 – 90	Urban Arterial Roads, Rural Expressways	5500	3500	2500	4500	2000	1384	1587	426	1603	3180	2394
100 – 120	Rural Roads and Expressways	12000	7200	4800	9600	3814	2539	681	2566	5089	3830	3371

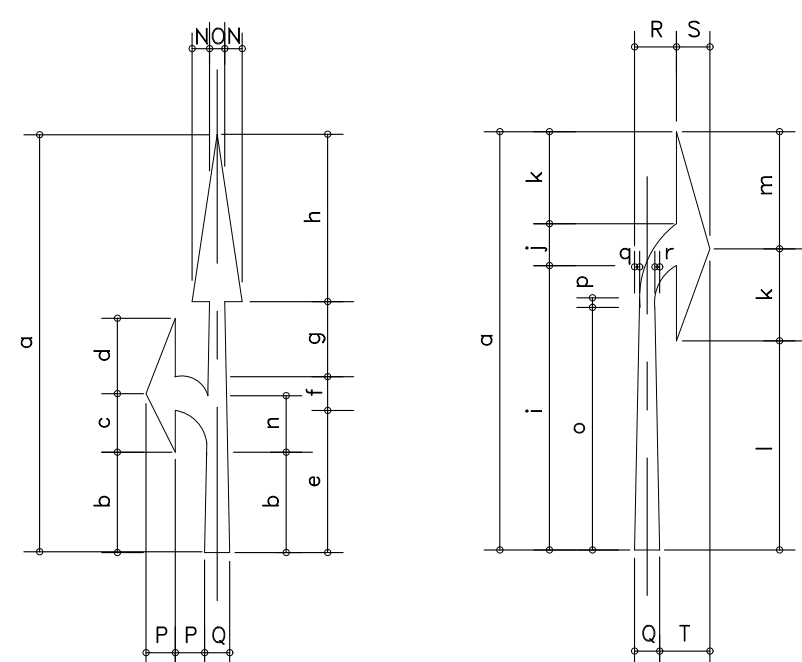
All Operating Speeds and Applications	M	N	O	P	Q	R	S	T	U	V
	300	210	180	1300	898	402	155	370	32	39

NOTES: (LANE REDUCTION ARROWS)

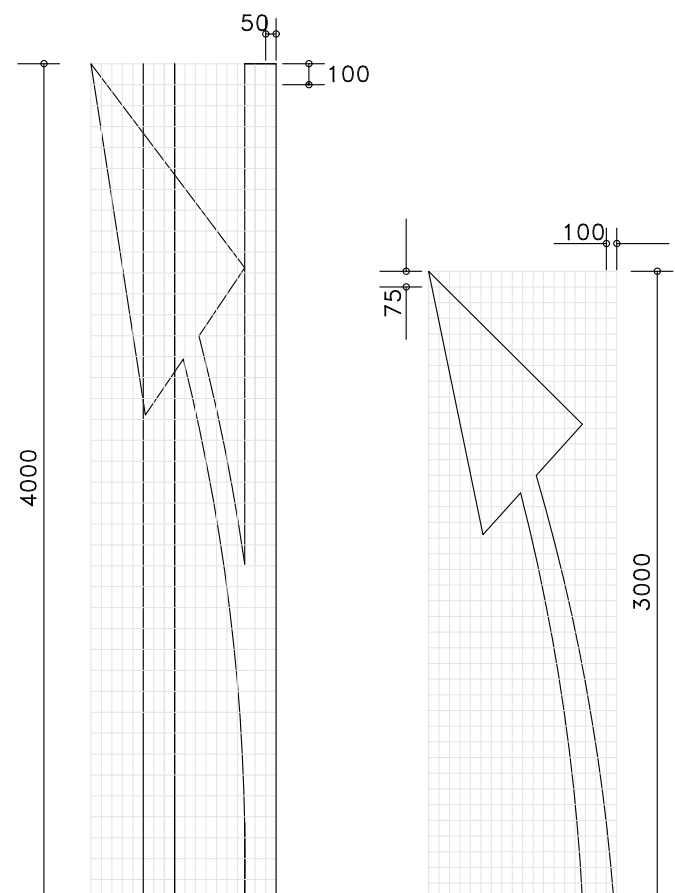
1. IT IS RECOMMENDED THAT THREE SETS OF ARROWS BE USED ON HIGH SPEED ROADS, SPACED AT FOUR MODULE INTERVALS BEFORE THE END OF THE LANE LINE. SINGLE ARROWS SETS MAY BE USED ON LOWER SPEED ROADS.
2. THE BENT ARROWS MAY BE USED IN ADDITION TO THE THREE-ARROW SETS ALONG THE LENGTH OF THE LANE REDUCTION TAPER.

ARROW AREA / (m²)		
α	WM6.1/WM6.3	WM6.2
4000	2.08	2.06
5000	2.61	2.58
7500	3.92	3.88
12000	6.56	6.20

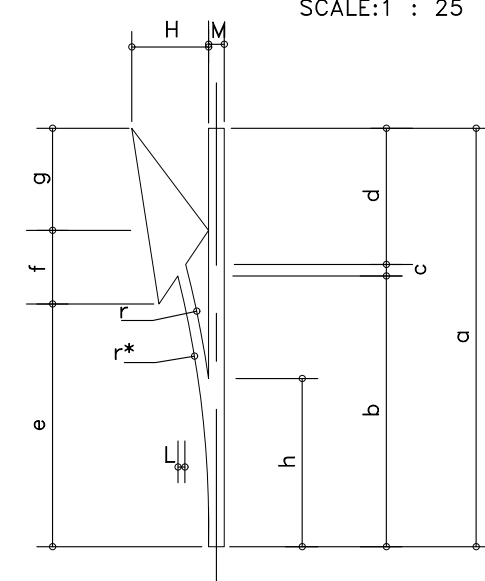
1 ANF REDUCTION ARROWS



MANDATORY DIRECTION ARROWS



SCALE:1 : 25



BARRIER LINE AHEAD ARROWS

NOTES: (BARRIER LINE AHEAD ARROWS)

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

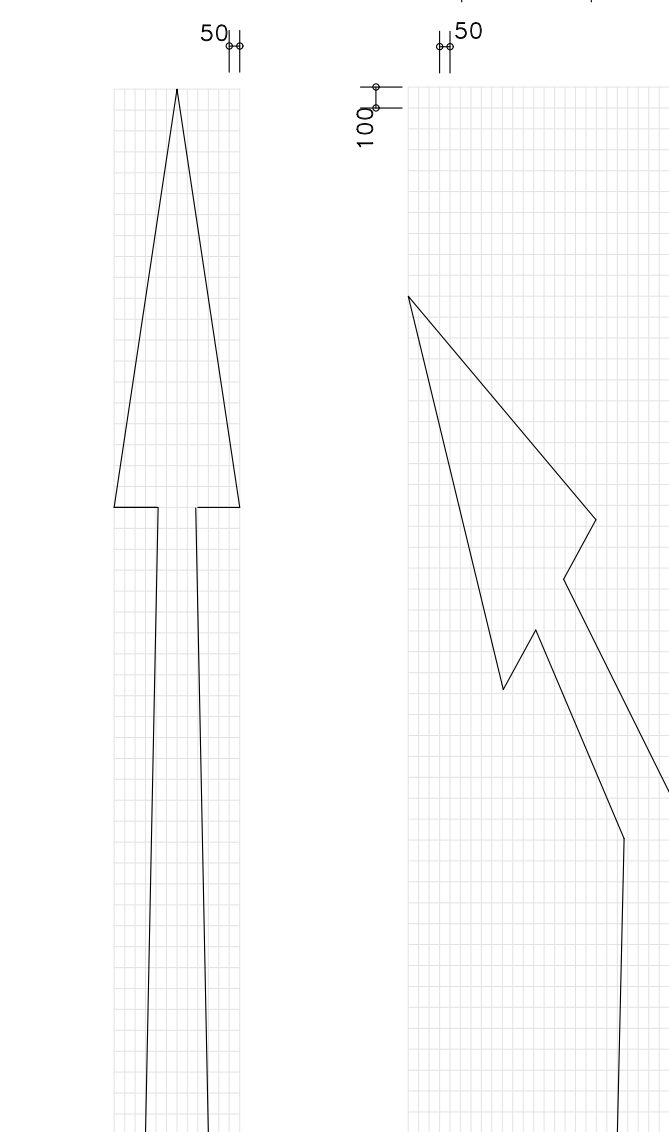
ARROW AREA / (m ²)	
a	Per Arrow
3000	0.62
4000	0.82

MARKING SPACING

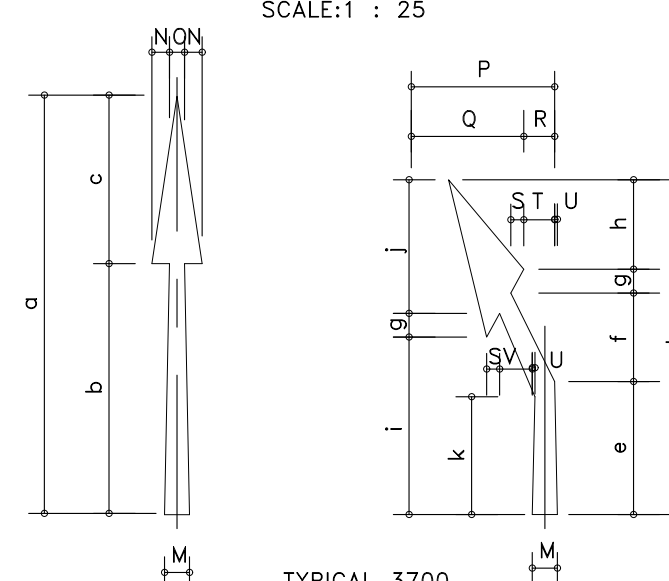
108000 RURAL - 81000 URBAN

60000 RURAL
45000 URBAN

24000 RURAL 36000 RURAL 48000 RURAL
18000 URBAN 27000 URBAN 36000 URBAN



SCALE:1 : 25



TYPICAL 3700

					DESIGNED BY:	R.R RAVELE
					DRAWN BY:	L MOJANAGA
0	03/2024	INITIAL ISSUE		FIM		
No	DATE	REVISION	CONSULT	DIR	CHECKED BY:	H.L. THARAGA

 MARULENG LOCAL MUNICIPALITY
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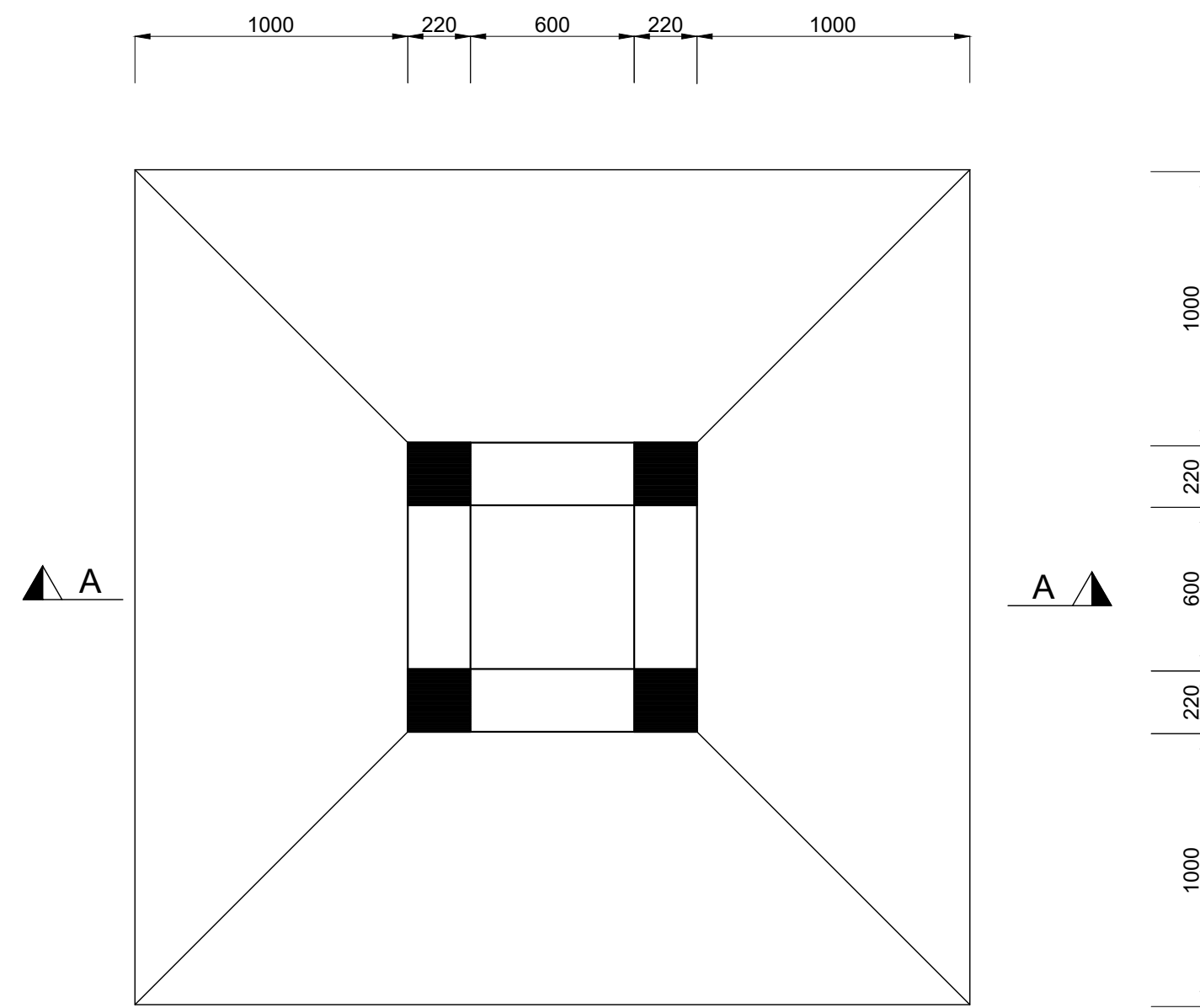
 **SIZEYA**
CONSULTING ENGINEERS
civil engineers structural engineers quantity surveyors
project managers

No. 6 Hans Van Rensburg Street
Office No. 14
Private Bag X9676, Postnet Suite 141
Polokwane, 0700
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Email : info@sizeya.co.za

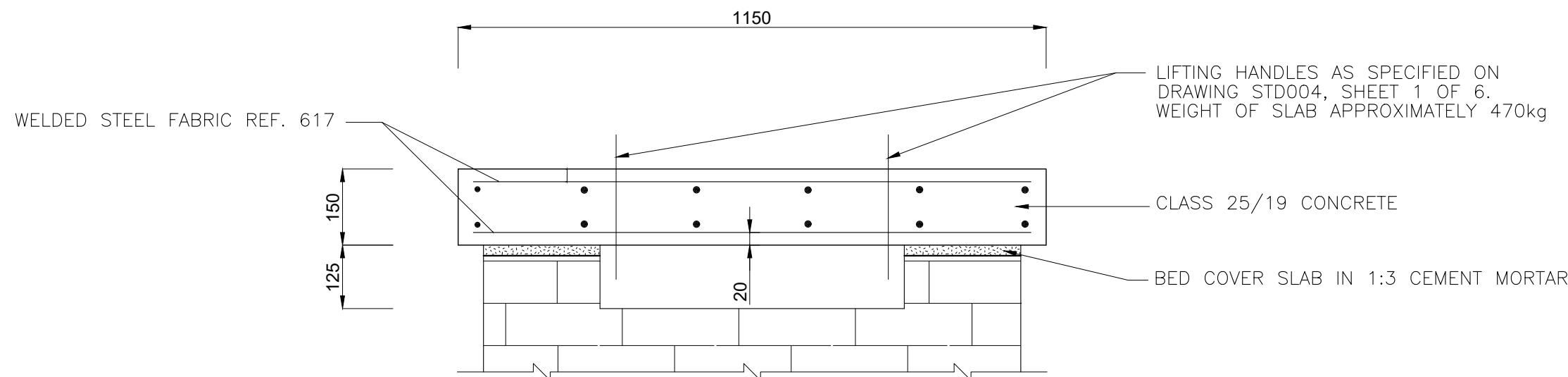
CONSULTING ENGINEER	DATE
EMPLOYER'S PROJECT MANAGER	DATE

CONTRACT No.: BM22/22/23	
PROJECT NAME:	
CONSTRUCTION OF KWARUNG INTERNAL STREETS AND STORMWATER CONTROL	
DRAWING TITLE:	
ROAD MARKINGS DETAILS	

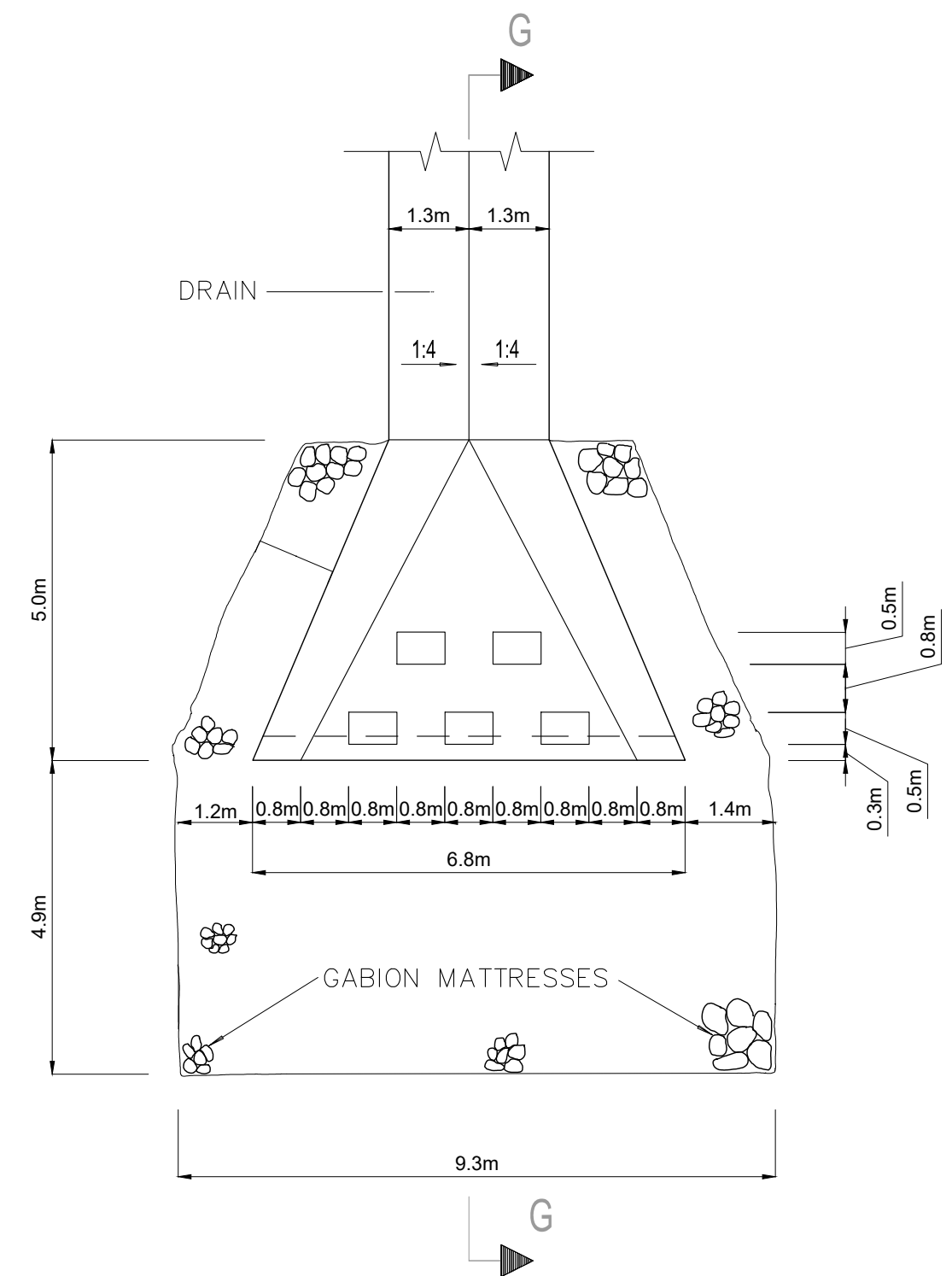
SHEET 1 OF 1					
DRAWING SCALE AS SHOWN					
CONSULTANTS DRAWING No.:					
PROJECT NAME :	SUBDISCIPLINE :	DWG NO. :	STAGE :	REV. NO.	
S354 - RD	STD	006	C	0-000	
BY: DR. RAJESH K. S. / DESIGNED BY: L. S. THIRU D. C. / CHECKED BY: H. M. S. / DATE: 08/09/2024					



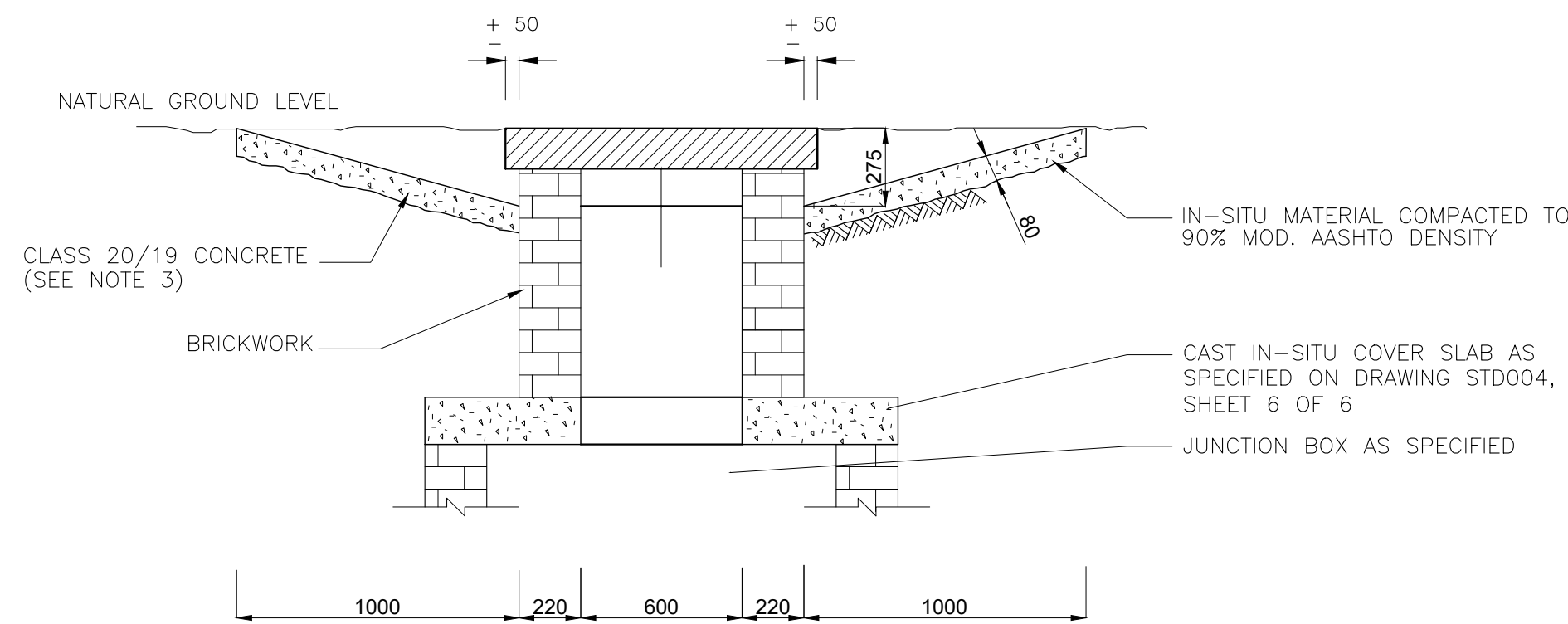
PLAN OF FIELD INLET (Without cover slab)



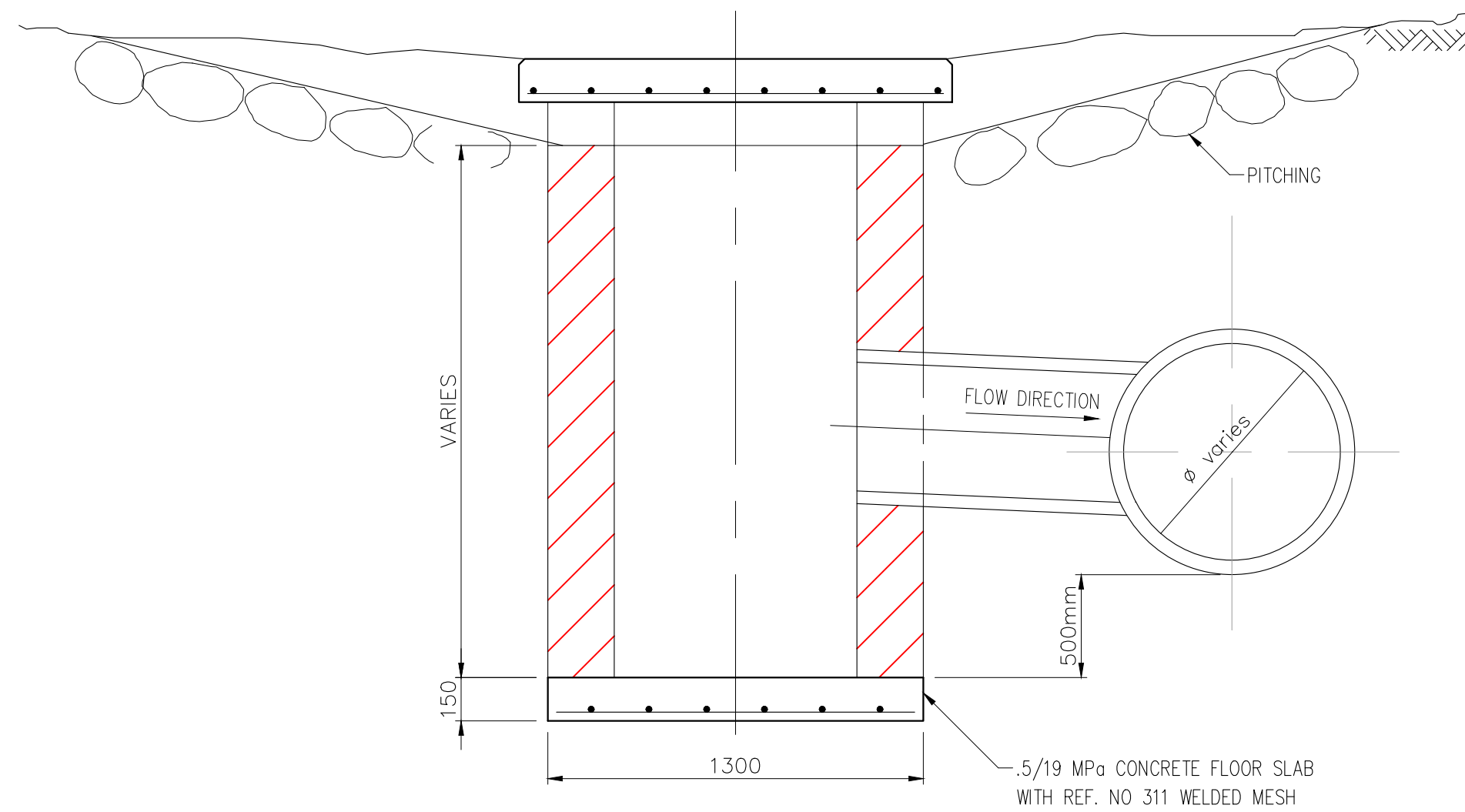
DETAIL OF PRECAST COVER SLAB



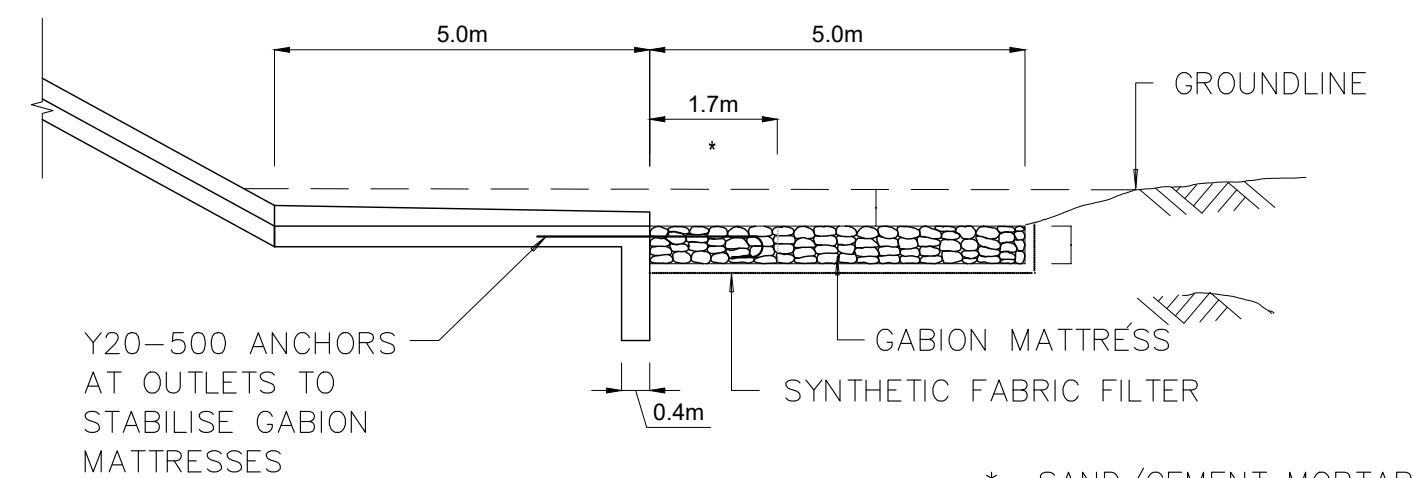
ENERGY BREAKER
1: 40



SECTION A-A



FIELD INLET – DETAILS

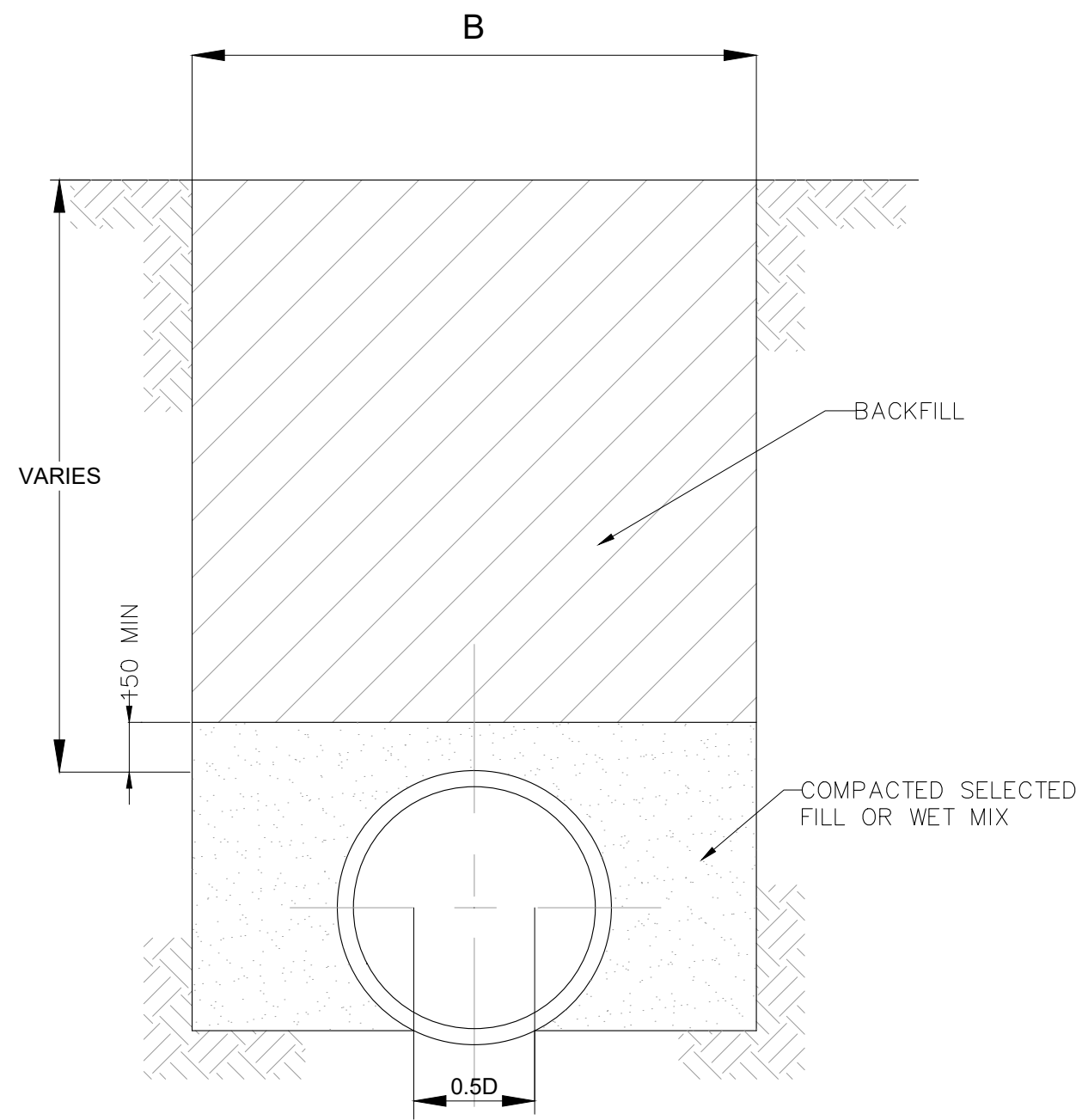


SECTION G-G
1:40

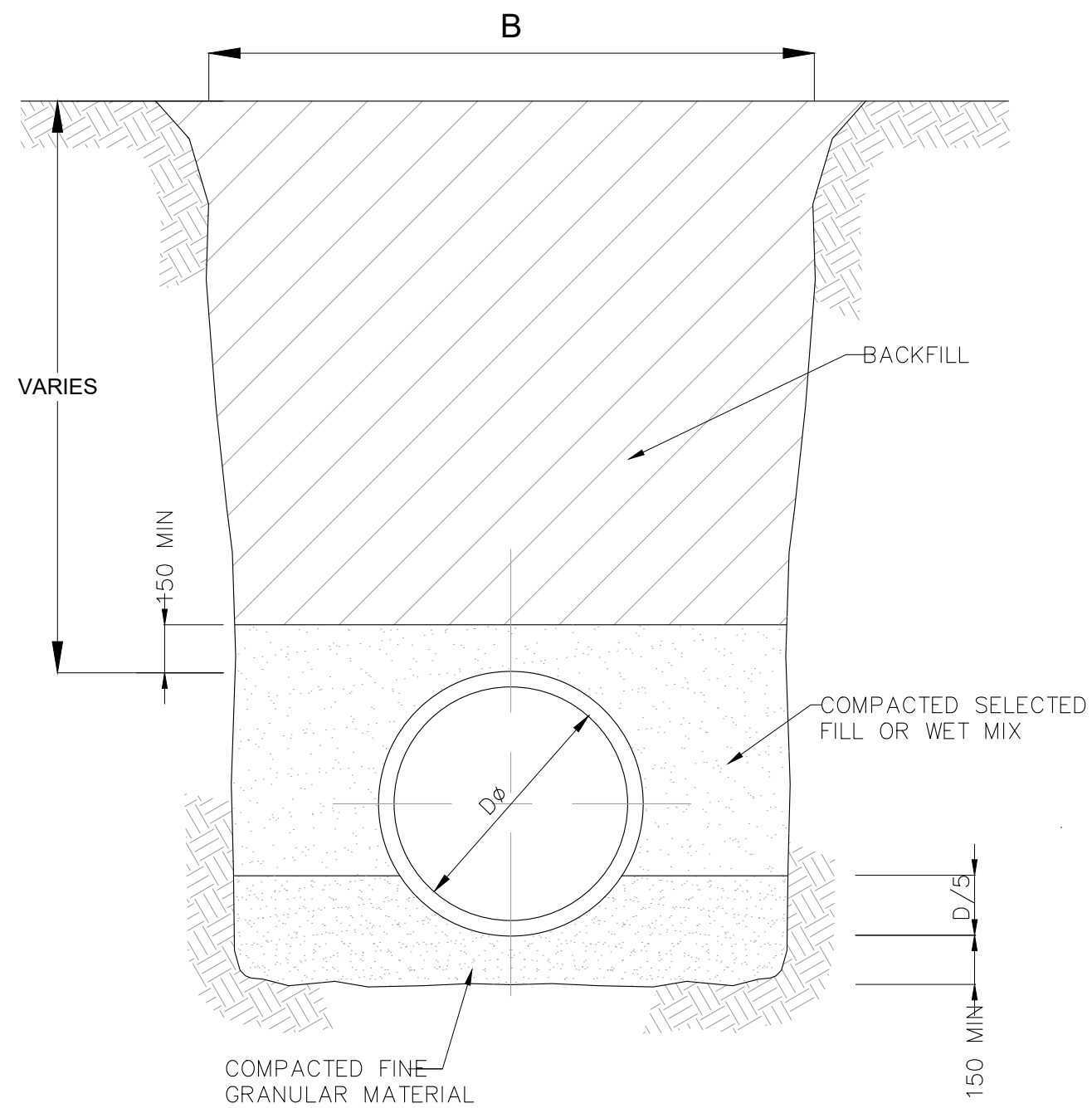
* SAND/CEMENT MORTAR TO SECURE ANCHORS

FOR TENDER

					DESIGNED BY: R.R RAVELE	 MARULENG LOCAL MUNICIPALITY P.O. BOX 67 HOEDSPRUIT 1380 TEL : +27 15 793 249 FAX : + 27 15 793 2341	 SIZEYA CONSULTING ENGINEERS civil engineers quantity surveyors structural engineers project managers No. 6 Hans Van Rensburg Street Office No. 14 Private Bag X9676, Postnet Suite 141 Polokwane, 0700 Tel : (015) 291 1020 Email : info@sizeya.co.za	CONSULTING ENGINEER DATE EMPLOYER'S PROJECT MANAGER DATE	CONTRACT No.: BM22/22/23 PROJECT NAME: CONSTRUCTION OF KWARUNG INTERNAL STREETS AND STORMWATER CONTROL DRAWING TITLE: FIELD-INLET DETAILS	SHEET 1 OF 1 DRAWING SCALE AS SHOWN CONSULTANTS DRAWING No.: PROJECT No. DISCIPLINE SUB-DISCIPLINE DWG No. STAGE REV No. S35.4 – RD – STD –007 – C –00 PD: PRELIMINARY DESIGN / DD: DETAILED DESIGN / T: TENDER / C: CONSTRUCTION / A: AS-BUILT / I: FOR INFORMATION ONLY
					DRAWN BY: L MOJANAGA					
					CHECKED BY: H.L. THARAGA					
0	03/2024	INITIAL ISSUE		FIM						
No	DATE	REVISION	CONSULT	DIR						



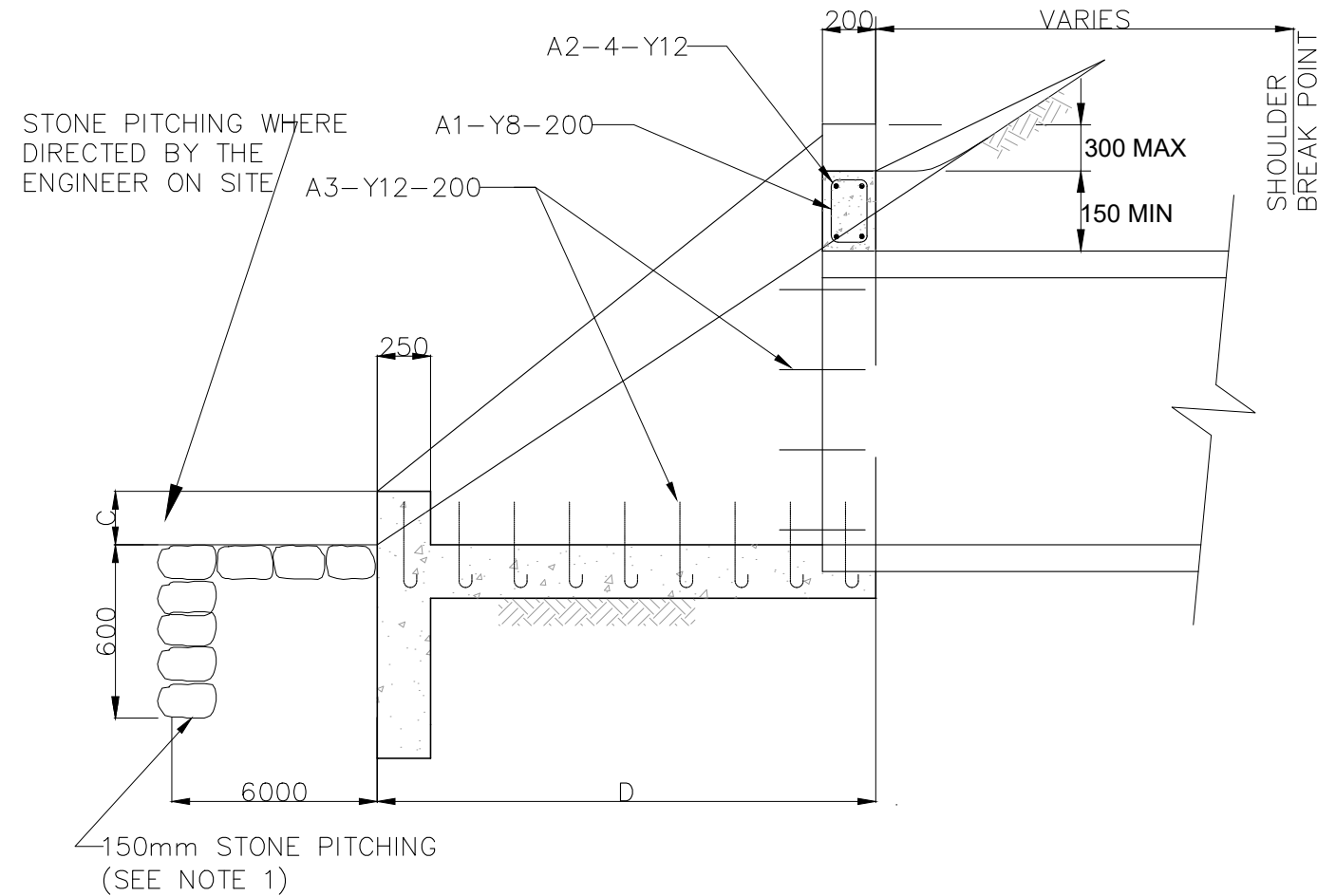
CLASS C PIPE BEDDING IN SOIL
SCALE 1:20



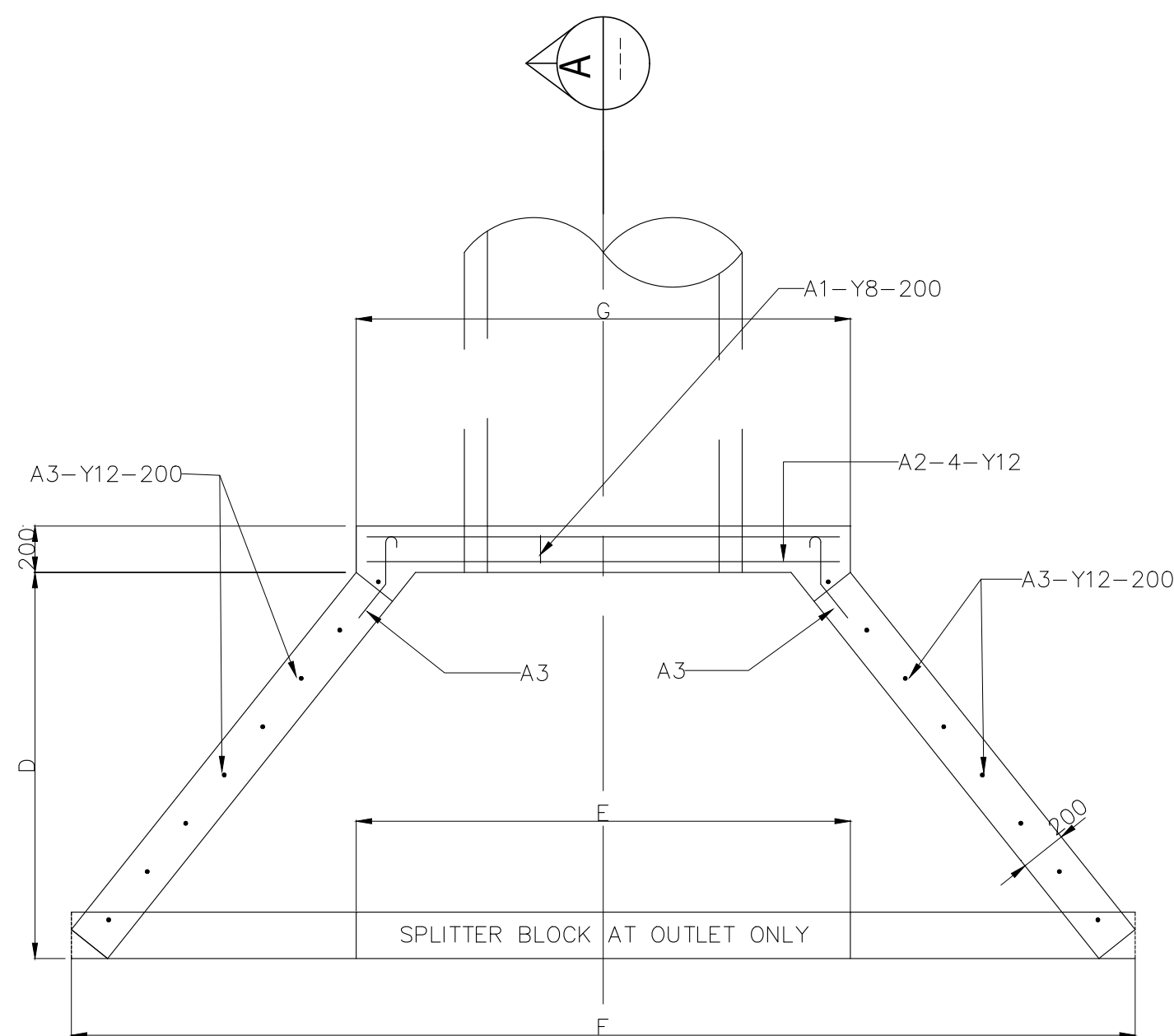
CLASS C PIPE BEDDING IN ROCK
SCALE 1:20

Dφ	WIDTH 'B'	
	SINGLE PIPE	DOUBLE PIPE
600	1600	2500
750	1750	2875
900	1900	3250

PIPE BEDDING DETAILS



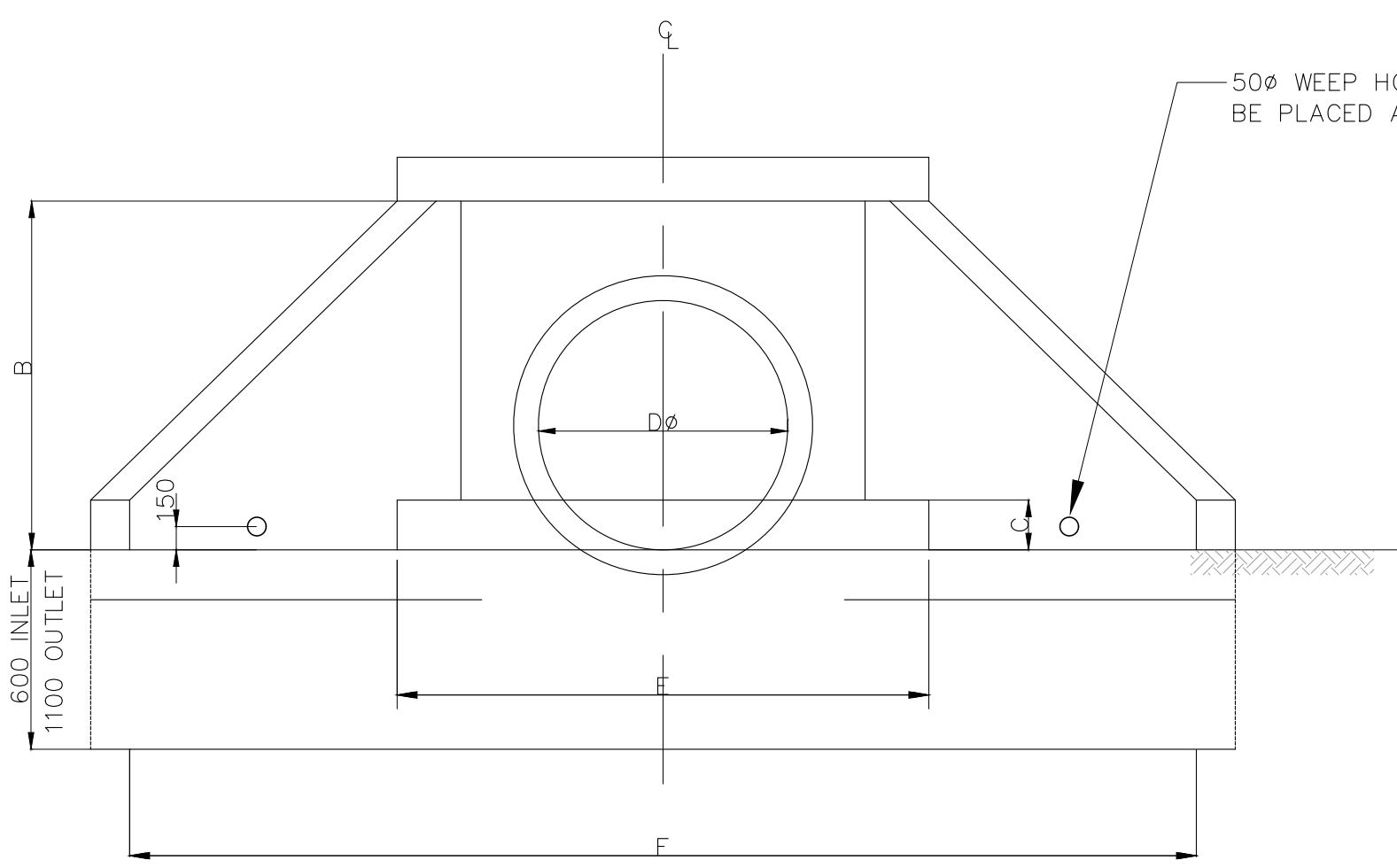
SECTION A-A
(FOR DIMENSIONS SEE TABLE 1)
(FOR REINFORCEMENT SEE TABLE 2)
SCALE 1:20



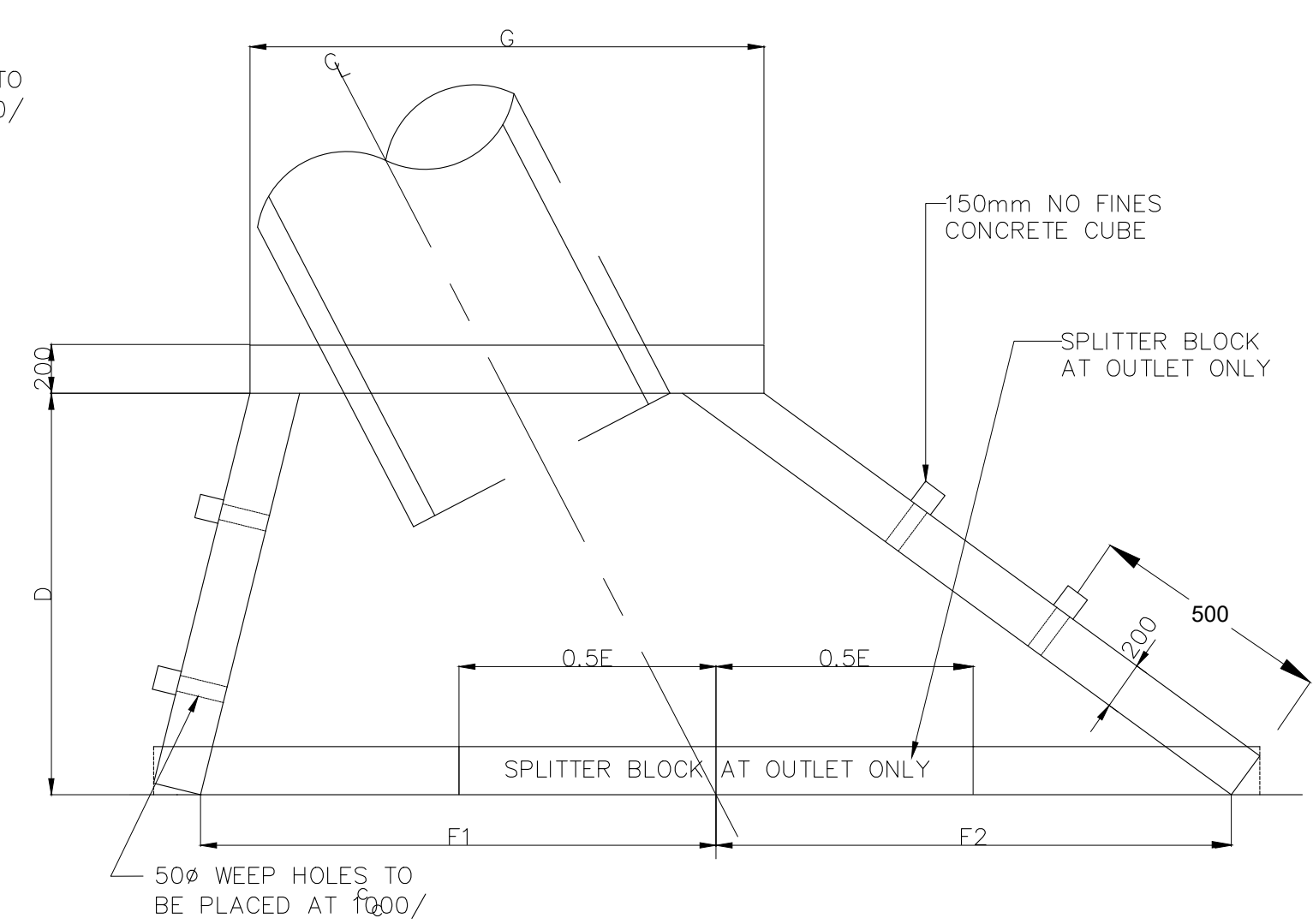
PLAN
SCALE 1:20
(FOR DIMENSIONS SEE TABLE 1)
(FOR REINFORCEMENT SEE TABLE 2)

TABLE 1

NOMINAL DIAMETER	DIMENSIONS					
A	B	C	D	E	F	G
450	660	270	790	1140	2050	1140
600	810	320	990	1300	2420	1300
750	970	390	1160	1470	2810	1470
900	1120	450	1340	1630	3180	1630
1050	1280	510	1540	1810	3570	1800
1200	1440	580	1730	1960	3960	1960



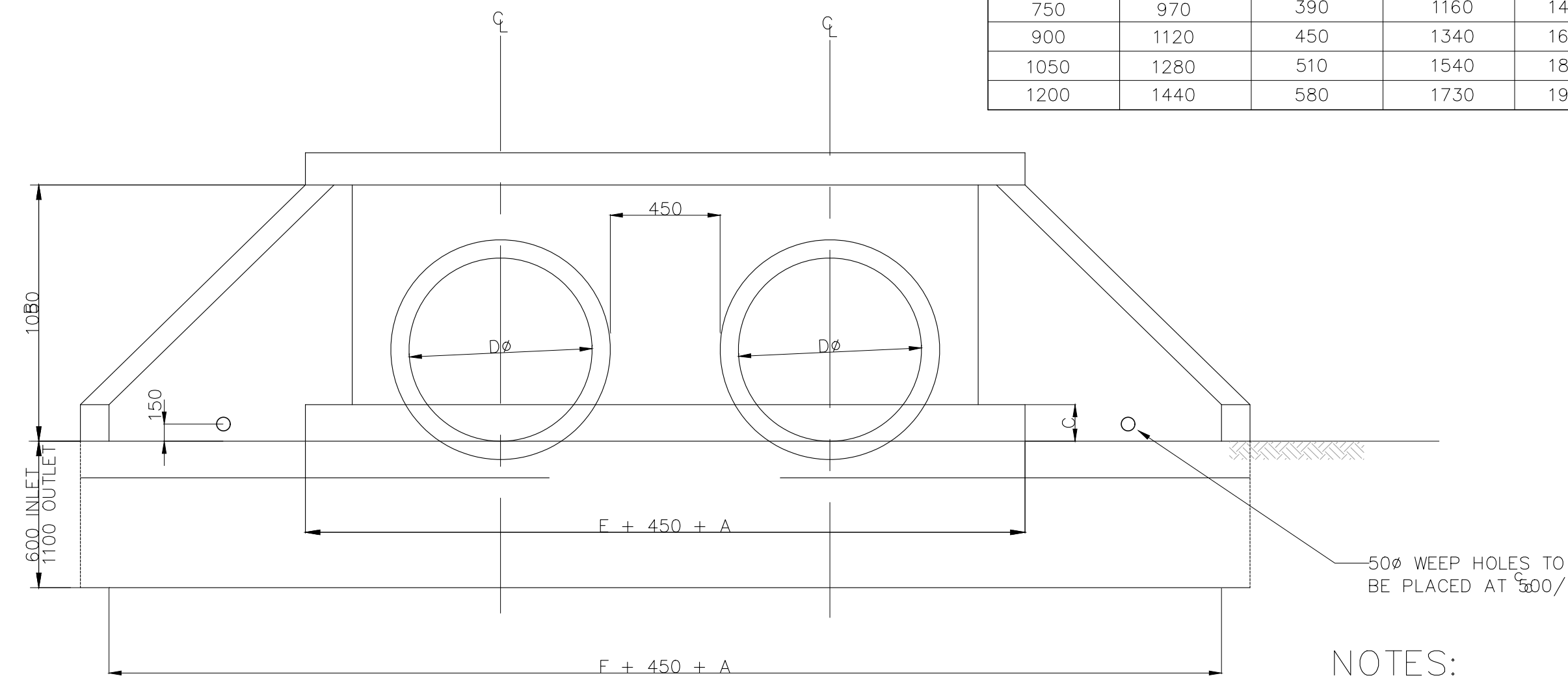
FRONT ELEVATION – SINGLE PIPE
(FOR DIMENSIONS SEE TABLE 1)
SCALE 1:20



SKUEW PIPE CULVERT
(FOR DIMENSIONS SEE TABLE 3)
SCALE 1:20

TABLE 3

NOMINAL DIAMETER	DIMENSIONS						
A	B	C	D	E	F1	F2	G
450	660	270	790	1140	1025	1025	1140
600	810	320	990	1300	1210	1210	1300
750	970	390	1160	1470	1410	1410	1470
900	1120	450	1340	1630	1590	1590	1630
1050	1280	510	1540	1800	1800	1800	1800
1200	1440	580	1730	1960	980	980	1960



FRONT ELEVATION – MULTIPLE PIPES
(FOR DIMENSIONS SEE TABLE 1)
SCALE 1:20

NOTES:

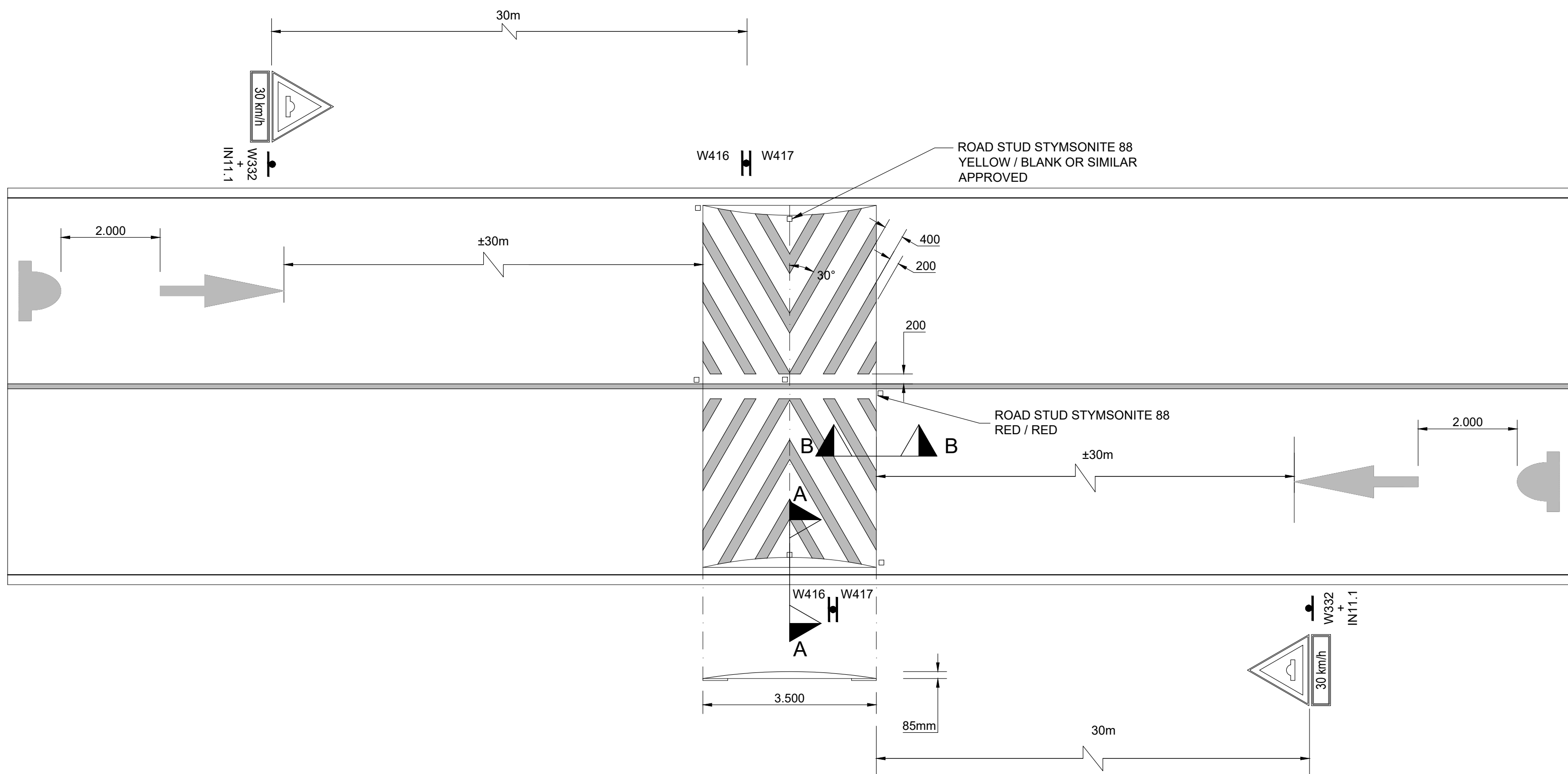
- INLET/OUTLET APPROACHES IN FILL CONDITION TO BE STONE PITCHED WHERE EROSION IS LIKELY TO OCCUR.
- SPLITTER BLOCK MAY BE OMITTED IF DISCHARGE VELOCITY IS LESS THAN 1.50m/s AND PROVIDED AT OUTLETS ONLY.
- CUT OFF WALLS MAY BE OMITTED IF STRUCTURE IS FOUNDED ON ROCK.
- FOR MULTIPLE PIPE CULVERTS INCREASE DIMENSIONS "E" AND "F" BY $(n-1)(A+450)$ mm
WHERE n = NUMBER OF PIPES
WHERE A = NOMINAL DIAMETER OF PIPES
- FOR SKEW PIPE CULVERTS THE HEADWALL SHALL BE PARALLEL TO THE CENTER LINE OF THE ROAD.
- IF CORRUGATED METAL PIPES ARE USED 4 x 20mm x 150mm LONG GALVANISED ANCHOR BOLTS IN THE HOLLOWS OF THE CORRUGATIONS ARE TO BE USED.
- ALL CONCRETE TO BE 20MPa. MIN COVER TO STEEL IS 40mm UNLESS OTHERWISE STATED.
- SQUARE MESH FABRIC (REFERENCE S.M.F 311) TO BE PLACED CENTRALLY
- DIMENSIONS IN TABLE 1 AND 3 ARE AS PER MANUFACTURING STANDARD OF ROCLA PIPE CULVERT TYPE SC TO SABS .

TABLE 2

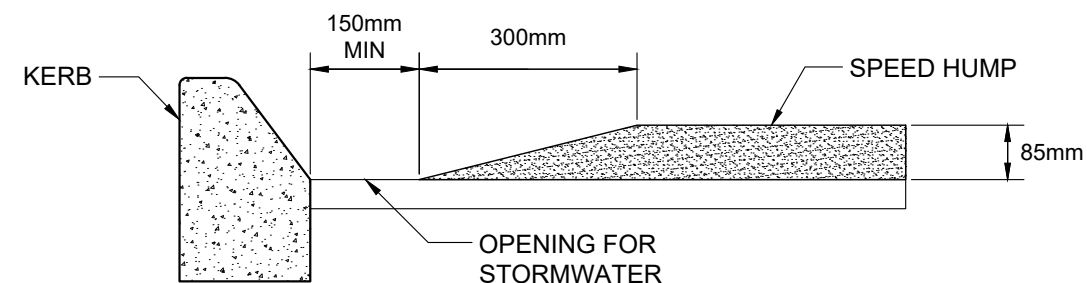
ITEM	NUMBER	DIAMETER	CUT LENGTH	CODE	SHAPE
A1	VARIES	Y8	600	60	150 110
A2	4	Y12	VARIES	20	STRAIGHT
A3	VARIES	Y12	500	32	

FOR TENDER

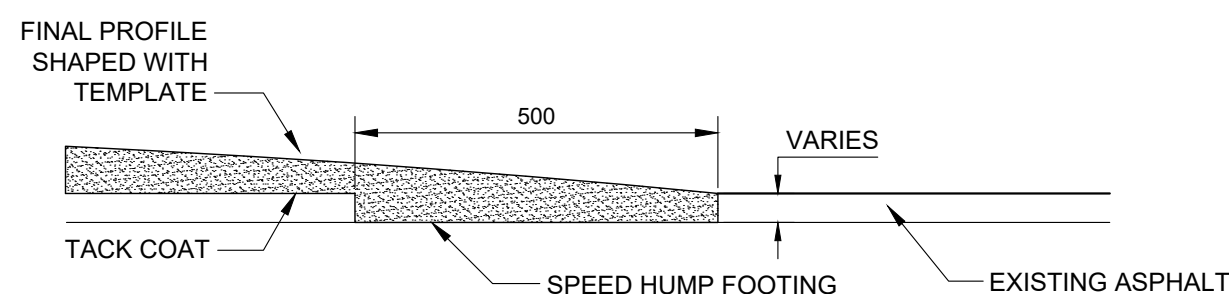
						DESIGNED BY:	R.R RAVELE	 MARULENG LOCAL MUNICIPALITY P.O.BOX 67 HOEDSPRUIT 1380 TEL : +27 15 793 249 FAX : + 27 15 793 2341	 No. 6 Hans Van Rensburg Street Office No. 14 Private Bag X9676, Postnet Suite 141 Polokwane, 0700 Tel : (015) 291 1020 Email : info@sizeya.co.za	CONSULTING ENGINEER	DATE	PROJECT NAME:	CONTRACT No.: BM22/22/23	SHEET 1 OF 1		
						CONSTRUCTION OF KWARUNG INTERNAL STREETS AND STORMWATER CONTROL	DRAWING SCALE AS SHOWN									
0	03/2024	INITIAL ISSUE			FIM		CHECKED BY:				H.L. THARAGA	CONSULTANTS DRAWING No.:				
No	DATE	REVISION			CONSULT	DIR						PROJECT No. DISCIPLINE SUB-DISCIPLINE DWG No. STAGE REV No. S35.4 RD STD 008 C 00				
											EMPLOYER'S PROJECT MANAGER	DATE	DRAWING TITLE:	HEADWALL AND BEDDING DETAILS	P.D. PRELIMINARY DESIGN / D.D. DETAILED DESIGN / T. TENDER / C. CONSTRUCTION / A. AS-BUILT / I. FOR INFORMATION ONLY	



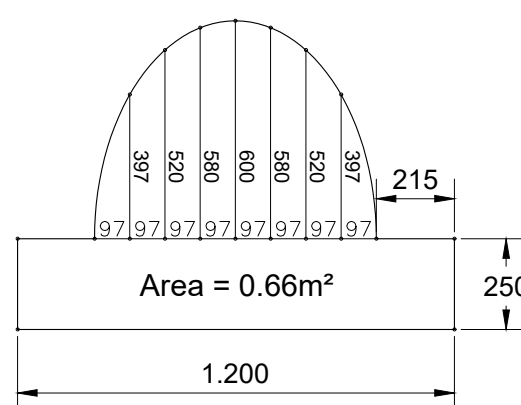
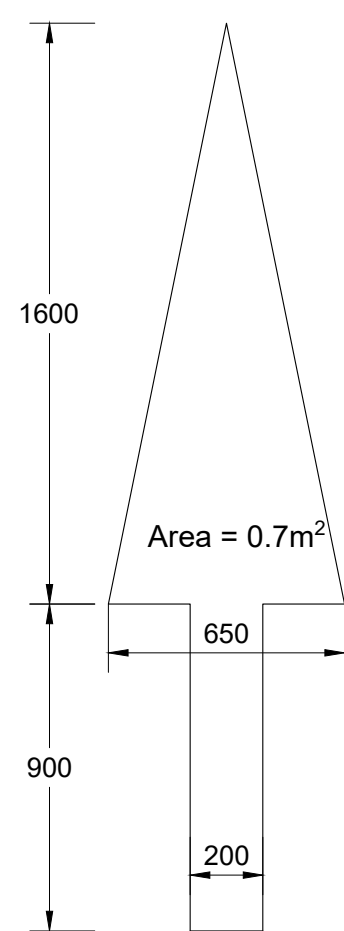
PLAN OF SPEED HUMP
SCALE 1:100



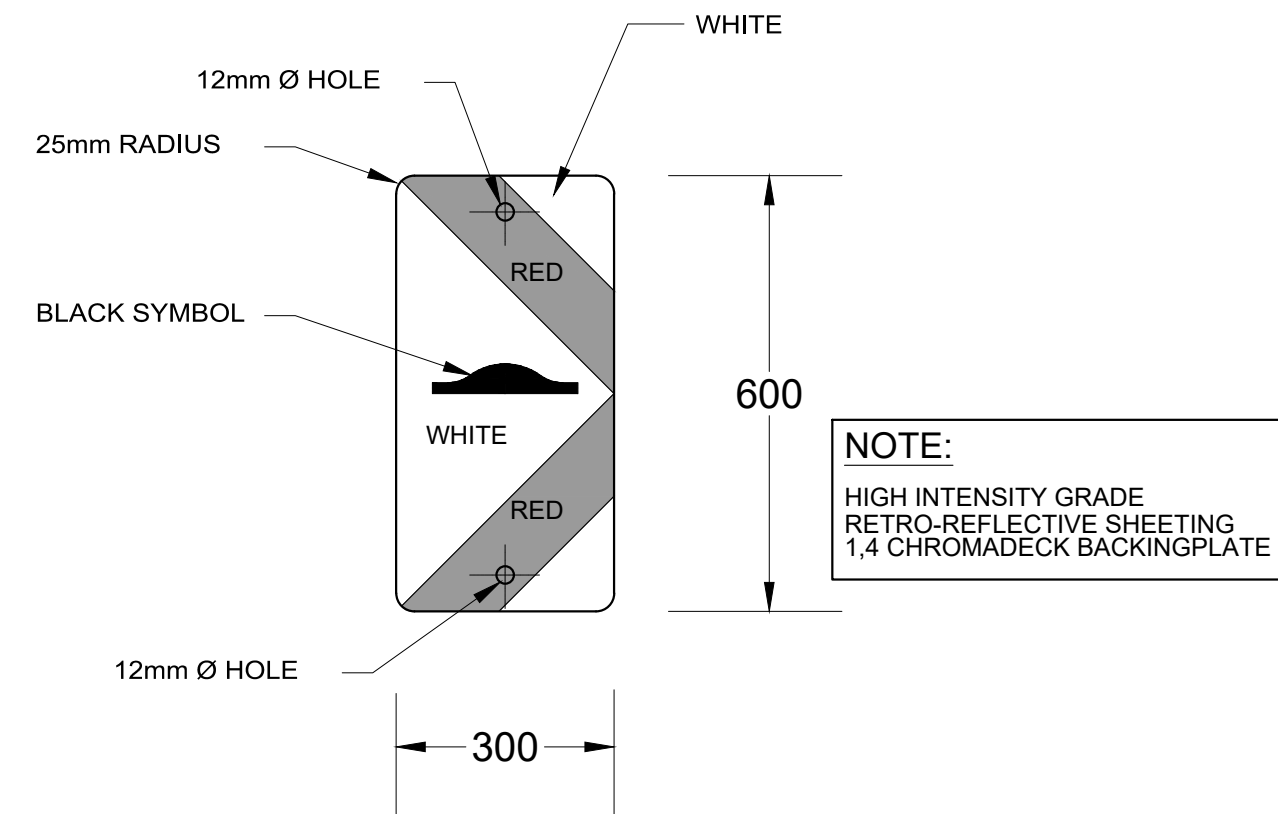
SECTION A-A:
CONSTRUCTION DETAIL OF SPEED HUMP
SCALE 1: 100



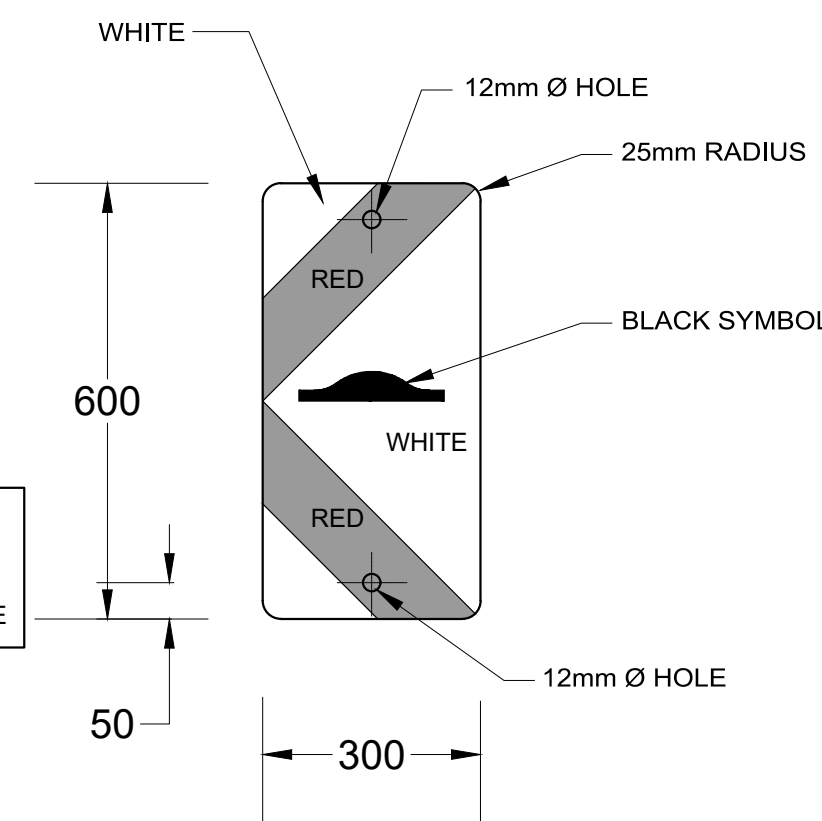
SECTION B-B:
CONSTRUCTION DETAIL OF SPEED HUMP



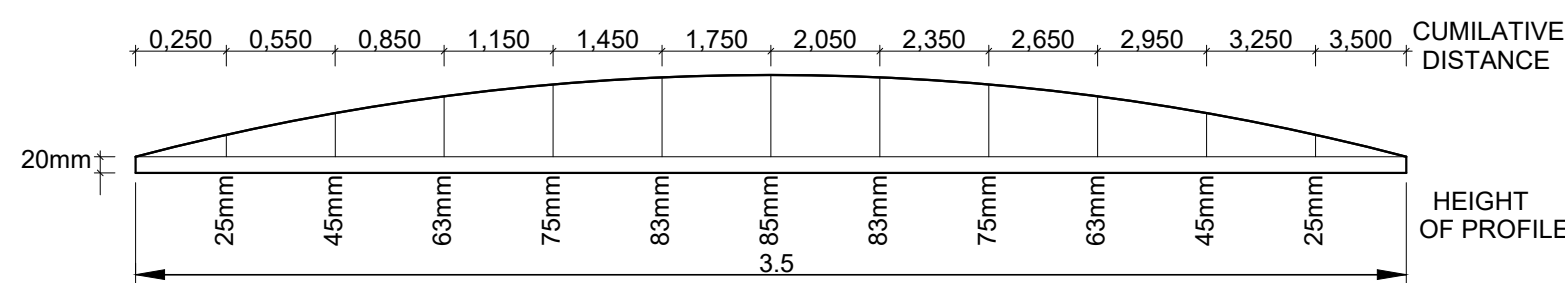
DETAIL OF SPEED HUMP ROAD MARKING
SCALE 1: 20



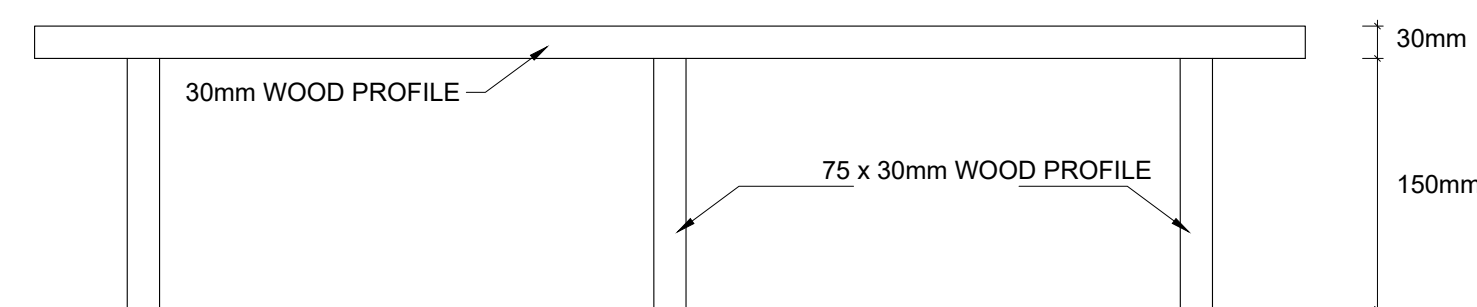
DANGER PLATE SPEEDHUMP (LEFT)
W416
SCALE 1:10



DANGER PLATE SPEEDHUMP (RIGHT)
W417
SCALE 1:10



SIDE ELEVATION



PLAN

TEMPLATE DETAIL FOR CONSTRUCTION OF SPEED HUMP
SCALE 1: 20

NOTES

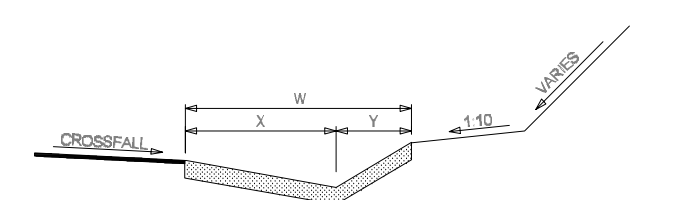
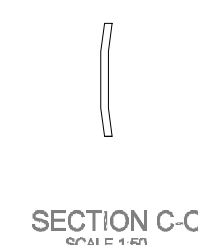
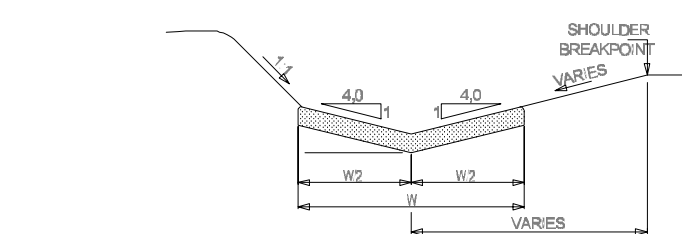
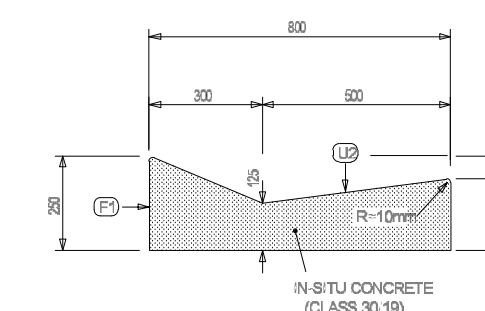
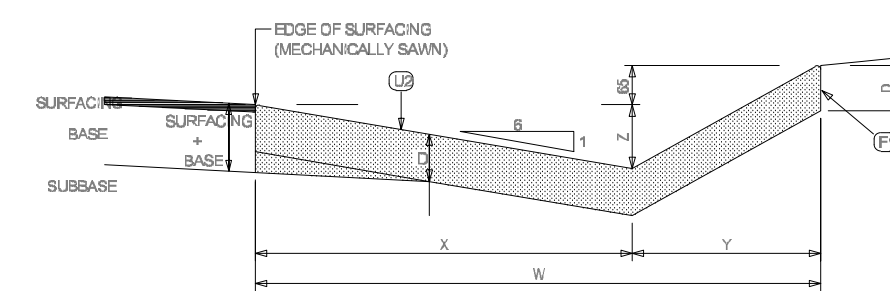
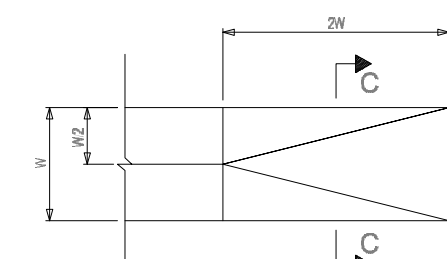
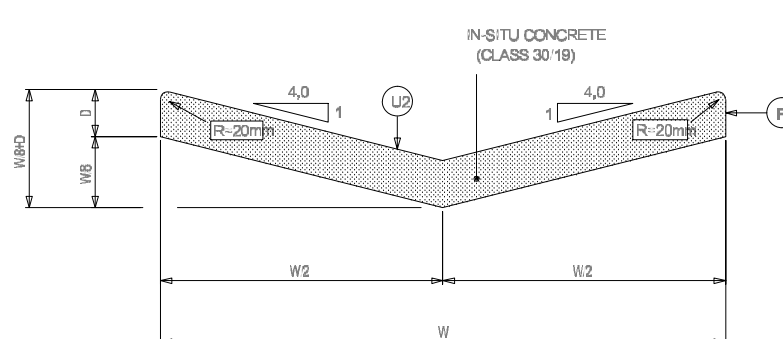
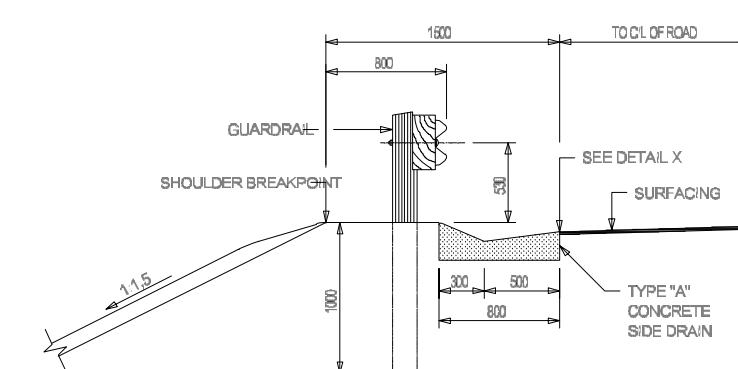
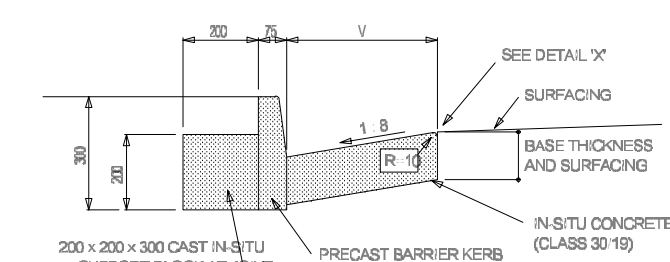
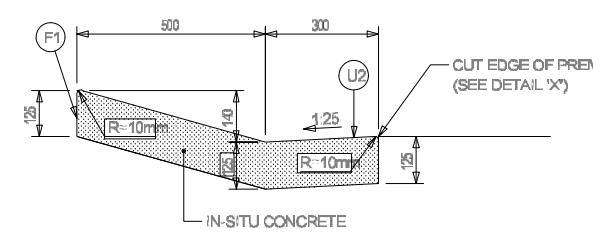
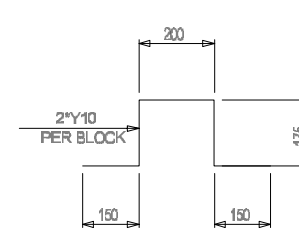
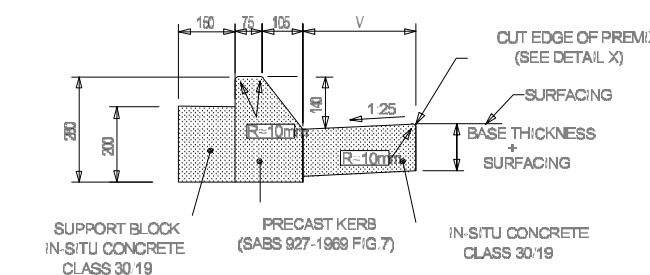
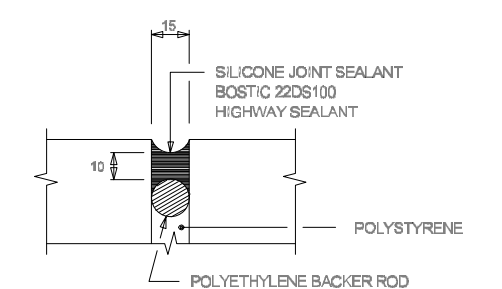
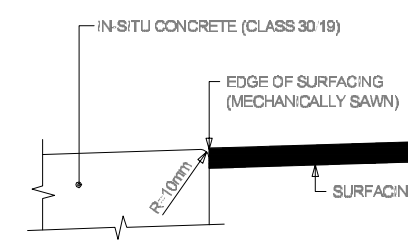
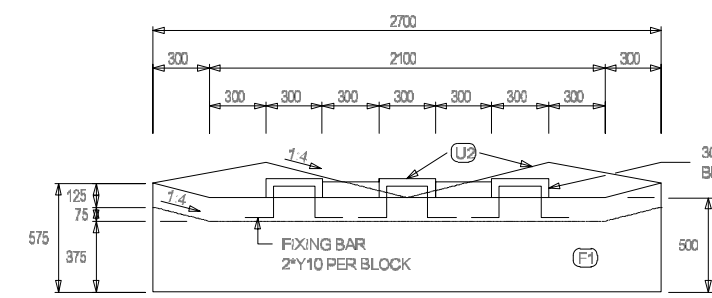
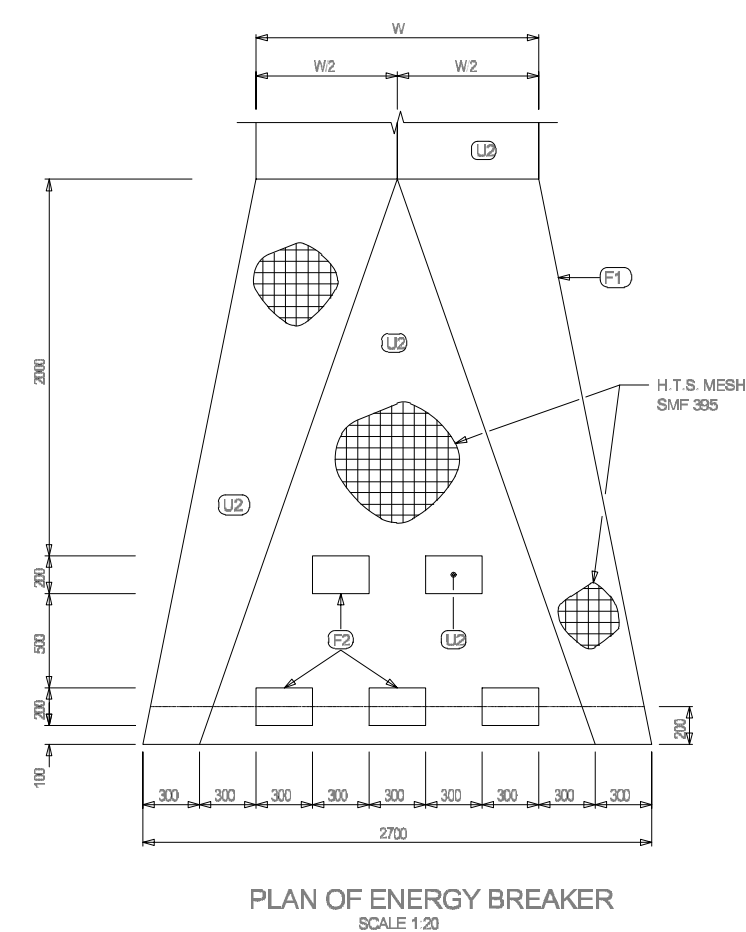
CONSTRUCTION METHOD:

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

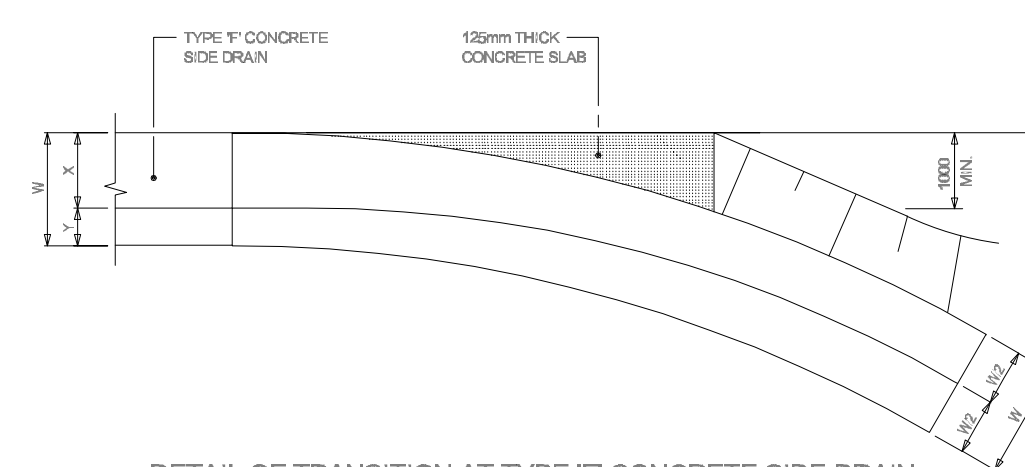
ON CONSTRUCTION DAY:

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

						DESIGNED BY:	R.R RAVELE	 MARULENG LOCAL MUNICIPALITY P.O.BOX 67 HOEDSPRUIT 1380 TEL : +27 15 793 249 FAX : + 27 15 793 2341	 No. 6 Hans Van Rensburg Street Office No. 14 Private Bag X9676, Postnet Suite 141 Polokwane, 0700 Tel : (015) 291 1020 Email : info@sizeya.co.za	CONSULTING ENGINEER	DATE	CONTRACT No.: BM22/22/23 PROJECT NAME: CONSTRUCTION OF KWARUNG INTERNAL STREETS AND STORMWATER CONTROL DRAWING TITLE: SPEED HUMP DETAILS	SHEET 1 OF 1
				DRAWN BY:	L MOJANAGA					DRAWING SCALE AS SHOWN			
0	03/2024	INITIAL ISSUE		FIM						CONSULTANTS DRAWING No.: PROJECT No. DISCIPLINE SUB-DISCIPLINE DWG No. STAGE REV No. S35.4- RD - STD - 009- C - 00			
No	DATE	REVISION	CONSULT	DIR	CHECKED BY:	H.L. THARAGA				PD: PRELIMINARY DESIGN / DD: DETAILED DESIGN / T: TENDER / C: CONSTRUCTION / A: AS-BUILT / E: FOR INFORMATION ONLY			



CASE(n)	W	W/2	W/8	D	W/8+D	VOLUME (m)
1	1000	500	125	125	250	0.1250
2	1500	750	188	125	313	0.1875
3	2000	1000	250	150	400	0.3000
4	2500	1250	313	150	463	0.3750



CASE(n)	W	X	Y	Z	D	VOLUME m
1	1000	670	330	110	125	0.1250
2	1500	1000	500	170	125	0.1875
3	2000	1330	670	220	150	0.3000
4	2500	1670	830	280	150	0.3750

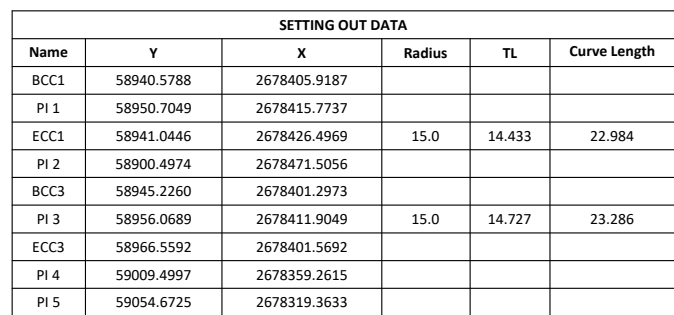
NOTES

1. ALL CONCRETE CHANNELS AND OTHER DRAINAGE STRUCTURES ON THIS PLAN TO BE CAST USING CLASS 30/19 CONCRETE
2. TYPES 'E' AND 'F' CONCRETE MUST BE CAST IN ALTERNATIVE LENGTHS OF 2.0 m MAXIMUM WITH EXPANSION JOINTS EVERY 5th PANEL (10 m)
3. ALL EXPOSED CORNERS MUST BE ROUNDED OFF TO A RADIUS OF 10 mm
4. THE CLASS OF SURFACE FINISH IS INDICATED AS 'F1' OR 'U2'
5. V MIN. = 150mm (PREFERRED = 300mm)

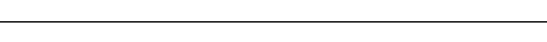


FOR TENDER

[illegible]

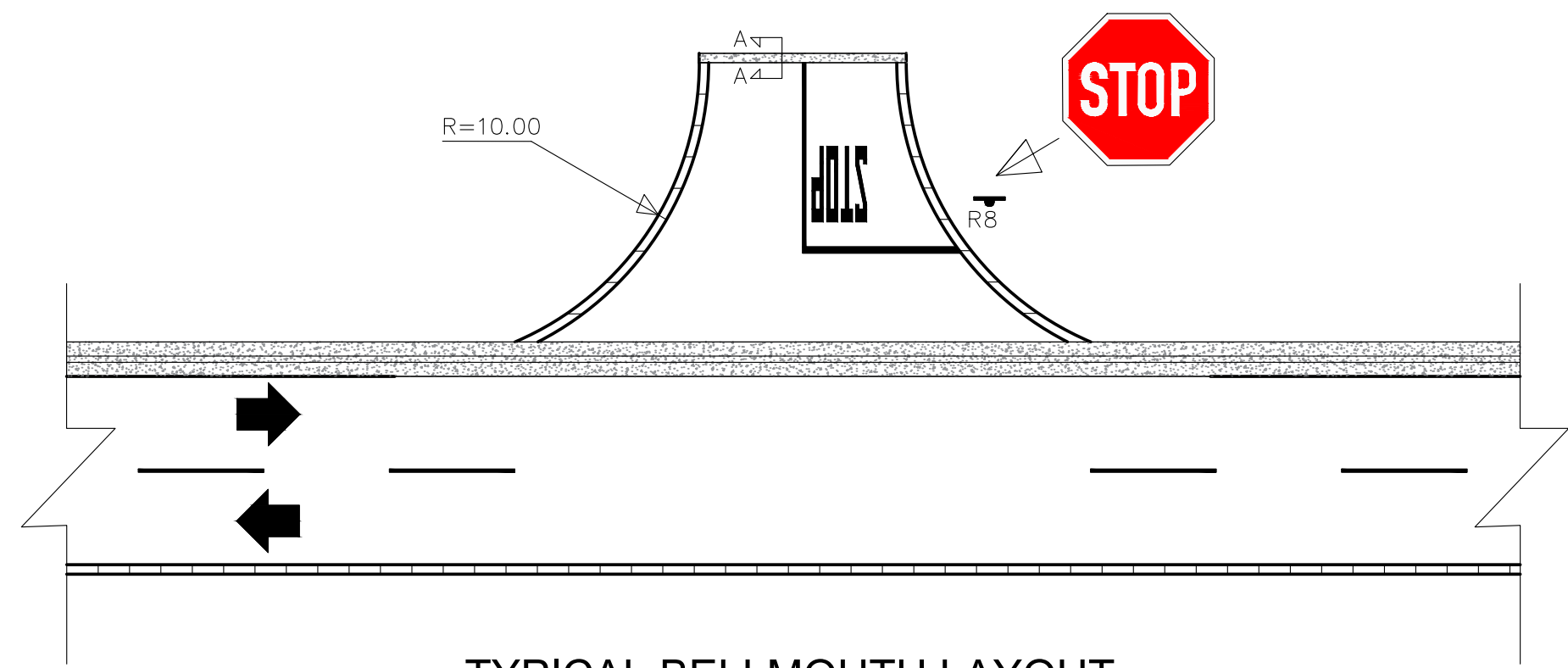


- FOR TENDER**

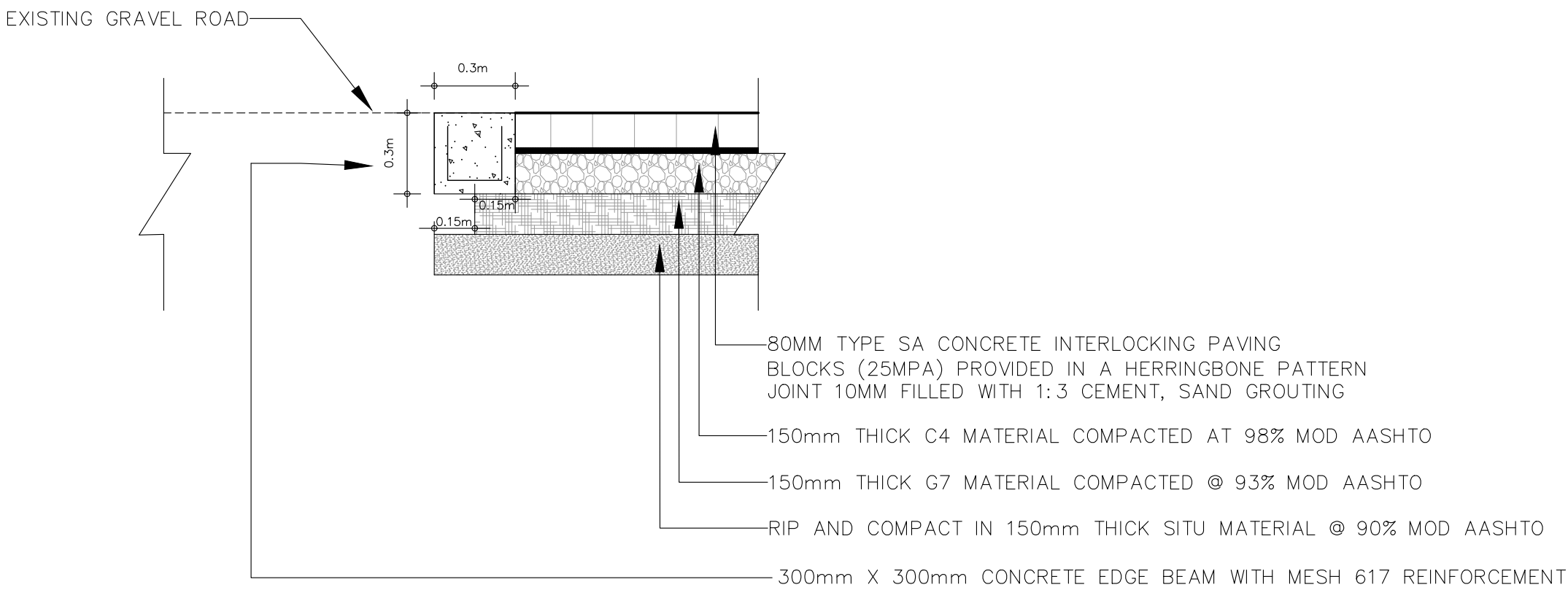
						DESIGNED BY:	R.R RAVELE	 MARULENG LOCAL MUNICIPALITY P.O.BOX 67 HOEDSPRUIT 1380 TEL : +27 15 793 249 FAX : + 27 15 793 2341	 No. 6 Hans Van Rensburg Street Office No. 14 Private Bag X9676, Postnet Suite 141 Polokwane, 0700 Tel : (015) 291 1020 Email : info@sizeya.co.za	CONSULTING ENGINEER	DATE	PROJECT NAME: CONSTRUCTION OF KWARUNG INTERNAL STREETS AND STORMWATER CONTROL	SHEET 1 OF 1
					DRAWN BY:	L MOJANAGA	EMPLOYER'S PROJECT MANAGER			DATE	DRAWING TITLE: RAL CONNECTION	DRAWING SCALE AS SHOWN	
0	03/2024	INITIAL ISSUE		FIM	CHECKED BY:	H.L. THARAGA						DRAWING SCALE AS SHOWN	
No	DATE	REVISION	CONSULT	DIR									

PROJECT No. | DISCIPLINE | SUB-DISCIPLINE | DWG No. | STAGE | REV No.
S\$5-4 - RD - STD - 010 - C -40

NO. 2021/100001/2021/000



TYPICAL BELLMOUTH LAYOUT



SECTION A-A

FOR TENDER

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1. ALL EMBLEMS TO BE DISPLAYED IN FULL COLOUR ON A SEMI-MATT BACKGROUND.
2. DESCRIPTION: MATT-BLACK, SERIES DIN B LETTERS AND NUMBERS ON A SEMI-MATT BLUE BACKGROUND (PANTONE 429U).
3. BORDER : WHITE NON-REFLECTORIZED.
4. TWO SIGN BOARDS SHALL BE ERECTED AS DETERMINED BY THE ENGINEER.
5. SAFCEC EMBLEM ONLY, IF CONTRACTOR IS A MEMBER, ALL OTHER CASES, INCLUDING DEPARTMENTAL CONSTRUCTION, REMAIN BLANK.

1:5 SLOPE

1:12 SOILCRETE
(OR AS REQUIRED
BY ENGINEER)

100

200

300

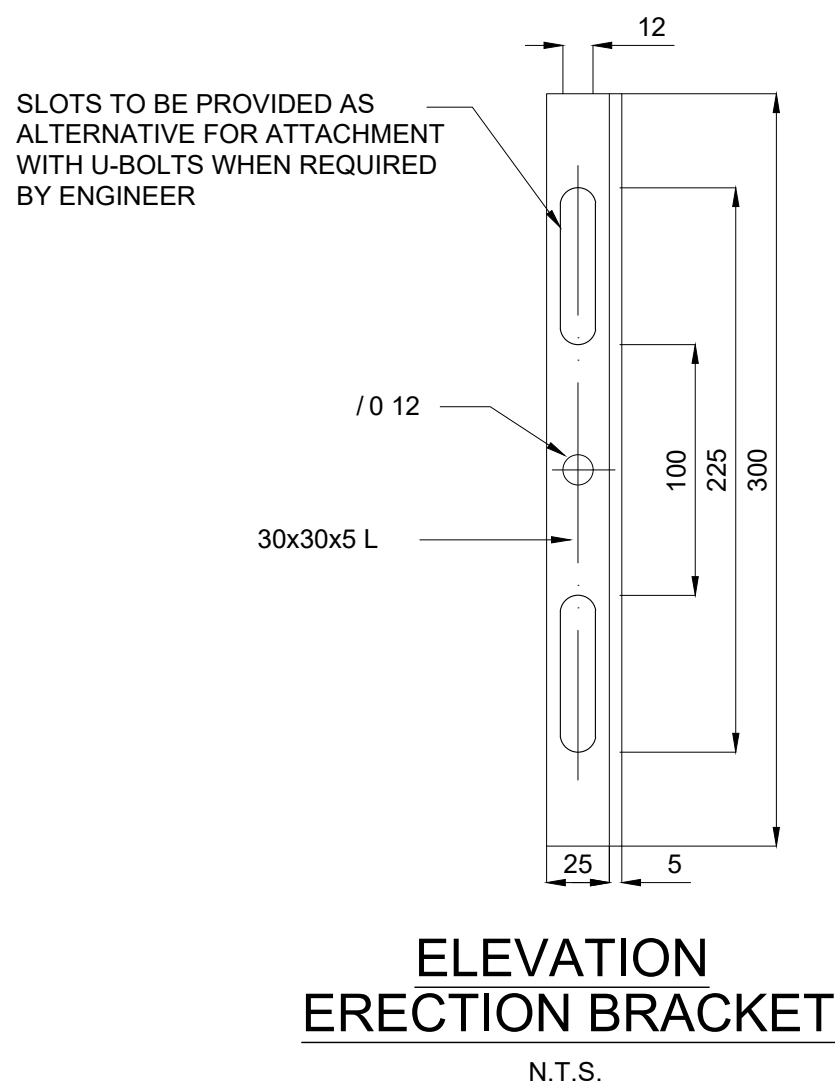
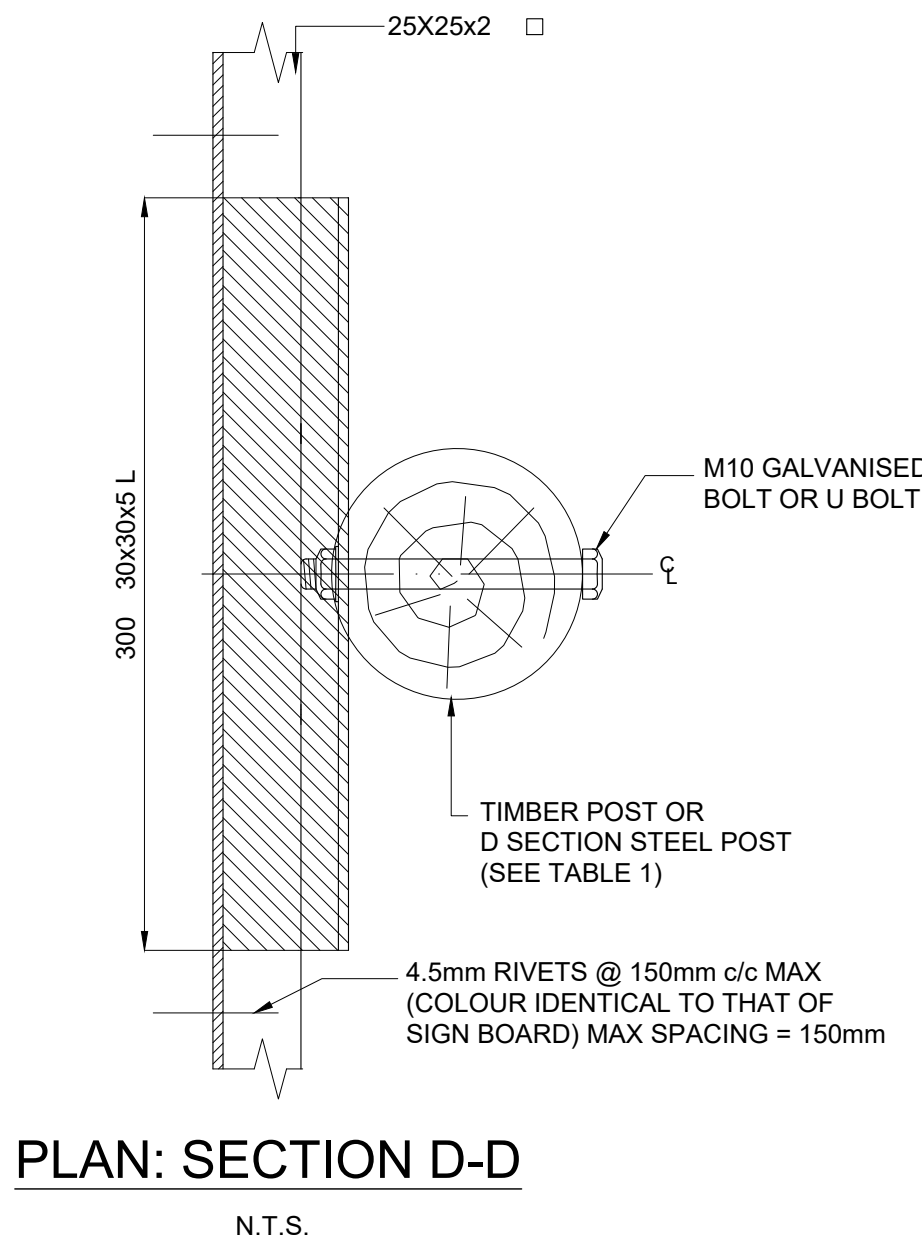
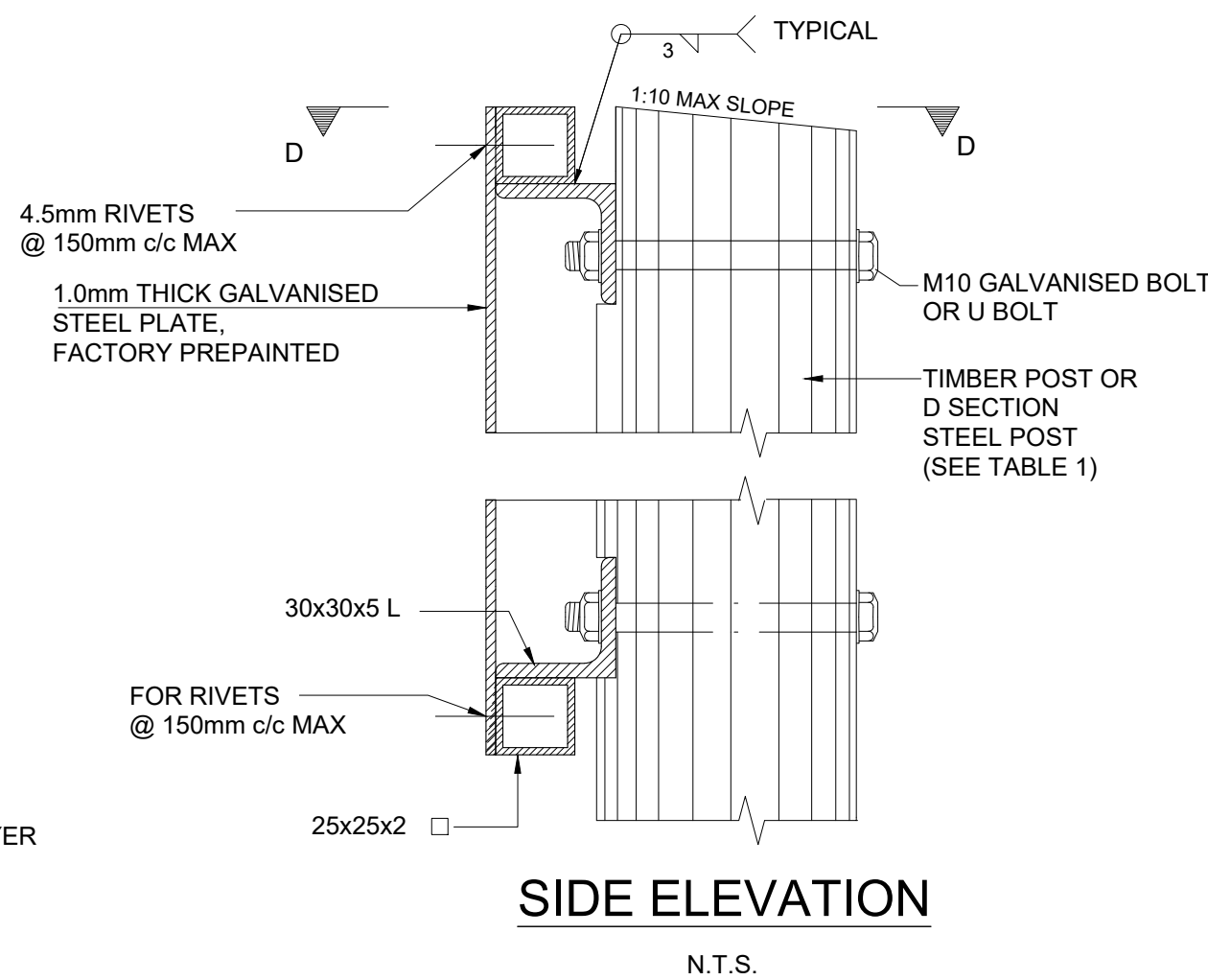
B (TABLE 1)

GRAVEL LAYER

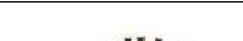
D (TABLE 1)

FOUNDATION DETAIL

N.T.S.



FOR TENDER

						DESIGNED BY:	R.R RAVELE	 MARULENG LOCAL MUNICIPALITY P.O.BOX 67 HOEDSPRUIT 1380 TEL : +27 15 793 249 FAX : + 27 15 793 2341	 SIZEYA CONSULTING ENGINEERS civil engineers quantity surveyors structural engineers project managers	CONSULTING ENGINEER	DATE	PROJECT NAME:	CONTRACT No.: BM22/22/23		SHEET 1 OF 1	
						DRAWN BY:	L MOJANAGA				CONSTRUCTION OF KWARUNG INTERNAL STREETS AND STORMWATER CONTROL		DRAWING SCALE AS SHOWN			
0	03/2024	INITIAL ISSUE			FIM					CHECKED BY:	H.L. THARAGA	CONSULTANTS DRAWING No.:				
No	DATE	REVISION			CONSULT							DIR	PROJECT No. DISCIPLINE SUB-DISCIPLINE DWG No. STAGE REV No. S33.3- RD - STD - 010- C - 00			
										EMPLOYER'S PROJECT MANAGER	DATE	DRAWING TITLE:	CONTRACT NAMEBOARD		PD: PRELIMINARY DESIGN / DD: DETAILED DESIGN / T: TENDER / C: CONSTRUCTION / A: AS-BUILT / F: FOR INFORMATION ONLY	