VOLUME 2

BLOUBERG MUNICIPALITY

BLOUBERG MUNICIPALITY

CONTRACT NO . BM22/22/23-02

FOR

CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD 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
civil engineers | quantity surveyors
structural engineers | project managers

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BENCH MARK LIST			
	Y	X	Z
BM1	4369.897	2558970.323	1012.971
BM2	4111.986	2559419.180	994.865
BM3	3936.509	2559906.357	979.739
BM4	3819.334	2560328.679	968.746
BM5	3336.679	2560438.245	965.902
BM6	3168.654	2559983.363	973.070
BM7	3041.658	2559877.045	975.038

HORIZONTAL DATA				
	Co ordinates			
Name	Y	X	Radius	Deflection
Start	4355.1087	2558987.6637	00.000	
1	4203.2628	2559226.0737	80.000	Right
2	4054.1077	2559512.1818	60.000	Right
3	4021.5661	2559588.4277	80.000	Right
4	3965.4982	2559773.8235	60.000	Right
5	3903.2667	2559986.6642	60.000	Right
6	3846.7392	2560299.0655	10.000	Left
7	3760.8165	2560308.7134	80.000	Right
8	3699.1078	2560346.6926	80.000	Left
9	3440.4612	2560465.0496	80.000	Left
10	3377.5880	2560475.3680	100.000	Left
11	3262.1272	2560431.9600	65.000	Left
12	3161.3616	2560235.9058	160.000	Left
13	3194.6612	2560101.8997	80.000	Right
14	3185.6883	2559977.8629	80.000	Right
End	3031.9138	2559843.7961	00.000	

VERTICAL DATA					
CH @ VPI	Elevation	C-length	Grade (%)	K-value	Type
00.000	1012.530		-03.485		
564.040	992.873	100.000	-02.799	145.773	Sag
1044.634	979.421	80.000	-02.398	199.359	Sag
1689.030	963.970	500.000	00.944	149.602	Sag
2203.620	968.830	100.000	01.383	228.226	Sag
2723.292	976.015				

FOR TENDER

No	DATE	DESCRIPTION	ISSUED BY
00	10/2023	INITIAL ISSUE	FIM

		SIGNATURE
DESIGNED BY	R.R RAVELE	
DRAWN BY	F.I MARAGENI	
CHECKED BY	H.L THARAGA	

BLOUBERG MUNICIPALITY

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CONSULTING ENGINEER DATE
PROFESSIONAL REGISTRATION No.
EMPLOYER'S PROJECT MANAGER DATE

CONTRACT NO:	BM22/22/23-02
PROJECT TITLE:	CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL
DRAWING TITLE:	PLAN LAYOUT

SHEET 2 OF 3

DRAWING SCALE
AS SHOWN

CONSULTANTS DRAWING No.:

PROJECT No.	DISCIPLINE	SUB-DISCIPLINE	DWG No.	STAGE	REV No.
S35.4 –	RD 2–	LAY	–001	–DD	–00

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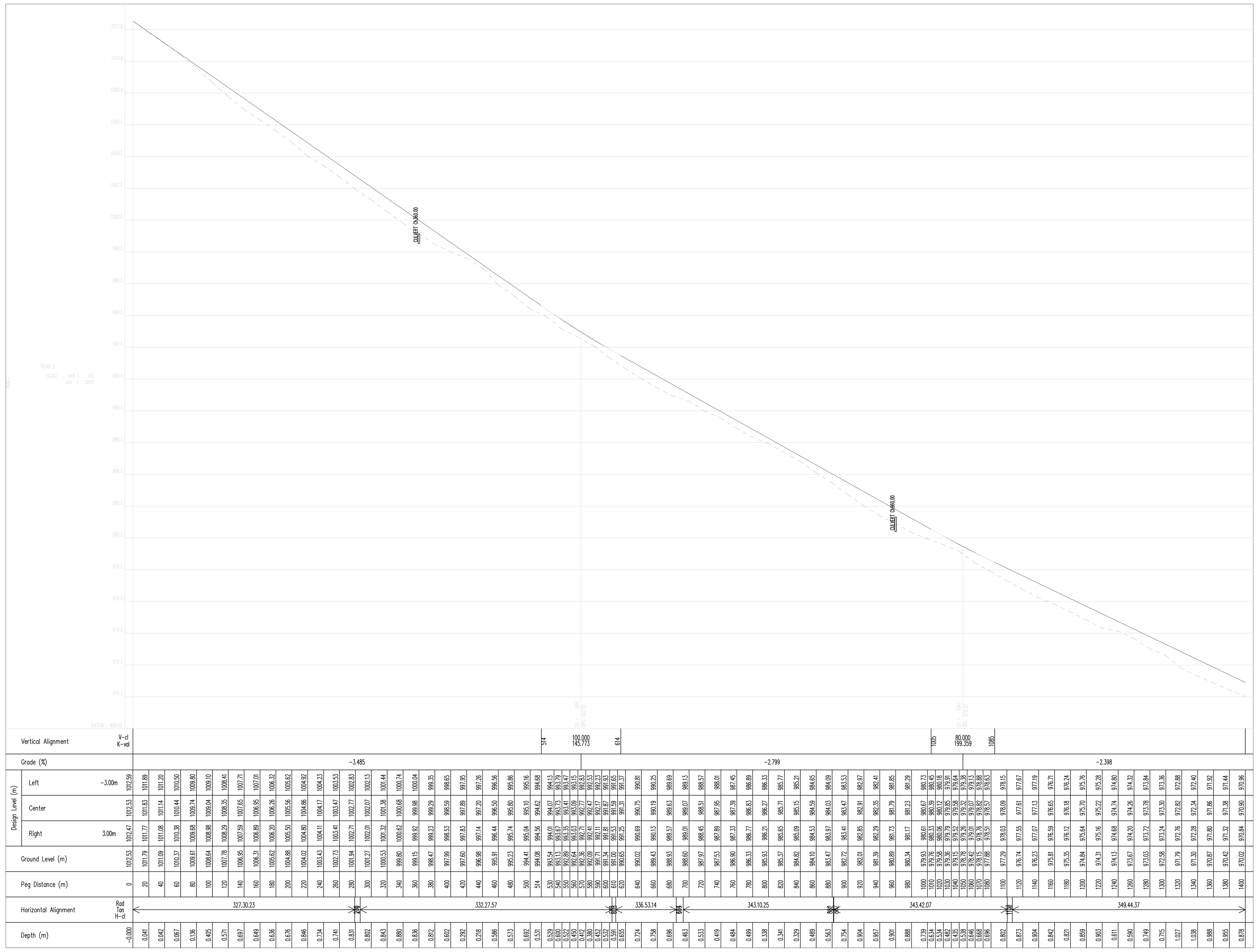

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EMPLOYER'S PROJECT MANAGER | DATE

CONTRACT NO:	BM22/22/23-02
PROJECT TITLE:	CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL
DRAWING TITLE:	PLAN LAYOUT & LONG SECTION (CH0 - CH1400)

SHEET 1 OF 3

DRAWING SCALE
AS SHOWN

CONSULTANTS DRAWING No.:

PROJECT No.	DISCIPLINE	SUB-DISCIPLINE	DWG No.	STAGE	REV No.
S35.4	RD 2	LS	001	DD	00

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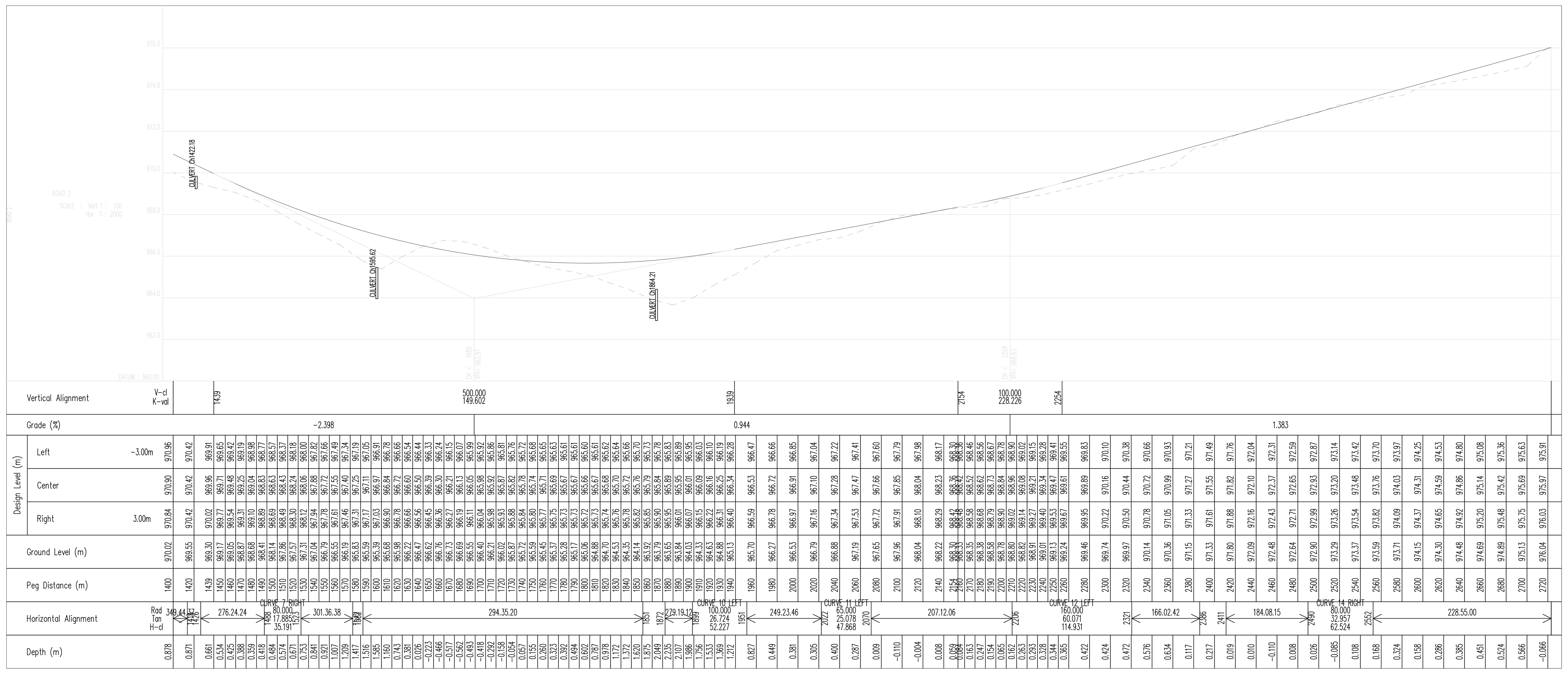

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EMPLOYER'S PROJECT MANAGER — DATE

CONTRACT NO:	BM22/22/23-02
PROJECT TITLE:	CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL
DRAWING TITLE:	PLAN LAYOUT & LONG SECTION (CH1400 - CH2720)

SHEET 1 OF 1

DRAWING SCALE
AS SHOWN

CONSULTANTS DRAWING No.:

PROJECT No.	DISCIPLINE	SUB-DISCIPLINE	DWG No.	STAGE	REV No.
S35.4	RD 2	LS	002	DD	00

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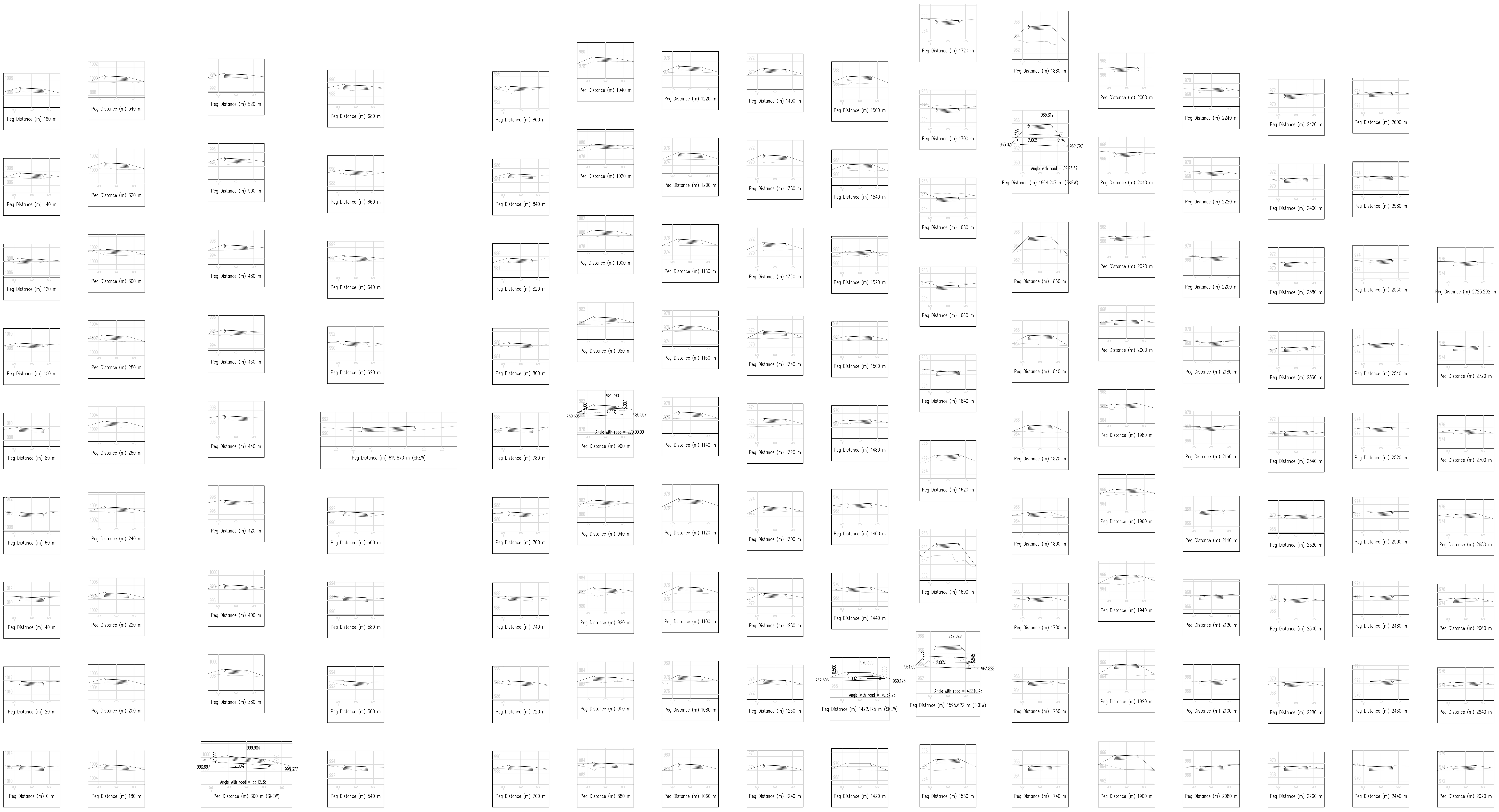

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PROFESSIONAL REGISTRATION No.

EMPLOYER'S PROJECT MANAGER — DATE

CONTRACT NO:	BM22/22/23-02
PROJECT TITLE:	CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL
DRAWING TITLE:	CROSS SECTIONS

SHEET 4 OF 4

DRAWING SCALE
AS SHOWN

CONSULTANTS DRAWING No.:

PROJECT No.	DISCIPLINE	SUB-DISCIPLINE	DWG No.	STAGE	REV No.
S35.4	RD 2	CS	004	DD	00

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UPGRADING OF GRAVEL ROAD TO PAVED ROAD

No	DATE	DESCRIPTION	ISSUED BY
00	12/2022	SCOPING REPORT - INITIAL ISSUE	TTM

		SIGNATURE
DESIGNED BY	R.R. RAVELE	
DRAWN BY	T.T. MPHOLOANE	
CHECKED BY	H.L. THARAGA	

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CONSULTING ENGINEER DATE

PROFESSIONAL REGISTRATION No.

EMPLOYER'S PROJECT MANAGER DATE

CONTRACT No.:	T.B.C.
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 TITLE:	LOCALITY PLAN

SHEET 1 OF 1

DRAWING SCALE
NOT TO SCALE

CONSULTANTS DRAWING No.:

PROJECT No.	DISCIPLINE	SUB-DISCIPLINE	DWG No.	STAGE	REV No.
S35.4	GL	LAY	001	SP	00

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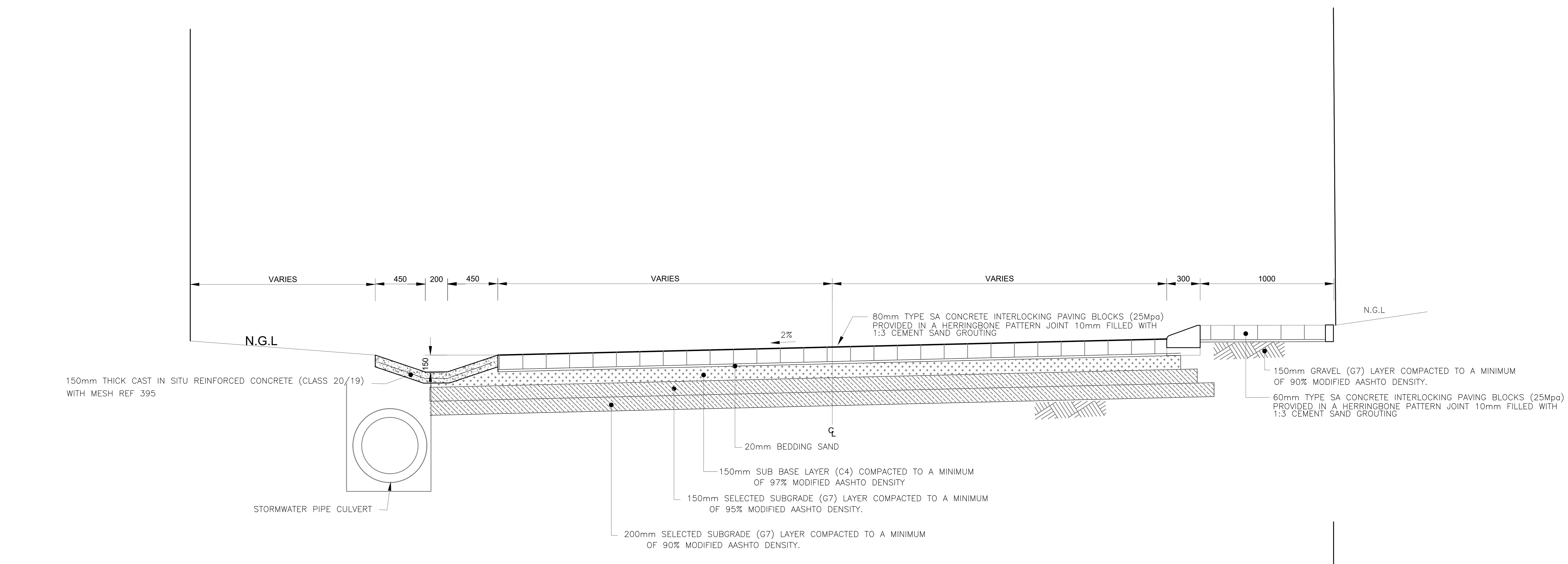
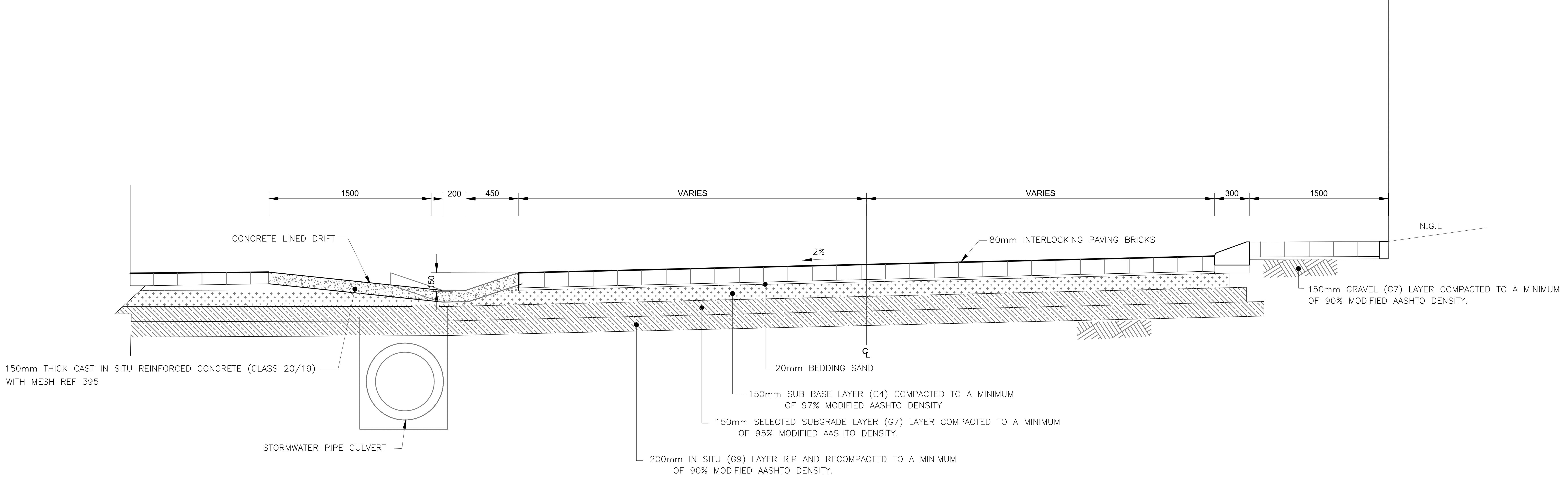
C: CONSTRUCTION / A: AS-BUILT / I: FOR INFORMATION ONLY



TYPICAL CROSS–SECTION & PAVEMENT DESIGN



TYPICAL CROSS–SECTION AT INTERSECTION & PAVEMENT DESIGN

NOTE:

1. IF THE INSITU MATERIAL HAS A CALIFORNIA BEARING RATIO (CBR) LESS THAN 3, THEN 200mm THICK OF LOWER SELECTED SUBGRADE LAYER SHOULD BE CONSTRUCTED UNDER THE 150mm THICK UPPER SELECTED SUBGRADE LAYER
2. IF THE INSITU MATERIAL HAS A PLASTICITY INDEX (PI) GREATER THAN 10, THEN THE INSITU MATERIAL MUST BE STABILISED WITH LIME
3. IF THE MOISTURE CONTENT OF THE INSITU MATERIAL IS SATURATED, THAN INVESTIGATES TO BE CONDUCTED TO DETERMINE THE SOURCE OF WATER. IF THE WATER SOURCE IS GROUND WATER SUB SURFACE DRAINAGE TO BE CONSTRUCTED AS SPECIFIED.

FOR TENDER

No	DATE	REVISION	CONSULT	DIR
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CONTRACT No.: BM22/22/23-02

PROJECT NAME:

CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL

DRAWING TITLE:

TYPICAL SECTION AND PAVEMENT DESIGN

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	001	C	000

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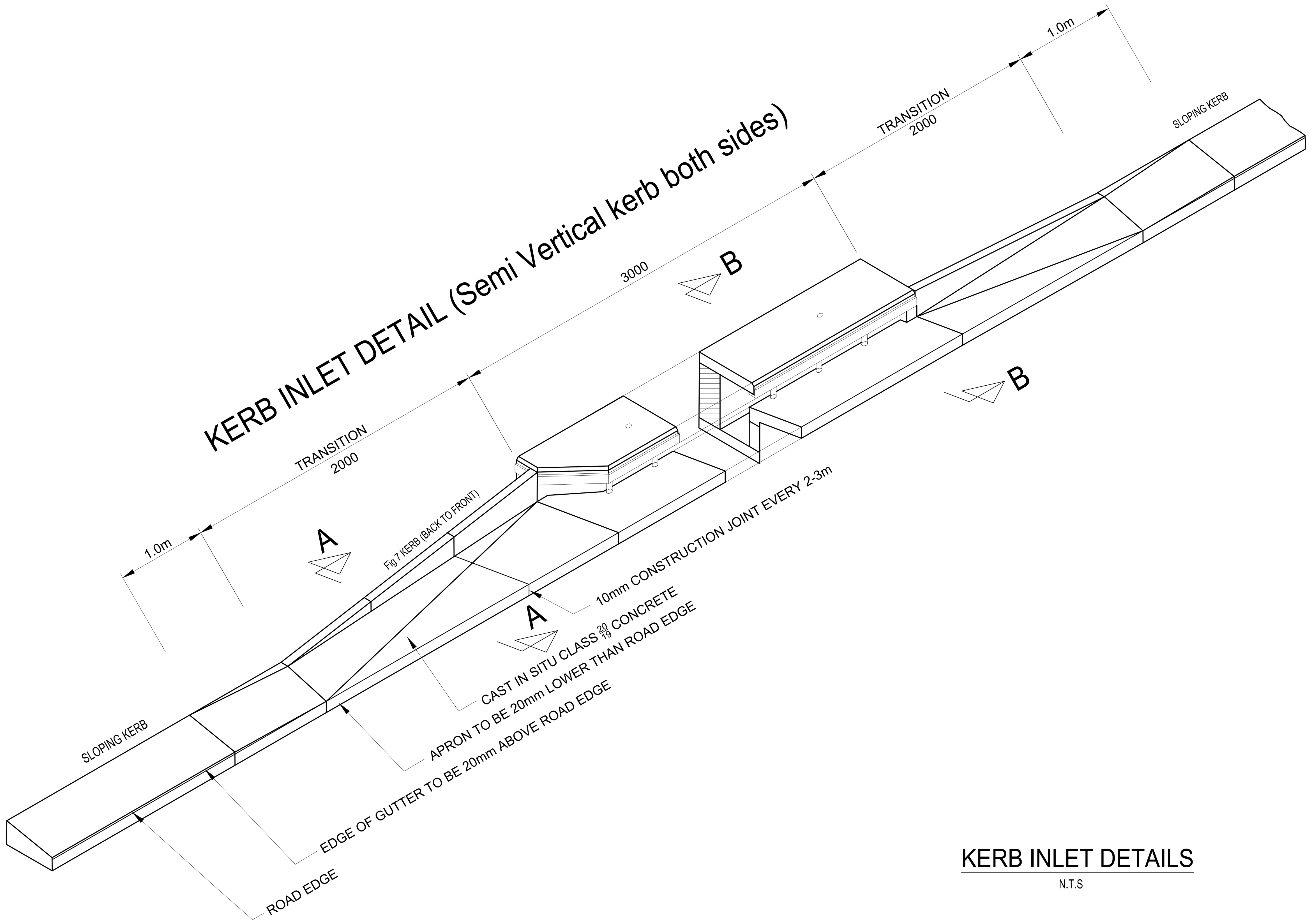
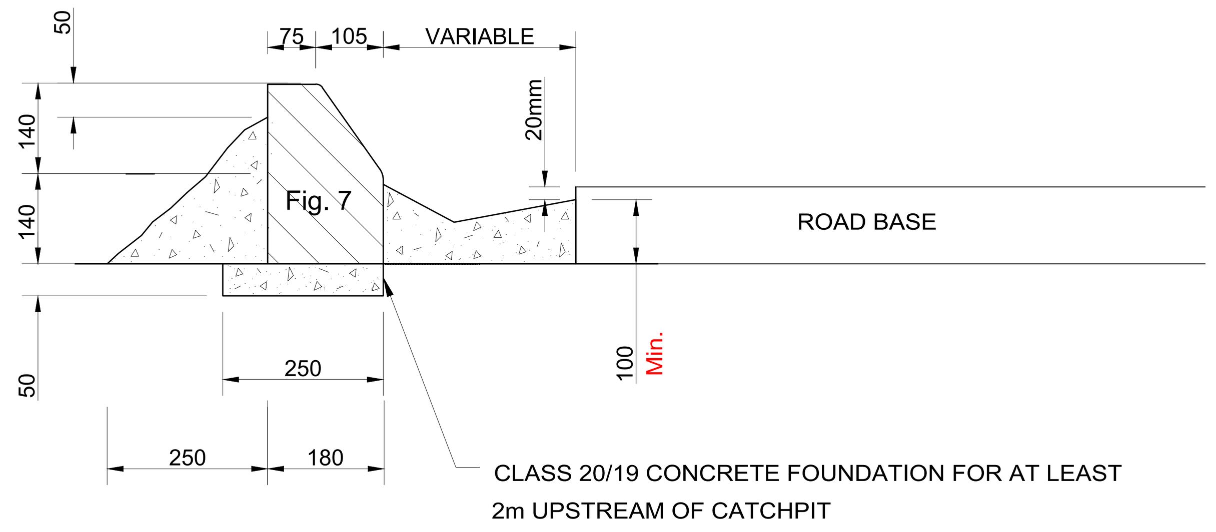
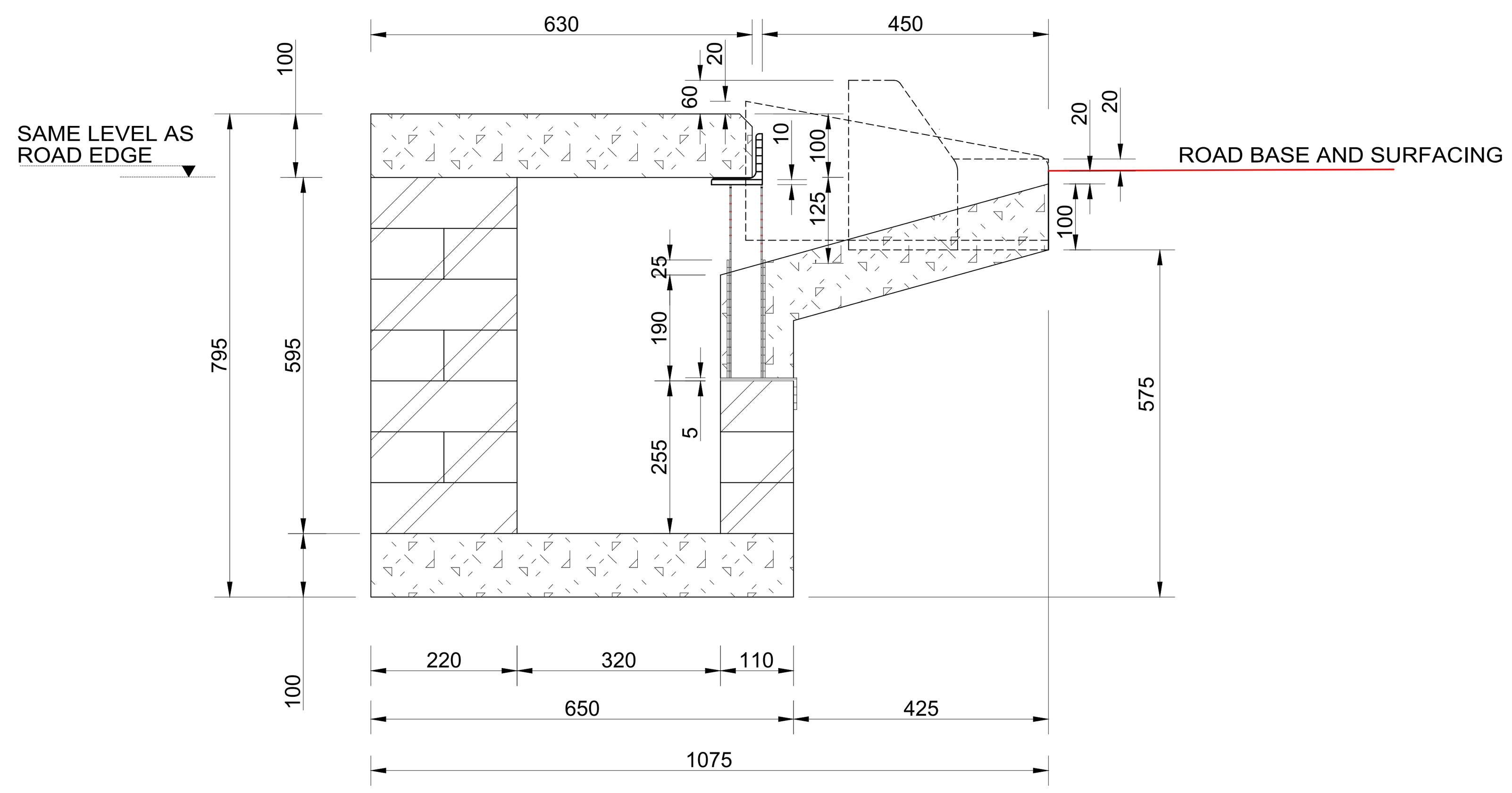


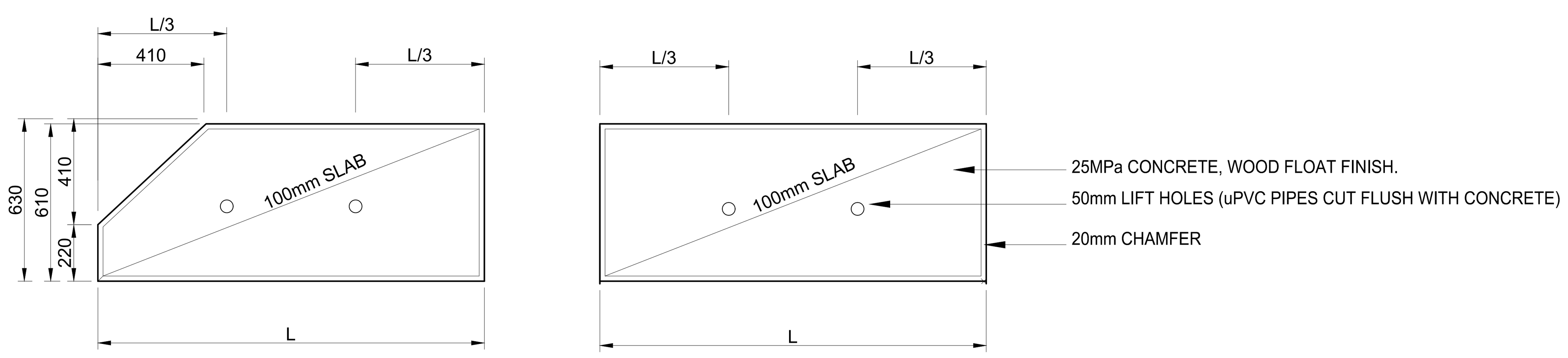
KERB INLET DETAILS
N.T.S



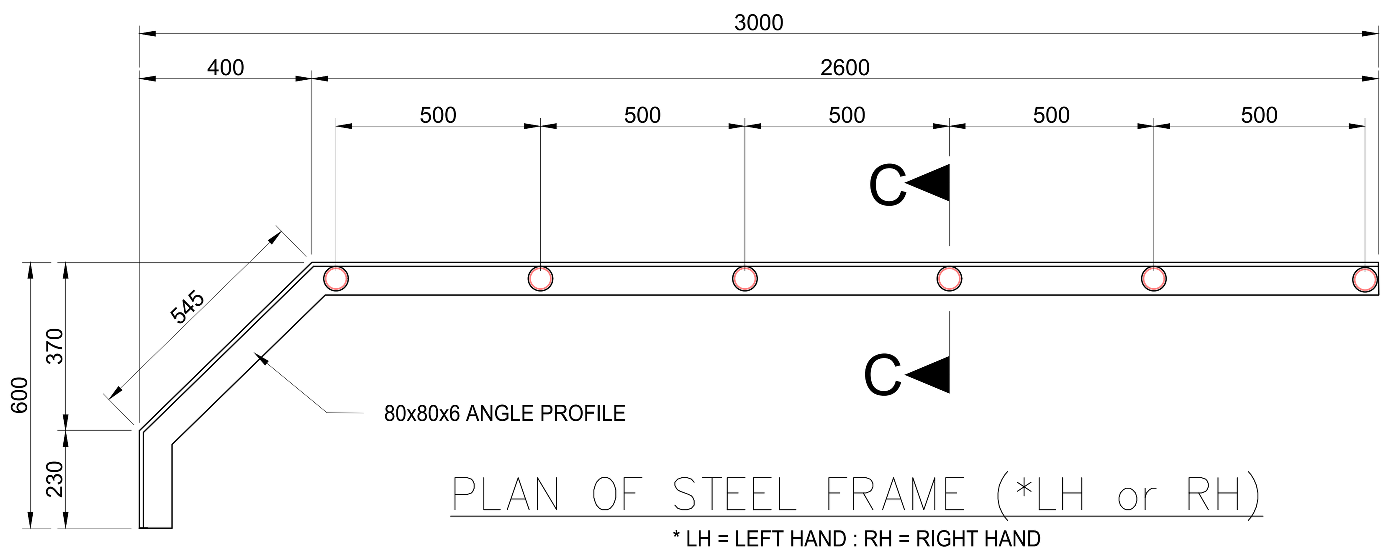
SECTION A-A
N.T.S



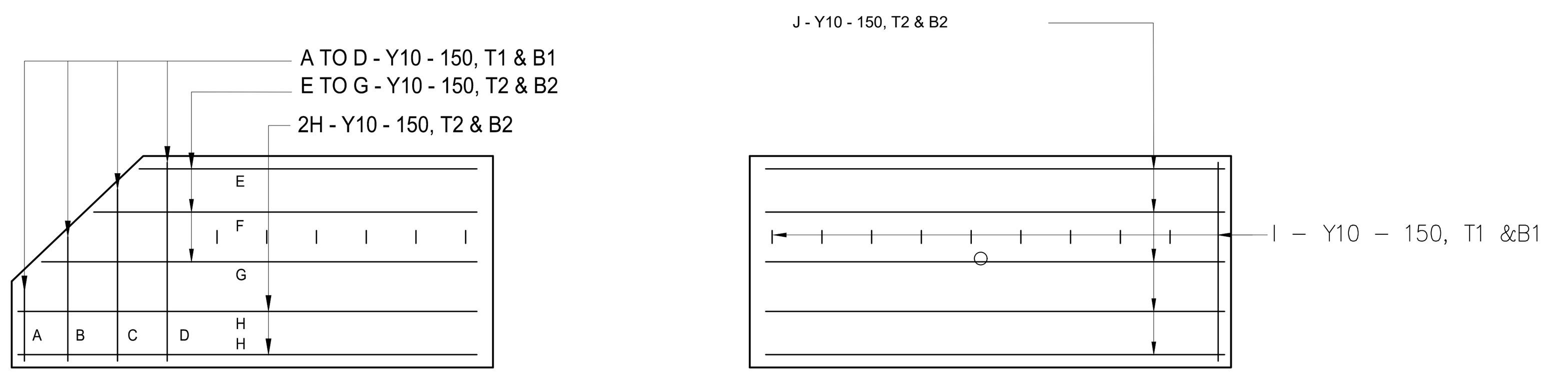
SECTION B-B
N.T.S



CONCRETE LAYOUT
NTS

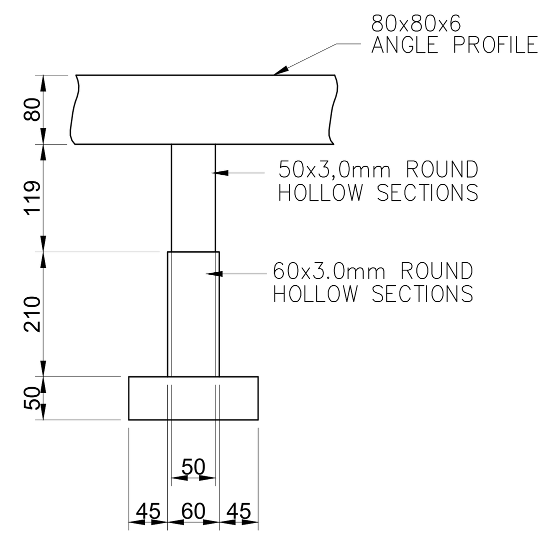


PLAN OF STEEL FRAME (*LH or RH)
* LH = LEFT HAND : RH = RIGHT HAND
NTS

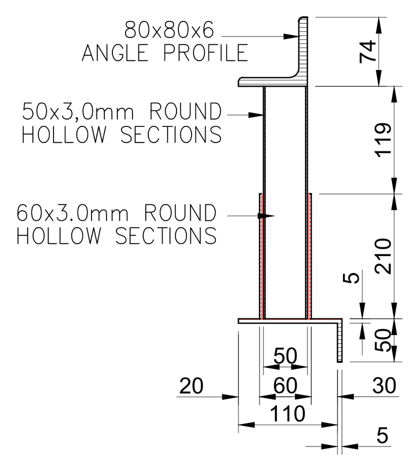


REINFORCEMENT LAYOUT
NTS

COVER DETAILS
NTS



ELEVATION OF STEEL FRAME
NTS



SECTION A – A
NTS

BENDING SCHEDULE 1,5m PRECAST CATCHPIT SLAB - Splayed corner							
L	ITEM No.	BAR MARK.	No PER ITEM.	TOTAL	BAR SIZE	BAR LENGTH	BEND.
1500	1	A	2	2	Y10	150	STRAIGHT
		B	2	2	Y10	300	STRAIGHT
		C	2	2	Y10	450	STRAIGHT
		D	14	14	Y10	550	STRAIGHT
		E	2	2	Y10	1050	STRAIGHT
		F	2	2	Y10	1200	STRAIGHT
		G	2	2	Y10	1320	STRAIGHT
		H	4	4	Y10	1450	STRAIGHT
		STOOLS	15	15	R10	750	250 45o/a 205

BENDING SCHEDULE 1,5m PRECAST CATCHPIT SLAB - Splayed corner							
L	ITEM No.	BAR MARK.	No PER ITEM.	TOTAL	BAR SIZE	BAR LENGTH	BEND.
1500	1	I	20	20	Y10	550	STRAIGHT
		J	10	10	Y10	1450	STRAIGHT
		STOOLS	15	15	R10	750	250 45o/a 205

BENDING SCHEDULE 1,5m PRECAST CATCHPIT SLAB - Splayed corner							
L	ITEM No.	BAR MARK.	No PER ITEM.	TOTAL	BAR SIZE	BAR LENGTH	BEND.
2000	1	A	2	2	Y10	150	STRAIGHT
		B	2	2	Y10	300	STRAIGHT
		C	2	2	Y10	450	STRAIGHT
		D	22	22	Y10	550	STRAIGHT
		E	2	2	Y10	1550	STRAIGHT
		F	2	2	Y10	1700	STRAIGHT
		G	2	2	Y10	1820	STRAIGHT
		H	4	4	Y10	1950	STRAIGHT
		STOOLS	15	15	R10	750	250 45o/a 205

BENDING SCHEDULE 1,5m PRECAST CATCHPIT SLAB - Splayed corner							
L	ITEM No.	BAR MARK.	No PER ITEM.	TOTAL	BAR SIZE	BAR LENGTH	BEND.
2000	1	I	28	28	Y10	550	STRAIGHT
		J	10	10	Y10	1950	STRAIGHT
		STOOLS	15	15	R10	750	250 45o/a 205

BENDING SCHEDULE 1,5m PRECAST CATCHPIT SLAB – Splayed corner							
L	ITEM No.	BAR MARK.	No PER ITEM.	TOTAL	BAR SIZE	BAR LENGTH	BEND.
2500	1	A	2	2	Y10	150	STRAIGHT
		B	2	2	Y10	300	STRAIGHT
		C	2	2	Y10	450	STRAIGHT
		D	28	28	Y10	550	STRAIGHT
		E	2	2	Y10	2050	STRAIGHT
		F	2	2	Y10	2200	STRAIGHT
		G	2	2	Y10	2320	STRAIGHT
		H	4	4	Y10	2450	STRAIGHT
		STOOLS	20	20	R10	750	250 45o/a 205

BENDING SCHEDULE 1,5m PRECAST CATCHPIT SLAB - Splayed corner							
L	ITEM No.	BAR MARK.	No PER ITEM.	TOTAL	BAR SIZE	BAR LENGTH	BEND.
2500	1	I	34	34	Y10	550	STRAIGHT
		J	10	10	Y10	2450	STRAIGHT
		STOOLS	20	20	R10	750	250 45o/a 205

BENDING SCHEDULE

FOR TENDER

No	DATE	REVISION	CONSULT	DIR
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CONTRACT No.: BM22/22/23-02

PROJECT NAME:
CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL

DRAWING TITLE:
KERB 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	002	C	000

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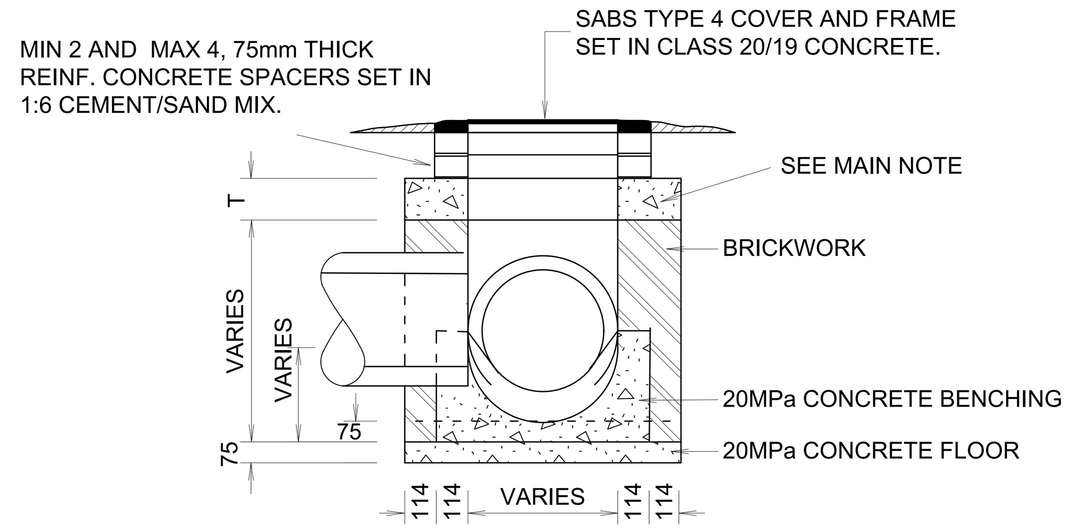
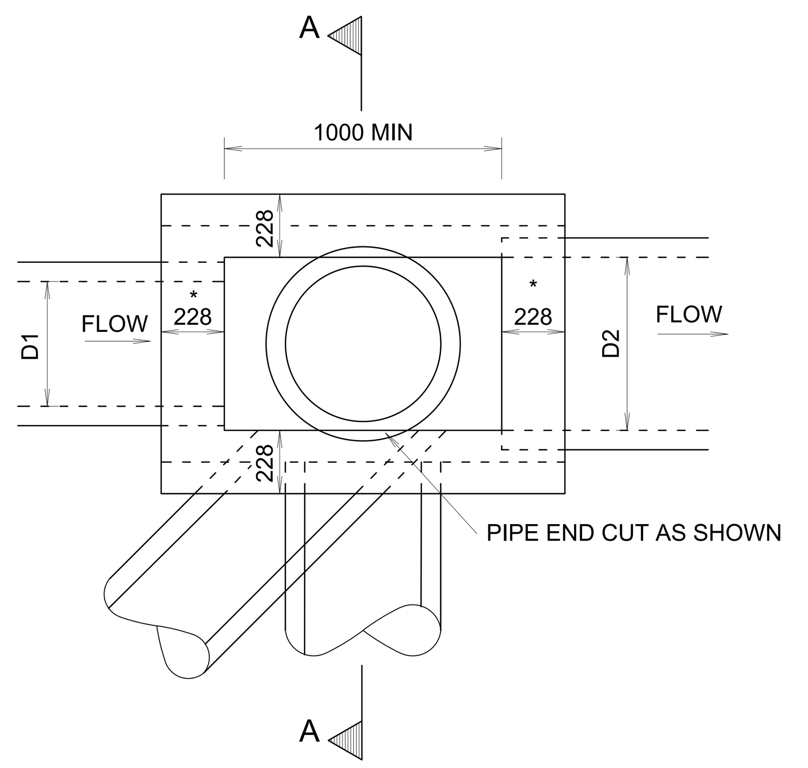
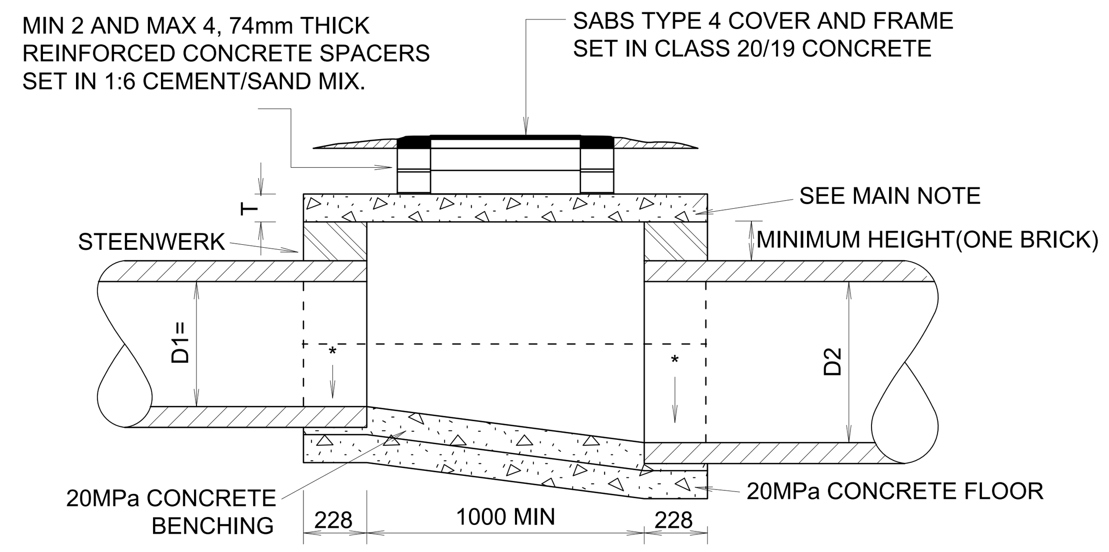


SECTION A-A



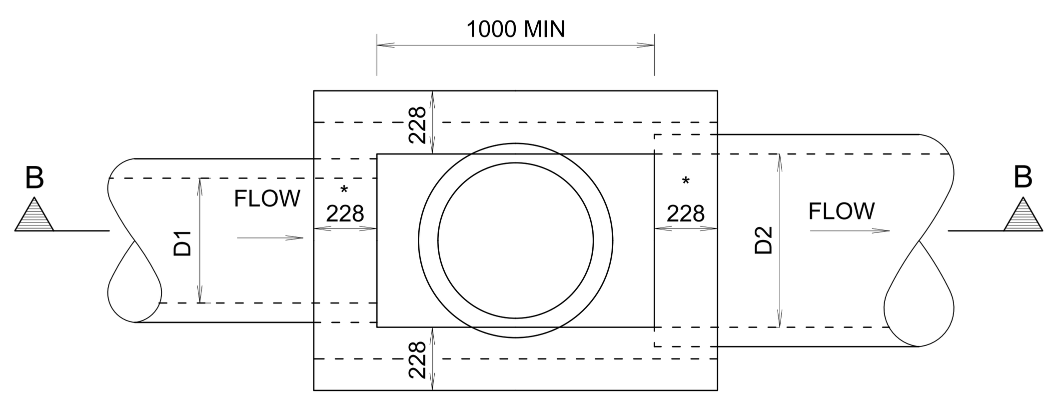
PLAN TYPE 1

MANHOLE/JUNCTION BOX TYPE 1



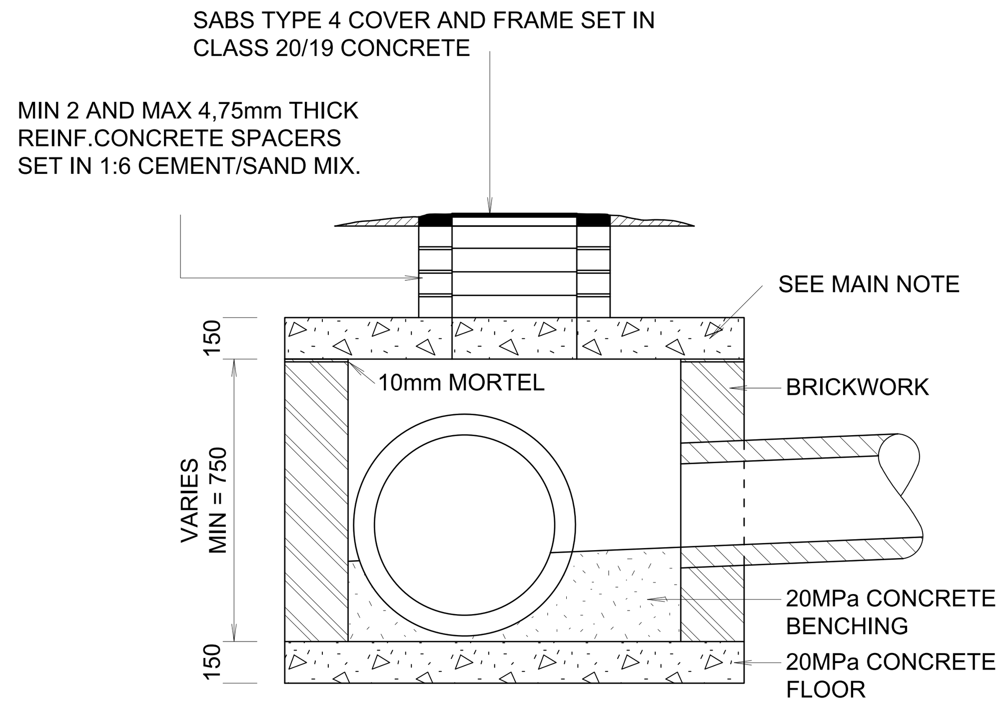
SECTION B-B

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

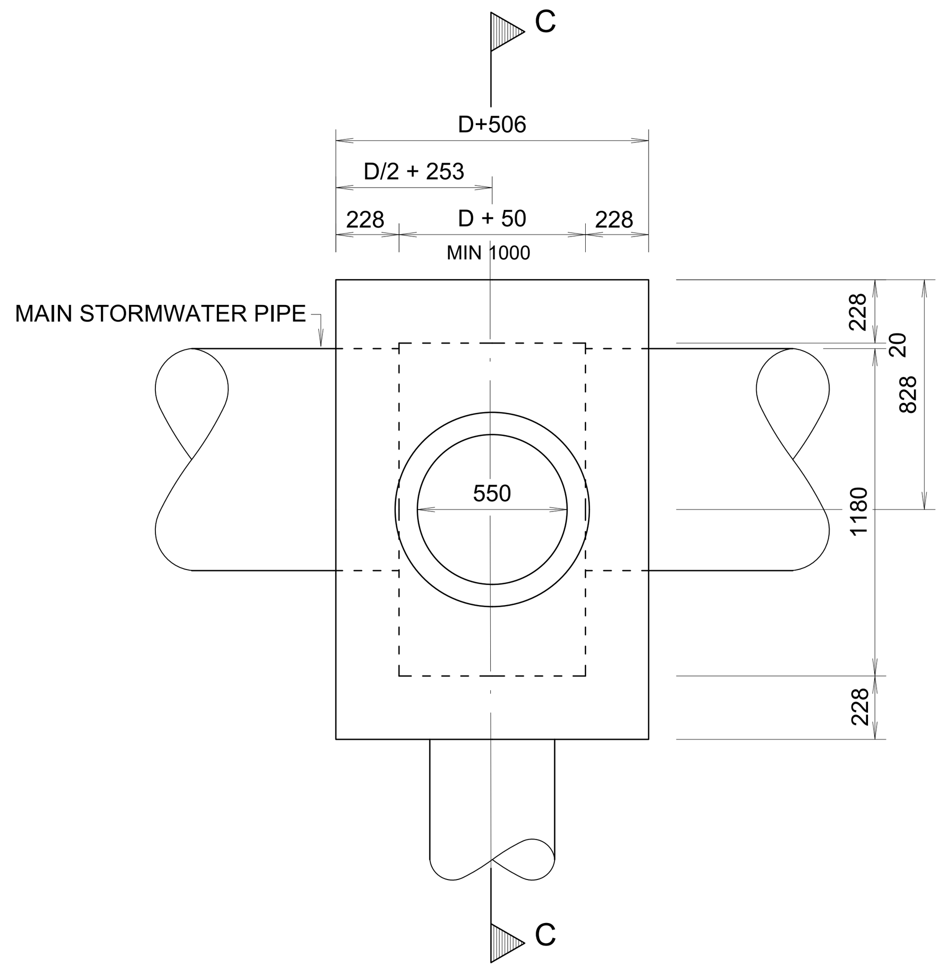


PLAN TYPE 2

MANHOLE/JUNCTION BOX TYPE 2



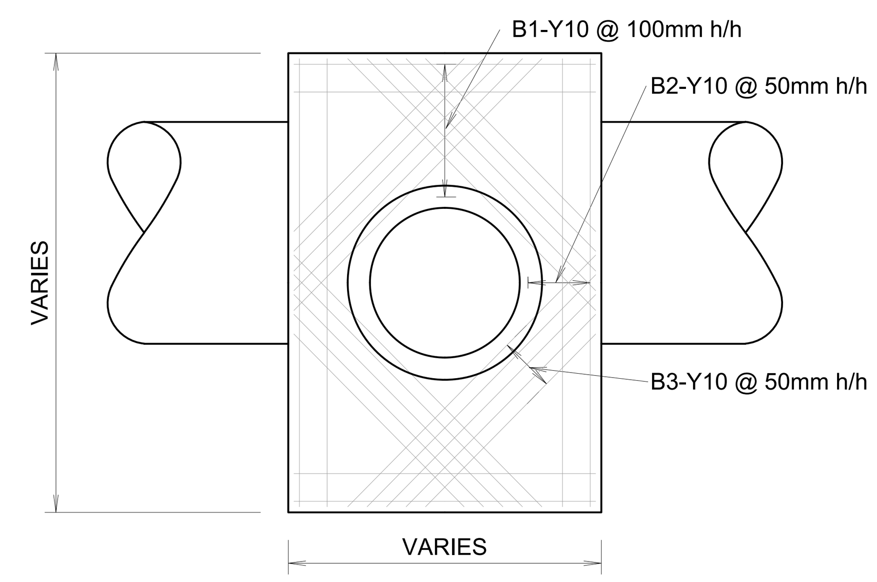
SECTION C-C



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.

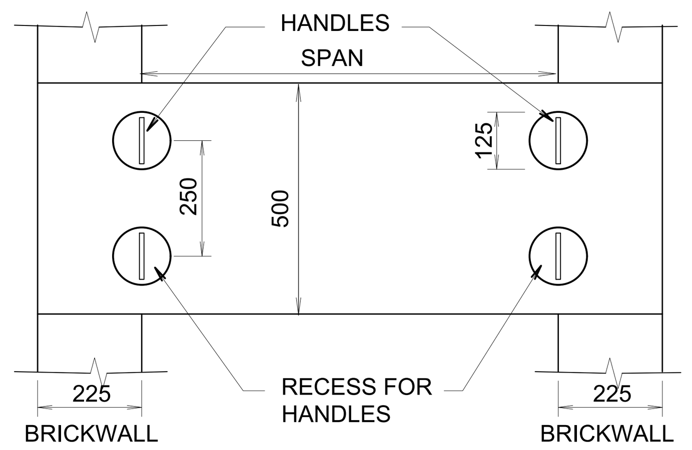


REINFORCEMENT DETAIL OF SLAB

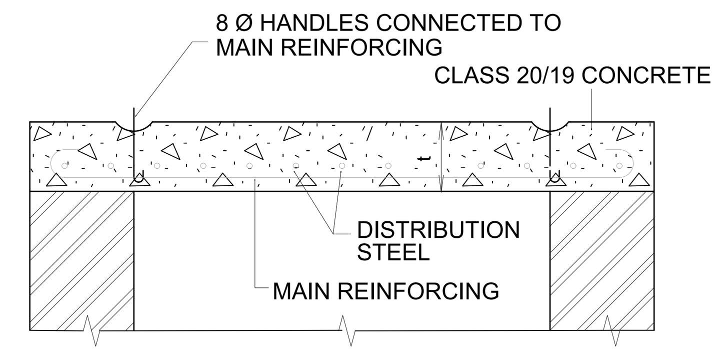
FOR ALL TYPES OF MANHOLES

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

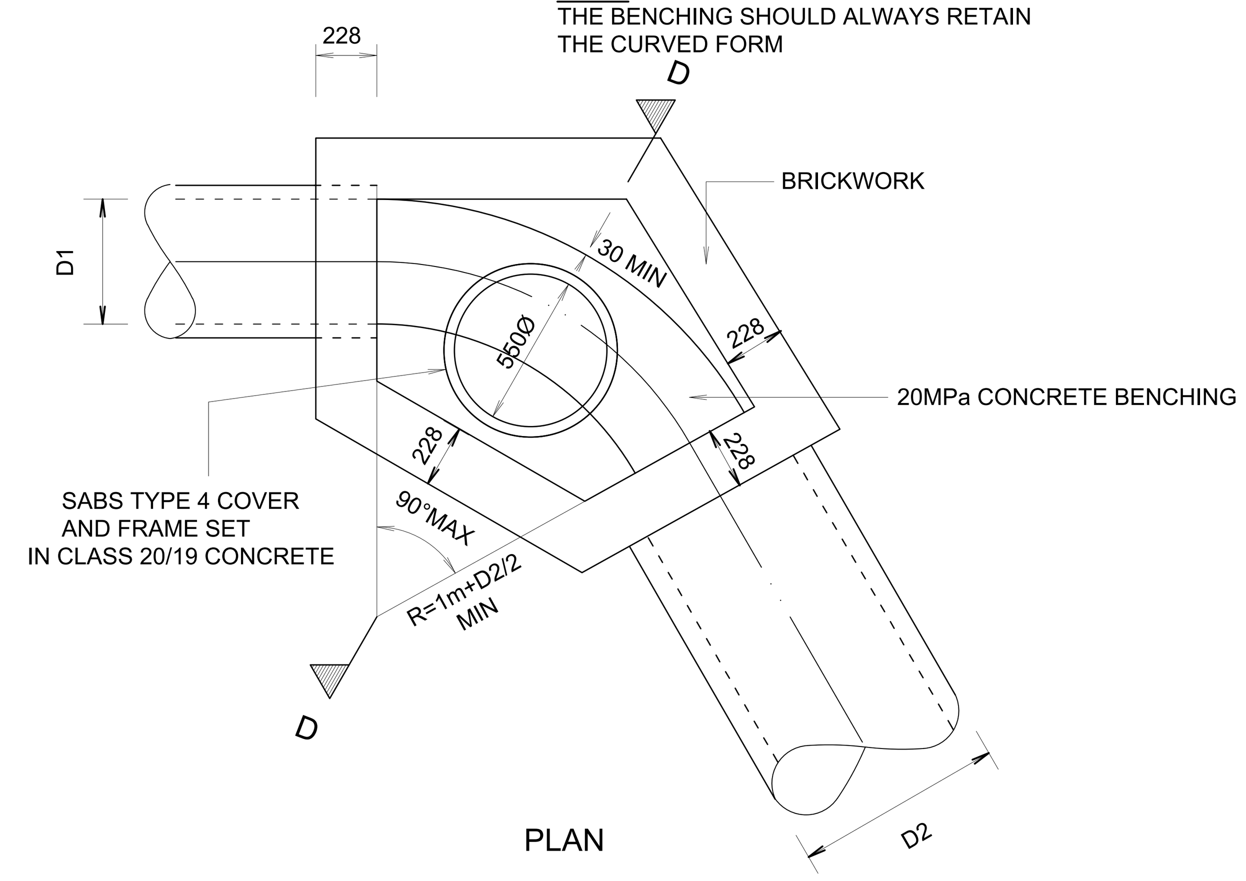


SECTION: PRECAST COVER

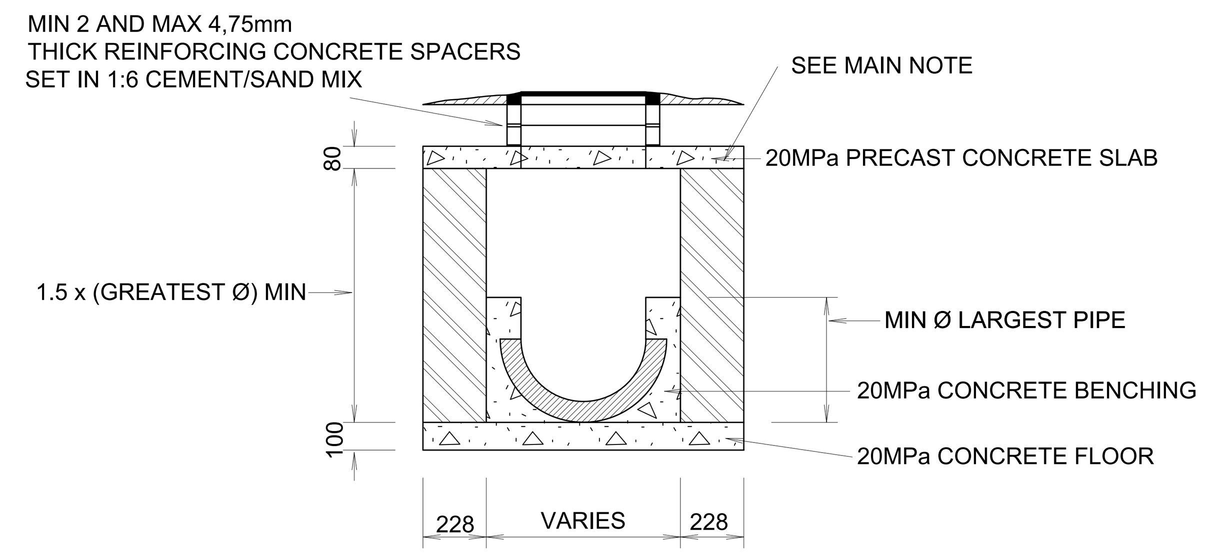
SLAB REINFORCING			
SPAN	t	MAIN REINFORCING	DISTR. STEEL
450	75	10 Ø @ 150	6 Ø @ 300
500	90	12 Ø @ 200	6 Ø @ 250
600	100	12 Ø @ 160	6 Ø @ 200
750	100	12 Ø @ 160	6 Ø @ 200
900	125	16 Ø @ 210	10 Ø @ 300
1 000	125	16 Ø @ 200	10 Ø @ 300
1 100	140	16 Ø @ 200	10 Ø @ 300
1 200	140	16 Ø @ 185	10 Ø @ 300
1 350	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)

NOTE:
THE BENCHING SHOULD ALWAYS RETAIN THE CURVED FORM



PLAN



SECTION D-D

MANHOLE/JUNCTION BOX TYPE 4

FOR TENDER

No	DATE	REVISION	CONSULT	DIR
0	03/2024	INITIAL ISSUE	FIM	

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CONSULTING ENGINEER — DATE
EMPLOYER'S PROJECT MANAGER — DATE

CONTRACT No.: BM22/22/23-02

PROJECT NAME:
CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL

DRAWING TITLE:
JUNCTION BOX DETAILS

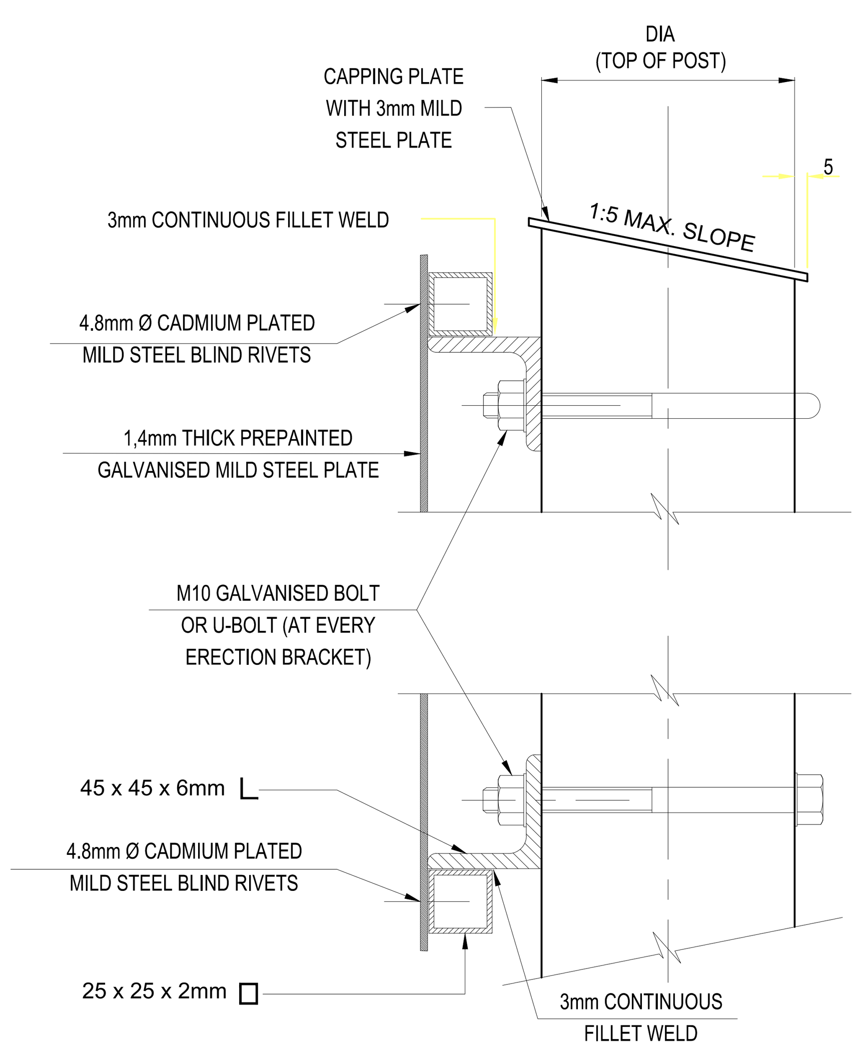
SHEET 1 OF 1

DRAWING SCALE
AS SHOWN

CONSULTANTS DRAWING No.:

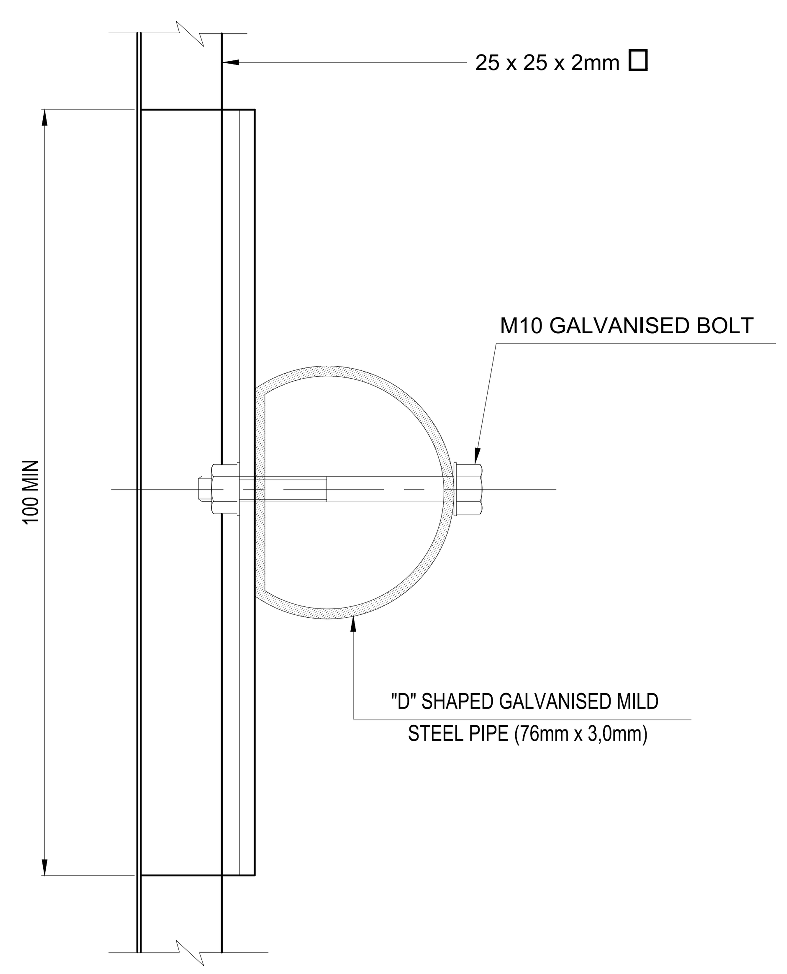
PROJECT No.	DISCIPLINE	SUB-DISCIPLINE	DWG No.	STAGE	REV No.
S35.4	RD	STD	003	C	000

PD: PRELIMINARY DESIGN / DD: DETAILED DESIGN / T: TENDER / C: CONSTRUCTION / A: AS-BUILT / I: FOR INFORMATION ONLY



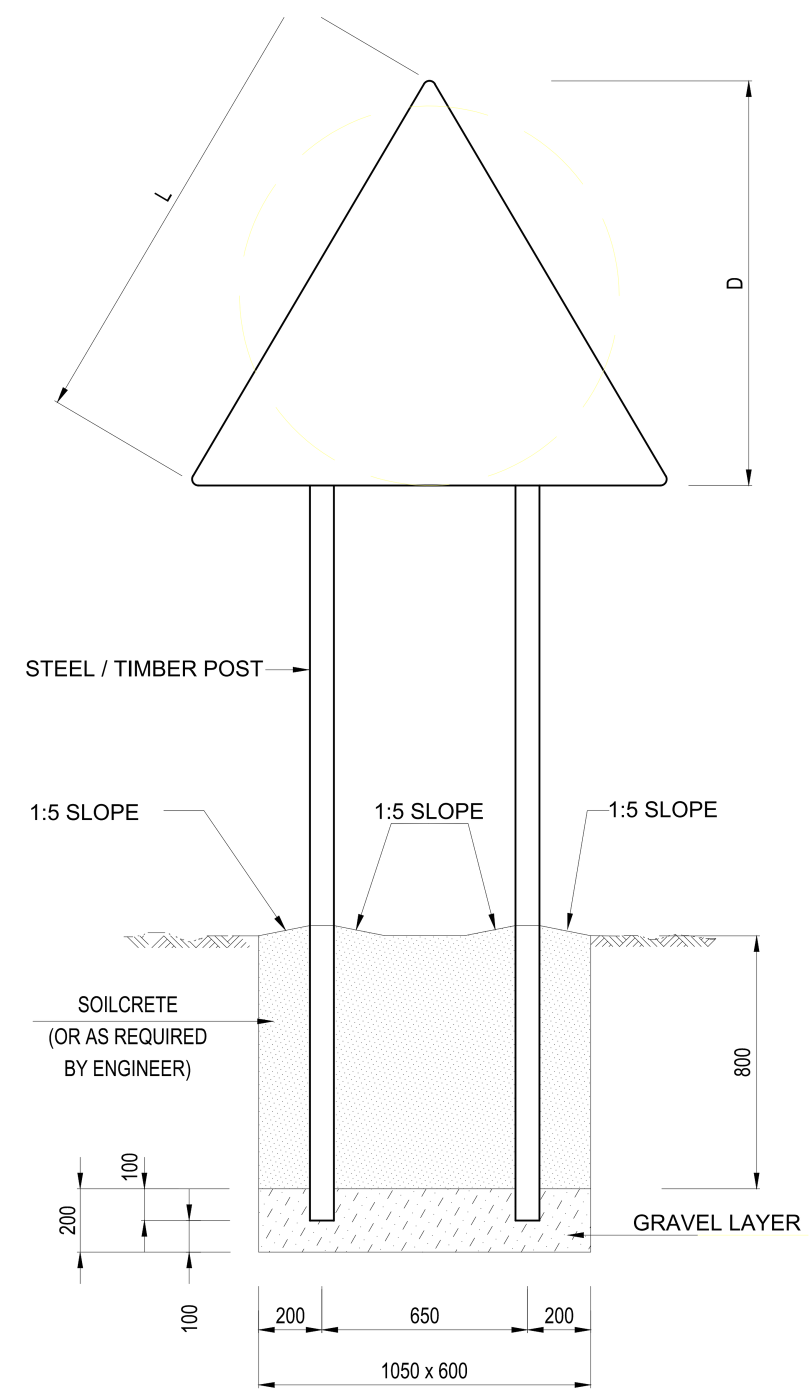
SIDE ELEVATION

SCALE 1 : 2,5



SIDE ELEVATION

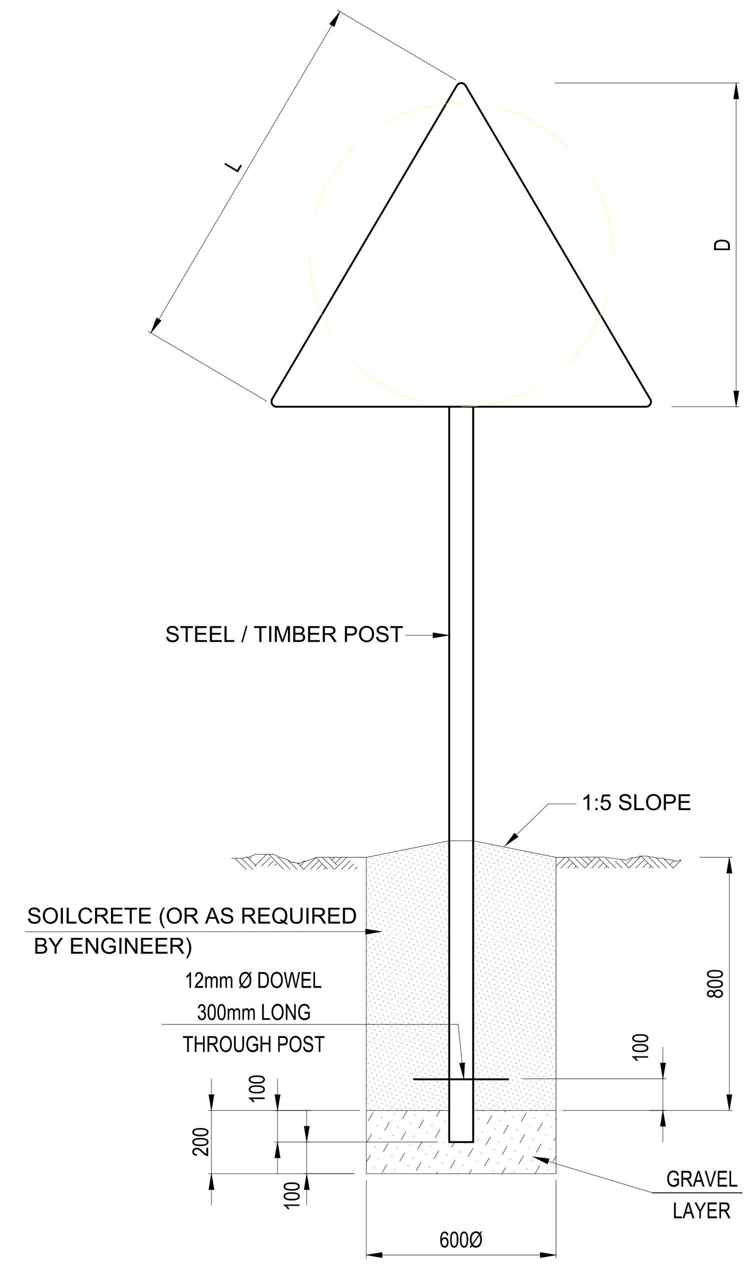
SCALE 1 : 2



FOUNDATION DETAIL

L = 1500 AND D = 1200

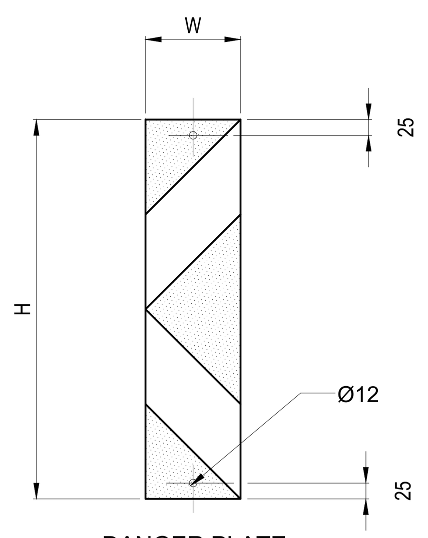
SCALE 1:20



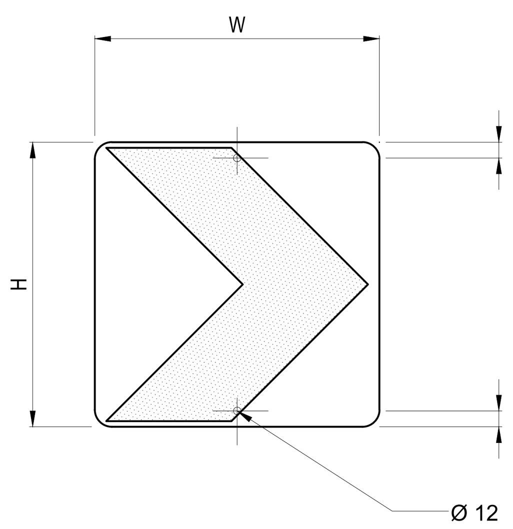
FOUNDATION DETAIL

L < 1200 AND D < 900

SCALE 1:20



DANGER PLATE
(W401 / W402)



SHARP CURVE CHEVRON
(W405 / W406)

MOUNTING HOLES FOR HAZARD MARKER SIGNS WITHOUT FRAMEWORK

HAZARD MARKER SIGNS		
	DANGER PLATE SIGN W401-RIGHT W402-LEFT	SHARP CURVE CHEVRON 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 :

1. 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).

2. 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).

3. BLIND RIVETS SHALL BE 4.8mm DIA CADMIUM PLATED MILD STEEL.

FOR TENDER

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CONTRACT No.: BM22/22/23-02

PROJECT NAME:

CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL

DRAWING TITLE:

ROAD SIGNS, ATTACHMENT AND FIXING 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	004	C	000

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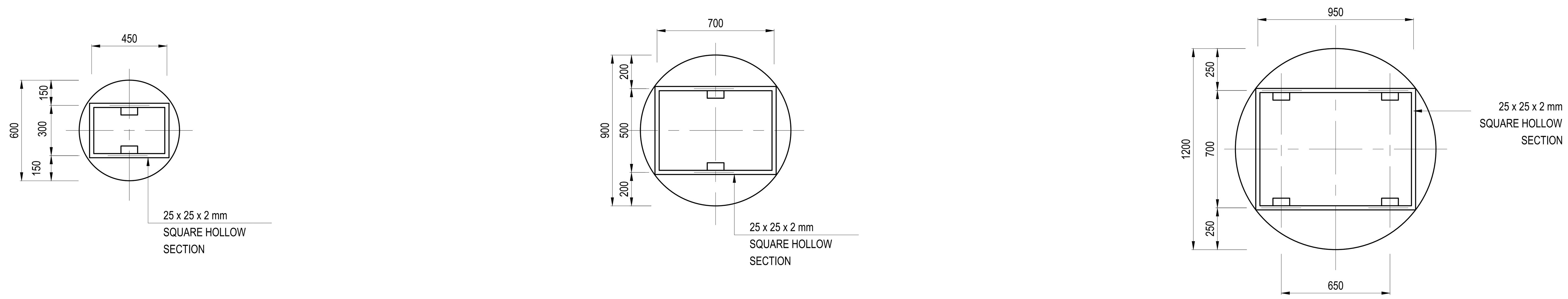


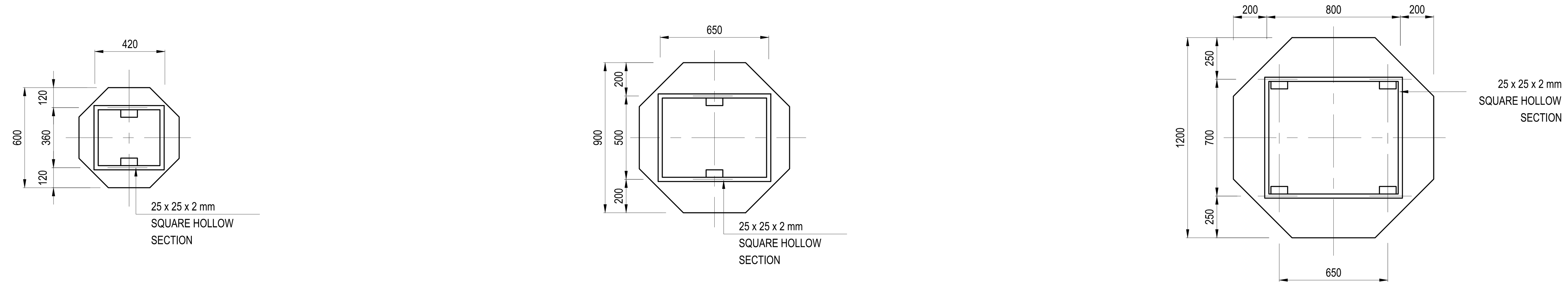
SINGLE SUPPORT

SINGLE SUPPORT

DOUBLE SUPPORT

REINFORCEMENT FOR CIRCULAR ROAD SIGNS

SCALE 1 : 20



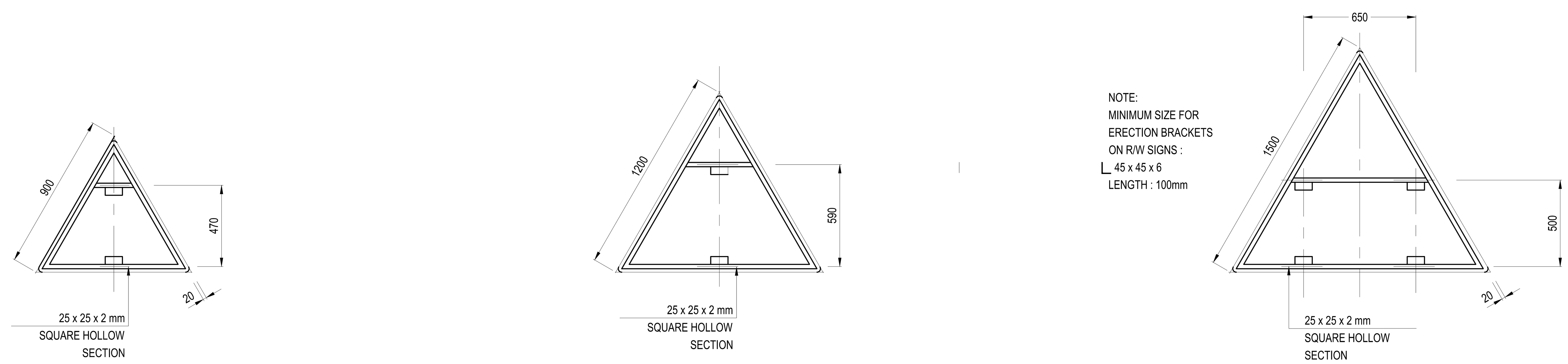
SINGLE SUPPORT

SINGLE SUPPORT

DOUBLE SUPPORT

REINFORCEMENT FOR STOP SIGNS

SCALE 1 : 20



SINGLE SUPPORT

SINGLE SUPPORT

DOUBLE SUPPORT

REINFORCEMENT FOR TRIANGULAR ROAD SIGNS

SCALE 1 : 20

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

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

NOTES :

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

1. DETAILS ON THIS DRAWING ARE APPLICABLE TO ROAD SIGNS SMALLER THAN 1,5m² REQUIRING DOUBLE / SINGLE SUPPORTS.

2. 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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ROAD SIGNS, ATTACHMENT AND FIXING 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	005	C	000

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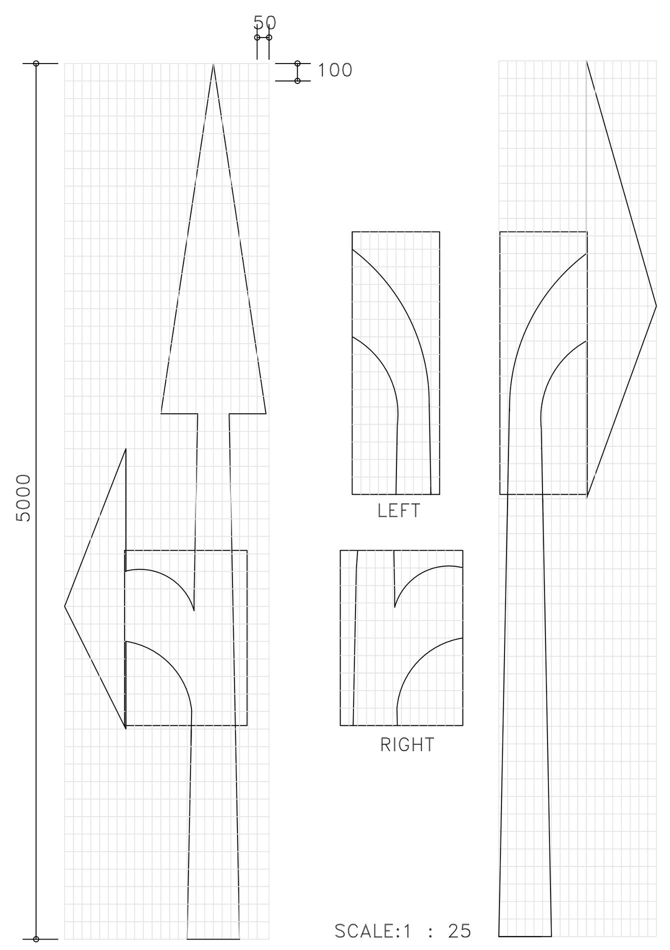
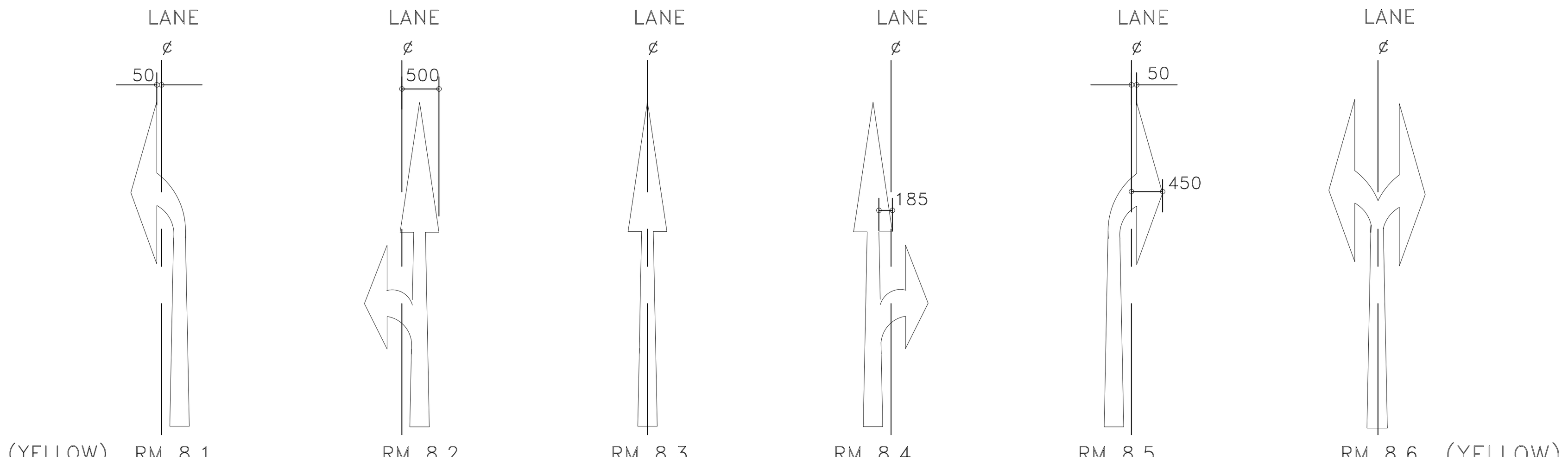


SCALE:1 : 25



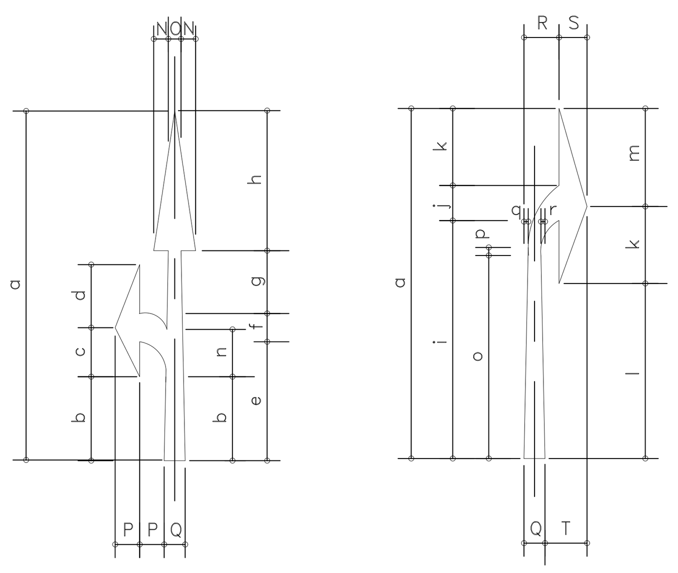
(YELLOW) (WHITE) RM 8.1 WM 7.1	RM 8.2 WM 7.2	RM 8.3 WM 7.3	RM 8.4 WM 7.4	RM 8.5 WM 7.5	RM 8.6 WM 7.6 (YELLOW) (WHITE)
LEFT TURN	STRAIGHT AHEAD AND LEFT TURN	STRAIGHT AHEAD	STRAIGHT AHEAD AND RIGHT TURN	RIGHT TURN	LEFT TURN AND RIGHT TURN

APPLICATIONS
SCALE: 1:50

DIMENSIONS (mm)

Operating Speed km/h	Typical Applications	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r
30 –40	City Centre	2500	600	350	450	884	200	417	1000	1700	250	550	1250	700	380	1450	58	30	29
50 – 90	Urban/Rural Expressway	4000	960	560	720	1406	320	666	1600	2720	400	880	2000	1120	608	2320	93	48	46
100 – 120	Rural and Freeways	5000	1200	700	900	1767	400	833	2000	3400	500	1100	2500	1400	760	2900	116	60	58
ALL	Special Applications	7500	1800	1050	1350	2651	600	1250	3000	5100	750	1650	3750	2100	1140	4350	174	90	87

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

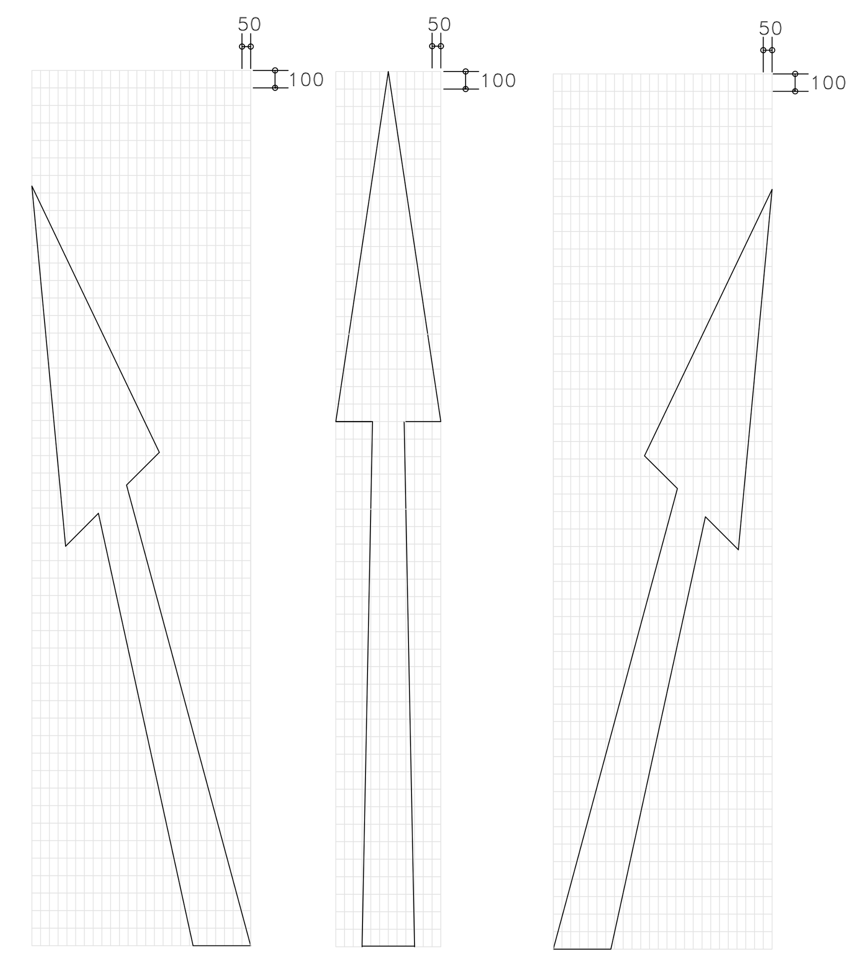


ARROW AREA / (m?)				
a	RM8.1/RM8.5 WM7.1/WM7.5	RM8.2/RM8.4 WM7.2/WM7.4	RM8.3 WM7.3	RM8.6 WM7.6
2500	0.67	0.89	0.66	1.03
4000	1.14	1.43	1.06	1.68
5000	1.45	1.78	1.32	2.12
7500	2.23	2.66	1.98	3.20

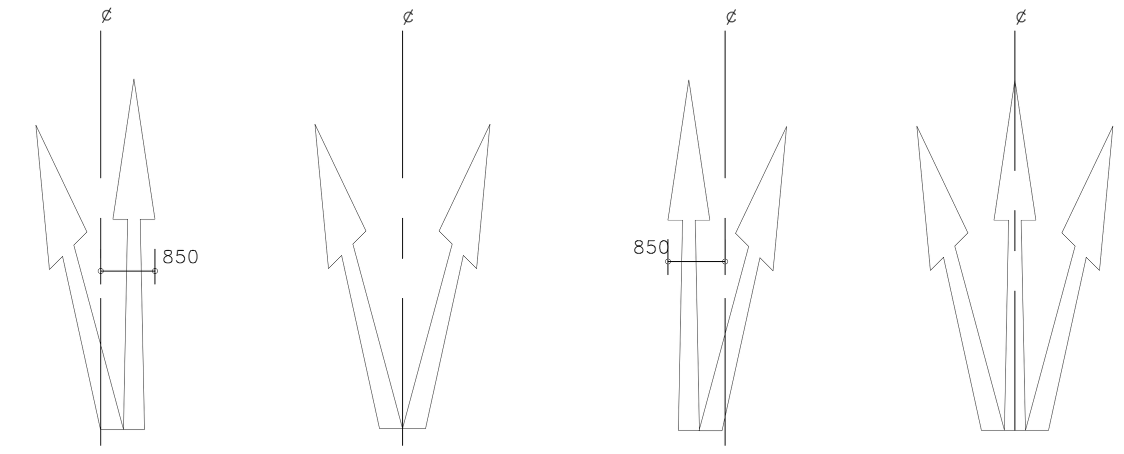
NOTES: (MANDATORY DIRECTION ARROWS)

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

MANDATORY DIRECTION ARROWS



SCALE:1 : 25



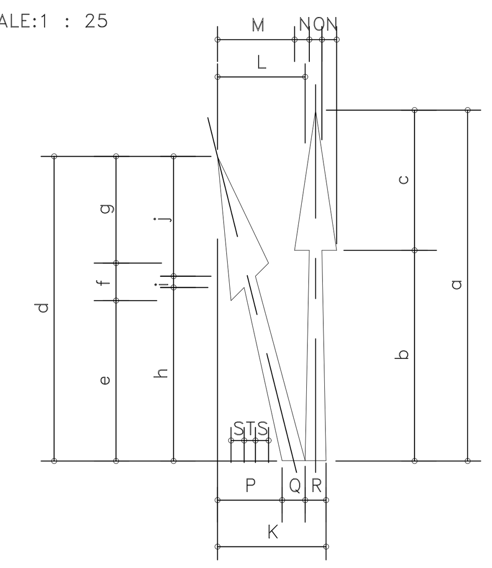
GM 3.1	GM 3.2	GM 3.3	GM 3.4
LANE ADDITION LEFT	LANE WIDENS TO TWO LANES	LANE ADDITION RIGHT	LANE ADDITIONS LEFT AND RIGHT

APPLICATIONS
SCALE 1 : 50

DIMENSIONS (mm)

Operating Speed km/h	Typical Applications	a	b	c	d	e	f	g	h	i	j
30 –40	City Centre	2500	1500	1000	2170	1141	268	761	1235	81	855
50 – 60	Urban Roads	4000	2400	1600	3472	1826	429	1218	1976	129	1367
70 – 90	Urban Arterial Roads/ Rural Expressways	5000	3000	2000	4340	2282	536	1522	2470	161	1709
100 – 120	Rural Roads and Freeways	7500	4500	3000	6510	3423	804	2283	3705	242	2564

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

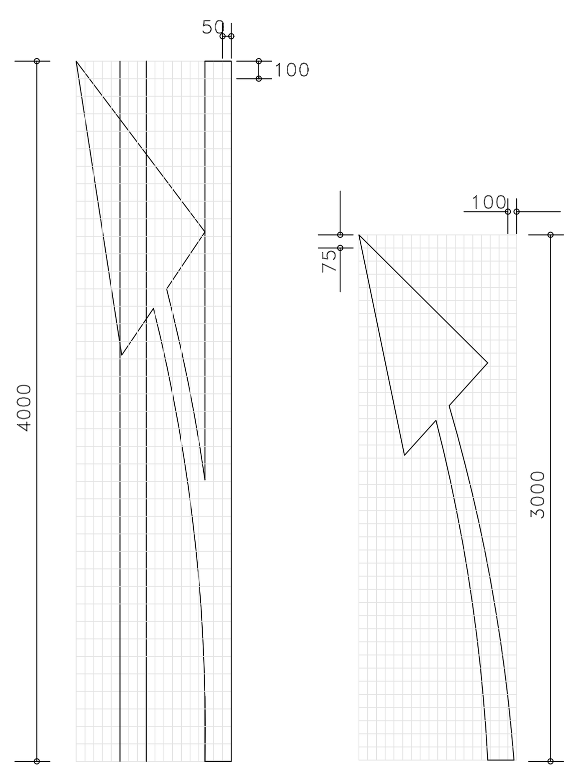


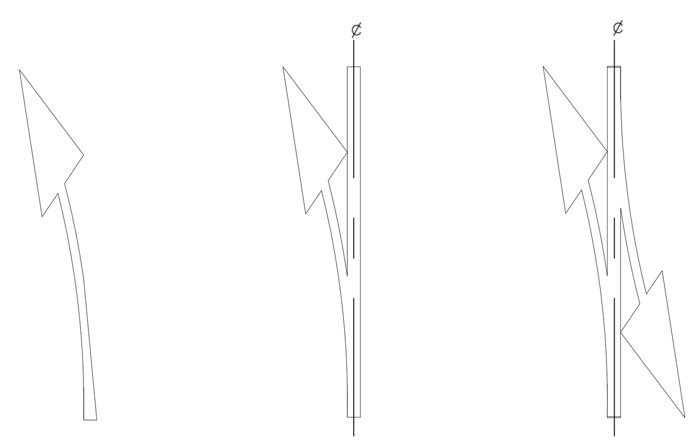
NOTES: (FURCATION ARROWS)

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

ARROW AREA / (m?)			
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





WM 8	WM 8.1	WM 8.2
BARRIER LINE AHEAD	BARRIER LINE AHEAD	BARRIER LINE AHEAD FROM BOTH DIRECTIONS

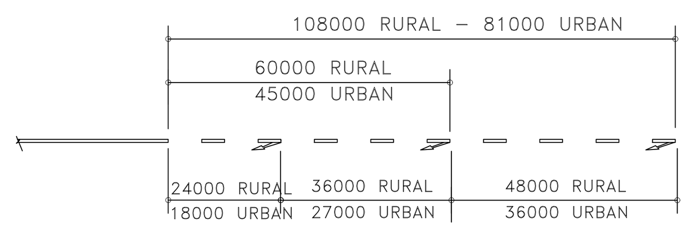
APPLICATIONS
SCALE 1 : 50

LEGEND:
R = RED
W = WHITE
Y = YELLOW

DIMENSIONS (mm)

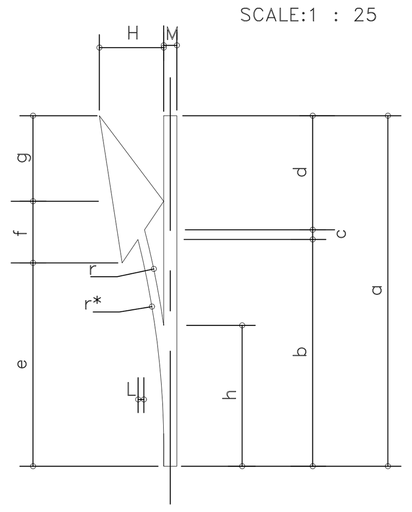
Typical Applications	a	b	c	d	e	f	g	h	r	r*
Urban	3000	1941	83	976	1741	528	731	1206	5620	5820
Rural	4000	2588	111	1301	2321	704	975	1608	9900	10000

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



MARKING SPACING

SCALE:1 : 25

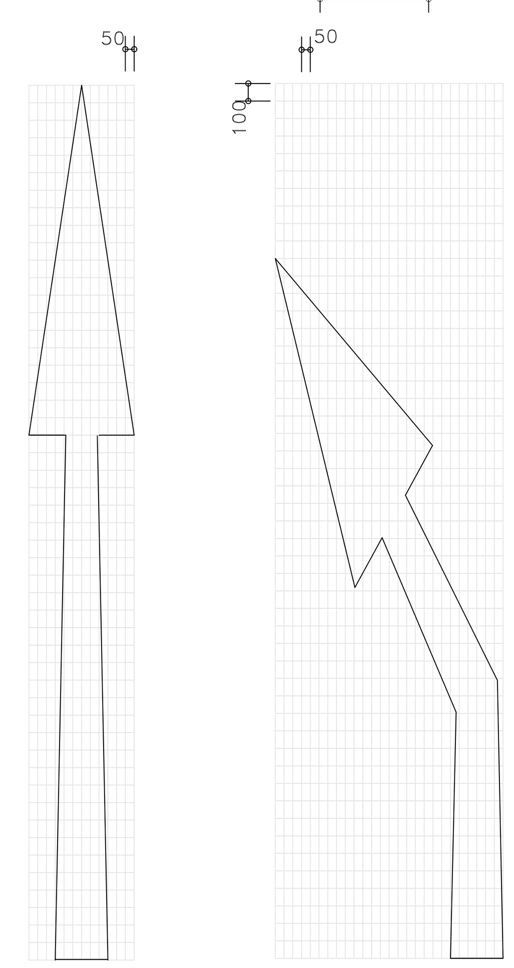


NOTES: (BARRIER LINE AHEAD ARROWS)

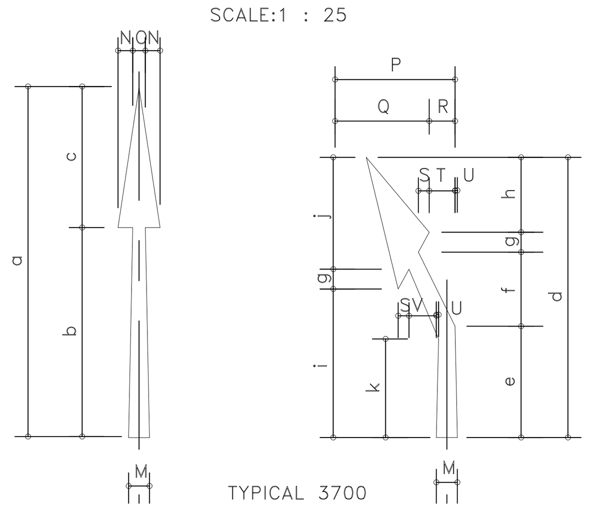
1. THESE ARROWS SHOULD BE USED IN MULTIPLES OF THREE (AT LEAST) IN ADVANCE OF THE START OF A SECTION OF NO OVERTAKING LINE , NO CROSSING LINE OR PAINTED ISLAND WHEN SUCH BARRIER LINES REPLACE A DIVIDING LINE.
2. THE ARROWS MAY BE MARKED ON TOP OF EXISTING DIVIDING LINE MARKINGS (IF THE EXISTING LINE 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.

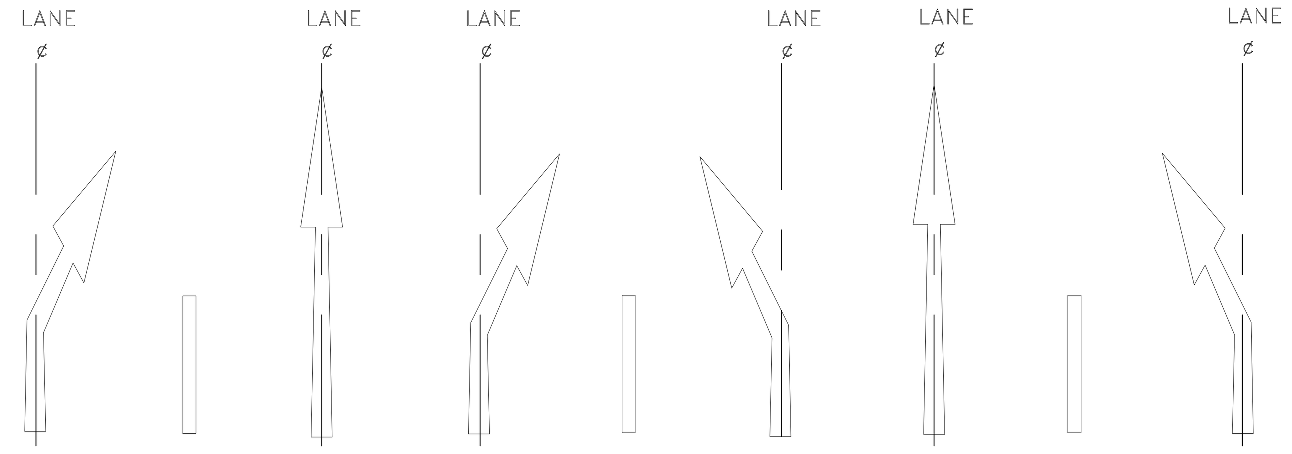
ARROW AREA / (m?)	
a	Per Arrow
3000	0.62
4000	0.82

BARRIER LINE AHEAD ARROWS



SCALE:1 : 25





WM 6.1	WM 6.2	WM 6.3
FROM THE LEFT	FROM BOTH SIDES	FROM THE RIGHT

APPLICATIONS
SCALE 1 : 50

DIMENSIONS (mm)

Operating Speed km/h	Typical Applications	a	b	c	d	e	f	g	h	i	j	k
30 –40	City Centre	4000	2400	1600	3200	1271	847	227	855	1696	1277	1126
50 – 60	Urban Roads	5000	3000	2000	4000	1589	1058	284	1069	2120	1596	1407
70 – 90	Urban Arterial Roads/ Rural Expressways	7500	4500	3000	6000	2384	1587	426	1603	3180	2394	2111
100 – 120	Rural Roads and Freeways	12000	7200	4800	9600	3814	2539	681	2566	5089	3830	3377

All Operating Speeds and Applications	M	N	O	P	Q	R	S	T	U	V
	300	210	180	1300	898	402	155	370	32	390

NOTES: (LANE REDUCTION ARROWS)

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

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

LANE REDUCTION ARROWS

FOR TENDER

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EMPLOYER'S PROJECT MANAGER DATE

CONTRACT No.: BM22/22/23-02

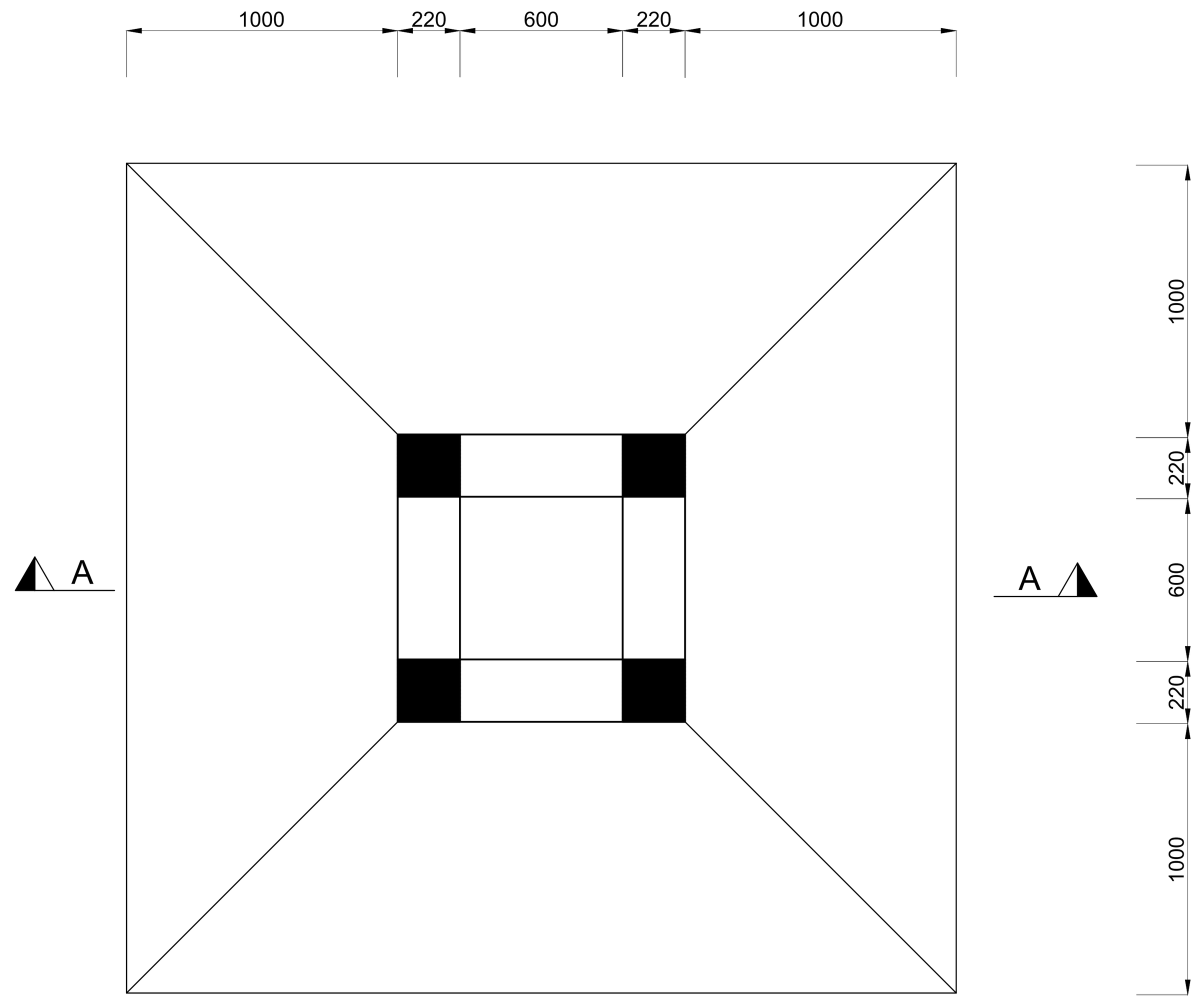
PROJECT NAME:
CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL

DRAWING TITLE:
ROAD MARKINGS DETAILS

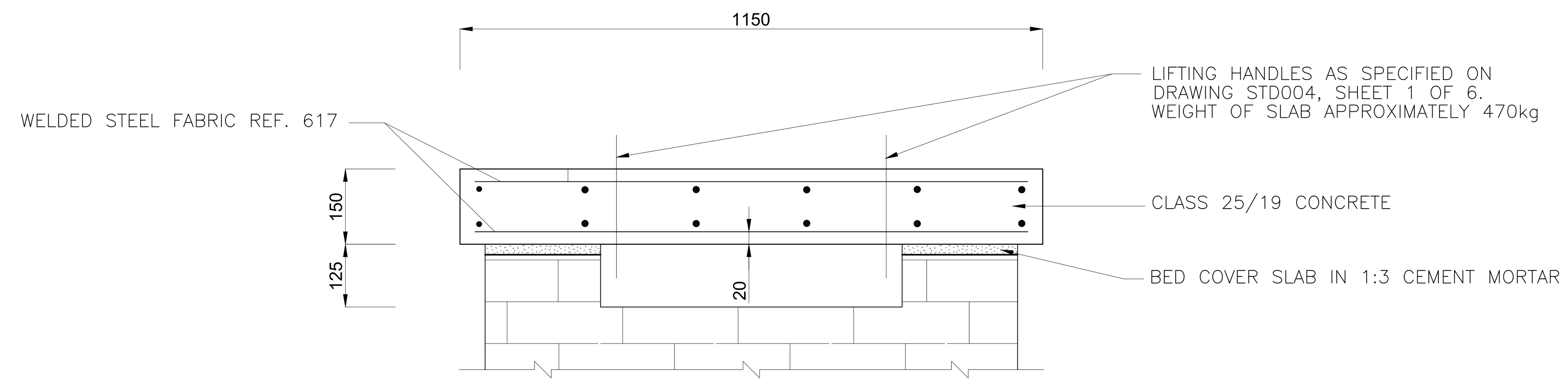
SHEET 1 OF 1

DRAWING SCALE
AS SHOWN

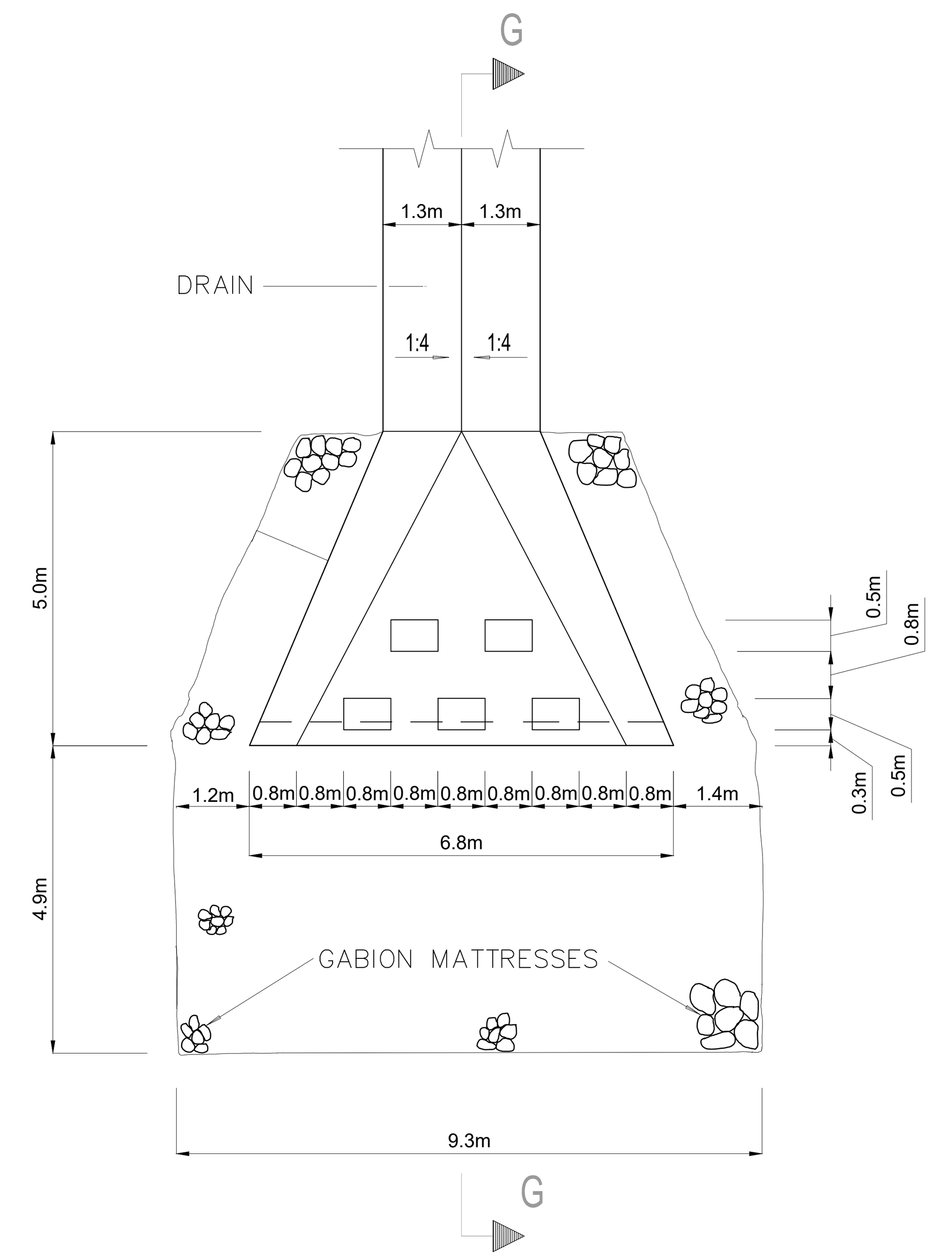
CONSULTANTS DRAWING No.:
PROJECT No. | DISCIPLINE | SUB-DISCIPLINE | DWG No. | STAGE | REV No.
S35.4 – RD – STD – 006 – C – 000
PD PRELIMINARY DESIGN / DD DETAILED DESIGN / T TENDER / C CONSTRUCTION / A AS-BUILT / I FOR INFORMATION ONLY



PLAN OF FIELD INLET (Without cover slab)

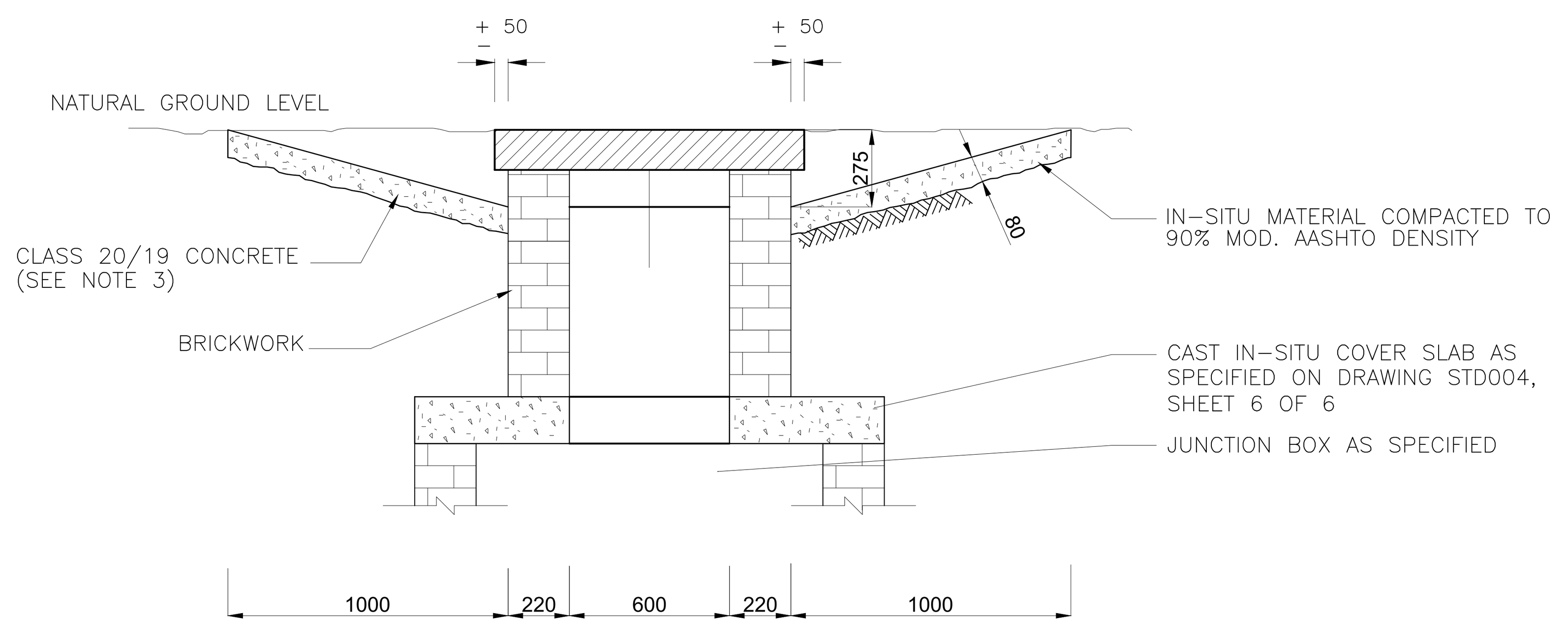


DETAIL OF PRECAST COVER SLAB

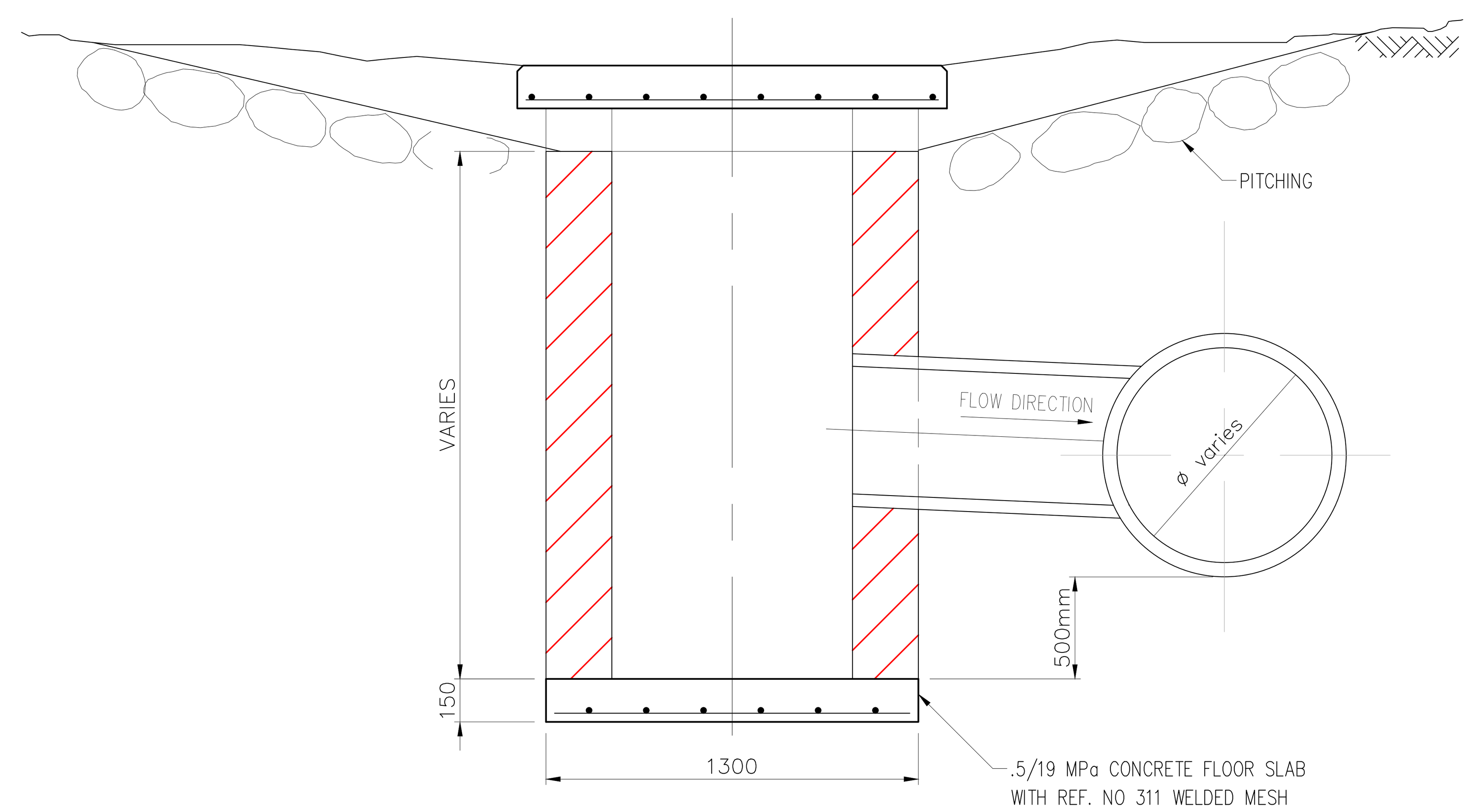


ENERGY BREAKER

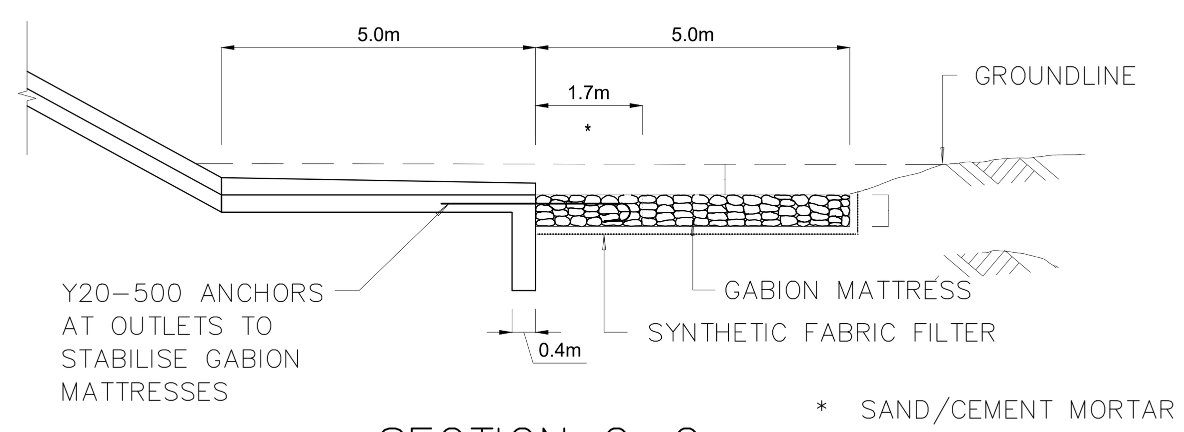
1: 40



SECTION A-A



FIELD INLET – DETAILS



SECTION G–G

1:40

* SAND/CEMENT MORTAR TO SECURE ANCHORS

FOR TENDER

No	DATE	REVISION	CONSULT	DIR
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EMPLOYER'S PROJECT MANAGER — DATE

CONTRACT No.: BM22/22/23-02

PROJECT NAME:

CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD 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

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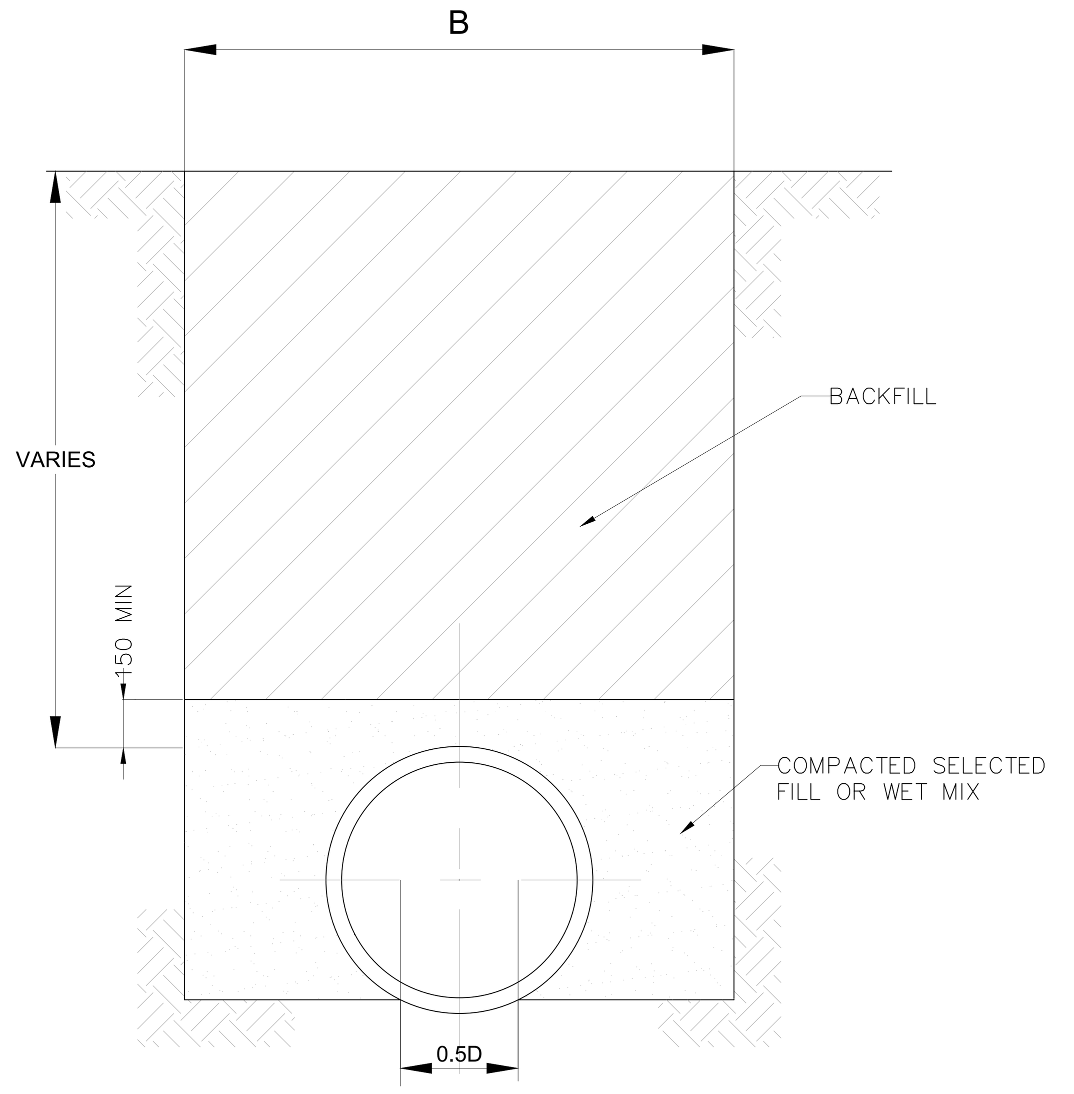
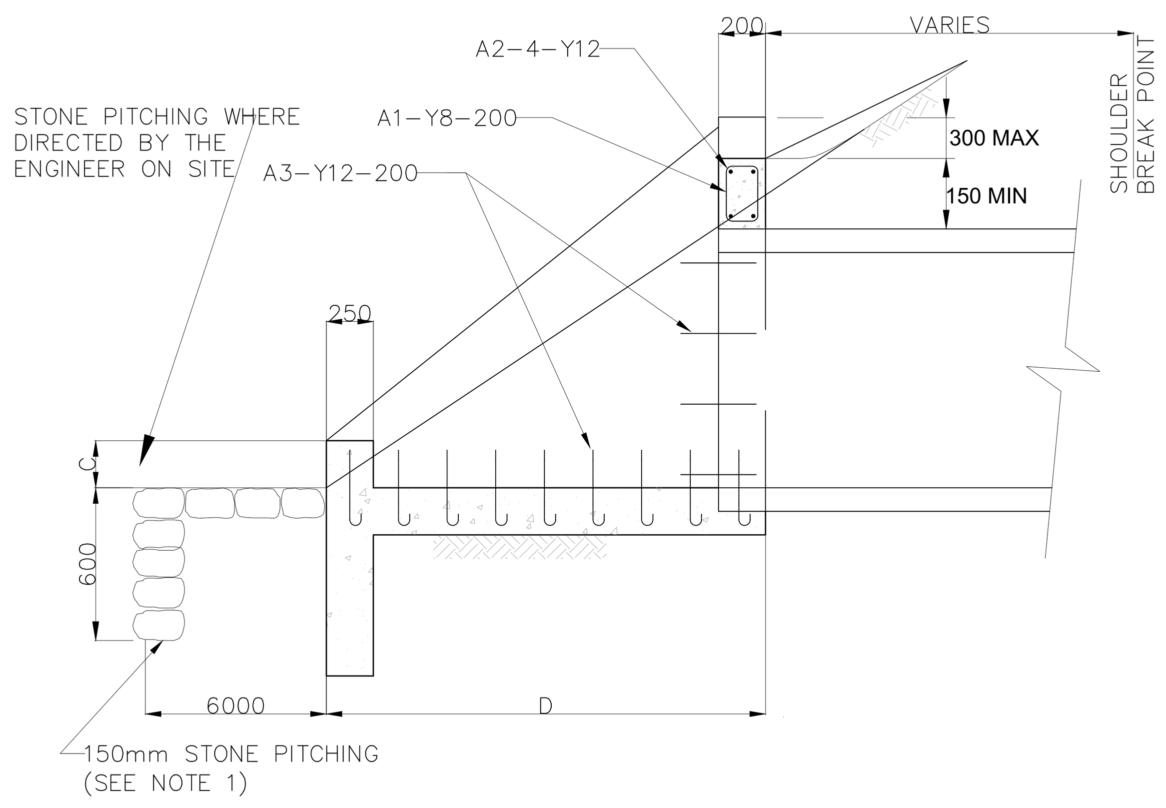


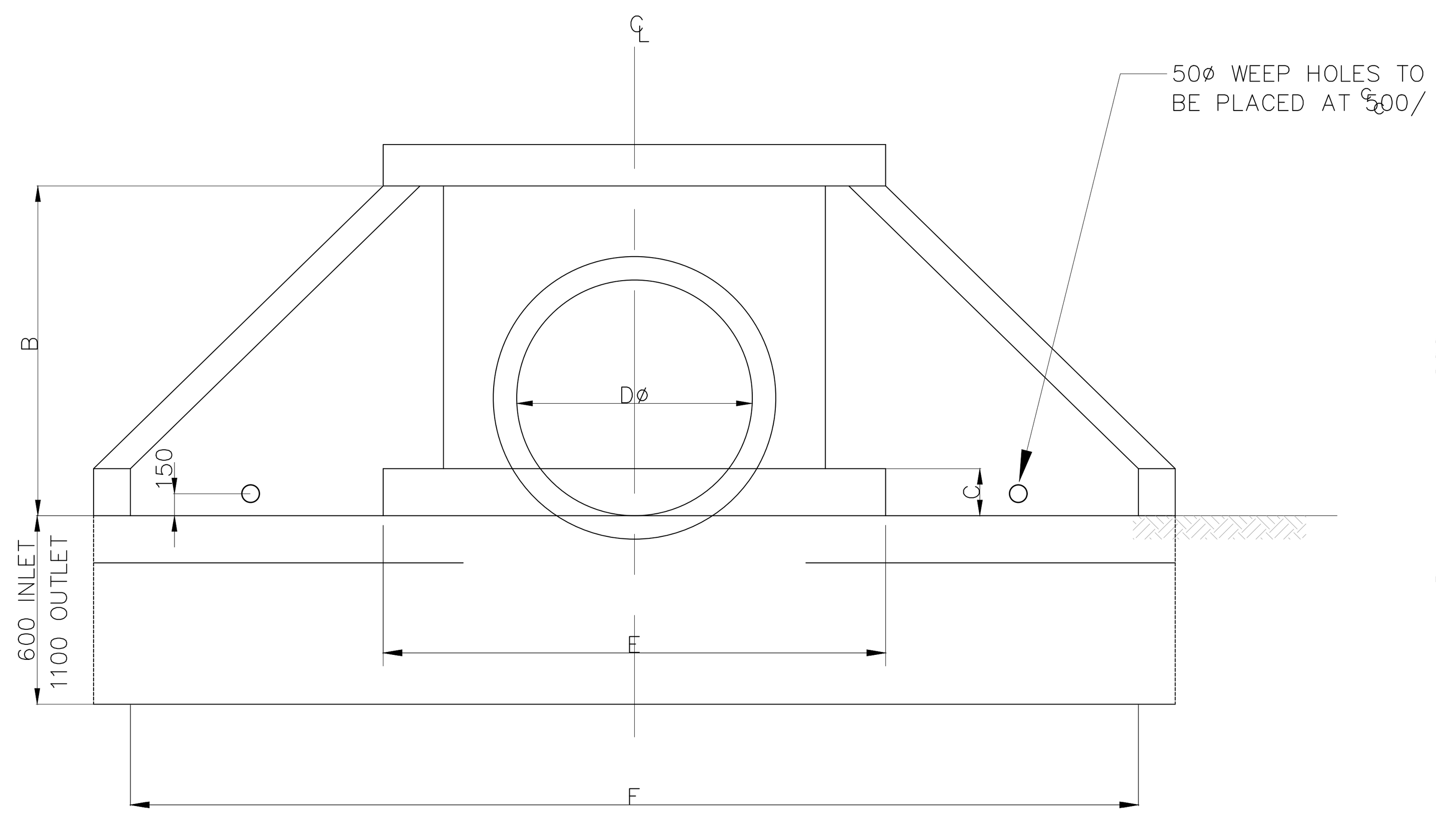
CLASS C PIPE BEDDING IN SOIL

SCALE 1:20



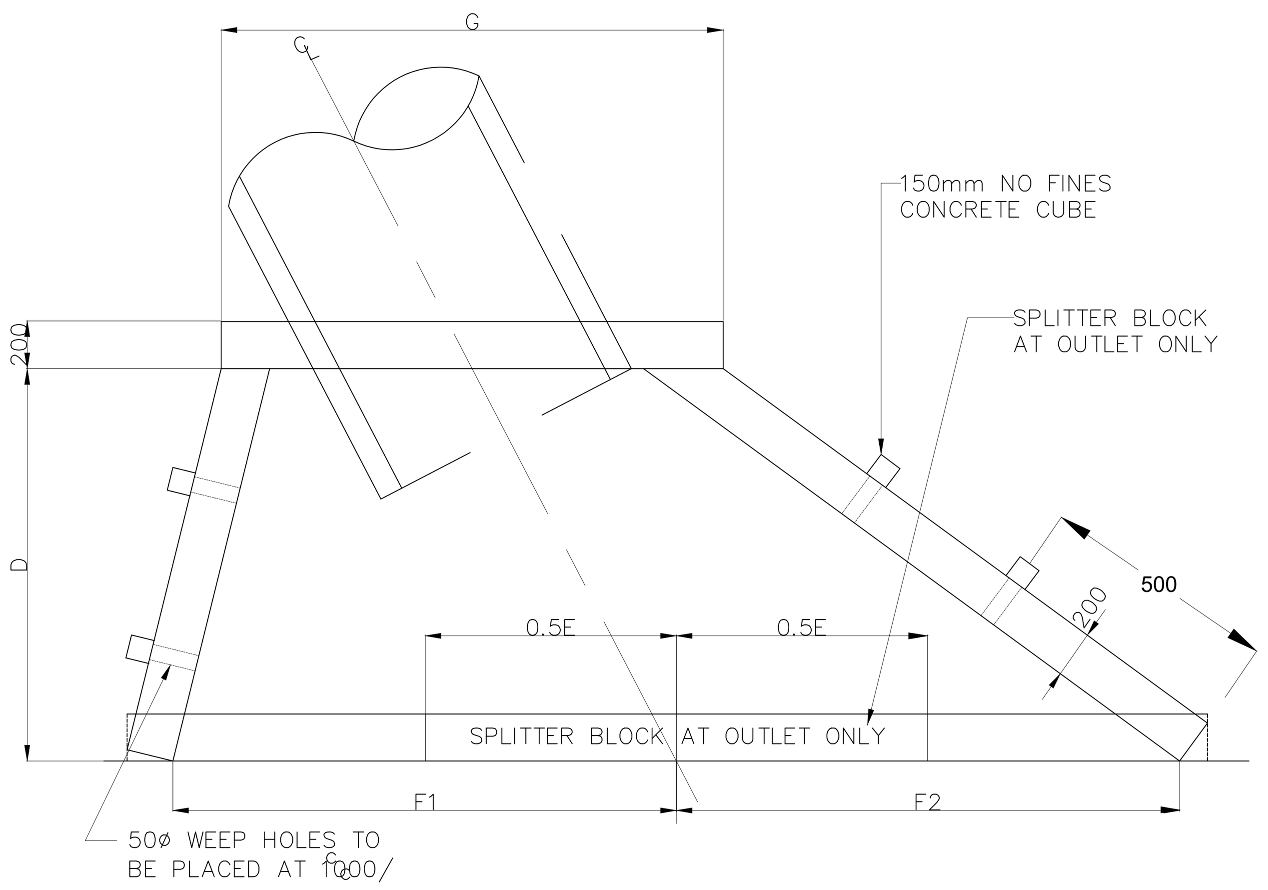
SECTION A-A

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



FRONT ELEVATION - SINGLE PIPE

(FOR DIMENSIONS SEE TABLE 1)
SCALE 1:20

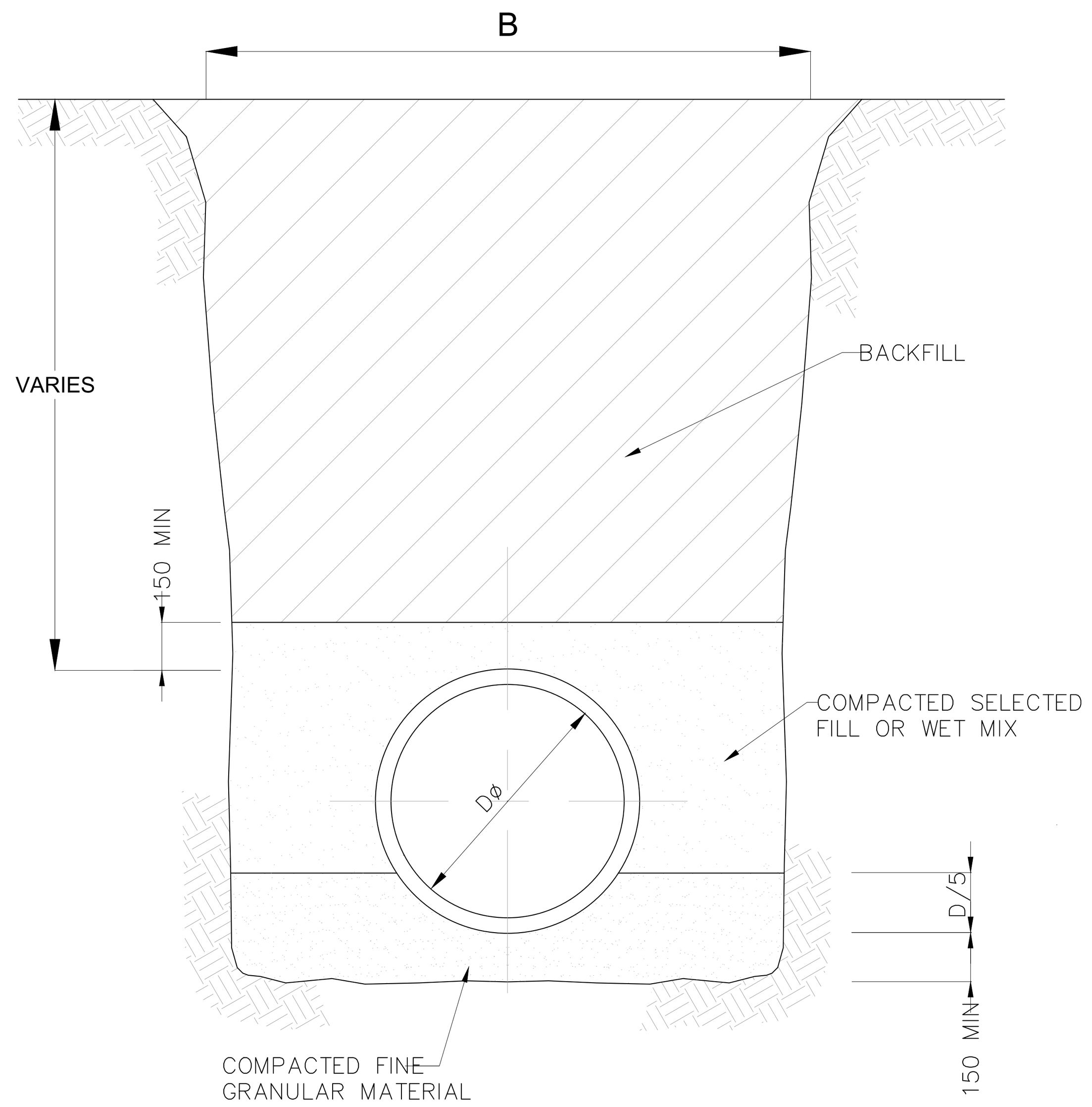


SKEW PIPE CULVERT

(FOR DIMENSIONS SEE TABLE 3)
SCALE 1:20

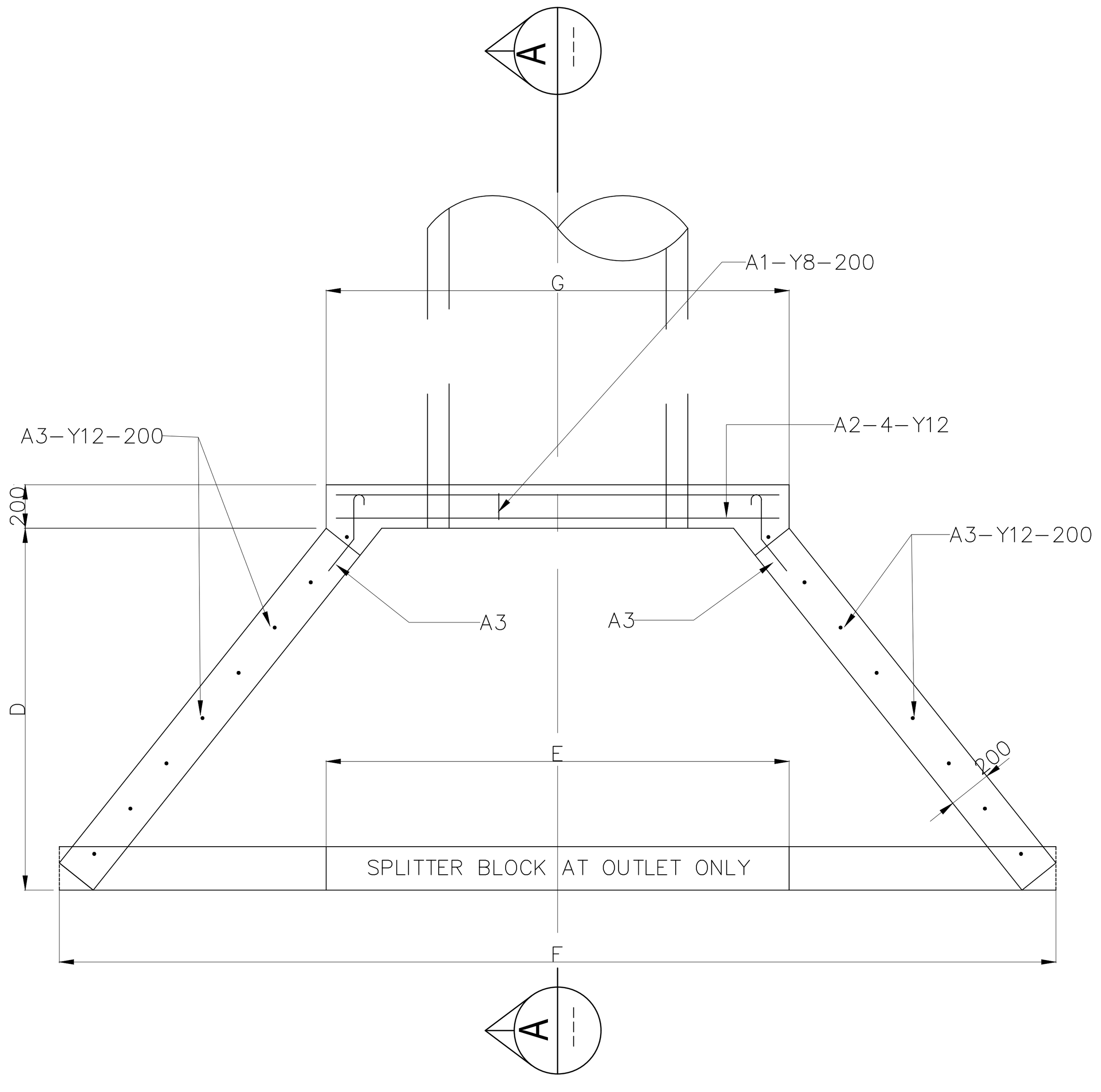
TABLE 3

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



CLASS C PIPE BEDDING IN ROCK

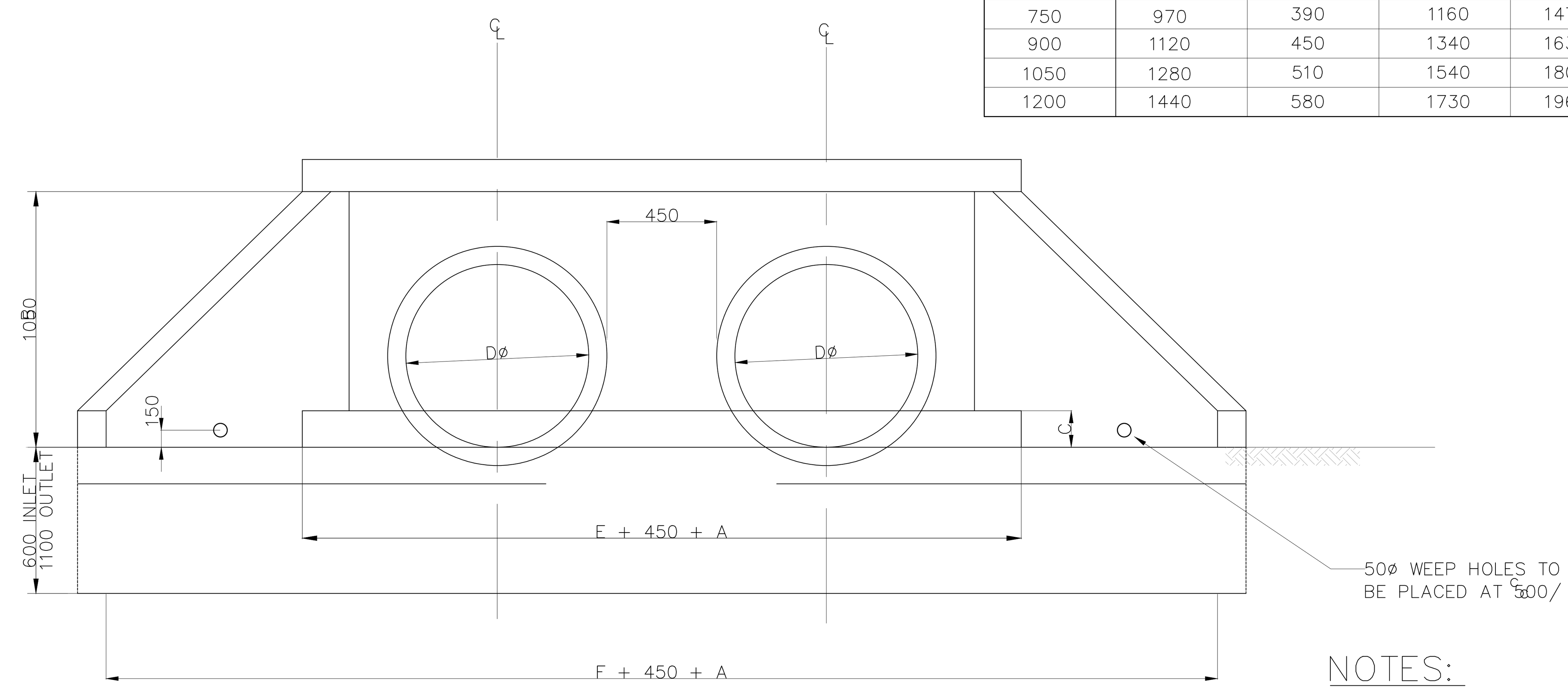
SCALE 1:20



PLAN

SCALE 1:20

(FOR DIMENSIONS SEE TABLE 1)
(FOR REINFORCEMENT SEE TABLE 2)



FRONT ELEVATION - MULTIPLE PIPES

(FOR DIMENSIONS SEE TABLE 1)
SCALE 1:20

NOTES:

1. INLET/OUTLET APPROACHES IN FILL CONDITION TO BE STONE PITCHED WHERE EROSION IS LIKELY TO OCCUR.
2. SPLITTER BLOCK MAY BE OMITTED IF DISCHARGE VELOCITY IS LESS THAN 1.50m/s AND PROVIDED AT OUTLETS ONLY.
3. CUT OFF WALLS MAY BE OMITTED IF STRUCTURE IS FOUNDED ON ROCK.
4. 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
5. FOR SKEW PIPE CULVERTS THE HEADWALL SHALL BE PARALLEL TO THE CENTER LINE OF THE ROAD.
6. 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.
7. ALL CONCRETE TO BE 20MPa. MIN COVER TO STEEL IS 40mm UNLESS OTHERWISE STATED.
8. SQUARE MESH FABRIC (REFERENCE S.M.F 311) TO BE PLACED CENTRALLY
9. DIMENSIONS IN TABLE 1 AND 3 ARE AS PER MANUFACTURING STANDARD OF ROCLA PIPE CULVERT TYPE SC TO SABS .

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

PIPE BEDDING DETAILS

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

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

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CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL

DRAWING TITLE:

HEADWALL AND BEDDING 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	008	C	00

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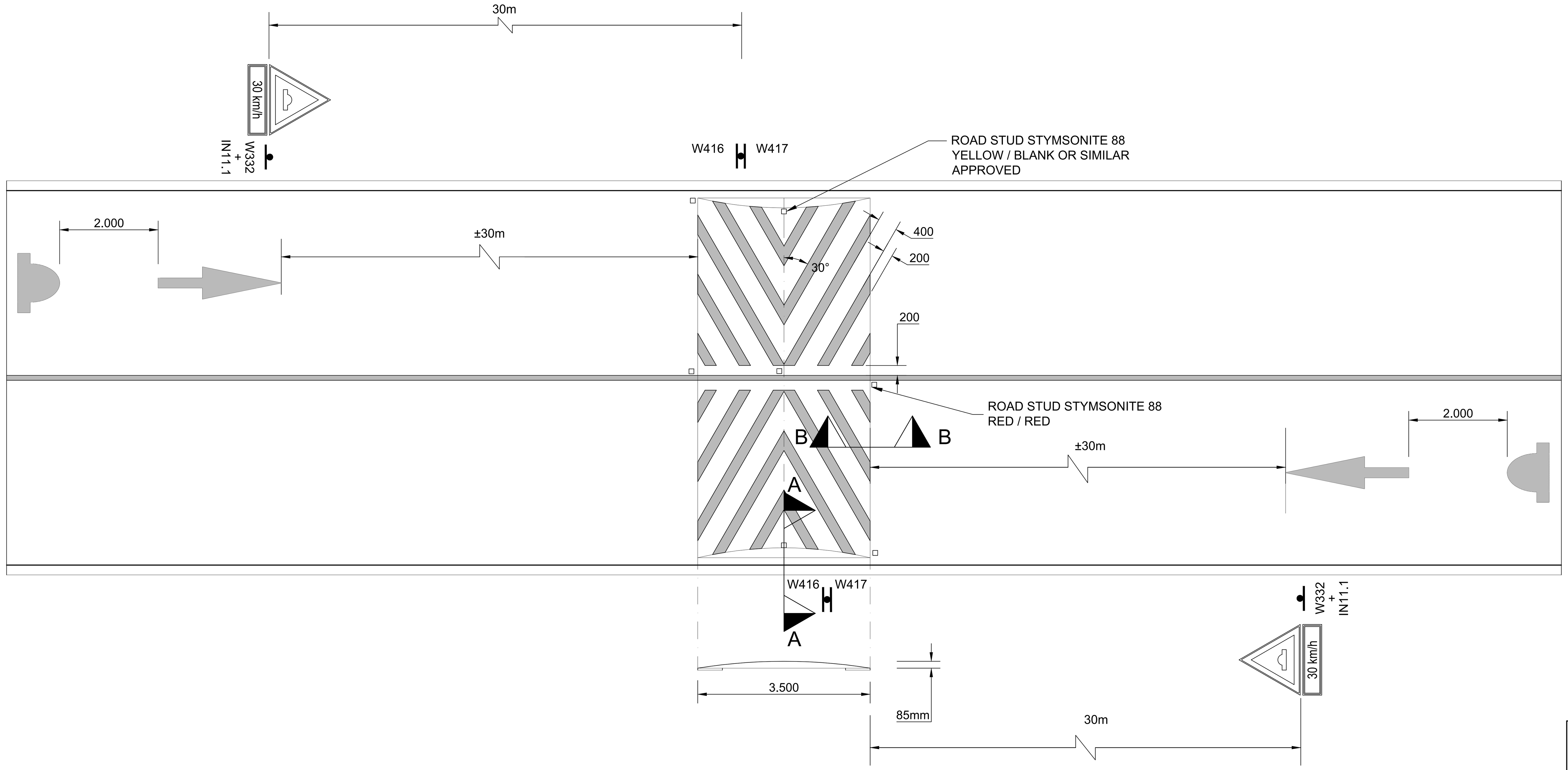
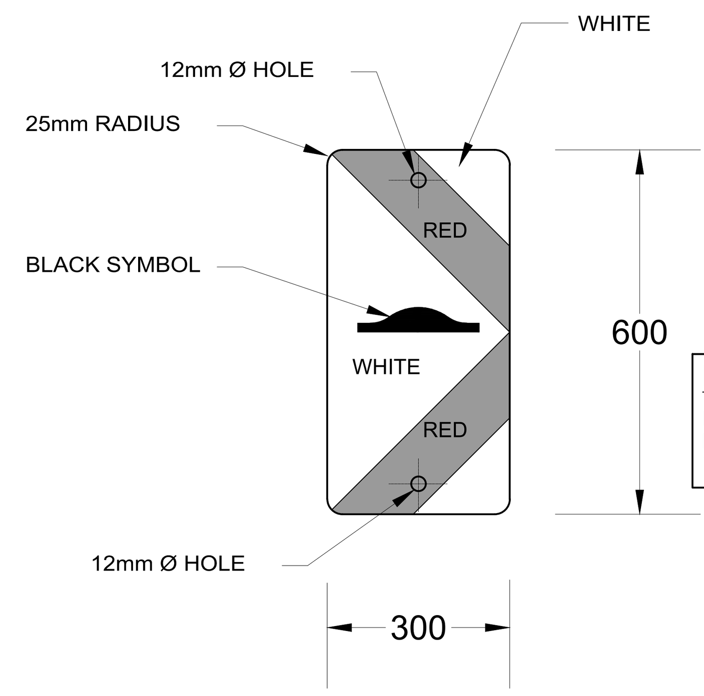


PLAN OF SPEED HUMP

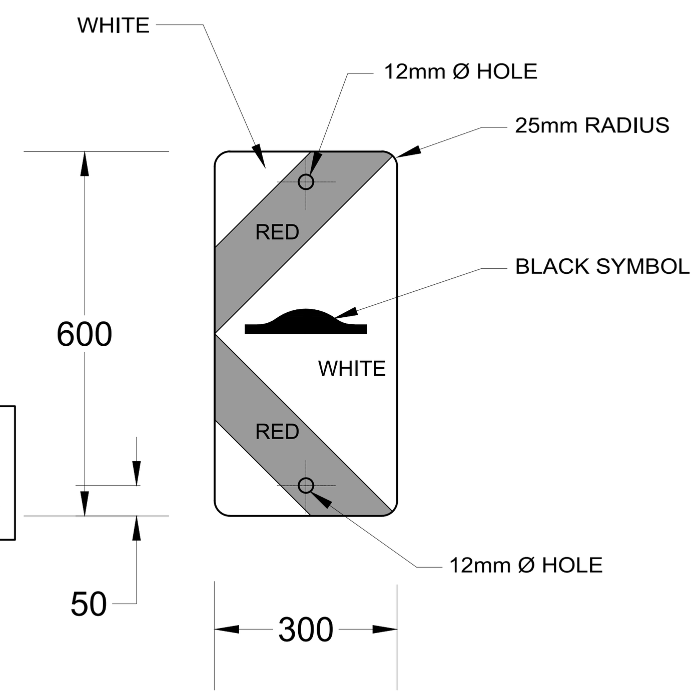
SCALE 1:100



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

DANGER PLATE SPEEDHUMP (LEFT)
W416

SCALE 1:10



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

DANGER PLATE SPEEDHUMP (RIGHT)
W417

SCALE 1:10

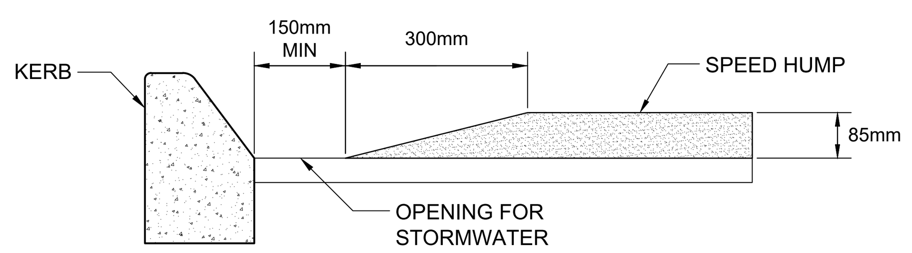
NOTES

CONSTRUCTION METHOD:

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

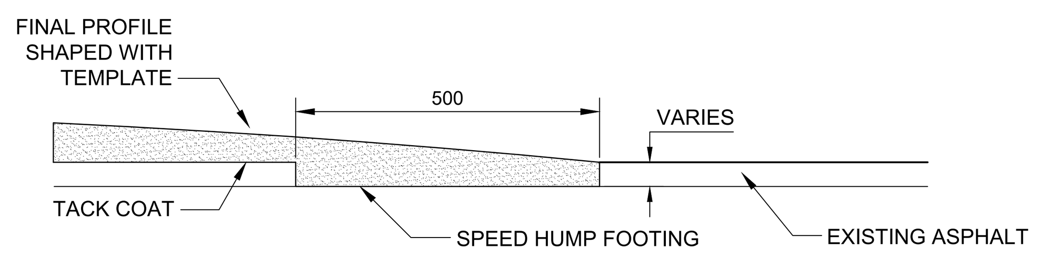
ON CONSTRUCTION DAY:

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.

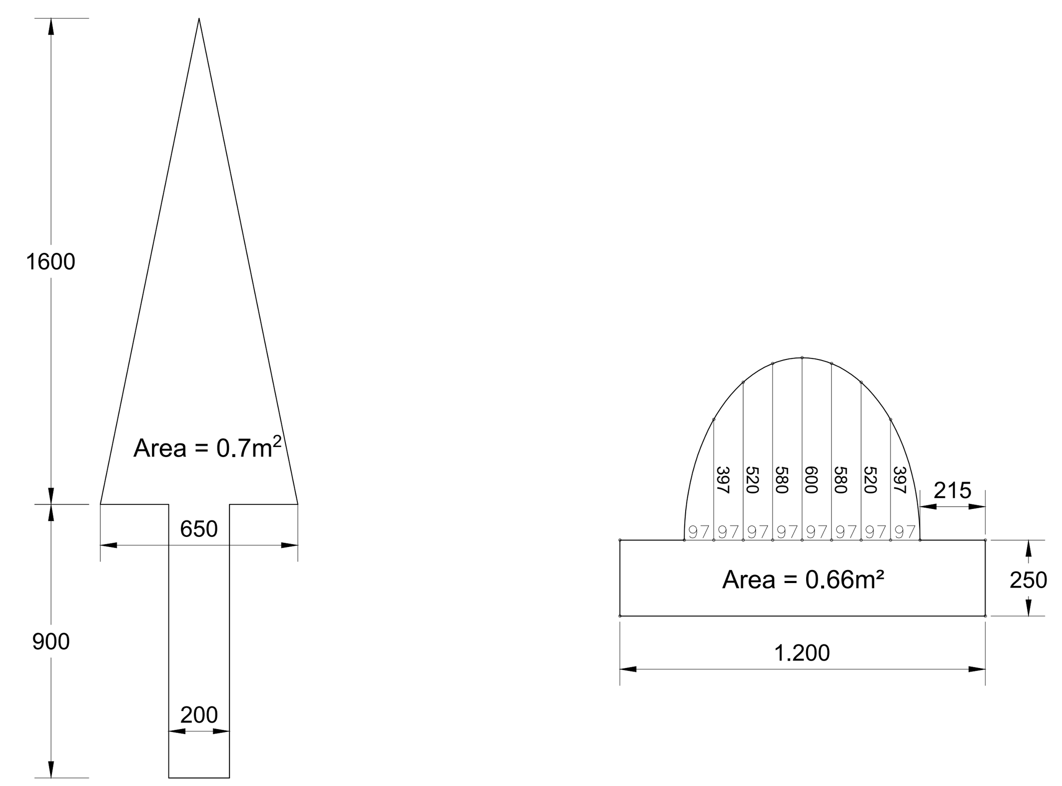


SECTION A-A:
CONSTRUCTION DETAIL OF SPEED HUMP

SCALE 1: 100

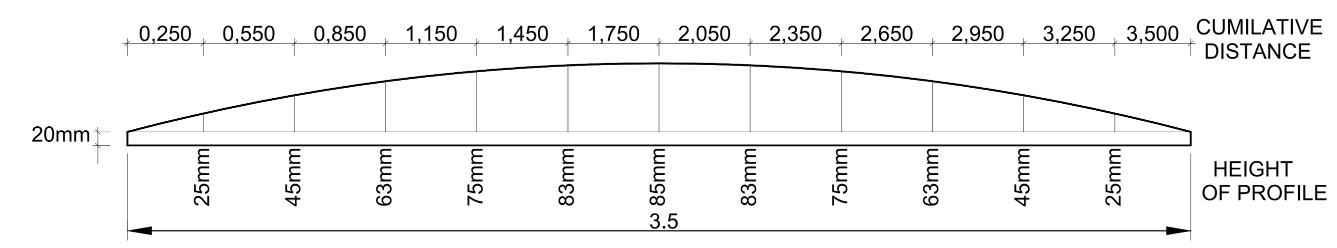


SECTION B-B:
CONSTRUCTION DETAIL OF SPEED HUMP

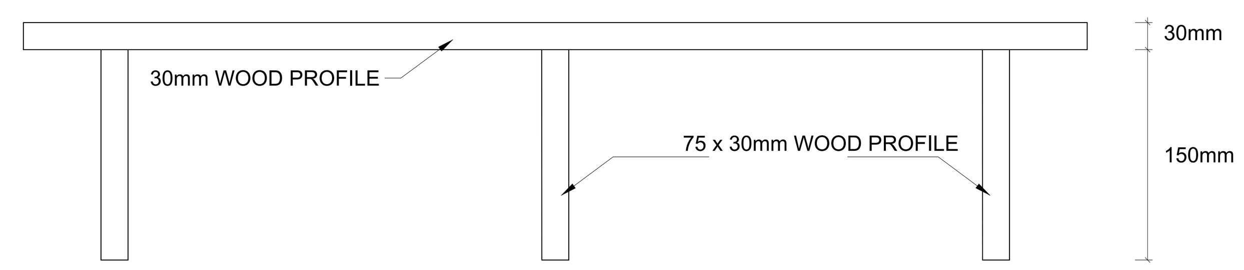


DETAIL OF SPEED HUMP ROAD MARKING

SCALE 1: 20



SIDE ELEVATION



PLAN

TEMPLATE DETAIL FOR CONSTRUCTION OF SPEED HUMP

SCALE 1: 20

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DRAWING TITLE:

SPEED HUMP DETAILS

SHEET 1 OF 1

DRAWING SCALE
AS SHOWN

CONSULTANTS DRAWING No.:

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S35.4	RD	STD	009	C	00

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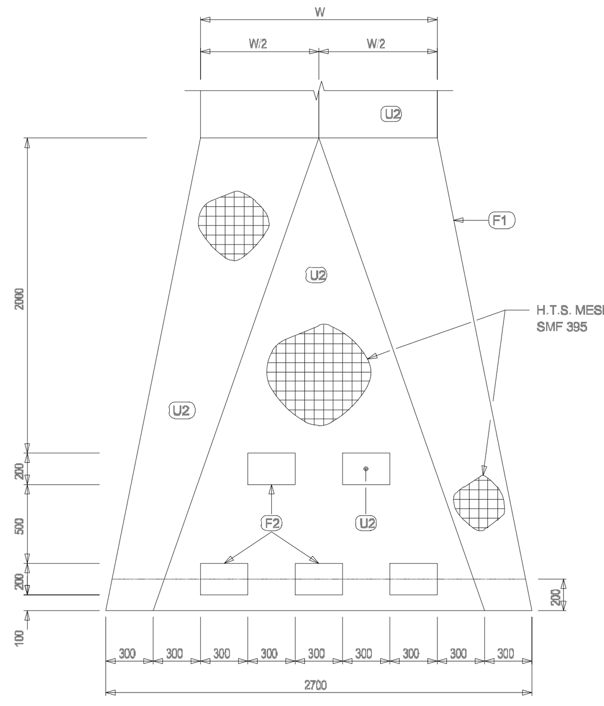
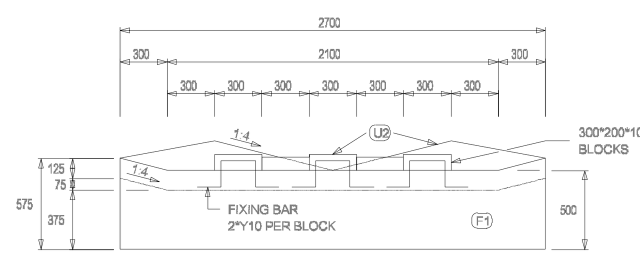
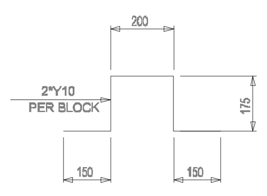


PLAN OF ENERGY BREAKER
SCALE 1:20

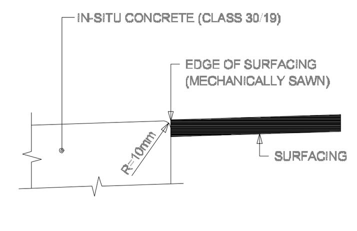


FRONT ELEVATION OF ENERGY BREAKER
SCALE 1:20

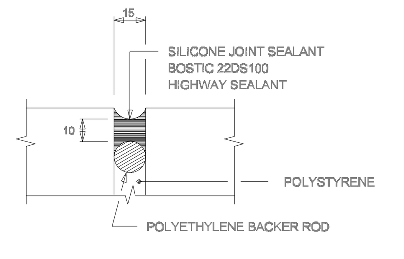


FIXING BAR
SCALE 1:10

DETAIL OF ENERGY BREAKER SYSTEM AT DISCHARGE POINT OF TYPE 'F' CONCRETE SIDE DRAIN

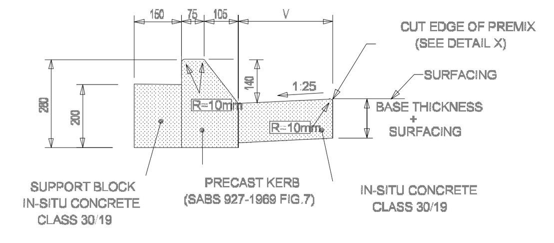


DETAIL X
SCALE 1:5

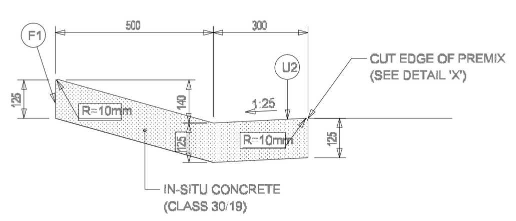


EXPANSION JOINT
SCALE : SCHEMATIC

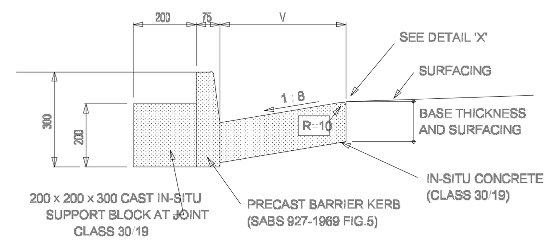
NOTE: EXPANSION JOINT EVERY 5th PANEL (10m)



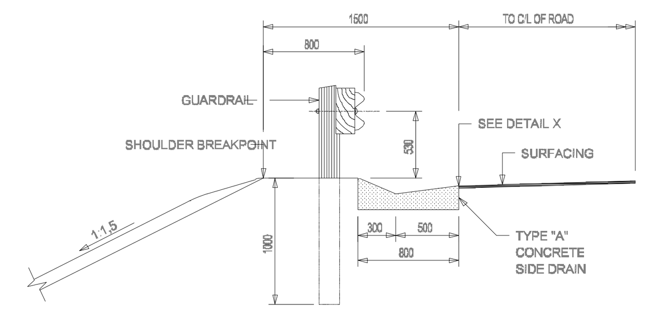
CROSS SECTION OF TYPE B SEMI MOUNTABLE KERB AT INTERSECTIONS
SCALE 1:10



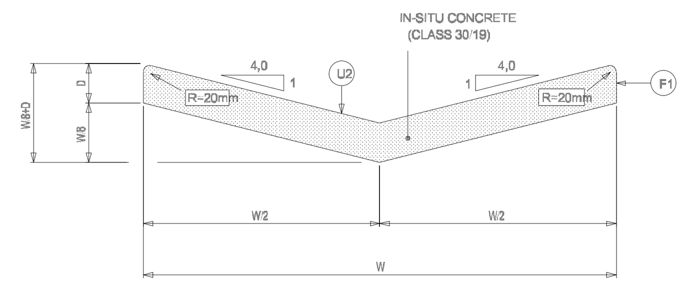
CROSS SECTION OF TYPE C MOUNTABLE KERB AT RURAL INTERSECTIONS
SCALE 1:10



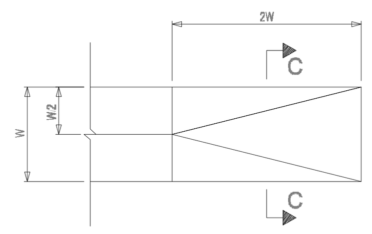
TYPE B1 KERB
SECTION THROUGH BARRIER KERB (FIG 5)
SCALE 1:10



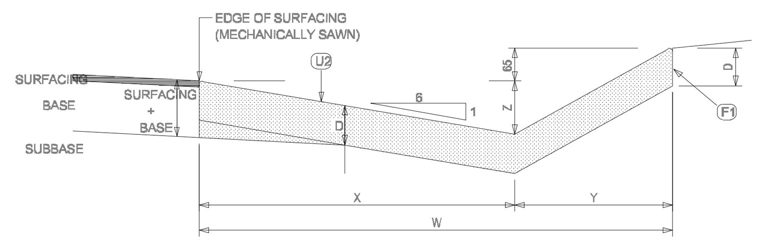
POSITION OF TYPE "A" CONCRETE SIDE DRAIN
SCALE 1:25



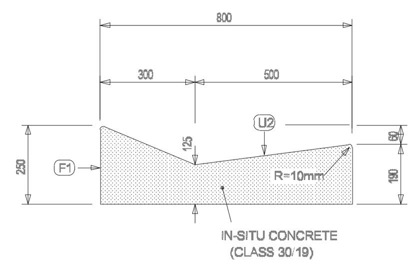
CROSS SECTION OF TYPE E CONCRETE CHANNEL IN OPEN DRAINS
SCALE : SCHEMATIC



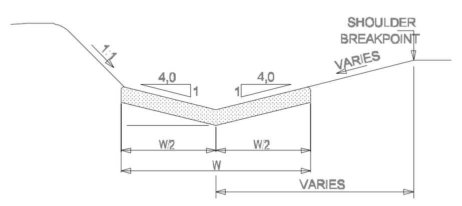
BEGINNING OF TYPE 'E' CONCRETE DRAIN
SCALE : SCHEMATIC



CROSS SECTION OF TYPE 'F' CONCRETE SIDE DRAIN IN CUTTINGS
SCALE : SCHEMATIC



CROSS SECTION OF TYPE "A"
CONCRETE SIDE DRAIN
SCALE 1:10

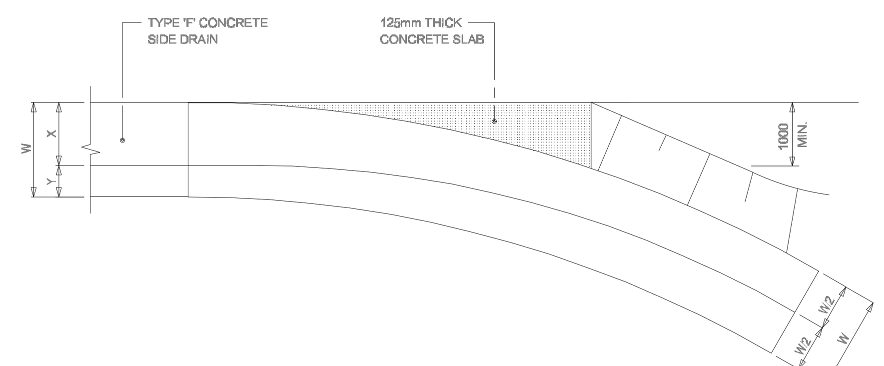


POSITION OF TYPE 'E' CONCRETE DRAIN
IN SHALLOW CUT
SCALE : SCHEMATIC

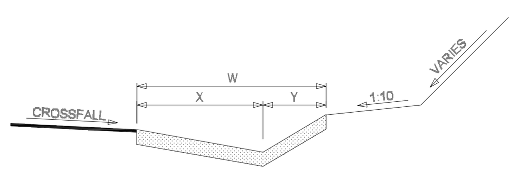
CASE(n)	W	W/2	W/8	D	W/8+D	VOLUME m^3/m
1	1000	500	125	125	250	0,1250
2	1500	750	188	125	313	0.1875
3	2000	1000	250	150	400	0.3000
4	2500	1250	313	150	463	0.3750

DIMENSIONS OF TYPE E CONCRETE CHANNELS

SECTION C-C
SCALE 1:50



DETAIL OF TRANSITION AT TYPE 'F' CONCRETE SIDE DRAIN
SCALE : SCHEMATIC



POSITION OF TYPE 'F' CONCRETE SIDE DRAIN
SCALE : SCHEMATIC

CASE(n)	W	X	Y	Z	D	VOLUME m^3/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

DIMENSIONS OF TYPE F CONCRETE CHANNELS

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)

ORIGINAL SCALE 1 : 100

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CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL

DRAWING TITLE:
DRAIN DETAILS

SHEET 1 OF 1

DRAWING SCALE
AS SHOWN

CONSULTANTS DRAWING No.:

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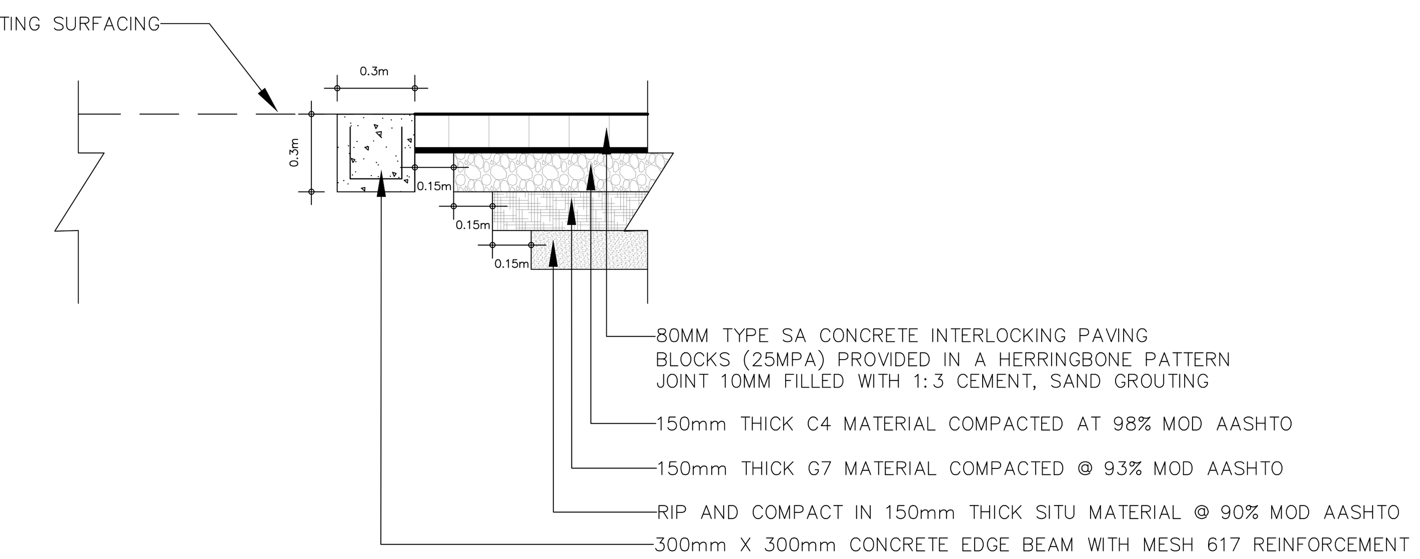
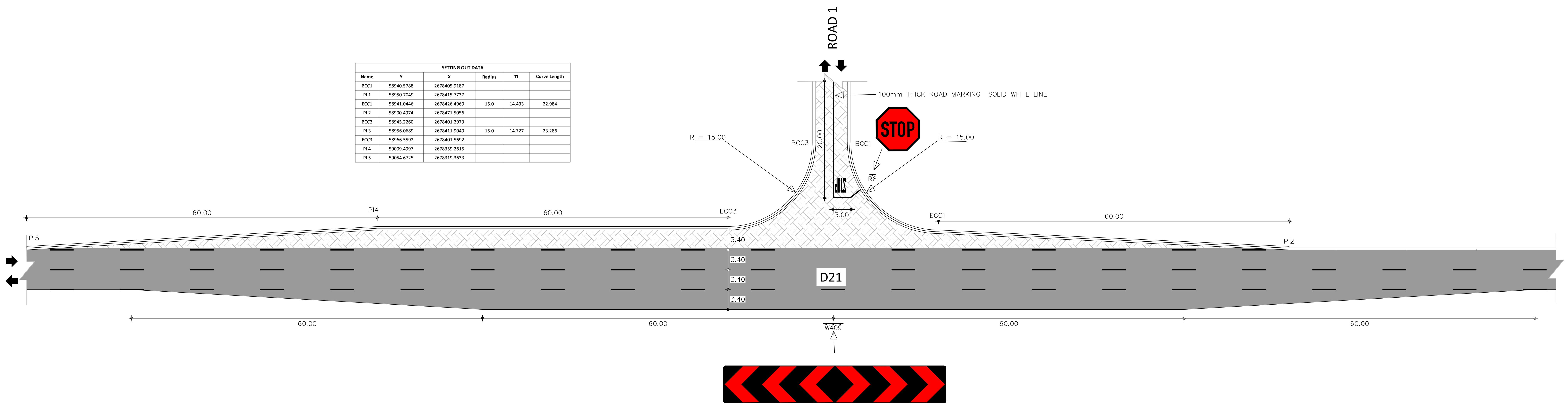


TYPICAL STRUCTURAL JOINT DETAIL

SETTING OUT DATA					
Name	Y	X	Radius	TL	Curve Length
BCC1	58940.5788	2678405.9187			
PI 1	58950.7049	2678415.7737			
ECC1	58941.0446	2678426.4969	15.0	14.433	22.984
PI 2	58900.4974	2678471.5056			
BCC3	58945.2260	2678401.2973			
PI 3	58956.0689	2678411.9049	15.0	14.727	23.286
ECC3	58966.5592	2678401.5692			
PI 4	59009.4997	2678359.2615			
PI 5	59054.6725	2678319.3633			



GENERAL NOTES:

1. THE CONTRACTOR TO KEEP A FULL SET OF DRAWINGS ON SITE.
2. THE CONTRACTOR IS RESPONSIBLE FOR THE CORRECT SETTING OUT OF THE WORKS.
3. THE CONTRACTOR SHALL VERIFY ALL LEVELS AND DIMENSIONS ON SITE IN THE PRESENCE OF AN ENGINEER PRIOR COMMENCEMENT OF WORKS.
4. DO NOT SCALE, USE FIGURES DIMENSIONS ONLY.
5. LARGE SCALE DETAILS TO BE USED WHEN AVAILABLE.
6. ALL LAYOUTS TO BE READ IN CONJUNCTION WITH ANY RELEVANT CIVIL; STRUCTURAL OR OTHER DRAWINGS
7. ANY ERROR OR DISCREPANCIES ARE TO BE REPORTED IMMEDIATELY TO THE ENGINEER FOR CORRECTION BEFORE THE WORK IS UNDERTAKEN.
8. THE CONTRACTOR IS TO IDENTIFY AND EXPOSE WHERE RELEVANT, ALL UNDERGROUND SERVICES ON SITE.

FOR TENDER

No	DATE	REVISION	CONSULT	DIR
0	03/2024	INITIAL ISSUE	FIM	

DESIGNED BY: R.R RAVELE
DRAWN BY: L MOJANAGA
CHECKED BY: H.L. THARAGA

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SIZEYA
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Polokwane, 0700
Tel : (015) 291 1020
Email : info@sizeya.co.za

CONSULTING ENGINEER — DATE

EMPLOYER'S PROJECT MANAGER — DATE

CONTRACT No.: BM22/22/23-02

PROJECT NAME:

CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL

DRAWING TITLE:

RAL CONNECTION

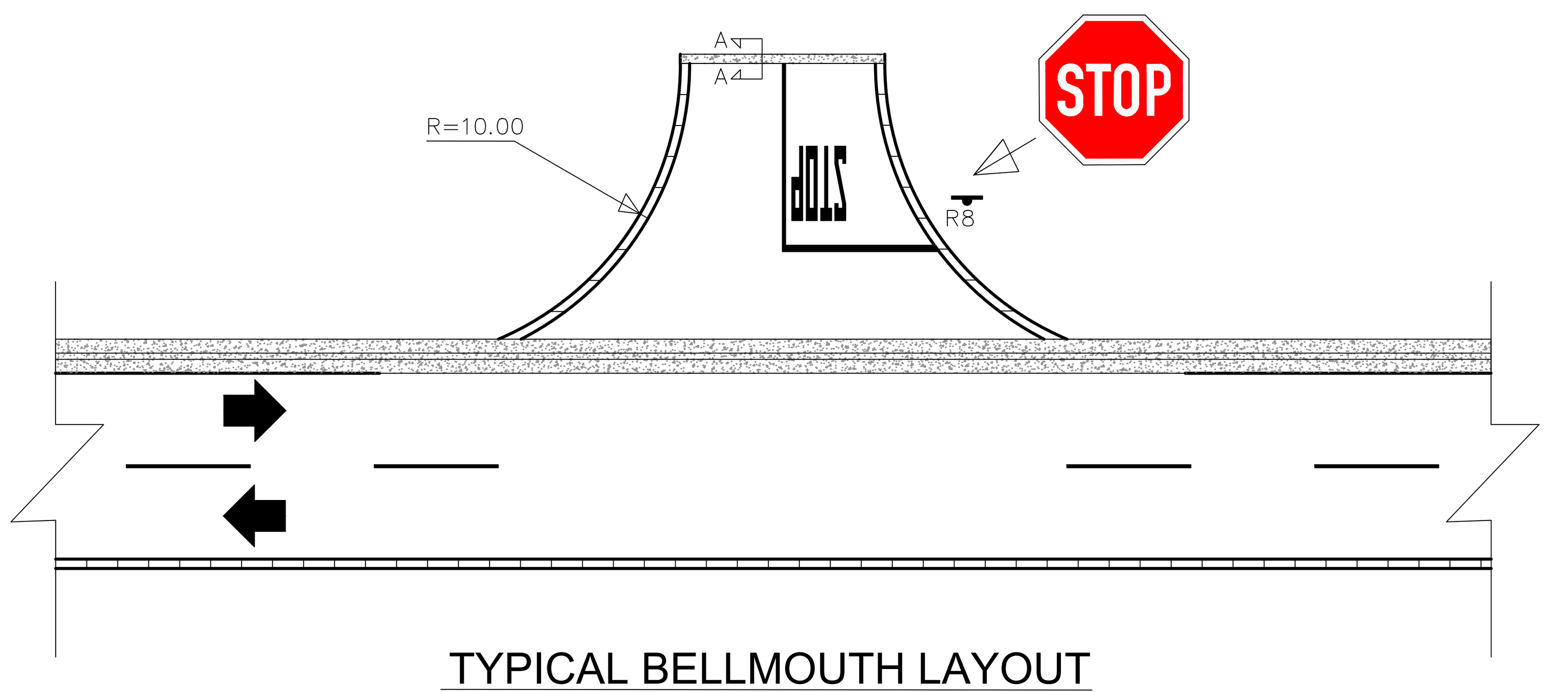
SHEET 1 OF 1

DRAWING SCALE
AS SHOWN

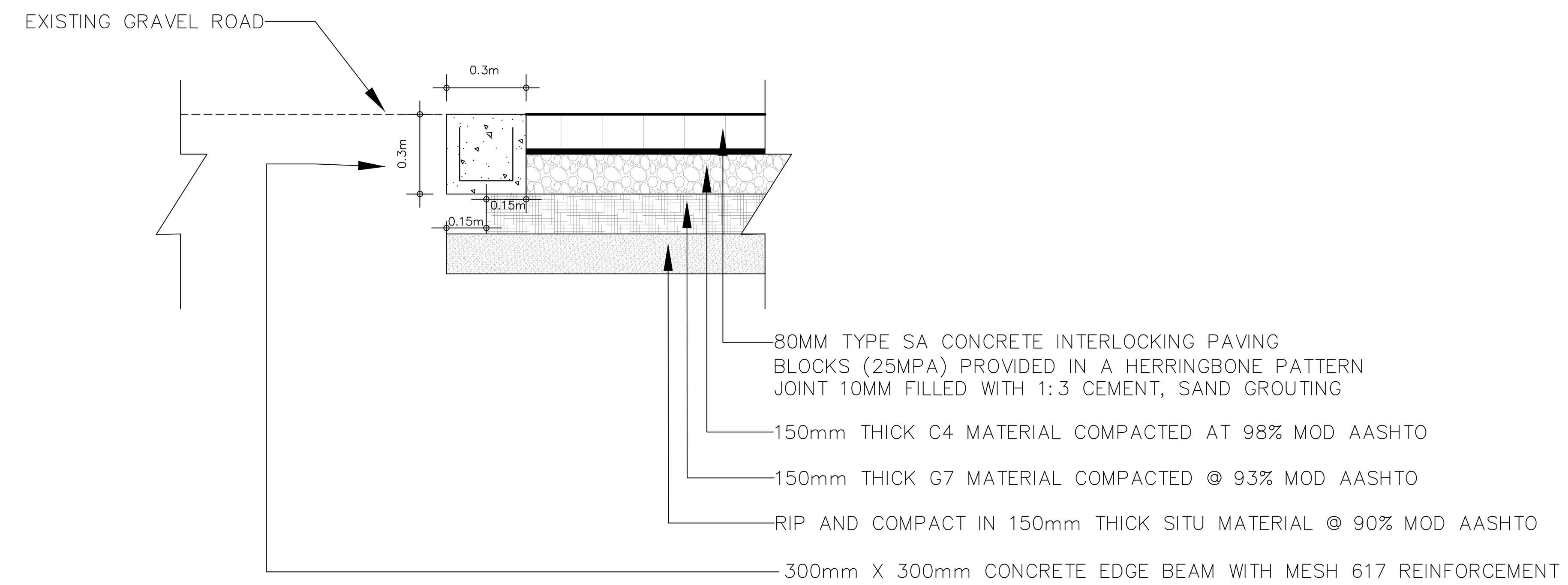
CONSULTANTS DRAWING No.:

PROJECT No.	DISCIPLINE	SUB-DISCIPLINE	DWG No.	STAGE	REV No.
S35.4	RD	STD	010	C	00

PD: PRELIMINARY DESIGN / **DD**: DETAILED DESIGN / **T**: TENDER / **C**: CONSTRUCTION / **A**: AS-BUILT / **i**: FOR INFORMATION ONLY



TYPICAL BELLMOUTH LAYOUT



SECTION A-A

FOR TENDER

No	DATE	REVISION	CONSULT	DIR
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CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL

DRAWING TITLE:

INTERSECTIONS

SHEET 1 OF 1

DRAWING SCALE
AS SHOWN

CONSULTANTS DRAWING No.:

PROJECT No.	DISCIPLINE	SUB-DISCIPLINE	DWG No.	STAGE	REV No.
S33.3	RD	STD	010	DD	00

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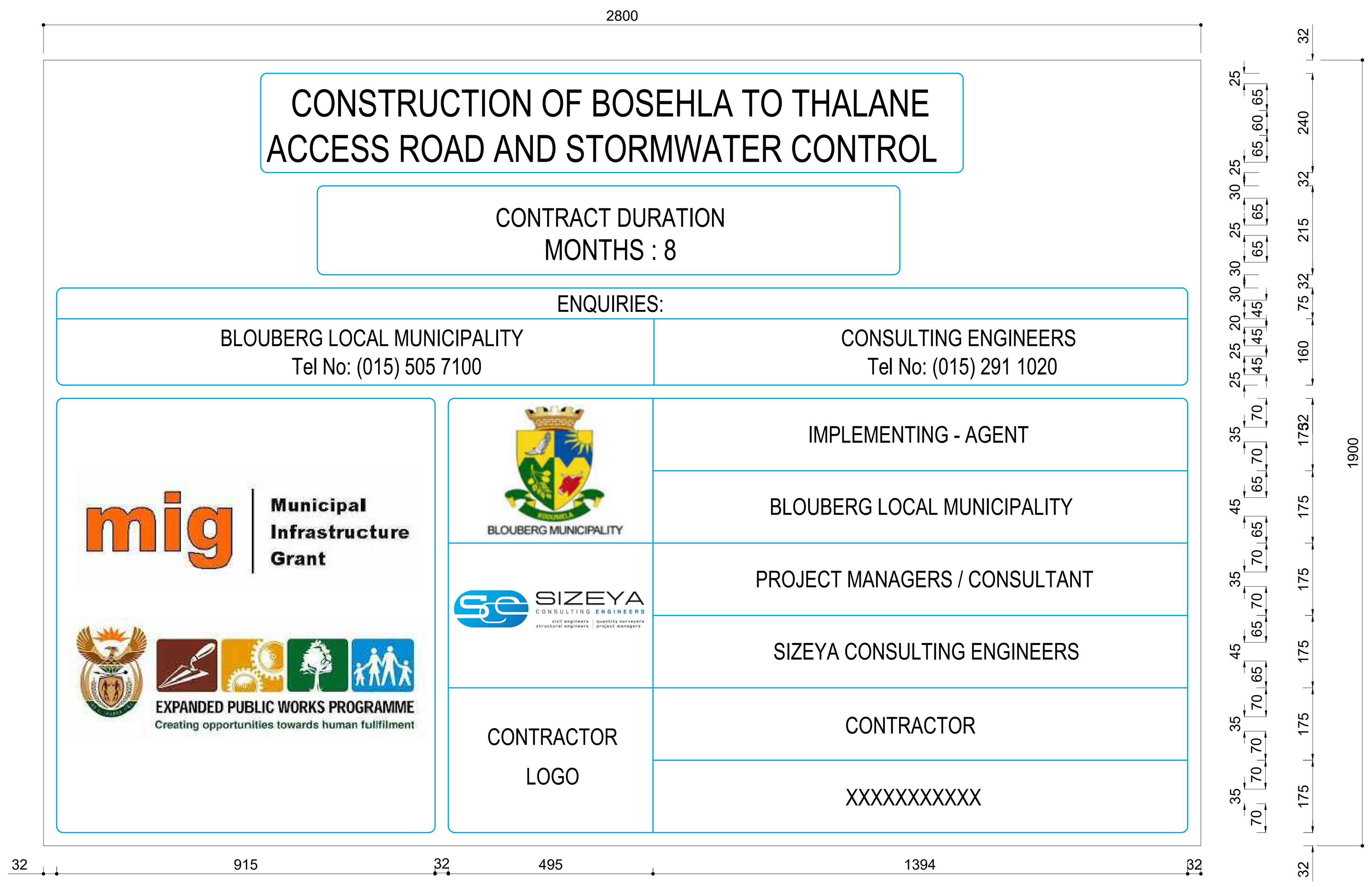
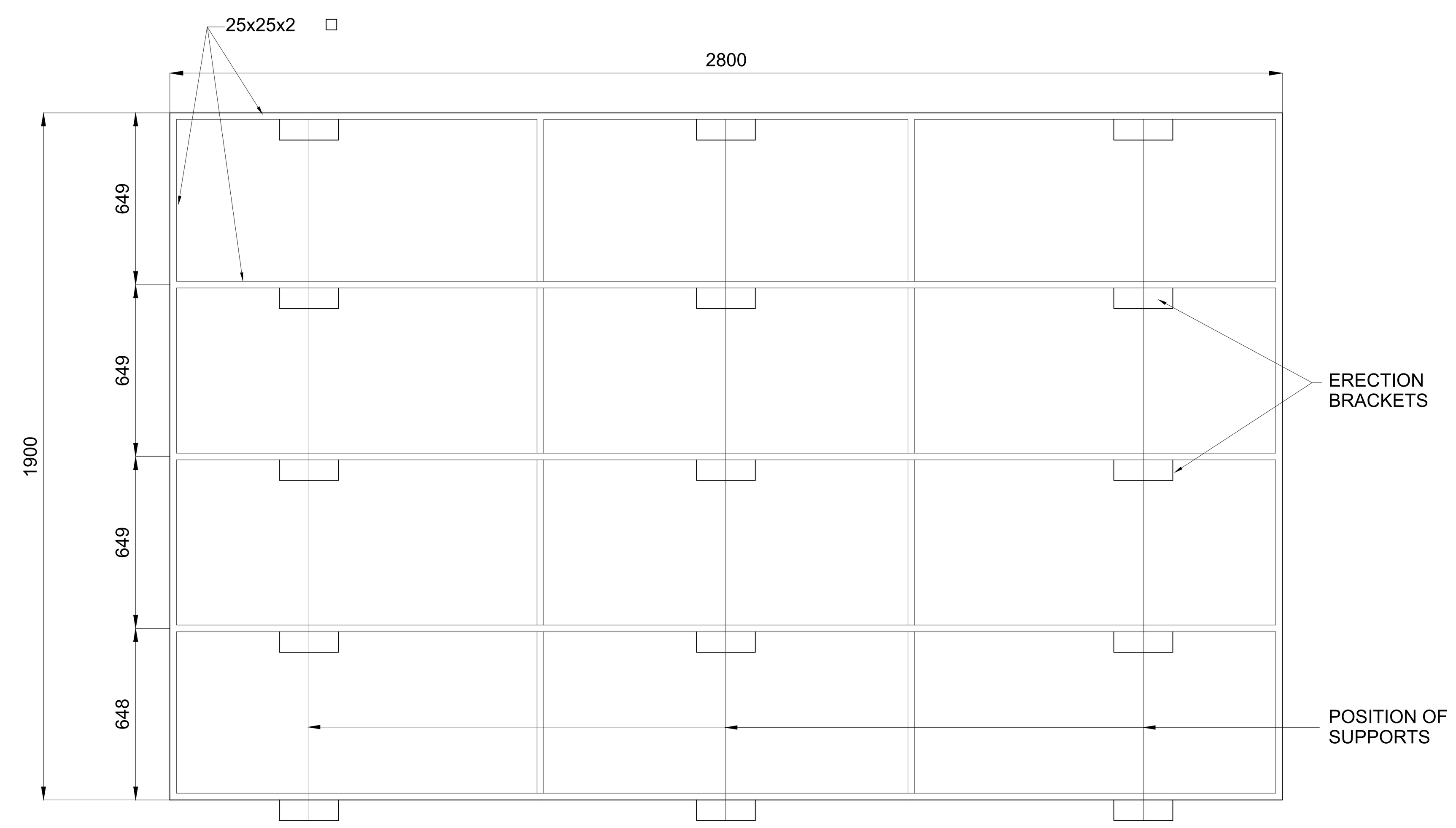


FRONT ELEVATION

N.T.S.



REAR SIDE BRACING

N.T.S.

SIGN BOARD DETAIL

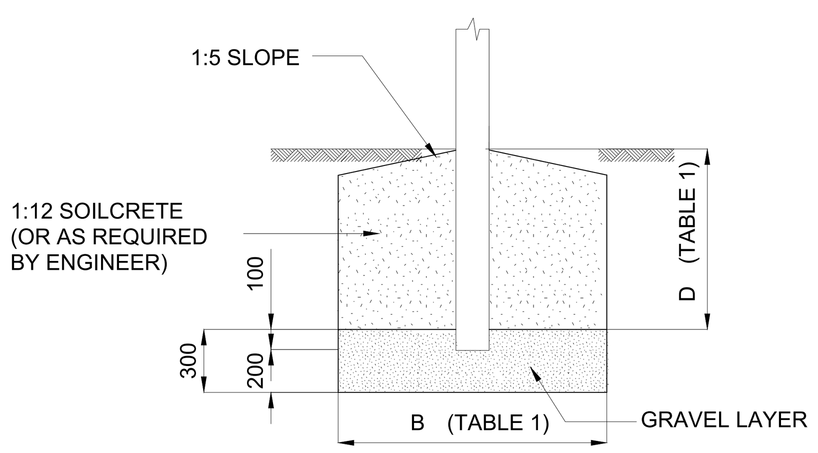
NOTE:

1. ALL EMBLEMS TO BE DISPLAYED IN FULL COLOUR ON A SEMI-MATT BACKGROUND.
2. DESCRIPTION: MATT-BLACK, SERIES DIN B LETTERS AND NUMBERS ON A SEMI-MATT 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.

TABLE 1

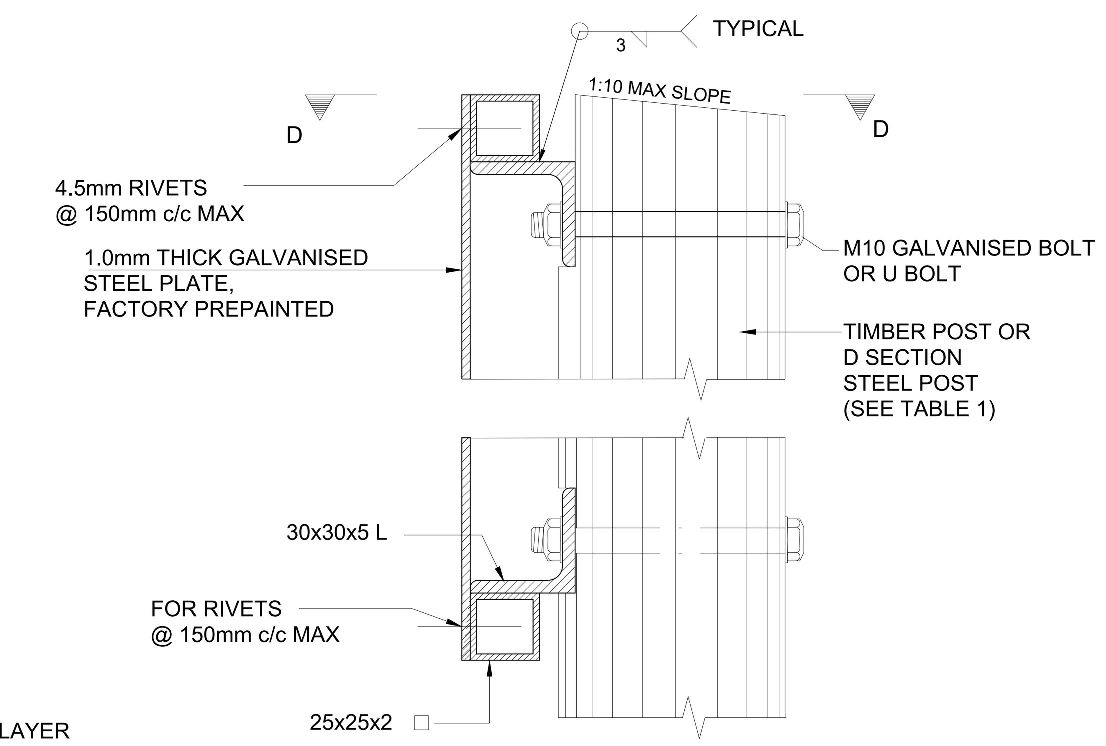
ERECTION DETAILS

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



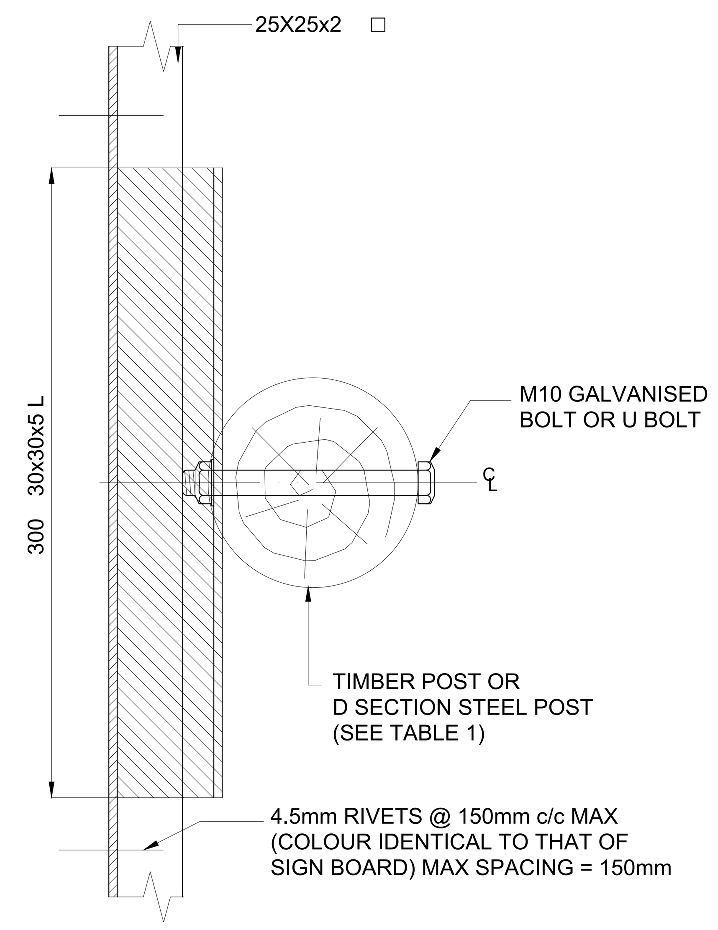
FOUNDATION DETAIL

N.T.S.



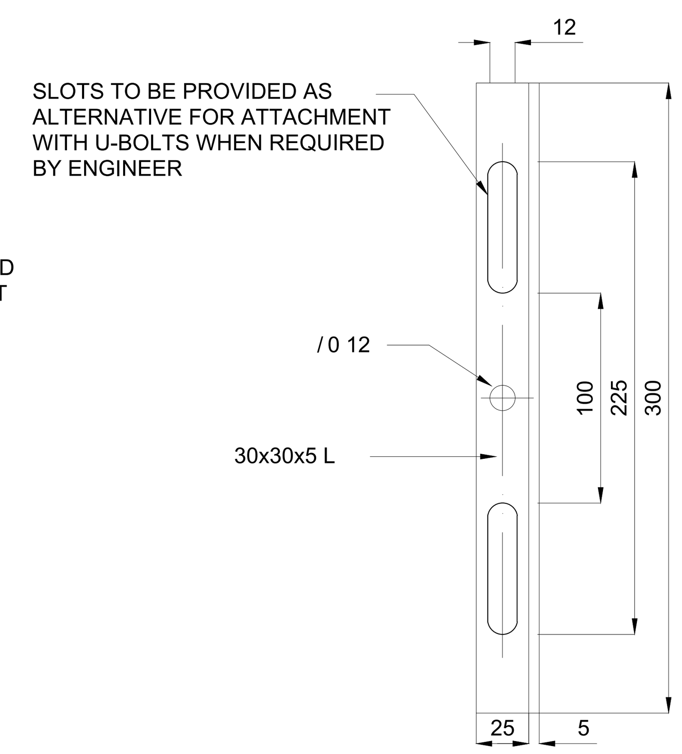
SIDE ELEVATION

N.T.S.



PLAN: SECTION D-D

N.T.S.



ELEVATION
ERECTION BRACKET

N.T.S.

FIXING DETAIL

FOR TENDER

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CONSTRUCTION OF BOSEHLA TO THALANE ACCESS ROAD AND STORMWATER CONTROL

DRAWING TITLE:

CONTRACT NAMEBOARD

SHEET 1 OF 1

DRAWING SCALE
AS SHOWN

CONSULTANTS DRAWING No.:
S33.3 — RD — STD — 010 — C — 00