



CLIMATE PROOFED ARID AND SEMI ARID RURAL ROADS,

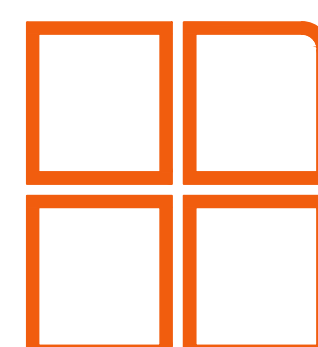
FINAL DESIGN OF MAUNDU NI MERI - SOSSIAN - KIRIMONROAD
BATCH 2

MARCH 2025

EMPLOYER

**DIRECTOR GENERAL
KERRA
P.O BOX 48151-00100,
NAIROBI, Kenya**

CONSULTANT



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	MAUNDU NI MERI - SOSSIAN - KIRIMON BATCH 2 DRAWINGS
	COVER PAGE
	DRAWING LIST
	GENERAL DRAWINGS
CE1045/GD/MSK/01	LOCATION MAP
CE1045/GD/MSK/01	MAUNDU NI MERI - SOSSIAN - KIRIMON SKETCH MAP
CE1045/GD/MSK/01	GENERAL LAYOUT (SHEET 1 OF 5) CHAINAGE 0+000 - 4+500
CE1045/GD/MSK/02	GENERAL LAYOUT (SHEET 2 OF 5) CHAINAGE 4+500 - 9+300
CE1045/GD/MSK/03	GENERAL LAYOUT (SHEET 3 OF 5) CHAINAGE 9+300 - 13+500
CE1045/GD/MSK/04	GENERAL LAYOUT (SHEET 4 OF 5) CHAINAGE 13+500 - 17+600
CE1045/GD/MSK/05	GENERAL LAYOUT (SHEET 5 OF 5) CHAINAGE 17+600 - 18+121
	TYPICAL CROSS-SECTION
CE1045/TD/MSK/01	TYPICAL CROSS-SECTION
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CE1045/CDS/MSK/O2	HEADWALL TYPE 2 (DROP INLETS)
CE1045/CDS/MSK/O3	HEADWALL TYPE 4 (FOR ACCESS CULVERT)
CE1045/CDS/MSK/O4	BEDDING AND HAUNCH PROFILES TYPE III& IV
CE1045/CDS/MSK/O5	CULVERT ROAD SIGNS
	STANDARD DRAWINGS
CE1045/SD/MSK/01	STANDARD DRAWING - STANDARD - ROAD SIGNS
CE1045/SD/MSK/02	STANDARD DRAWING - STANDARD - ROAD SIGNS INSTALLATION
CE1045/SD/MSK/03	STANDARD DRAWING - STANDARD - TRAFFIC MANAGEMENT
CE1045/SD/MSK/04	STANDARD DRAWING - PUBLICITY SIGN BOARD

GENERAL DRAWINGS



REVISIONS	No.	DATE	DESCRIPTION



Kenya Rural Roads Authority
Bara Bara Plaza,
P.O. Box 48151- 00100, Nairobi. Kenya

DIRECTOR GENERAL	
DIRECTOR (PLANNING , DESIGN &ENVIRONMENT)	



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Tel. (020) 2717213/4

PROJECT TITLE:	DRAFT DETAILEDENGINEERING DESIGN OF MAUNDU NI MERI - SOSSIAN - KIRIMON
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DRAWING TITLE:	GENERAL LAYOUT SHEET 1 OF 5 CHAINAGE 0+000 - 4+500
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DRAWN BY: M.M DESIGNED BY: C.N.M CHECKED BY: M.J.N	Drg No. CE1045/GD/MSK/01
Scale: 1:5000	Date :DECEMBER 2024



REVISIONS	No.	DATE	DESCRIPTION



Kenya Rural Roads Authority
Bara Bara Plaza,
P.O. Box 48151- 00100, Nairobi. Kenya

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DIRECTOR (PLANNING , DESIGN &ENVIRONMENT)	



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PROJECT TITLE:
DECEMBER DETAILEDENGINEERING DESIGN OF MAUNDU NI MERI - SOSSIAN - KIRIMON

DRAWING TITLE:
GENERAL LAYOUT SHEET 2 OF 5 CHAINAGE 4+500 - 9+300

DRAWN BY: M.M DESIGNED BY: C.N.M CHECKED BY: M.J.N	Drg No. CE1045/GD/MSK/02
Scale: 1:5000	Date :DECEMBER 2024



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PROJECT TITLE:

DRAFT DETAILEDENGINEERING DESIGN OF
MAUNDU NI MERI - SOSSIAN - KIRIMON

DRAWING TITLE:

GENERAL LAYOUT
SHEET 3 OF 5
CHAINAGE 9+300 - 13+500

DRAWN BY: M.M DESIGNED BY: C.N.M CHECKED BY: M.J.N	Drg No. CE1045/GD/MSK/03
Scale: 1:5000	Date : DECEMBER 2024



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PROJECT TITLE:

DRAFT DETAILEDENGINEERING DESIGN OF
MAUNDU NI MERI - SOSSIAN - KIRIMON

DRAWING TITLE:

GENERAL LAYOUT
SHEET 4 OF 5
CHAINAGE 13+500 - 17+600

DRAWN BY: M.M DESIGNED BY: C.N.M CHECKED BY: M.J.N	Drg No. CE1045/GD/MSK/04
Scale: 1:5000	Date : DECEMBER 2024



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PROJECT TITLE:
DRAFT DETAILEDENGINEERING DESIGN OF
MAUNDU NI MERI - SOSSIAN - KIRIMON

DRAWING TITLE:
GENERAL LAYOUT
SHEET 2 OF 4
CHAINAGE 17+600 - 18+121

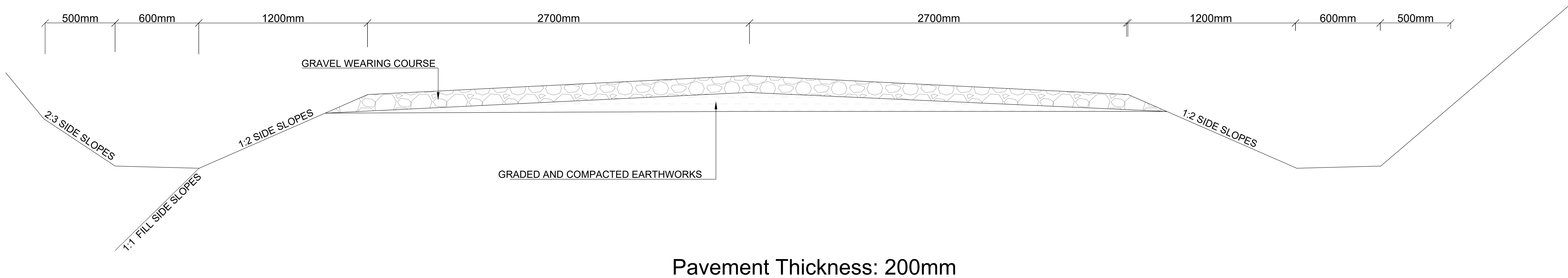
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DESIGNED BY: C.N.M
CHECKED BY: M.J.N

Scale: 1:5000

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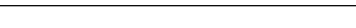
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TYPICAL CROSS-SECTION



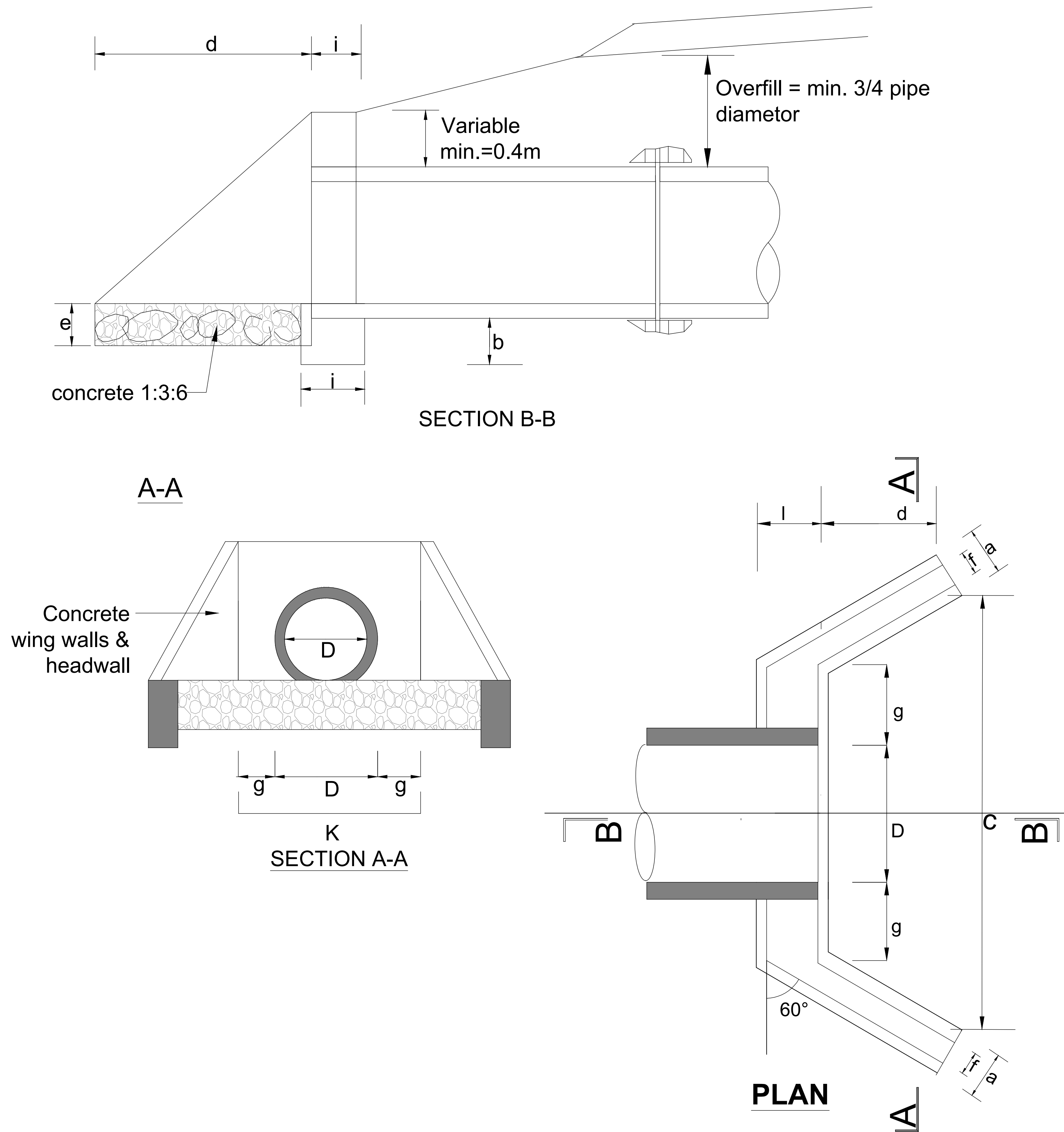
Slope benching details

- GENERAL NOTES:
- 1. Final fill slopes 1:1
 - 2. Cutting backslopes may be steepened as instructed at culvert locations to minimise pipe extensions.
 - 3. Cutting Backslopes 2:3
 - 4. Width of side ditches 600Mm or wider as instruted by the Engineer.

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									Scale: NTS	Date : DECEMBER 2024				

TYPICAL CULVERT DRAWINGS

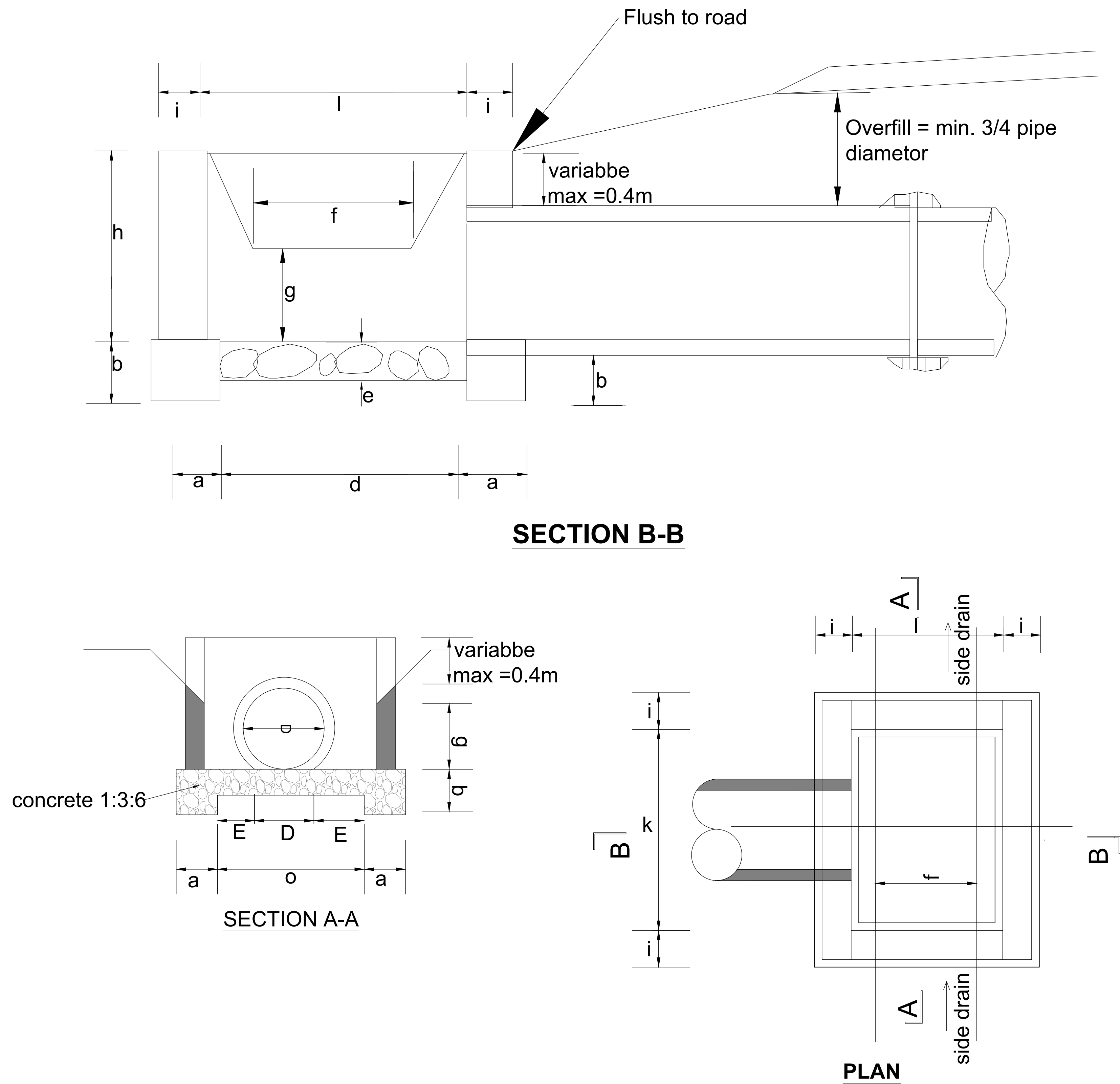
FIGURE H.8 - HEADWALL TYPE 1 (HEAD AND WINGWALLS)



DIMENSIONS AND MATERIAL REQUIREMENTS

PIPE DIAMETER IN (M)			TYPE A			TYPE B		
			(CONCRETE BLOCKS)			(STONE MASONRY)		
			450	600	900	450	600	900
DIMENSION UNIT								
a	FOUNDATION	m	0.30	0.30	0.30	0.40	0.40	0.60
b	FOUNDATION	m	0.30	0.30	0.40	0.30	0.30	0.40
c	FOUNDATION		2.20	2.35	2.89	2.20	2.35	2.89
d	APRON	m	1.00	1.00	1.20	1.00	1.00	1.20
e	APRON	m	0.20	0.20	0.20	0.20	0.20	0.20
f	WALL	m	0.20	0.20	0.20	0.40	0.40	0.40
g	WALL	m	0.30	0.30	0.30	0.30	0.30	0.30
h	WALL	m	1.15	1.15	1.39	1.15	1.15	1.39
i	WALL	m	0.20	0.20	0.20	0.40	0.40	0.40
k	APRON	m	1.05	1.20	1.50	1.05	1.20	1.50
MATERIAL REQUIREMENT								
FOUNDATION								
	(Concrete)	m3	0.3	0.32	0.51	0.4	0.42	1.03
HEAD/WINGWALLS								
	(Concrete/)	m3	0.4	0.47	0.67	0.8	0.93	1.35
APRON								
	(Concrete)	m3	0.33	0.36	0.53	0.33	0.36	0.53

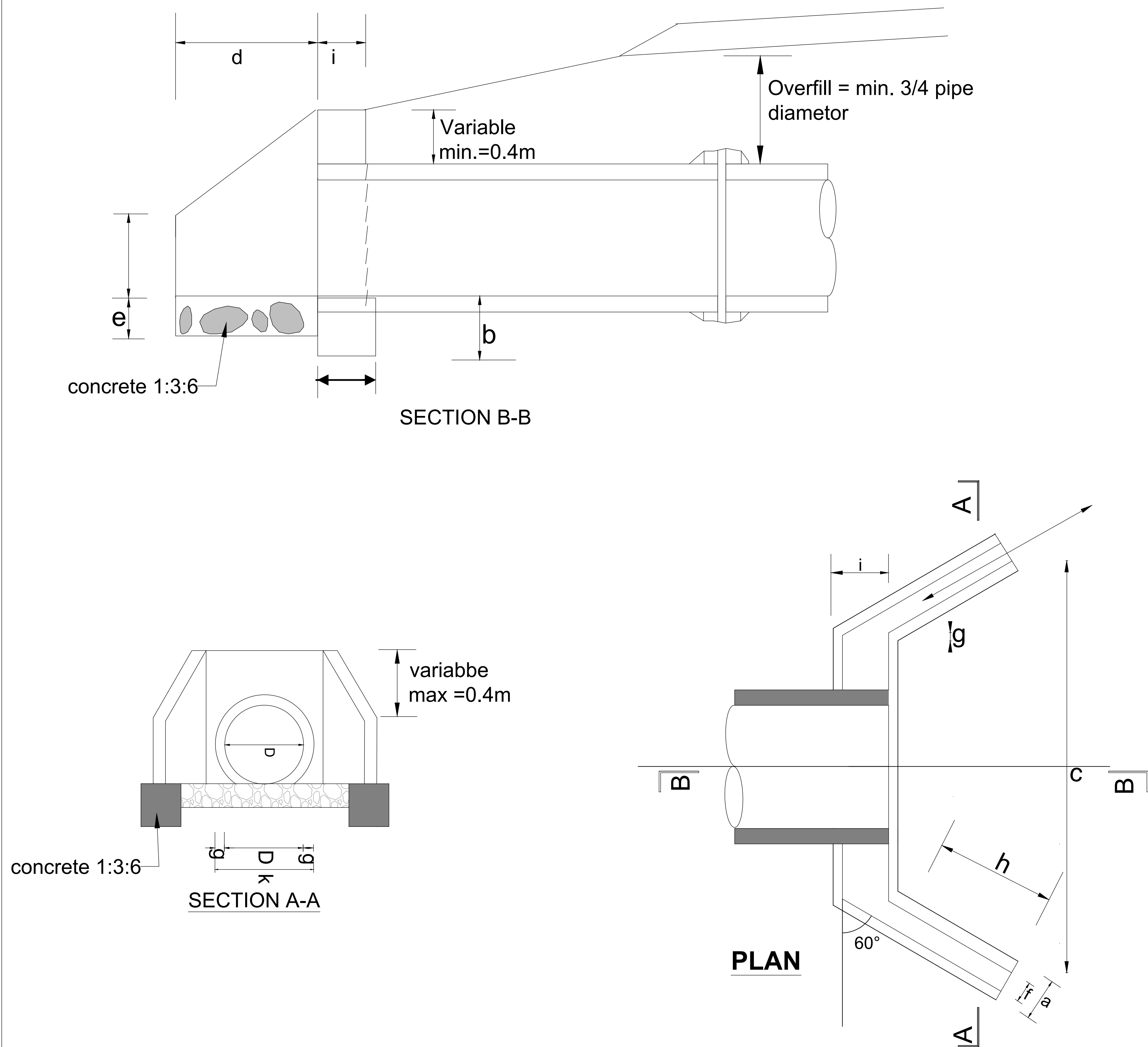
FIGURE H.9 - HEADWALL TYPE 2 (DROP INLETS)



DIMENSIONS AND MATERIAL REQUIREMENTS

PIPE DIAMETER IN (M)			TYPE A			TYPE B		
			(CONCRETE BLOCKS)			(STONE MASONRY)		
			450	600	900	450	600	900
DIMENSION			UNIT					
a	FOUNDATION	m	0.30	0.30	0.30	0.40	0.40	0.40
b	FOUNDATION	m	0.30	0.30	0.30	0.30	0.30	0.30
c	FOUNDATION	m	1.10	1.10	1.40	1.20	1.20	1.50
d	APRON	m	0.90	0.90	0.90	1.00	1.00	1.00
e	APRON	m	0.20	0.20	0.20	0.20	0.20	0.20
f	DROP INLET	m	0.60	0.60	0.60	0.60	0.60	0.60
g	DROP INLET	m	0.30	0.40	0.60	0.30	0.40	0.60
h	DROP INLET	m	0.60	0.80	1.20	0.60	0.80	1.20
l	DROP INLET	m	0.20	0.20	0.20	0.40	0.40	0.40
k	DROP INLET	m	1.20	1.20	1.50	1.20	1.20	1.50
l	DROP INLET	m	1.00	1.00	1.00	1.00	1.00	1.00
m	DROP INLET	m	0.38	0.30	0.30	0.38	0.30	0.30
MATERIAL REQUIREMENT								
FOUNDATION								
	(Concrete)	m3	0.47	0.47	0.52	0.72	0.72	0.79
HEAD/WINGWALLS								
	(Concrete/Masonry)	m3	0.53	0.69	1.11	1.24	1.63	2.61
APRON								
	(Concrete)	m3	0.24	0.24	0.30	0.24	0.24	0.30

FIGURE H.12 - HEADWALL TYPE 4 (FOR ACCESS CULVERT)



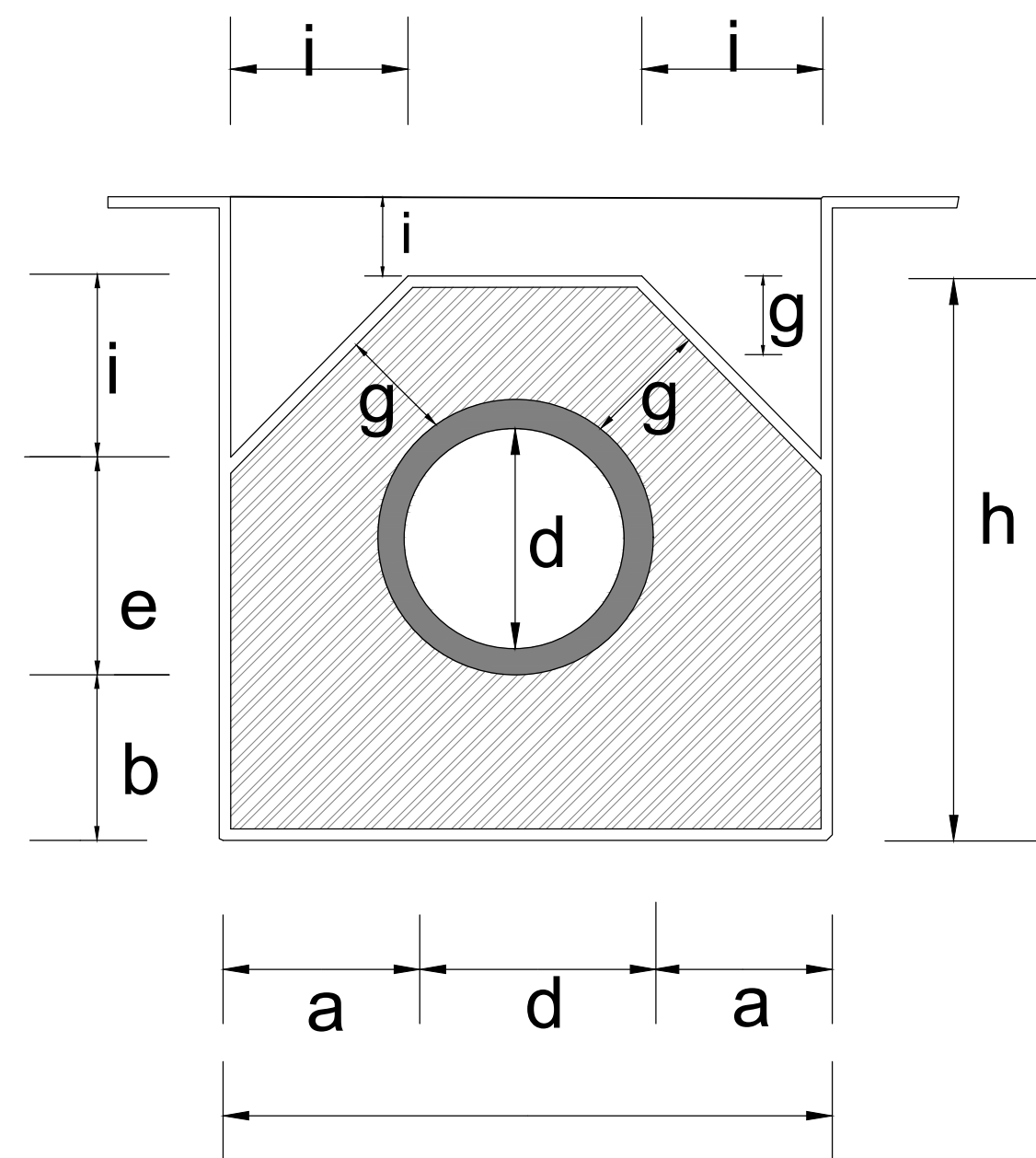
DIMENSIONS AND MATERIAL REQUIREMENTS

PIPE DIAMETER IN (M)		TYPE A (CONCRETE BLOCKS)			TYPE B (STONE MASONRY)		
		450	600	900	450	600	900
DIMENSION UNIT							
a	FOUNDATION m	0.30	0.30		0.40	0.40	
b	FOUNDATION m	0.30	0.30		0.30	0.30	
c	APRON	1.34	1.49		1.34	1.49	
d	APRON m	0.60	0.60		0.60	0.60	
e	APRON m		0.20		0.20	0.20	
f	WINGWALLS m	0.20	0.20		0.40	0.40	
g	WINGWALLS m	0.10	0.10		0.10	0.10	
h	HEADWALLS m	0.69	0.69		0.69	0.69	
l	HEADWALLS m	0.20	0.20		0.40	0.40	
k	HEADWALLS m	0.65	0.80		0.65	0.80	
l	HEADWALLS m	0.40	0.40		0.40	0.40	
MATERIAL REQUIREMENT							
FOUNDATION							
(Concrete 1:2:4, 1:3:6) m3		0.18	0.2		0.24	0.26	
HEAD/WINGWALLS							
(Concrete/Masonry) m3		0.25	0.29		0.50	0.58	
APRON							
m3		0.12	0.14		0.12	0.14	

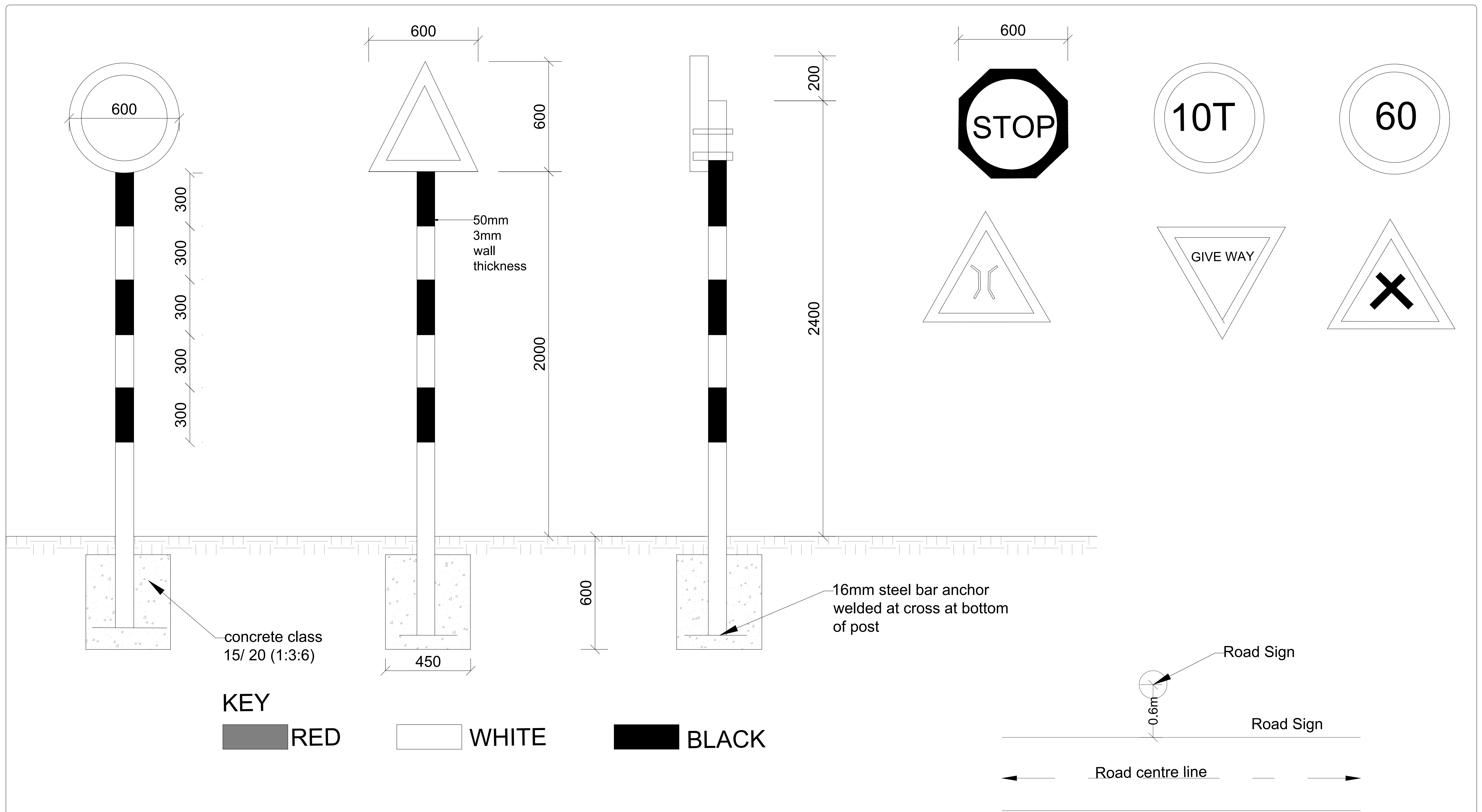
FIGURE H.14-BEDDING AND HAUNCH PROFILES TYPE III& IV

PROFILE IV

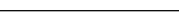
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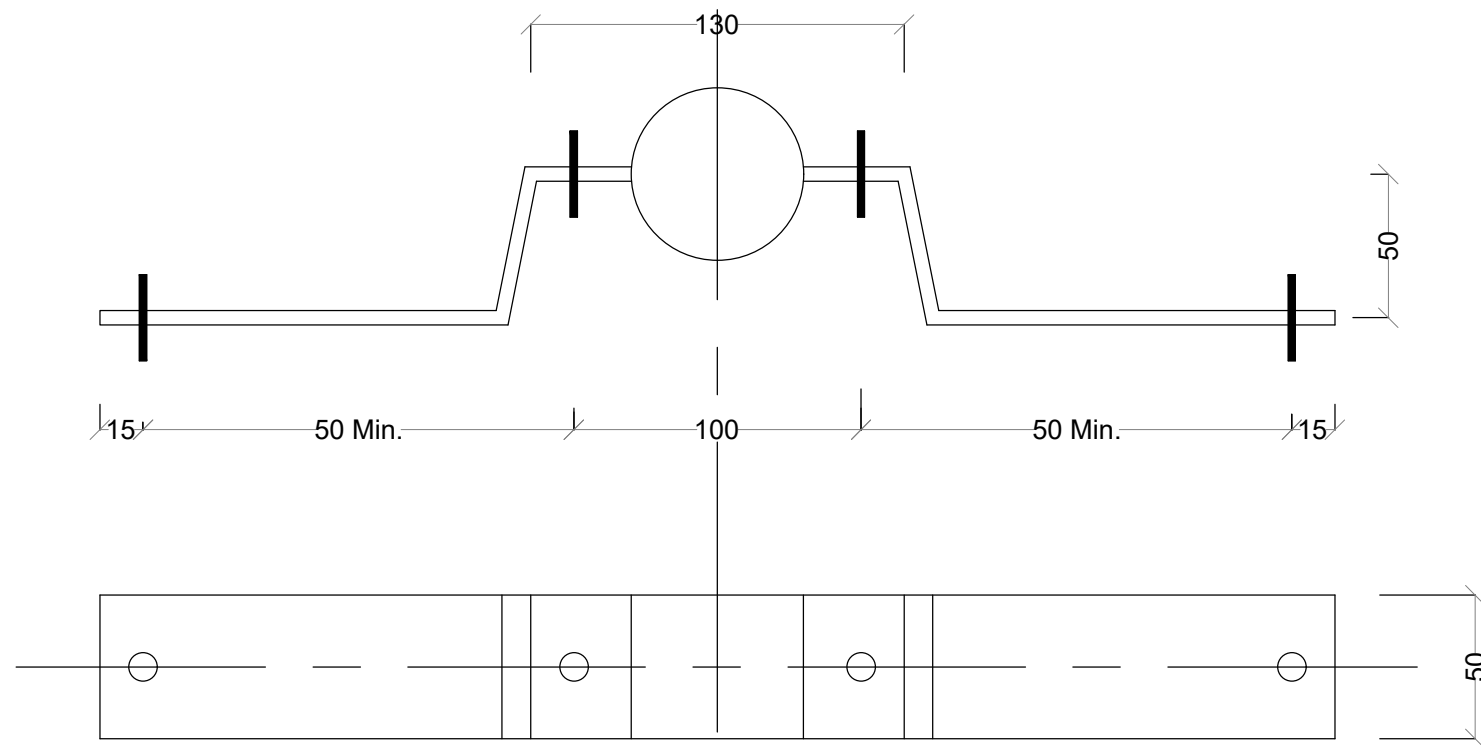
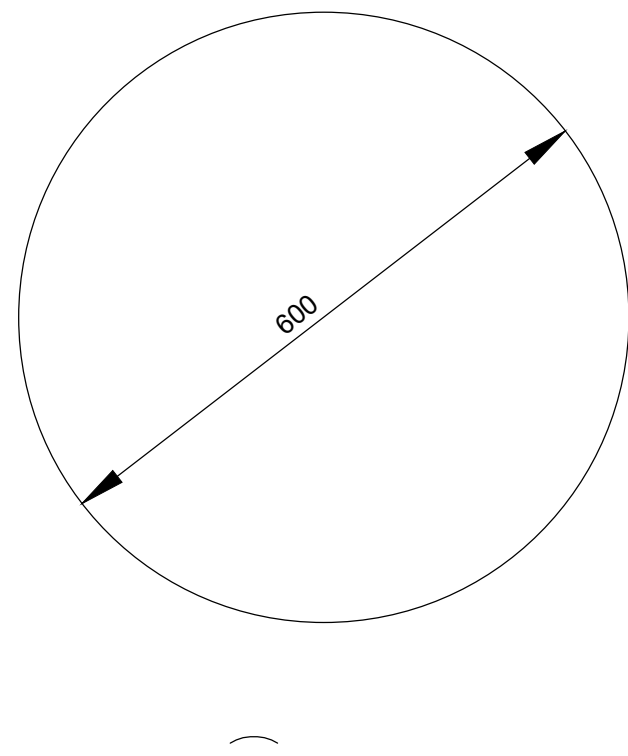
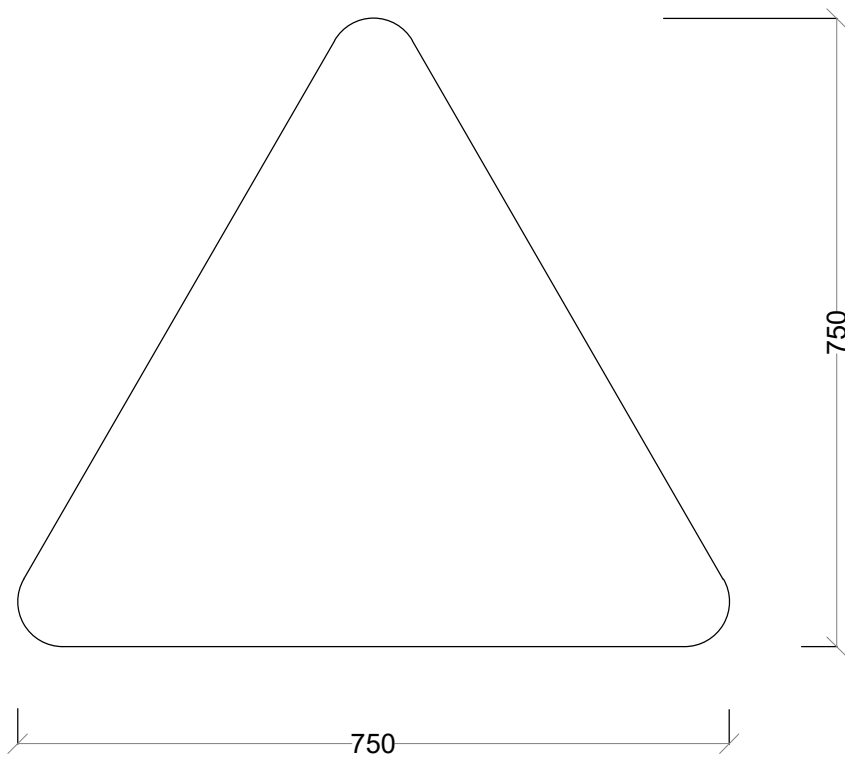
450 (mm)	600 (mm)	900 (mm)
Dimensions in (m)		
0.15	0.2	0.2
0.15	0.15	0.15
0.86	0.15	1.48
0.56	0.72	1.08
0.46	0.15	0.78
0.15	0.15	0.15
0.15	0.15	0.15
0.81	1.02	1.38
0.28	0.35	0.45
volume in (m3/m)		
0.37	0.61	0.92
-fair to poor subgrade condition -overfill >³/₄ Dia; -Seasonal waterflow only. -Use gravel material for. -backfill/overfill.		



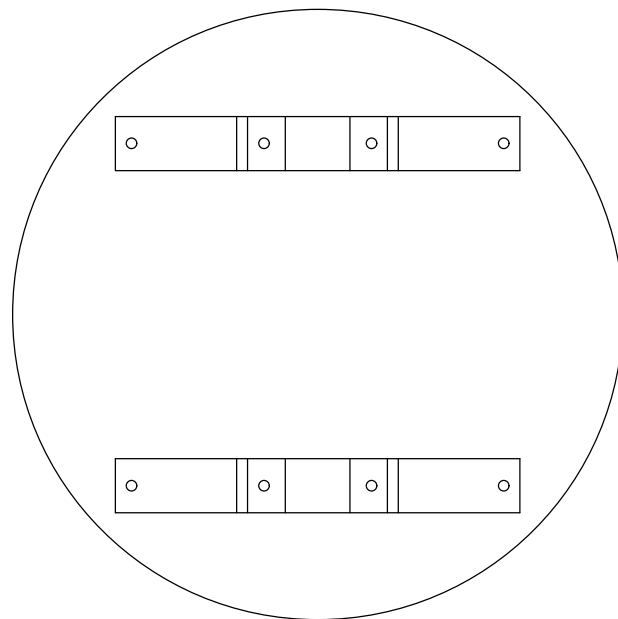
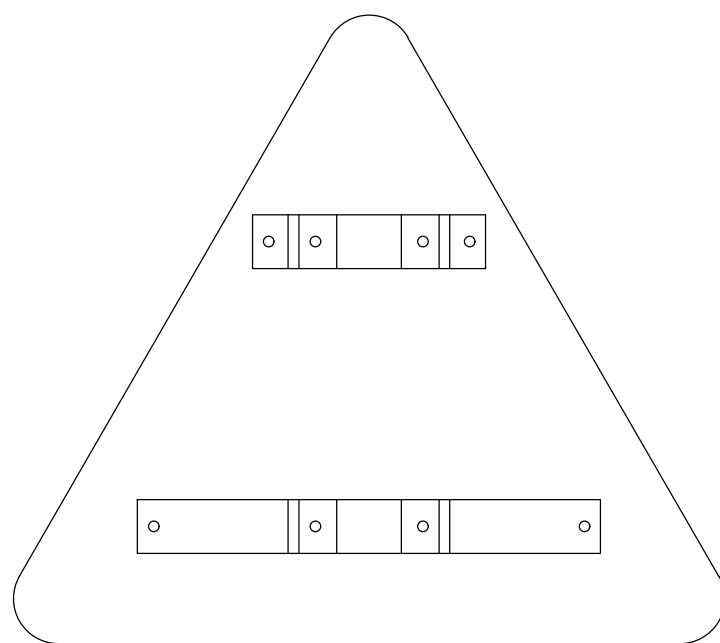
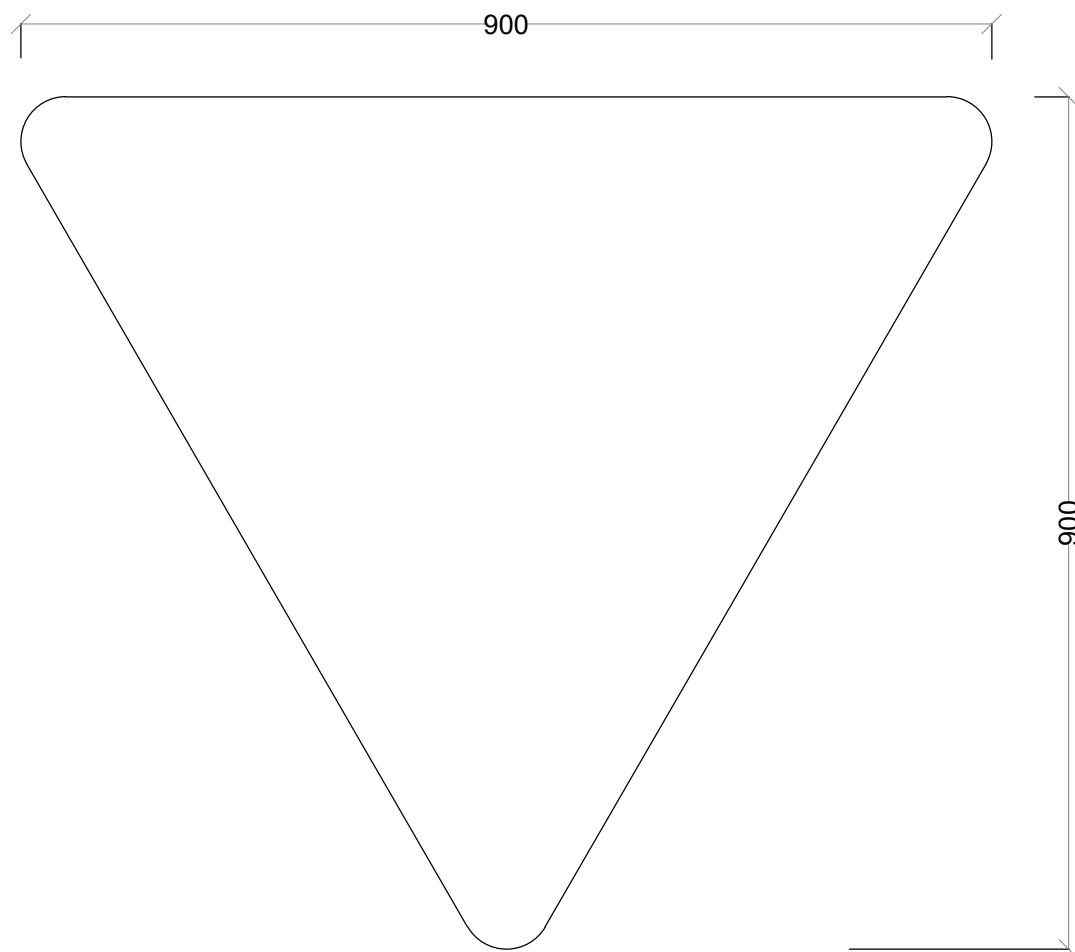
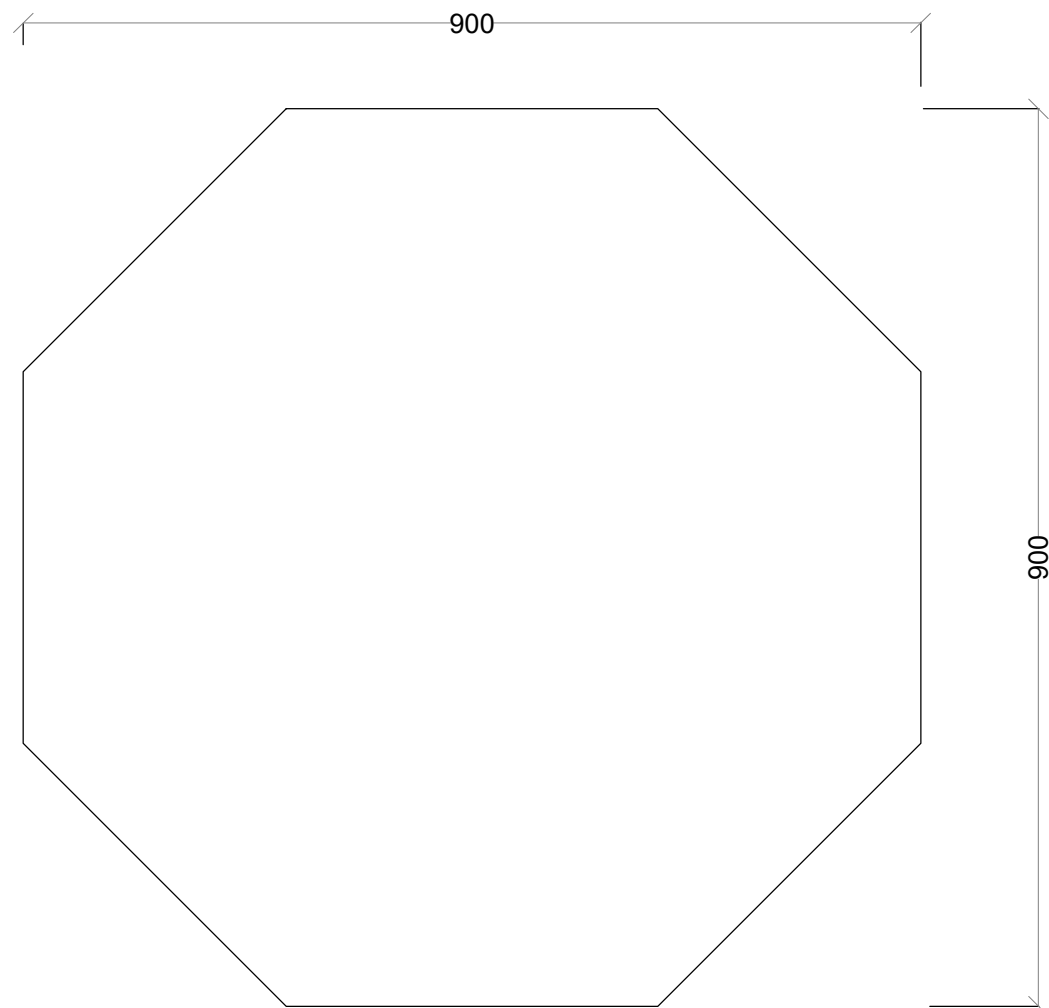
- 1.The type of sign required and their location shall de shown as road plan or as directed by engineer
- 2.signs plate to be 2mm thick mild steel plate
- 3.sign post to be 50mm fixing clamp/brackets
- 4.Sign plate to be fixed to steel tube by \$Nos M10 bolts and 50mm fixing clamp/brackets
- 5,Sign paints shall be reflective
- 6.The sign plate and post shall be treated by applying two coats of lead red oxide paint before applying a priming and two finish coats of approved paints. Paints used shall have a hard,durable and glossy finish.

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																Date : DECEMBER 2024	

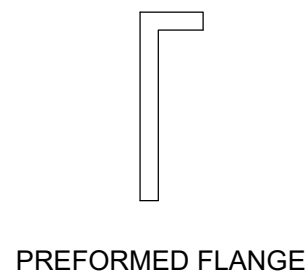
STANDARD DRAWINGS



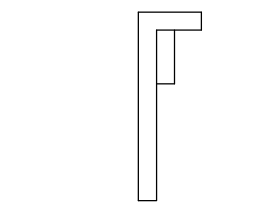
FIXING BRACKET DETAIL
SCALE 1:2.5



TYPICAL FIXING DETAILS
SCALE 1:25



PREFORMED FLANGE

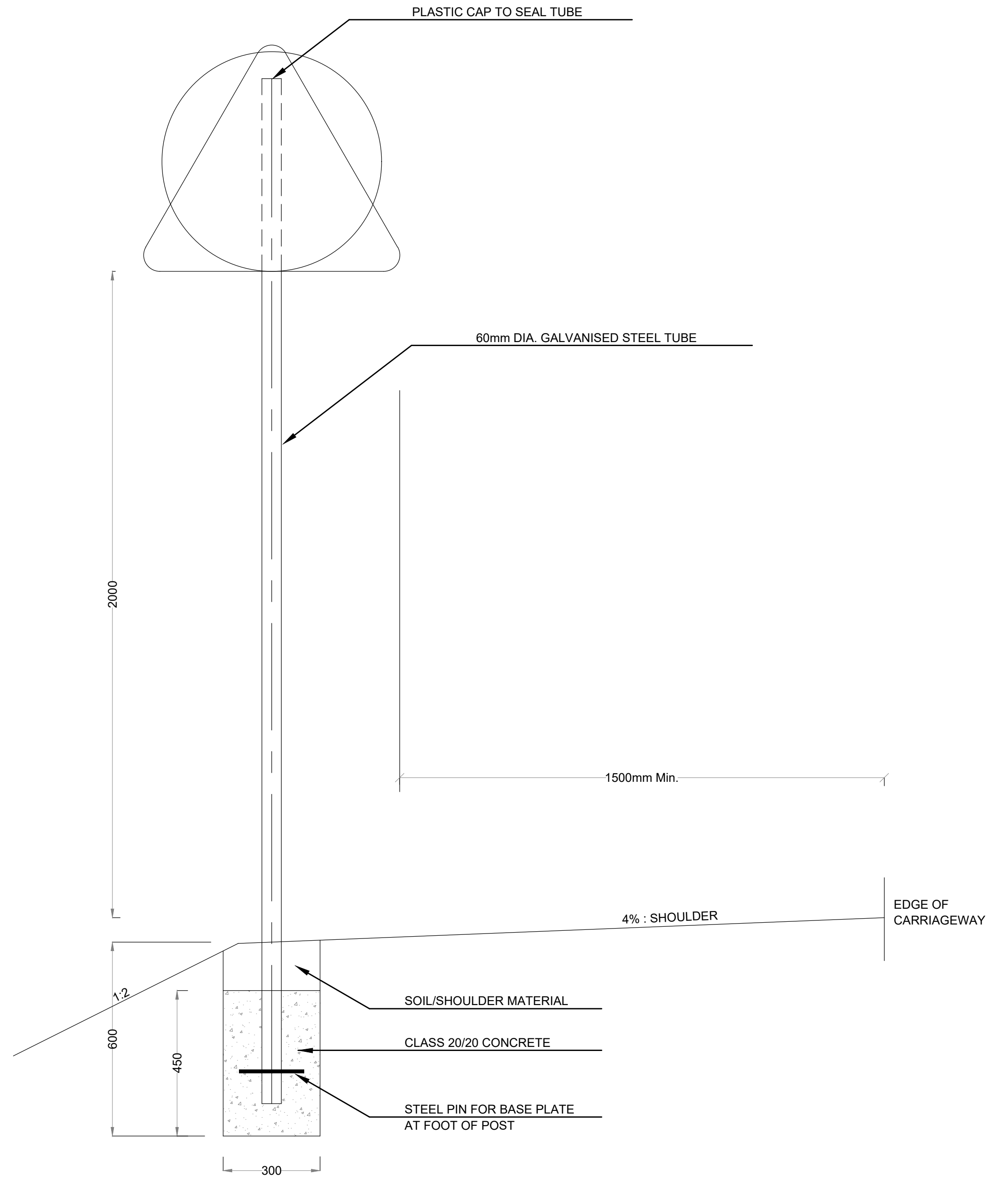


ANGLE STIFFENING

STIFFENING TO SIGNS
SCALE 1:20

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. ALL ROAD SIGNS ARE 3mm ALUMINIUM PLATES WITH REFLECTIVE MATERIALS.
3. PLASTIC WASHERS TO BE PLACED BETWEEN ALUMINIUM SIGNS AND STEEL BRACKETS.
4. ALL SIGN SUPPORTS AND FITTINGS TO BE GALVANISED MILD STEEL.
5. THE ENDS OF BOLTS TO BE HAMMERED OR SPOT WELDED.
6. ALL WHITE, RED, BLUE AND YELLOW PARTS ON SIGNS TO BE MADE OF RETRO-REFLECTIVE MATERIAL.
7. THE WIDTHS OF SIGN MARKINGS TO BE AS FOLLOWS;
RED BORDERS TO STANDARD SIGNS - 75mm
RED STRIPES ON COUNT DOWN SIGNS - 75mm
RED BORDER TO PRIORITY TRIANGLE SIGNS - 100mm
RED BORDER TO PROHIBITORY SIGNS - 50mm
RED BORDERS TO CRUCIFORM LEVEL "X" - 60mm
WHITE BORDER TO PRIORITY (OCTAGON) - 50mm
YELLOW STRIPES ON HAZARD SIGNS - 100mm.
BLACK STRIPES ON HAZARD SIGNS - 200mm.



SIGN PLACEMENT
SCALE 1:25

No.	DATE	DESCRIPTION



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Consultant:



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Tel. (020) 2717213/4

PROJECT TITLE:

DRAFT DETAILED
ENGINEERING DESIGN OF
MAUNDU NI MERI - SOSSIAN - KIRIMON
(ROAD) BATCH 2

DRAWING TITLE:

STANDARD DRAWING -
STANDARD - ROAD SIGNS

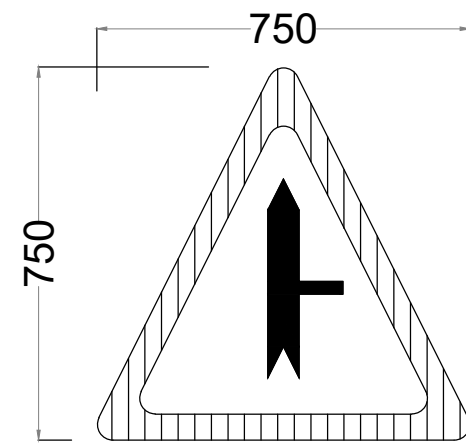
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DESIGNED BY: C.N.M
CHECKED BY: M.J.N

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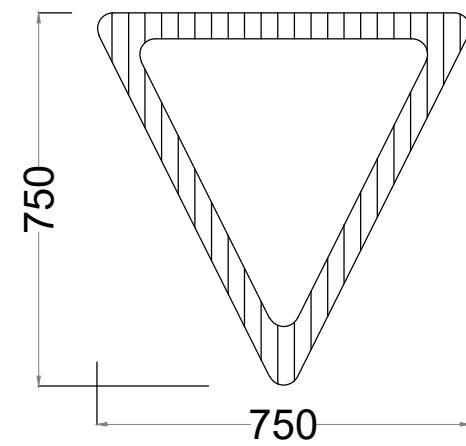
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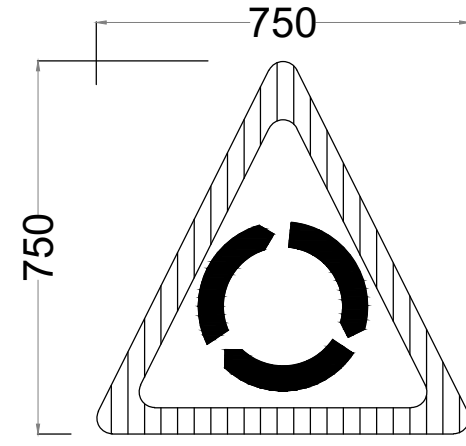
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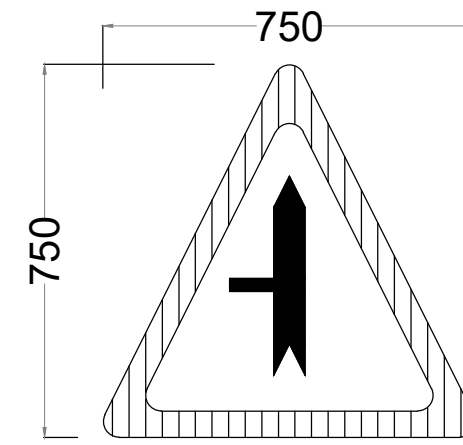
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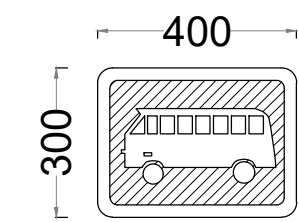
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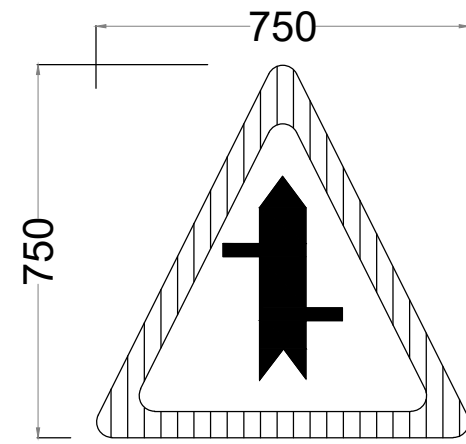
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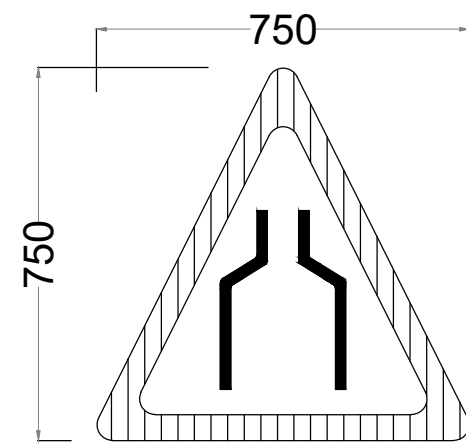
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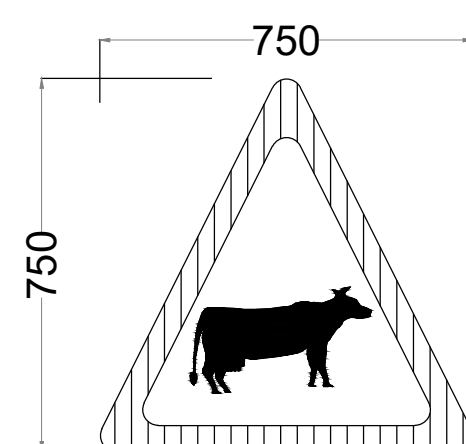
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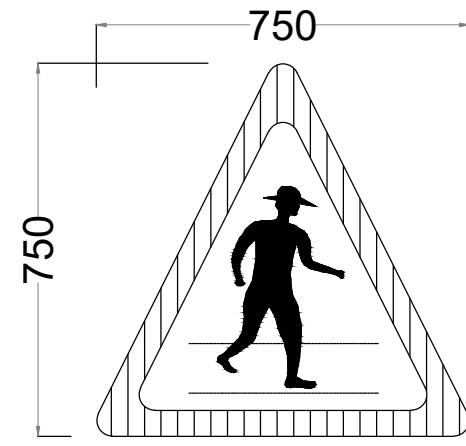
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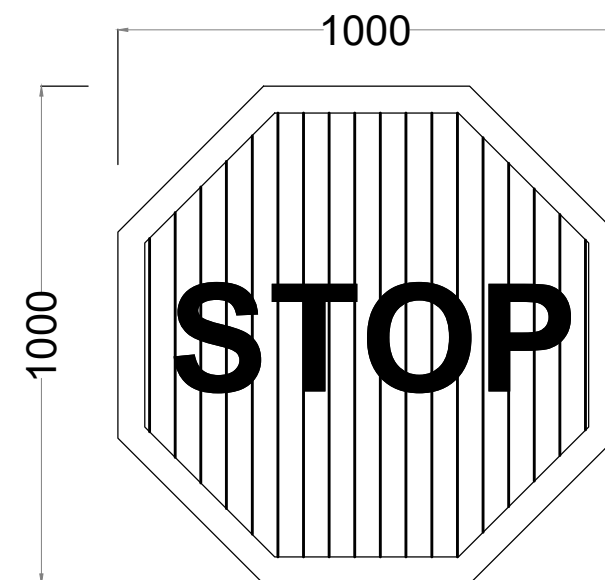
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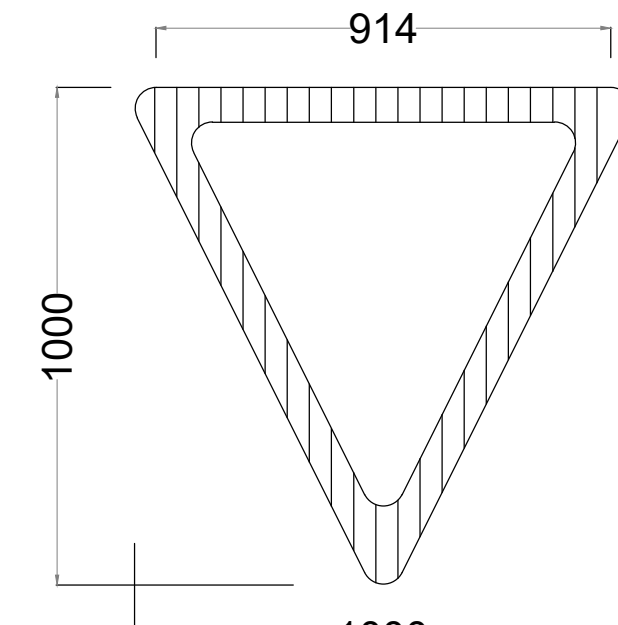
SIGN TYPE W 20



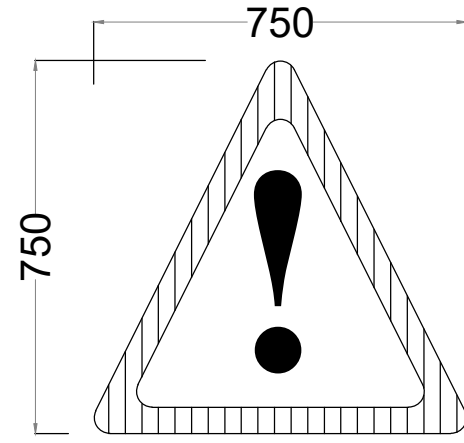
SIGN TYPE W 17



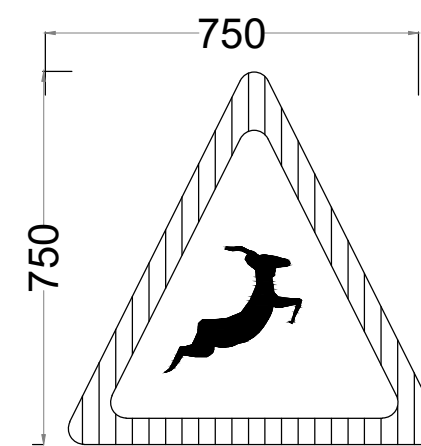
SIGN TYPE R 1



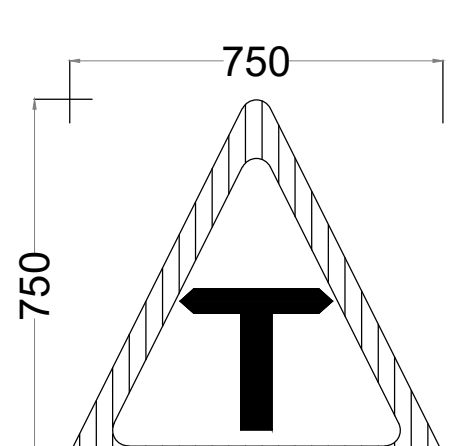
SIGN TYPE R2



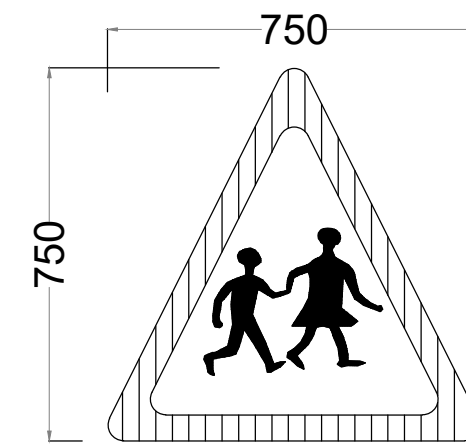
SIGN TYPE W26



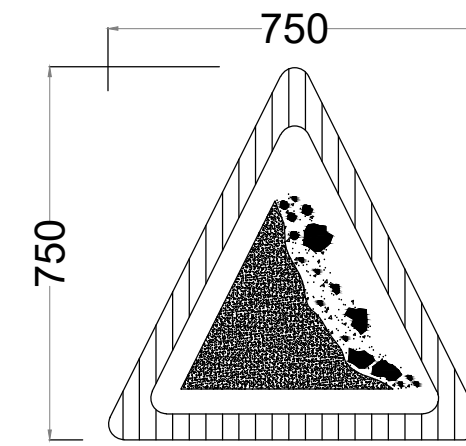
SIGN TYPE W 21



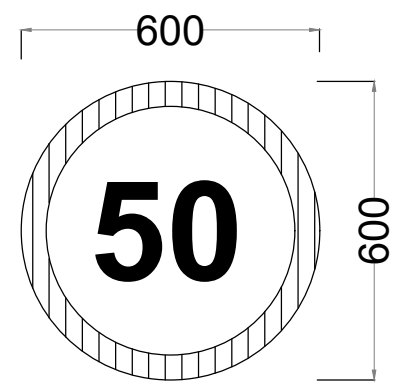
SIGN TYPE W 27



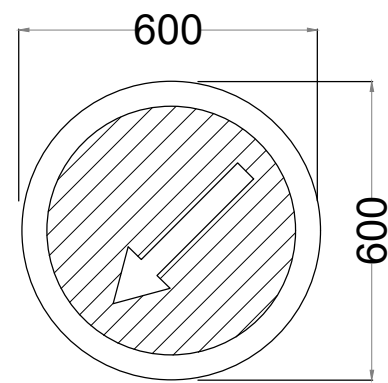
SIGN TYPE W 18



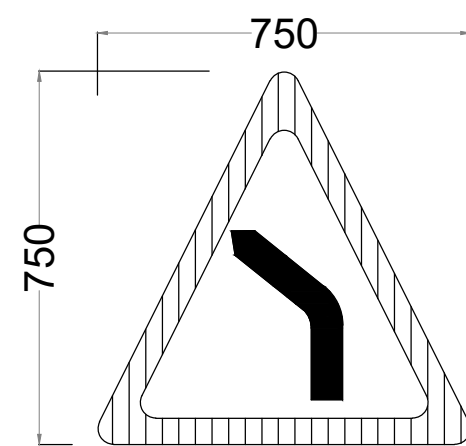
SIGN TYPE W16



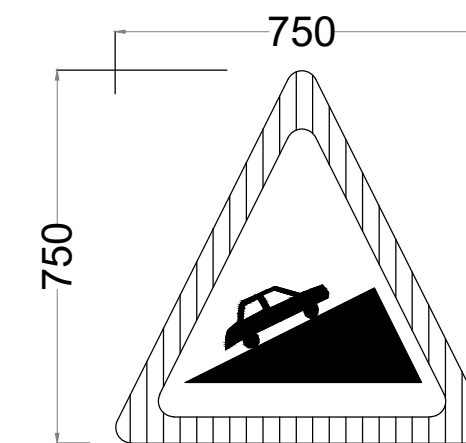
SIGN TYPE P25



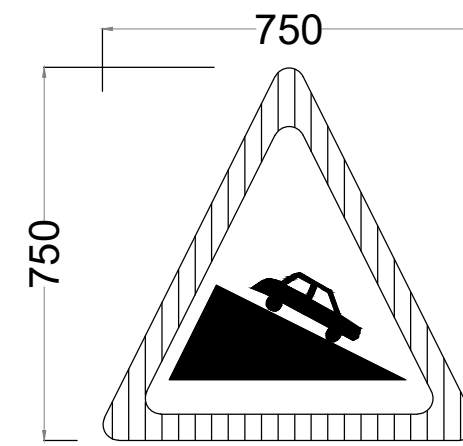
SIGN TYPE M5



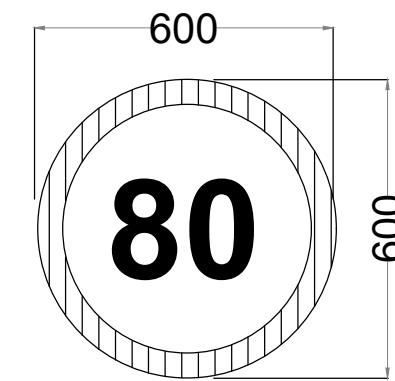
SIGN TYPE W 1



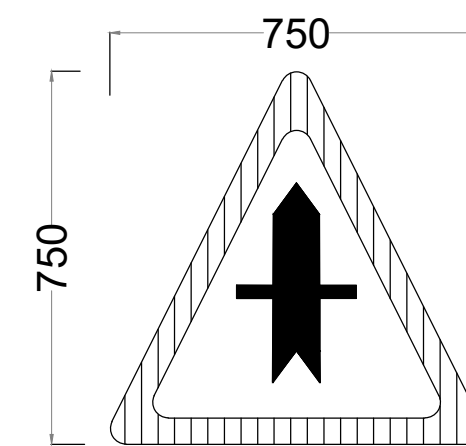
SIGN TYPE W 6



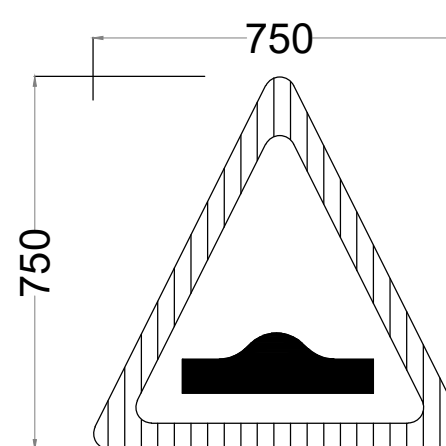
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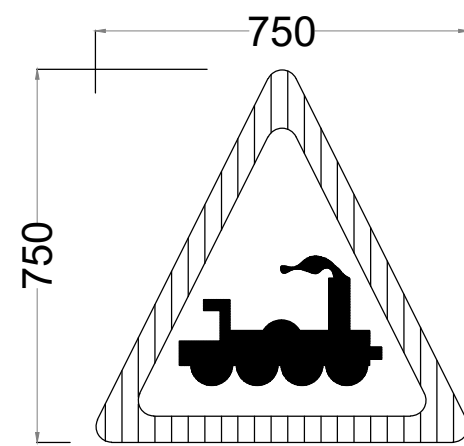
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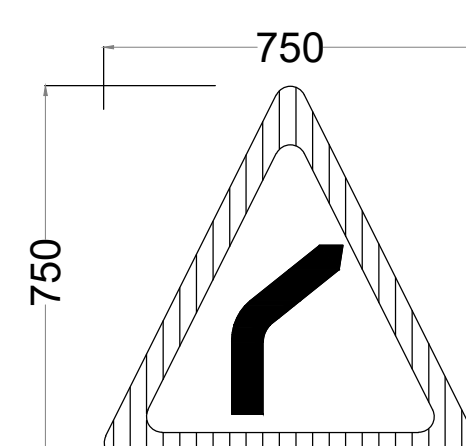
SIGN TYPE W 28A



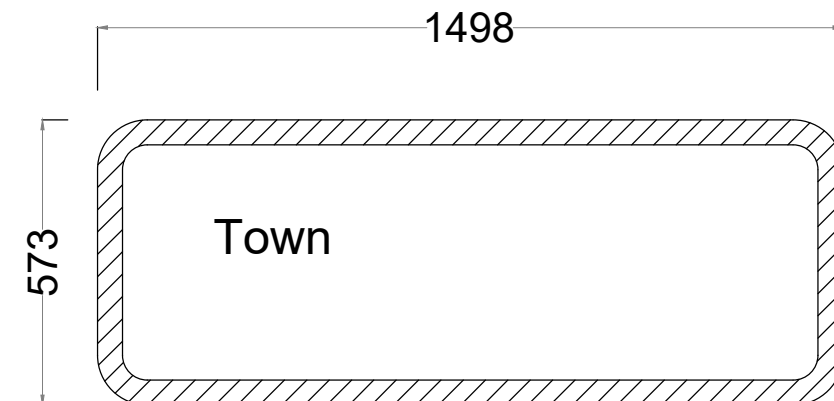
SIGN TYPE W 12



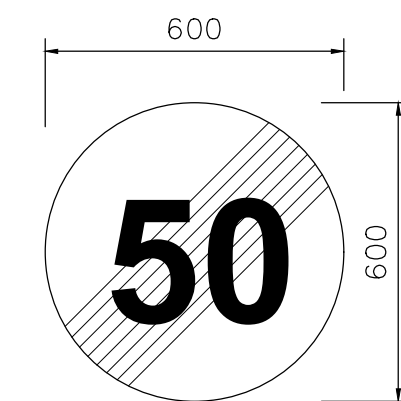
SIGN TYPE W 32



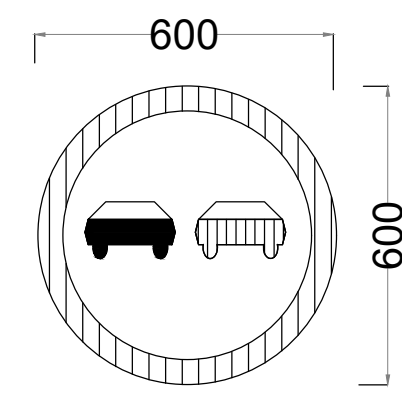
SIGN TYPE W 2



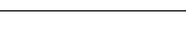
SIGN TYPE - I 27

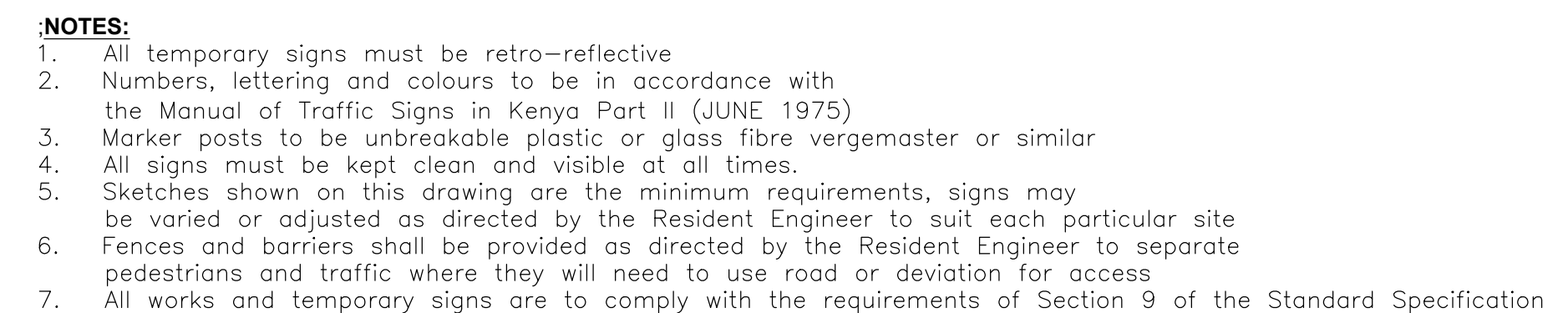
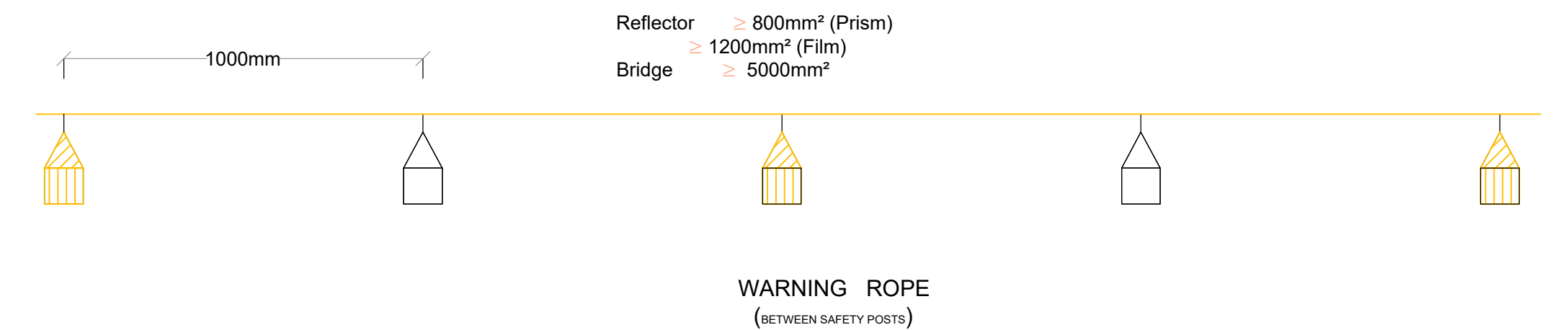
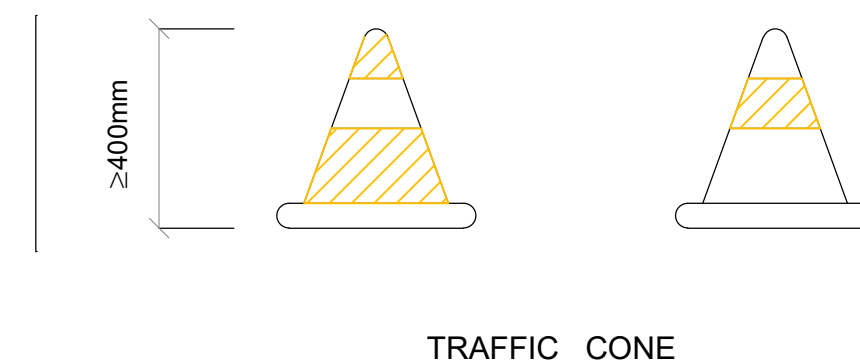
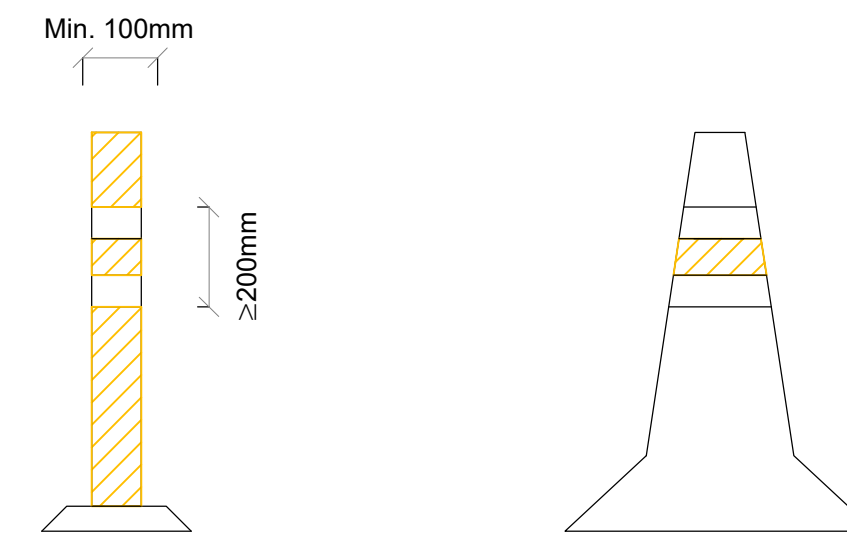
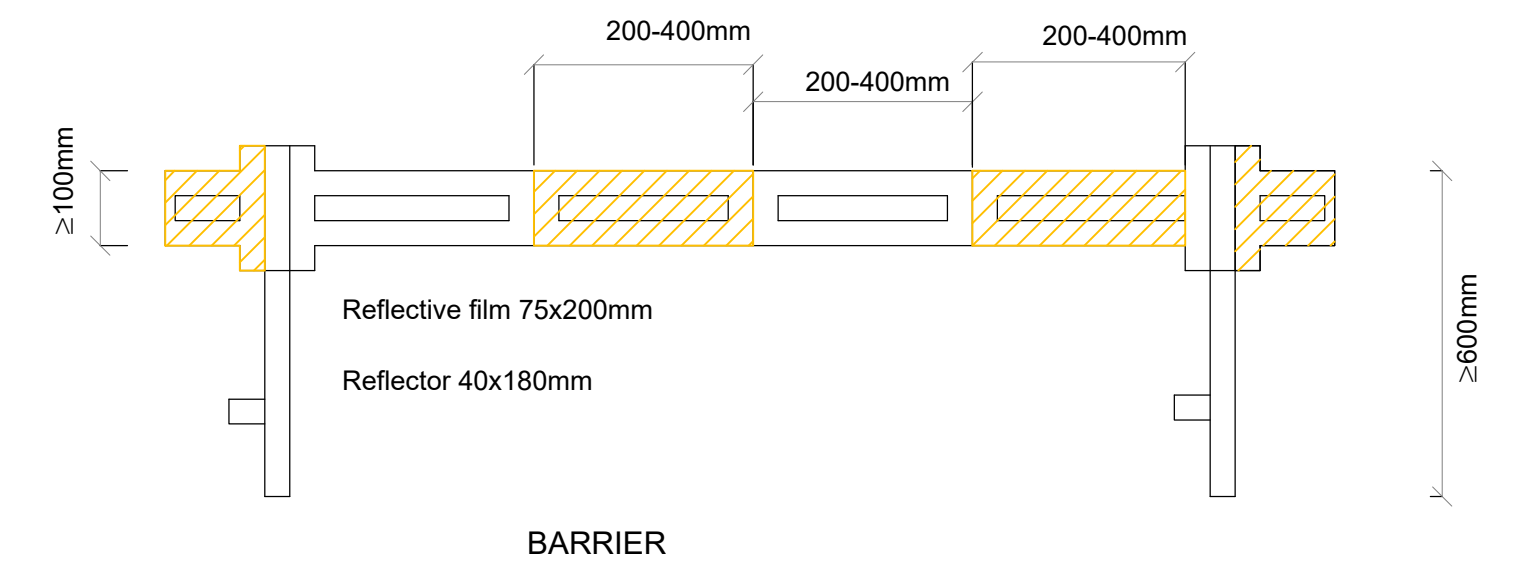


SIGN TYPE P30

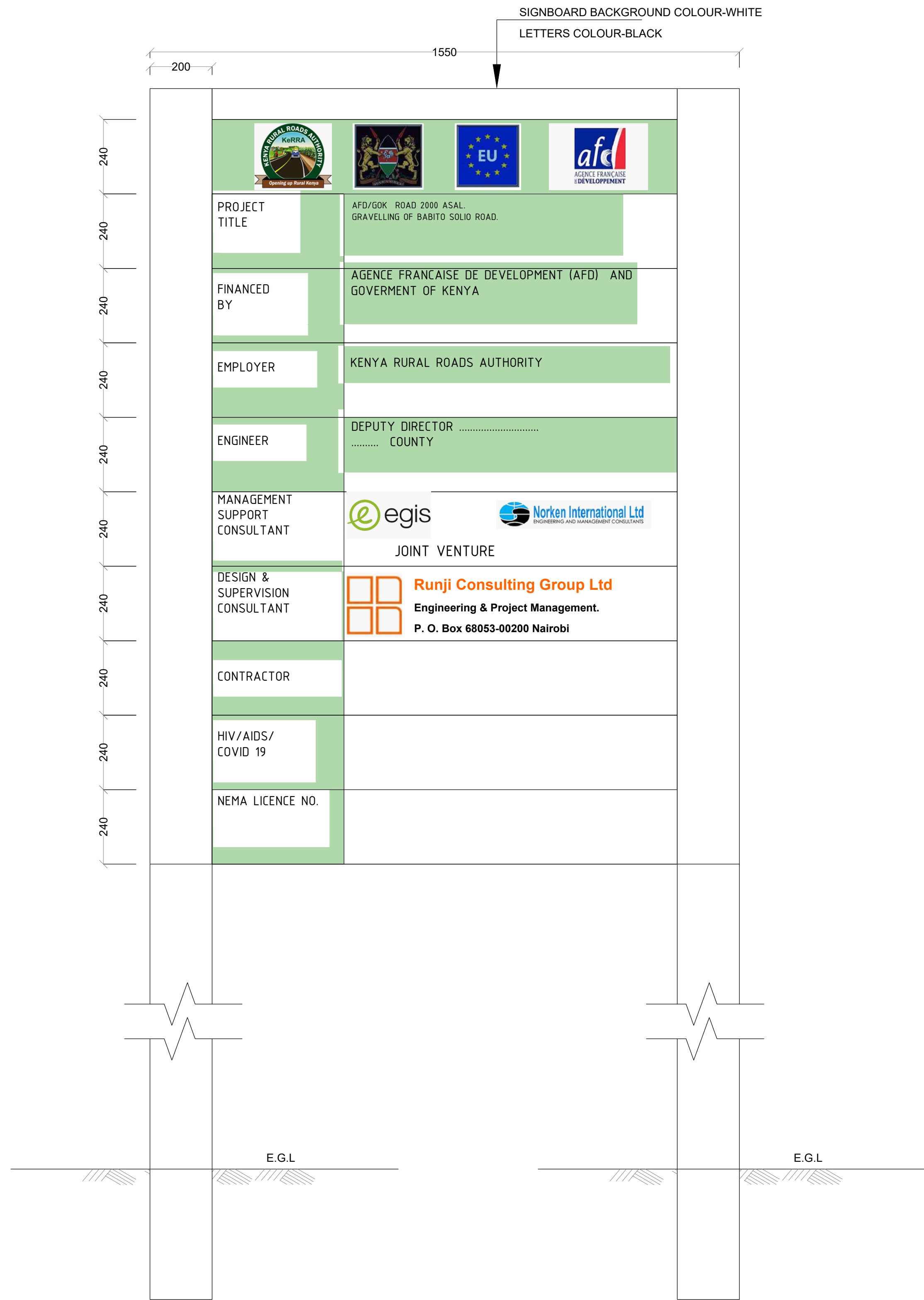


SIGN TYPE P23

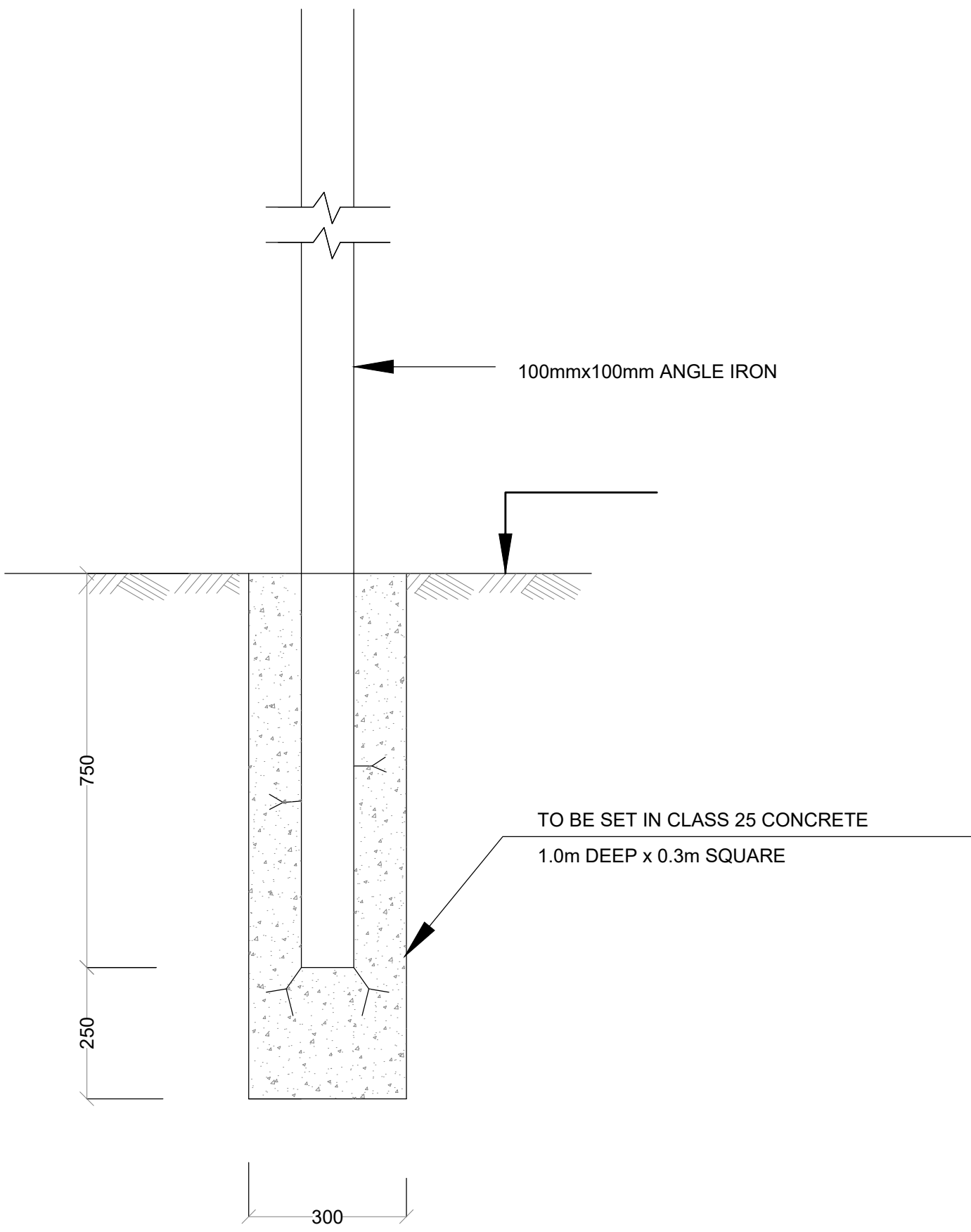
REVISIONS	No.	DATE	DESCRIPTION	 Kenya Rural Roads Authority Bara Bara Plaza, P.O. Box 48151- 00100, Nairobi. Kenya	DIRECTOR GENERAL		Consultant:  Runji Consulting Group Ltd Engineering & Project Management. 3, Kindaruma Road (Off Ngong Road) P. O. Box 68053-00200 Nairobi Tel. (020) 2717213/4	PROJECT TITLE: DRAFT DETAILED ENGINEERING DESIGN OF MAUNDU NI MERI - SOSSIAN - KIRIMON (ROAD) BATCH 2	DRAWING TITLE: STANDARD DRAWING - STANDARD - ROAD SIGNS INSTALLATION	DRAWN BY: M.M DESIGNED BY: C.N.M CHECKED BY: M.J.N	Drg No. CE1045/SD/MK/02		
					DIRECTOR (PLANNING , DESIGN &ENVIRONMENT)								



REVISIONS	No.	DATE	DESCRIPTION	 Kenya Rural Roads Authority Bara Bara Plaza, P.O. Box 48151- 00100, Nairobi. Kenya	DIRECTOR GENERAL DIRECTOR (PLANNING , DESIGN &ENVIRONMENT)	Consultant:  Runji Consulting Group Ltd Engineering & Project Management. 3, Kindaruma Road (Off Ngong Road) P. O. Box 68053-00200 Nairobi Tel. (020) 2717213/4	PROJECT TITLE: DRAFT DETAILED ENGINEERING DESIGN OF MAUNDU NI MERI - SOSSIAN - KIRIMON (ROAD) BATCH 2	DRAWING TITLE: STANDARD DRAWING - TRAFFIC MANAGEMENT	DRAWN BY: M.M DESIGNED BY: C.N.M CHECKED BY: M.J.N Scale: AS SHOWN	Drg No. CE1045/SD/MK/03 Date : DECEMBER 2024



- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
 2. SPACING BETWEEN LINES TO BE 50mm.
 3. SPACING BETWEEN EDGE AND LINE TO BE 50mm.
 4. ALL STEEL POSTS TO BE TO BS 3049 CLASS 'A' (HOT ROLLED).
 5. THE FINISH TO BE HOT DIP GALVANIZED TO BS 729.
 6. ALL BOLTS SHALL BE BUTTON-HEADED AND GALVANISED.



SIGNBOARD FIXING DETAIL
SCALE: 1:100

REVISIONS	No.	DATE	DESCRIPTION	 Kenya Rural Roads Authority Bara Bara Plaza, P.O. Box 48151- 00100, Nairobi. Kenya	DIRECTOR GENERAL		Consultant:  Runji Consulting Group Ltd Engineering & Project Management. 3, Kindaruma Road (Off Ngong Road) P. O. Box 68053-00200 Nairobi Tel. (020) 2717213/4	PROJECT TITLE: DRAFT DETAILED ENGINEERING DESIGN OF MAUNDU NI MERI - SOSSIAN - KIRIMON (ROAD) BATCH 2	DRAWING TITLE: STANDARD DRAWING - PUBLICITY SIGN BOARD	DRAWN BY: M.M DESIGNED BY: C.N.M CHECKED BY: M.J.N Scale: AS SHOWN	Drg No. CE1045/SD/MK/04 Date : DECEMBER 2024