

COUNTY GOVERNMENT OF KWALE



- NOTES**
- 1. All dimensions are in mm
 - 2. Stickers to be placed on both sides of the sign board
 - 3. 50mmx50mmx18G Square Hollow Sections to be used for main posts
 - 4. 20mmx20mmx18G Square Hollow Sections to be used for minor links
 - 5. 18G steel sheets to be used for all surfaces with stickers
 - 6. All steel sections and sheets to be painted with an approved black metal paint
 - 7. All joints to be welded to approved standards

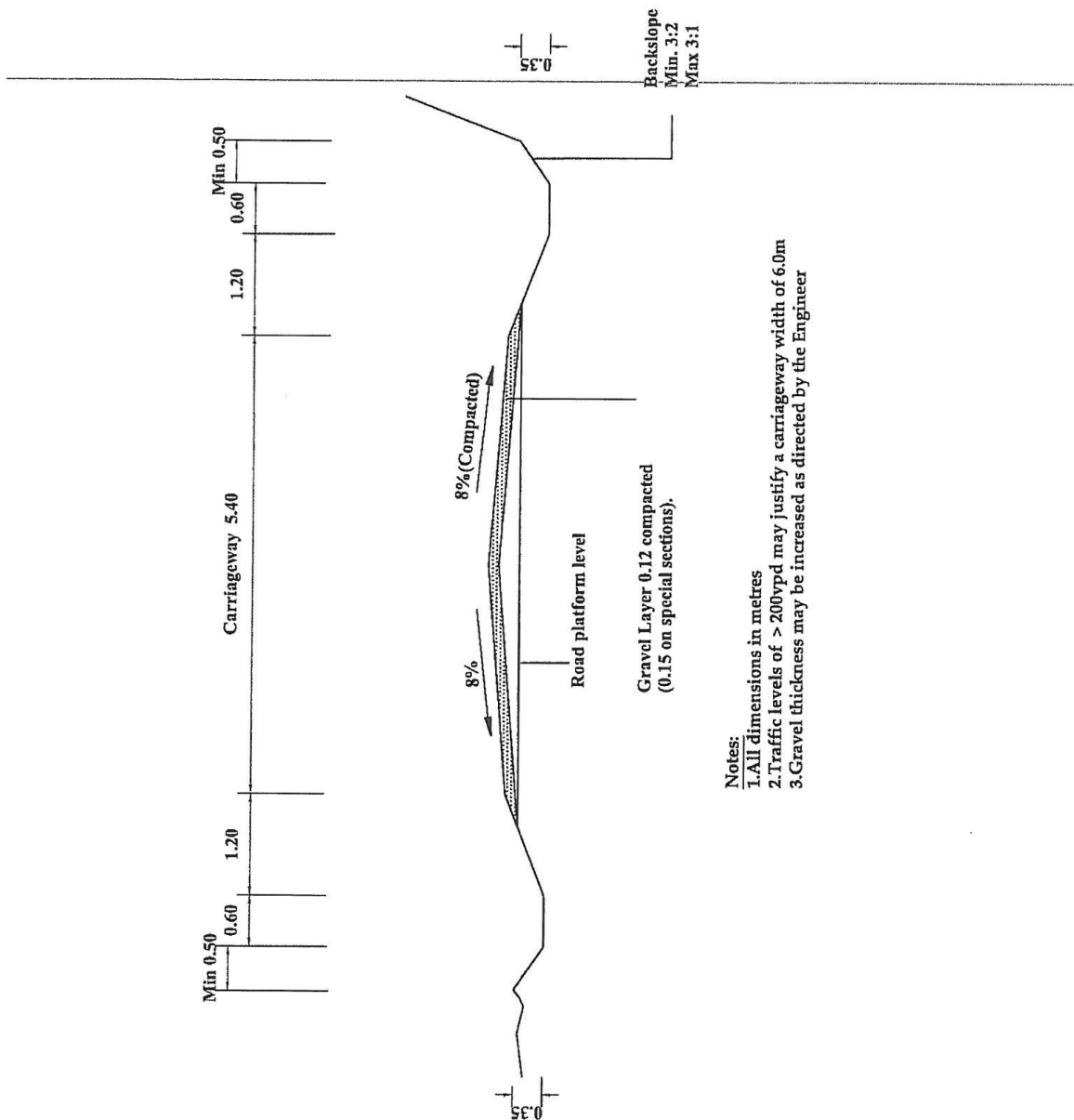
DESIGNED BY		Date			ROADS AND PUBLIC WORKS DEPARTMENT		Revision	Description	Date	Project Title:	
DRAWN BY		Date			CHIEF OFFICER	Date				TYPICAL DRAWINGS FOR ROAD WORKS	
CHECKED BY		Date			DIRECTOR	Date				PROJECT SIGN BOARD	Scale:
APPROVED BY		Date			ENGINEER (ROADS)	Date				Date	

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FIGURE C.1-CROSS SECTION A (MINOR STANDARD CROSS-SECTION)

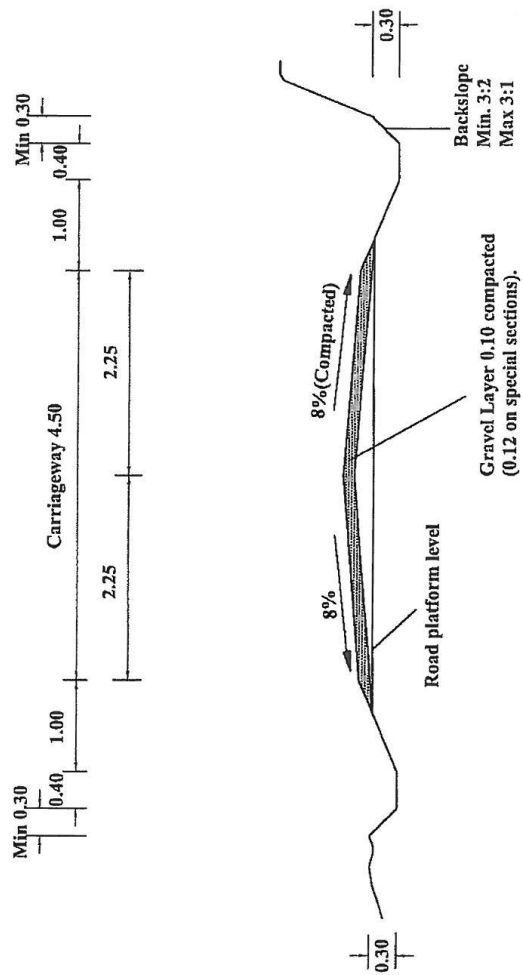


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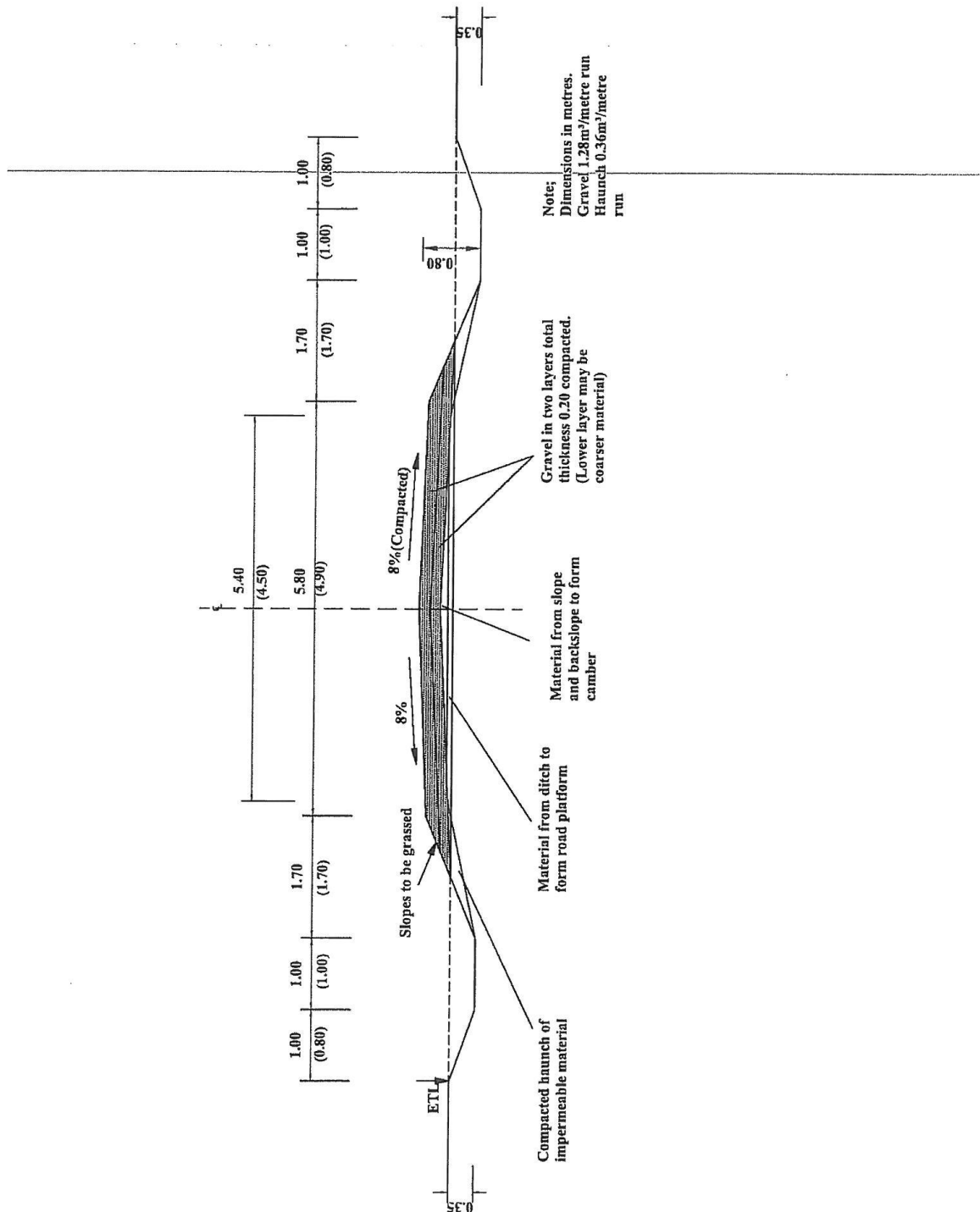
FIGURE C2- CROSS SECTION B (REDUCED CROSS-SECTION)



- Notes:
1. All dimensions in metres
 2. Gravel thickness may be increased as directed by the Engineer

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FIGURE C3-CROSS- SECTION C (BLACK COTTON SOIL)

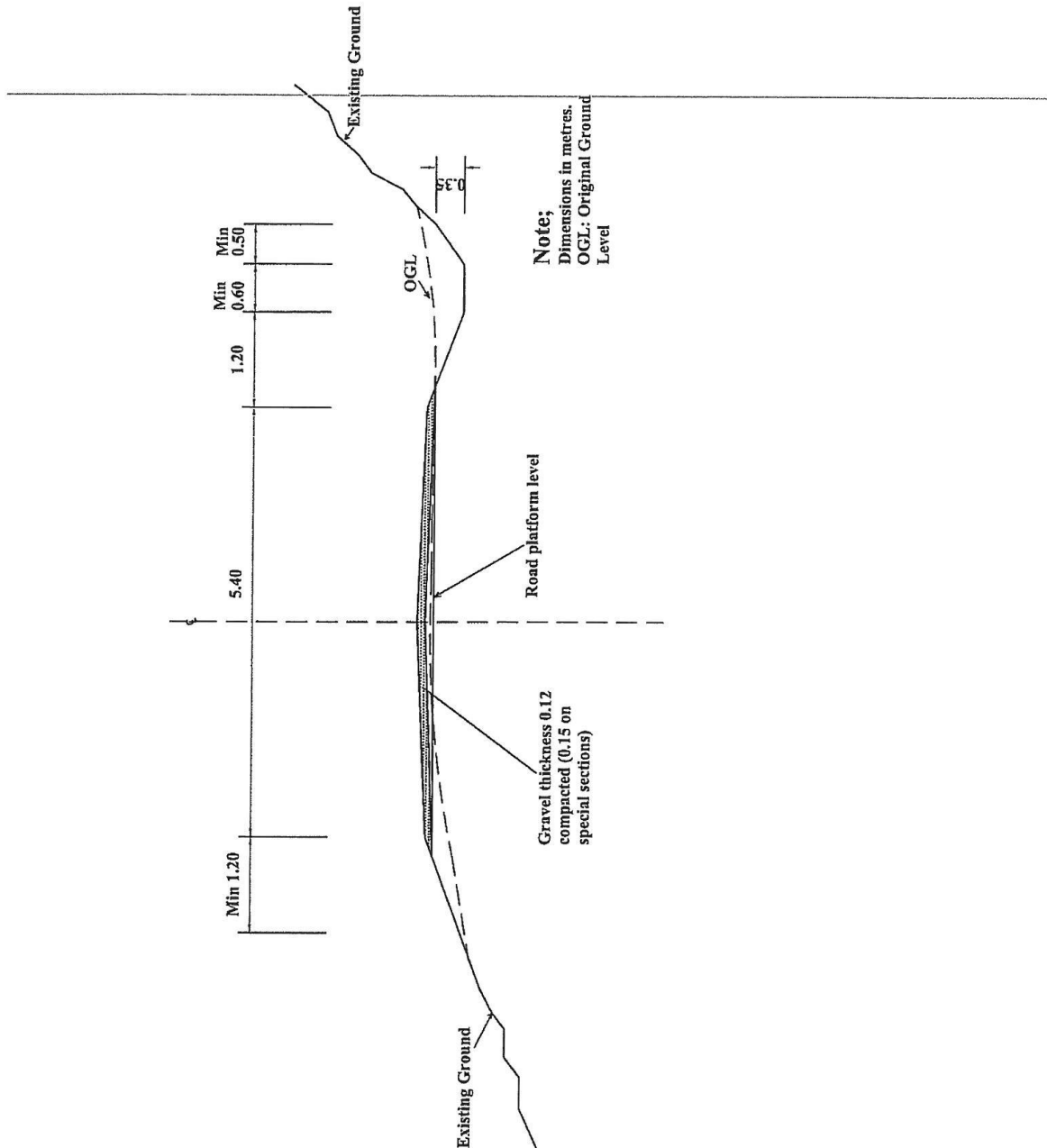


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FIGURE C4-CROSS- SECTION D (SIDELONG GROUND)

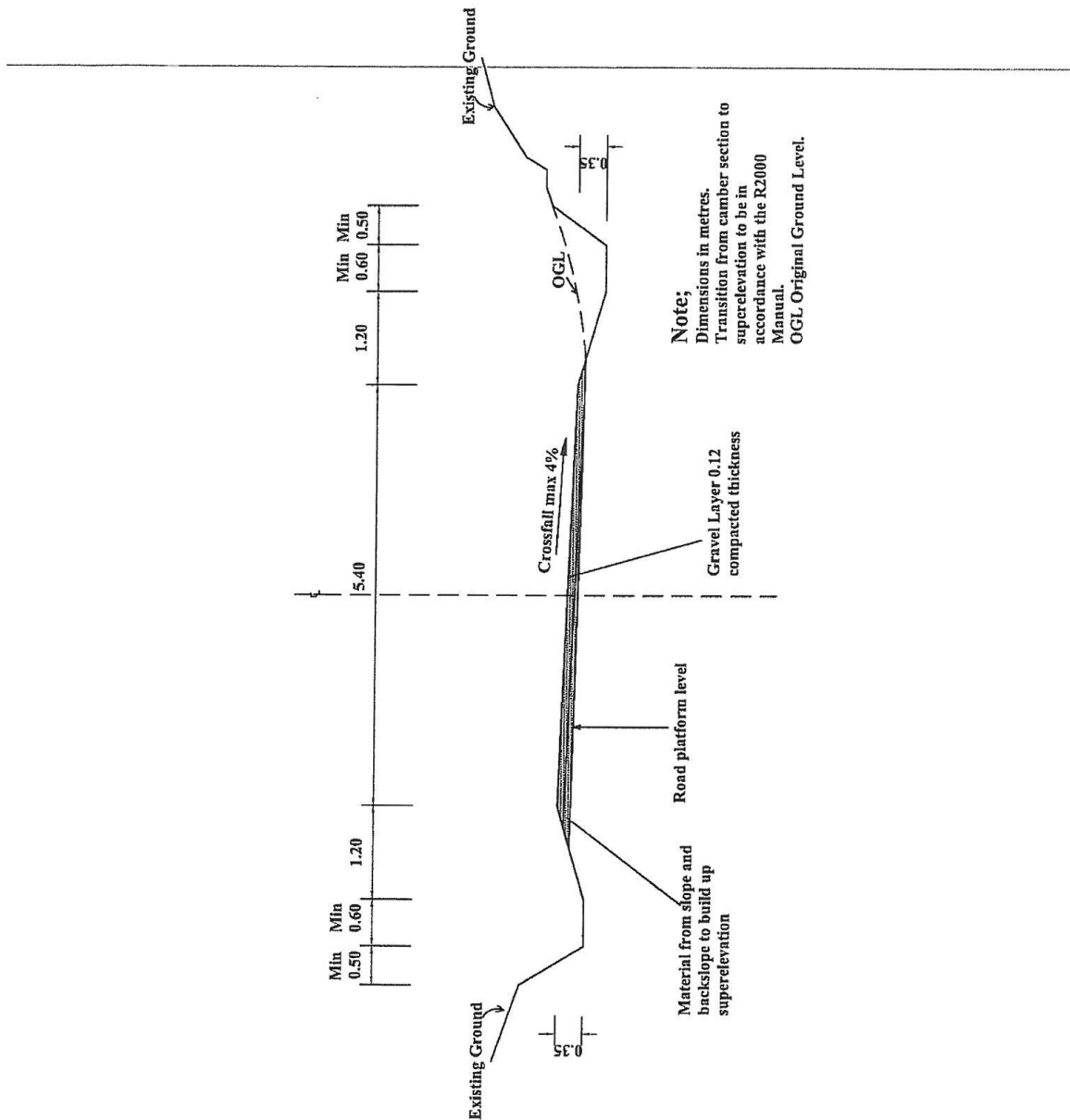


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FIGURE C5- STANDARD CROSS- SECTION (SUPERELEVATION)



Mitre drain
Cross Section



Location, direction and length of the mitre drain to be as directed by the Engineer

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FIGURE C.7 SCOUR CHECKS

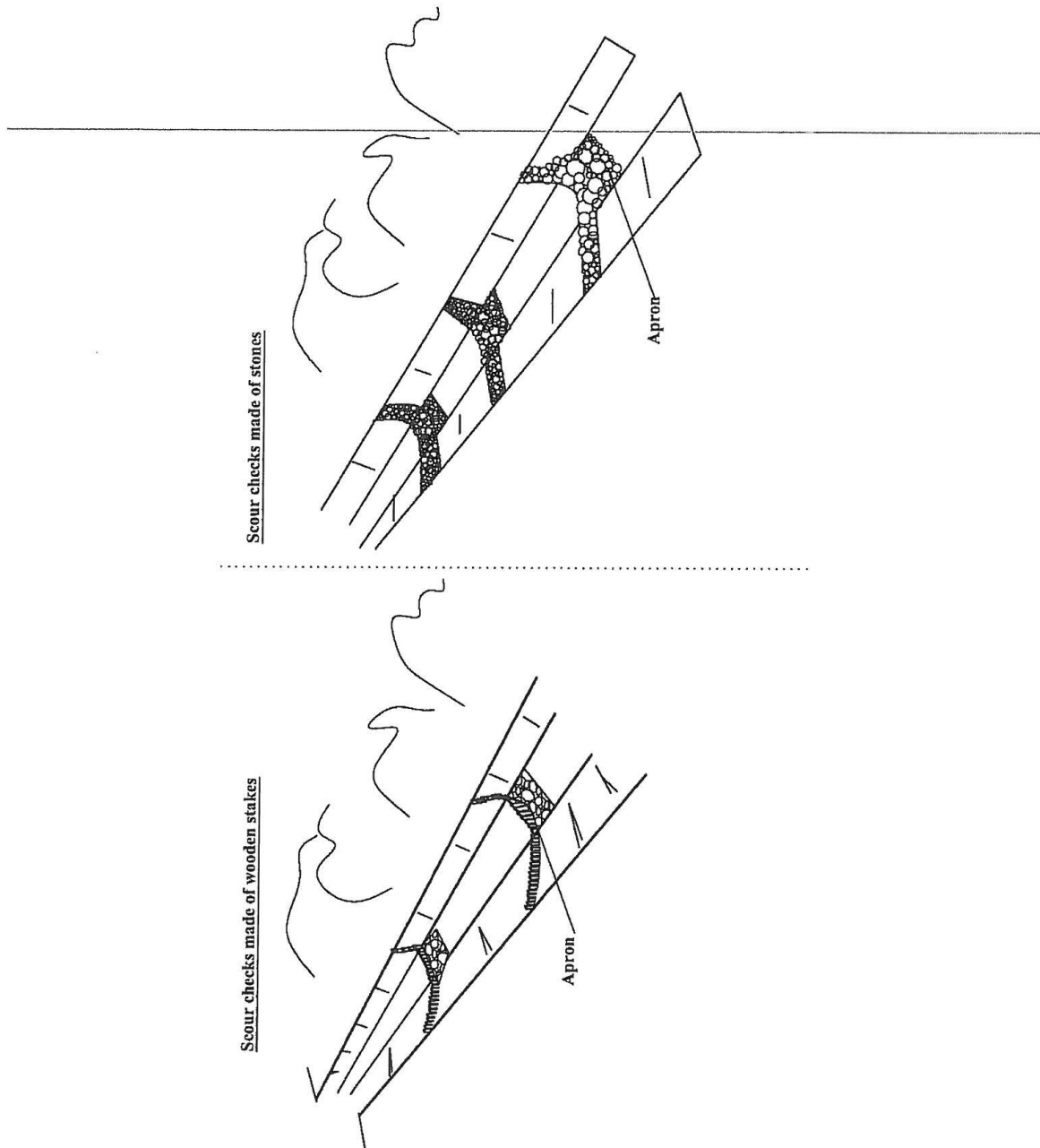
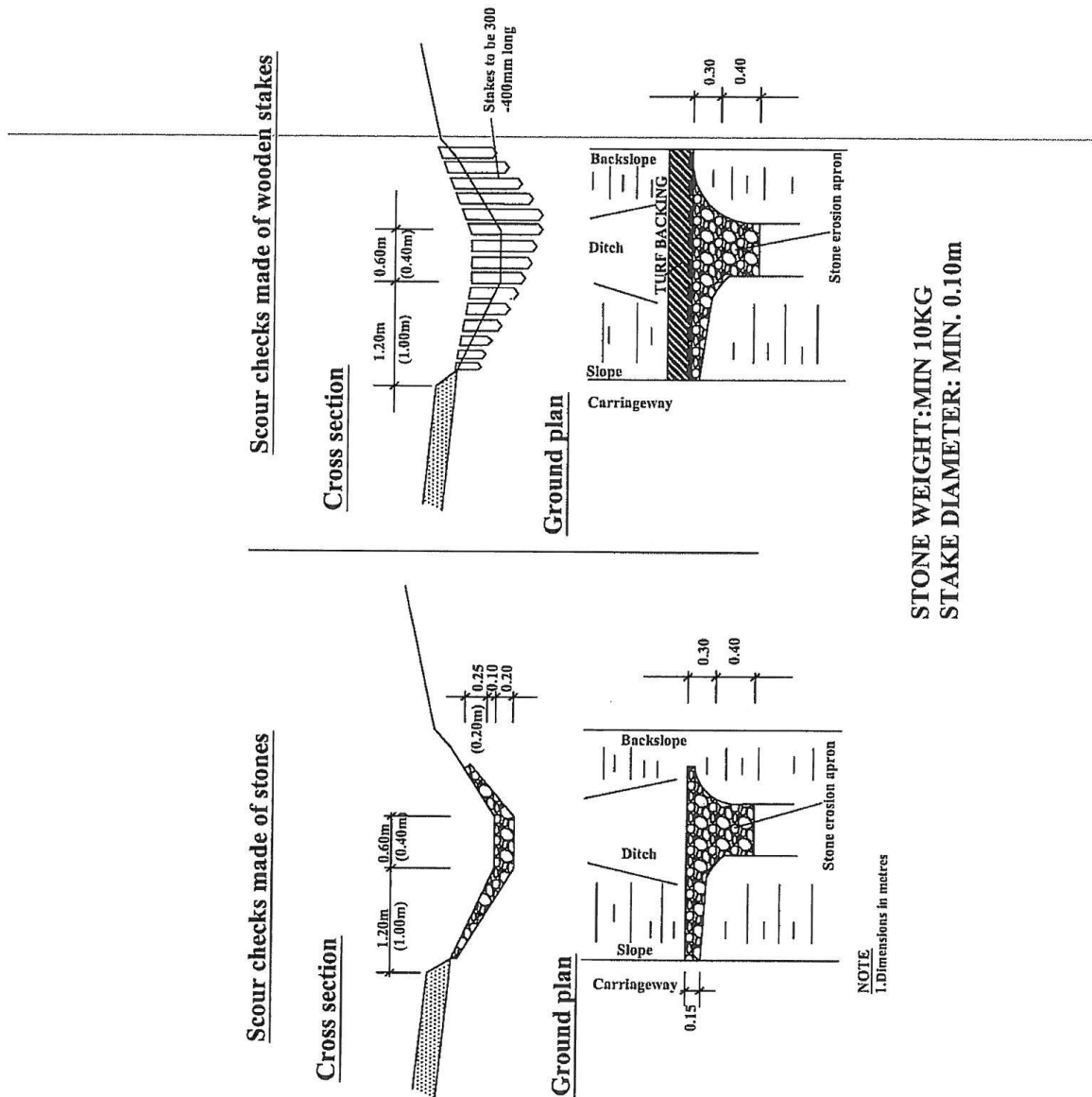


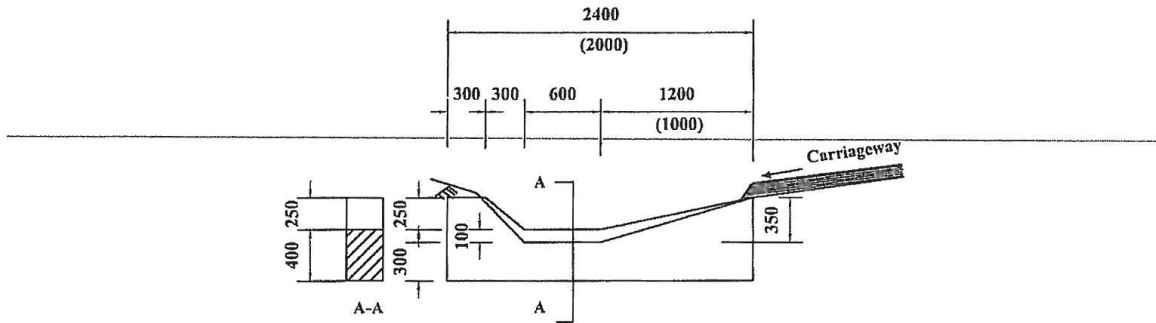
FIGURE C8-DIMENSIONS OF SCOUR CHECKS FOR STANDARD DRAIN



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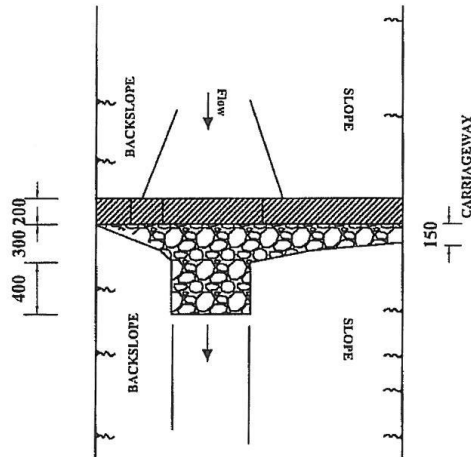
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Figure C9a-Masonry Scour Checks



Note
1. Dimensions in mm

SECTION OF MASONRY SCOUR CHECK



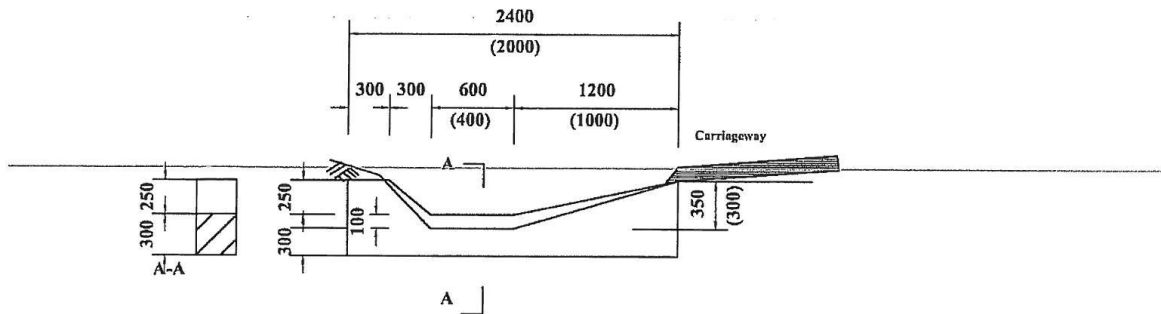
PLAN OF DRAIN WITH SCOUR CHECK

Cross- Section	Sizes In mm			Excav (m3)	Concrete (m3)	Apron stone pitching (m3)
	Length	Width	Depth			
A	2400	200	550	0.22	0.25	0.18
B	2000	200	500	0.18	0.2	0.14

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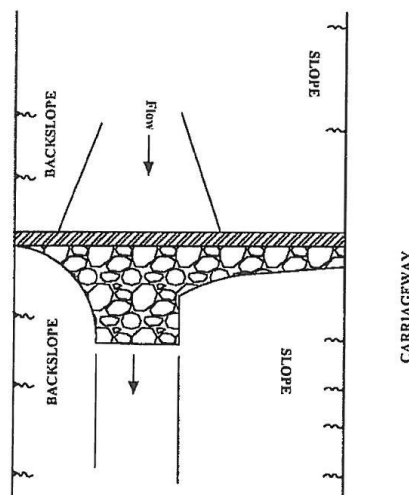
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FIGURE C9b- CONCRETE SCOUR CHECKS



SECTION OF CONCRETE SCOUR CHECK

NOTE
1. Dimensions in mm



PLAN OF DRAIN WITH SCOUR CHECK

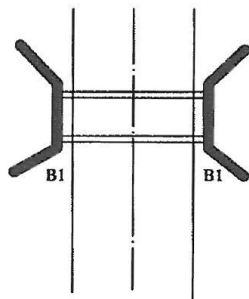
Cross-Section	Sizes in mm			Excav (m3)	Concrete (m3)	Apron stone pitching (m3)
	Length	Width	Depth			
A	2400	100	550	0.13	0.15	0.18
B	2000	100	500	0.10	0.09	0.14

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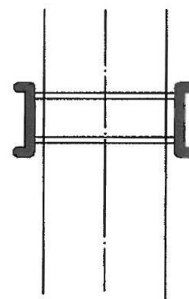
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FIGURE C10- CULVERT ENTRY/EXIT STRUCTURE TYPES

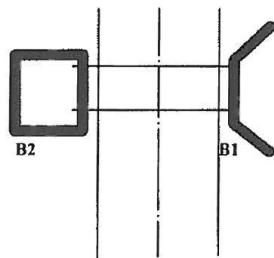
TYPE1(ENTRY AND EXIT)



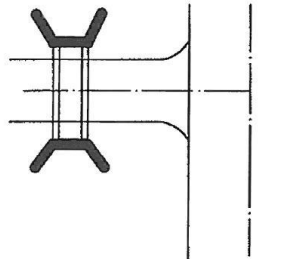
TYPE3(ENTRY AND EXIT)



TYPE 2(ENTRY ONLY)



TYPE 4(ENTRY AND EXIT ON
ACCESS)



NOTE

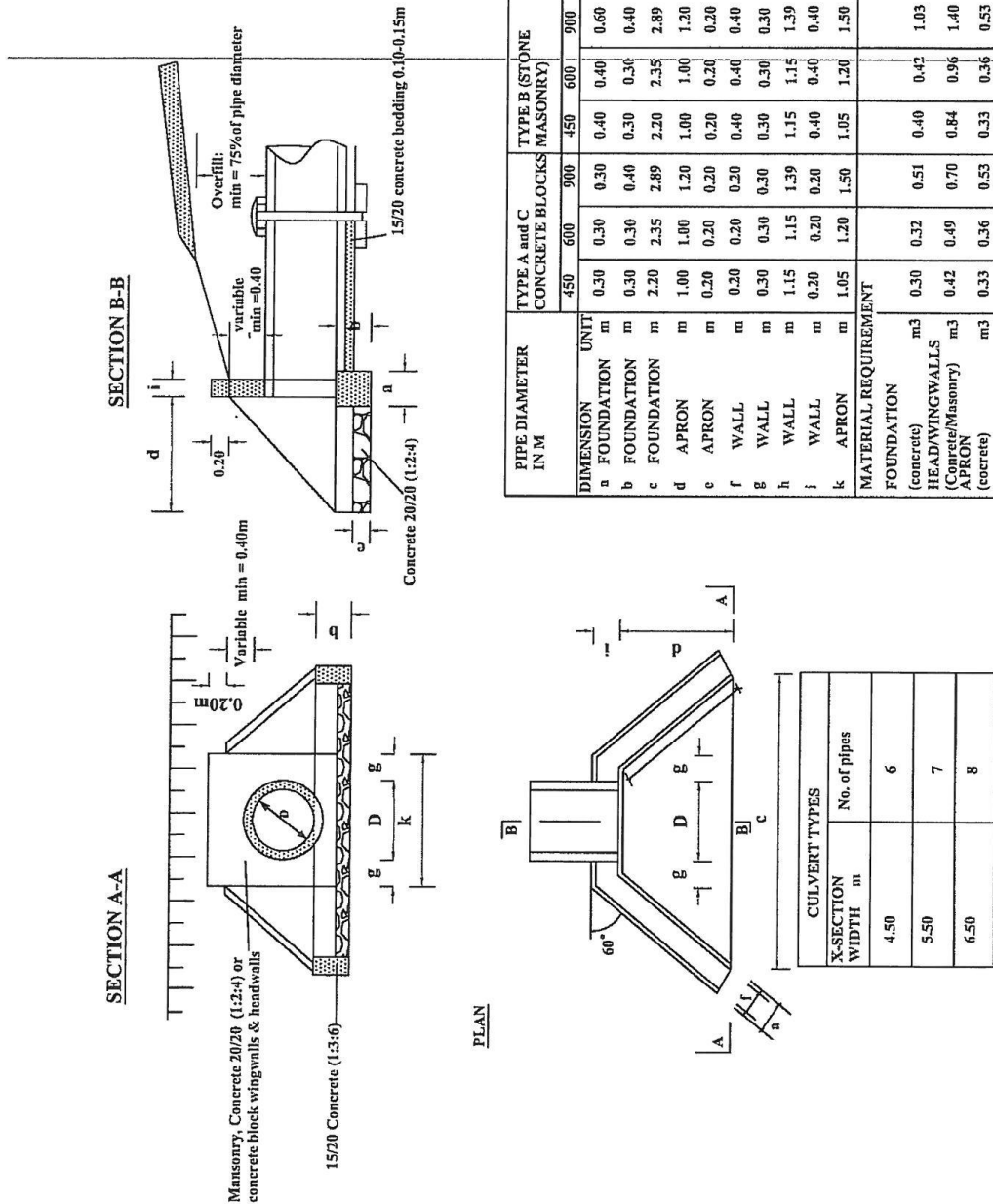
1. The code numbers specify the shape and function and the code letter denotes the material;

A =Concrete block

B =Stone masonry

C =Concrete

FIGURE C11- HEADWALL TYPE 1 (HEAD AND WINGWALLS)

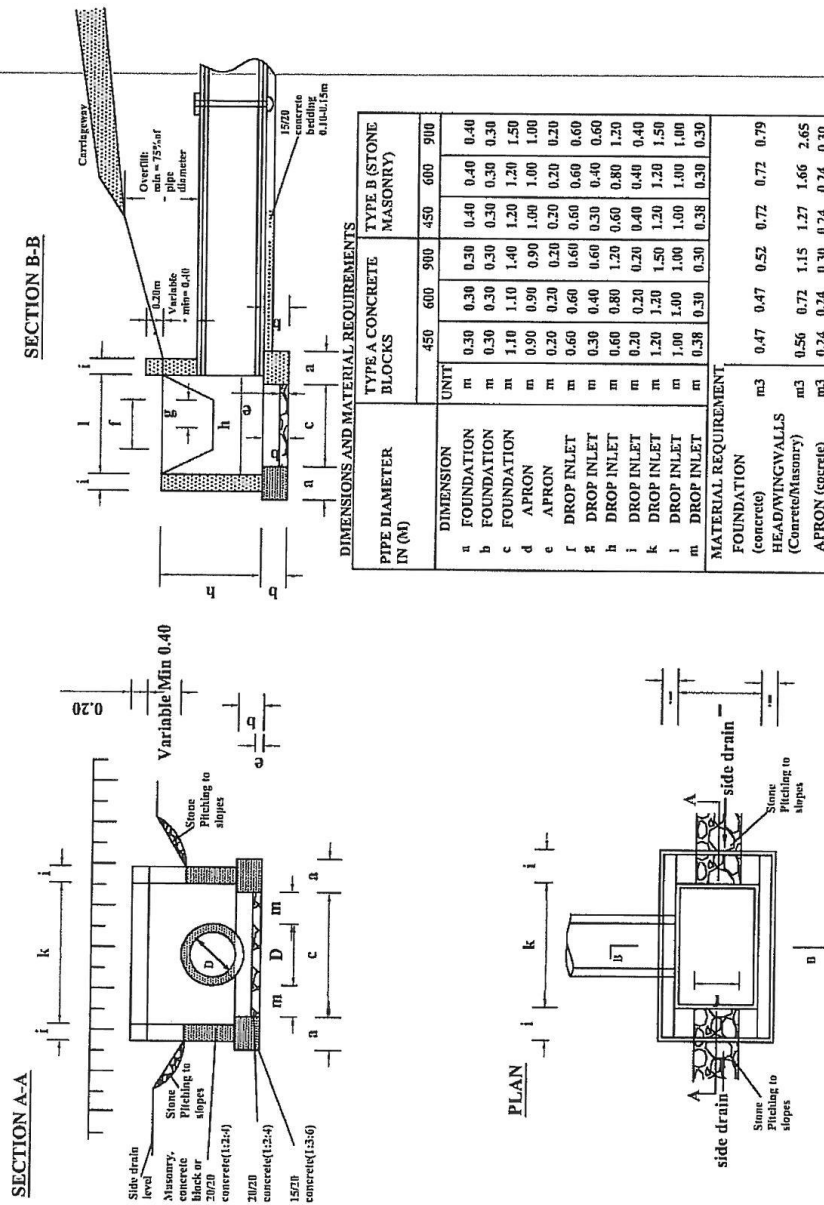


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FIGURE C12-HEADWALL TYPE 2(DROP INLET)

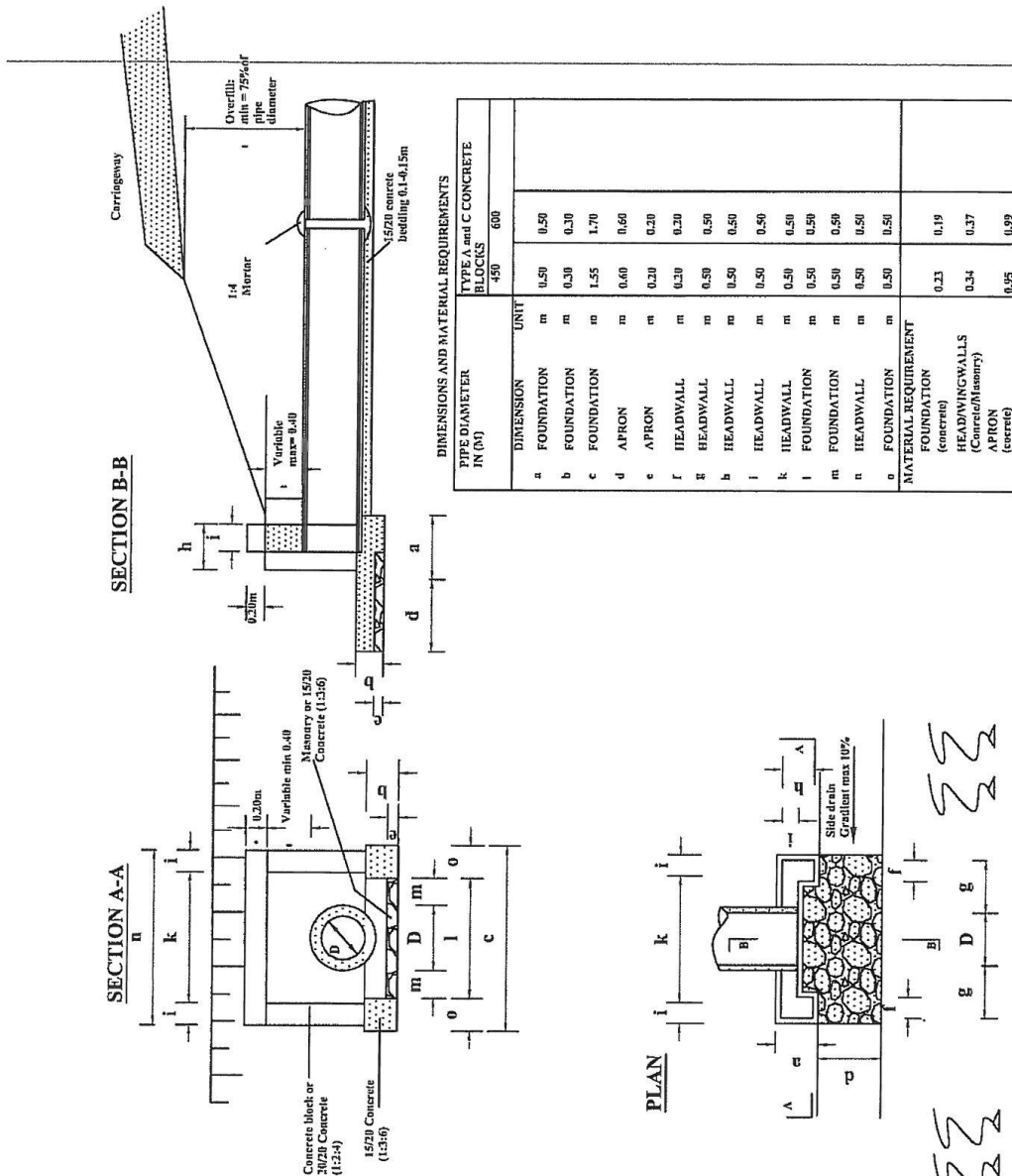


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FIGURE C.13-HEADWALL TYPE 3A (CONCRETE/ BLOCK HEADWALLS)

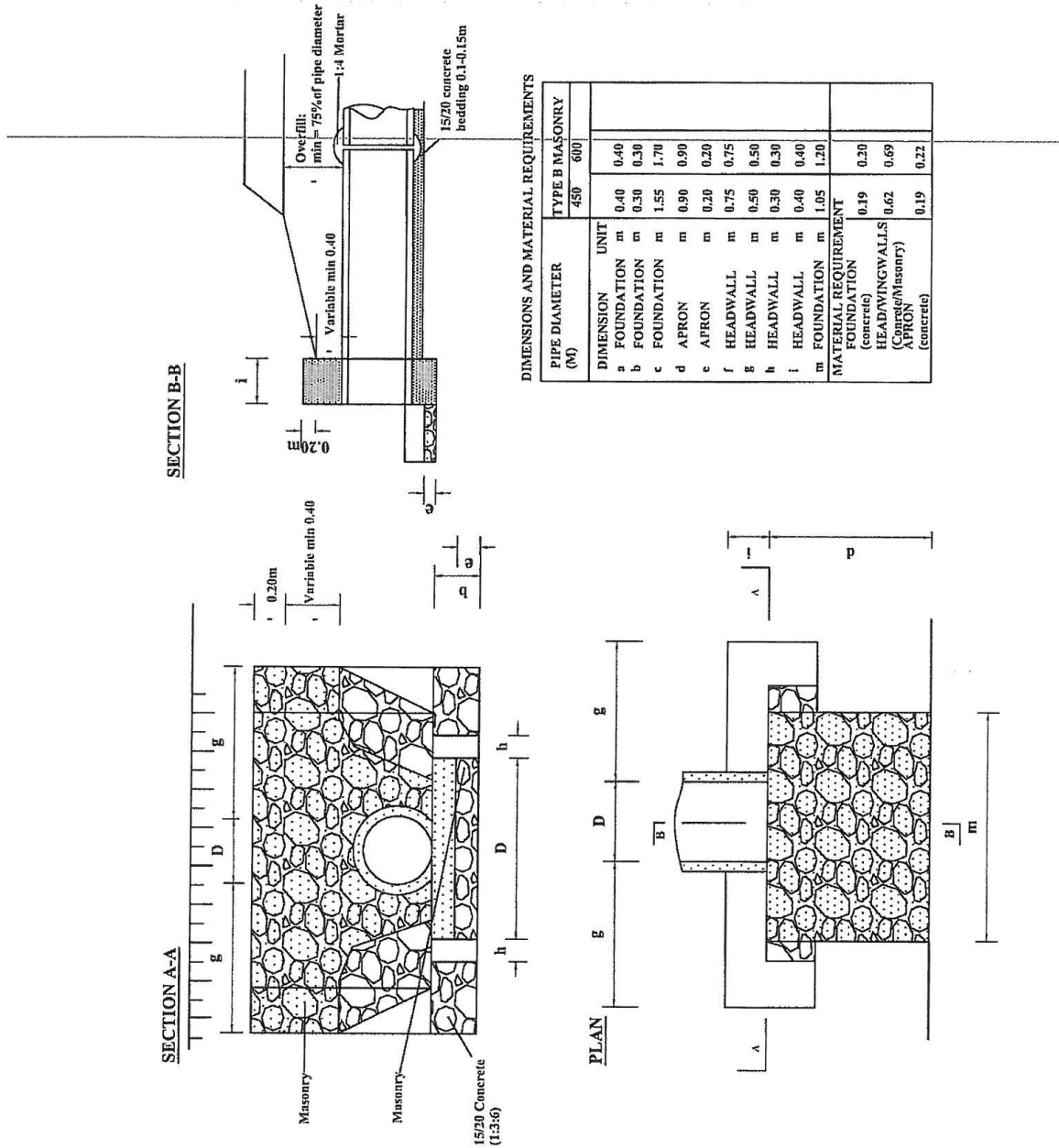


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FIGURE C14-HEADWALL TYPE 3B(STONE MASONRY HEADWALLS)

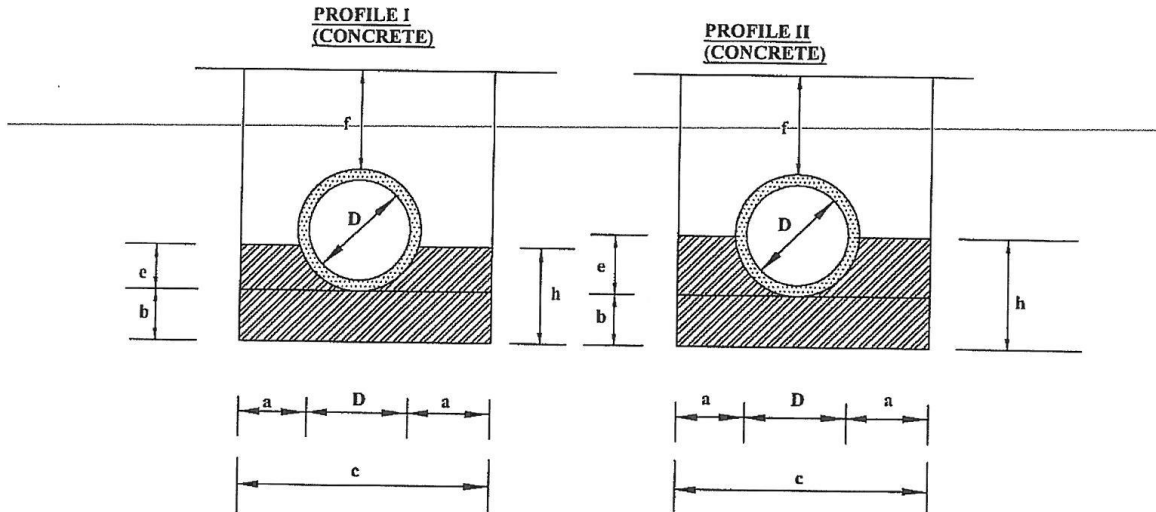


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FIGURE C16-BEDDING AND HAUNCH PROFILE TYPES I & II



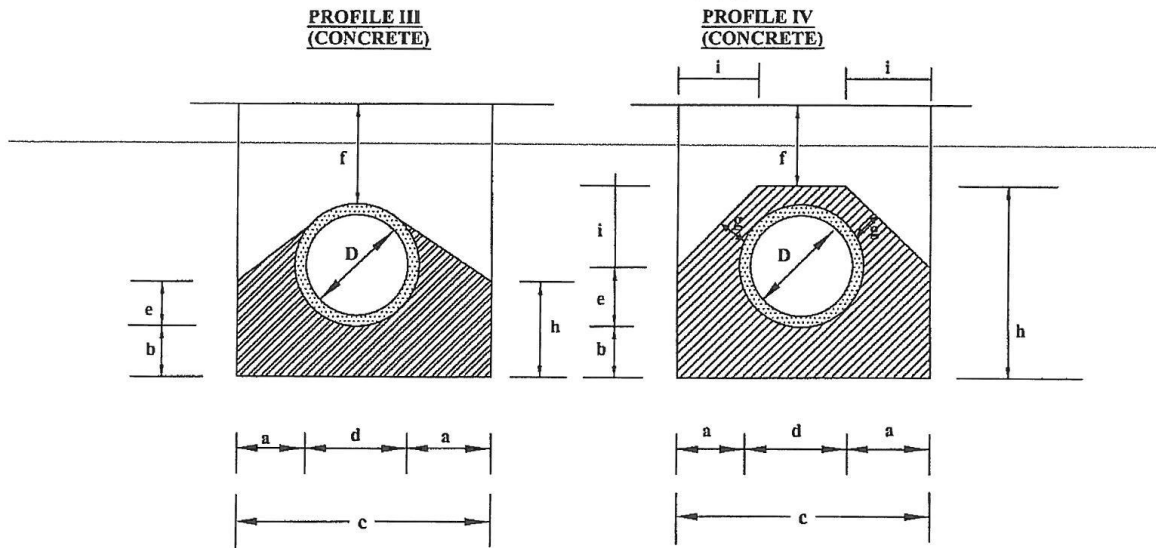
Diameter (D)	450 (mm)	600 (mm)	900 (mm)
a	0.15	0.20	0.20
b	0.10	0.15	0.15
c	0.86	1.12	1.48
d	0.56	0.72	1.08
e	0.14	0.18	0.27
f(min)	0.34	0.45	0.68
g	-	-	-
h	0.24	0.33	0.42
i	-	-	-
Concrete Class 15/20	Volume in (m3/m)		
	0.24	0.24	0.24
Application	-Fair subgrade condition -Overfill > 75% of the pipe diameter -Seasonal water flow only		
Remarks	Material for back/overfill shall be approved by the Engineer		

450 (mm)	600 (mm)	900 (mm)
0.15	0.20	0.20
0.10	0.15	0.15
0.86	1.12	1.48
0.56	0.72	1.08
0.28	0.36	0.54
0.34	0.45	0.68
-	-	-
0.38	0.51	0.69
-	-	-
Volume in (m3/m)		
0.20	0.37	0.56
-Fair to poor subgrade condition -Overfill > 75% of the pipe diameter -Seasonal water flow only		
Material for back/overfill shall be approved by the Engineer		

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FIGURE C17-BEDDING AND SURROUND PROFILE TYPES III & IV



Diameter (D)	450 (mm)	600 (mm)	900 (mm)
a	0.15	0.20	0.20
b	0.10	0.15	0.15
c	0.86	1.12	1.48
d	0.56	0.72	1.08
e	0.42	0.54	0.81
f(min)	0.23	0.3	0.45
g	-	-	-
h	0.52	0.69	0.96
i	-	-	-
Concrete	Volume in (m3/m)		
Class 15/20	0.26	0.47	0.71
Application	-Fair subgrade condition -Overfill > 75% of the pipe diameter -Seasonal water flow only		
Remarks	Material for back/overfill shall be approved by the Engineer		

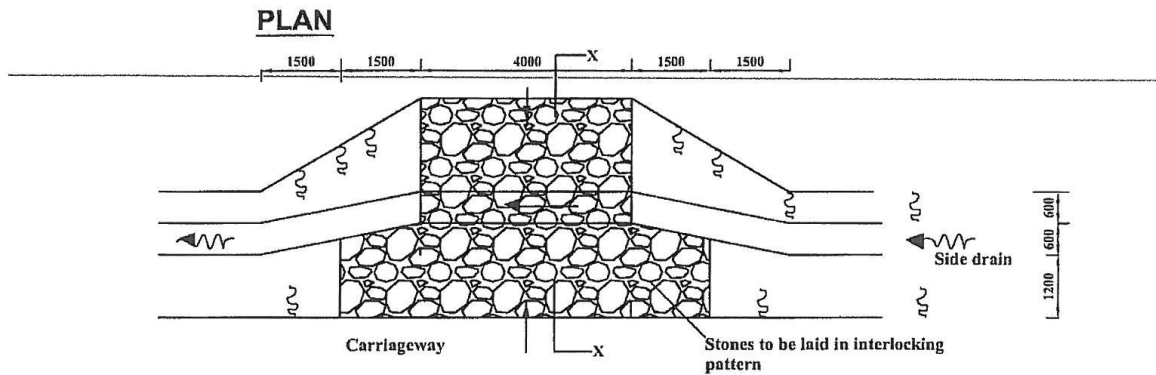
450 (mm)	600 (mm)	900 (mm)
0.15	0.20	0.20
0.10	0.15	0.15
0.86	1.12	1.48
0.56	0.72	1.08
0.46	0.52	0.78
0.15	0.15	0.15
0.15	0.15	0.15
0.81	1.02	1.38
0.28	0.35	0.45
Volume in (m3/m)		
0.37	0.61	0.92
-Fair to poor subgrade condition -Overfill > 75% of the pipe diameter -Seasonal water flow only		
Material for back/overfill shall be approved by the Engineer		

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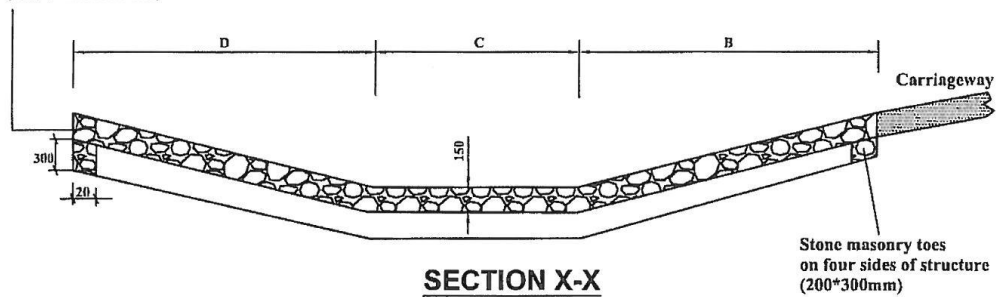
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FIGURE C18-ACCESS DRIFT



150mm Grouted Stone Pitching
(Cement mortar 1:4)

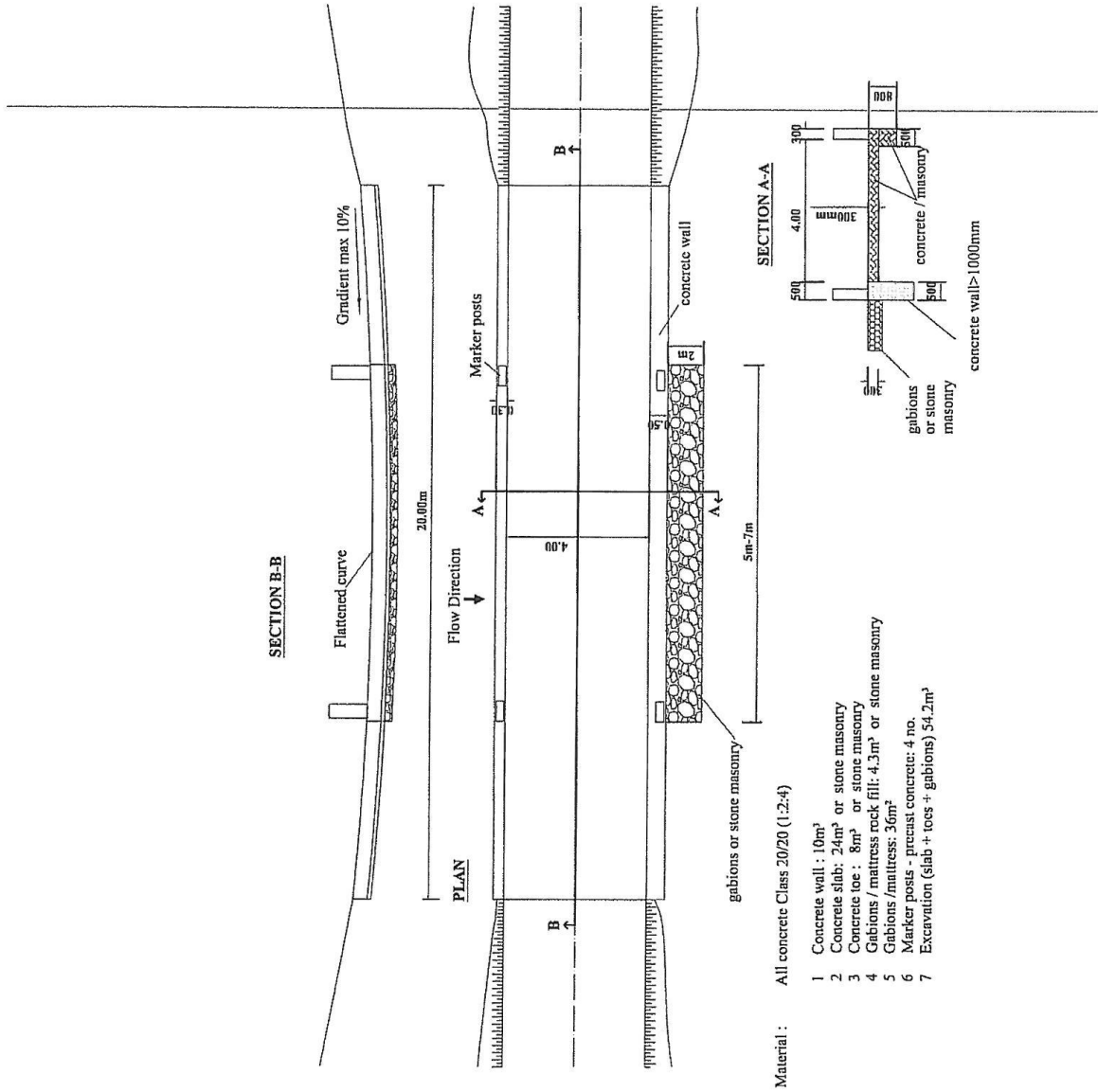


QUANTITIES TABLE								
Cross section	DIMENSIONS					Excavation(m3)	Stone masonry (m3)	150mm Grouted stone pitching(m3)
	A	B	C	D	E			
A	4000	1800	600	1800	4200	7.5	1.30	21.75
	6000	1800	600	1800	4200	10.00	1.60	30.15
B	4000	1400	400	1800	3600	7.00	1.20	18.30
	6000	1400	400	1800	3600	9.00	1.50	25.50

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FIGURE C19-LEVEL DRIFT

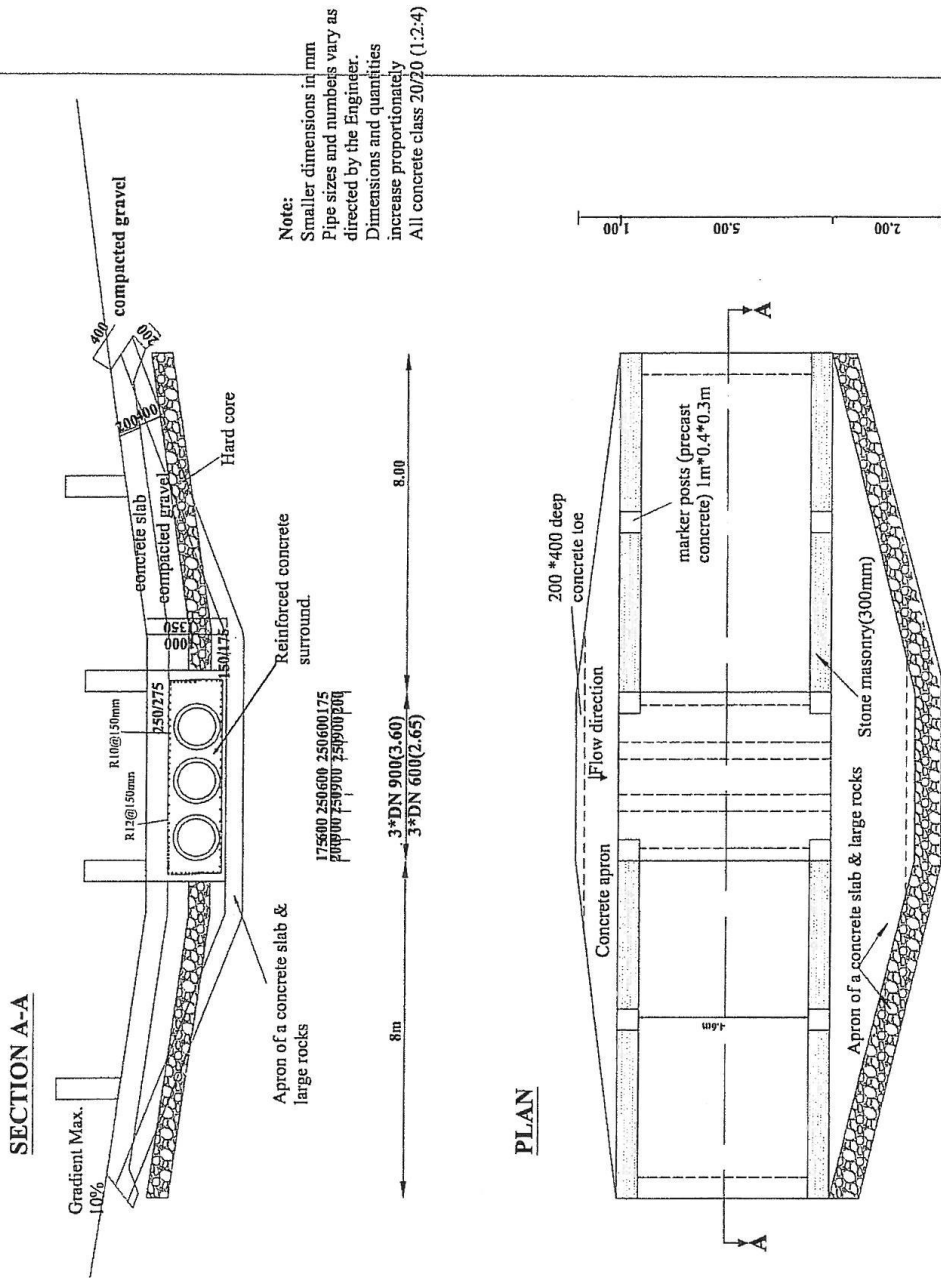


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FIGURE C20-VENTED DRIFT

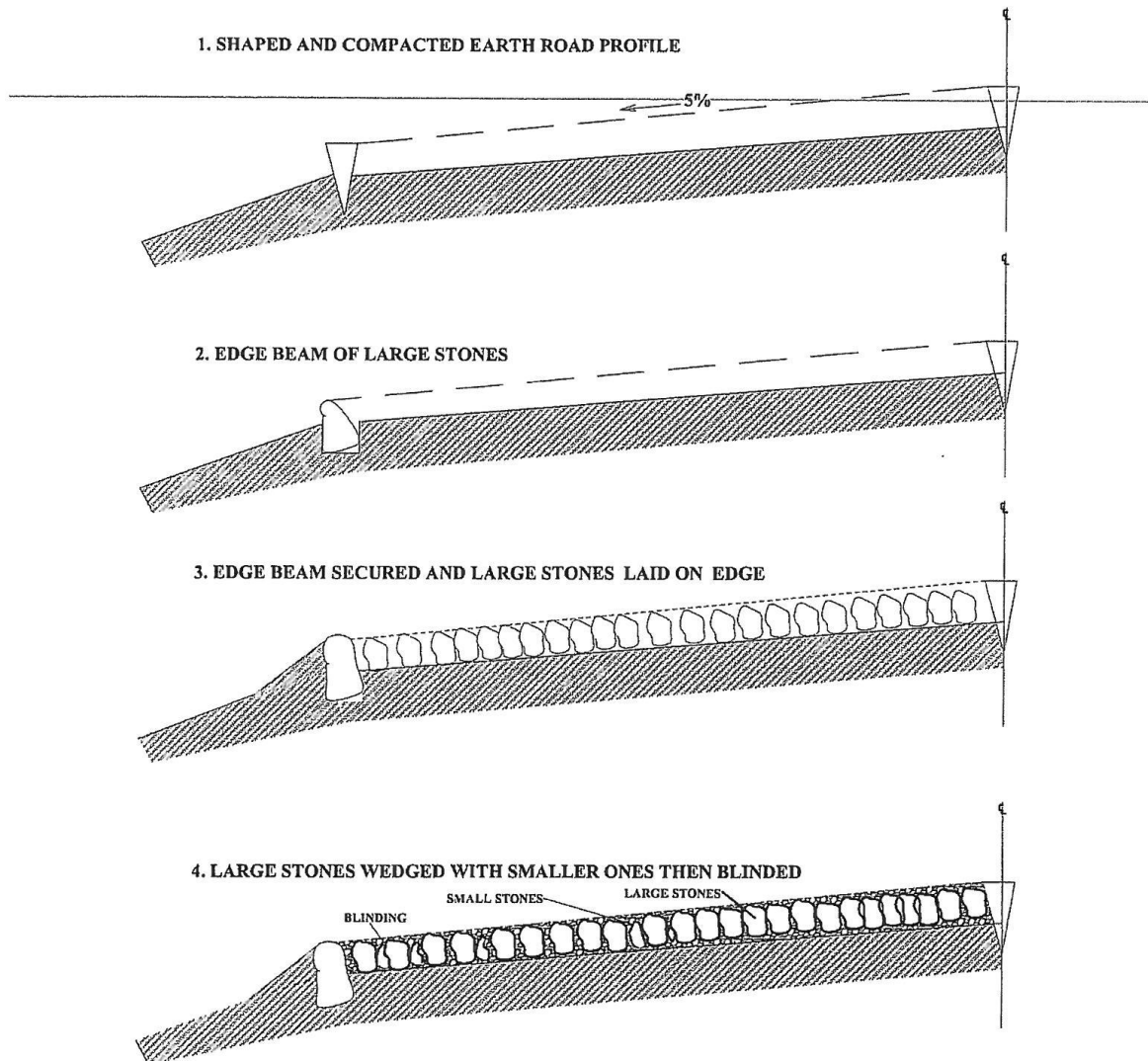


Note:
Smaller dimensions in mm
Pipe sizes and numbegs vary as
directed by the Engineer.
Dimensions and quantities
increase proportionately
All concrete class 20/20 (1:2:4)

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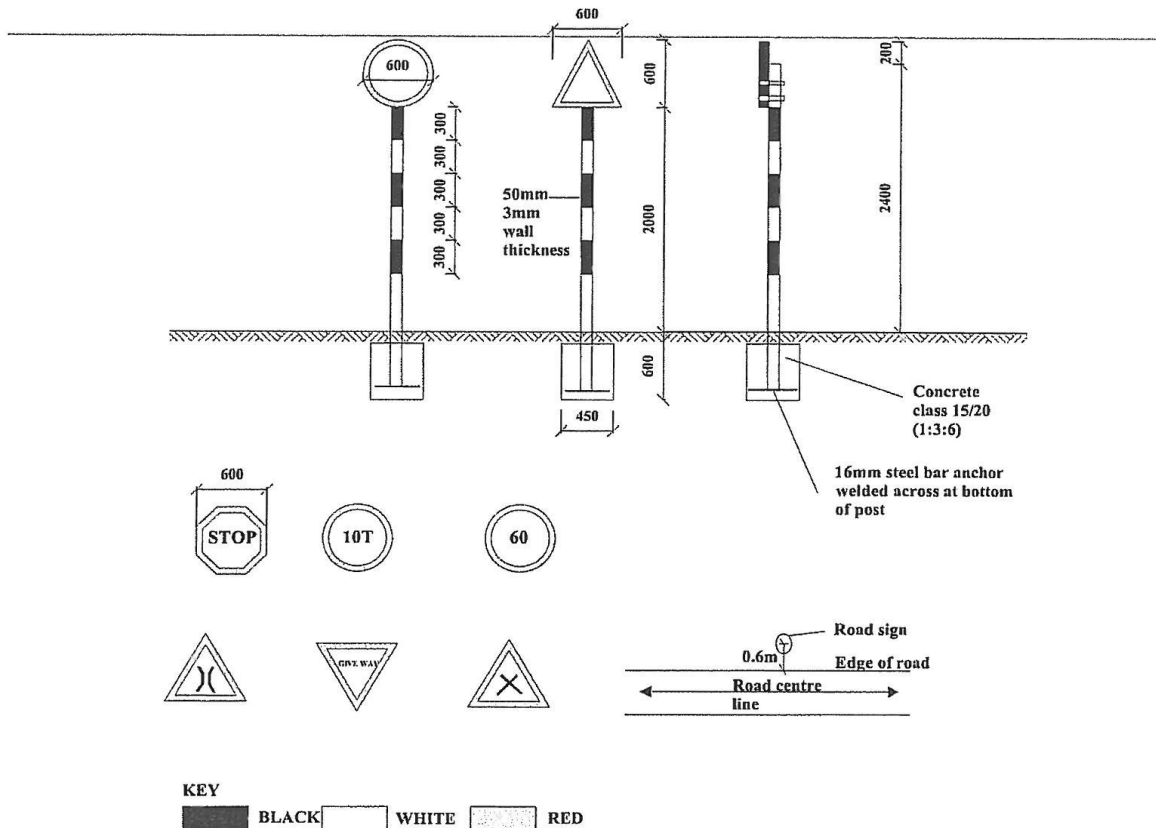
FIGURE C21-HAND PACKED STONE PAVEMENT



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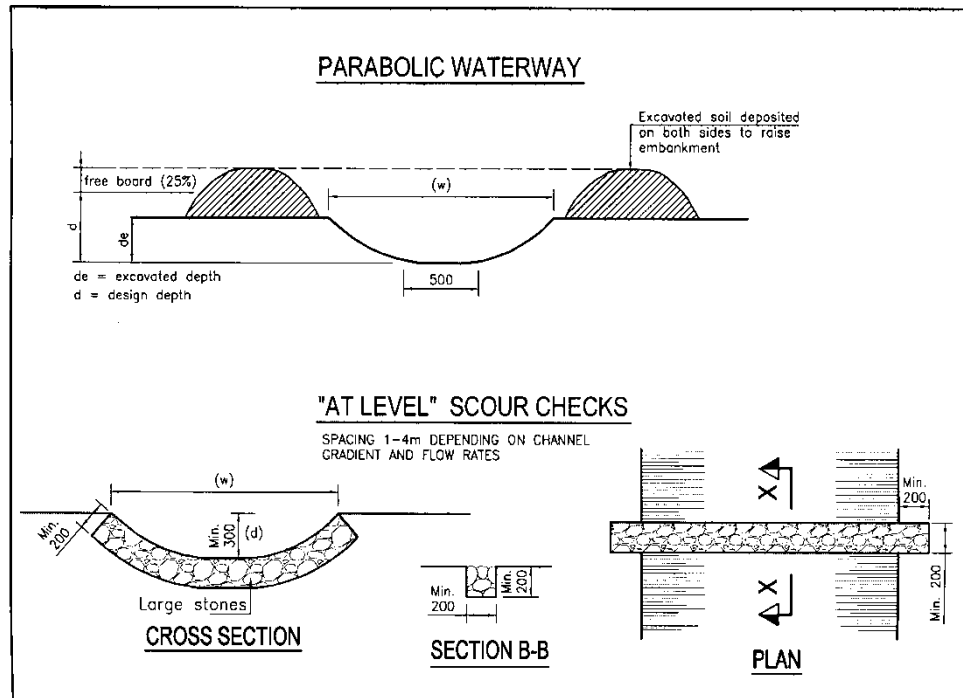
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FIGURE C22-TRAFFIC SIGNS



1. The type of sign required and their location shall be as shown on the Road Plan or as directed by the Engineer.
2. Sign plate to be 2mm thick mild steel plate
3. Sign post to be 50mm fixing clamps/brackets.
4. Sign plate to be fixed to steel tube by 5 Nos M10 bolts and 50mm fixing clamps/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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Quantities Tables

A Parabolic waterway

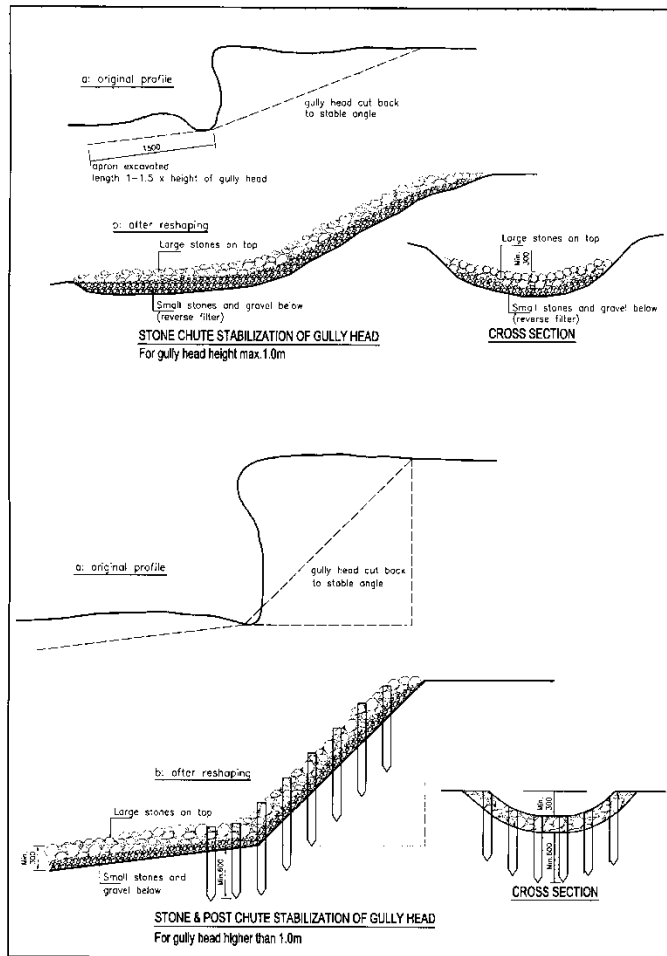
Top width (m)	Depth	Excavation volume (m ³ /m)
1.50	0.6	0.6
2.00	0.6	0.8
3.00	0.75	1.5

B At level scour check

Top width (m)	Excavation volume (m ³)	Hardcore volume (m ³)
1.50	0.10	0.10
2.00	0.15	0.15
3.00	0.25	0.25

Figure C9c- At level Scour checks

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Quantities Tables

A. Gully head shaping and stone lining

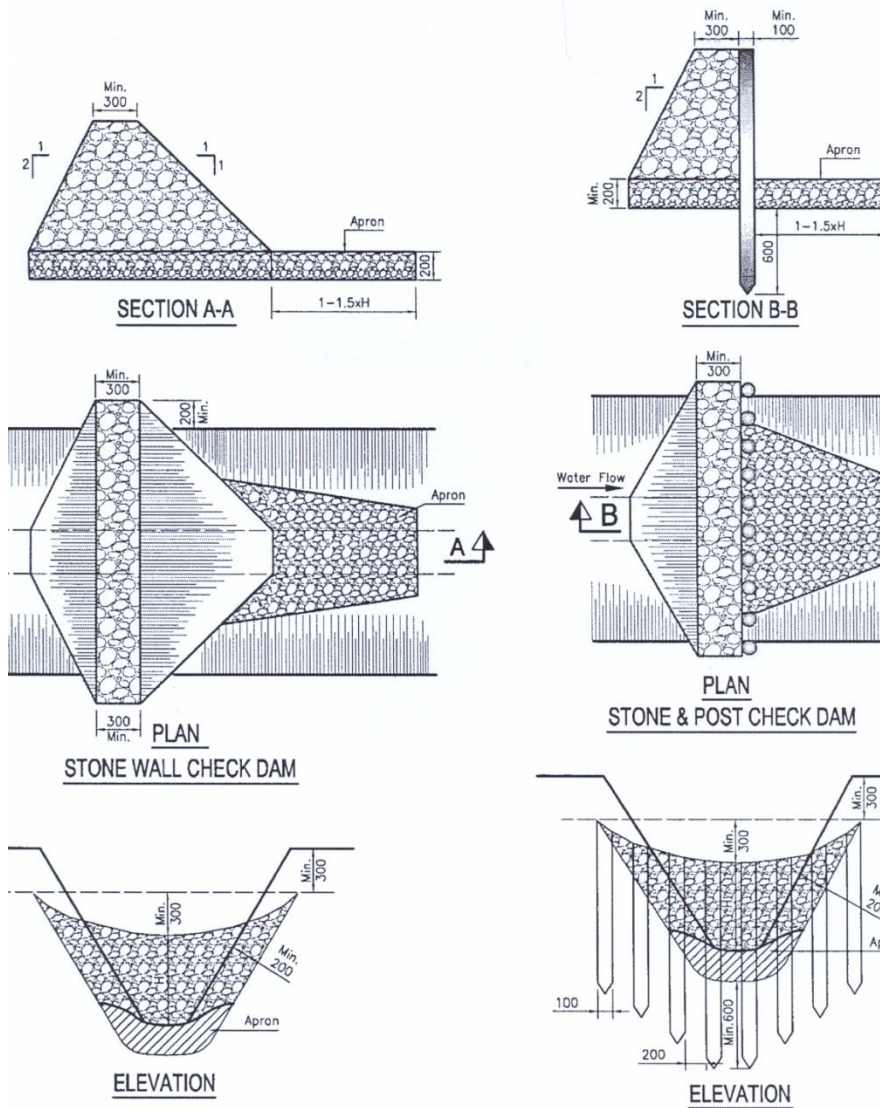
Top width (m)	Depth (m)	Length (m)	Excavation volume (m3/)	Hardcore Volume (m3)
1.50	0.3	3.20	0.80	1.0
1.50	0.3	3.20	1.20	1.5
2.00	0.3	3.20	1.60	2.0

B. Gully Head shaping, stone & posts lining

Top width (m)	Depth (m)	Length (m)	Excavation volume (m3/)	Hardcore Volume (m3)
2.0	0.3	3.00	1.50	1.80
2.0	0.3	3.40	2.40	2.0
2.0	0.3	4.50	4.60	2.70
2.0	0.3	6.70	10.20	4.0

Figure C9d – Gully head and stone and post protection

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Spacing in metres between check dams

% slope	Height of check dam spillway (m)				
	0.15	0.25	0.50	0.75	1.00
5	15.0	25.0			
7	5.0	8.7	17.5	25	35
10	2.5	4.2	8.4	12.6	16.8
15	1.4	2.3	4.6	6.9	9.2
20	0.9	1.6	3.2	4.8	6.4
25		1.3	2.5	3.8	5.0
30		1.0	2.0	3.0	4.0
40			1.6	2.4	3.2
50			1.2	1.8	2.0

Figure C9e – Stone and post dam checks