

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

MINISTRY OF HIGHWAYS, PORTS & SHIPPING

ROAD DEVELOPMENT AUTHORITY

**CHINA DEVELOPMENT BANK FUNDED IMPROVEMENT
AND REHABILITATION OF
PRIORITY ROAD PROJECT 3 (PRP3)**

CIVIL WORK CONTRACT NO: RDA/RNIP/PRP3/PHASE-1/PACKAGE-4

Contract Component No.	Description
RDA/RNIP/PRP3/Phase-1/Package-4/C7	Kandy - Jaffna Road (1.65 - 3.9 km)
RDA/RNIP/PRP3/Phase-1/Package-4/C8	Marawila - Udubaddawa Road (0.00 - 19.55 km)

CONTRACTOR

HUNAN CONSTRUCTION ENGINEERING GROUP CORPORATION (HUNAN)

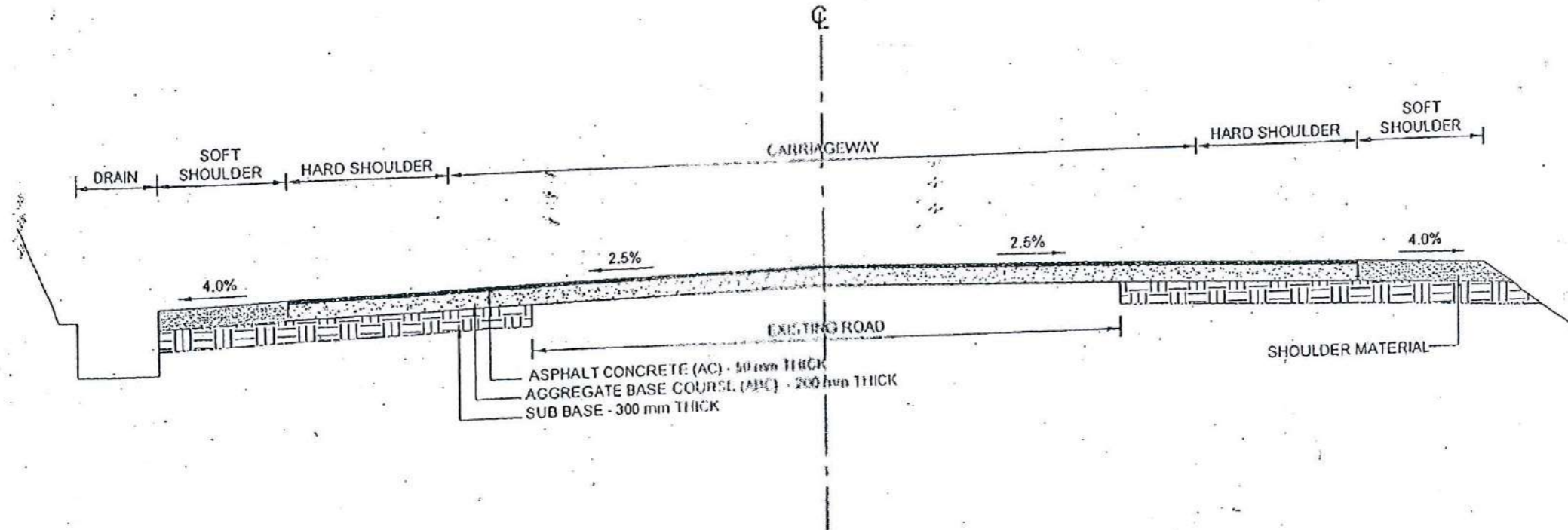
**VOLUME 4
The Drawings**

DECEMBER 2013

Handwritten notes:
Drawings
to be submitted

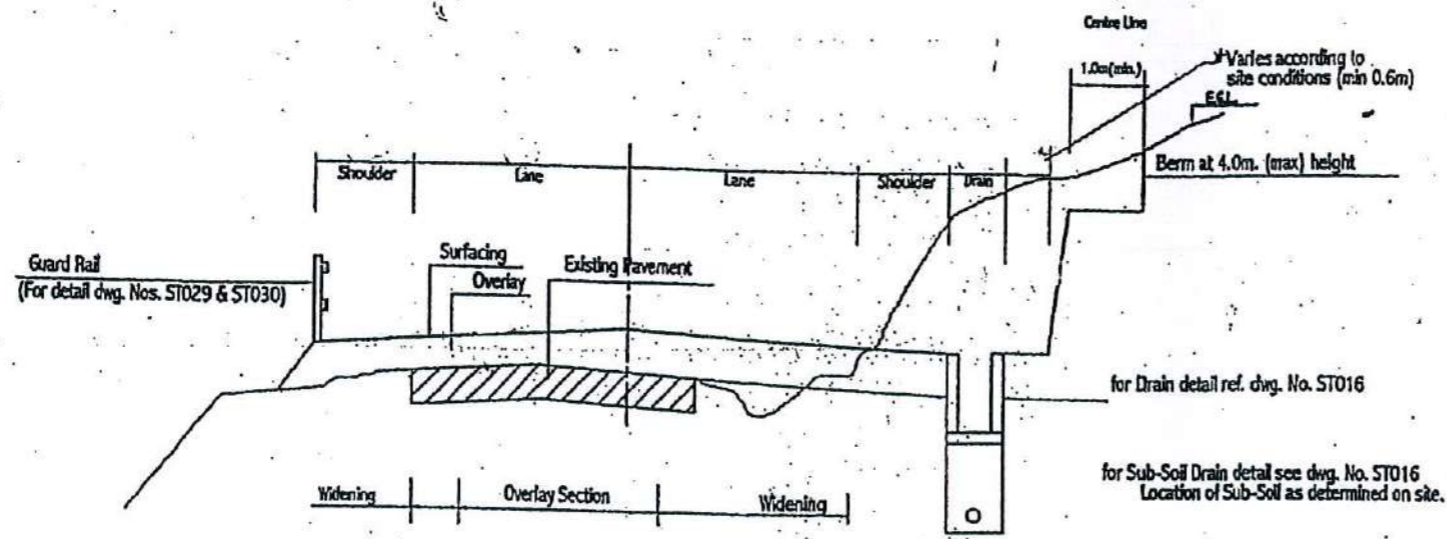
Package 3

	ROAD NAME	CARRIAGWAY WIDTH	APPROXIMATE HARD SHOULDER WIDTH	APPROXIMATE EARTH SHOULDER WIDTH
C7	Kandy Jaffna (A009)	3.5 x 4	1.0 x 2	-
C8	Marawila - Udubeddawa (B272)	3.7 x 2	1.5 x 2	1.0 x 2

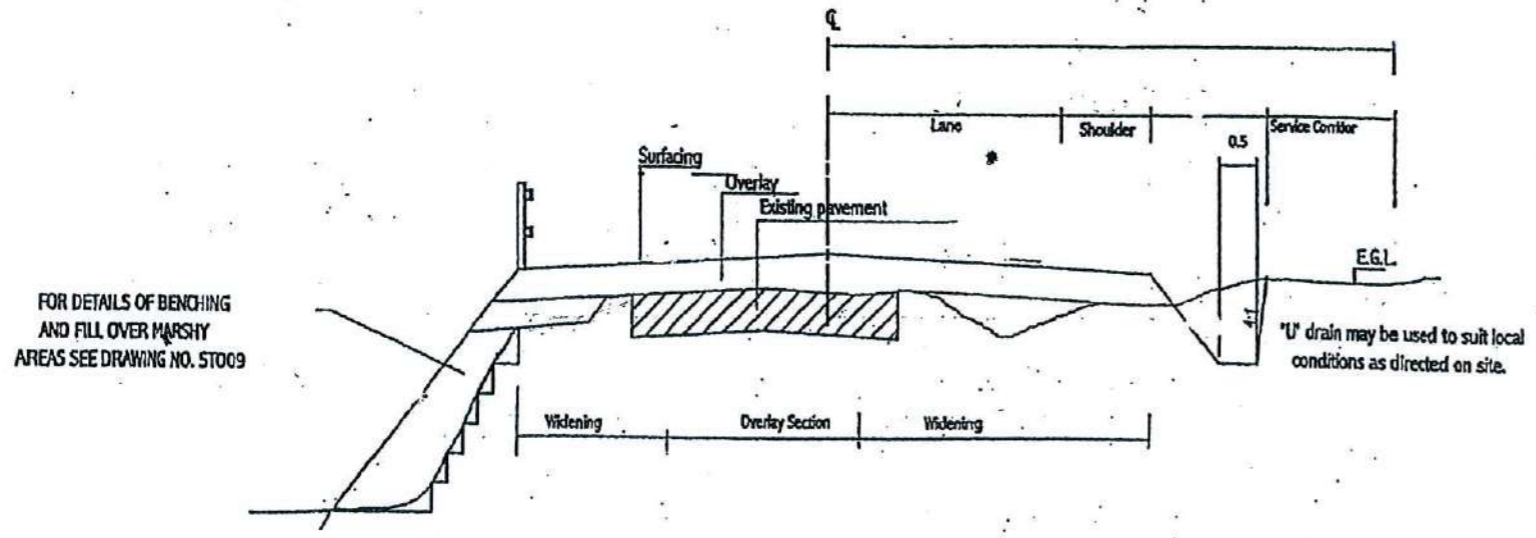


TYPICAL CROSS SECTION
NOT TO SCALE

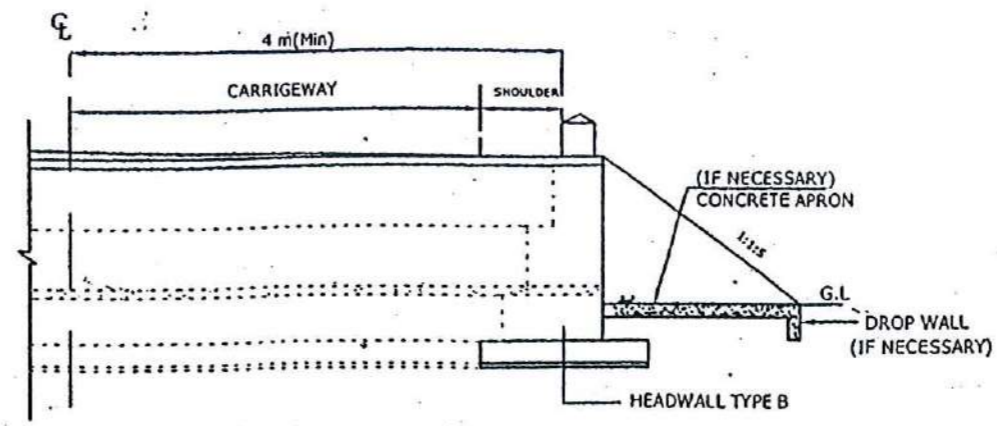
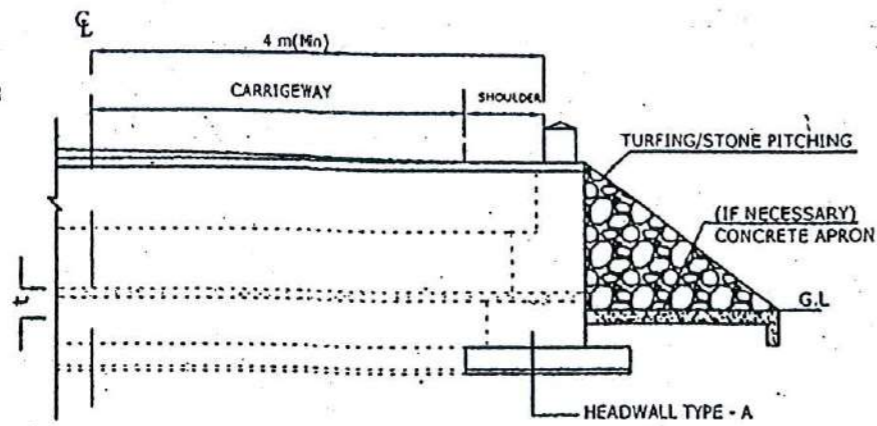




TYPICAL CROSS SECTION



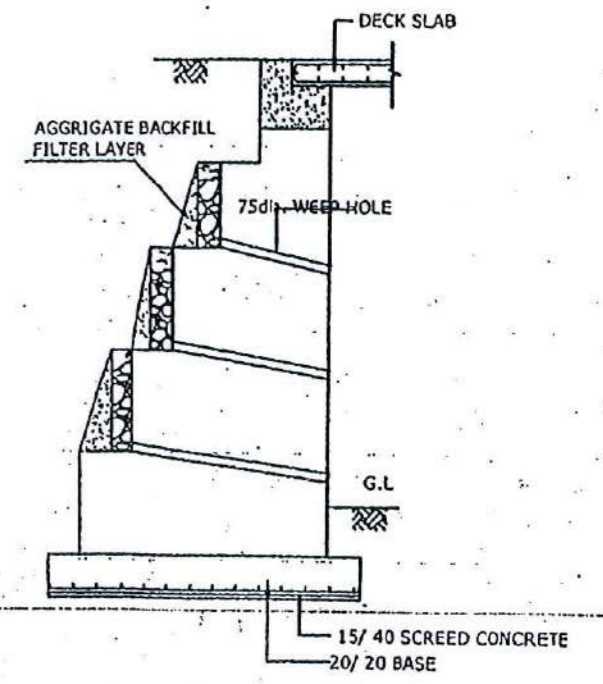
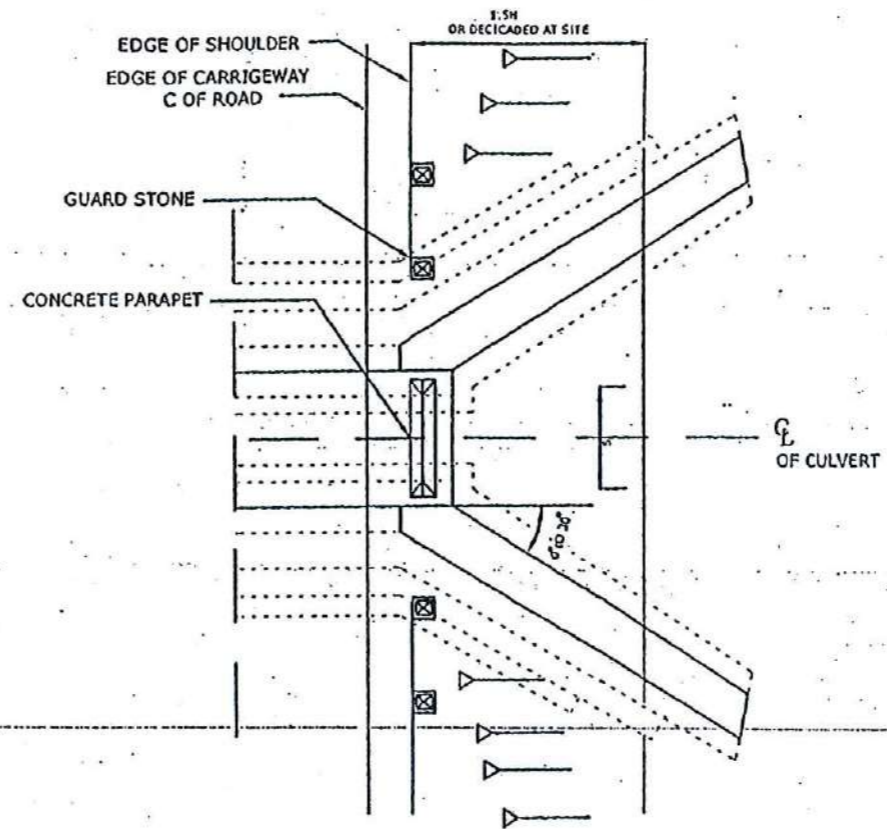
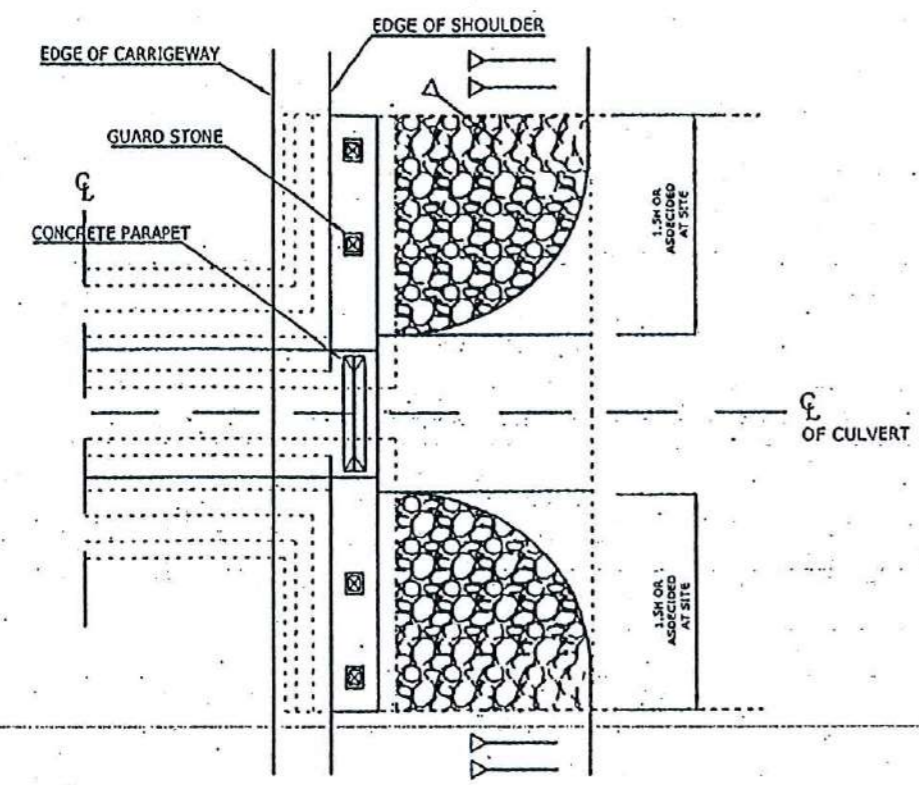
TYPICAL CROSS SECTION TYPE



- NOTES :-**
1. ALL THE DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.
 2. ABUTMENT BASE AND CONCRETE LINING SHALL BE STEPPED IF NECESSARY AS APPROVED BY THE ENGINEER.

t	
INLET	OUTLET
0	75

HALF SECTIONAL ELEVATION

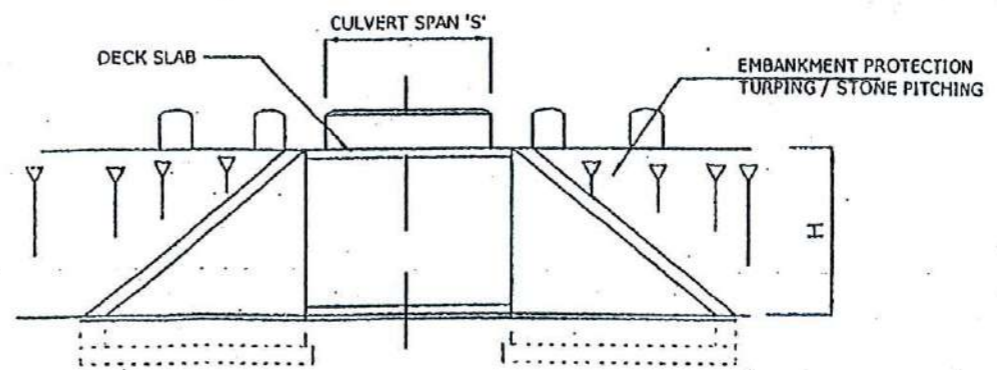
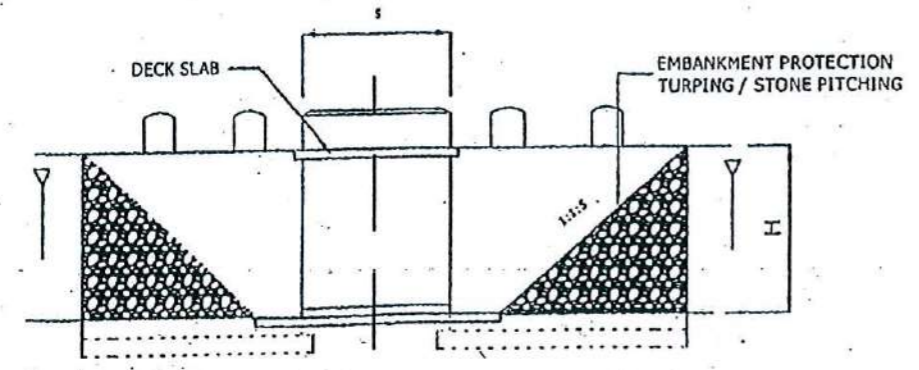


ABUTMENT & HEADWALL LAYOUT - TYPE A

ABUTMENT & HEADWALL LAYOUT - TYPE B

TYPICAL DECK CULVERT ABUTMENT

PLAN



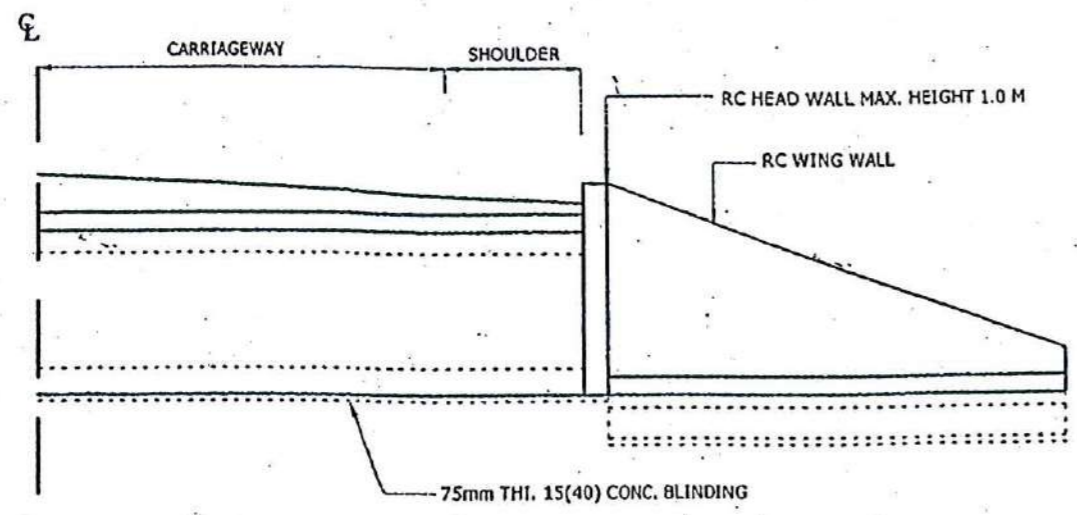
SLAB CULVERT WITH TYPE A HEADWALL

SLAB CULVERT WITH TYPE B HEADWALL

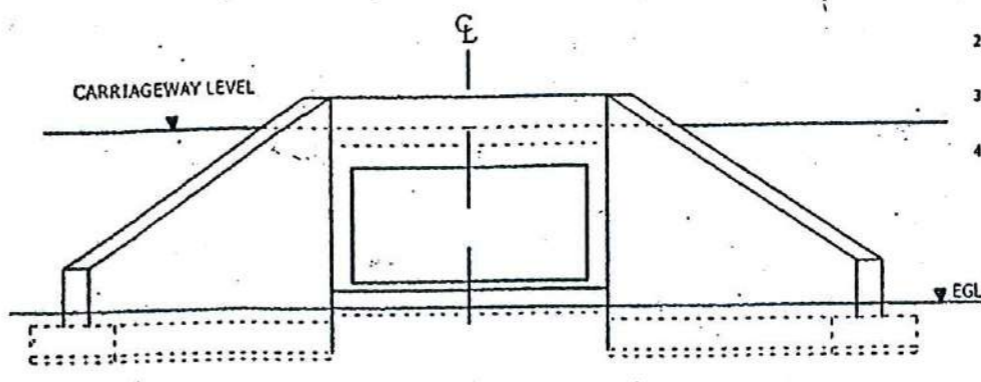
ELEVATION



Project Director
(CDB - PRD)
Road Development Auth.



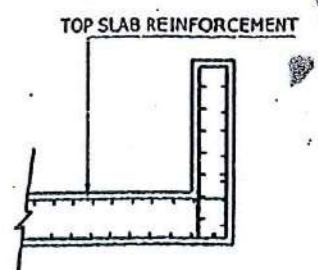
HALF ELEVATION



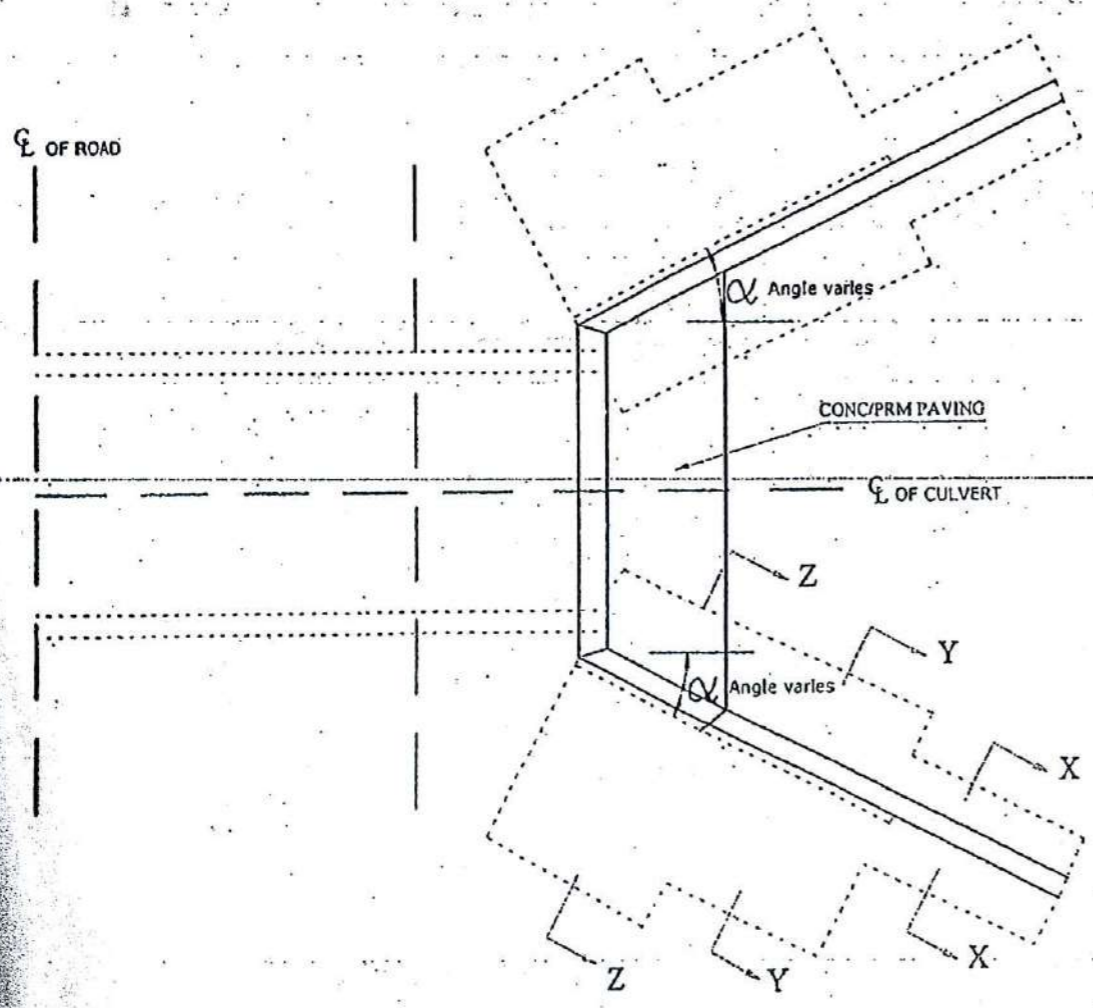
ELEVATION

NOTES :

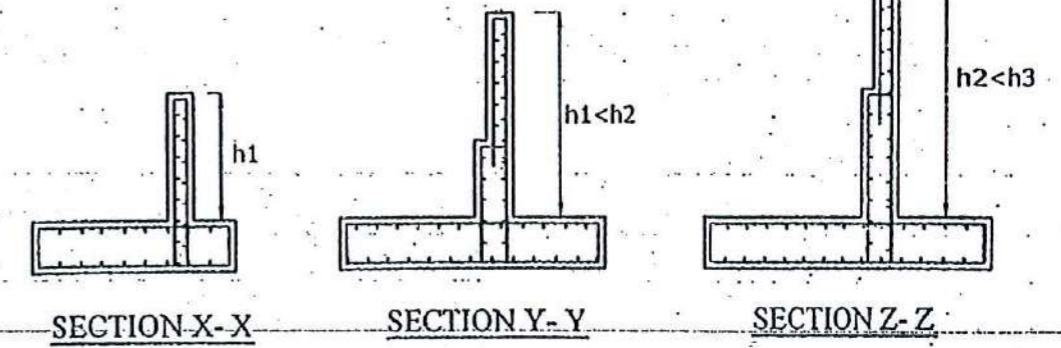
1. THIS DRAWING PROVIDES A GUIDANCE ONLY. EXACT DETAILS TO SUIT SITE CONDITIONS, SHALL BE DECIDED BY THE ENGINEER AT CONSTRUCTION STAGE.
2. BOX OPENING SIZE (h & w) MUST BE GREATER THAN OR EQUAL TO THE MINIMUM REQUIRED OPENING SIZE.
3. EXACT WALL THICKNESS (ts, tw, lb and lt) AND R/F MUST BE DECIDED TO SUIT THE SITE CONDITION AND LOADING.
4. CONCRETE GRADE SHALL BE GR. 25(20).



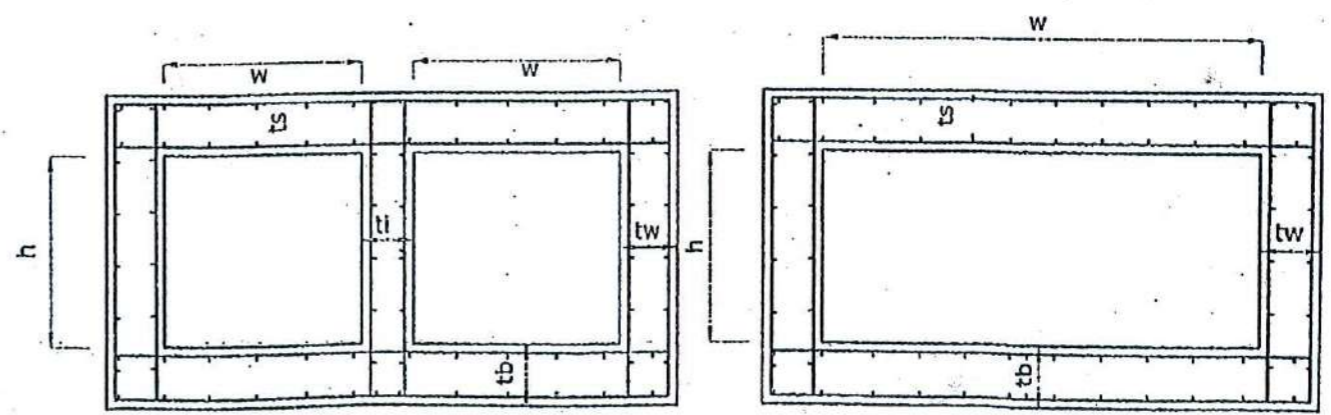
DETAIL OF HEADWALL



PLAN

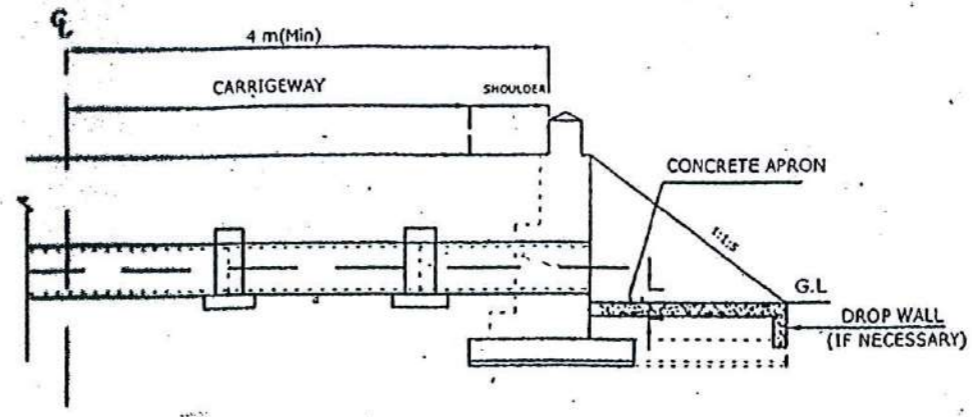
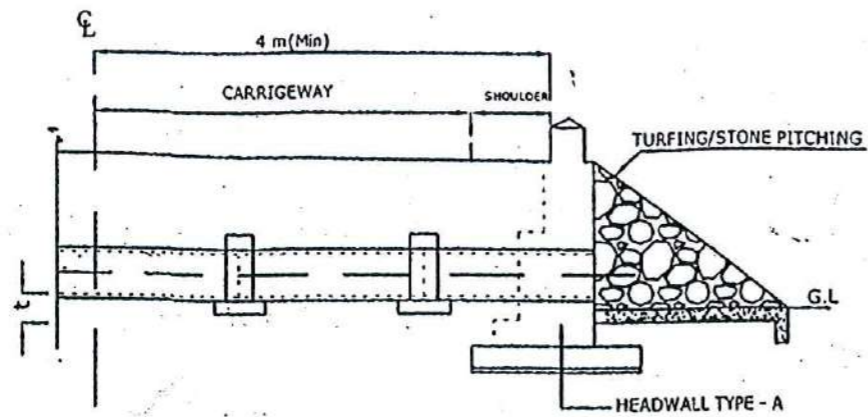


TYPICAL WINGWALL SECTIONS



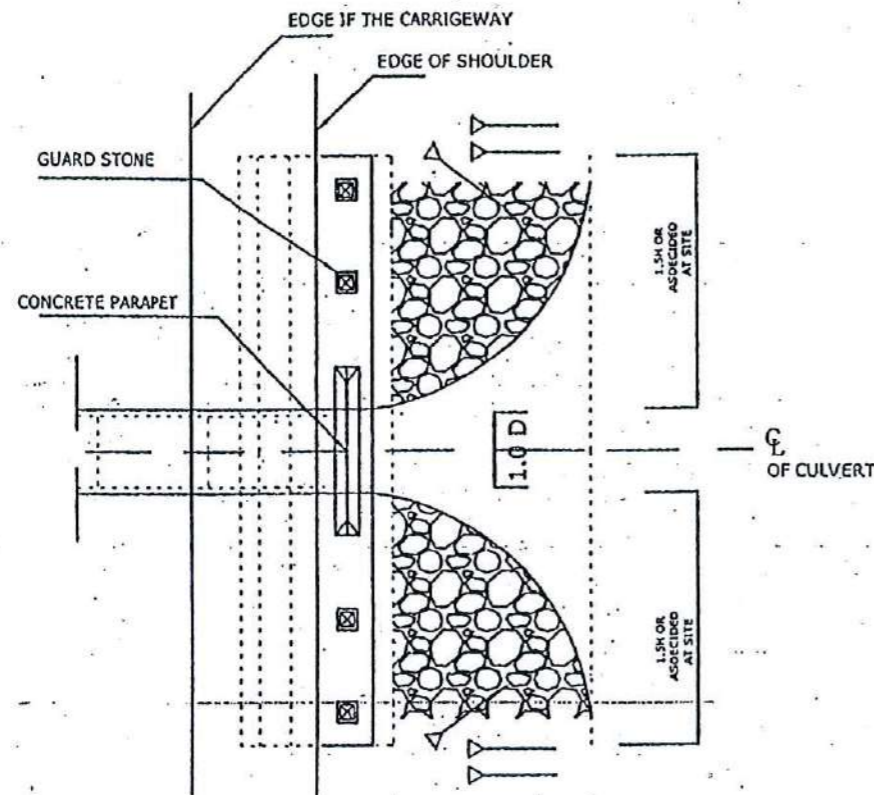
TWIN BOX TYPE

SINGLE BOX TYPE

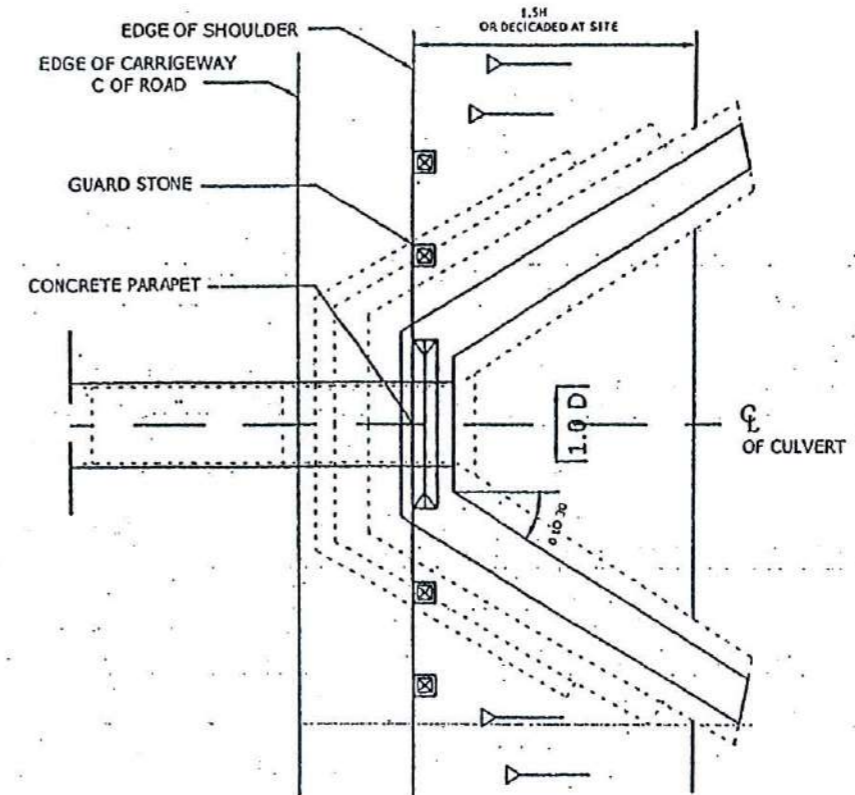


HALF SECTIONAL ELEVATION

- NOTES :-**
1. ALL THE DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.
 2. TYPE OF HEAD WALL SHALL BE DECIDED BY THE ENGINEER TO SUIT THE SITE CONDITIONS.
 3. PIPES SHALL BE LAID TO AGRADIENT OF 1 IN 200.
 4. COLLARS TO BE USED IN CASE OF PIPES WITHOUT TONGUE AND GROVE.
 5. SLOPE OF EMBANKMENT FILL TO BE 1:1.5 OR AS AS DIRECTED AT SITE BY THE ENGINEER.
 6. PRE CAST CONCRETE GUARD STONES SHALL BE FIXED AT 1500 C/C OR AS DIRECTED BY THE ENGINEER.
 7. TYPE OF EMBANKMENT PROTECTION TO BE AS DIRECTED BY THE ENGINEER.

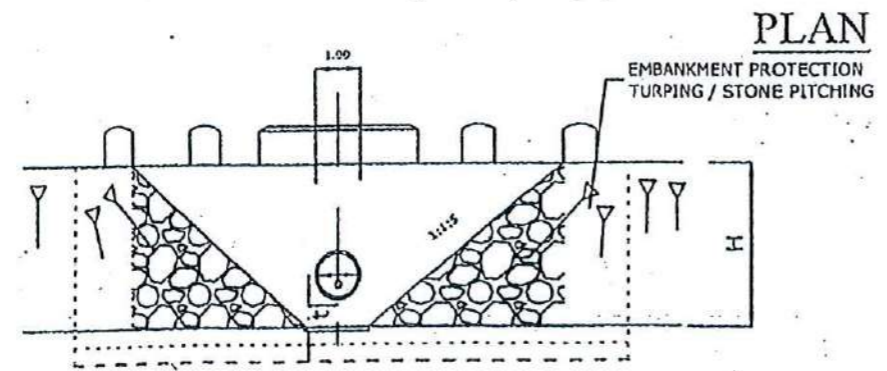


ABUTMENT & HEADWALL LAYOUT - TYPE A

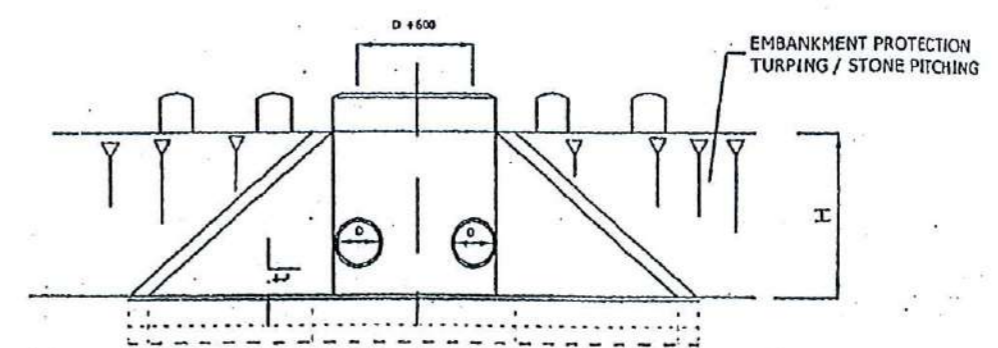


ABUTMENT & HEADWALL LAYOUT - TYPE B

INLET	OUTLET
0	75



SINGLE PIPE CULVERT WITH TYPE A HEADWALL

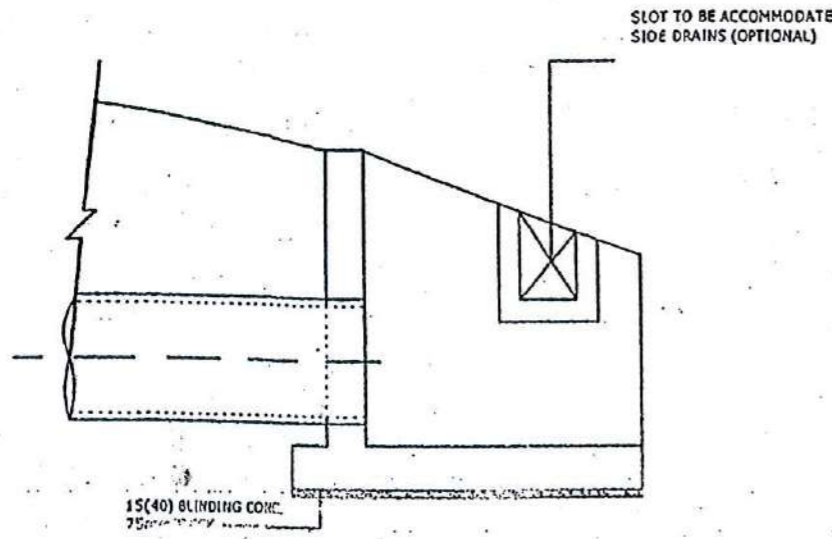


TWIN PIPE CULVERT WITH TYPE B HEADWALL

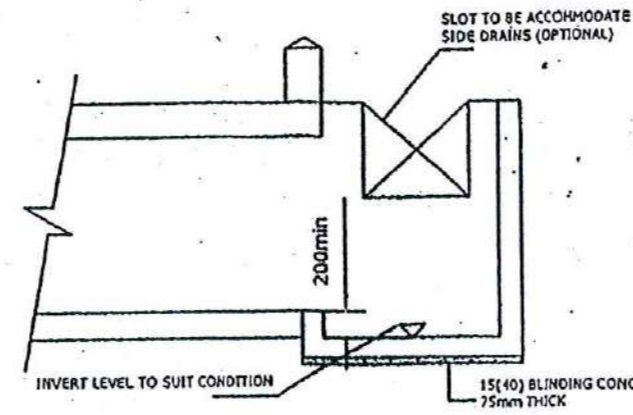
ELEVATION

NOTES :

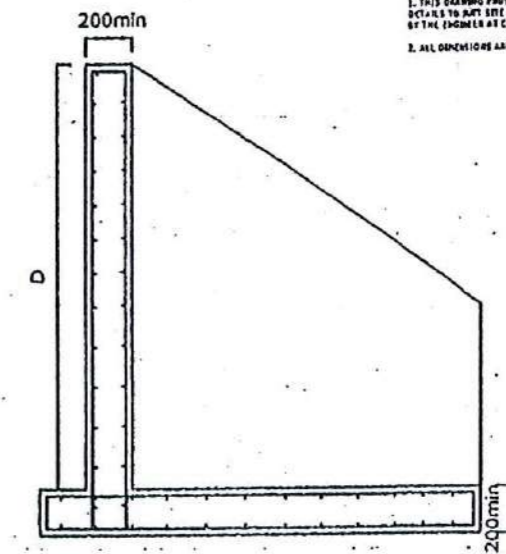
- 1. THIS DRAWING PROVIDES A GUIDANCE ONLY EXACT DETAILS TO ANY SITE CONDITIONS SHALL BE DECIDED BY THE ENGINEER AT CONSTRUCTION STAGE.
- 2. ALL DIMENSIONS ARE IN MM.



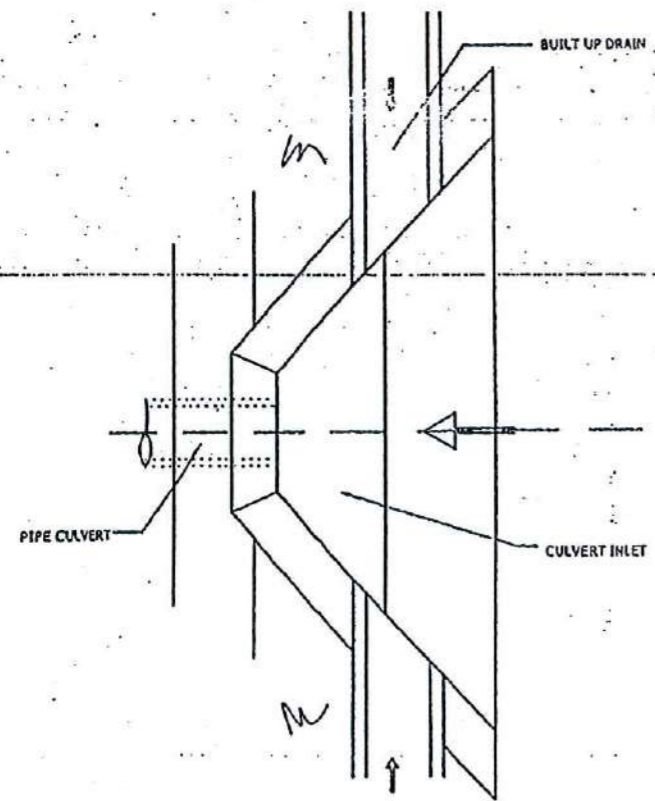
SECTION



SECTION

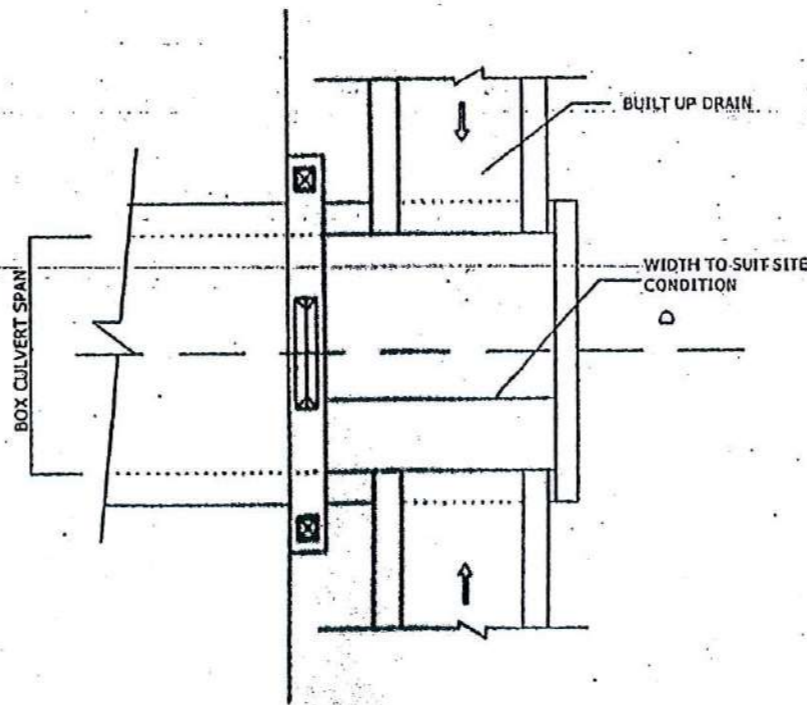


FOR TYPE -2



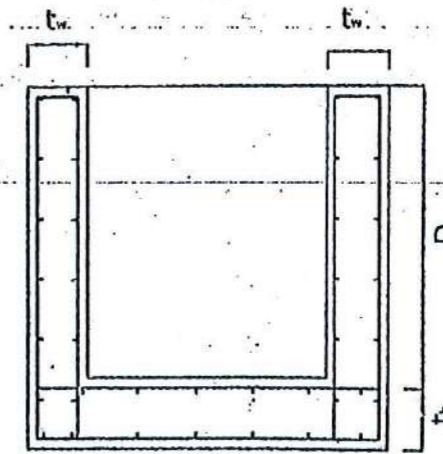
PLAN

TYPE 1- PIPE CULVERT



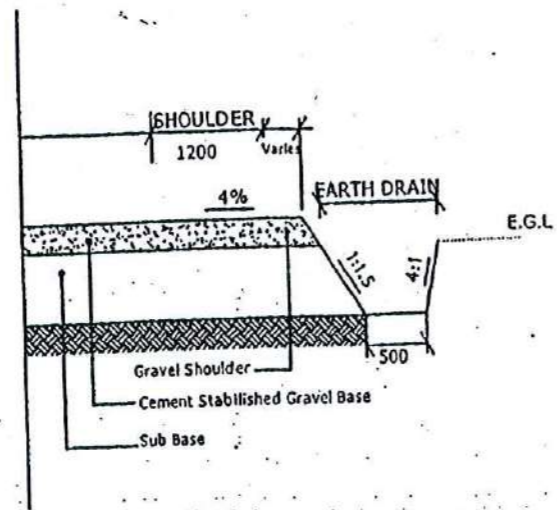
PLAN

TYPE 2- BOX CULVERT

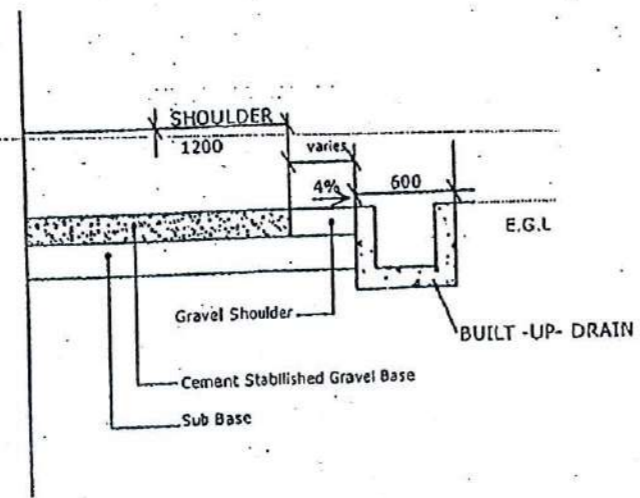


FOR TYPE -1

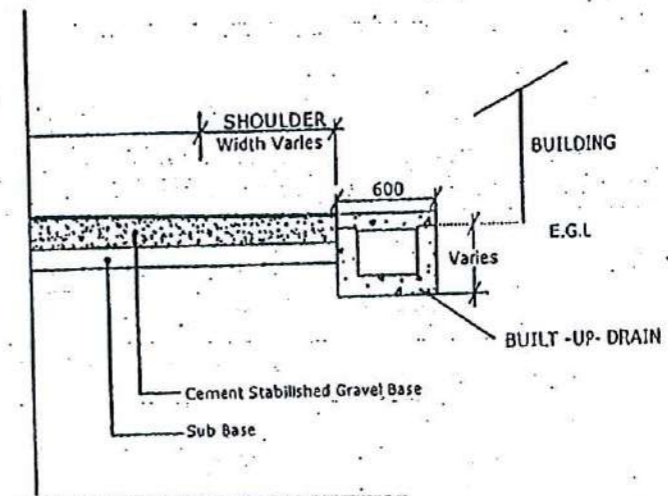
TYPICAL R/F ARRANGEMENT FOR CULVERT INLETS



EARTH DRAIN

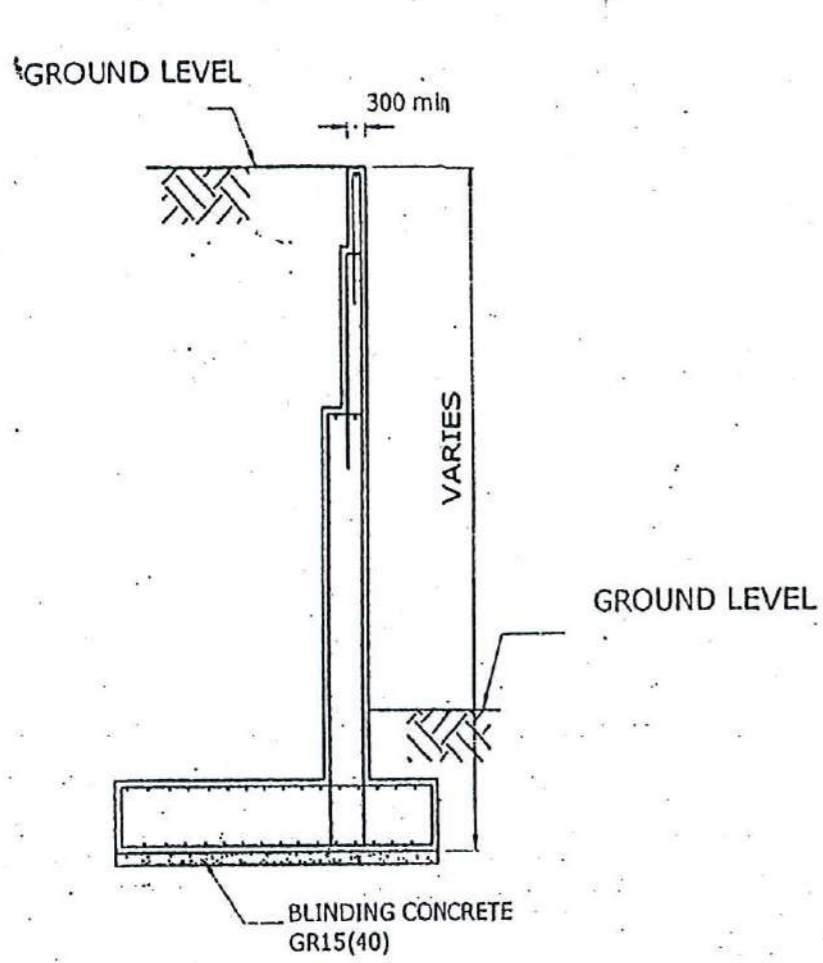


BUILT UP DRAIN

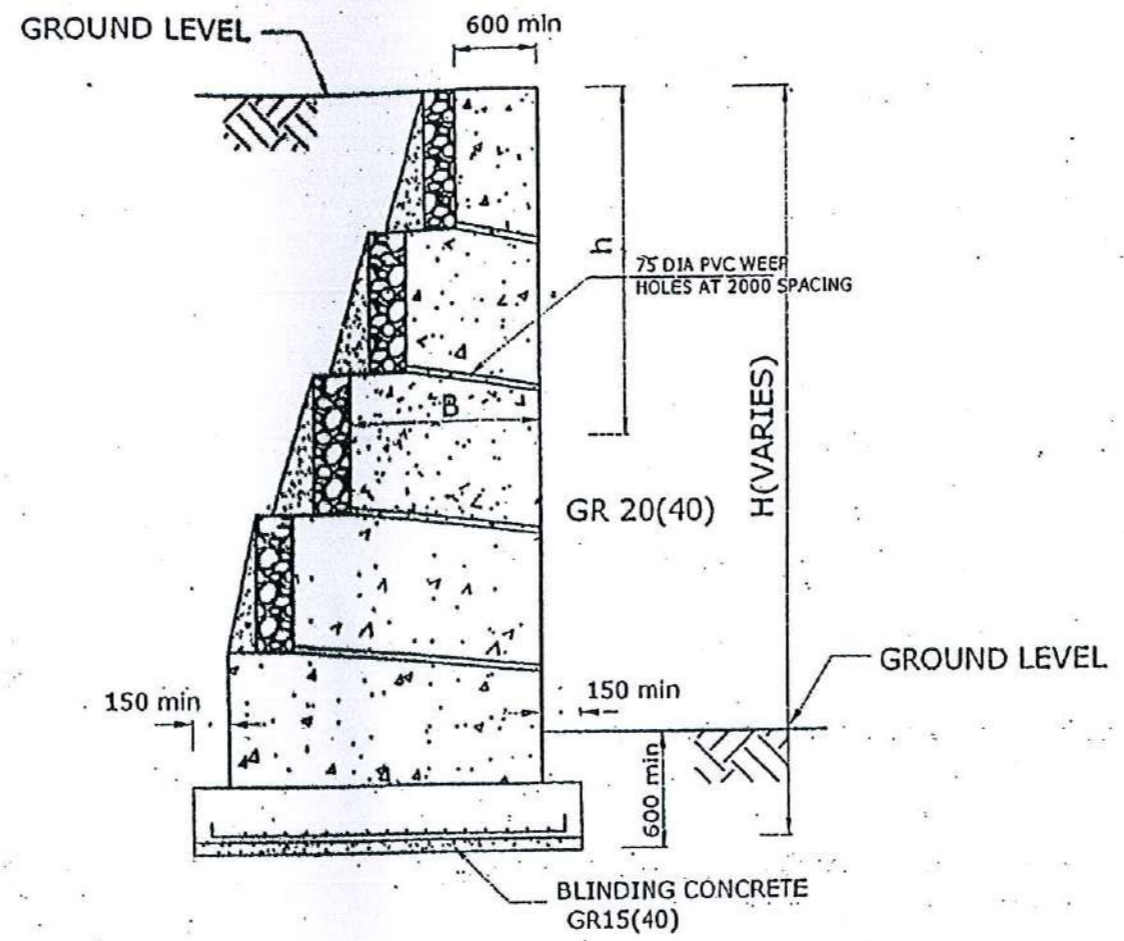


BUILT UP DRAIN WITH COVER



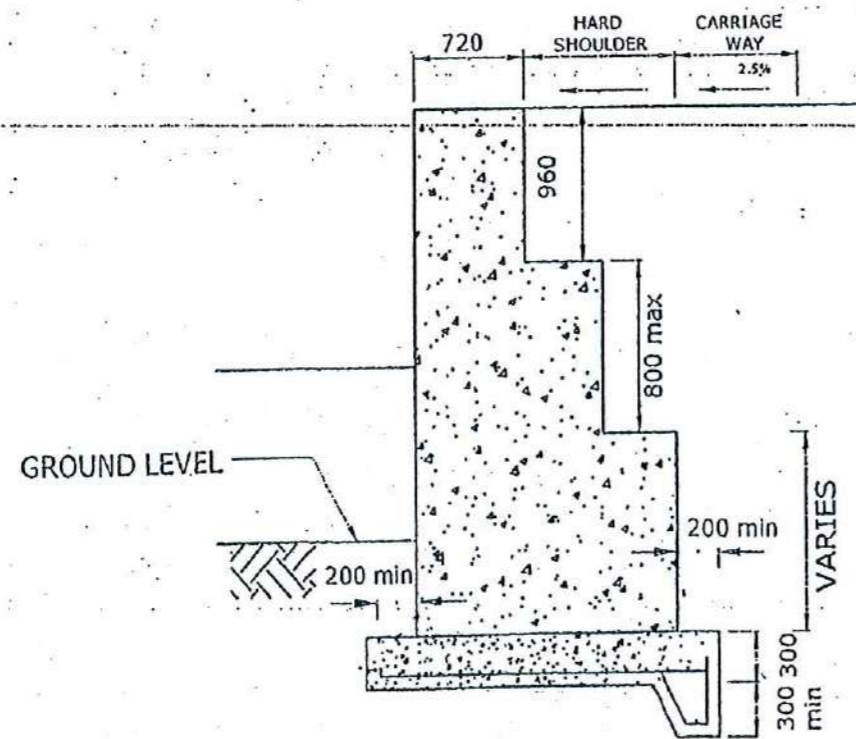


TYPICAL R/F RETAINING WALL

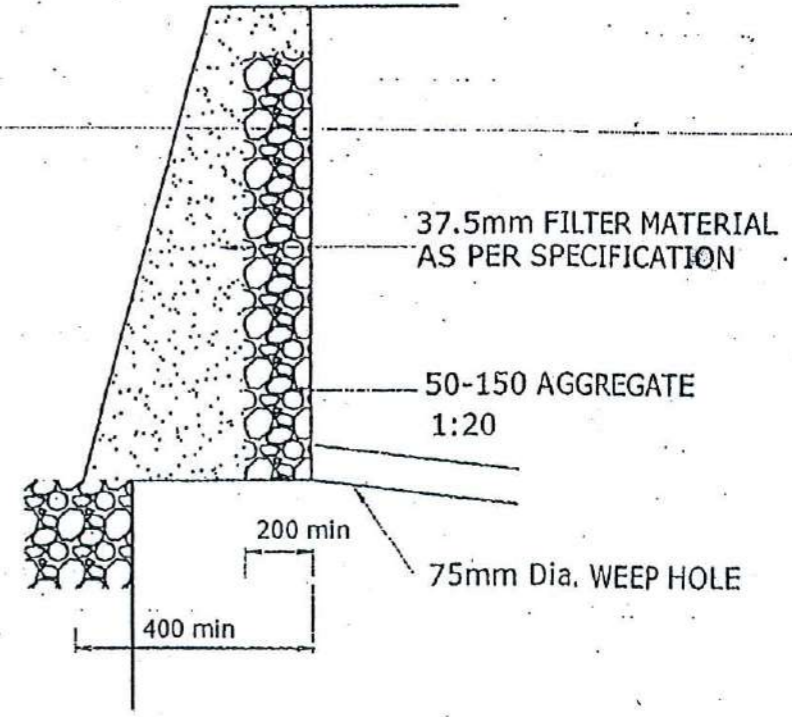


TYPICAL GRAVITY RETAINING WALL - TYPE 1

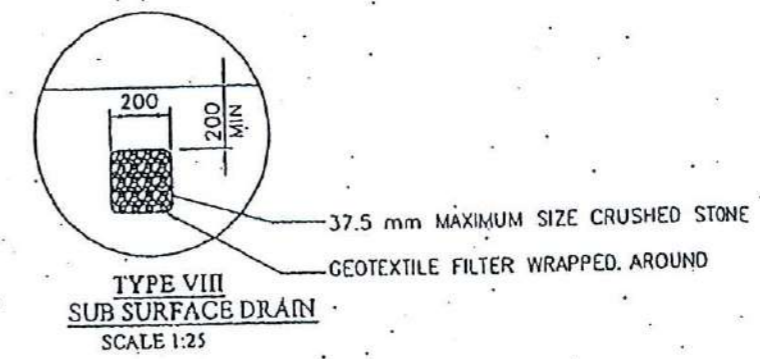
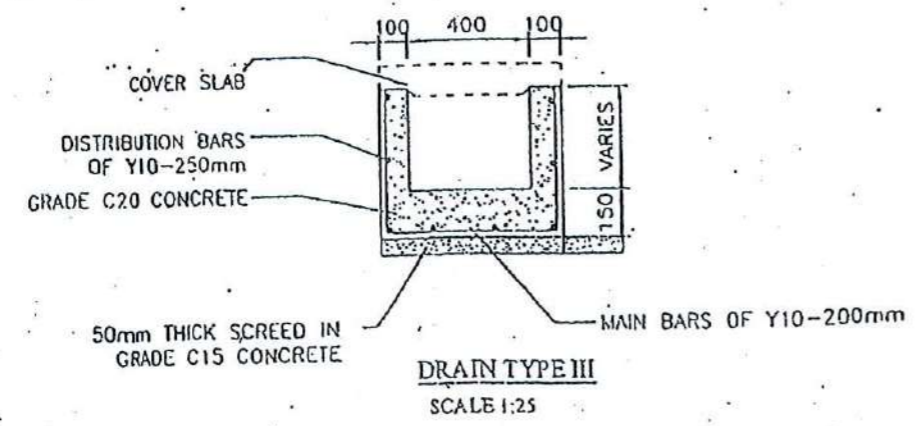
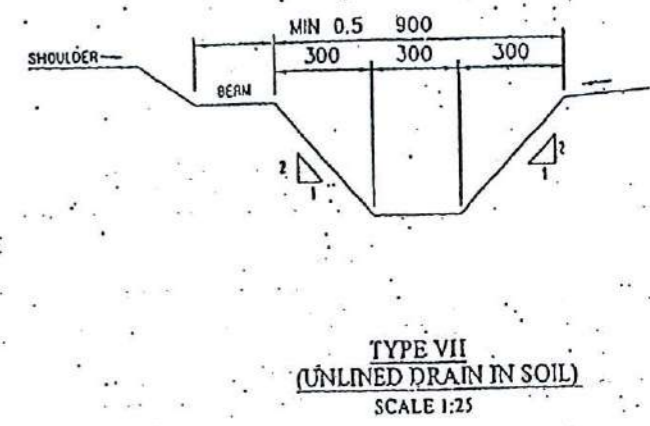
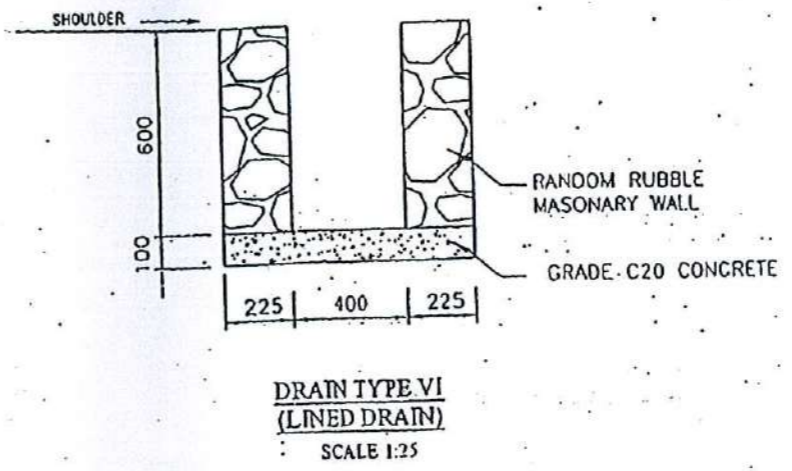
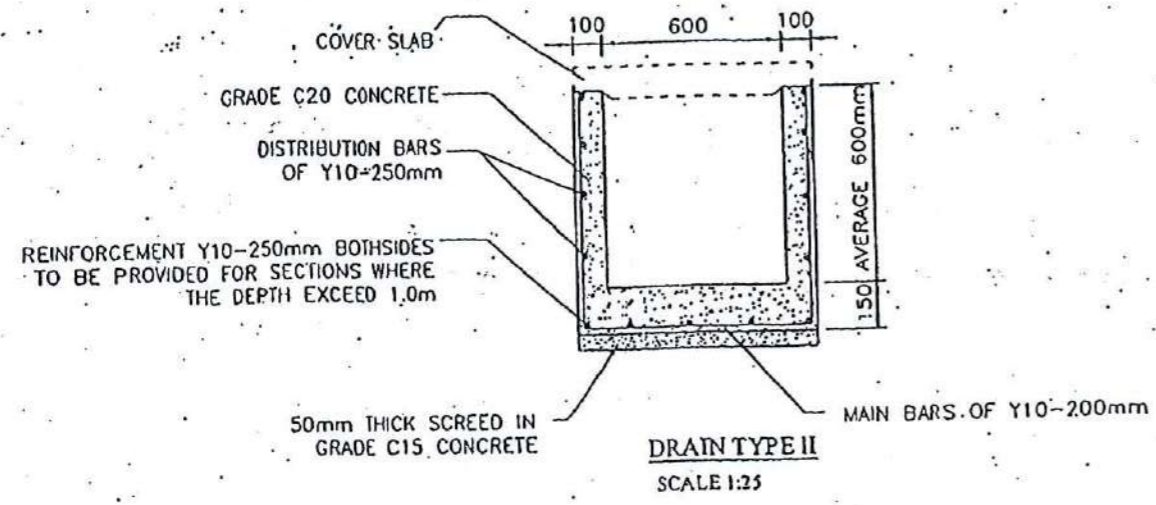
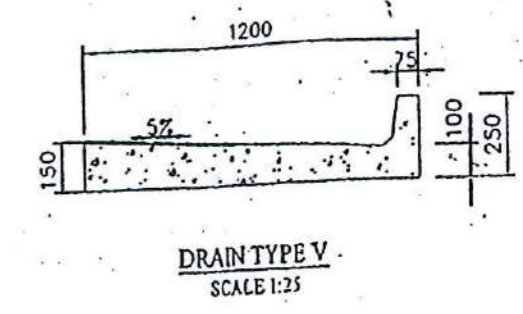
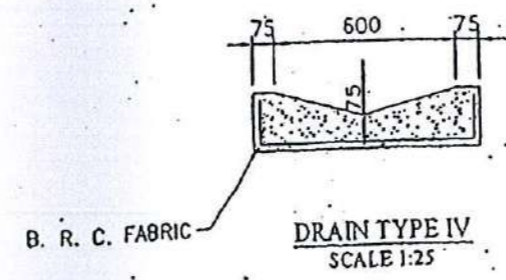
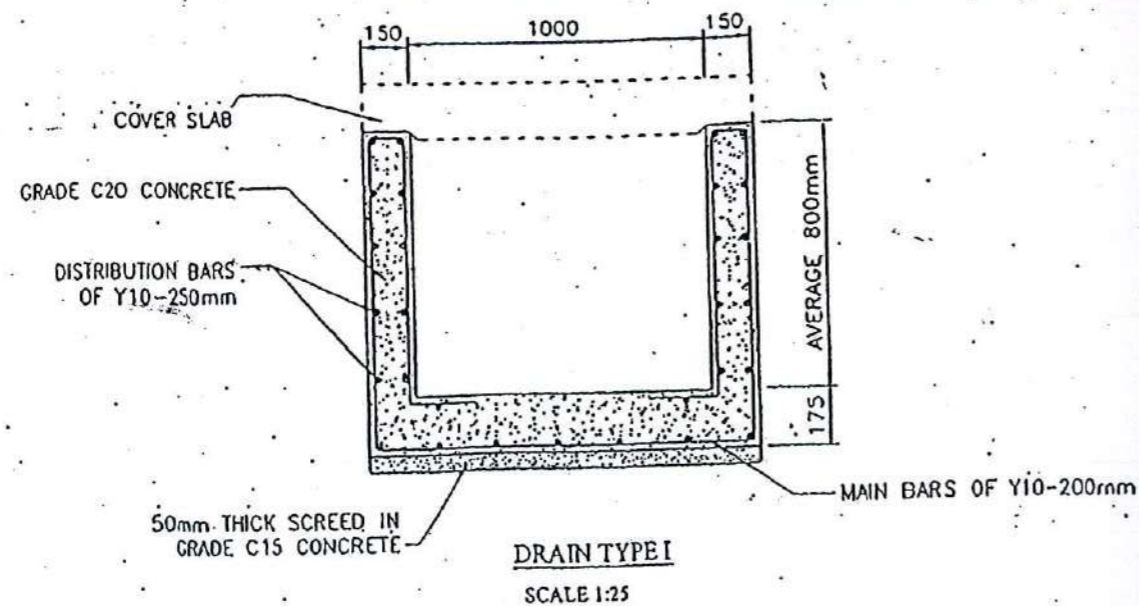
- NOTE:**
1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. POROUS BACK FILL TO BE PROVIDED ALONG THE ENTIRE LENGTH OF THE WALL.
 3. PROVIDE WEEP HOLES OF 75 MM. DIA. PVC PIPES OR OTHER APPROVED BY THE ENGINEER.
 4. FOUNDATION DEPTH BELOW INVERT LEVEL SHALL BE DECIDED TO SUIT SITE CONDITIONS.
 5. NO OF STEPPINGS FOR GRAVITY RETAINING WALL WILL VARY WITH THE -H.
 6. GRAVITY RETAINING WALL TYPE -2 SHALL USE FOR WIDENING OF CAUSEWAYS, A CROSSING LAGOONS OR SEA.



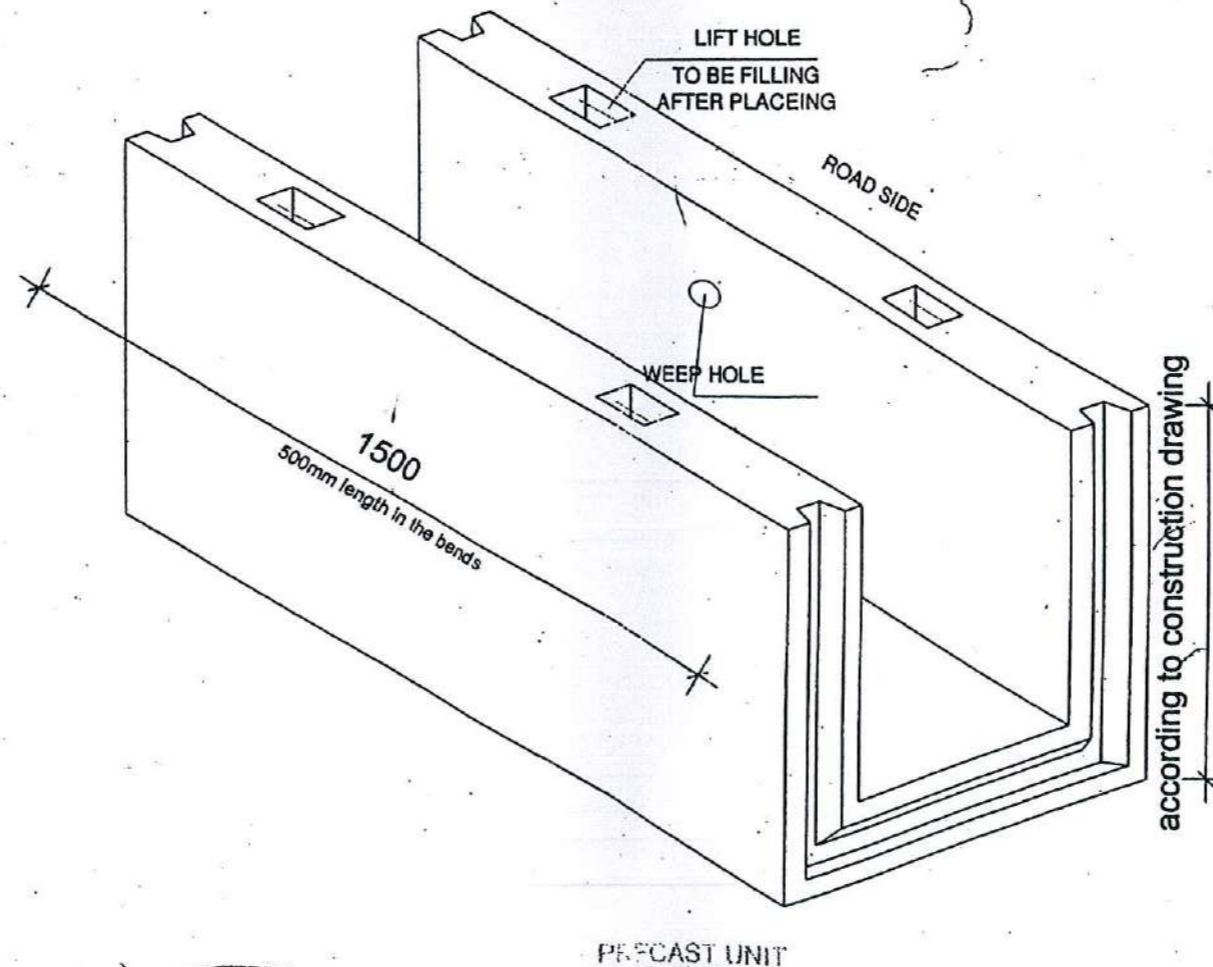
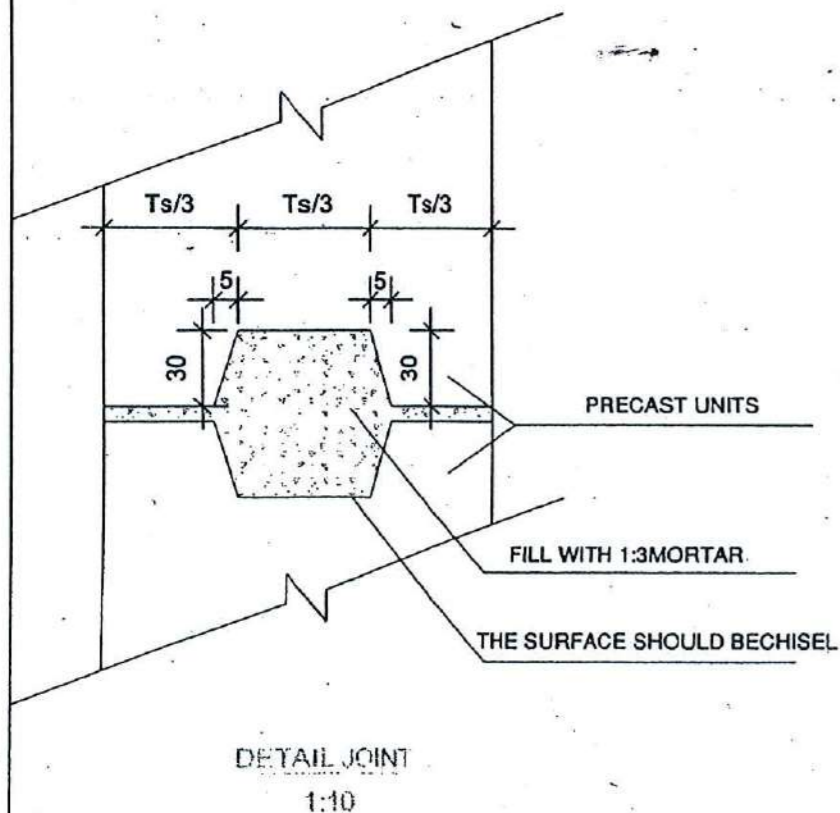
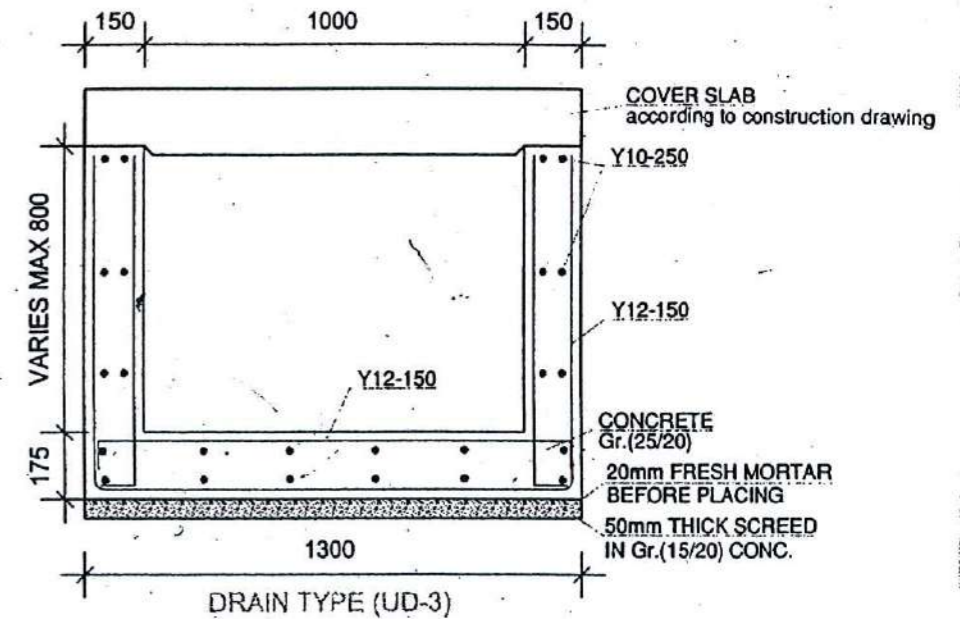
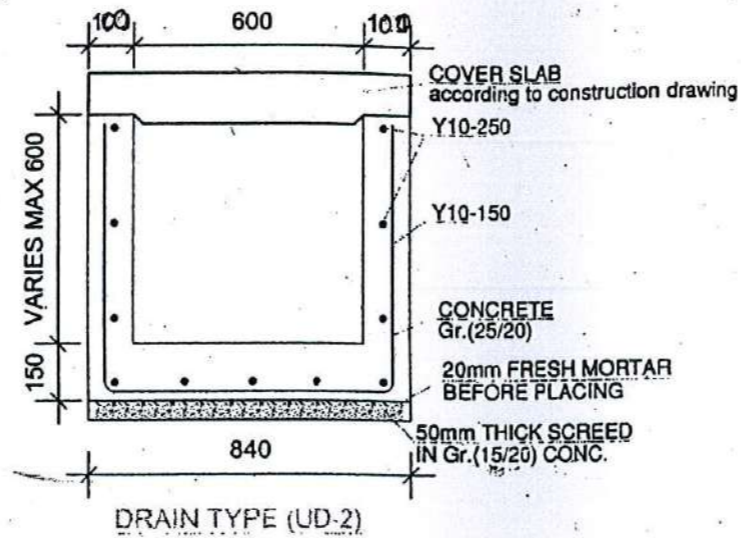
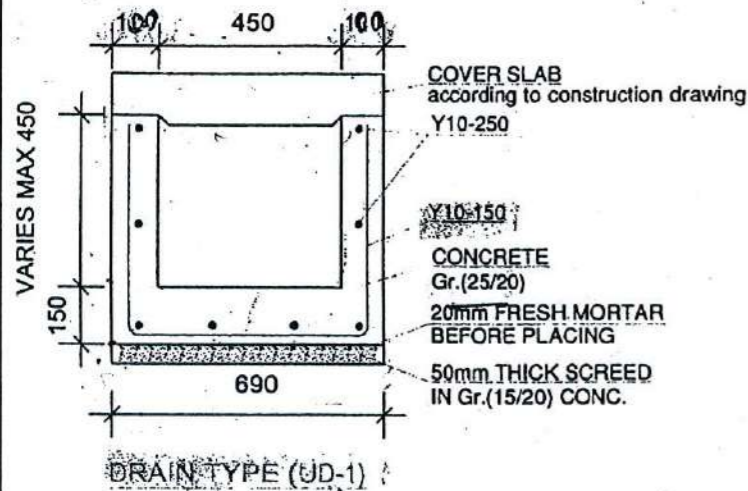
GRAVITY RETAINING WALL - TYPE 2



TYPICAL FILTER



- NOTE:**
- (i) THE DEPTHS OF DRAINS OF ALL TYPES ARE AS DETAILED AND TO SUIT SITE CONDITIONS.
 - (ii) TOP LEVEL OF DRAIN SECTION IS TO BE DETERMINED WITH RESPECT TO ROAD FINISHED LEVEL.
 - (iii) DRAIN TYPE (VI) IS TO BE ADOPTED IN REPAIRS OF EXISTING SECTIONS OF RANDOM RUBBLE MASONRY DRAINS. HOWEVER, IT COULD BE USED IN NEW SECTIONS SPECIALLY WHERE EXISTING RR MASONRY DRAINS HAVE TO BE EXTENDED.
 - (iv) SUBSOIL DRAIN TYPE VIII IS TO BE LAID ACROSS THE SHOULDERS. THESE DRAINS SHOULD NOT BE LAID UNDER CARRIAGEWAY.



GENERAL NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. ALL MATERIALS AND WORKMANSHIP ARE TO BE IN ACCORDANCE WITH THE SPECIFICATION.
3. A 20MM GAP TO BE PROVIDED IN THE BASE GROOVE TO FACILITATE MORTAR FILLING.

CONCRETE:

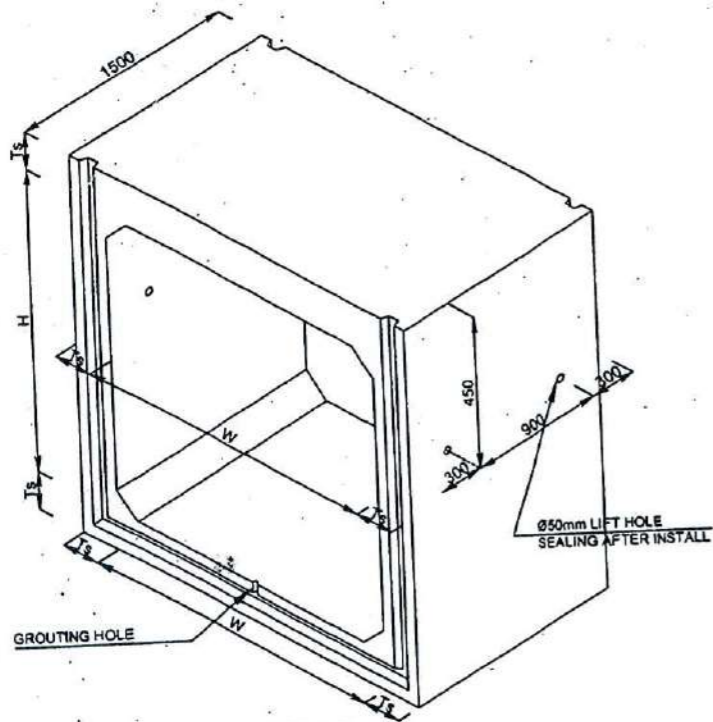
1. CONCRETE GRADE SHALL BE USED AS FOLLOWS:
(a) PRECAST RCC: GRADE 25/20
(b) DRAIN BASE: GRADE 15/20

REINFORCEMENT:

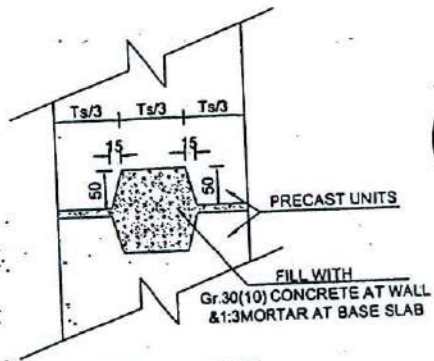
1. ALL BARS MARKED 'R' SHALL BE HOT ROLLED MILD STEEL PLAIN BARS OF YIELD STRENGTH NOT LESS THAN 250 N/mm².
2. ALL BARS MARKED 'Y' SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 420 N/mm².
3. REINFORCEMENT BARS SHALL BE BENT ACCORDANCE WITH STANDARD SPECIFICATIONS.
4. MINIMUM CLEAR CONCRETE COVER 30 mm.

WEEP HOLE:

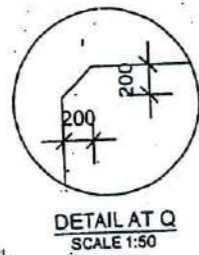
1. WEEP HOLES TO BE PROVIDED AT 1500mm C/C SPACING USING 50mm DIA PVC PIPES.
2. WEEP HOLES SHALL BE PLACED 45 DEGREE HORIZONTAL ANGLE TO MATCH WATER FLOW DIRECTION OF CONCRETE TOP DRAIN.



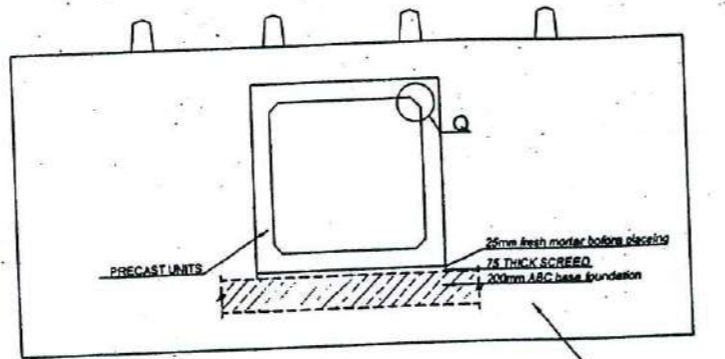
ISOMETRIC VIEW OF 1500 LONG PRECAST UNITS



DETAIL AT 'P' 1:10

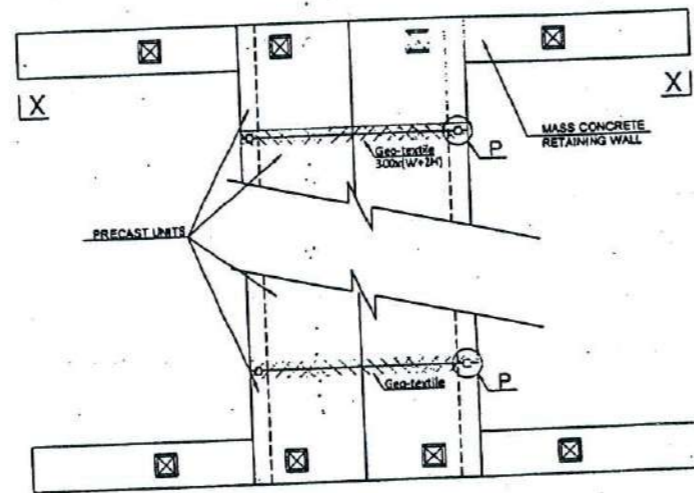


DETAIL AT 'Q' SCALE 1:50

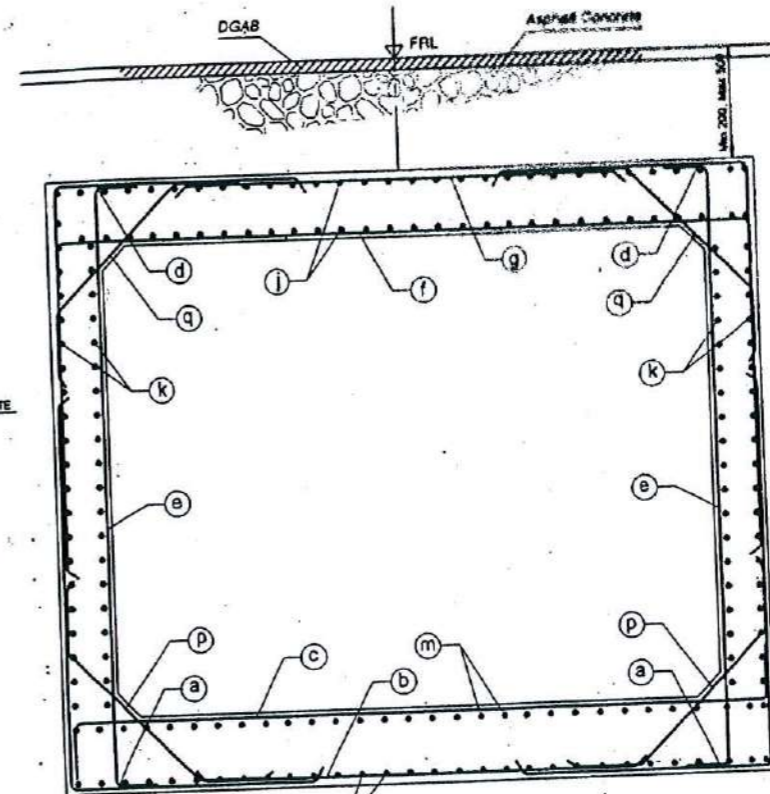


X-X SECTIONAL ELEVATION

SCALE 1:100



PLAN VIEW SCALE 1:100



REINFORCEMENT ARRANGEMENT

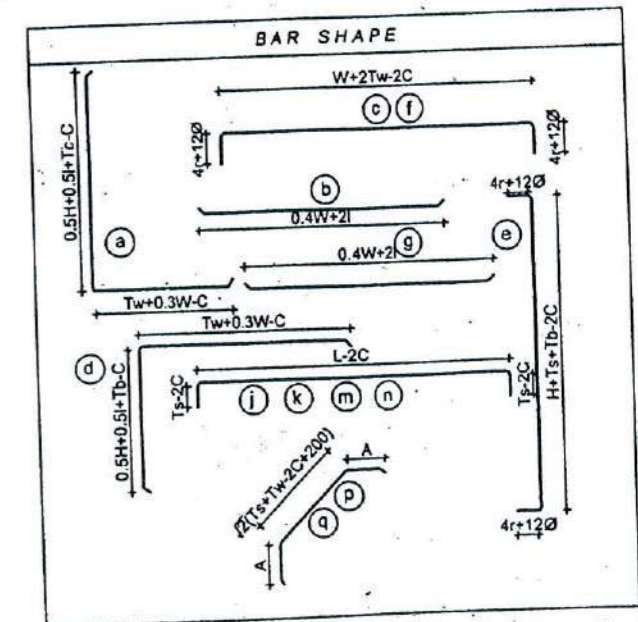
GENERAL NOTES

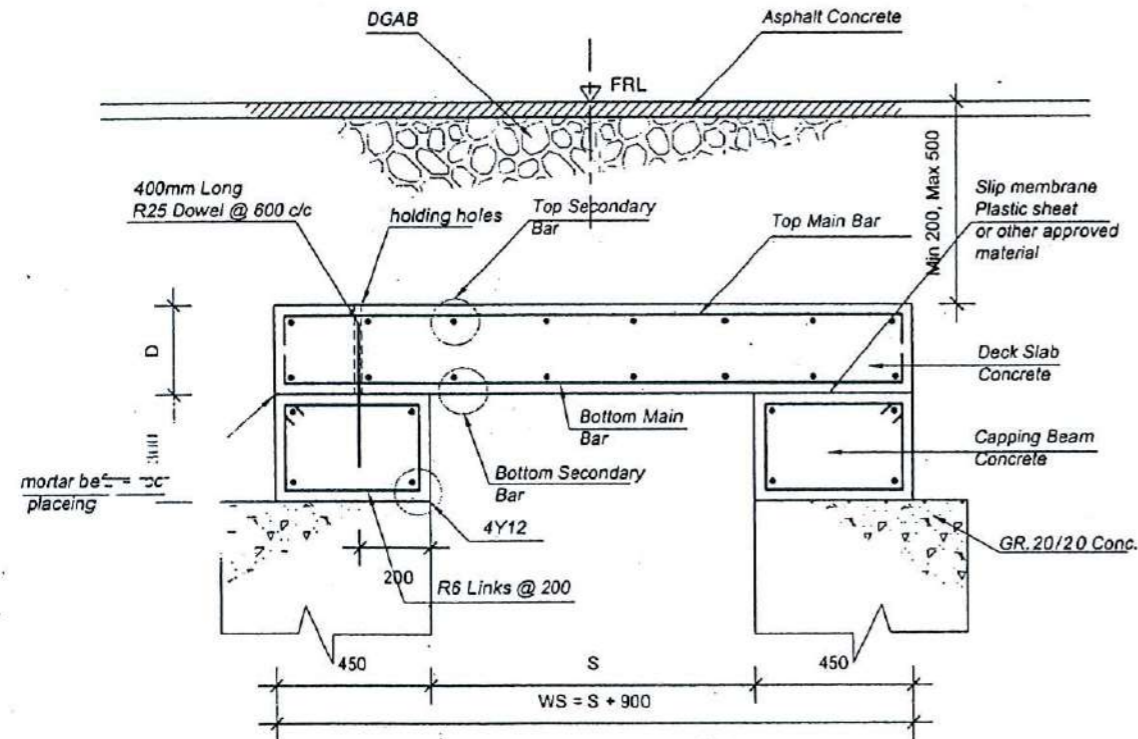
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. THIS DRAWINGS TO SUIT SITE CONDITIONS SHALL BE DECIDED BY THE ENGINEER AT CONSTRUCTION STAGE.
3. CONCRETE GRADE SHALL BE GR. 30
4. REINFORCEMENT SHALL BE HOT ROLLED HIGH YIELD STEEL TO BS 4489 WITH MIN $f_y = 460$ N/SQMM
5. CLEAR COVER TO REINFORCEMENT SHALL BE 50.
6. MINIMUM RADIUS FOR SCHEDULING 3Ø
7. LAP LENGTH 5ØØ
8. ANCHORAGE LENGTH 5ØØ
9. TWO NOS OF BOTTOM CHAMFER BARS (b) CAN BE COMBINED TOGETHER WHERE EVER NEEDED, THE SAME CAN BE ADAPTED FOR TOP CHAMFER BARS (k)
10. BOTTOM BAR NOS (a) AND (b) CAN BE REPLACED WITH A NEW BAR HAVING THE DIAMETER OF BAR NO (a) ALSO THE SAME CAN BE ADOPTED FOR TOP BARS (d) AND (g)
11. MAXIMUM SOIL COVER TO BE 500mm

SPECIAL NOTES

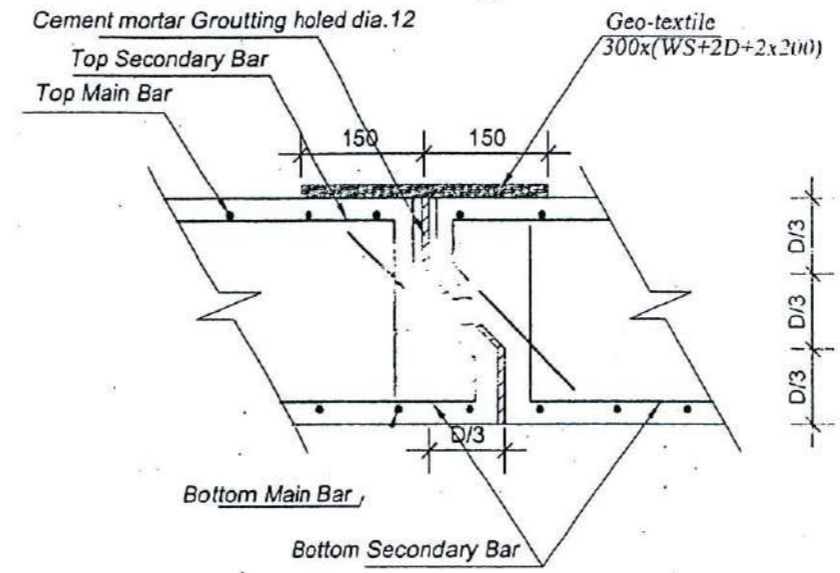
1. W - WIDTH OF OPENING
2. H - HEIGHT OF OPENING
3. Ts - TOP SLAB THICKNESS
4. Tb - BOTTOM SLAB THICKNESS
5. Tw - SIDE WALL THICKNESS
6. A - LAP LENGTH

INTERNAL DIMENSION		CULVERT I.D NO	SLAB THICKNESS (TS)	BASE THICKNESS (TB)	WALL THICKNESS EXT (TW)	REINFORCEMENT DETAILS											
W(m)	H(m)					a	b	c	d	e	f	g	n	p	q	s	
1.0	1.0	SC - 1	200	200	200	T12-200	T12-200	T16-200	T16-200	T12-200	T16-200	T12-200	T12-250	T12-200	T12-200	T16-200	
1.5	1.0	SC - 2	200	200	200	T12-150	T12-150	T16-150	T16-150	T12-150	T16-150	T12-150	T12-250	T12-150	T12-150	T16-150	
1.5	1.5	SC - 5	200	200	200	T12-150	T12-150	T16-150	T16-150	T12-150	T16-150	T12-150	T12-250	T12-150	T12-150	T16-150	
2.0	1.5	SC - 6	225	225	225	T16-150	T12-150	T20-150	T16-150	T12-150	T20-150	T12-150	T12-250	T12-150	T12-150	T16-150	
2.5	1.5	SC - 7	225	225	225	T16-150	T12-150	T20-150	T16-150	T12-150	T20-150	T12-150	T12-250	T12-150	T12-150	T16-150	
2.0	2.0	SC - 10	225	225	225	T16-150	T12-150	T20-150	T16-150	T16-150	T20-150	T12-150	T12-250	T12-150	T12-150	T16-150	
2.5	2.0	SC - 11	225	225	225	T16-150	T12-150	T20-150	T16-150	T16-150	T20-150	T12-150	T12-250	T12-150	T12-150	T16-150	
1.5	2.5	SC - 13	200	200	200	T12-150	T12-150	T20-150	T16-150	T12-150	T20-150	T12-150	T12-250	T12-150	T12-150	T16-150	
2.0	2.5	SC - 14	225	225	225	T16-150	T12-150	T20-150	T16-150	T12-150	T20-150	T12-150	T12-250	T12-150	T12-150	T16-150	
2.5	2.5	SC - 15	225	225	225	T16-150	T12-150	T20-150	T16-150	T16-150	T20-150	T12-150	T12-250	T12-150	T12-150	T16-150	

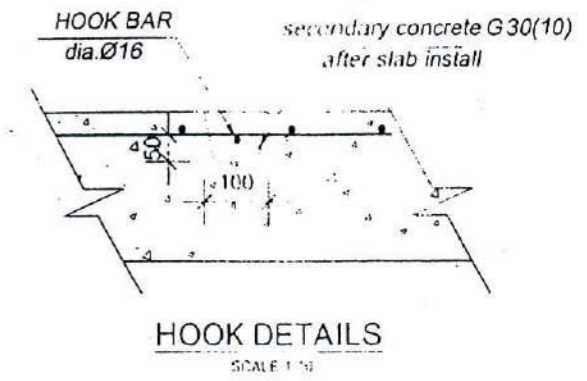




CULVERT ROOF SLAB REINFORCEMENT DETAILS
SCALE 1:20

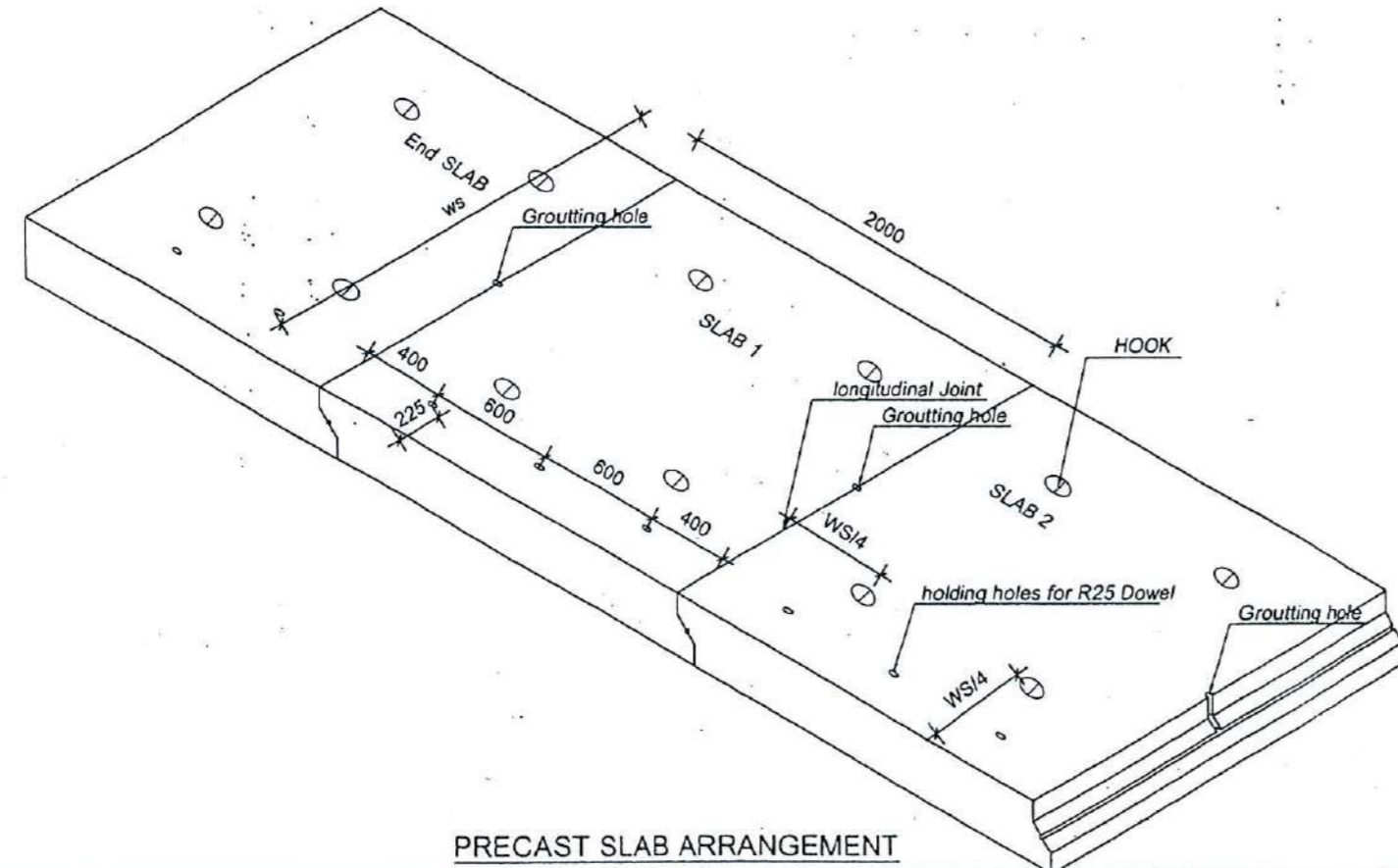


LONGITUDINAL JOINT DETAILS
SCALE 1:10



HOOK DETAILS
SCALE 1:10

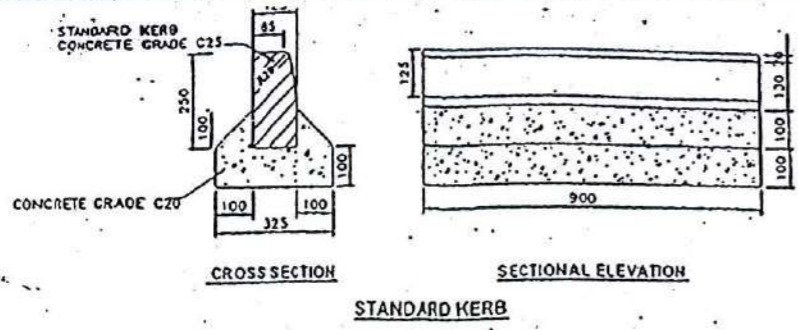
- GENERAL NOTES**
- (1) ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED
 - (2) ALL BARS MARKED "Y" SHALL BE HIGH YIELD DEFORMED BARS (TYPE 1) OF YIELD STRENGTH NOT LESS THAN 460 N/mm² AND "R" SHALL BE HOT ROLLED MILD STEEL OF YIELD STRENGTH NOT LESS THAN 250 N/mm²
 - (3) REINFORCEMENT BARS SHALL BE BENT ACCORDANCE WITH STANDARD SPECIFICATIONS
 - (4) THE PREFABRICATION WIDTH OF ROOF SLAB SHALL SUIT WITH THE APPROVED DRAWINGS
 - (5) CONCRETE COVER TO REINFORCEMENT - 30mm
- CONCRETE GRADE**
ROOF SLAB & CAPPING BEAM = GRADE 30/20
- (6) DURING SITE CERTAIN END SLAB SHALL BE CONSIDERED TO MATCH WITH THE TOTAL LENGTH OF CULVERT
 - (7) CHAMFER AT EACH OUTER EDGE 10*10mm.



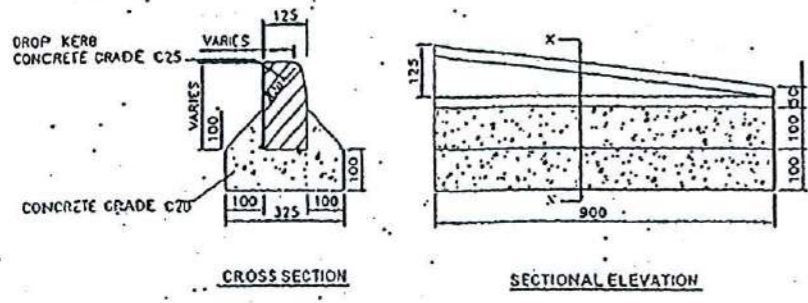
PRECAST SLAB ARRANGEMENT

REINFORCEMENT SCHEDULE FOR CULVERT ROOF SLAB						
TYPE	SPAN WIDTH (m)	THICKNESS OF SLAB (mm)	BOTTOM		TOP	
			MAIN BAR	SECONDARY BAR	MAIN BAR	SECONDARY BAR
PS-1000	1.0	300	Y16 @ 150	Y12 @ 150	Y12 @ 150	Y12 @ 150
PS-1500	1.5	300	Y16 @ 150	Y12 @ 150	Y12 @ 150	Y12 @ 150
PS-2000	2	300	Y16 @ 150	Y12 @ 150	Y12 @ 150	Y12 @ 150
PS-2500	2.5	400	Y16 @ 125	Y12 @ 150	Y12 @ 150	Y12 @ 150
PS-3000	3	400	Y16 @ 125	Y12 @ 150	Y12 @ 150	Y12 @ 150

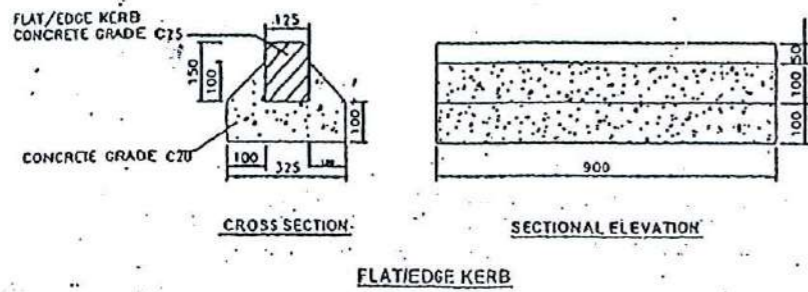
REINFORCEMENT SCHEDULE



STANDARD KERB

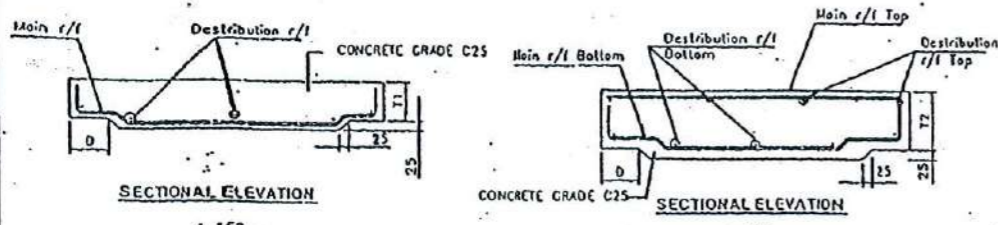


DROP KERB



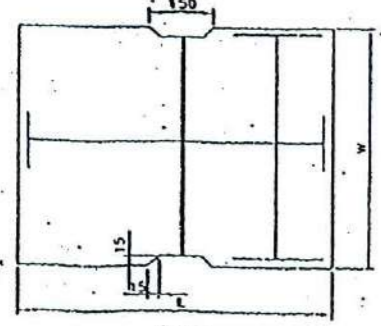
FLAT/EDGE KERB

DETAILS OF 0.9m LONG PRE CAST CONCRETE KERB SECTIONS
SCALE 1:20



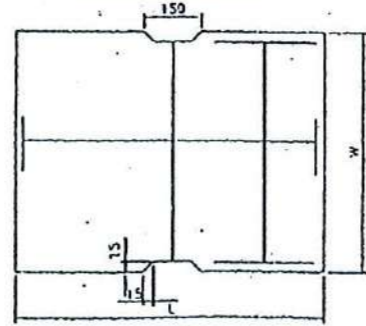
SECTIONAL ELEVATION

SECTIONAL ELEVATION



PLAN

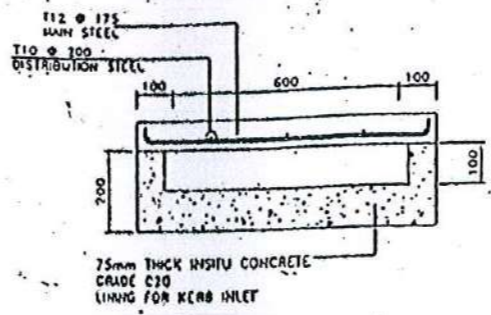
PEDESTRIAN ACCESS



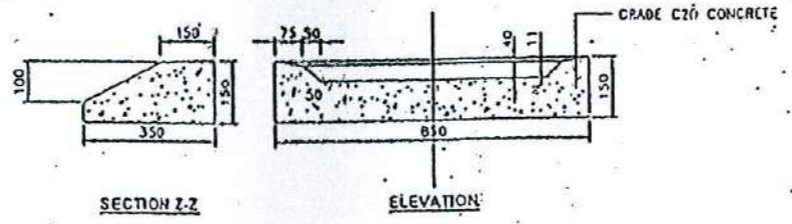
PLAN

VEHICULAR ACCESS

DETAILS OF COVER SLABS (SEE TABLE 2)
SCALE 1:10

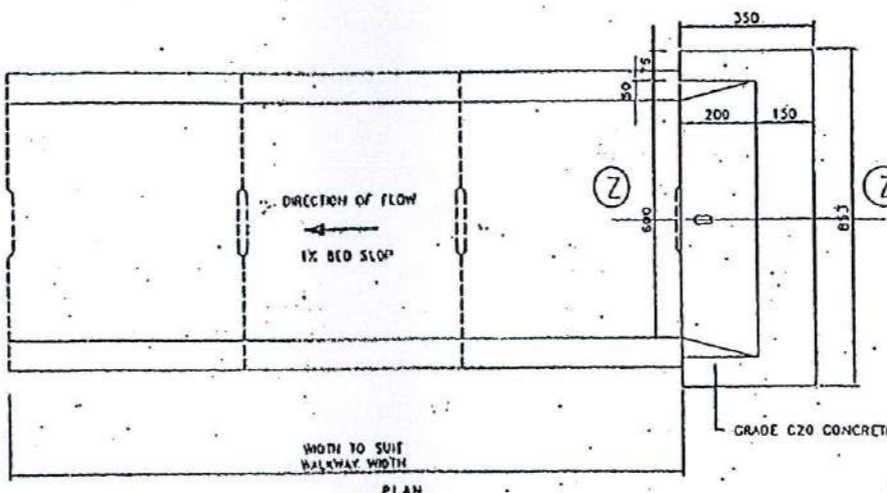


SECTIONAL ELEVATION OF KERB INLET
SCALE 1:10



SECTION Z-Z

ELEVATION



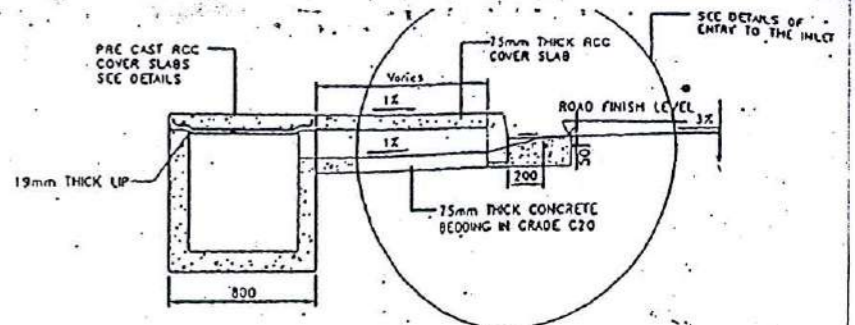
PLAN

DETAILS OF KERB INLET
SCALE 1:20

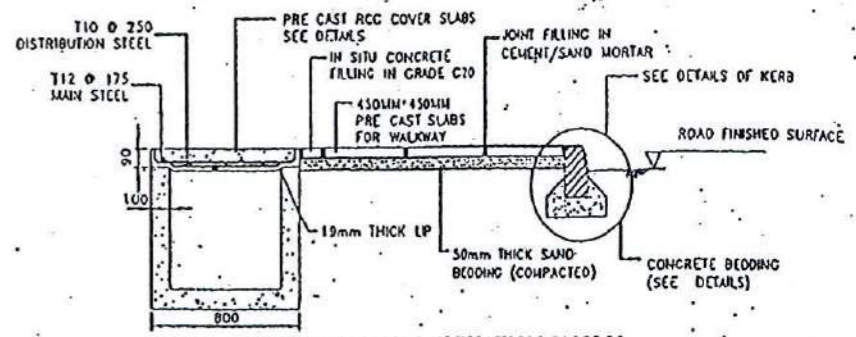
DRAIN TYPE	Slab		Pedestrian Access				Vehicular Access					
	Length L	Width W	R/F (T10)		R/F Bottom (T12)		R/F Top (T10)					
			T1	D	Main	Distribution	T2	D	Main	Distribution		
I	1300	600	125	150	5 Nos.	8 Nos.	150	150	5 Nos.	10 Nos.	5 Nos.	10 Nos.
II	800	600	75	100	5 Nos.	6 Nos.	125	100	5 Nos.	7 Nos.	5 Nos.	7 Nos.
III	600	500	75	100	5 Nos.	5 Nos.	100	100	5 Nos.	5 Nos.	5 Nos.	5 Nos.

* R/F = Reinforcement

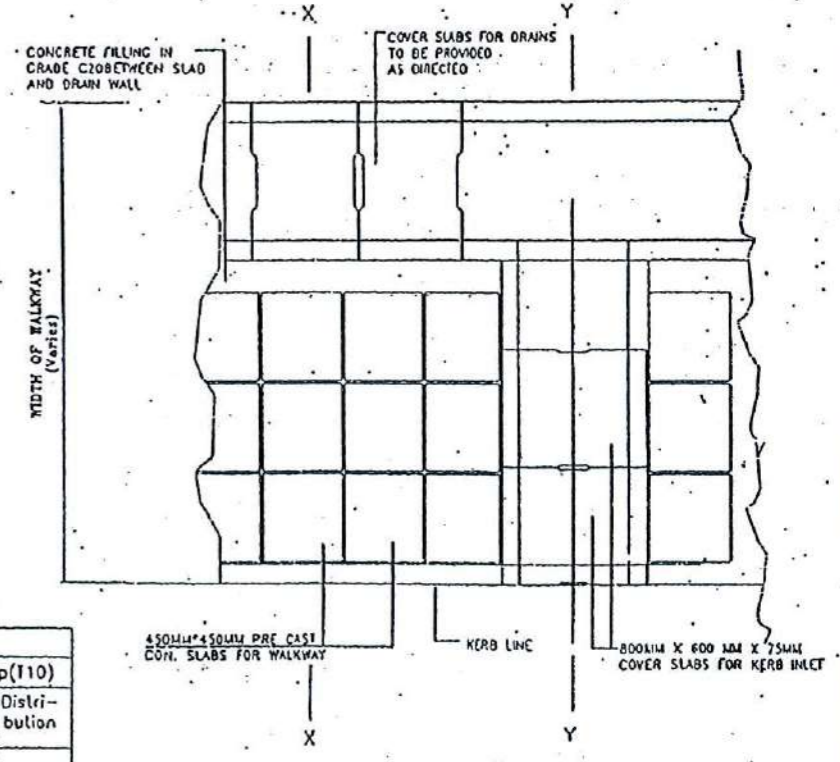
TABLE 2: DETAILS OF COVER SLABS



SECTIONAL ELEVATION ON Y-Y
SCALE 1:40

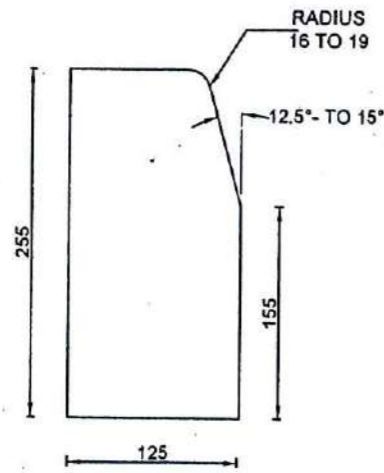


PART SECTIONAL ELEVATION ON X-X
SCALE 1:40

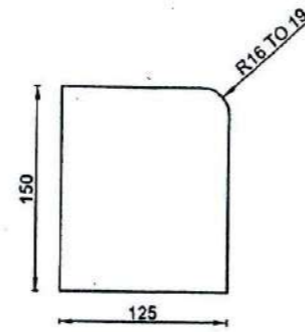


PLAN OF THE WALKWAY & THE KERB INLET
SCALE 1:40

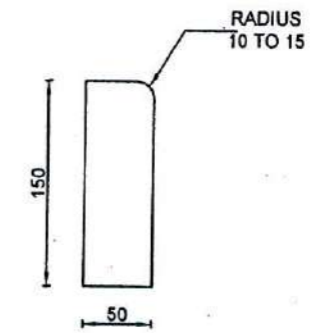
- NOTE:
- (i) PLACEMENT OF RESPECTIVE COVER SLABS FOR PEDESTRIAN & VEHICULAR ACCESS TO BE DECIDED AT SITE.
 - (ii) KERB INLETS SHOULD BE SPACED AT 12M INTERVALS
 - (iii) ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.



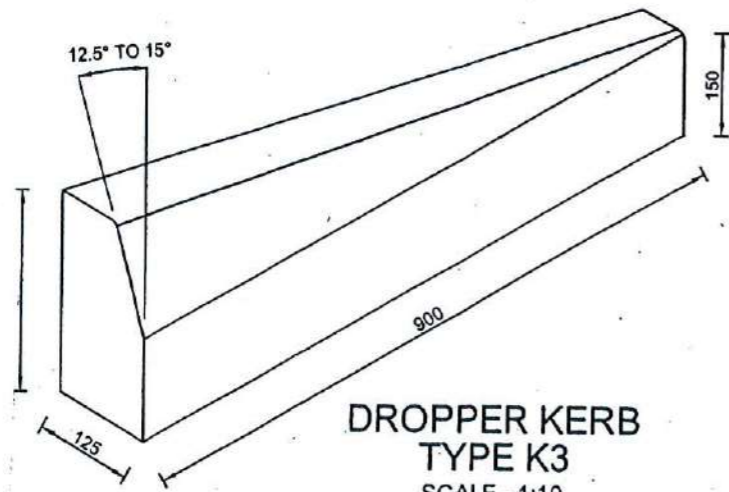
**BARRIER KERB
TYPE K1**
SCALE - 1:5



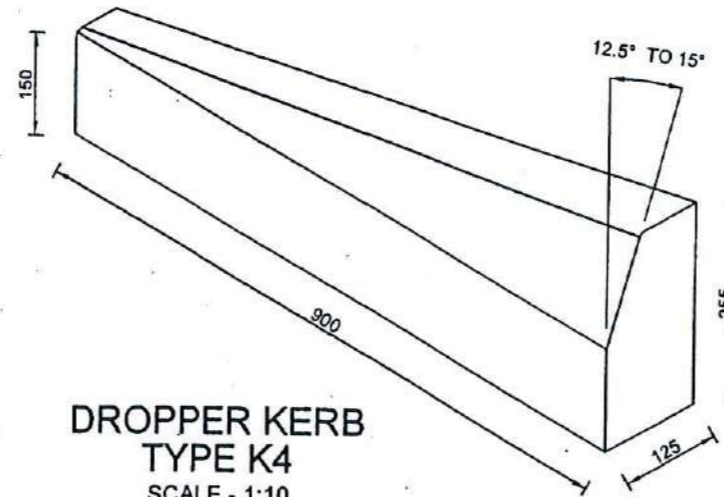
**DROPPED KERB
TYPE K2**
SCALE - 1:5



**CONCRETE EDGING
TYPE E1**
SCALE - 1:5



**DROPPER KERB
TYPE K3**
SCALE - 1:10



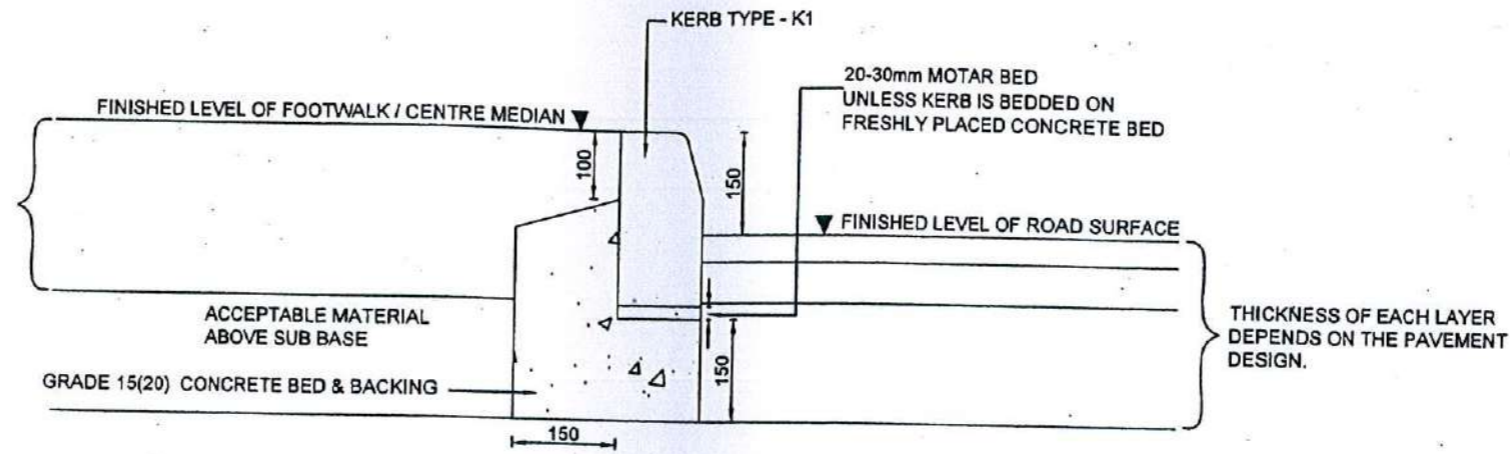
**DROPPER KERB
TYPE K4**
SCALE - 1:10

NOTE -

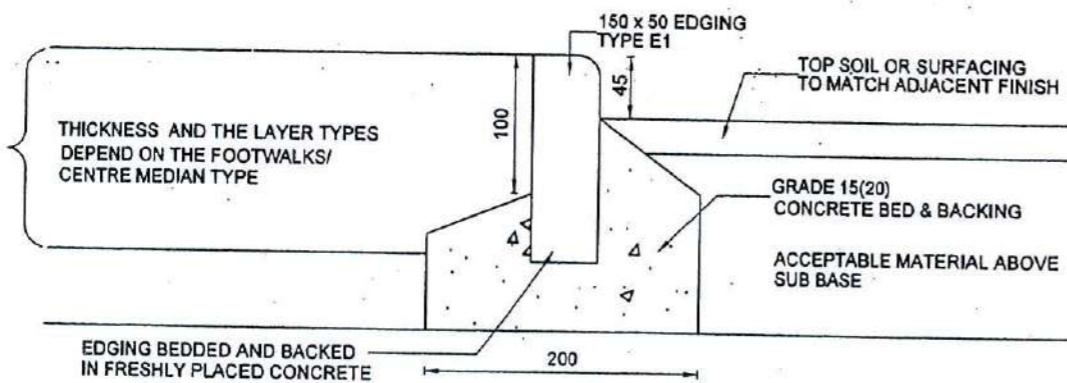
1. GRADE 20(20) CONCRETE TO BE USED IN CASTING KERBS.
2. MAXIMUM CASTING LENGTH 900mm.
3. ALL DIMENSIONS ARE IN MILLIMETERS.



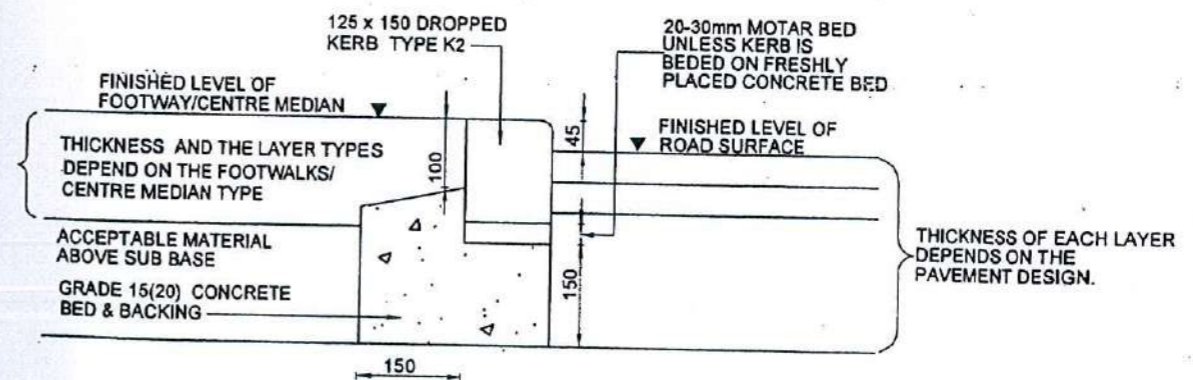
THICKNESS & THE LAYER TYPES
DEPEND ON THE FOOTWALKS/
CENTRE MEDIAN TYPE



STANDARD FOOTWALK / MEDIAN EDGE USING KERB TYPE K1
SCALE - 1:10

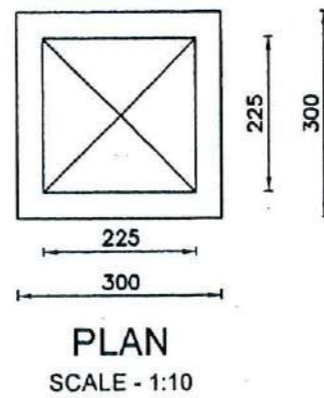
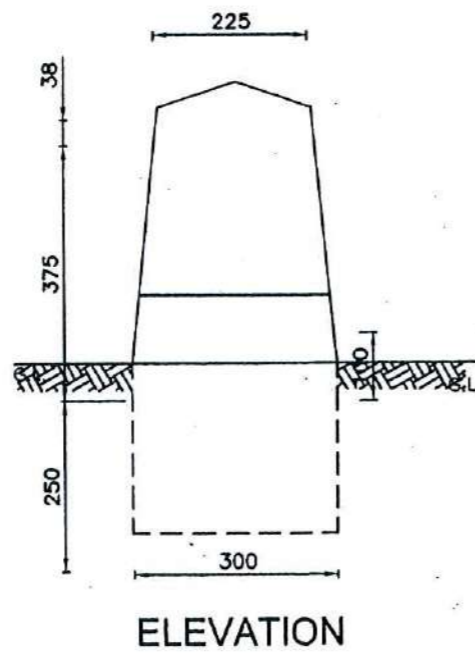


STANDARD PRECAST EDGE USING KERB TYPE E1
SCALE - 1:5



STANDARD FOOTWALK/MEDIAN EDGE USING
KERB TYPE K2
SCALE - 1:10

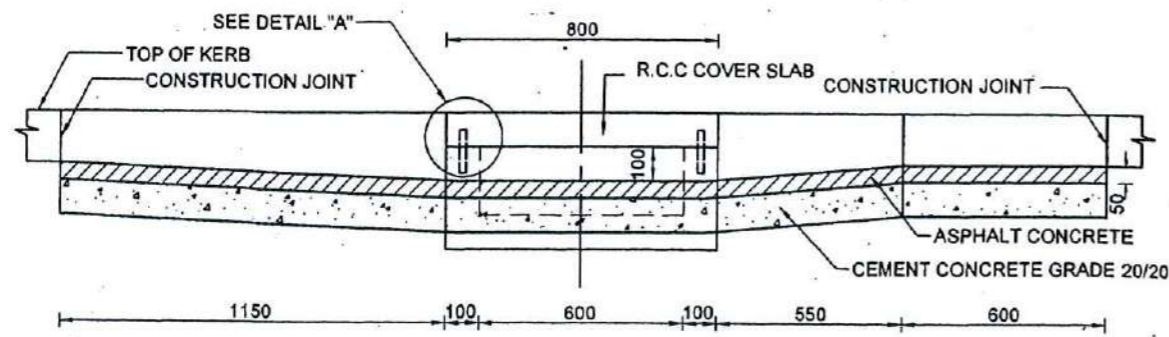
NOTE -
1. KERBS TO BE PAINTED IN BLACK & WHITE ALTERNATIVELY, PREFERABLY STARTING WITH
WHITE & ENDING WITH WHITE.
2. ALL DIMENSIONS ARE IN MILLIMETERS.



NOTE

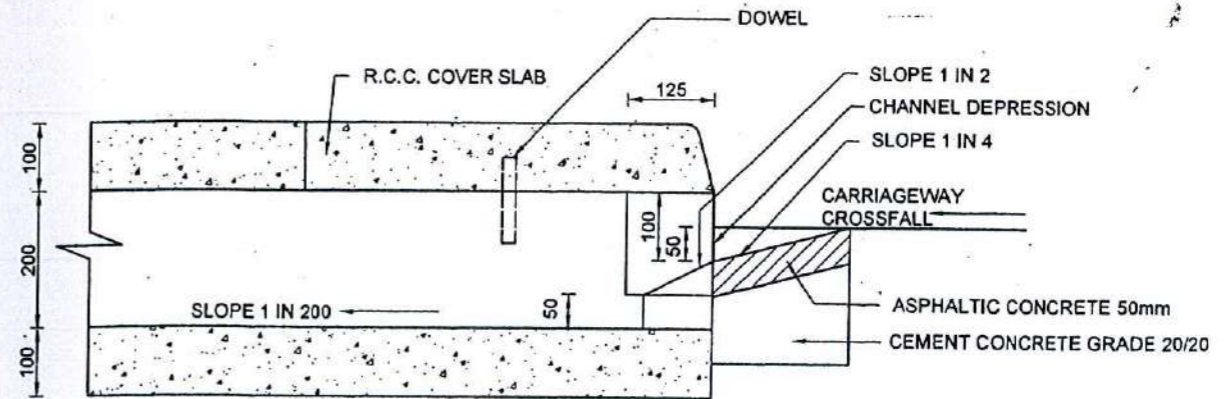
1. GRADE 15 (20) CONCRETE TO BE USED IN CASTING THE GUARD STONE.
2. GUARD STONE TO BE PLANTED ON FIRM GROUND AS DIRECTED BY THE ENGINEER.
3. BOTTOM 100mm OF THE GUARD STONE TO BE PAINTED IN BLACK AND REMAINING TOP SECTION IN WHITE.
4. ALL DIMENSIONS ARE IN MILLIMETRES.





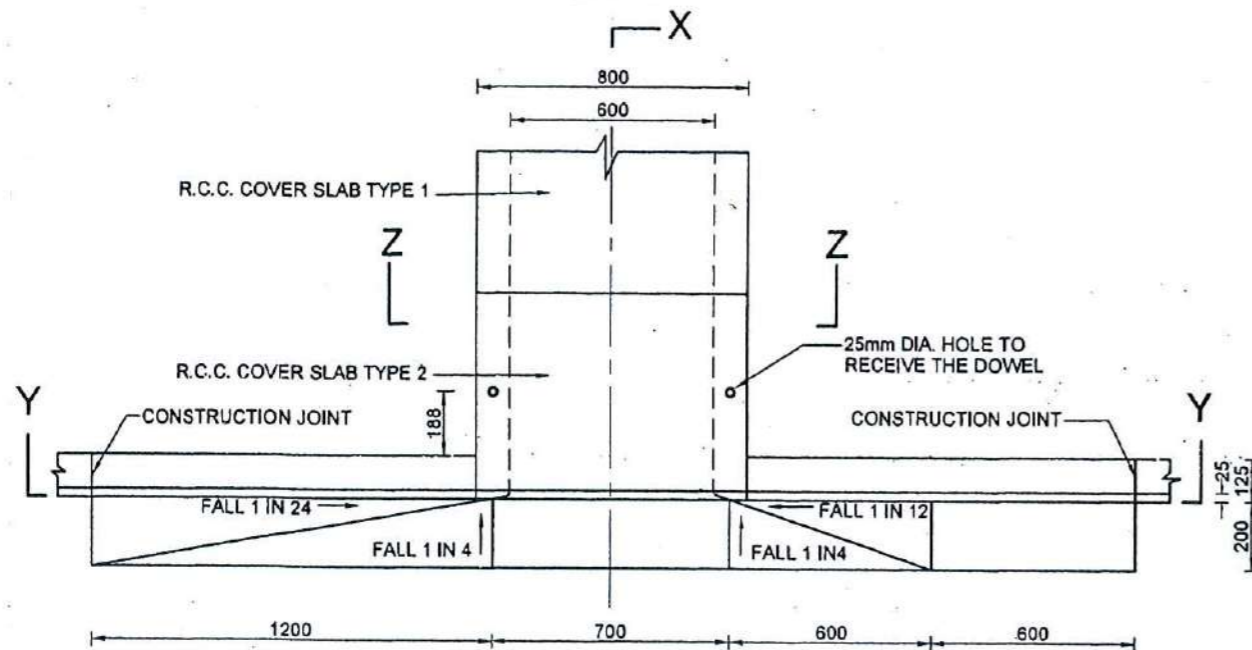
SECTION Y-Y

SCALE-1:20



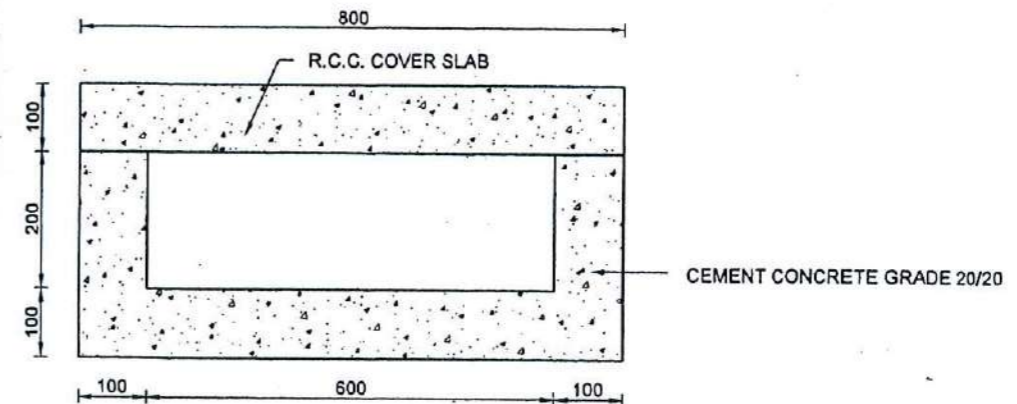
SECTION X-X

SCALE-1:10



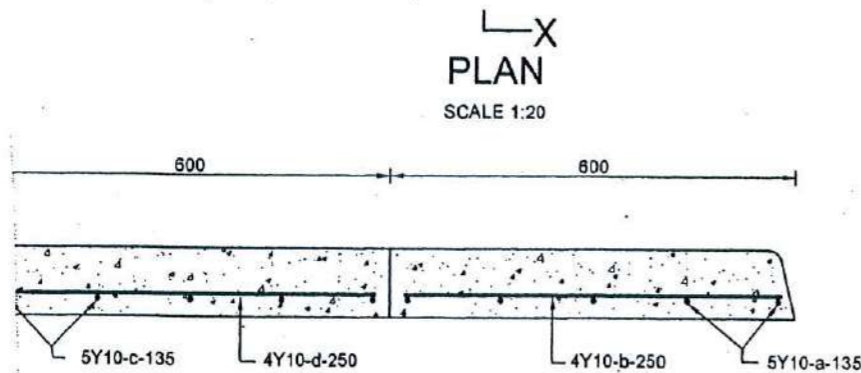
PLAN

SCALE 1:20



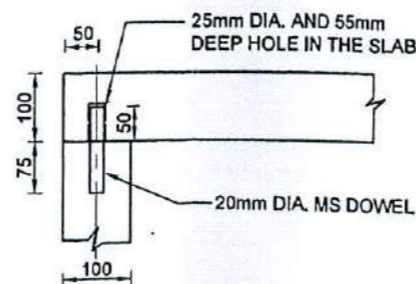
SECTION Z-Z

SCALE-1:10



SECTION OF COVER SLABS

SCALE-1:10



DETAIL AT "A"

SCALE - 1:10

SCHEDULE OF REINFORCEMENT

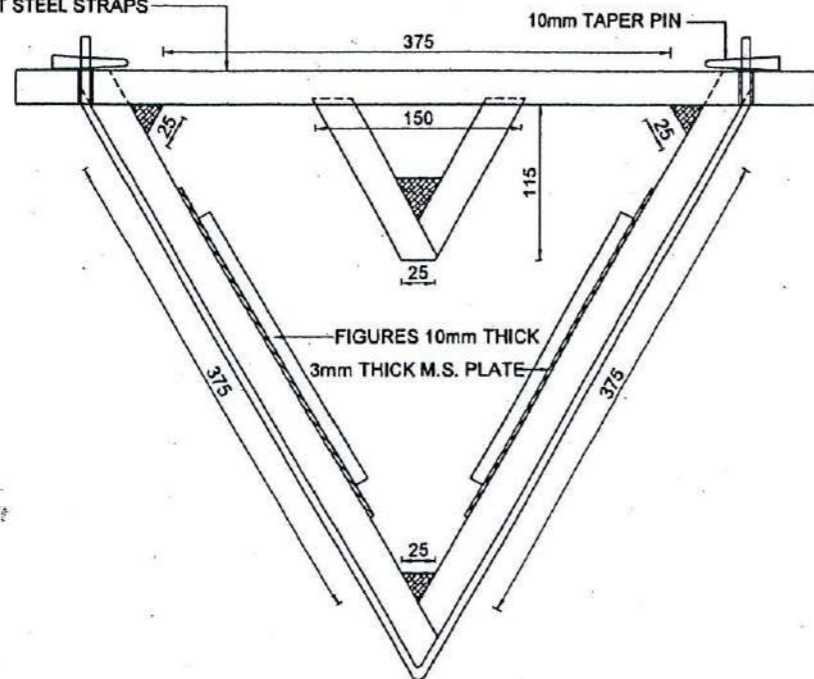
LOCATION	MARK	DIA (mm)	No.OFF	TYPE OF STEEL	CUT LENGTH (mm)	WEIGHT (kg)	BENDING	REMARKS
COVER SLAB TYPE 1	a	10	5	y	860	2.65	50 760 50	
	b	10	4	y	560	1.38	560	
COVER SLAB TYPE 2	c	10	5	y	860	2.65	50 760 50	
	d	10	4	y	560	1.38	560	

NOTE

1. ALL CEMENT CONCRETE TO BE OF GRADE 20/20.
2. CLEAR COVER TO REINFORCEMENT TO BE 20mm.
3. TWO COATS OF ANTICORROSIVE PAINT TO BE APPLIED TO THE EXPOSED AREA OF THE DOWEL.
4. ALL DIMENSIONS ARE IN MILLIMETERS.

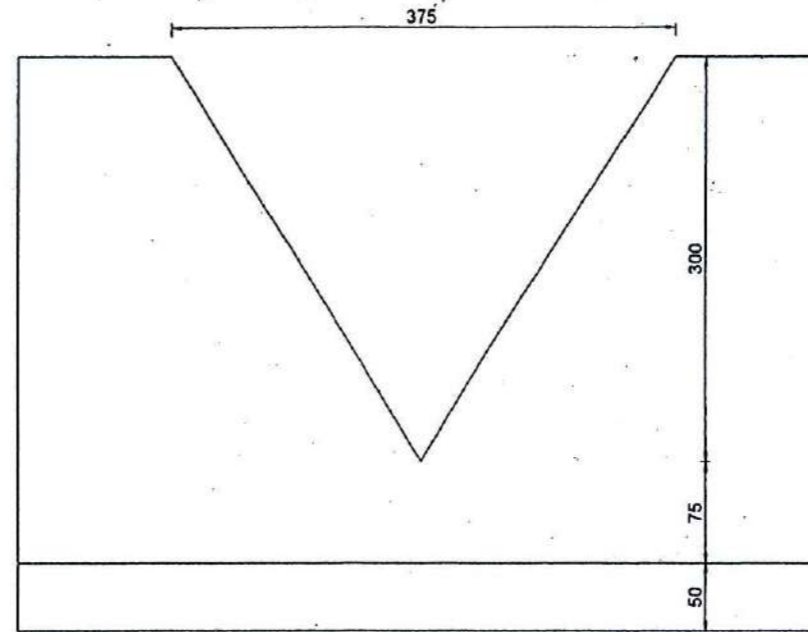


5Nos. 150mm x 100mm x 25mm
PLANKS TO FIT STEEL STRAPS



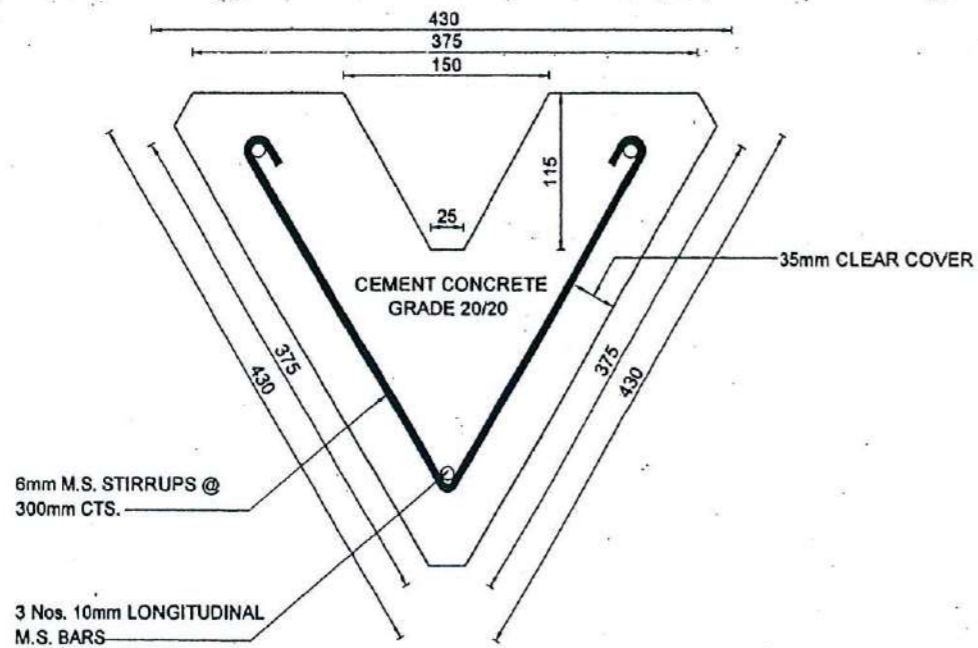
SECTION THROUGH MOULD

SCALE - 1:5



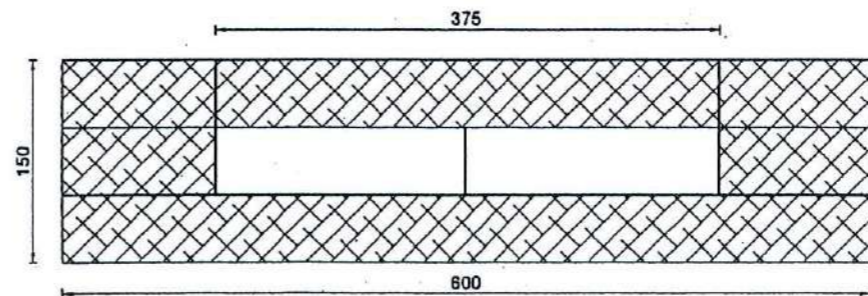
ELEVATION

SCALE - 1:5



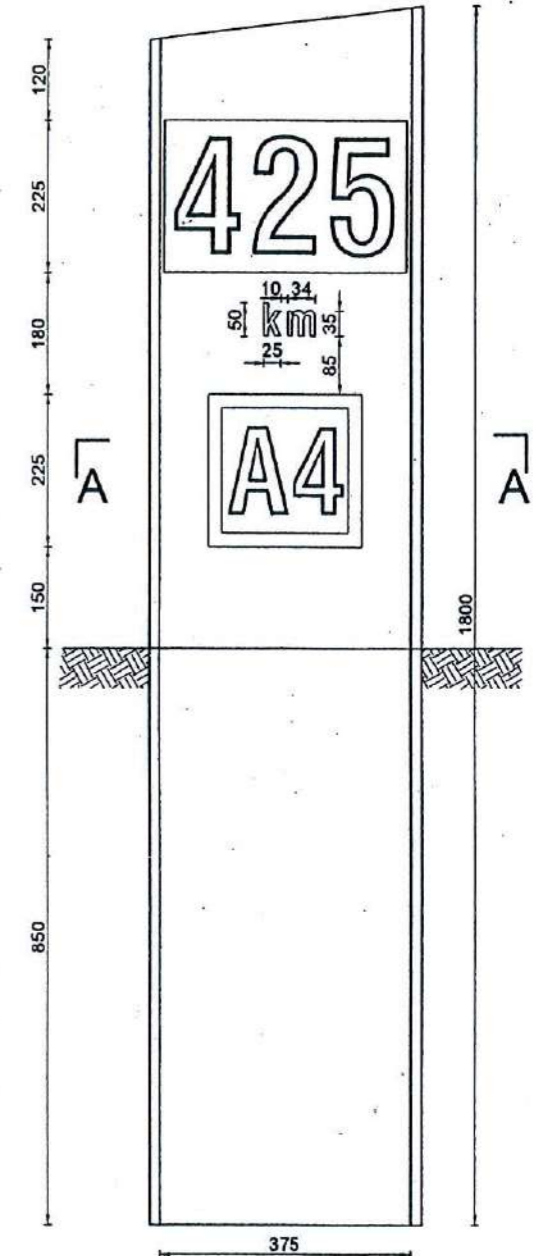
CROSS SECTION A-A

SCALE - 1:5



PLAN

SCALE - 1:5



FRONT ELEVATION

SCALE - 1:10

NOTE -

- FIGURES 2,3,4,5,6 & 7 TO BE LATTERALLY REVERSED AND RIVETED TO PLATE SO THAT THE CASTS GIVE THEIR IMPRESSION.
- FIGURES TO BE PAINTED BLACK ON KILOMETRE STONE.
- FIGURES ON ROUTE NUMBERS SHOULD BE 2/3 FULL SIZE AND SHAPE OF FIGURES SHOWN ABOVE.
- 225mm x 225mm x 21mm RECESS TO BE LEFT FOR ROUTE NUMBERS ON FACE OF STONE.
- ALL DIMENSIONS ARE IN MILLIMETERS.

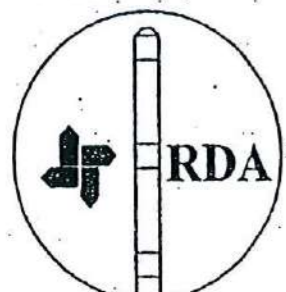


SITING DETAILS OF WARNING SIGNS

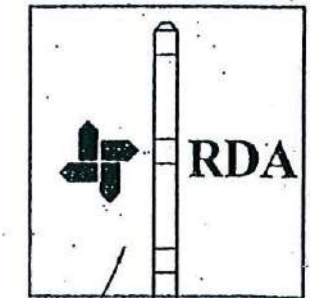
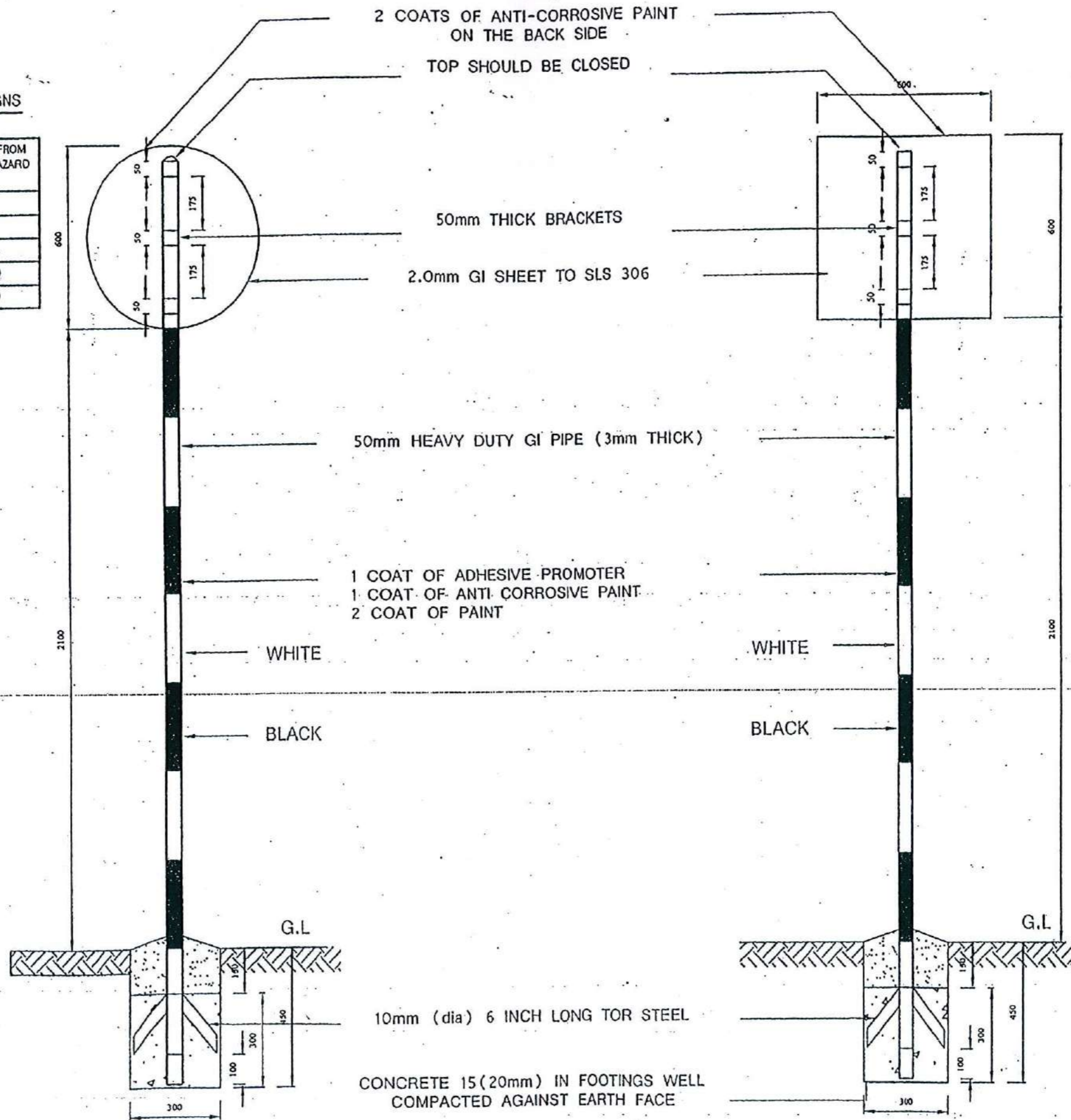
TRAVEL SPEED km/h	CLEAR VISIBILITY DISTANCE (m)	DISTANCE FROM SIGN TO HAZARD (m)
30	60	45
40	60	45
50	60	60
60	60	100
80	75	160

NOTES:-

1. THE RETRO-REFLECTIVE SIGN SHALL BE DIAMOND TYPE.
2. ALL DIMENSION ARE IN mm. UNLESS OTHERWISE STATED.



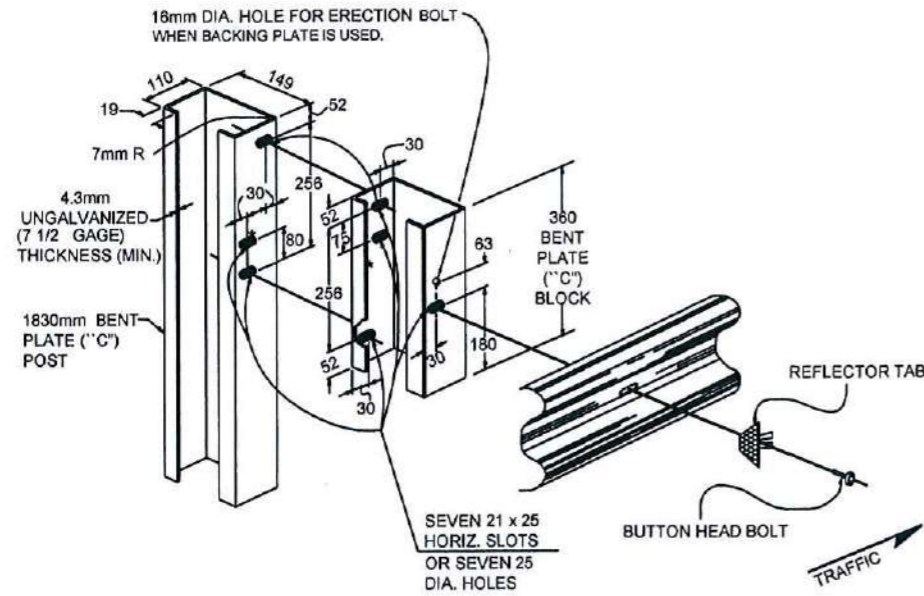
REAR SIDE



WHITE IN COLOUR

REAR SIDE

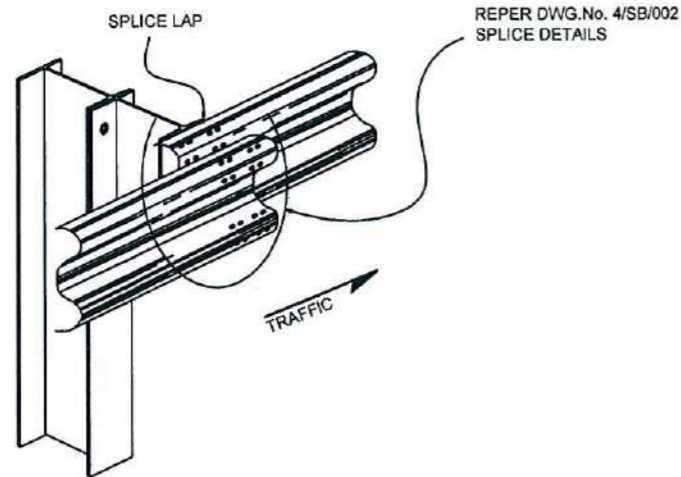




P-52-76
ALTERNATIVE STEEL "C"
POST & BLOCK

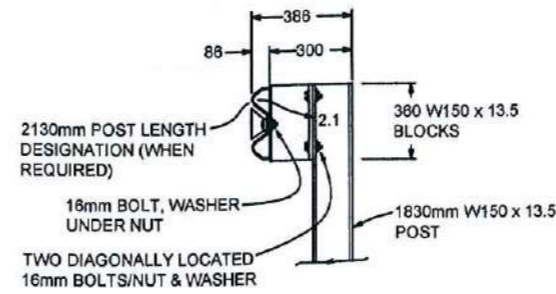
* NOTE: ADDITIONAL HOLES SHALL BE PROVIDED IN POSTS (AND STEEL BLOCKS) TO FACILITATE FUTURE RAISING OF THE RAIL FOR OVERLAYS, ETC..

STANDARD SPACING - 1.83m C-C
A POST SHALL BE AT EACH BEAM JOINT AND MID-SPAN

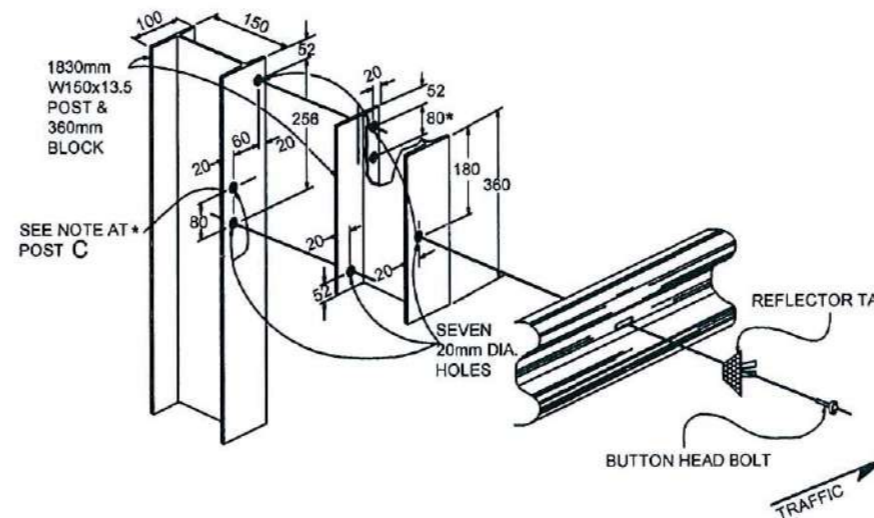


W-BEAM SPLICE

REFER DWG.No. 4/SB/002
SPLICE DETAILS



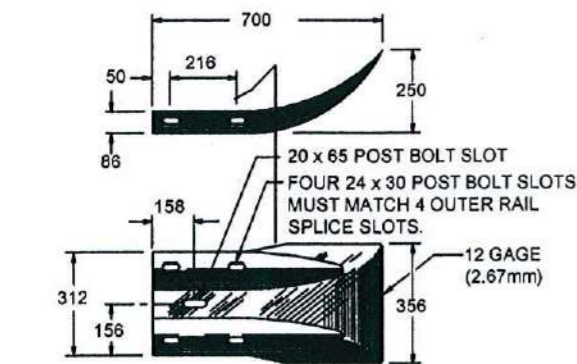
TYPICAL GUARDRAIL ASSEMBLY



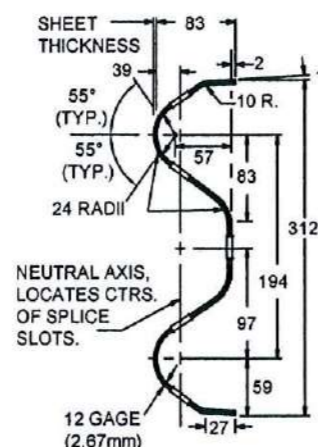
(PWE01 & PWB01)
P-10-79
STEEL POST & BLOCK
STANDARD SPACING - 1.83m C-C
A POST SHALL BE AT EACH BEAM JOINT AND MID-SPAN

NOT TO SCALE

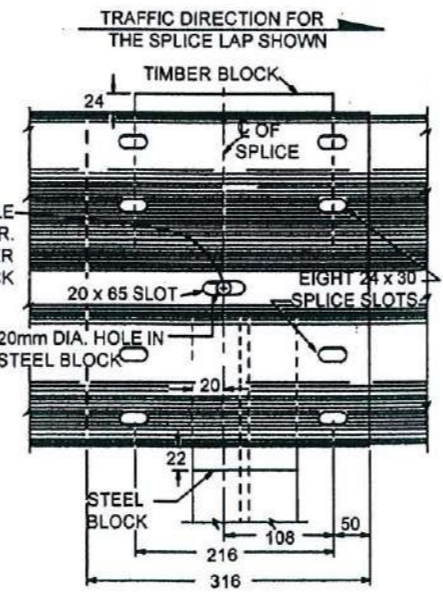
- ALL W-BEAM SPLICES, AND SPLICES OF TERMINAL CONNECTORS TO W-BEAM SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC UNLESS OTHERWISE NOTED. REFER DWG. No. 4/SB/002 FOR SPLICE DETAILS
- MATERIAL TYPE AND SHAPE OF POSTS AND BLOCKS SHALL BE THE SAME THROUGHOUT THE PROJECT EXCEPT WHEN SPECIFIC POSTS AND BLOCKS ARE SPECIFIED SUCH AS AT END ANCHORAGE AND BOX CULVERTS.
- CONCRETE MAY BE READY-MADE OR FIELD-MIXED AND SHALL CONSIST OF A MINIMUM OF 1 PART CEMENT TO 6 PARTS AGGREGATE BY VOLUME.
- ACCEPTABLE ALTERNATIVES TO W150x13.5 POSTS AND BLOCKS ARE W150x12.8 ROLLED OR WELDED BEAM, OR THE BENT PLATE ("C"). THE WELDED BEAM SHALL BE IN ACCORDANCE WITH ASTM A 769 WITH THE SAME SHAPE AND WEIGHT PER FOOT AS A W150x12.8 OR W150x13.5.
- OPEN SIDES OF "C" POSTS AND BLOCKS SHALL FACE AWAY FROM APPROACHING TRAFFIC IN ROADSIDE INSTALLATIONS. IN DOUBLE-CLICKED MEDIAN INSTALLATIONS THE OPEN SIDES SHALL ALL FACE IN THE SAME DIRECTION.
- 2130mm POSTS, WHEN SPECIFIED IN THE CONTRACT SHALL BE INSTALLED INSTEAD OF THE STANDARD 1830mm POSTS. 2130mm POSTS SHALL BE MARKED WITH THE NUMBER 2.1 TO ENSURE PERMANENT IDENTIFICATION. THE NUMBER 2.1 SHALL BE A MINIMUM 50mm HEIGHT AND LOCATED AS SHOWN IN THE ELEVATION VIEWS.
- STANDARD GALVANISED ROUND STEEL WASHERS SHALL BE USED UNDER ALL NUTS IN CONTACT WITH POSTS.
- REFLECTOR TABS SHALL BE INSTALLED AT 7620mm INTERVALS (EXCEPTION BELOW). REFLECTOR TABS WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE GUARD RAIL THE TABS SHALL BE MOUNTED SO THAT THE BOLT SLOT FACES AWAY FROM TRAFFIC AND THE REFLECTOR SURFACE FACES THE APPROACHING TRAFFIC FOR ONE-WAY ROADS. FOR TWO-WAY ROADS, BOTH SIDES OF THE TABS SHALL BE REFLECTOR SO THAT DELINEATION IS PROVIDED FOR BOTH DIRECTIONS OF TRAVEL. REFLECTOR COLOUR SHALL MATCH THE COLOR OF THE ADJACENT TRAVELLED WAY EDGE LINE. SEE TAB DETAIL ON DWG. No.4/SB/002
- REFLECTOR TABS SHALL NOT BE INSTALLED AT THE FOLLOWING LOCATIONS:
-THE END 7 POSTS IN THE TYPE 3E END ANCHORAGE.
-GUARD RAIL IN AREAS OF CONTINUOUS HIGHWAY LIGHTING.
- REFERENCES SUCH AS "P-10-79", "F-3(2)-76", AND "RE-3-73" IN THIS STANDARD SPECIFY HARDWARE DETAILS FROM "A GUIDE TO STANDARDISED HIGHWAY BARRIER RAIL HARDWARE" PREPARED BY THE AASHTO-AGC-ARTBA JOINT CO-OPERATIVE COMMITTEE. REFERENCES SUCH AS (PWE1-3), (FBB06) AND (RVM06a) SPECIFY HARDWARE DETAILS FROM A DRAFT VERSION OF THE UPDATED GUIDE, WHICH GIVES DIMENSIONS IN SI (METRIC) UNITS. THESE REFERENCES ARE SHOWN IN PARENTHESES.



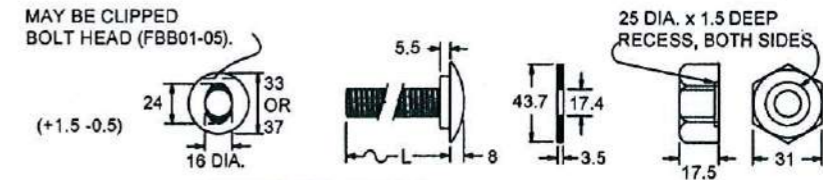
(RWE01a) RE-5 (CLASS A, TYPE 1 OR 2) -76 (GALV.)
(RWE01a) RE-5 (CLASS A, TYPE 4) -76 (CORR. RESIST.)
TERMINAL SECTION (FLARED)



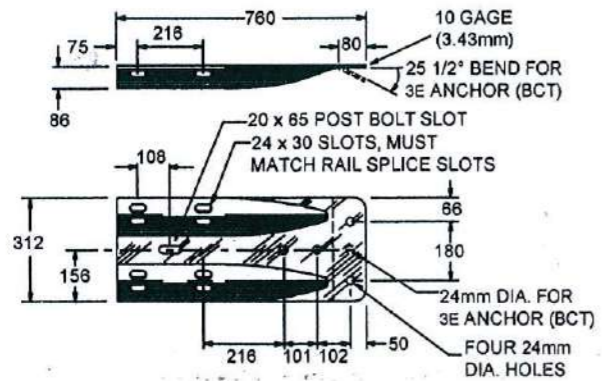
(RWM-2a) RE-3 (CLASS A, TYPE 1 OR 2) -73 (GALV.)
(RWM-2a) RE-3 (CLASS A, TYPE 4) -73 (CORR. RESIST.)
W-BEAM RAIL SECTION



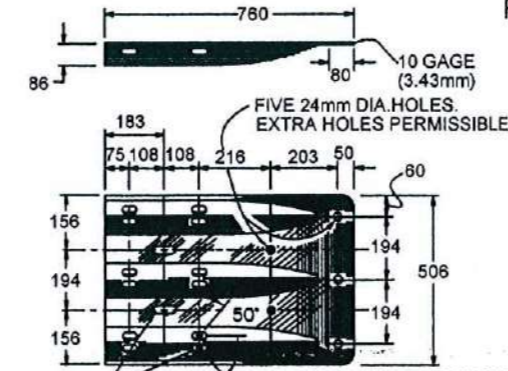
RAIL SPLICE



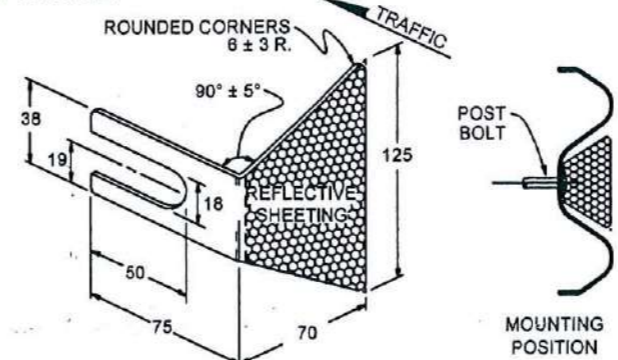
DIAMETER & TYPE	LENGTH L	THREAD LENGTH	INTENDED USE	AASHTO-AGC-ARTBA STANDARD NUMBER	NO. BOLTS, NUTS & WASHERS
16mm BUTTON HEAD, OVAL SHLDR.	35 50	FULL (30) MIN. 45	ALL RAIL SPLICES FASTEN RAIL TO STEEL BLOCK	F-3 (1 1/4")-76 (FBB01) F-3 (2")-76 (FBB02)	8 PER SPLICE 1 PER POST
16mm HEX HEAD	50	FULL	FASTEN STEEL BLOCK TO POST	F-8-76 (FBX16a)	2 PER BLOCK



(RWE02b) RE-8 (CLASS B, TYPE 1 OR 2) -79 (GALV.)
(RWE02b) RE-8 (CLASS B, TYPE 4) -79 (CORR. RESIST.)
TERMINAL SECTION (CONNECTOR)

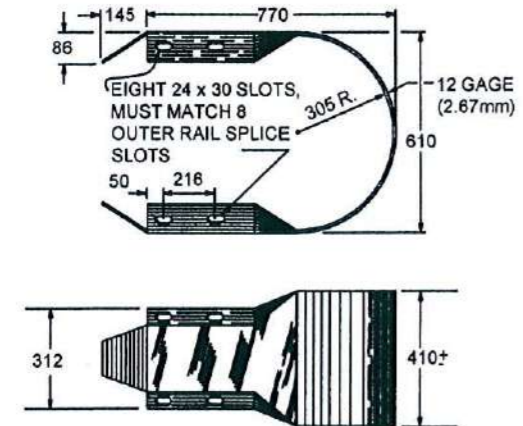


(RTE01b) RE-83 (CLASS B, TYPE 1 OR 2) -76 (GALV.)
(RTE01b) RE-83 (CLASS B, TYPE 4) -76 (CORR. RESIST.)
THREE BEAM TERMINAL SECTION (CONNECTOR)

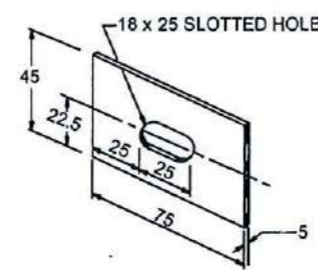


REFLECTOR TAB

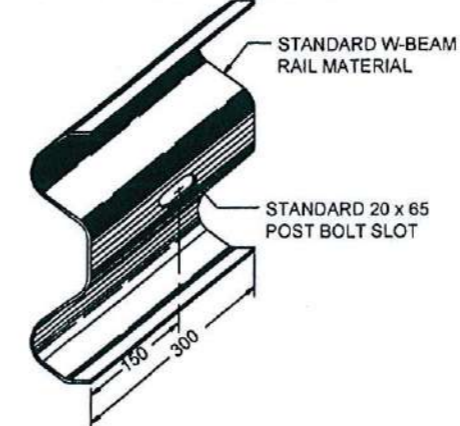
REFLECTOR TABS SHALL BE MANUFACTURED FROM 12 GAGE (2.7mm) TO 14 GAGE (1.9mm) STEEL. REFLECTIVE SHEETING SHALL CONFORM TO ASTM D4956 TYPE III. SEE NOTES ON DWG. 4/SB/001



(RWE06a) RE-7 (CLASS A, TYPE 1 OR 2) -79 (GALV.)
(RWE06a) RE-7 (CLASS A, TYPE 4) -79 (CORR. RESIST.)
TERMINAL SECTION (BUFFER)



(FWR03) F-12-73
RECTANGULAR WASHER
(TO BE USED ONLY WHERE SPECIFIED.)



(RWB01a-b) RE-4 (CLASS A, TYPE 1 OR 2) -76 (GALV.)
(RWB01a-b) RE-4 (CLASS A, TYPE 4) -76 (CORR. RESIST.)
BACKUP PLATE
(REQUIRED BEHIND RAIL AT EACH NON-SPLICE STEEL POST & BLOCK SYSTEM)

PART	MATERIAL SPEC.	GALVANISING SPEC.	CORROSION-RESISTANT SPEC.
W-BEAM RAIL BACK-UP PLATE & TERMINAL SECTIONS	AASHTO M 180, CLASS A OR B	AASHTO M 180, TYPE 1 OR 2	AASHTO M 180, TYPE 4
WELDED BEAM OR STRUCTURAL SHAPE STEEL POST BLOCK & BASE PLATE	ASTM A 36M	AASHTO M 111M	AASHTO M 222M (ASTM A 588M)
BENT PLATE ("C") POST & BLOCK	ASTM A 570M, GRADE 36 ASTM A 36M	AASHTO M 111M	AASHTO M 222M (ASTM A 588M)
NUTS, BOLTS & STUDS FOR GENERAL USE	ASTM A 307		
HIGH STRENGTH BOLTS & NUTS	ASTM A 325		AASHTO M 232, CLASS C
HIGH STRENGTH STUDS & NUTS	ASTM A 449		OR
ROUND STEEL WASHERS	ASTM F 436M		ASTM B 895 CLASS 50
RECTANGULAR WASHERS	AASHTO M 180		
OTHER FITTINGS	ASTM A 36M	AASHTO M 111M	

THE TABULATION OF GUARD RAIL WILL SPECIFY THE TYPE OF CORROSION PROTECTION: GALVANISED OR CORROSION-RESISTANT STEEL.

STEEL POSTS AND BLOCKS SHALL HAVE THE SAME CORROSION PROTECTION AS SPECIFIED FOR THE METAL BEAM RAIL. PUNCHING, DRILLING, OR CUTTING WILL NOT BE PERMITTED AFTER GALVANISING.

HARDWARE DETAILS AND SPECIFICATIONS

NOT TO SCALE