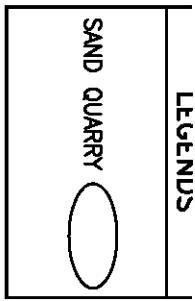




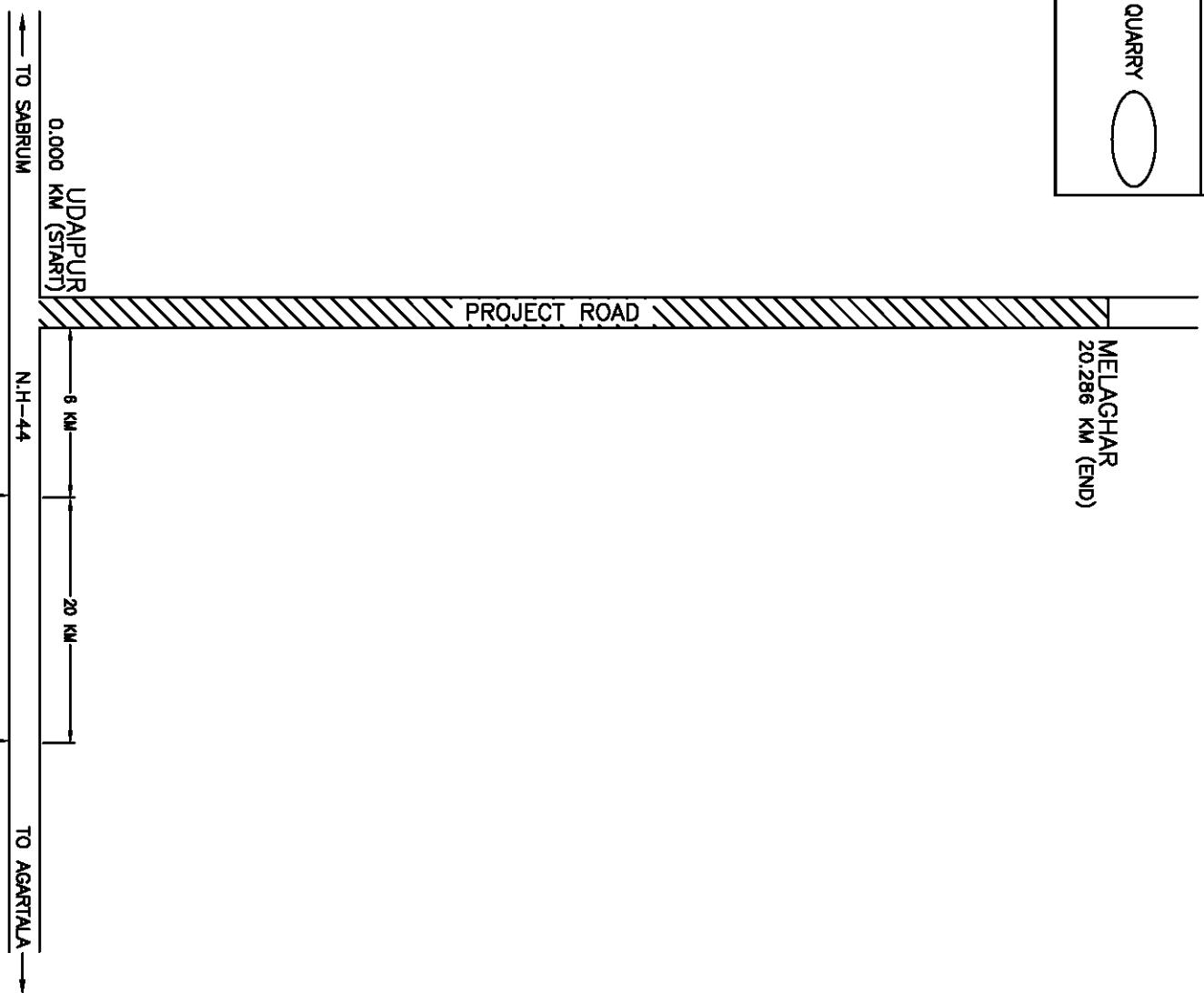
LEGENDS

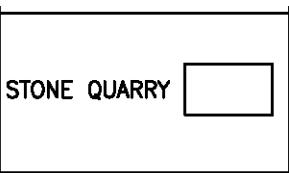
SAND QUARRY



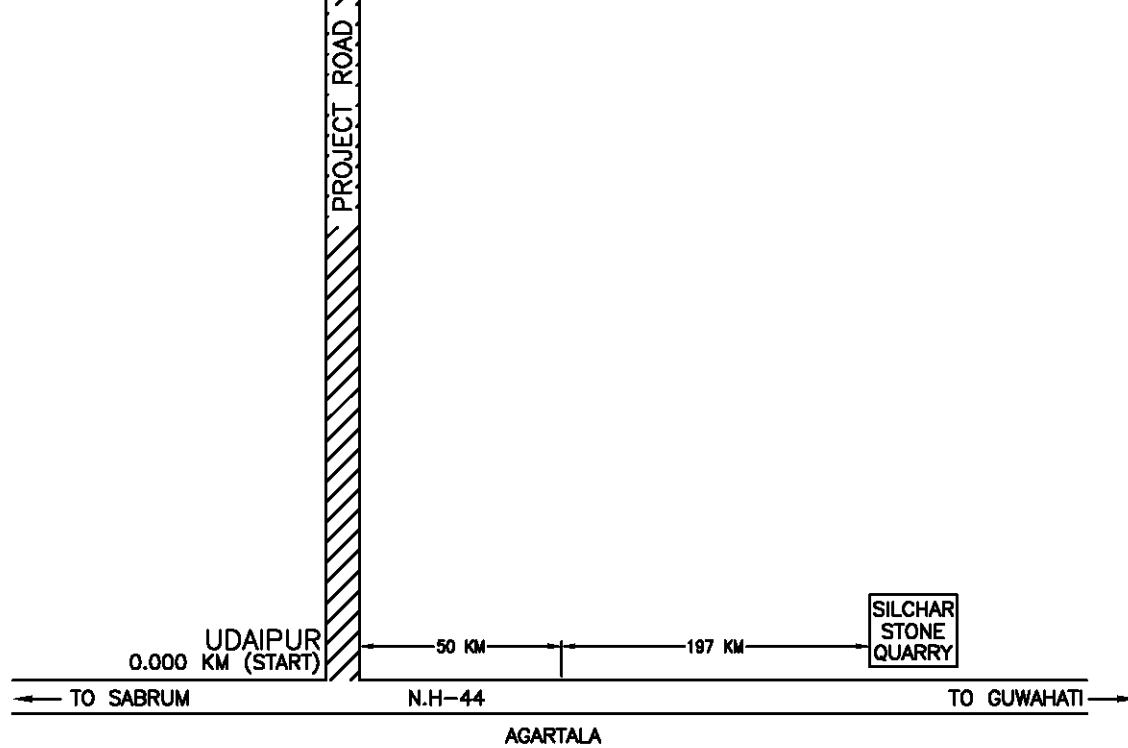
MELAGHAR
20.286 KM (END)

PROJECT ROAD





MELAGHAR
20.286 KM (END)



DRAWING NO.	TITLE
JPR/TR 02/DRW/001	KEY MAP
JPR/TR 02/DRW/002	GENERAL NOTES AND LEGENDS
D DRAWINGS	
JPR/TR 02/DRW/003	TYPICAL HORIZONTAL AND VERTICAL CURVES
JPR/TR 02/DRW/004	TYPICAL SUPERELEVATION DETAILS
JPR/TR 02/DRW/005-007	TYPICAL ROAD SIGNAGES
JPR/TR 02/DRW/008	TYPICAL JUNCTION DETAILS
JPR/TR 02/DRW/009	TYPICAL TRAFFIC DIVERSION DETAILS
JPR/TR 02/DRW/010	TYPICAL CURVE WIDENING DETAILS
JPR/TR 02/DRW/011	TYPICAL KILOMETRE STONE DETAILS
JPR/TR 02/DRW/012	TYPICAL BOUNDARY STONE & GUARD POST DETAILS
JPR/TR 02/DRW/013	TYPICAL BUS-BAY DETAILS
JPR/TR 02/DRW/014	METAL CRASH BARRIER
JPR/TR 01/DRW/015	TYPICAL TOE WALL SECTION / RETAINING WALL SECTION

TR 02 : UDAIPUR-MELAGHAR

DRAWING NO.	TITLE
JPR/TR 02/DRW/A1-A3	TYPICAL CROSS SECTIONS
JPR/TR 02/DRW/101	SCHEDULE OF JUNCTIONS AND CROSS ROADS
JPR/TR 02/DRW/102	JUNCTION DETAIL AT CH:-0+000
JPR/TR 02/DRW/103	JUNCTION DETAIL AT CH:-20+280
JPR/TR 02/DRW/104A	SCHEDULE OF GPS
JPR/TR 02/DRW/104B	SCHEDULE OF TBM
JPR/TR 02/DRW/105A	STONE QUARRIES CHART
JPR/TR 02/DRW/105B	SAND QUARRIES CHART
JPR/TR 02/DRW/201-229	PLAN & PROFILE

GENERAL NOTES:

GENERAL

- THESE DRAWINGS ARE FOR TENDER PURPOSES ONLY.

ROADS

- THE DESIGN IS PREPARED USING THE METRIC SYSTEM.
- ALL COORDINATES ARE IN METERS THE LOCAL COORDINATE SYSTEM IS DEFINED AS A TRANSVERSE MERCATOR PROJECTION BASED ON THE NATIONAL DATUM.
- ALL LEVELS ARE IN METERS.
- THE CONTRACTOR SHALL VERIFY THAT THE ALIGNMENT SETTING OUT GIVEN IN THE DRAWING MATCHES THE EXISTING ROAD.
- THE CONTRACTOR SHALL VERIFY ALL LEVELS GIVEN IN THE DRAWINGS AND ESTABLISH TEMPORARY BENCHMARKS AS NECESSARY FOR FULL CONTROL OF PAVEMENT LEVELS DURING CONSTRUCTION.
- THE CONTRACTOR SHALL VERIFY ALL SOIL INVESTIGATION DATA AND CORRESPONDING GROUND TREATMENT AND PAVEMENT THICKNESS AS GIVEN IN THE DRAWINGS.

LEGEND FOR PLAN DRAWINGS:

LEGEND:-



EXISTING ROAD SHOWING CENTER LINE,
CARRIAGeway, SHOULDER

PROPOSED ROAD SHOWING STATIONING
CENTER LINE, CARRIAGeway, SHOULDER
& EARTH WORK

CULVERT OR BRIDGE NO.

EXISTING BUILDING AND HUTS

EASTING

NORTHING

CLOTHOID PARAMETER

HORIZONTAL CURVE RADIUS

RATE OF SUPER ELEVATION (W/W)

KILOMETER STONE

STATION POINT

GPS MARK

TEMPORARY BENCH MARK

WELL

BUILT UP AREA

HUT

GATE

FENCING

CULVERT/SCUPPER

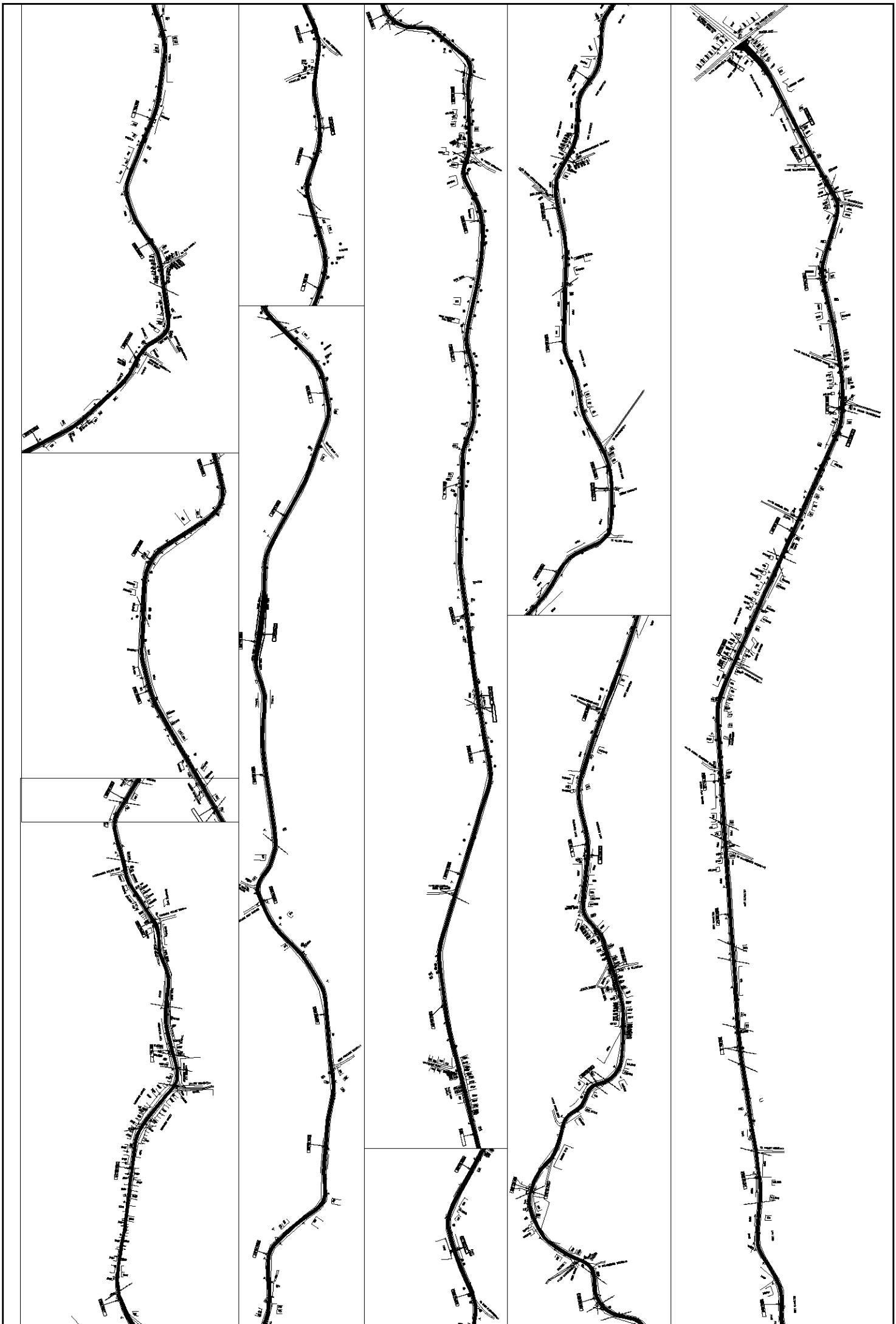
SIDE ROAD

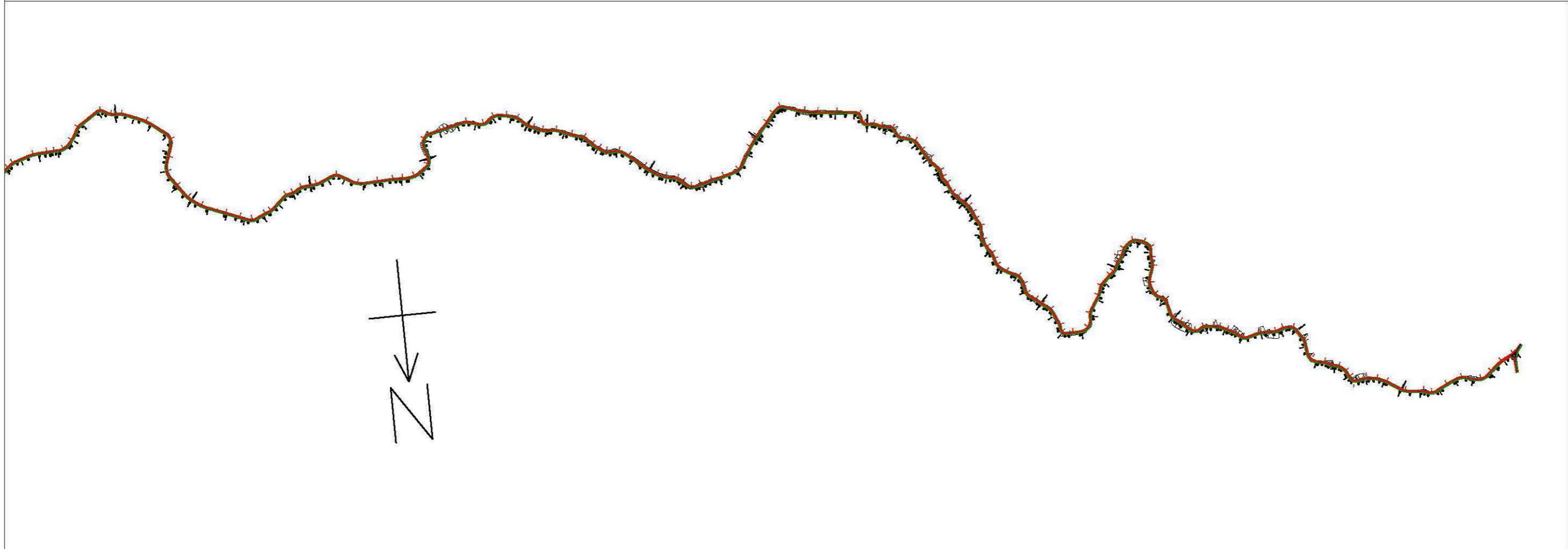
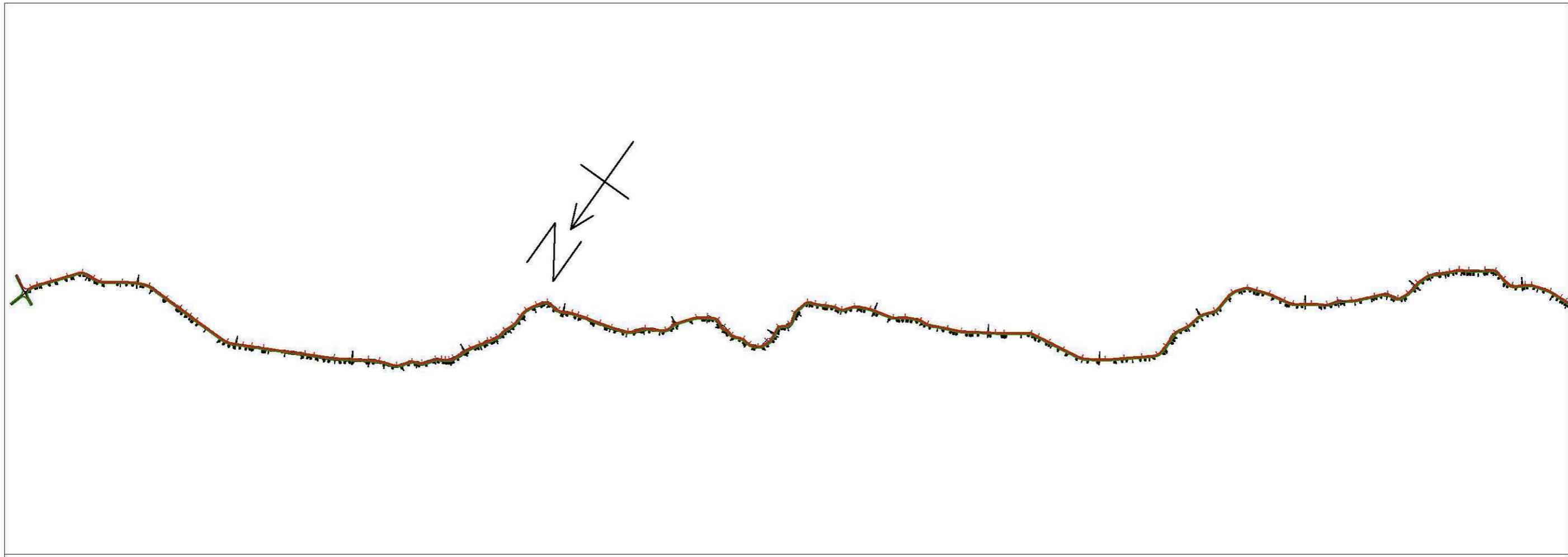
LEGEND FOR LONGITUDINAL PROFILE DRAWINGS:

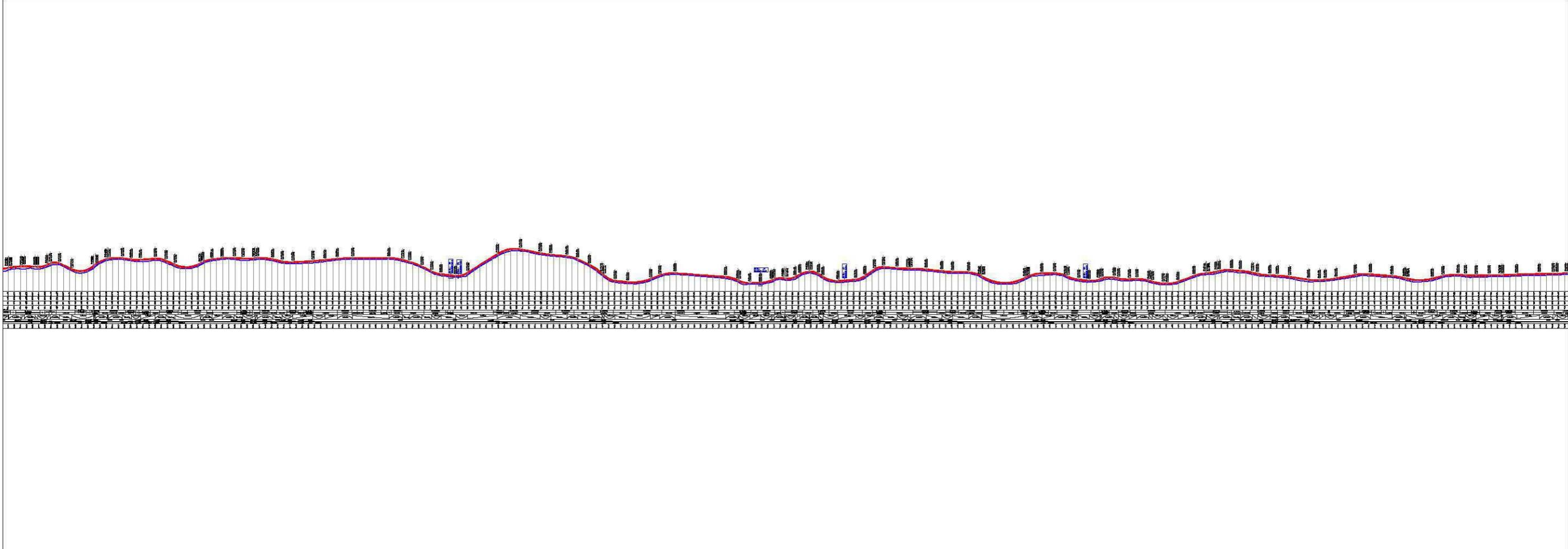
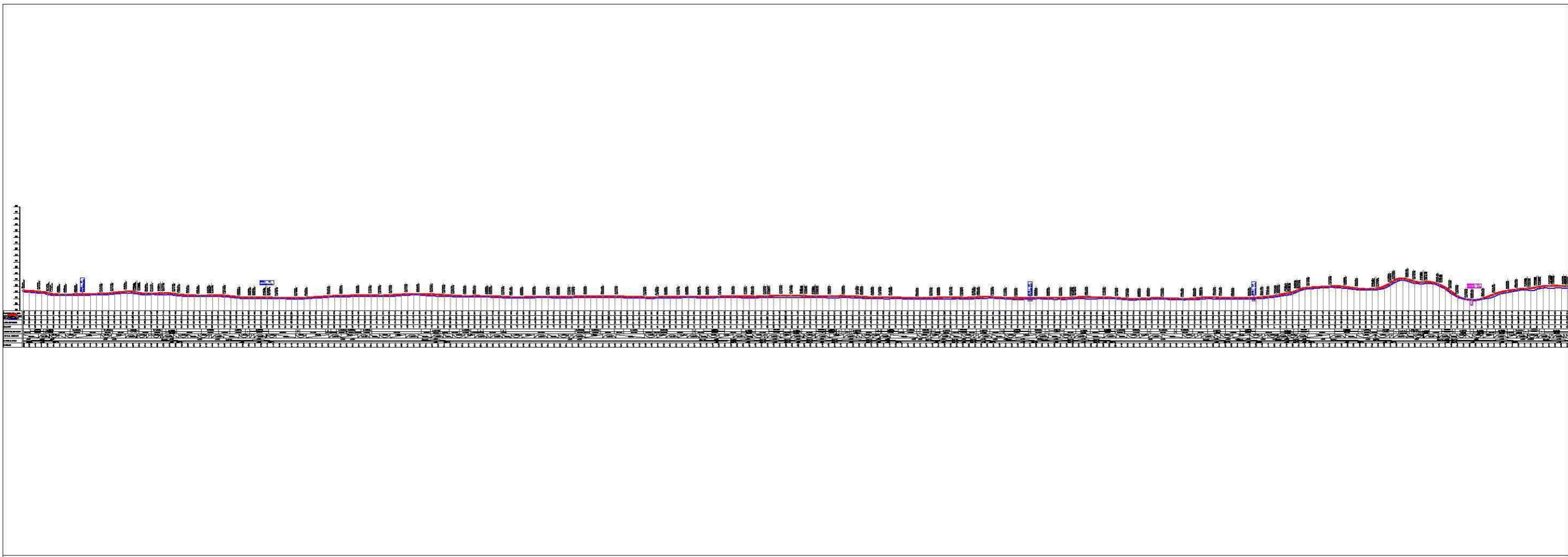
HOR	HORIZONTAL
VERT	VERTICAL
L	IN THE PROFILE LENGTH OF PARABOLA ($L = L_1 + L_2$)
e	SUPERELEVATION (M/M)
St	STATION
Ele	ELEVATION
—	PROPOSED ROAD LEVEL
—	EXISTING GROUND LEVEL

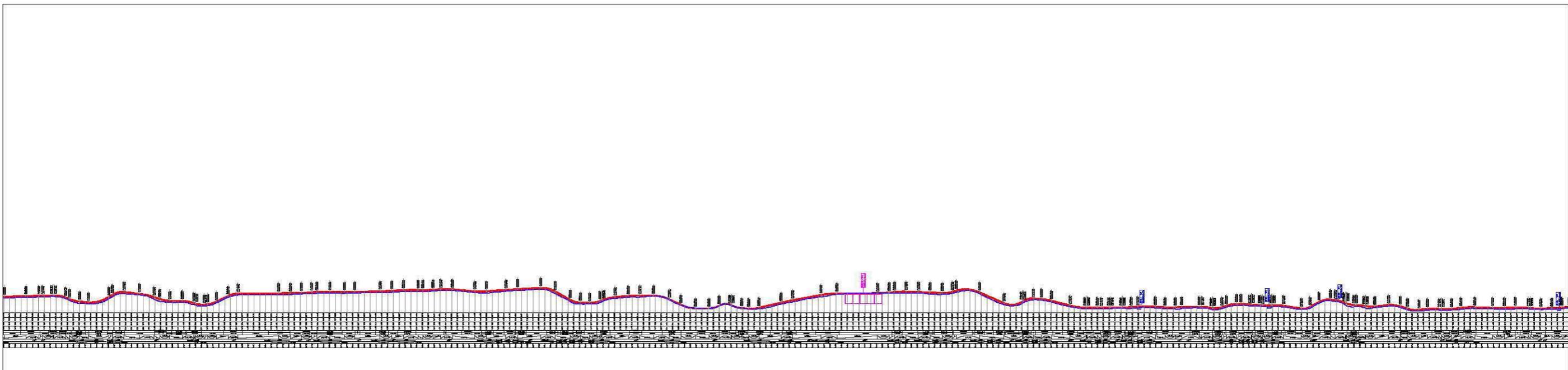
ABBREVIATIONS:

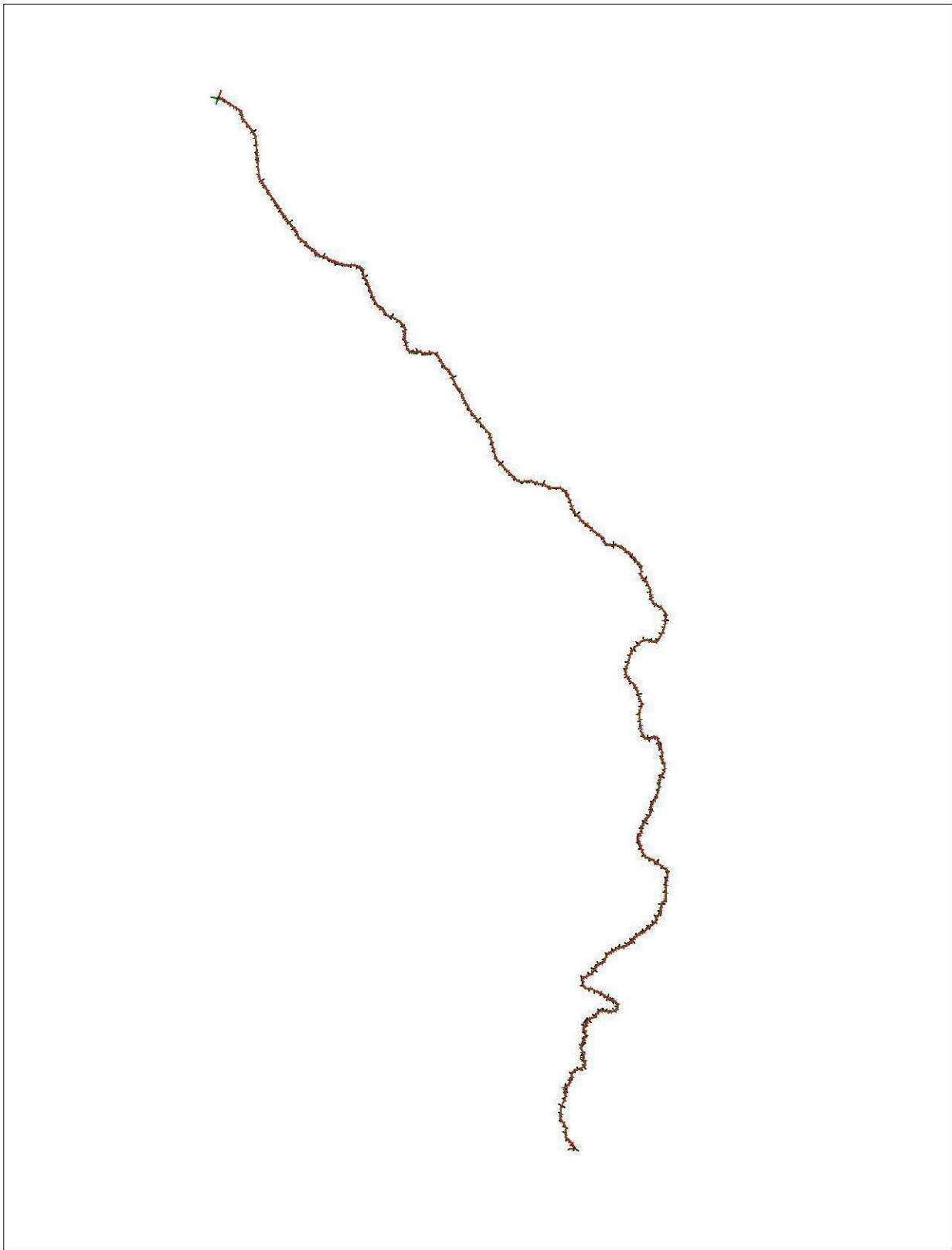
N.T.S	NOT TO SCALE
N.G.L	NATURAL GROUND LEVEL
N.A	NOT APPLICABLE
H.F.L	HIGH FLOOD LEVEL

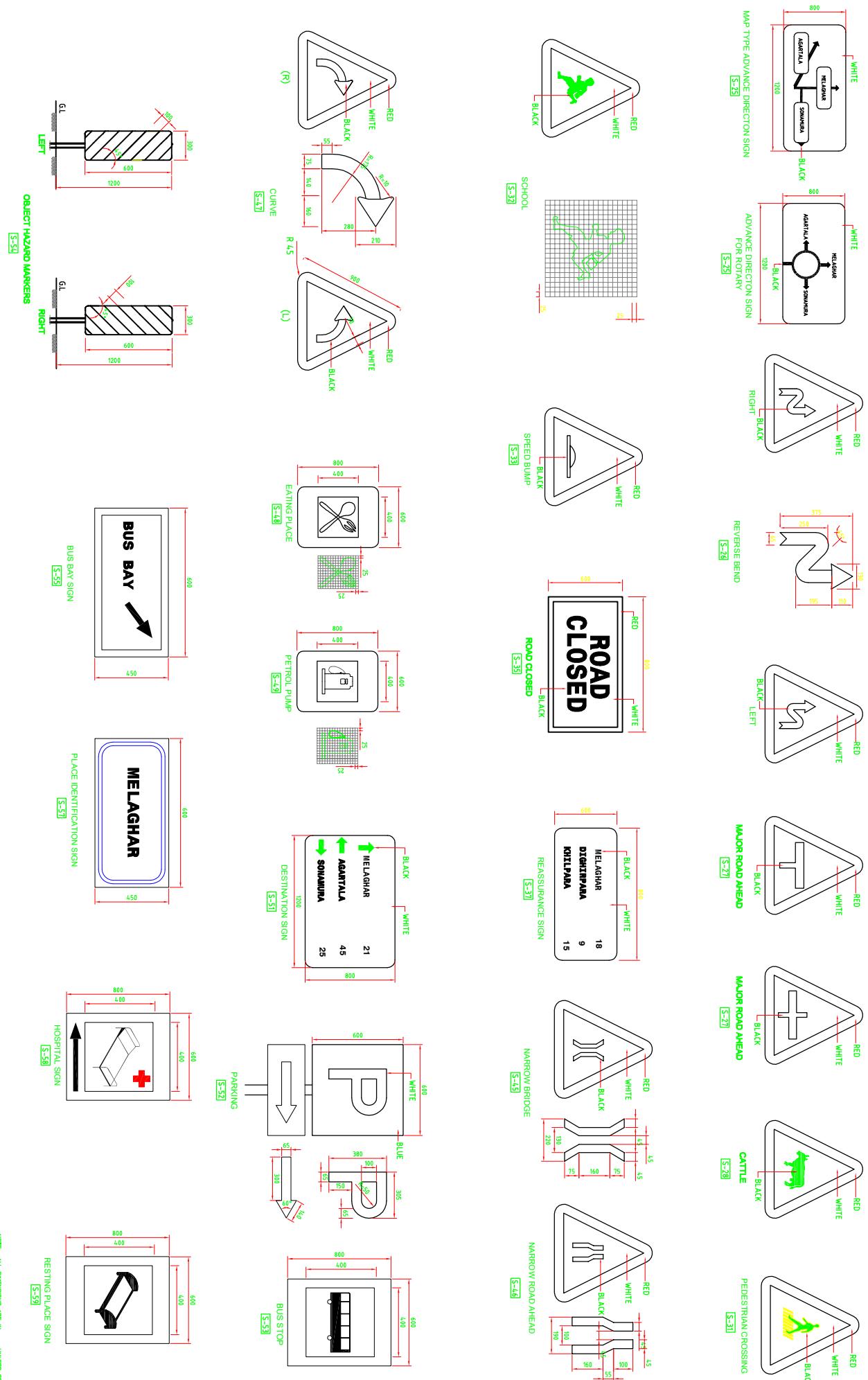


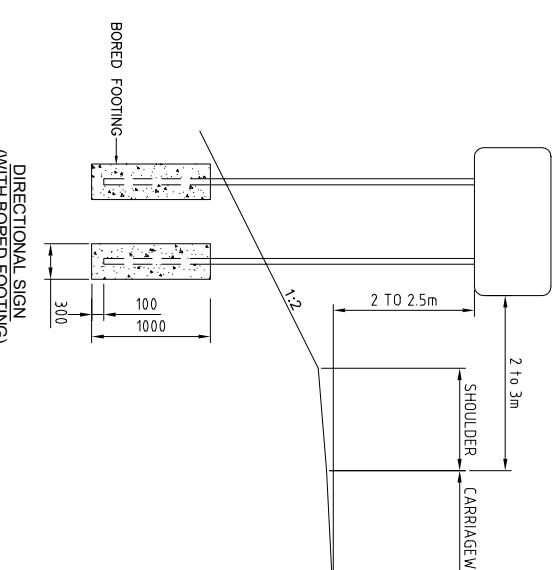
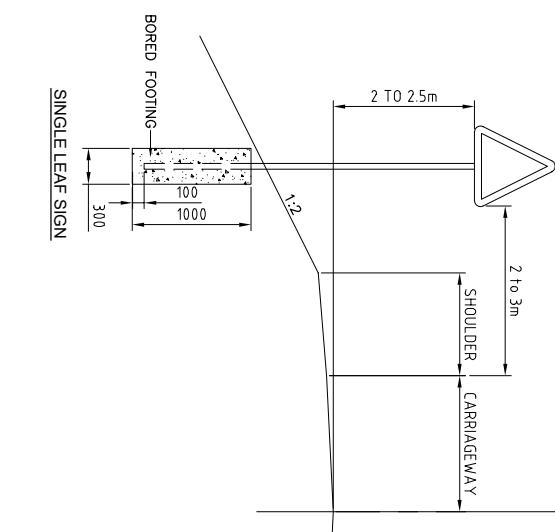
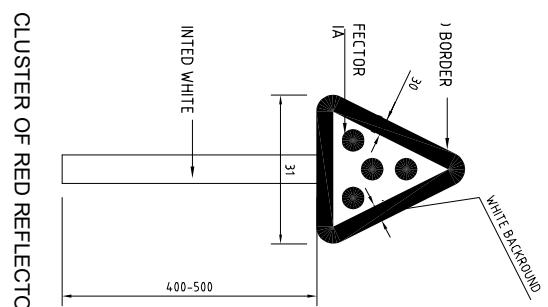
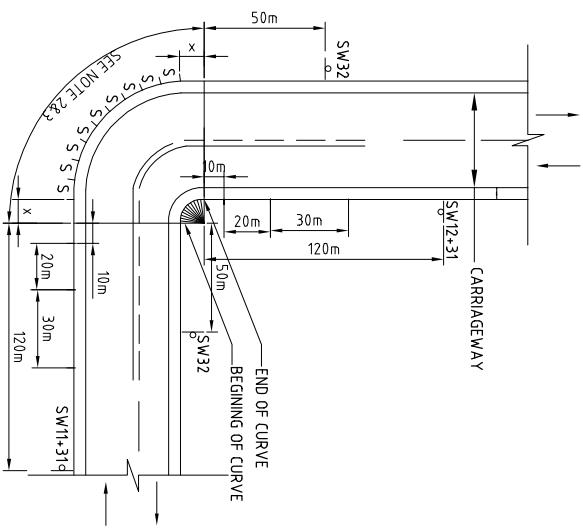












DIRECTIONAL SIGN
(WITH BORED FOOTING)

CLUSTER OF RED REFLECTORS

[TA-1]

TABLE 1: RECOMMENDED SPACING FOR ROADWAY
DELINATEATORS ON HORIZONTAL CURVE.

RADIUS OF CURVE (metres)	SPACING ON CURVE; S (metres)
25	6
50	8
75	10
100	12
125	14
150	16
175	18
200	20
200-1000	NA

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS SPECIFIED
2. ADJUST DISTANCE X SUITABLY SO THAT THE LAST ROADWAY DELINATEATOR IS AT THE END OF THE CURVE.
3. INSTALL ALL DELINATEATORS AT EDGE OF THE ROADWAY PERPENDICULAR TO THE INCOMING TRAFFIC.
4. SEE TABLE 1 FOR VALUE OF S i.e SPACING OF DELINATEATORS ON THE CURVE.

GPS PILLAR

Easting	Northing	Code	Chainage	Location	Description
587459.187	2520432.400	PL1	5.80	LHS	Near MR 10 Junction Road (KMS-8)
587850.741	2525395.335	PL21	10.80	LHS	Near K.H.K.Pressing In Panchdariya Village (KMS-13)
588082.270	2530342.177	PL41	15.80	LHS	Near OFC pillar
587491.655	2535404.623	PL62	21.00	LHS	Near Tree KMS 24 In Tarana Village
585620.632	2539903.795	PL82	26.00	LHS	Near Tree Sanwer Bypass
585223.518	2544521.399	PL102	30.95	LHS	Near HMS 34/6
584026.966	2549358.089	PL122	36.00	LHS	Near HMS 39/6
582745.224	2554194.392	PL142	41.05	LHS	Near 7/5 WTR pillar
580287.427	2558316.682	PL162	46.05	LHS	Near HMS 49/6
578083.817	2562338.959	PL181	50.80	LHS	Bypass Ujjain

NTS

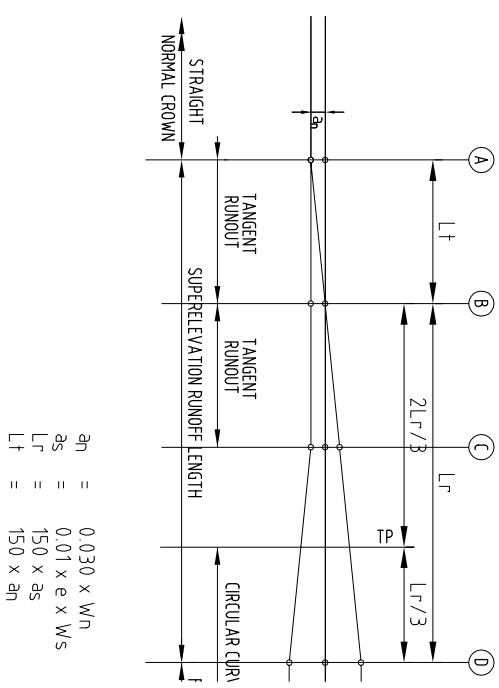
SCHEDULE OF GPS

587418.425	2521593.748	541.865	TBM 1	1.175	LHS	Near Petrol Pump On SB
587424.748	2522474.363	544.827	TBM 2	2.025	LHS	Near KMS 10
587455.832	2522960.041	547.118	TBM 3	2.500	LHS	TBM 3 (PL 11) On Poultry Farm Step
587561.121	2523804.828	541.601	TBM 4	3.375	RHS	On Culvert
587579.403	2524040.284	539.587	TBM 5	3.625	RHS	On Culvert In Baroli Village
587625.782	2524516.983	540.198	TBM 6	4.100	LHS	On HP Culvert Near Mahavir Stone Crusher
588006.942	2525833.580	540.579	TBM 7	5.400	LHS	Near 14/4 HP Culvert
587886.296	2526531.553	537.889	TBM 8	6.100	LHS	ON 15/2 Culvert In Rignodiya Village
587795.634	2526826.732	537.497	TBM 9	6.400	LHS	On 15/6 Culvert
587699.387	2527209.646	537.822	TBM 10	6.825	LHS	On 15/8 HP Culvert In Sanjaynagar Village
587798.825	2528270.069	531.760	TBM 11	7.900	RHS	On 16/10 HP Culvert
587855.045	2528716.299	534.863	TBM 12	8.350	LHS	On 17/4 HP Culvert
587935.822	2529199.817	531.542	TBM 13	8.825	RHS	On 17/10 HP Culvert
588069.445	2530107.753	528.714	TBM 14	9.750	RHS	On 18/08 HP Culvert
587895.387	2531752.307	522.886	TBM 15	11.410	LHS	Near 20/4 HP Culvert
588069.646	2532700.570	522.006	TBM 16	12.375	RHS	On 21/4 HP Culvert
588033.772	2533157.436	520.750	TBM 17	12.850	RHS	On 21/8 HP Culvert In Rajoda Village
587502.629	2535611.683	512.412	TBM 18	15.000	LHS	Near 23/10 HP Culvert
587153.397	2536991.353	510.310	TBM 21	16.850	LHS	On 25/8 HP Culvert
586828.635	2537629.485	509.239	TBM 22	17.575	LHS	On 26/6 HP Culvert
586687.281	2537910.893	508.469	TBM 23	17.875	LHS	On 26/8 HP Culvert
585995.860	2538808.169	507.504	TBM 24		LHS	On 27/10 HP Culvert Near KMS- 7
585711.417	2539342.892	504.992	TBM 25	19.675	LHS	On 1/4 HP Culvert Bypass Sanwer
585643.126	2539712.633	506.877	TBM 26	20.050	LHS	On 1/8 HP Culvert Bypass Sanwer
585703.445	2540436.665	506.899	TBM 27	20.800	RHS	On Khan River 2/6 Bridge In Sanwer Bypass
585464.021	2541437.847	506.678	TBM 29	21.925	RHS	On 3/6 SlabCulvert Bypass Sanwer
585362.934	2541560.026	506.921	TBM 30	22.075	LHS	On 3/8 SlabCulvert Bypass Sanwer
585106.314	2541901.423	507.574	TBM 31	22.500	LHS	On 4/2 HP Culvert Bypass end Sanwer Chowk KMS 31
585190.246	2543288.962	511.475	TBM 32	23.925	LHS	On 33/4 HP Culvert
585199.888	2543552.339	511.957	TBM 33	24.175	LHS	On 33/8 HP Culvert
585248.574	2544388.677	506.819	TBM 34	25.025	RHS	On 34/6 SLAB Culvert
585228.184	2544674.704	506.215	TBM 35	25.300	RHS	On 34/8 SLAB Culvert
584853.668	2545999.037	506.699	TBM 36	26.675	RHS	On 36/2 HP Culvert
584528.848	2546941.924	504.924	TBM 37	27.675	RHS	On 37/2 HP Culvert
584437.034	2547184.683	504.292	TBM 38	27.925	RHS	On 37/4 HP Culvert
584073.966	2548425.899	493.129	TBM 39	29.925	LHS	On 38/8 SLAB Culvert In PanthPiplai Village
584070.534	2548564.304	493.067	TBM 40	29.350	LHS	On Temple In PanthPiplai Village
584052.954	2549096.037	494.234	TBM 41	29.900	LHS	On 39/4 SLAB Culvert In PanthPiplai Village
584035.648	2549320.486	497.438	TBM 42	30.150	LHS	On 39/6 HP Culvert
583957.773	2549781.429	493.547	TBM 43	30.600	RHS	On Mile Stone
583737.602	2550435.912	496.559	TBM 44	31.300	RHS	On 40/8 HP Culvert In Ramvasa Village
583592.472	2550985.590	496.023	TBM 45	31.850	LHS	On 41/2 HP Culvert In Ramvasa Village HMS 41/2
583566.166	2551160.295	495.687	TBM 46		LHS	On HP Culvert After HMS 41/2
583391.452	2551862.956	493.506	TBM 47	32.800	LHS	On 42/2 HP Culvert
583048.016	2552674.389	493.410	TBM 48	33.675	RHS	On 43/2 HP Culvert
582667.764	2554297.069	490.840	TBM 49	35.375	LHS	On 44/8 HP Culvert
582032.205	2554847.470	492.641	TBM 50	36.225	LHS	On Water Tank Near Dhaba
581951.771	2555024.931	491.518	TBM 51	36.450	LHS	On 45/10 HP Culvert
581809.992	2555277.313	491.625	TBM 52	36.725	LHS	On Petrol Pump Island edge
581588.799	2555600.125	491.890	TBM 53	37.125	LHS	Under Tree Near Alakhdham Farm In Mendiya Village
581152.977	2556290.150	489.986	TBM 54	37.925	LHS	On 47/4 HP Culvert In Mendiya Village
581064.249	2556453.566	489.145	TBM 55	38.125	LHS	On 47/6 HP Culvert In Mendiya Village
580945.554	2556679.321	490.141	TBM 56	38.375	RHS	On 47/6 HP Culvert
580581.351	2557919.417	491.809	TBM 57	39.700	LHS	On Kshipra river bridge
580152.600	2558472.160	497.706	TBM 58	40.450	I LHS	On 40/10 HP Culvert Near Devaro Mar

4	0+650				Brick Soling road to Khilpara
5	0+740				B.T. road to Jamjari
6	0+970				To Khilpara
7	1+270				B.T. road to Dighirpara
8	1+630				Brick Soling road to Village
9	2+650				Brick soling road to Rajdhar nagar
10	2+730				To Rest house road (PMGSY)
11	3+220				B.T. road to Khilpara
12	3+750				Road to GangaferraKhilpara (PMGSY)
13	4+900				B.T. road to Kashimura
14	4+950				Brick Soling road to Village
15	6+800				Brick Soling road to Village Musalman para
16	7+520				Road to Dudh Purkurwn
17	8+100				Road to Village
18	8+960				Brick Soling road to Village
19	9+350				Road to Dudh Puskarini Bazar
20	10+300				Road to Tula bagan
21	10+420				Moram roadto Bipin Nagar
22	11+630				Road to Singamura village
23	11+750				Road to Kakraban village
24	12+860				B.T. Road to College
25	13+050				Old B.T. road to Shighati
26	14+450				Road to Nalchar
27	15+230				Road to Mahonbhog
28	17+850				B.T. road to Kalparia (PMGSY)
29	18+870				B.T. road to Debpara (PMGSY)
30	19+330				Brick Soling road to Village
31	19+760				B.T. road to Chilamura (PMGSY)
32	20+250				Sanamura & Agartala B.T. road

SUPERELEVATION FOR CIRCULAR CURVE

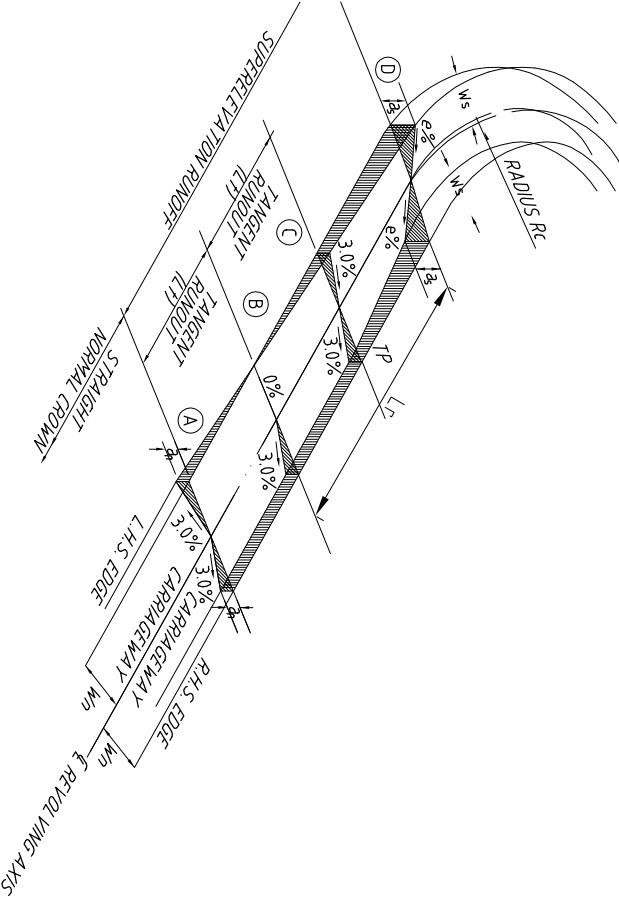
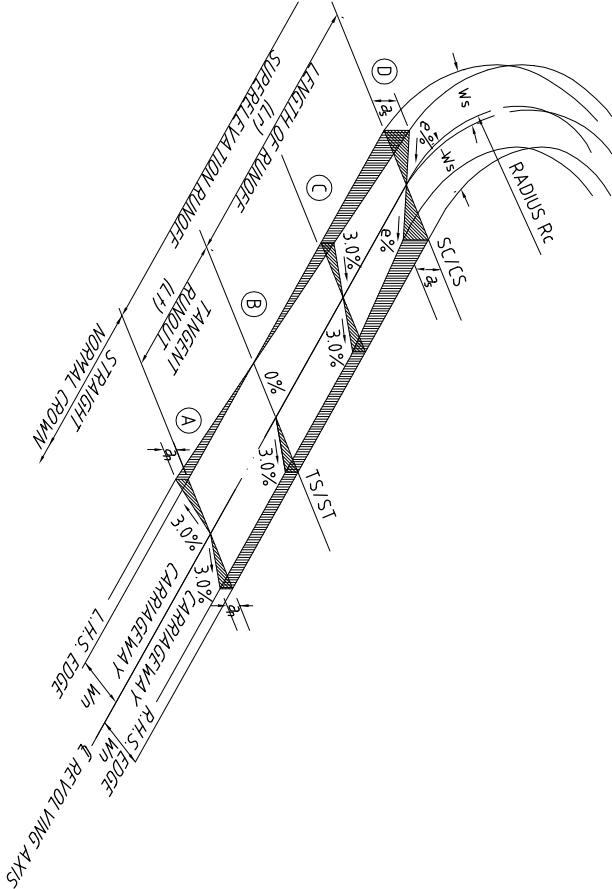
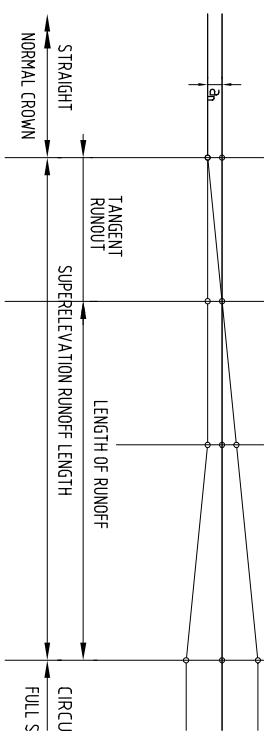
NOTE:
Level of centre line setting out points s
be as shown in Plan and Profile Drawing



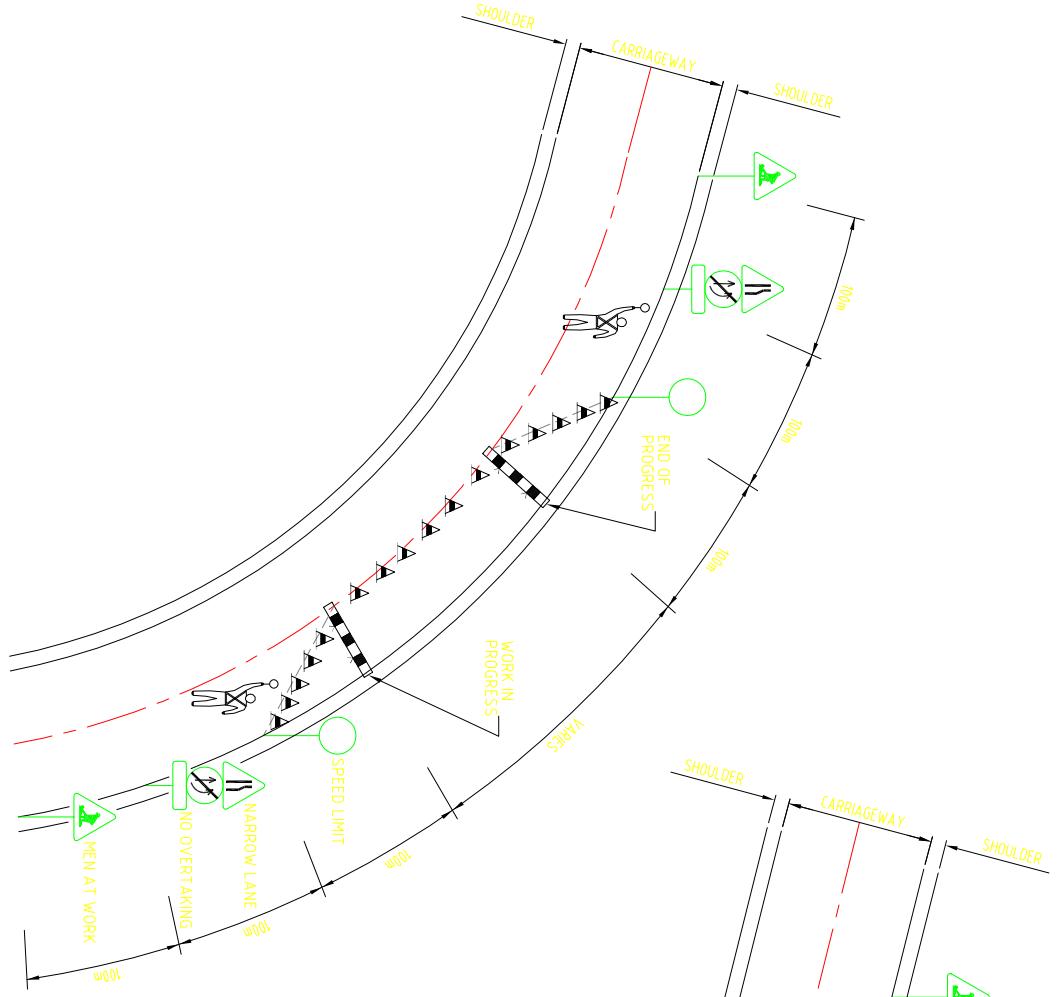
SUPERELEVATION FOR CURVE WITH SPIRAL

where:
 L_s is length of spiral (m) as shown
 Out Details and Plan and Profile
 e is carriageway crossfall gradient
 s is superelevation as shown in Plan
 W_n is carriageway width (m) at
 W_s is carriageway width (m) at

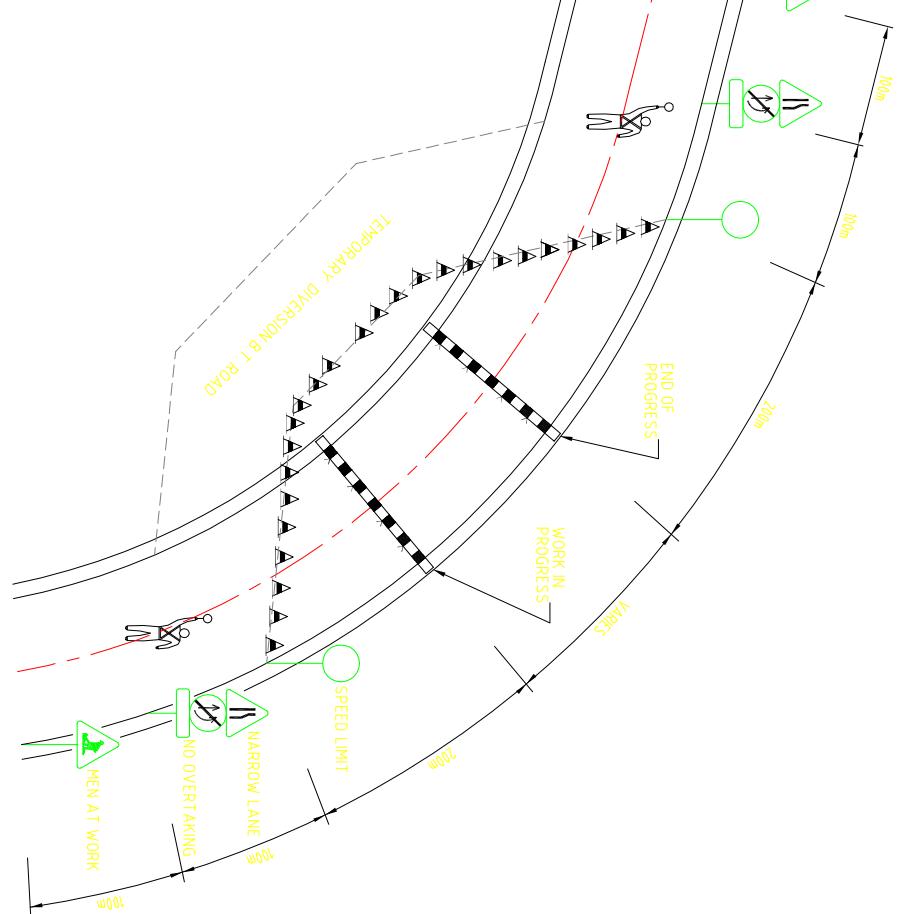
$$\begin{aligned} L_r &= L_s \\ \theta_n &= 0.030 \times W_n \\ \delta_s &= 0.01 \times e \times W_s \\ L_t &= L_s \times \delta_s \end{aligned}$$

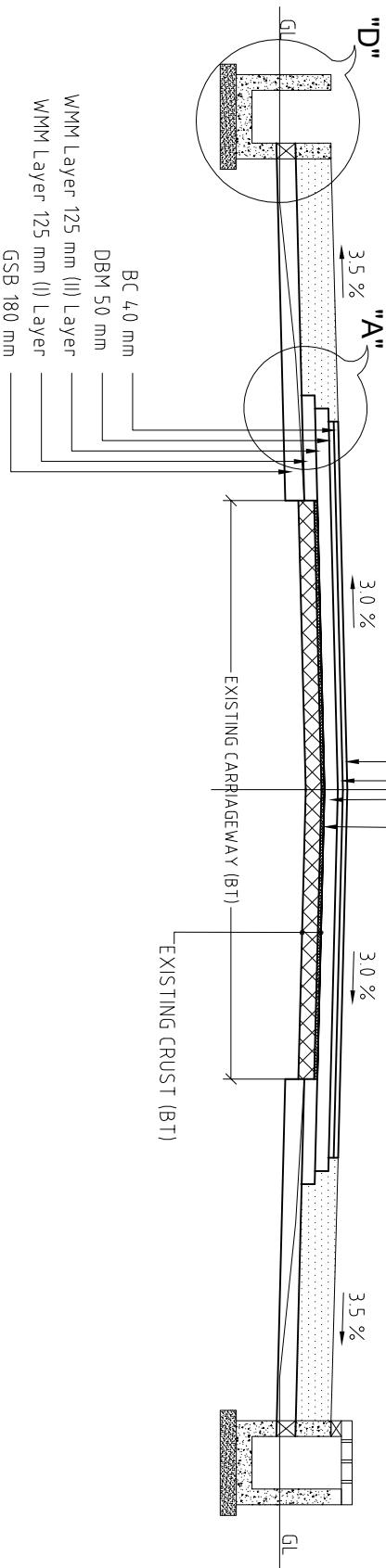
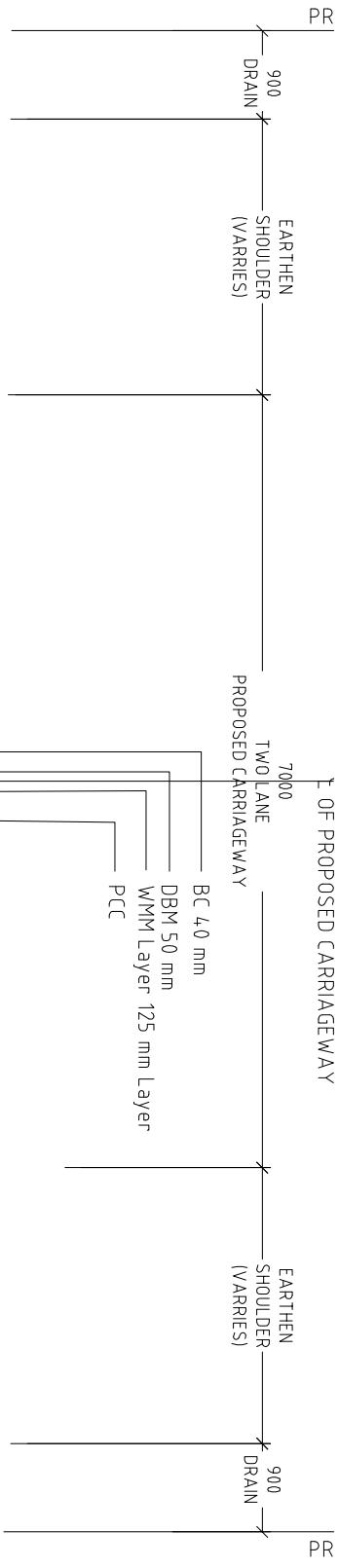


DIVERSION OF TRAFFIC OFF HALF THE ROAD



DIVERSION OF TRAFFIC OFF THE WHOLE ROAD





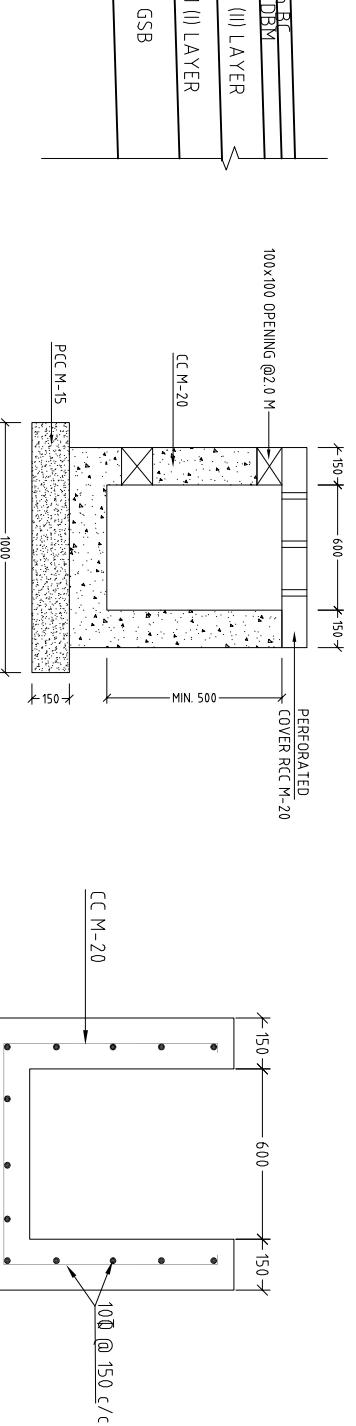
TYPICAL CROSS SECTION

NORMAL CAMBER (URBAN AREA)

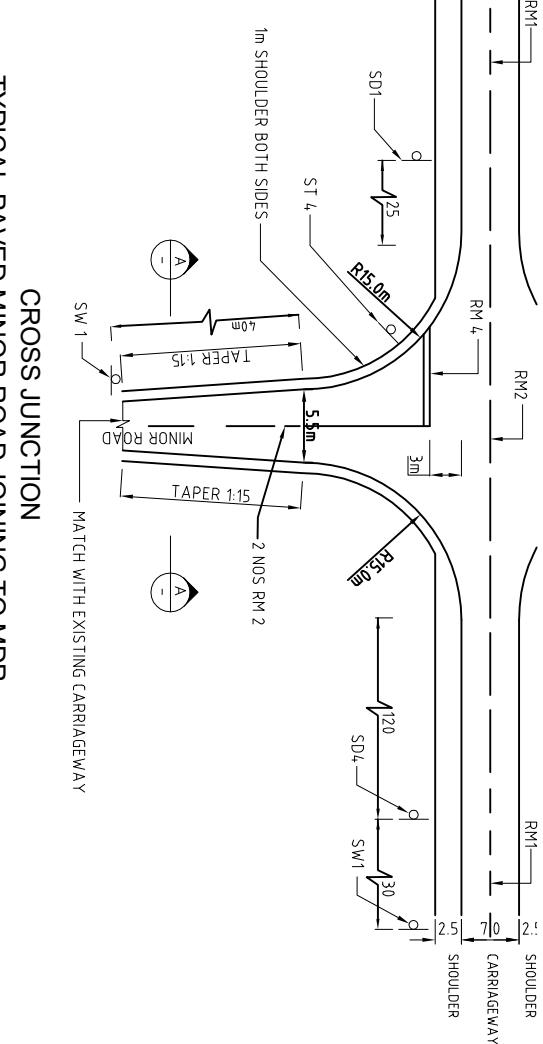
ABBREVIATIONS:

1. B.C. = BITUMINOUS CONCRETE
2. D.B.M. = DENSE BITUMINOUS
3. W.M.M. = WET MIX MACADAM
4. G.S.B. = GRANULAR SUB BASE
5. P.C.C. = PROFILE CORRECTIVE
6. G.L. = GROUND LEVEL

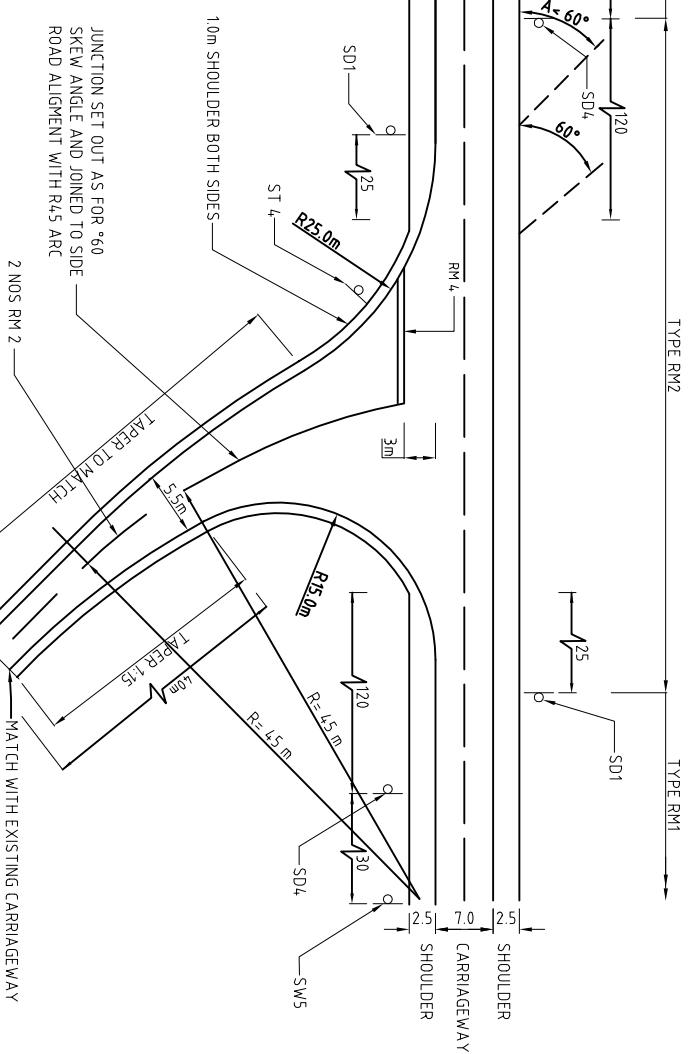
NOTE:
FOR DRAINS UPTO 600 mm DEPTH
FOR DEPTHS GREATER THAN 600 m



DETAIL OF DRAIN ("D")



CROSS JUNCTION
TYPICAL PAVED MINOR ROAD JOINING TO MDR



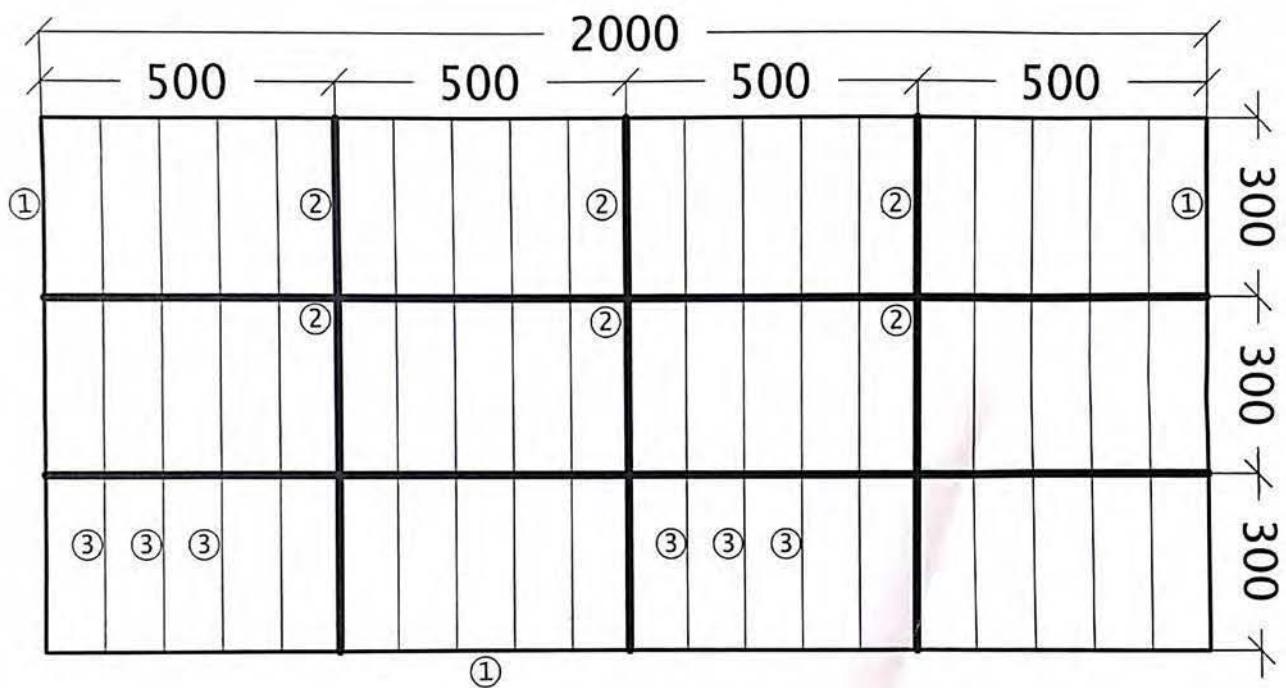
T-JUNCTION
TYPICAL PAVED MINOR ROAD JOINING TO MDR

EWED T-JUNCTION, SKEW ANGLE (A) LESS THAN 60°

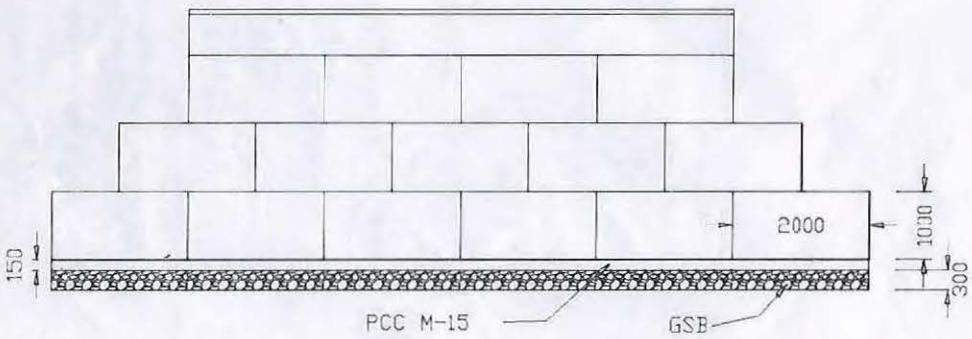
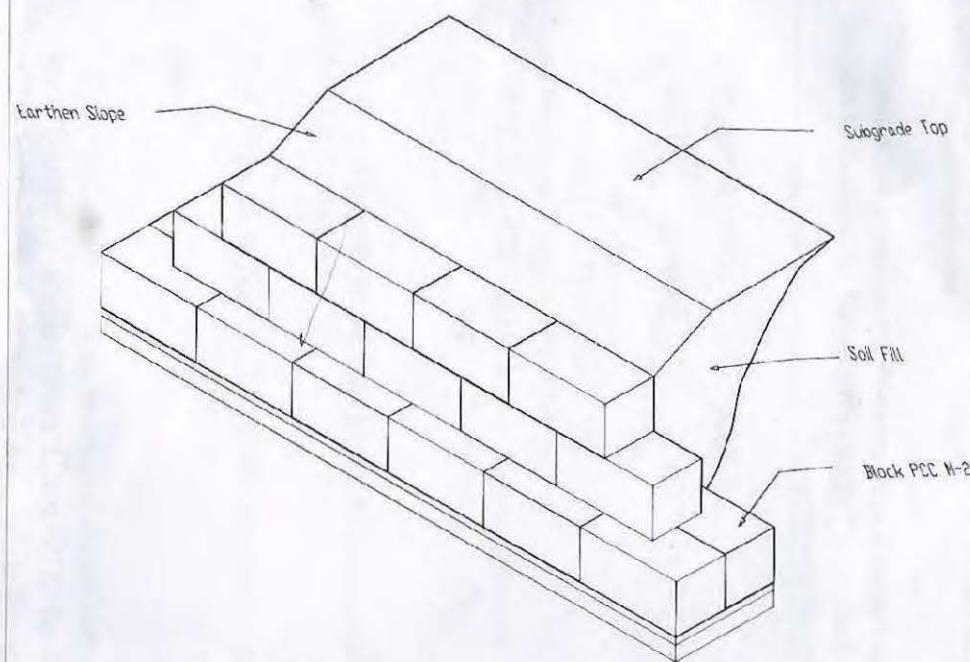
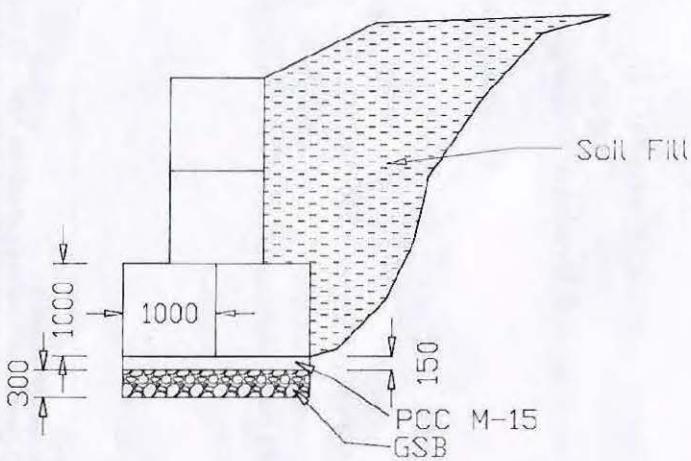
TYPICAL PAVED MINOR ROAD JOINING TO MDR

SKEWED T-JUNCTION

TYPICAL PAVED MINOR ROAD JOINING TO MDR



①	75x75x6mm MS Angle
②	75x75x75x6mm MS T-Section
③	75x12mm MS plate



Notes:-

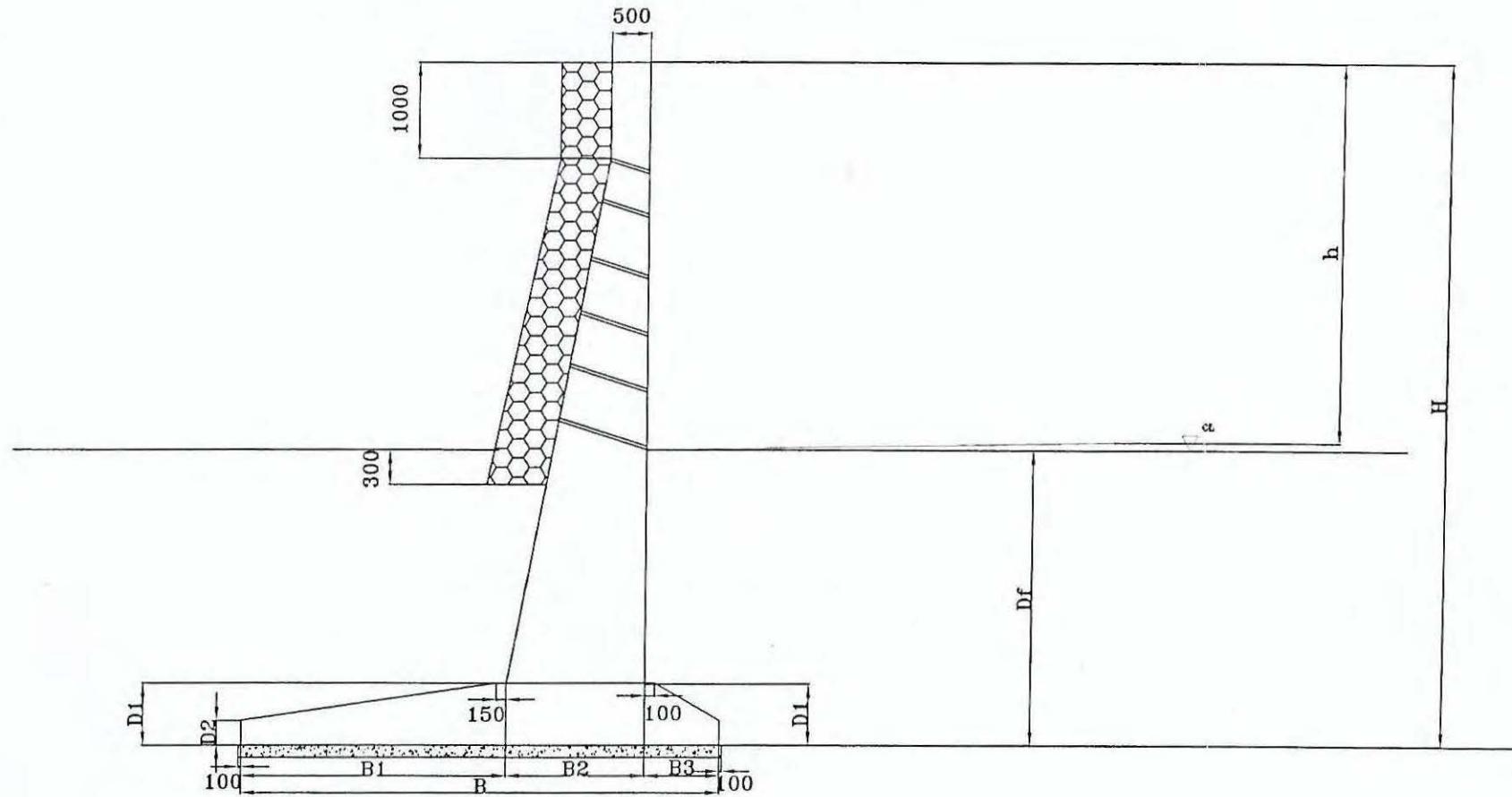
1. All Dimensions are in Millimeters
2. Blocks are made of M-20 PCC

GOOD FOR CONSTRUCTION



CONTRACTOR:	ECI-NAYAK JV	Client:	PUBLIC WORKS DEPARTMENT (PWD), UDAIPUR TRIPURA	Consultant:	EgiS India Consulting Engineers Pvt. Ltd.	Title:	DRAWING FOR CONCRETE BLOCK PITCHING
Designed:	RAKHAL	Checked:		Approved:	Approved	Rev:	0
Drawn:	RAKHAL	Scale:	NTS	Date:	10/01/2016	Sheet:	A4

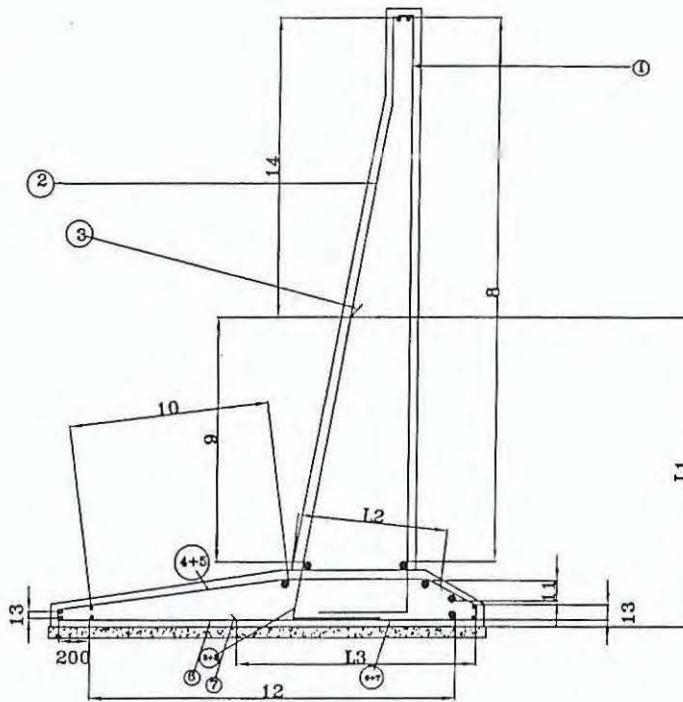
RETAINING WALL FOR CULVERT



DIMENSION DETAIL OF RETAINING WALL

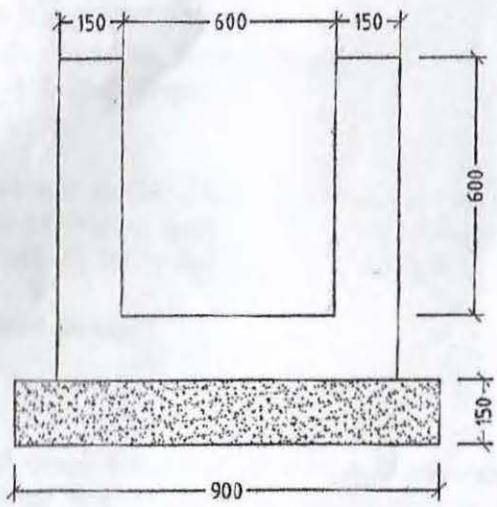
H (M)	h (M)	B (MM)	B_1 (MM)	B_2 (MM)	B_3 (MM)	D_1 (MM)	D_2 (MM)	D_f (MM)	LHS Length(m)	RHS Length(m)
3	1	2500	1600	700	400	500	300	2000	0	10
4	2	2800	1900	500	400	500	300	2000	10	10
5	3	3800	2700	600	500	600	300	2000	40	40
6	4	4500	2900	800	800	800	300	2000	30	30
7	5	5500	3400	900	1200	900	300	2000	60	20
8	6	6200	3600	1000	1600	1000	300	2000	50	20
9	7	7100	3700	1100	2250	1100	300	2000	60	20
10	8	8500	4500	1200	2800	1200	300	2000	20	60
10.2	8.2	8700	4500	1200	3000	1200	300	2000	10	0

REINFORCEMENT DETAILS OF RETAINING WALL

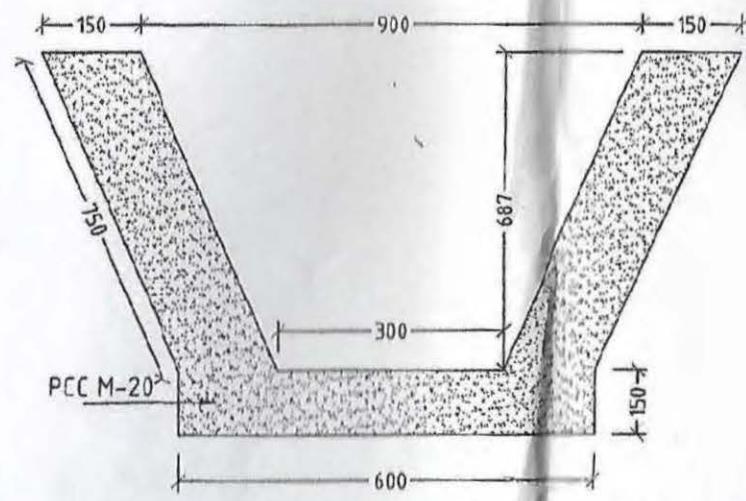


REINFORCE DETAILS OF RCC RETAINING WALL

H(M)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	L1	L2	L3
3	10@200	10@250	10@250	12@250	12@250	12@250	12@250	10@200	10@200	10@200	10@200	10@200	2 NOS 10 dia	10@200	1500	850	1350
4	10@200	16@250	16@250	16@250	16@250	12@250	12@250	10@200	10@200	10@200	10@200	10@200	2 NOS 10 dia	10@200	2100	850	1450
5	10@200	16@250	16@250	20@300	20@300	16@300	16@300	10@200	10@200	10@200	10@200	10@200	2 NOS 10 dia	10@200	2700	900	1800
6	10@150	16@250	16@200	16@200	16@200	12@200	12@200	10@150	10@150	10@150	10@150	10@150	2 NOS 10 dia	10@150	3300	1000	2000
7	12@150	20@250	20@250	20@300	20@300	16@300	16@300	12@150	12@150	12@150	12@150	12@150	2 NOS 10 dia	12@150	4500	1225	2595
8	12@150	20@200	20@200	20@200	20@200	16@200	16@200	12@150	12@150	12@150	12@150	12@150	2 NOS 10 dia	12@150	5250	1300	3300
9	12@150	25@250	25@250	20@200	20@200	16@200	16@200	12@150	12@150	12@150	12@150	12@150	2 NOS 10 dia	12@150	6400	1550	4300
10	16@250	25@250	25@200	25@200	25@200	20@200	20@200	16@250	16@250	16@250	16@250	16@250	2 NOS 10 dia	16@250	7300	1600	4900
10.2	16@250	25@200	25@200	25@200	25@200	20@200	20@200	16@250	16@250	16@250	16@250	16@250	2 NOS 10 dia	16@250	7300	1600	4900



CROSS-SECTION AS PER DPR OF LINED DRAIN

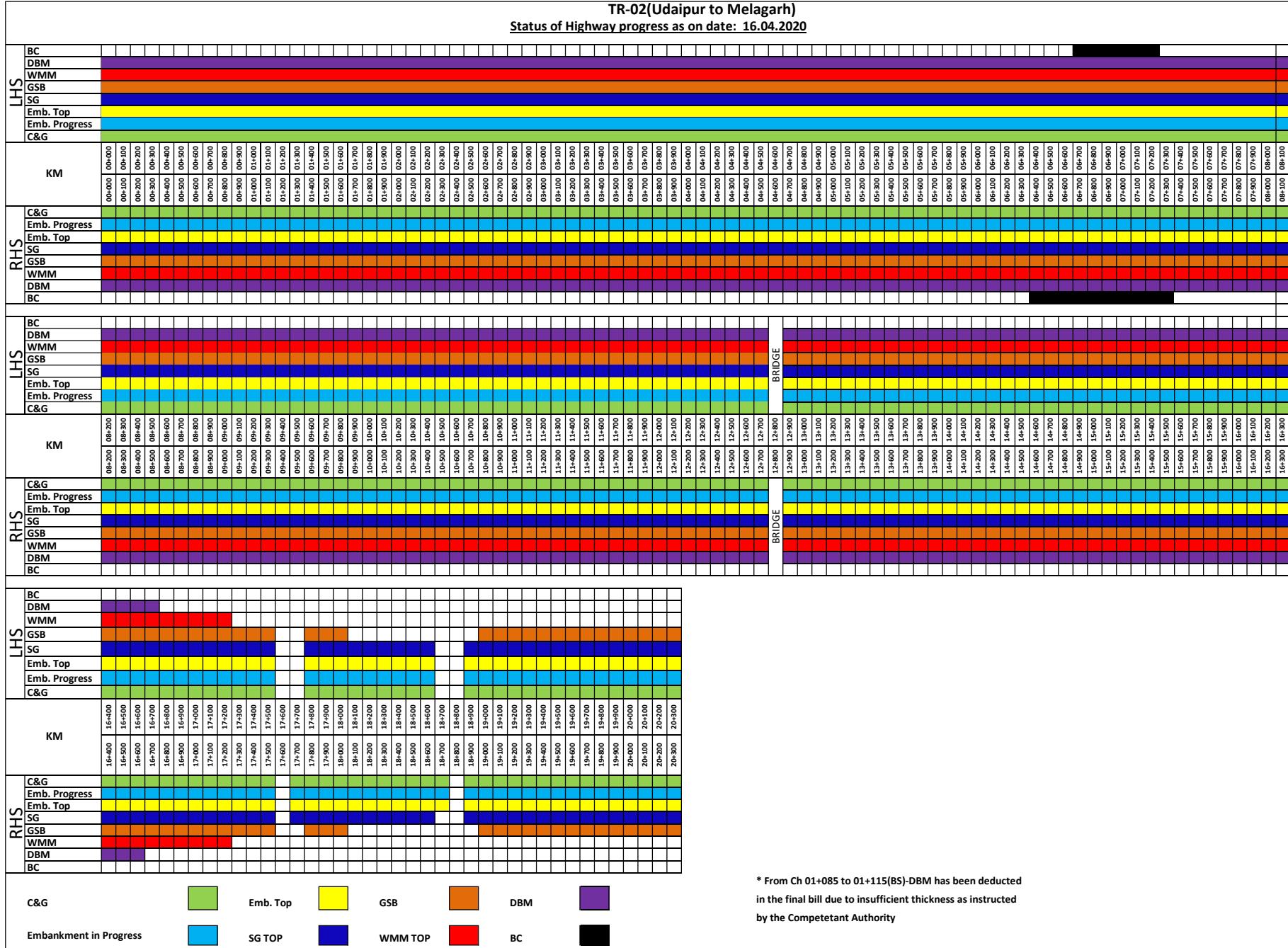


NOW PROPOSED CROSS-SECTION
OF LINED DRAIN

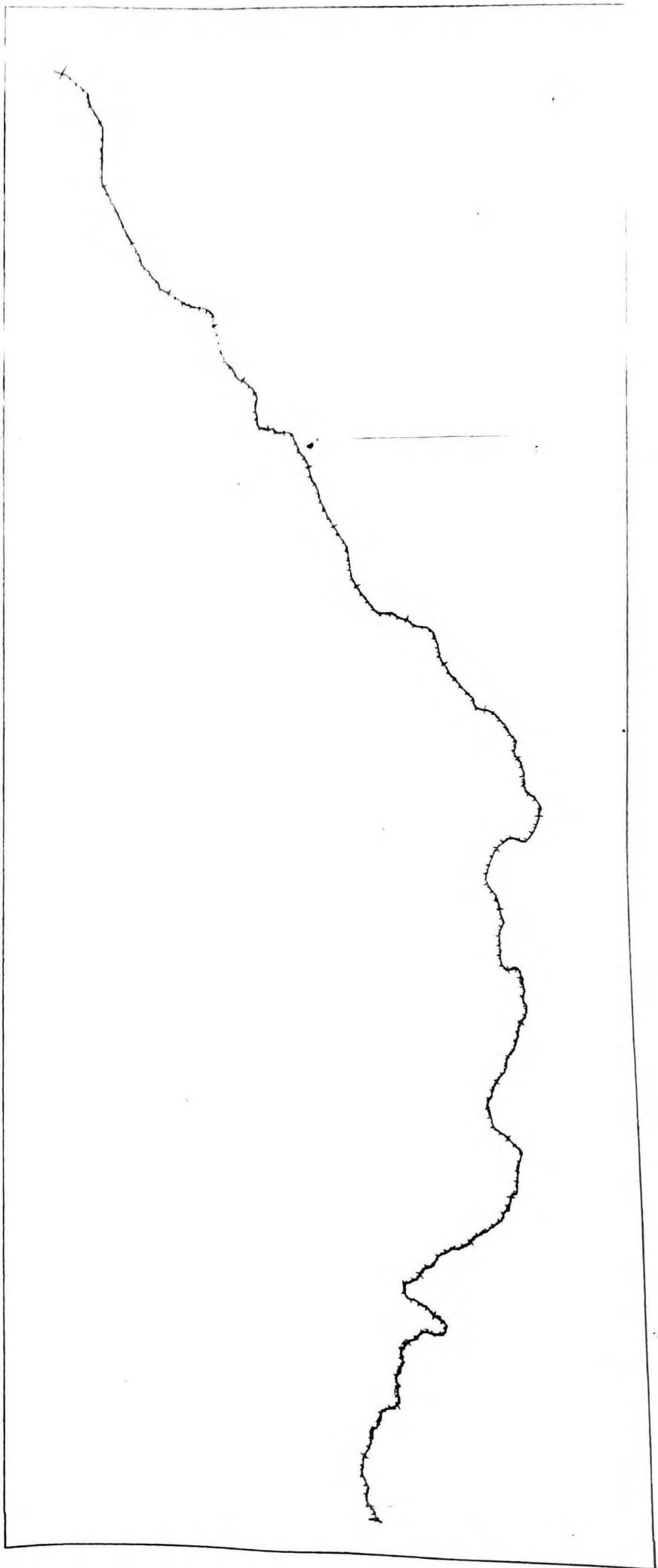


TR-02(Udaipur to Melagarh)

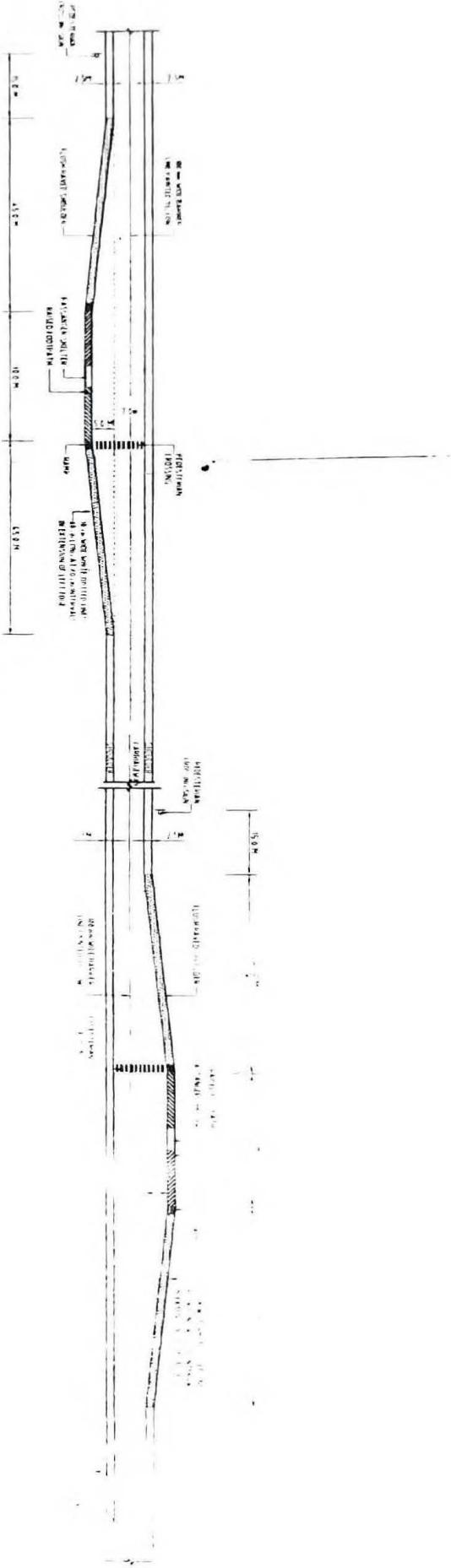
Status of Highway progress as on date: 16.04.2020



* From Ch 01+085 to 01+115(BS)-DBM has been deducted in the final bill due to insufficient thickness as instructed by the Competent Authority



LAYOUT FOR PICK-UP BUS STOP ON ROAD CARRYING MEDIUM TO LIGHT TRAFFIC

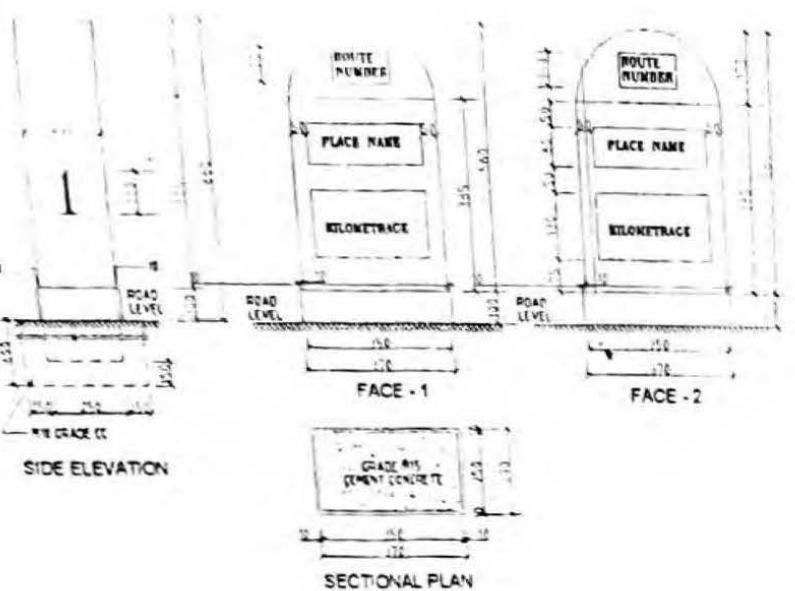


卷之三

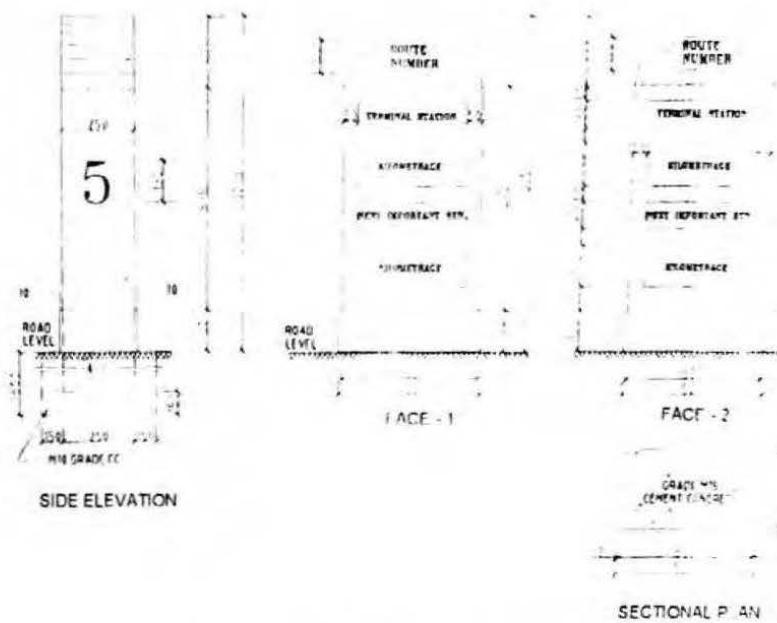
1001

ALBURY DETAILS

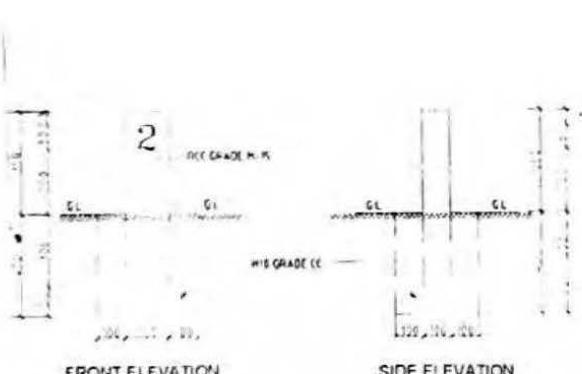
VIII



TYPE DESIGN FOR ORDINARY KILOMETRE STONE



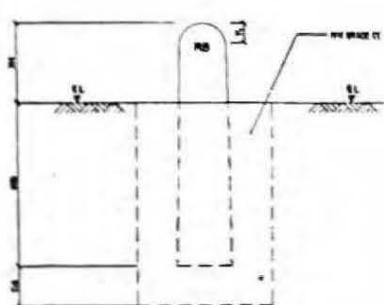
TYPE DESIGN FOR 5th KILOMETRE STONE



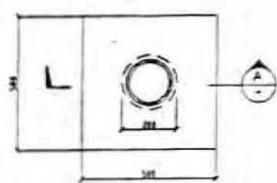
www.vetmed.ws

TYPE DESIGN FOR 200-METRE STONES

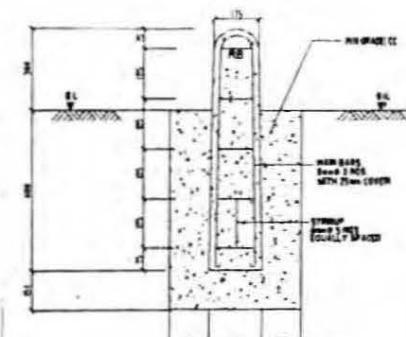
NOTES
ALL DIMENSIONS ARE IN MILLIMETERS
FOR DETAILS REFER TO C.B. 1972 BN 4-24-74



FRONT ELEVATION



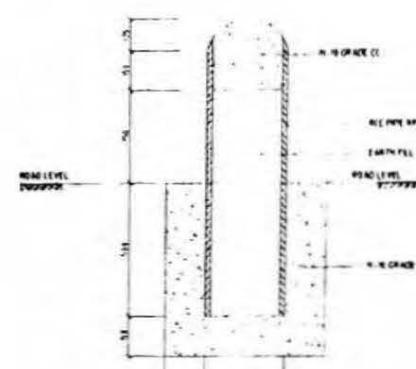
PLAN
TYPE BOUNDARY STONE WITH
R.C.C. AS MATERIAL



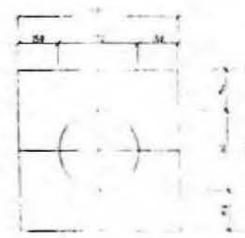
SECTION 'A'- 'A'

NOTES:

- 1 ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
- 2 DRAWINGS ARE NOT TO BE SCALED ONLY WHERE DIMENSIONS SHALL BE FOLLOWED.



ELEVATION



PLAN

TYPICAL R.C. GUARD POST

NOTES:

- 1 ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT WHERE OTHERWISE INDICATED.
- 2 GUARD POSTS TO BE PAINTED AT SPECIFIED COLOR IN CONTRACTOR'S DISCRETION.

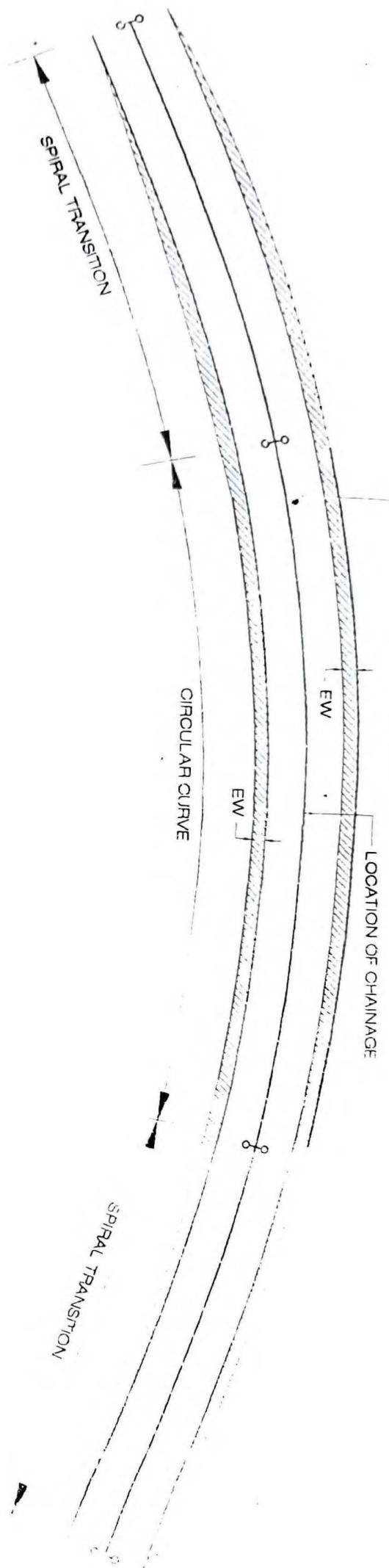
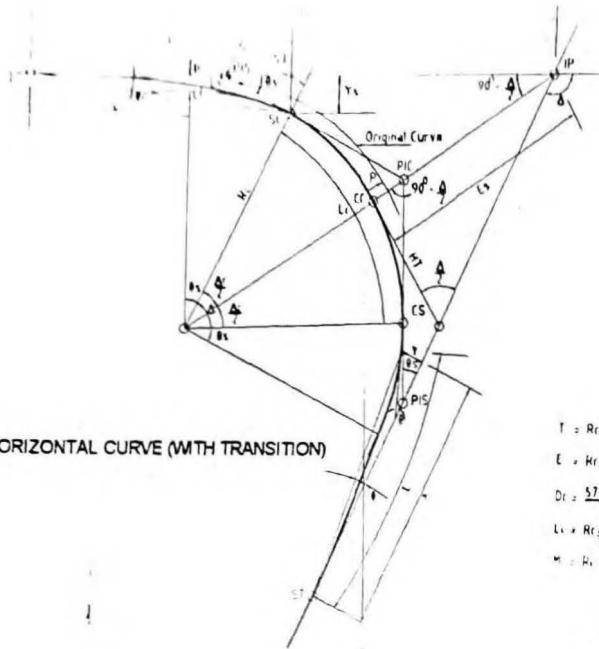


TABLE OF CURVE WIDENING

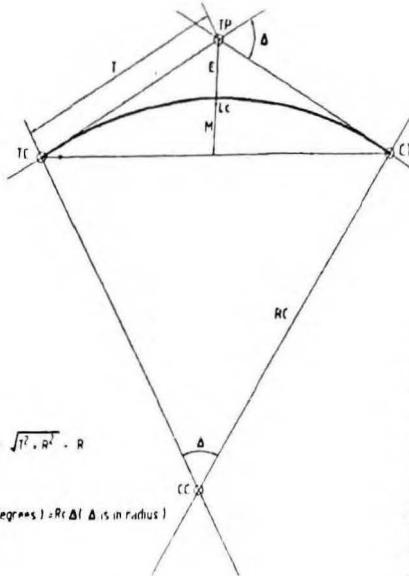
CURVE RADIUS (m)	TOTAL ADDITIONAL WIDTH (m)
570.6	1.5
1140.6	1.2
1710.6	0.9
2280.6	0.6
2850.6	NIL



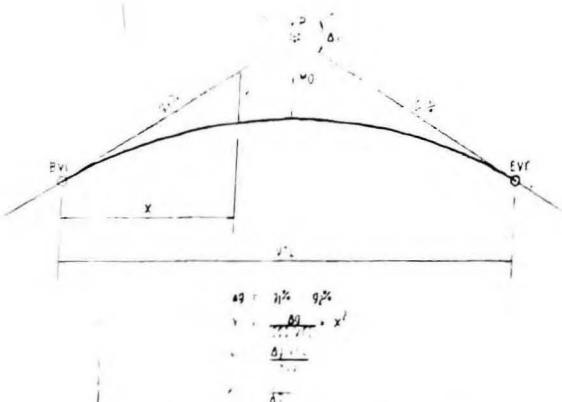
NOTES

- $\frac{1}{2} \Delta^2$ OR $\frac{\Delta^2}{2R}$ (in radians)
- $\frac{1}{2} \Delta^2 R^2 = L_s$
- $\frac{\Delta}{R} = C$
- $0.0031 \times \Delta^2$ (seconds)
- $\frac{1}{2} \Delta^2 \times R$
- $\Delta = 2\pi$
- $L_s = \frac{R^2}{2} \cdot \frac{\Delta^2}{2} = \frac{R^2}{2} \cdot \frac{(2\pi)^2}{2} = \frac{R^2 \pi^2}{2}$ in radians
- $L_s = \frac{R^2}{2} \cdot \frac{63.3}{62} \cdot \frac{63.5}{1820} = \frac{R^2}{2} \cdot \frac{63^2}{1820^2} = \frac{R^2}{2} \cdot 0.000182$ in meters
- $L_s = 50m$
- $X_s = R \cos \Delta$
- $\frac{X_s}{L_s} = \text{OR}$ OR $\sqrt{R^2 + L_s^2}$
- $Y_s = R \sin \Delta = R \tan \Delta = \frac{L_s}{R}$ (approx)
- $(R - \Delta) \sin \Delta = R$
- $(R + \Delta) \tan \Delta = R$
- $R_s = R \sin \Delta$
- $\Delta R = R_s / R$
- $\text{Grade} = \text{Percent} = \tan \Delta = R_s / R$
- $\Delta = \frac{180}{R} = \frac{\pi}{R}$
- $\Delta = \frac{\pi}{R}$

Definition of A T-Curve
An Arc Length which has a constant angle of Δ
 $\Delta = 5729.578 / R$



TYPICAL HORIZONTAL CIRCULAR CURVE



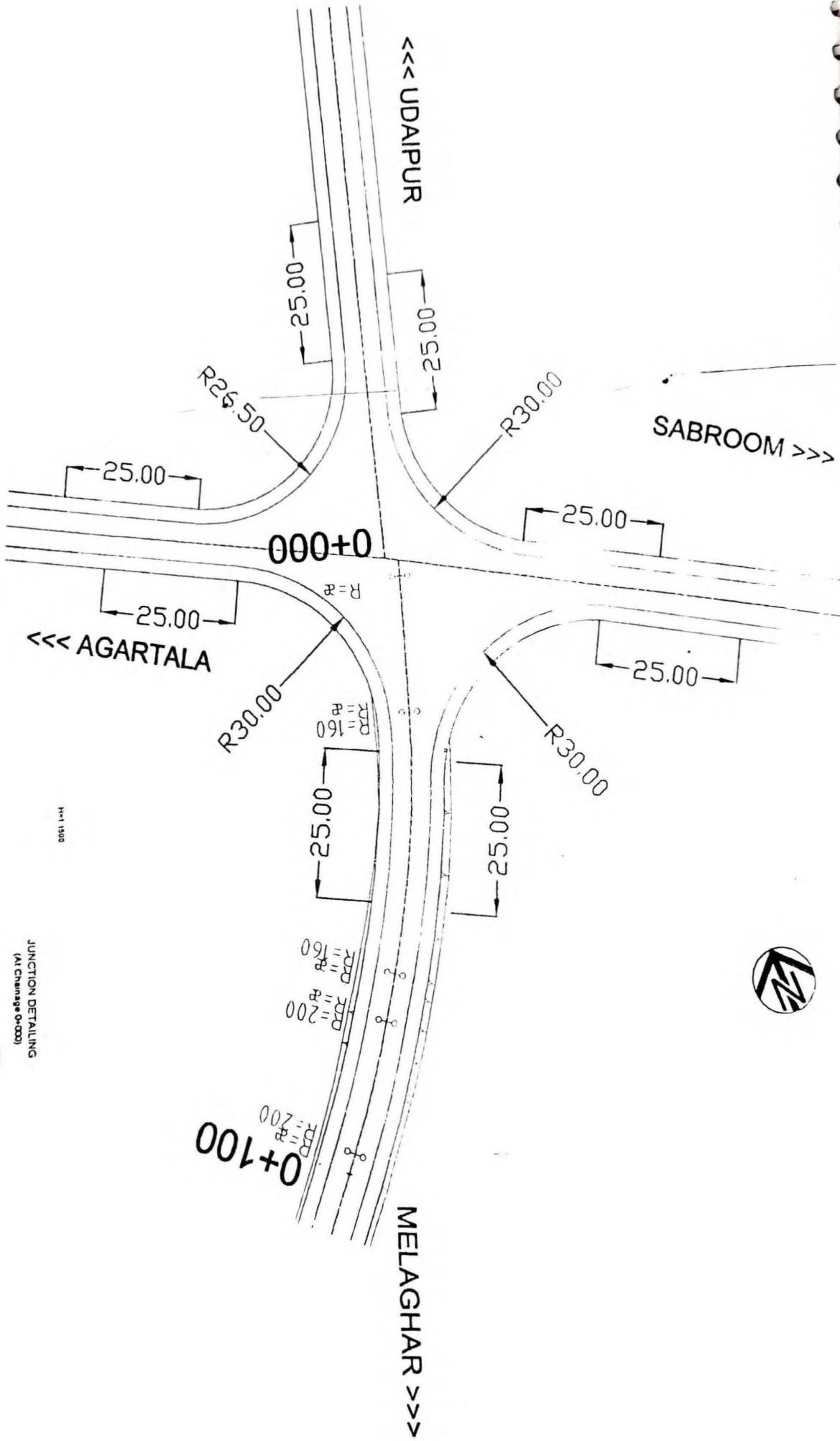
**TYPICAL VERTICAL CURVE
PARABOLIC CURVE**

NTS

**TYPICAL HORIZONTAL AND
VERTICAL CURVES**

NOTATION

- Δ TOTAL DEFLECTION ANGLE
- IP INTERSECTION POINT OF TANGENTS (HORIZONTAL POINT OF INTERSECTION)
- TS POINT OF CHANGE FROM SPIRAL TO TANGENT
- ST POINT OF CHANGE FROM SPIRAL TO CIRCULAR CURVE
- SC POINT OF CHANGE FROM SPIRAL TO SPHERICAL (SPRAL) CURVE
- TC POINT OF CHANGE FROM TANGENT TO CIRCULAR CURVE
- CT POINT OF CHANGE FROM CIRCULAR CURVE TO TANGENT
- CS POINT OF CHANGE FROM CIRCULAR CURVE TO SPIRAL
- CC CIRCULAR CURVE CENTER
- θ_s CENTRAL ANGLE OF SPIRAL ARC L_s (SPIRAL ANGLE)
- θ DEFLECTION ANGLE AT TS FROM INITIAL TANGENT TO SC OR AT ST FROM INITIAL TANGENT TO CS
- R_c RADIUS OF CIRCULAR CURVE
- L_s LENGTH OF SPIRAL CURVE FROM TS TO CC OR CT TO CS
- L_c LENGTH OF CIRCULAR CURVE
- L TOTAL LENGTH OF CURVE FROM TS TO ST
- Δ_c CENTRAL ANGLE OF CIRCULAR CURVE
- x_s TANGENT DISTANCE FOR SLOPES WITH REFERENCE TO TS/ST
- y_s TANGENT OFFSET AT SLOPES WITH REFERENCE TO TS/ST
- ST SHORT TANGENT
- LT LONG TANGENT
- t TANGENT OFFSET E FROM TS TO ST (TANGENT OFFSET)
- z TOTAL HORIZONTAL DISTANCE FROM TS TO ST
- e EXTERNAL DISTANCE OFFSET FROM TS TO CC (LEAFLEAF) FOR HORIZONTAL CURVE WITH TRANSITION
- l_p LENGTH OF SPAN OFF
- $\%e$ SUPER ELEVATION IN PERCENTAGE
- l_c LONG CHORDS TS TO ST TO CS
- p OFFSET FROM THE INITIAL TANGENT TO A PARALLEL TANGENT OF SHIFTED CURVE
- Δ_h CENTRAL SHIFT OF CIRCULAR CURVE
- ht HALF TANGENT DISTANCE
- d_c DEGREE OF CIRCULAR CURVE
- PIS INTERSECTION OF LONG TANGENT AND SHORT TANGENT OF SPIRAL
- λ PARAMETER OF CIRCULAR CURVE
- t TANGENT LENGTH (CIRCULAR CURVE)
- f CORRECTION FACTOR FOR SPIRAL DEFLECTION ANGLE
- e OFFSET FROM P TO MIDDLE OF THE CURVE FOR HORIZONTAL CURVE WITHOUT TRANSITION
- Δ_g ALGEBRAIC DIFFERENCE IN GRADES (PERCENT) OF THE GRADES (TANGENTS)
- VPI VERTICAL POINT OF INTERSECTION
- BVC BEGINNING OF VERTICAL CURVE (POINT OF TANGENT TO CURVE)
- EVC END OF VERTICAL CURVE (POINT OF CURVE TO TANGENT)
- g GRADIENT
- hd HORIZONTAL VERTICAL OFFSET FROM VPI TO THE MIDDLE OF THE CURVE
- v VERTICAL ELEVATION AT THE POINT OF TANGENT
- s SPIRAL ANGLE (ANGLE FROM ANY POINT ON SPIRAL)
- α DEFLECTION ANGLE AT TS FROM INITIAL TANGENT TO SPHERICAL CURVE
- β DEFLECTION ANGLE AT ST FROM TS TO SPHERICAL CURVE
- γ DEFLECTION ANGLE AT CS FROM ST TO SPHERICAL CURVE
- δ DEFLECTION ANGLE AT CT FROM CS TO SPHERICAL CURVE
- k HORIZONTAL DISTANCE REQUIRED TO EFFECT A ONE PERCENT CHANGE IN GRADIENT



H.M. 1900

1:500
100' 200' 300' 400' 500'

1:500

<< SONAMPUR

UDAIPUR >>



20+200

R30.00

25.00

25.00

25.00

R60.00

R=200

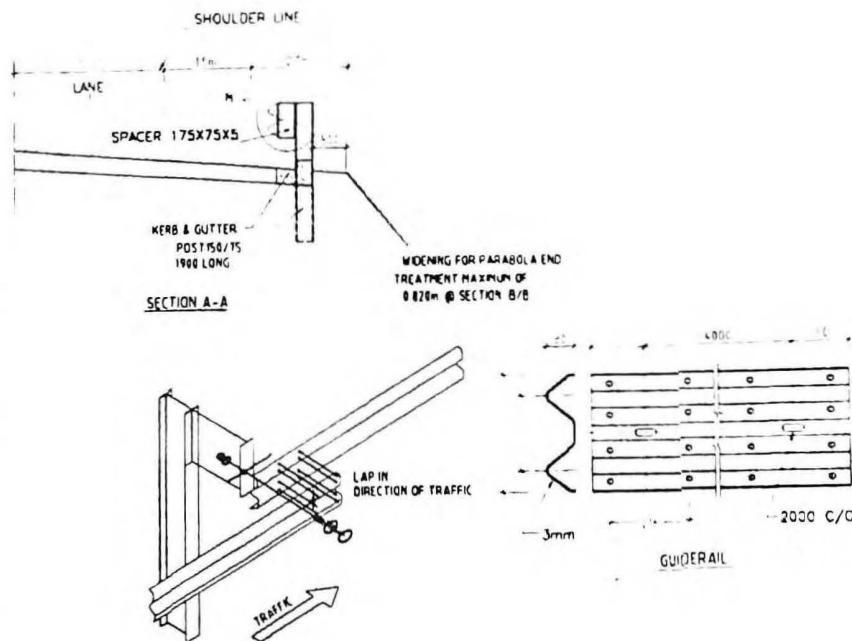
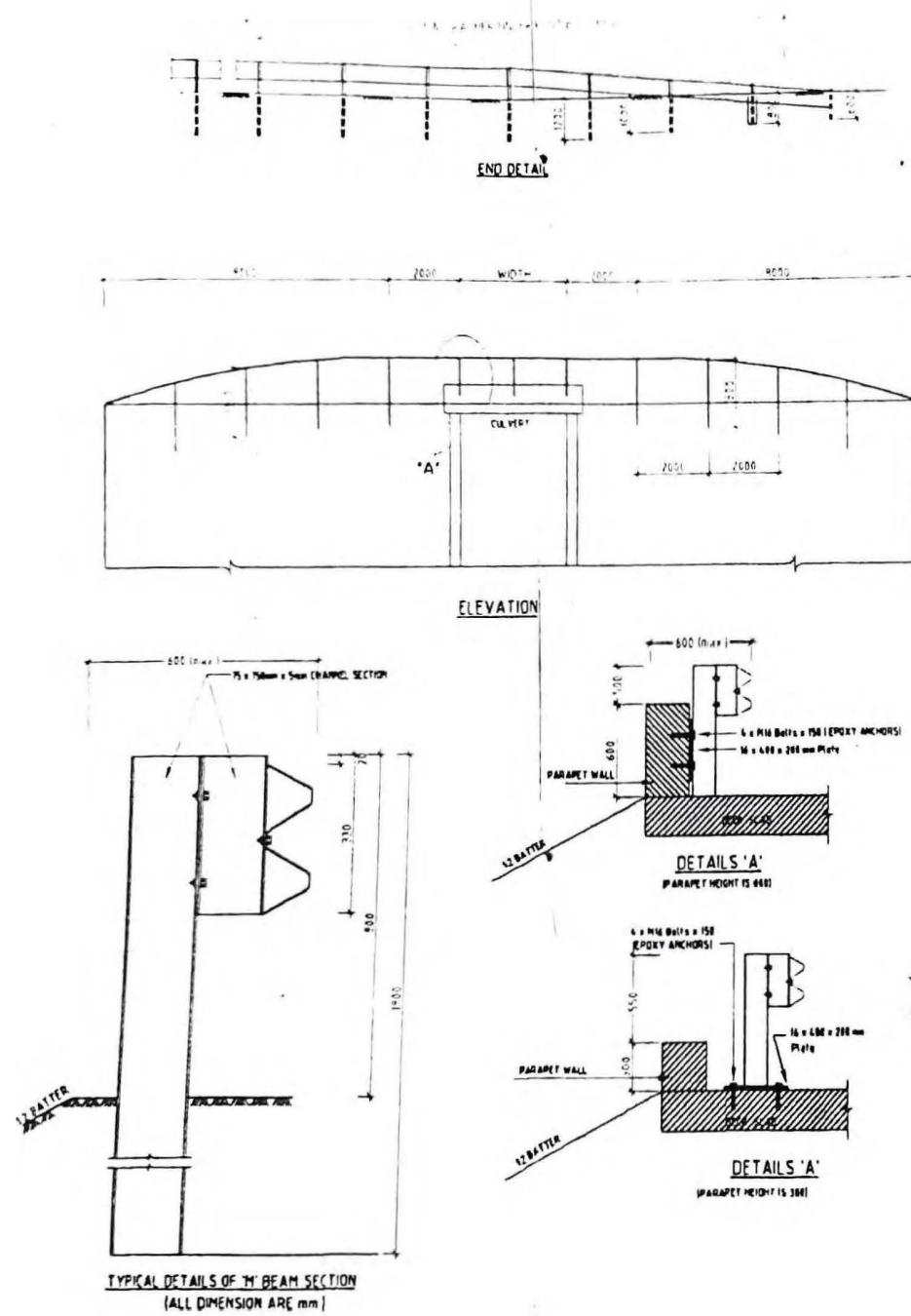
AGARTALA >>

20+280

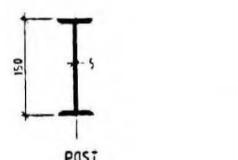
R105.00

R=200

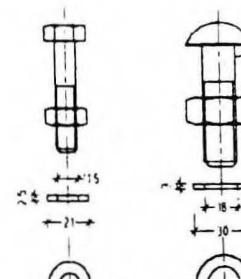
25.00



EXPLODED VIEW OF
W BEAM SPLICE / ASSEMBLY



805



HIGH TENSILE BOLTS & NUTS

- NOTE -

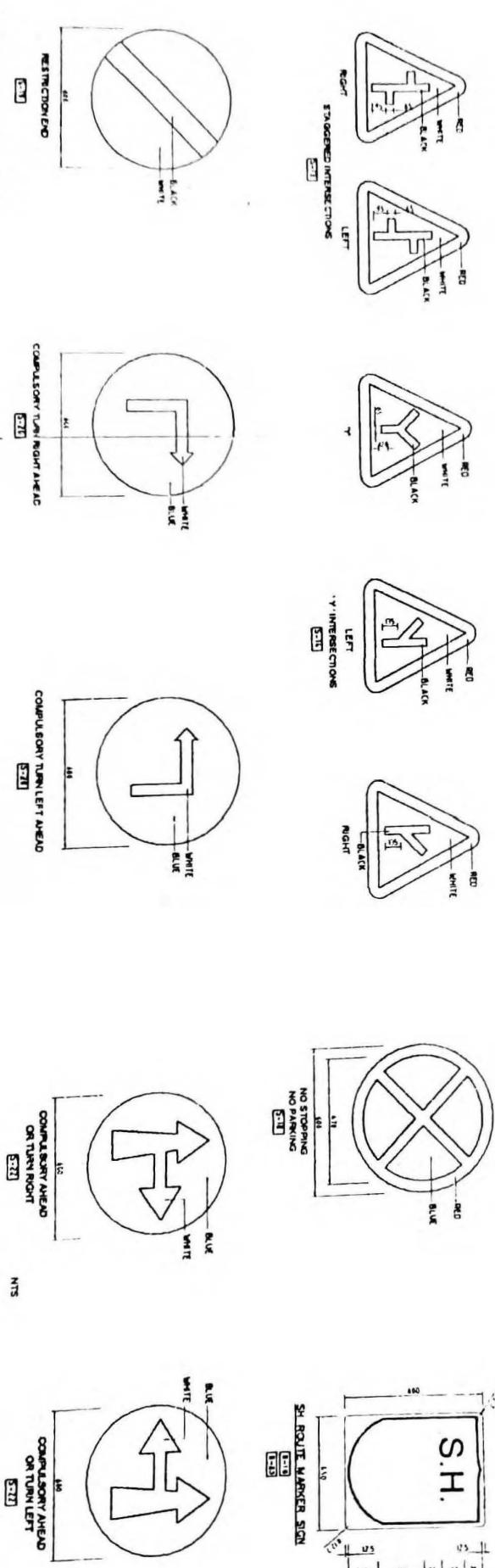
 1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SPECIFIED
 2. IN ACCESS CULVERT TO BE LAID IN DITCH WITHOUT HEADWALL AND WITHOUT CONCRETE BEDDING
 3. PIPE CULVERT SHALL BE CONSTRUCTED AS PER ITC SP-13
 4. ALL POSTS SPACERS & RAILS TO BE ST-42 GRADE STEEL AND CONFORM TO IS 1974
 5. ALL JOINTS TO BE WELDED
 6. GUARDRIAL POSTS, SPACERS, BASE PLATE AND FOUNDATION BOLTS SHALL BE HOT DIP GALVANISED
 7. REINFORCEMENT OF RAILING POST SHOULD BE SUITABLY ANCHORED
 8. CASTING OF POST SHALL BE DONE IN SINGLE POUR AFTER ACCURATELY POSITIONING THE PRECAST MANORAIL

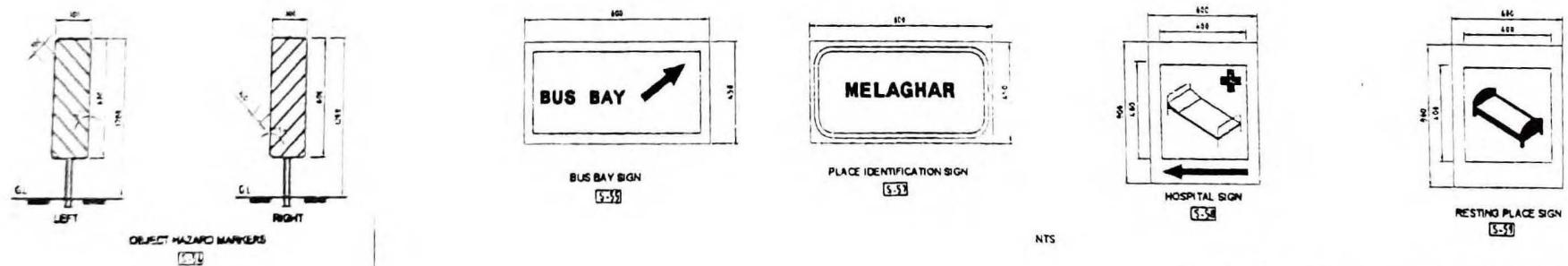
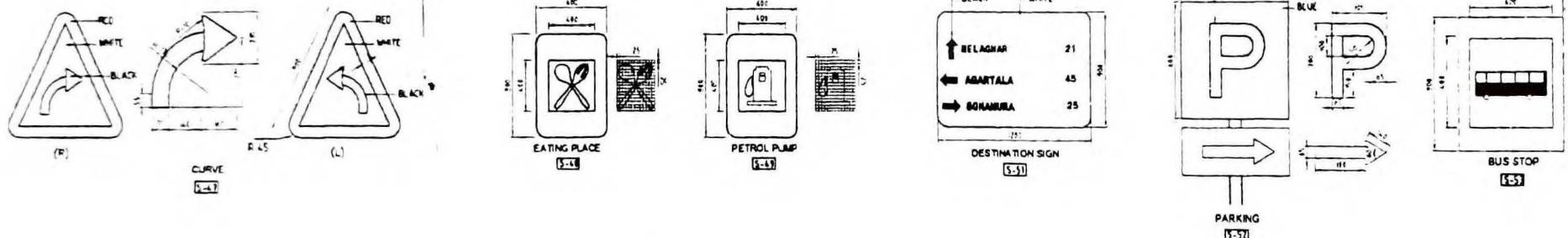
2

METAL CRASH BARRIER

GENERAL DRAWINGS

NOTE: All dimensions are in mm unless specified





Typical Road Signages Of
(Reflectors & Hazard Markers)

NOTE: ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED

NTS