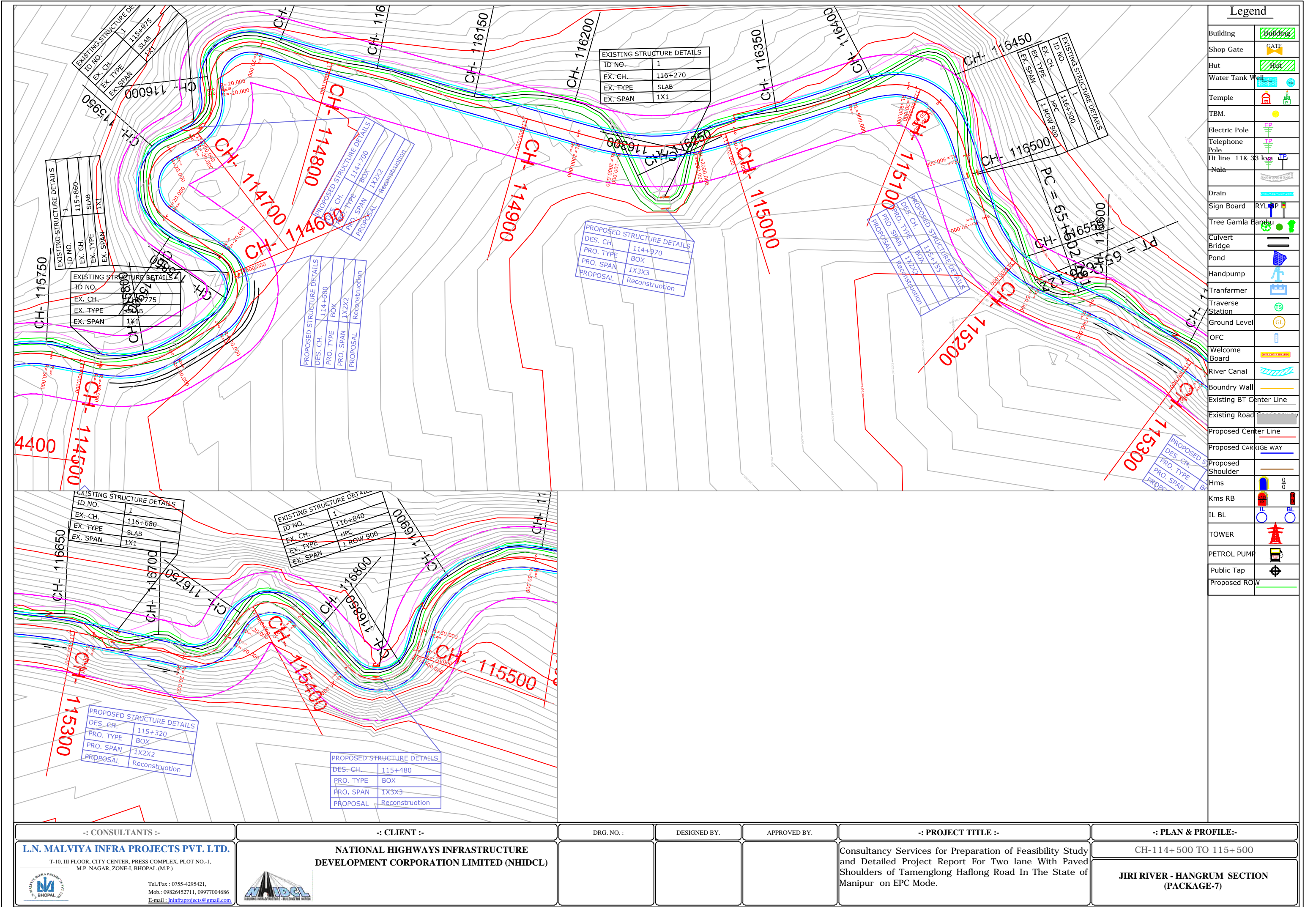


<p align="center"><b>-: CONSULTANTS :-</b></p>	<p align="center"><b>-: CLIENT :-</b></p>	<p align="center">DRG. NO. :</p>	<p align="center">DESIGNED BY.</p>	<p align="center">APPROVED BY.</p>	<p align="center"><b>-: PROJECT TITLE :-</b></p>	<p align="center"><b>-: PLAN &amp; PROFILE:-</b></p>
<p><b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b></p> <p>T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)</p> <div data-bbox="89 1965 201 1984"> </div> <p>Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfraprojects@gmail.com">lninfraprojects@gmail.com</a></p>	<p align="center"><b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b></p> <div data-bbox="572 1959 730 1984"> </div>				<p>Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong Haflong Road In The State of Manipur on EPC Mode.</p>	<p align="center">CH-113+500 TO 114+500</p> <p align="center"><b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b></p>





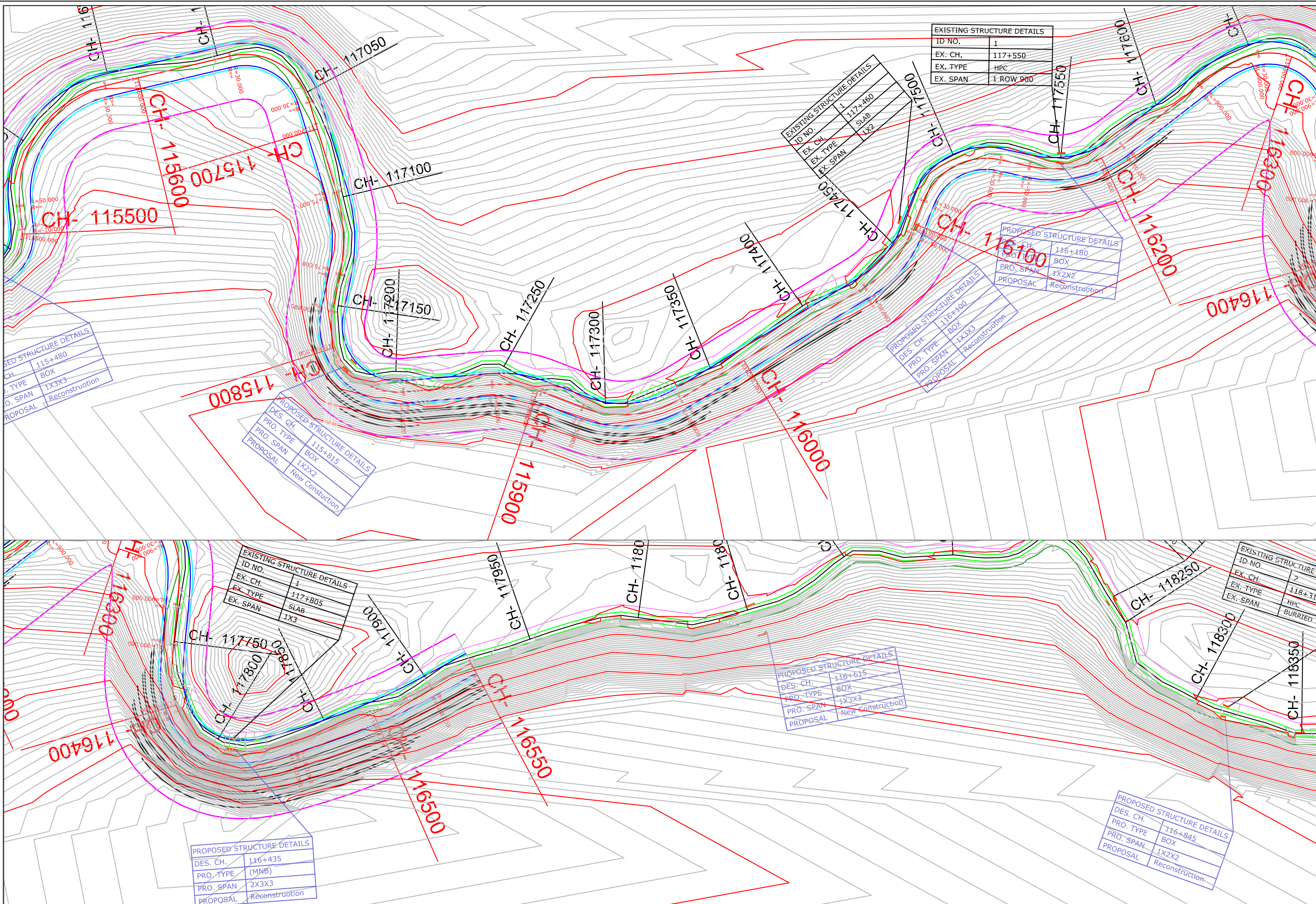
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Building	
Shop Gate	
Hut	
Water Tank Well	
Temple	
TBM.	
Electric Pole	
Telephone Pole	
Ht line 11 & 33 kva	
Nala	
Drain	
Sign Board	
Tree Gamla Bambu	
Culvert	
Bridge	
Pond	
Handpump	
Tranformer	
Traverse Station	
Ground Level	
OFC	
Welcome Board	
River Canal	
Boundry Wall	
Existing BT Center Line	
Existing Road	
Proposed Center Line	
Proposed CARRIGE WAY	
Proposed Shoulder	
Hms	
Kms RB	
IL BL	
TOWER	
PETROL PUMP	
Public Tap	
Proposed ROW	

-: CONSULTANTS :-		-: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-: PLAN & PROFILE:-
L.N. MALVIYA INFRA PROJECTS PVT. LTD. T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)		NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)					Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong Haflong Road In The State of Manipur on EPC Mode.	CH-114+ 500 TO 115+ 500
 Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@projects@gmail.com">lninfra@projects@gmail.com</a>		 NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED						JIRI RIVER - HANGRUM SECTION (PACKAGE-7)





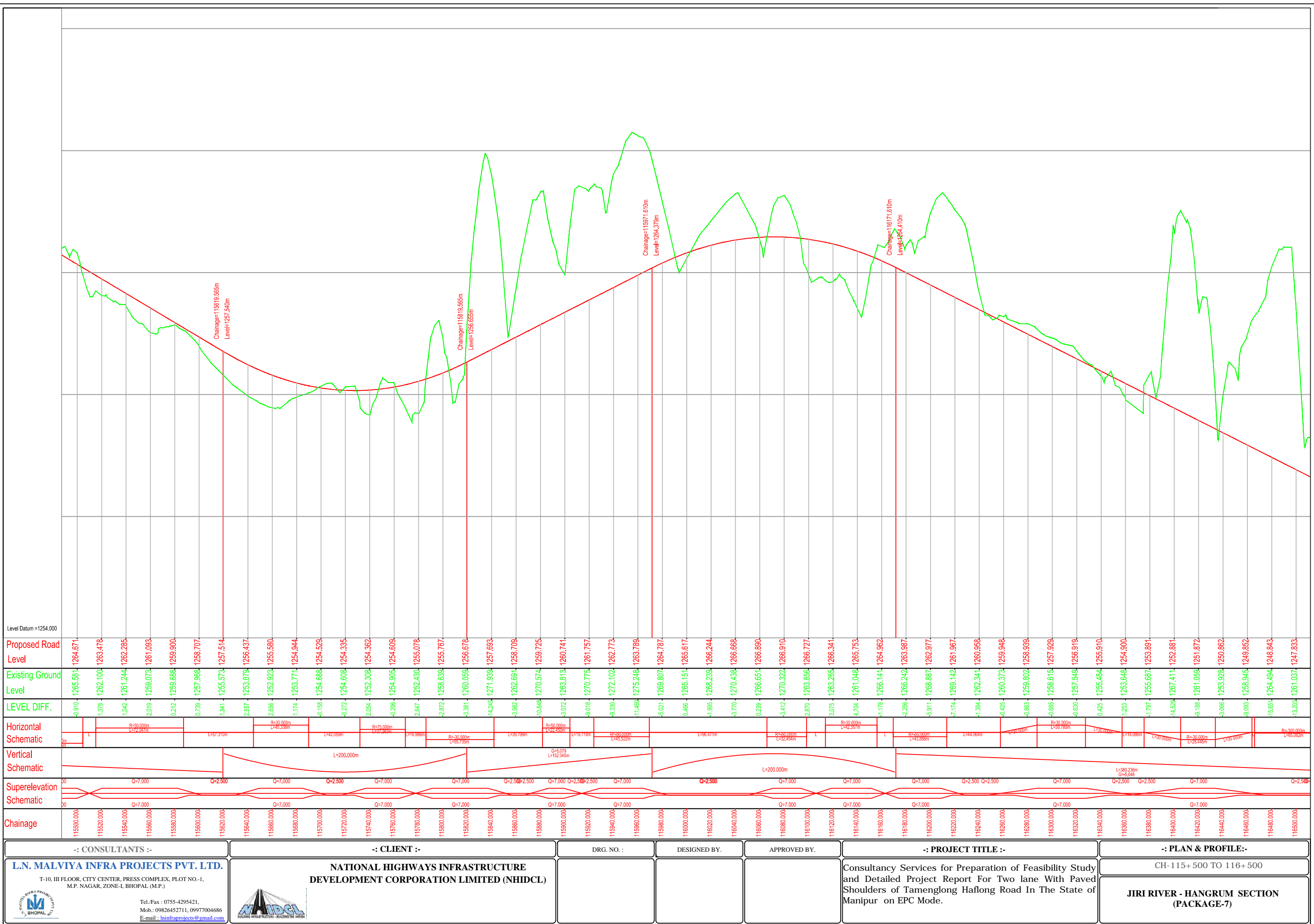




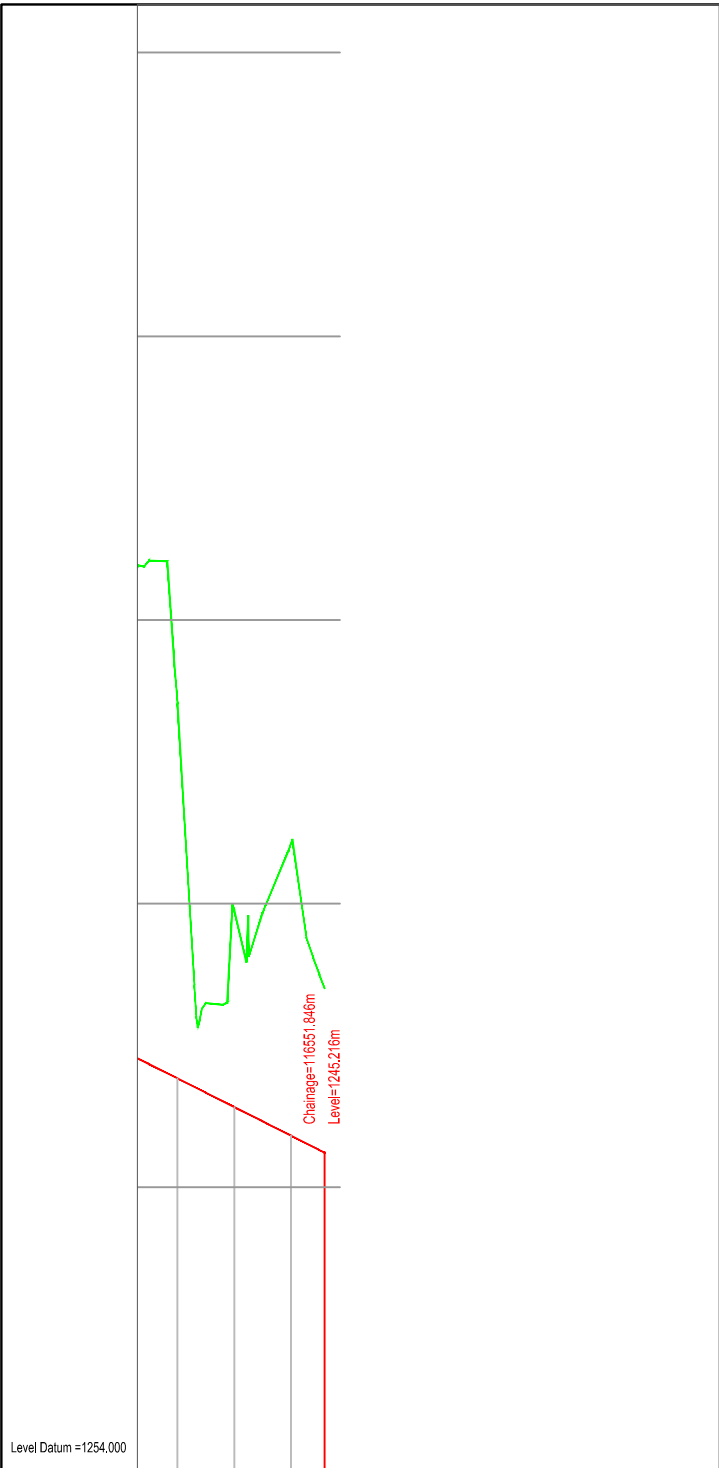
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Building	
Shop Gate	
Hut	
Water Tank Well	
Temple	
TBM.	
Electric Pole	
Telephone Pole	
Ht line 11 & 33 kva	
Nala	
Drain	
Sign Board	
Tree Gamla Bambu	
Culvert	
Bridge	
Pond	
Handpump	
Tranformer	
Traverse Station	
Ground Level	
OFC	
Welcome Board	
River Canal	
Boundry Wall	
Existing BT Center Line	
Existing Road	
Proposed Center Line	
Proposed CARRIGE WAY	
Proposed Shoulder	
Hms	
Kms RB	
IL BL	
TOWER	
PETROL PUMP	
Public Tap	
Proposed ROW	

:- CONSULTANTS :-		:- CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	:- PROJECT TITLE :-		:- PLAN & PROFILE:-	
L.N. MALVIYA INFRA PROJECTS PVT. LTD.		NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)					Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong Haslong Road In The State of Manipur on EPC Mode.		CH-115+500 TO 116+500	
T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)									JIRI RIVER - HANGRUM SECTION (PACKAGE-7)	
Tel/Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@projects@gmail.com">lninfra@projects@gmail.com</a>										









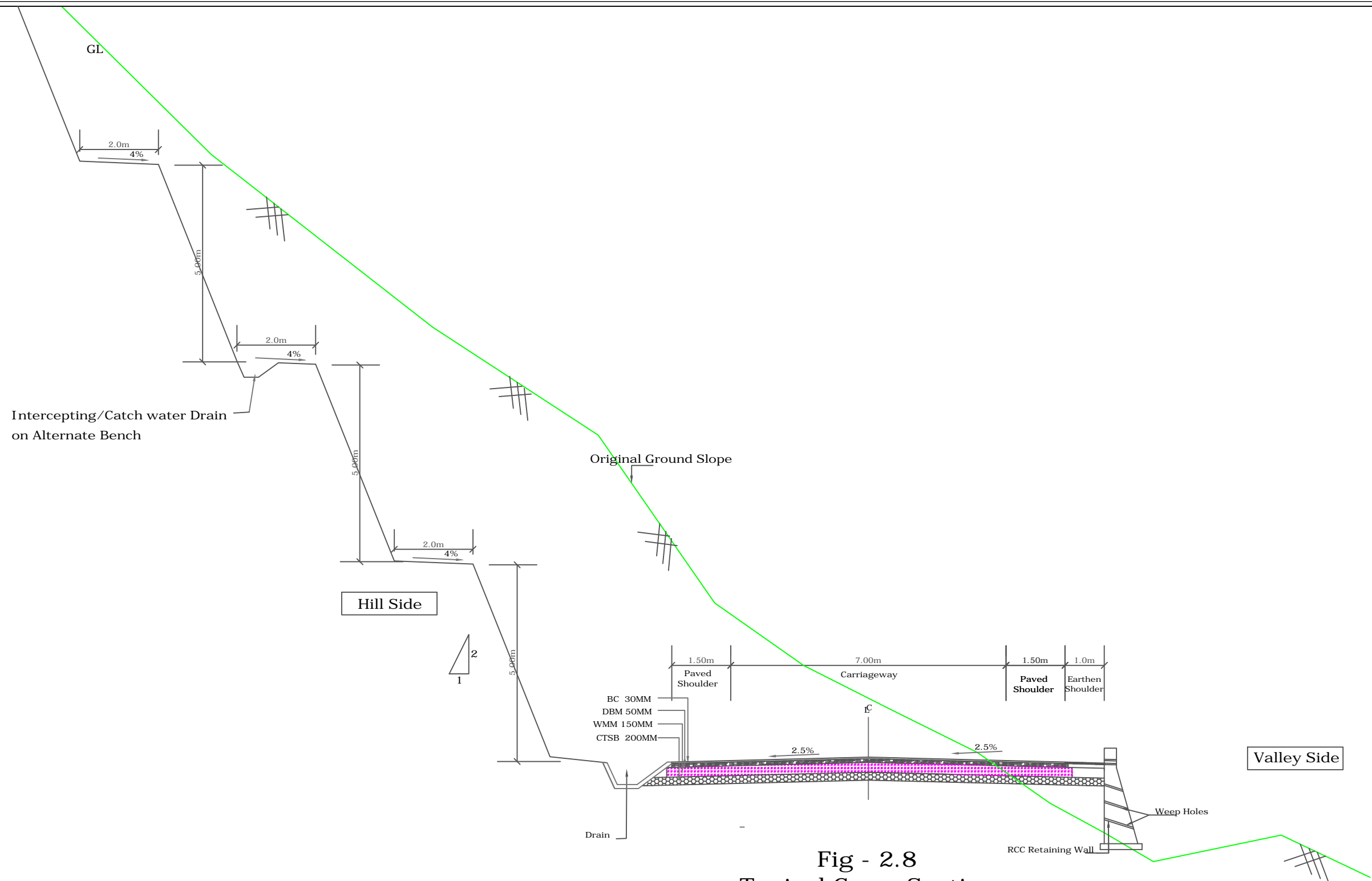
Proposed Road Level	1247.833	1246.824	1245.814
Existing Ground Level	1261.037	1253.780	1256.118
LEVEL DIFF.	-13.203	-6.957	-10.305
Horizontal Schematic	<div><div>R=500.000m</div><div>L=65.000m</div><div>L=241.830m</div></div>		
Vertical Schematic			
Superelevation Schematic	<div><div>Q=2.500=2.500</div></div>		
Chainage	11650.000	116520.000	116540.000

-: CONSULTANTS :-		-: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-: PLAN & PROFILE:-
<div>L.N. MALVIYA INFRA PROJECTS PVT. LTD.<div>T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)<div><div><div></div></div><div><div></div></div></div><div>Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : lninfraprojects@gmail.com</div></div></div>		<div>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)<div><div><div></div></div><div><div></div></div></div><div>BUILDING NEW INFRASTRUCTURE - BUILDING THE NATION</div></div>					Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong Haflong Road In The State of Manipur on EPC Mode.	CH- 116+ 500 TO 116+ 550
							JIRI RIVER - HANGRUM SECTION (PACKAGE-7)	





## **4. TYPICAL CROSS SECTIONS**





**Fig - 2.8**  
**Typical Cross Section**  
**2- lane Carriageway With One Side Retaining Wall**  
**(Open Country - Mountainous Terrain)**

-: CONSULTANTS :-		-: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-: TYPICAL CROSS SECTIONS :-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.) 		<b>NATIONAL HIGHWAYS INFRASTRUCTURE  DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b> 					Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong- Tousem- Liasang- Haflong In The State of Manipur & Assam on EPC Mode.	
Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@projects@gmail.com">lninfra@projects@gmail.com</a>								



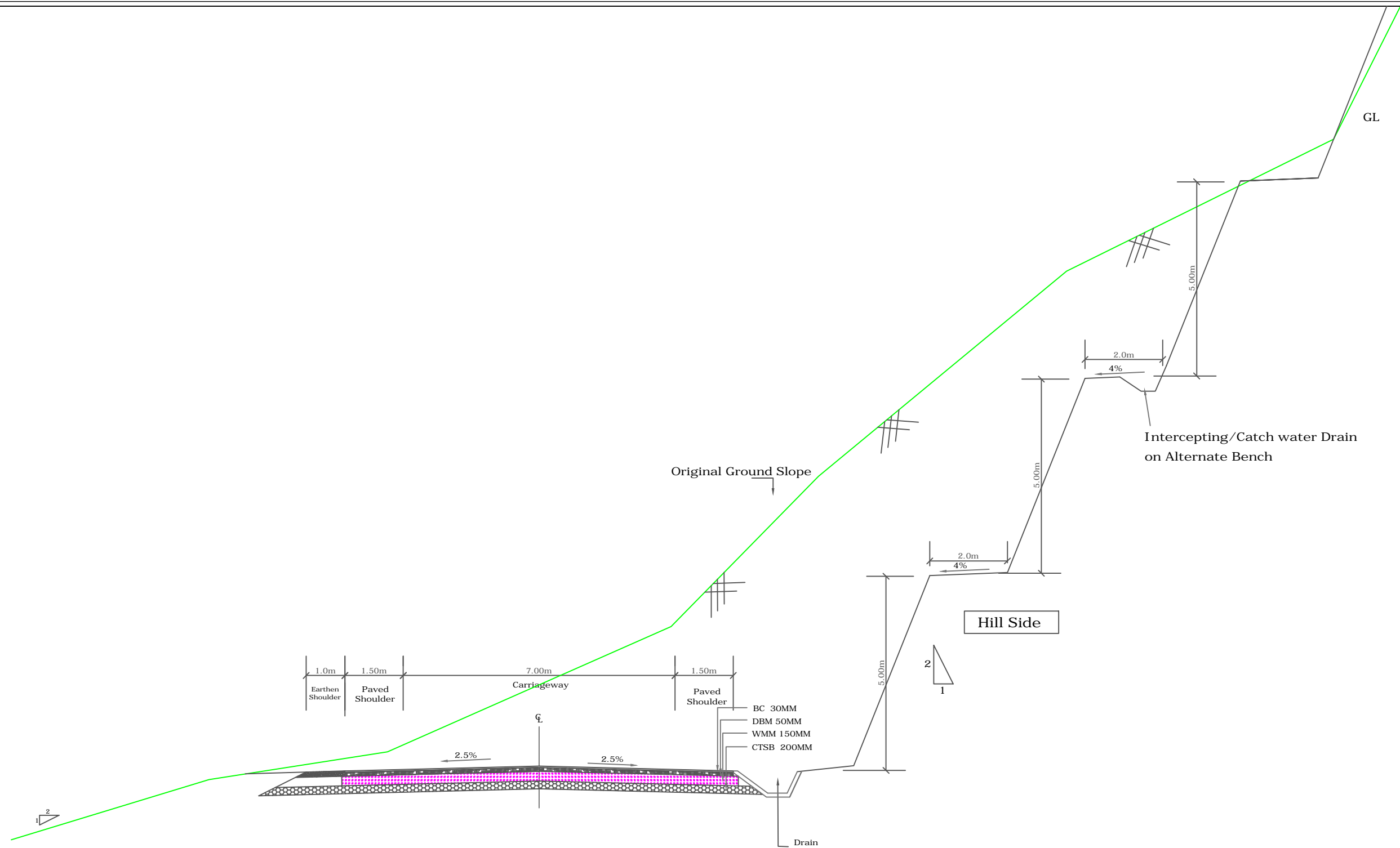




Fig - 2.9  
Typical Cross Section  
2- lane Carriageway Without Retaining Wall  
(Open Country - Mountainous Terrain)

-: CONSULTANTS :-		-: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-:TYPICAL CROSS SECTIONS:-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.) 		<b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b> 					Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong- Tousem- Liasang- Haflong In The State of Manipur & Assam on EPC Mode.	
Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@projects@gmail.com">lninfra@projects@gmail.com</a>								



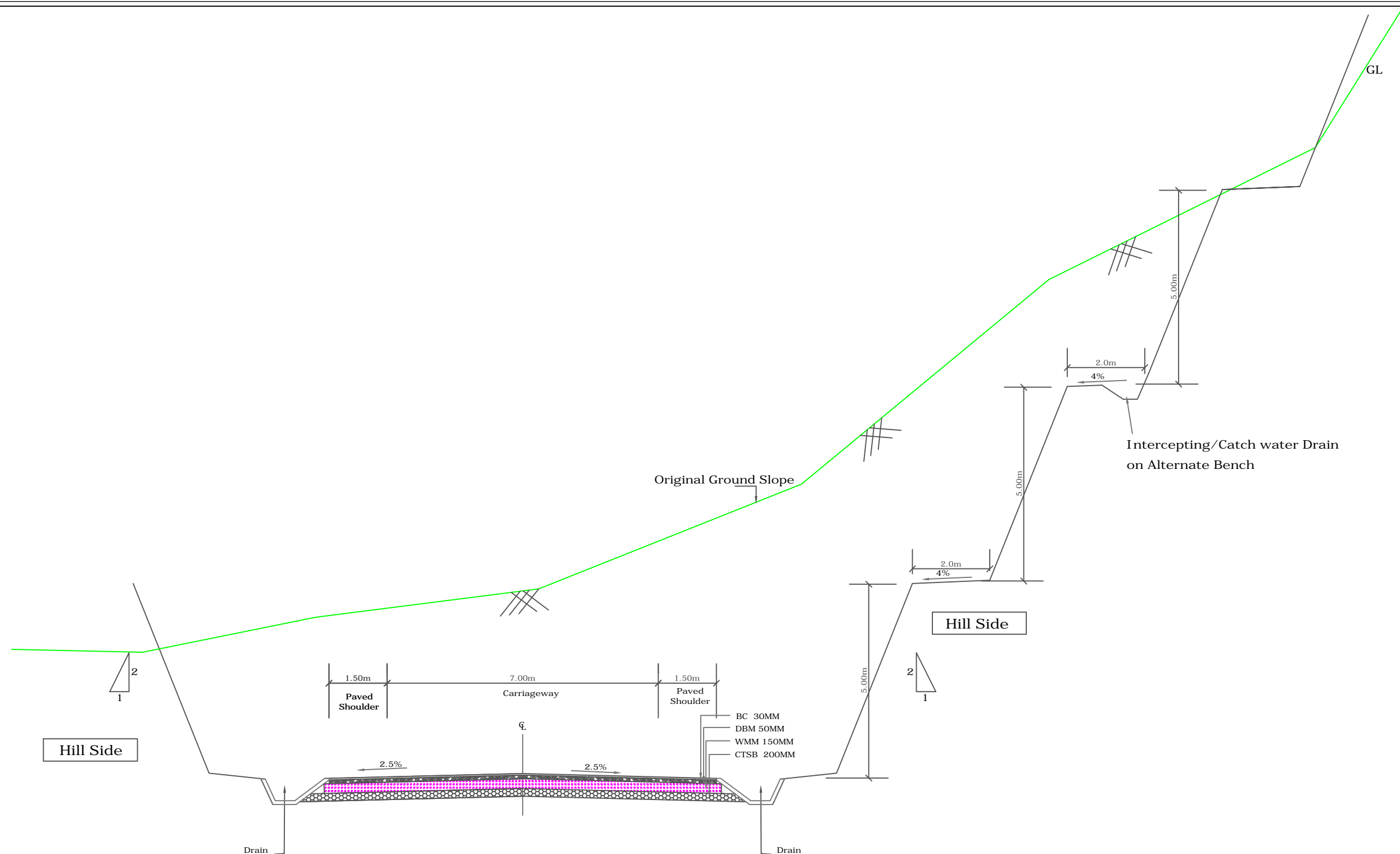




Fig - 2.11 (new)  
(Hilly Terrain) Typical Cross Section  
2- lane Carriageway With Paved Shoulders  
(Through Cut) Hill Section

-: CONSULTANTS :-		-: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-:TYPICAL CROSS SECTIONS:-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)  Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@projects@gmail.com">lninfra@projects@gmail.com</a>		<b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b> 					Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong- Tousem- Liasang- Haflong In The State of Manipur & Assam on EPC Mode.	



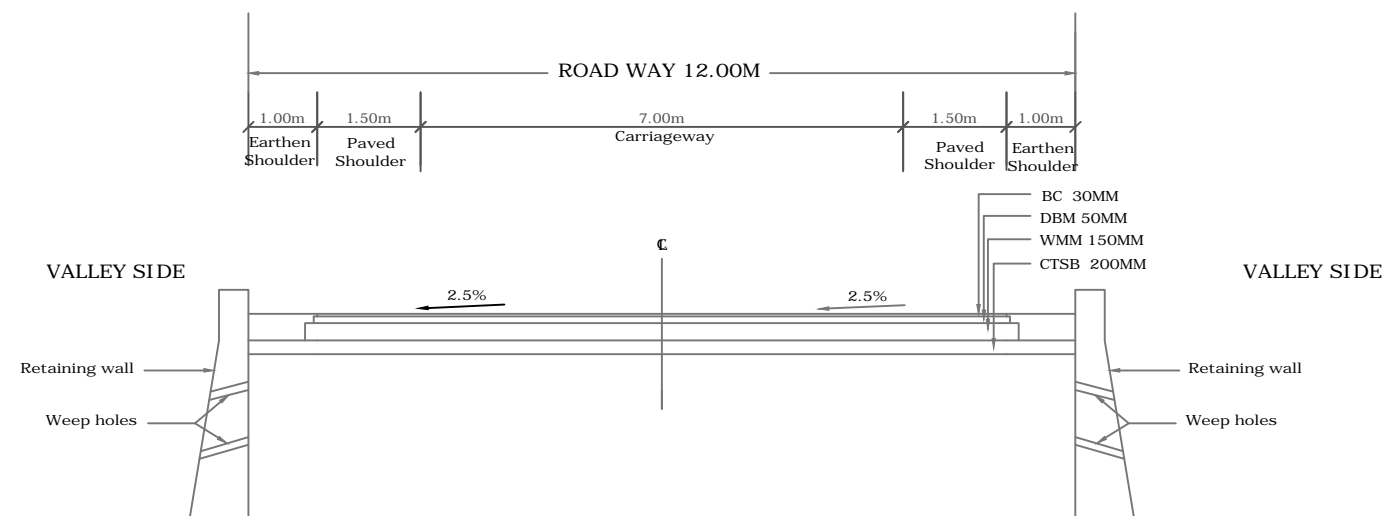




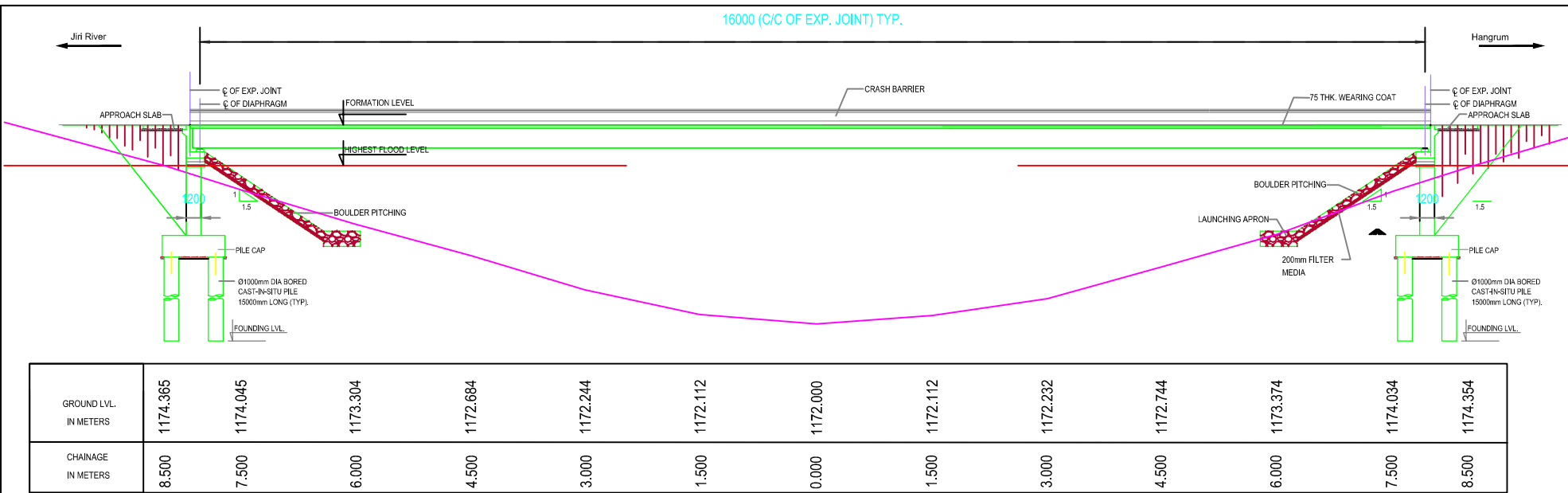
Fig - 2.12 (new)  
 Typical Cross Section (Hilly Terrain)  
 2- lane carriageway (With Paved Shoulder)  
 (With Retaining Wall on both Side)

:- CONSULTANTS :-	:- CLIENT :-	DRG. NO. :	DESIGNED BY.	APPROVED BY.	:- PROJECT TITLE :-	:-TYPICAL CROSS SECTIONS:-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)  Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@projects@gmail.com">lninfra@projects@gmail.com</a>	<b>NATIONAL HIGHWAYS INFRASTRUCTURE            DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b> 				Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong- Tousem- Liasang- Haflong In The State of Manipur & Assam on EPC Mode.	

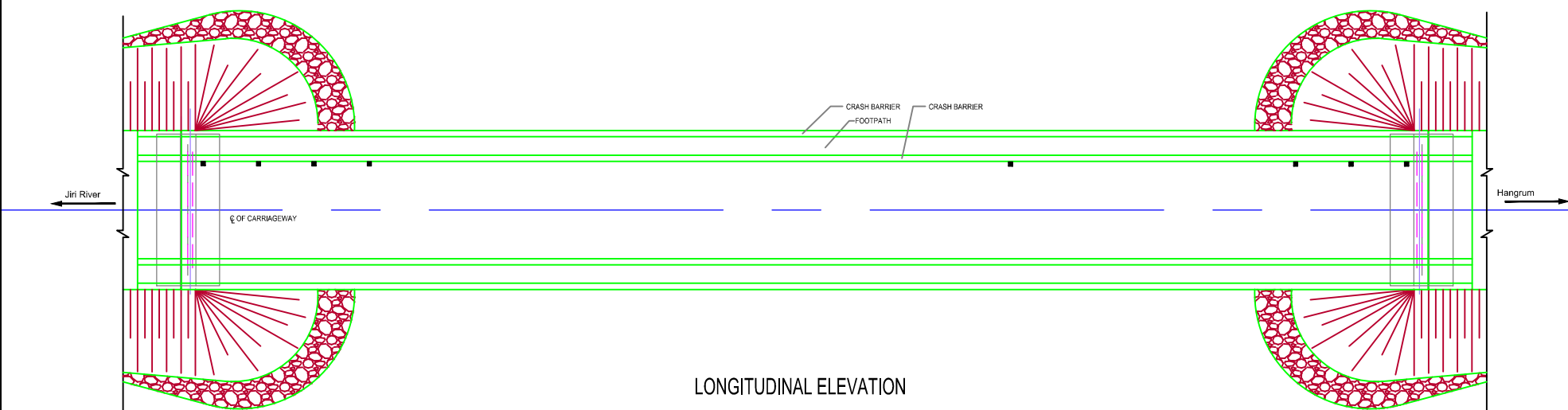


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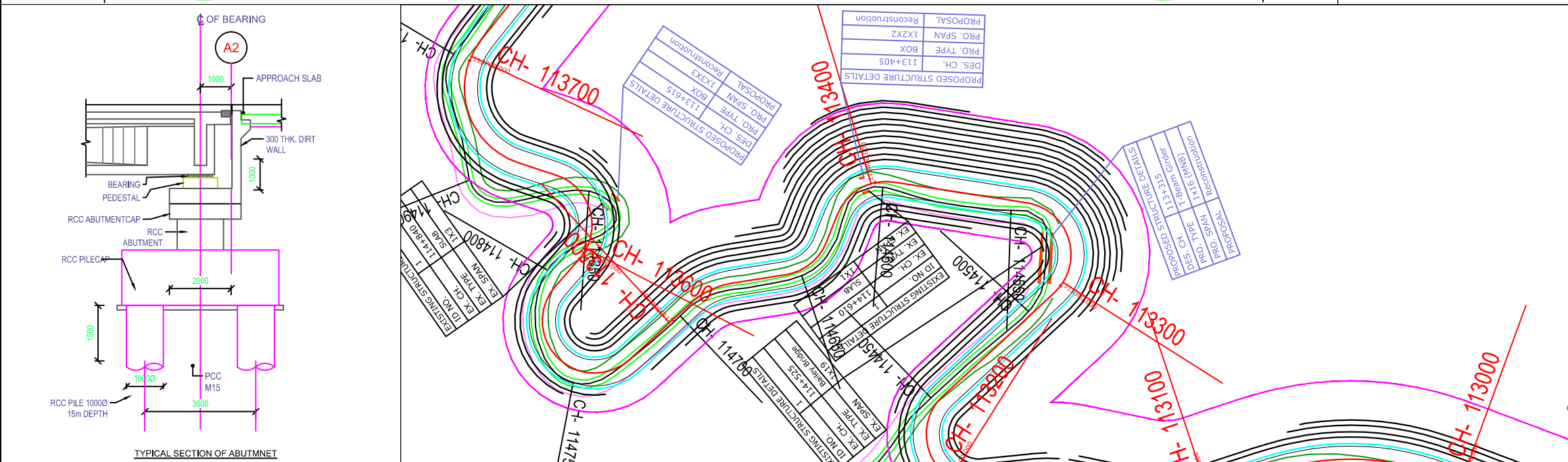
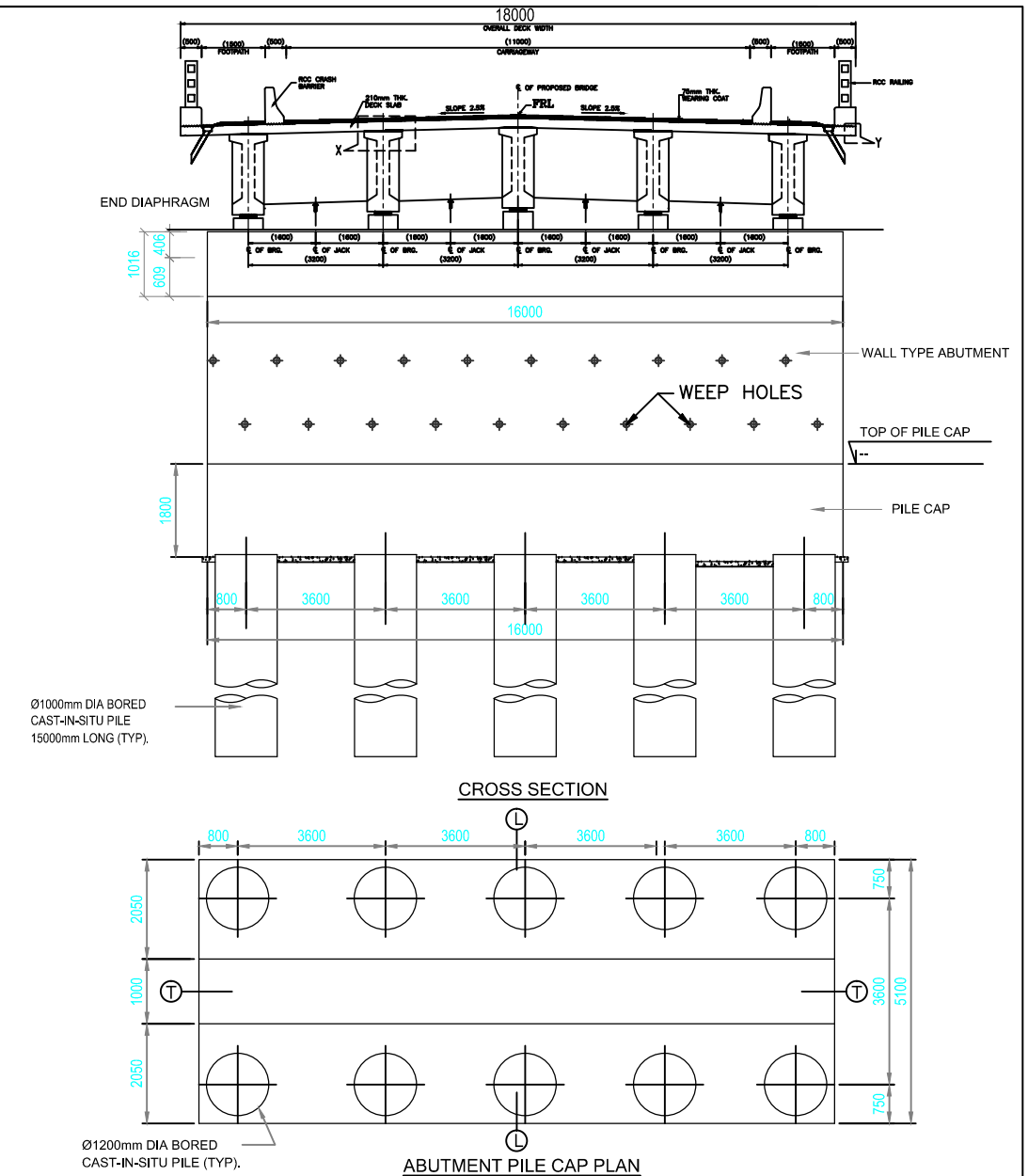




SECTIONAL ELEVATION THROUGH CENTRE LINE





LONGITUDINAL ELEVATION

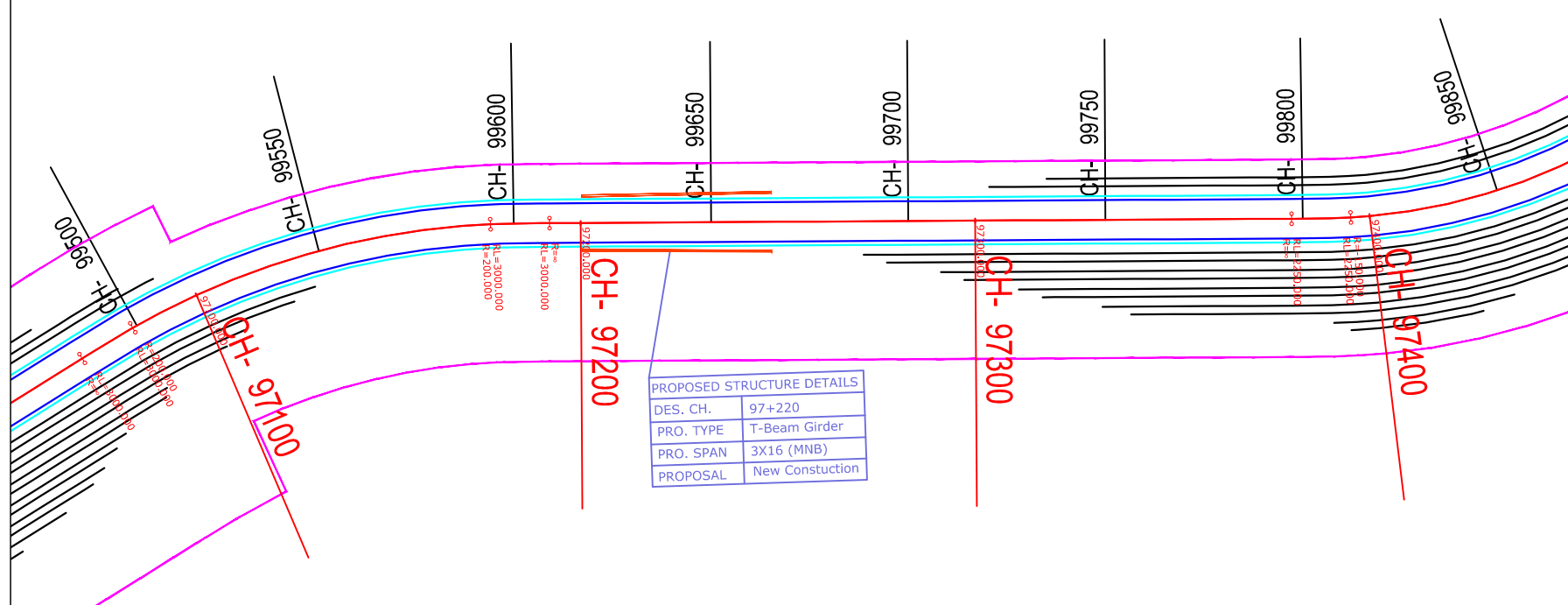
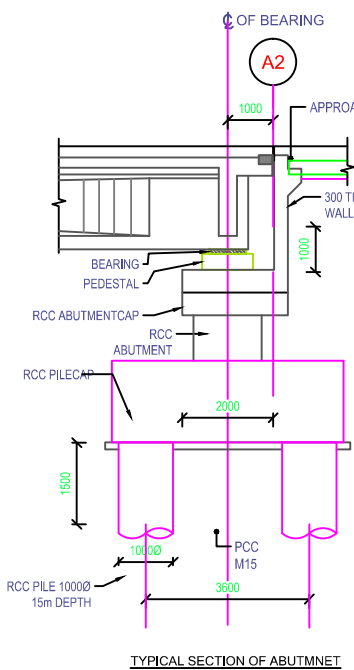
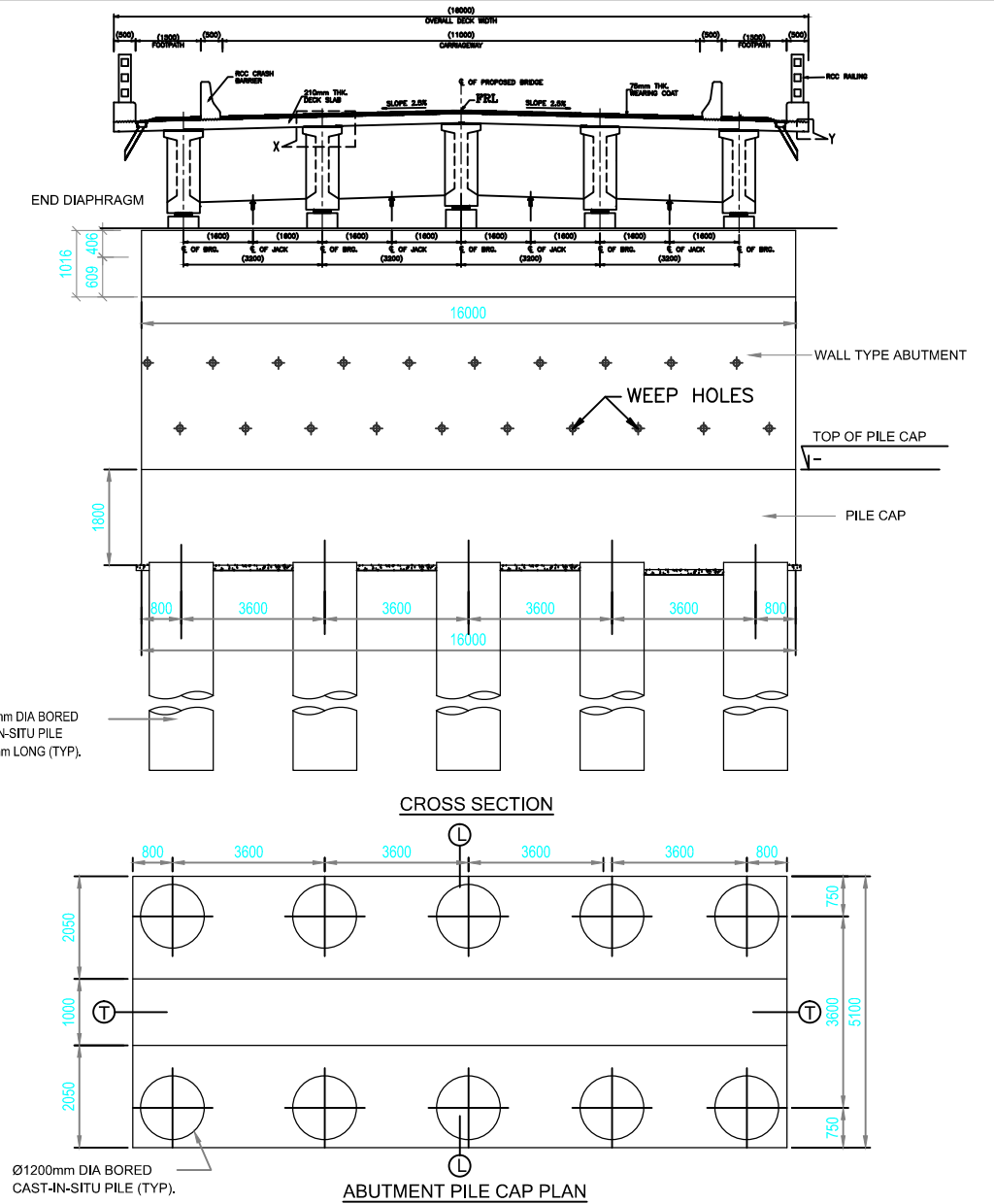
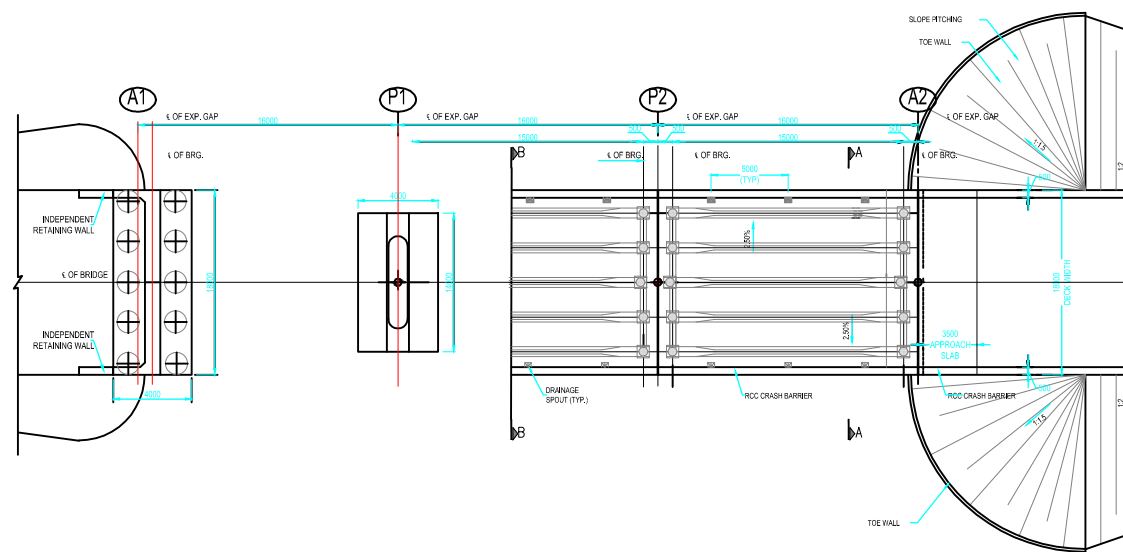
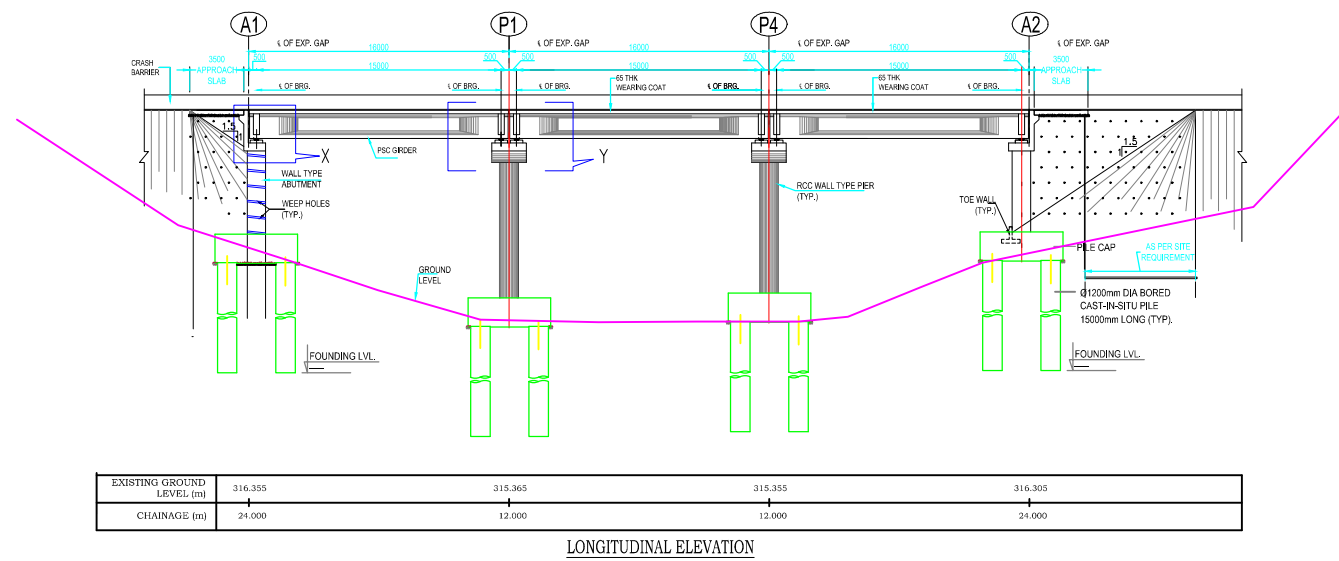


NOTES :-

1. TYPES OF BRIDGE
  2. LENGTH OF BRIDGE
  3. OVER ALL WIDTH OF BRIDGE
  4. CLEAR ROADWAY (CARRIAGE WAY)
  5. DESIGN DISCHARGE
  6. CATCHMENT AREA
  7. DESIGN VELOCITY
  8. FORMATION LEVEL
  9. SOFFIT LEVEL
  10. H.F.L.
  11. L.W.L.
  12. SCOUR LEVEL ABUTMENT
  14. FOUNDATION LEVEL ABUTMENT
  15. TYPE OF SUPER STRUCTURE
  16. TYPE OF SUB STRUCTURE
  17. TYPE OF FOUNDATION
  18. FOUNDING STRATA
  19. TYPE OF BEARING
  20. APPROACH SLAB
  21. APPROACH SLAB
  22. RAILING
  23. WEARING COAT
  24. EXPANSION JOINTS
  25. SPECIFICATIONS
  26. SAFE BEARING CAPACITY
  27. DESIGN LOADING
  28. ALL DIMENSIONS IN MM.
- HIGH LEVEL  
16.0 MTS. (1 SPANS c/c 16.0 MTS. )  
18.00 MTS.  
11.00 MTS.  
58.70 CUMEC.  
4.5 SQ. KM.  
2.76 M/SEC.  
R.L. 1177.282 M  
R.L. 1175.541 M  
R.L. 1174.391 M  
Dry Stream  
1170.759 M  
1159.365 M  
R.C.C. T- BEAM GIRDER
- RC.C. WALLTYPE ABUTMENT CUM RETURN  
R.C.C. WALL TYPE PIER  
PILE FOUNDATION  
SOIL  
ELASTOMERIC BEARING  
R.C.C. STRUCTURAL SLAB  
R.C.C. STRUCTURAL SLAB  
R.C.C. CRASH BARRIER AS PER STD. DWG.  
M-30 75MM  
EXPANSION JOINTS AS PER STD. DRG.  
AS PER M.O.R.T. & H. SPECIFICATIONS  
20T/SqM. AS PER N.I.T. AND SPECIFICATION.  
ONE LANE OF I.R.C. CLASS AA LOADING OR  
TWO LANE OF I.R.C. CLASS 'A' LOADING.

-: CONSULTANTS :-		-: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-: GENERAL ARRANGEMENT DRAWING:-
<div>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</div> <div>T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-I, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)</div> <div><div>Tel./Fax : 0755-4295421, Mob: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@rediffmail.com">lninfra@rediffmail.com</a></div></div>		<div>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</div> <div></div>					Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong Haflong Road In The State of Manipur on EPC Mode.	<div>MINOR BRIDGE AT CH. 113+315 (1X16m)</div> <div>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</div>





- NOTES :-**
1. TYPES OF BRIDGE
  2. LENGTH OF BRIDGE
  3. OVER ALL WIDTH OF BRIDGE
  4. CLEAR ROADWAY (CARRIAGE WAY)
  5. DESIGN DISCHARGE
  6. CATCHMENT AREA
  7. DESIGN VELOCITY
  8. FORMATION LEVEL
  9. SOFFIT LEVEL
  10. H.F.L.
  11. L.W.L.
  12. SCOUR LEVEL ABUTMENT
  14. FOUNDATION LEVEL ABUTMENT
  15. TYPE OF SUPER STRUCTURE
  16. TYPE OF SUB STRUCTURE
  17. TYPE OF FOUNDATION
  18. FOUNDING STRATA
  19. TYPE OF BEARING
  20. APPROACH SLAB
  21. APPROACH SLAB
  22. RAILING
  23. WEARING COAT
  24. EXPANSION JOINTS
  25. SPECIFICATIONS
  26. SAFE BEARING CAPACITY
  27. DESIGN LOADING
  28. ALL DIMENSIONS IN MM.
- HIGH LEVEL**  
48.0 MTS. (3 SPANS @ 16.0 MTS. )  
18.00 MTS.  
11.00 MTS.  
144.82 CUMEC.  
15.0 SQ. KM.  
2.25 M/SEC.  
R.L. 318.353 M  
R.L. 316.612 M  
R.L. 315.512 M  
Dry Stream  
312.202M  
303.359M  
T-BEAM GIRDER
- R.C.C. WALLTYPE ABUTMENT CUM RETURN**  
R.C.C. WALL TYPE PIER  
PILE FOUNDATION  
SOIL  
ELASTOMERIC BEARING  
R.C.C. STRUCTURAL SLAB  
R.C.C. STRUCTURAL SLAB  
R.C.C. CRASH BARRIER AS PER STD. DWG.  
M-30 75MM  
EXPANSION JOINTS AS PER STD. DRG.  
AS PER M.O.R.T. & H. SPECIFICATIONS  
20T/SqM. AS PER N.I.T. AND SPECIFICATION.  
ONE LANE OF I.R.C. CLASS AA LOADING OR  
TWO LANE OF I.R.C. CLASS 'A' LOADING.

:- CONSULTANTS :-

**L.N. MALVIYA INFRA PROJECTS PVT. LTD.**

T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1,  
M.P. NAGAR, ZONE-I, BHOPAL (M.P.)



Tel./Fax : 0755-4295421,  
Mob.: 09826452711, 09977004686  
E-mail : [lninfra@lninfra.com](mailto:lninfra@lninfra.com)

:- CLIENT :-

**NATIONAL HIGHWAYS INFRASTRUCTURE  
DEVELOPMENT CORPORATION LIMITED (NHIDCL)**



DRG. NO. :

DESIGNED BY.

APPROVED BY.

:- PROJECT TITLE :-

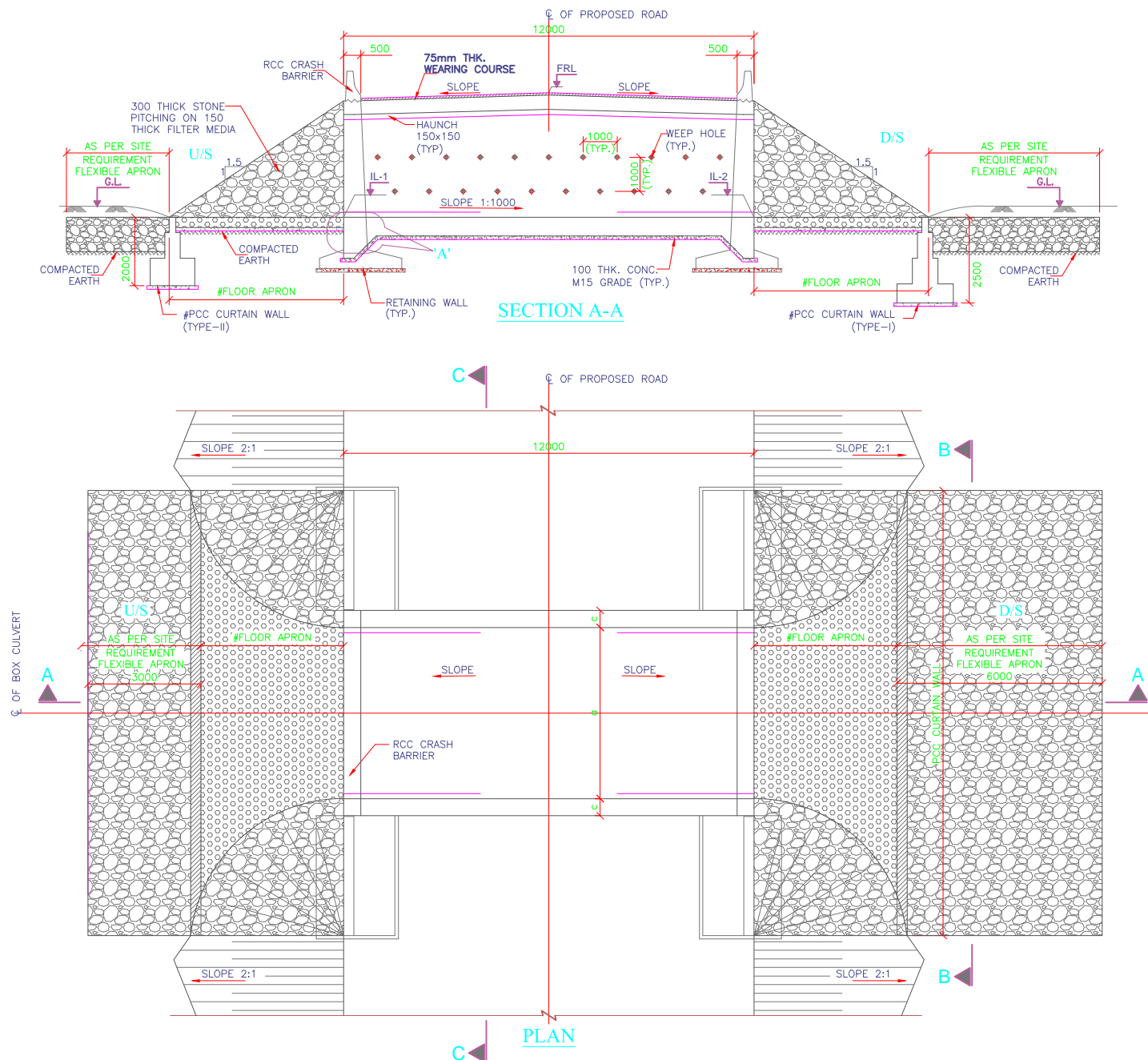
Consultancy Services for Preparation of Feasibility Study  
and Detailed Project Report For Two lane With Paved  
Shoulders of Tamenglong Haflong Road In The State of  
Manipur on EPC Mode.

:- GENERAL ARRANGEMENT DRAWING:-

MINOR BRIDGE AT CH. 97+220 (3X16m)

**JIRI RIVER - HANGRUM SECTION  
(PACKAGE-7)**





NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS ARE IN METER UNLESS MENTIONED OTHERWISE.
- DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THE SAFE BEARING CAPACITY ASSUMED IN THE DESIGN IS 10T/M . THIS SBC SHOULD BE VERIFIED AT SITE BEFORE EXECUTION. ANY VARIATION ON SITE SHOULD BE INFORMED TO THE DESIGN ENGINEER FOR NECESSARY ACTION.
- GRADE OF UNTENSIONED STEEL SHALL BE Fe 500, CONFIRMING TO IS:1786.
- CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:-  
(i) RCC BOX..... M30  
(ii) RCC CRASH BARRIER..... M40  
(iii) RETAINING WALL..... M30  
(iv) PCC LEVELING COURSE..... M15
- THE RCC BOX SHOULD BE CONSTRUCTED FIRST AND THE SIDE FILLING & COMPACTION SHALL BE DONE AS PER MoRTH SPECIFICATIONS.
- THE BACKFILL MATERIAL BEHIND RCC BOX/RETAINING WALL SHALL BE AS PER MoRTH SPECIFICATIONS.
- DETAIL OF CAMBER/SUPER ELEVATION MAY BE VERIFIED WITH LATEST PLAN AND PROFILE DRAWING.
- FLOW DIRECTION SHOWN IN THE DRAWING IS INDICATIVE ONLY. BED PROTECTION FOR UPSTREAM AND DOWN STREAM SHALL BE BASED ON THE FLOW DIRECTION IN SITE.
- FLEXIBLE APRON SHALL BE PROVIDED AS PER THE SPECIFICATION/DETAILS MENTIONED IN PLATE-22 OF IRC:SP:13-2004.
- DISCREPANCY IF ANY IS TO BE IMMEDIATELY BROUGHT IN TO THE NOTICE OF ENGINEER FOR NECESSARY MODIFICATION IN THE DRAWING.
- RETAINING WALL SHALL BE PROVIDED BOTH HORIZONTALLY AND VERTICALLY SHALL BE PROVIDED IN RETAINING WALL.
- 600mm THK. FILTER MEDIA SHALL BE PROVIDED BEHIND RETAINING WALL.
- ALL LEVELS SHOWN IN THIS DRAWING SHOULD BE VERIFIED AT SITE WITH RESPECT TO PLAN & PROFILE BEFORE EXECUTION OF WORK.

LEGEND:-

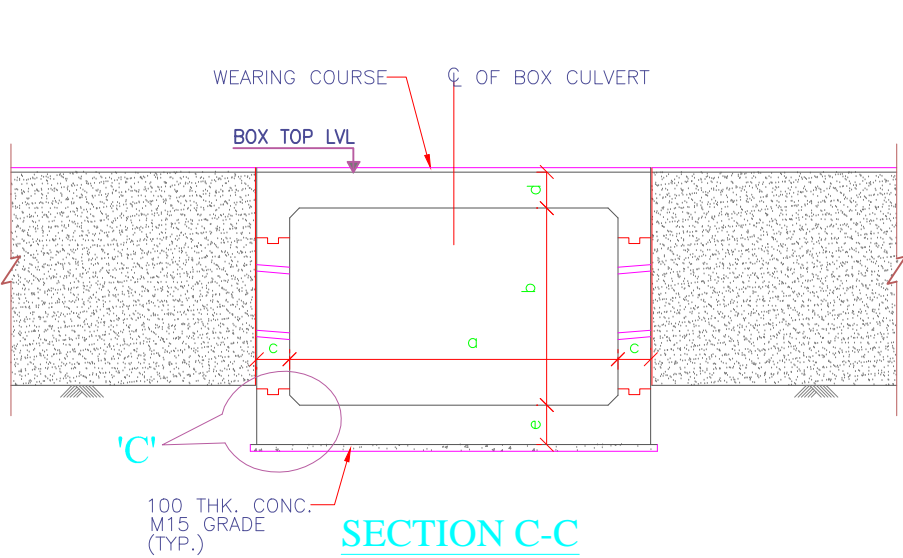
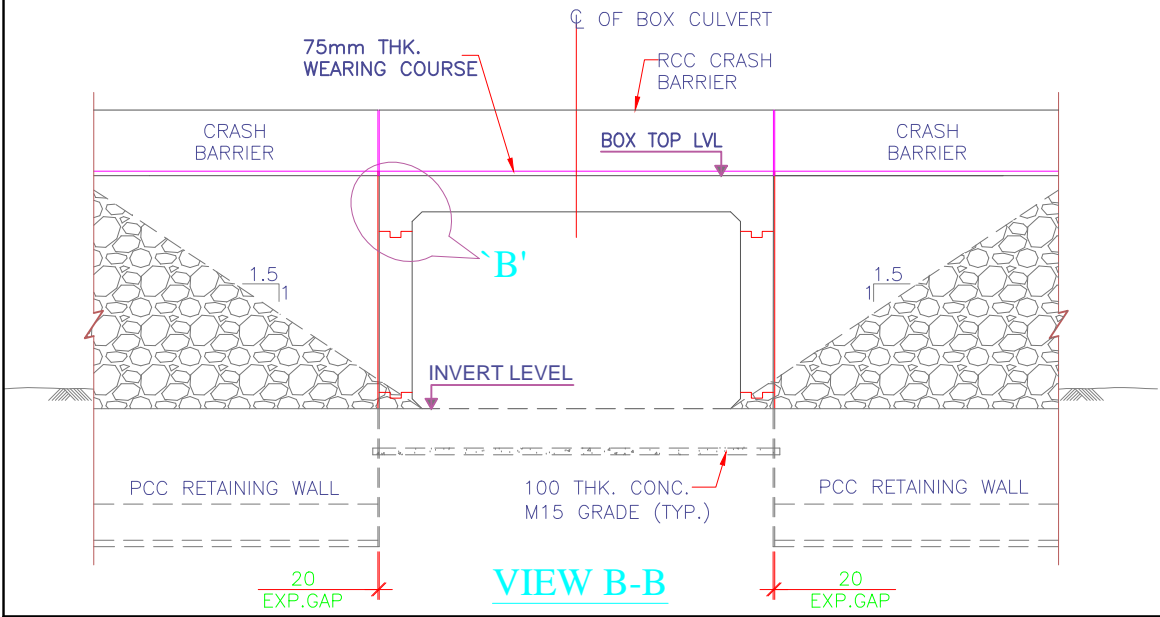
FRL	-	FINISHED ROAD LEVEL
GL.	-	GROUND LEVEL
LVL.	-	LEVEL
IL	-	INVERT LEVEL

TABLE-1 SCHEDULE OF BOX CULVERT

S.No.	DESIGN CH: SCHEDULE	PROPOSAL	DIRECTION OF FLOW	SKEW ANGLE	PROPOSED DETAILS					
					TYPE	DIMENSION DETAILS OF BOX				
						a	b	c	d	e
1		NEW CONSTRUCTION	R TO L	0°	BOX	2000	2000	300	300	325

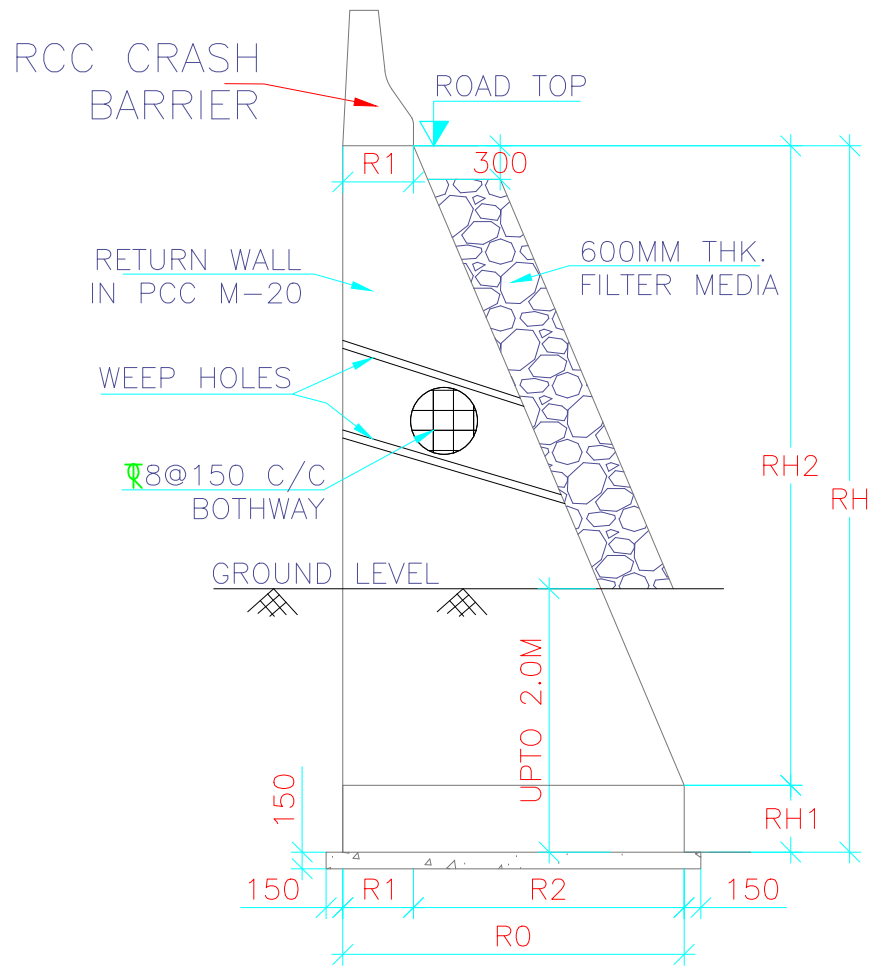
TABLE-2 DIMENSION DETAILS OF PCC RETURN WALL

S. No.	DIMENSION DETAILS(mm)					
	R0	R1	R2	RH	RH1	RH2
1	3450	500	2950	4300	600	3700

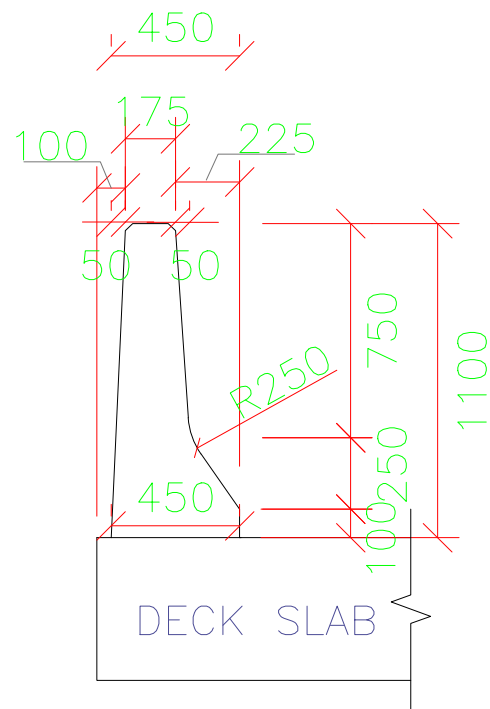


-: CONSULTANTS :-		-: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-:General Arrangement Drawing:-
L.N. MALVIYA INFRA PROJECTS PVT. LTD. T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-1, BHOPAL (M.P.) Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : lninfraprojects@gmail.com		NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)					Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong Haflong Road In The State of Manipur on EPC Mode.	GAD Box-1X2X2
							JIRI RIVER - HANGRUM SECTION (PACKAGE-7)	

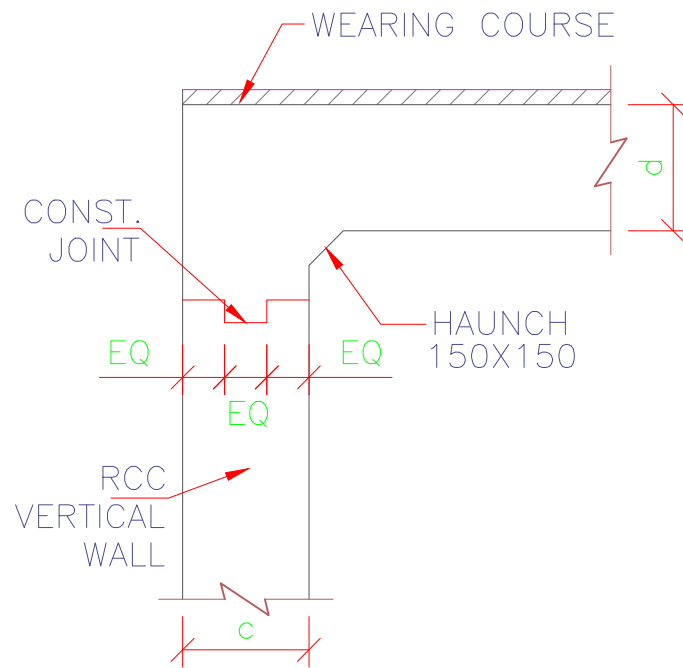




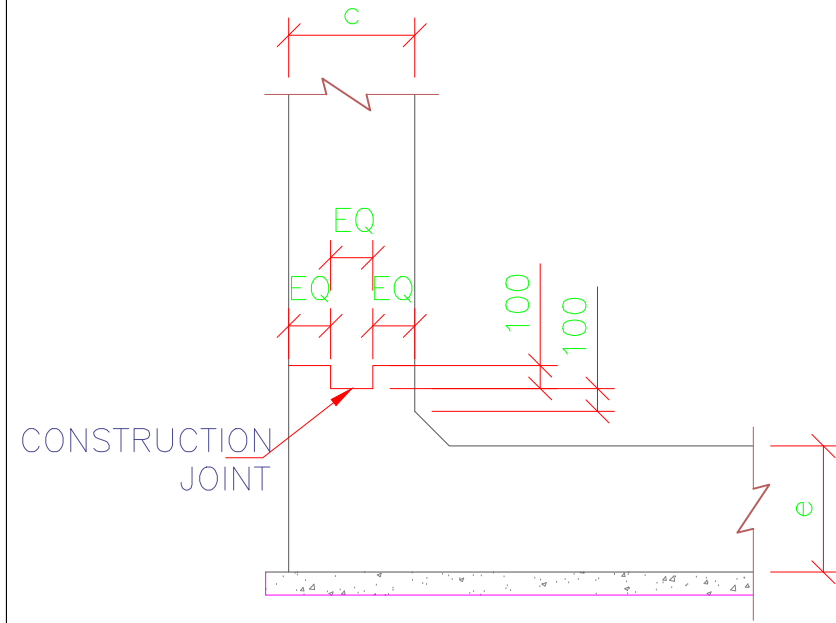
DETAIL OF PCC RETAINING WALL



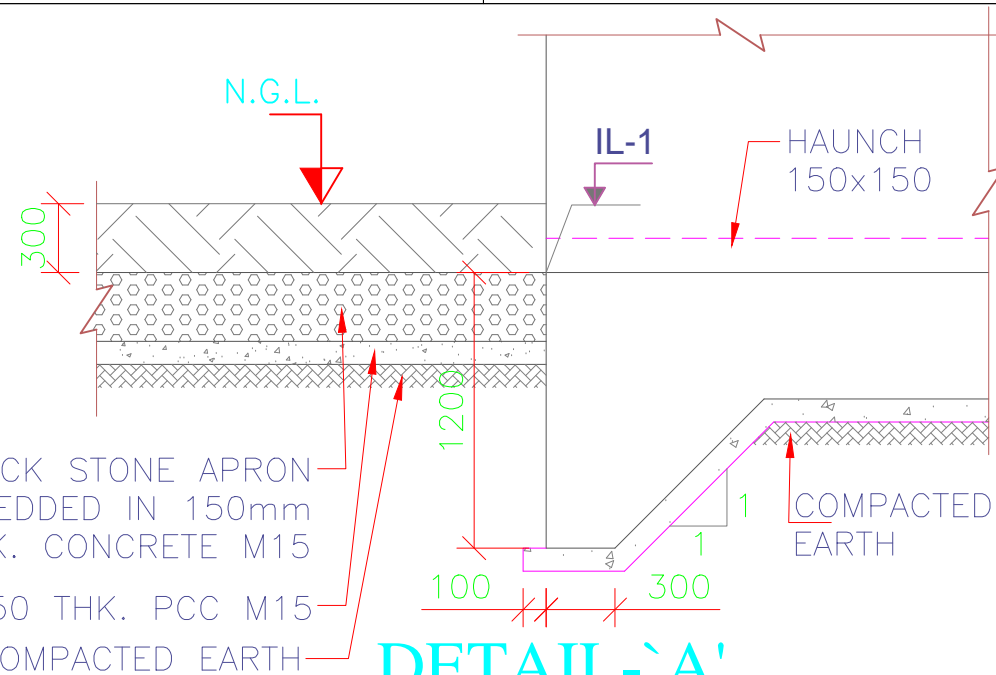
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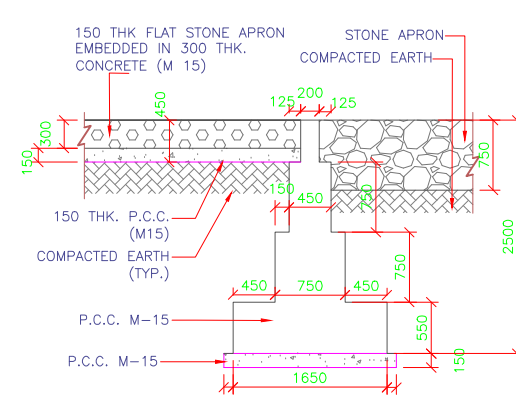
DETAIL-'B'



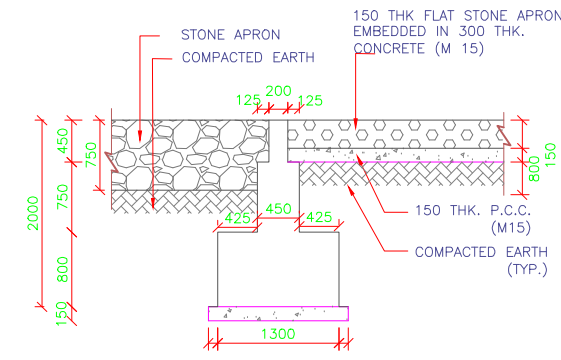
DETAIL-'C'



DETAIL-'A'



DETAIL OF CURTAIN WALL TYPE-I



DETAIL OF CURTAIN WALL TYPE-II

Drawing Change/Rev	PROPOSAL			
	Recommendation on the basis of Reconstruction in etc.	Type of Structure	Span	Max Length
97950	New Construction	BOX	1X2X2	
97950	New Construction	BOX	1X2X2	
98060	New Construction	BOX	1X2X2	
98950	New Construction	BOX	1X2X2	
99060	New Construction	BOX	1X2X2	
99950	New Construction	BOX	1X2X2	
99750	New Construction	BOX	1X2X2	
100040	New Construction	BOX	1X2X2	
100250	New Construction	BOX	1X2X2	
100465	New Construction	BOX	1X2X2	
100750	New Construction	BOX	1X2X2	
101060	New Construction	BOX	1X2X2	
101270	New Construction	BOX	1X2X2	
101520	New Construction	BOX	1X2X2	
101880	New Construction	BOX	1X2X2	
101950	New Construction	BOX	1X2X2	
102010	New Construction	BOX	1X2X2	
102420	New Construction	BOX	1X2X2	
102890	New Construction	BOX	1X2X2	
102950	New Construction	BOX	1X2X2	
103100	New Construction	BOX	1X2X2	
103300	New Construction	BOX	1X2X2	
103550	New Construction	BOX	1X2X2	
103750	New Construction	BOX	1X2X2	
103950	New Construction	BOX	1X2X2	
104150	New Construction	BOX	1X2X2	
104380	New Construction	BOX	1X2X2	
104600	New Construction	BOX	1X2X2	
104930	New Construction	BOX	1X2X2	
105050	New Construction	BOX	1X2X2	
105550	New Construction	BOX	1X2X2	
105750	New Construction	BOX	1X2X2	
105910	New Construction	BOX	1X2X2	
106320	New Construction	BOX	1X2X2	
106950	New Construction	BOX	1X2X2	
107115	Reconstruction	BOX	1X2X2	
107240	Reconstruction	BOX	1X2X2	
107665	Reconstruction	BOX	1X2X2	
107785	Reconstruction	BOX	1X2X2	
107975	New Construction	BOX	1X2X2	
108130	New Construction	BOX	1X2X2	
108345	Reconstruction	BOX	1X2X2	
108860	New Construction	BOX	1X2X2	
108825	New Construction	BOX	1X2X2	
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109455	New Construction	BOX	1X2X2	
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110400	New Construction	BOX	1X2X2	
110715	Reconstruction	BOX	1X2X2	
110855	Reconstruction	BOX	1X2X2	
111220	New Construction	BOX	1X2X2	
111520	Reconstruction	BOX	1X2X2	
112020	Reconstruction	BOX	1X2X2	
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114010	Reconstruction	BOX	1X2X2	
114180	Reconstruction	BOX	1X2X2	
114285	Reconstruction	BOX	1X2X2	
114600	Reconstruction	BOX	1X2X2	
114700	Reconstruction	BOX	1X2X2	
115155	Reconstruction	BOX	1X2X2	

-: CONSULTANTS :-

**L.N. MALVIYA INFRA PROJECTS PVT. LTD.**

T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1,  
M.P. NAGAR, ZONE-I, BHOPAL (M.P.)

Tel./Fax : 0755-4295421,  
Mob.: 09826452711, 09977004686  
E-mail : [lninfra@projects@gmail.com](mailto:lninfra@projects@gmail.com)



-: CLIENT :-

**NATIONAL HIGHWAYS INFRASTRUCTURE  
DEVELOPMENT CORPORATION LIMITED (NHIDCL)**



DRG. NO. :

DESIGNED BY.

APPROVED BY.

-: PROJECT TITLE :-

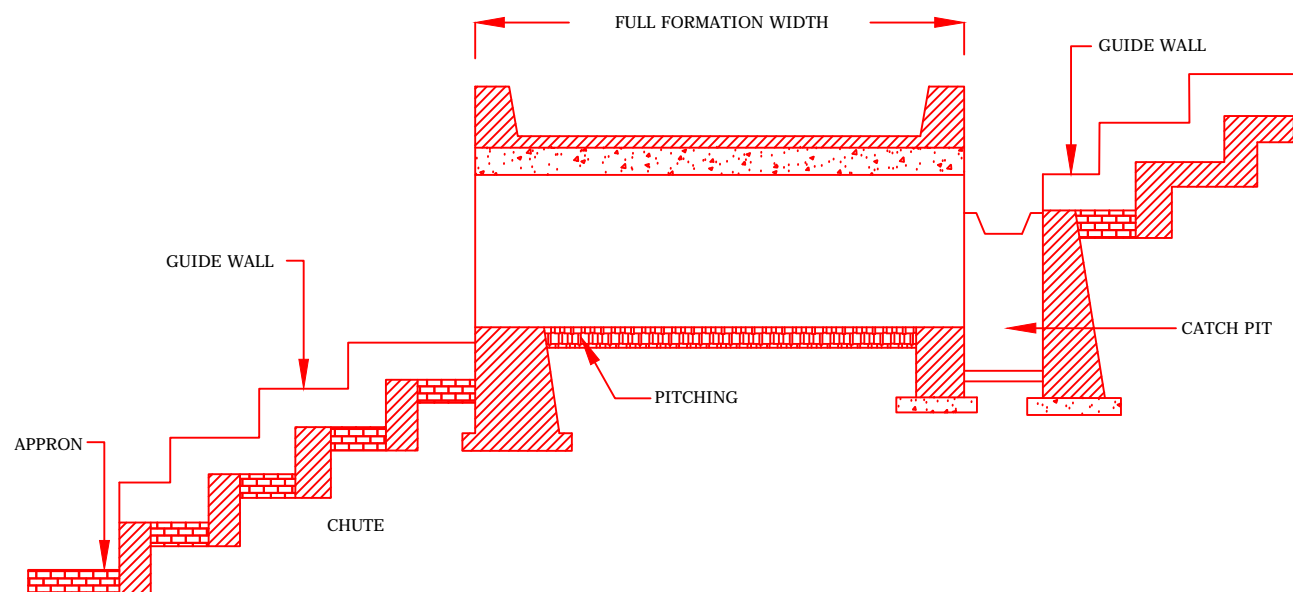
Consultancy Services for Preparation of Feasibility Study  
and Detailed Project Report For Two lane With Paved  
Shoulders of Tamenglong Haflong Road In The State of  
Manipur on EPC Mode.

-:General Arrangement Drawing:-

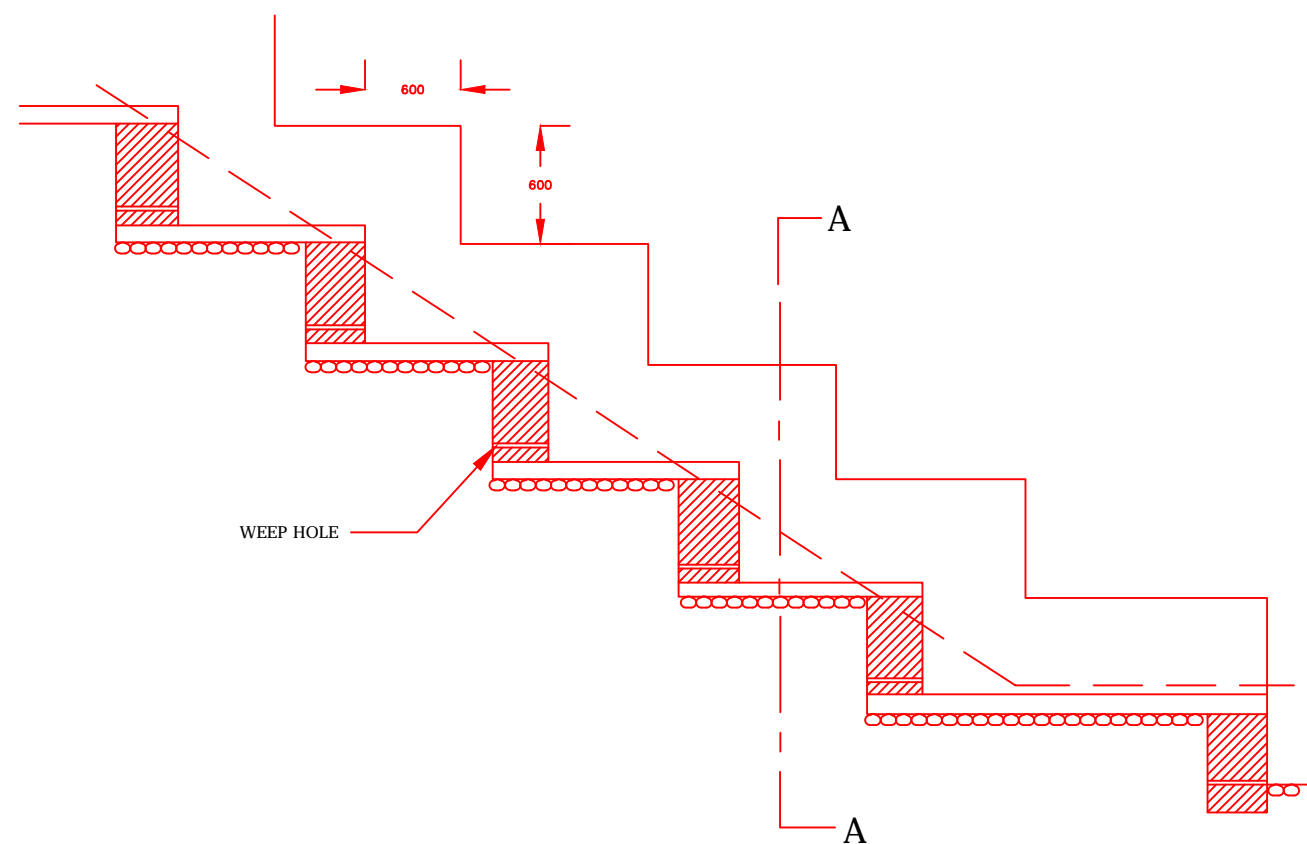
GAD Box-1X2X2

**JIRI RIVER - HANGRUM SECTION  
(PACKAGE-7)**

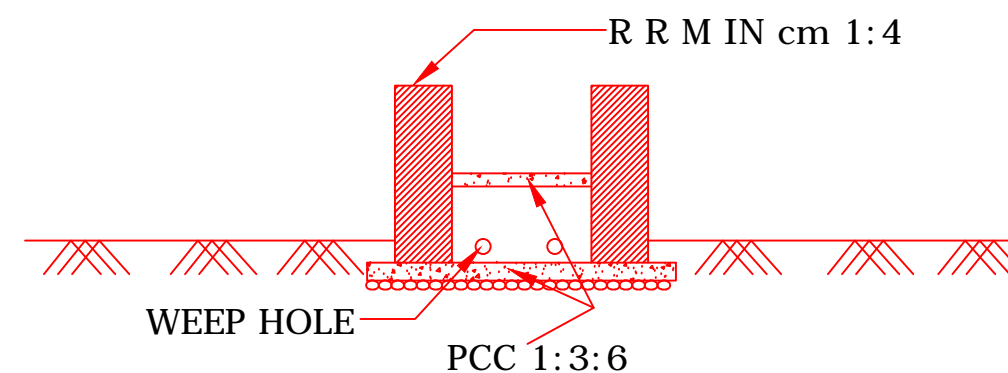




CULVERT WITH CATCH PIT, CHUTE, GUIDE WALL AND APRON





LONGITUDINAL SECTION OF CHUTE



CROSS SECTION A - A

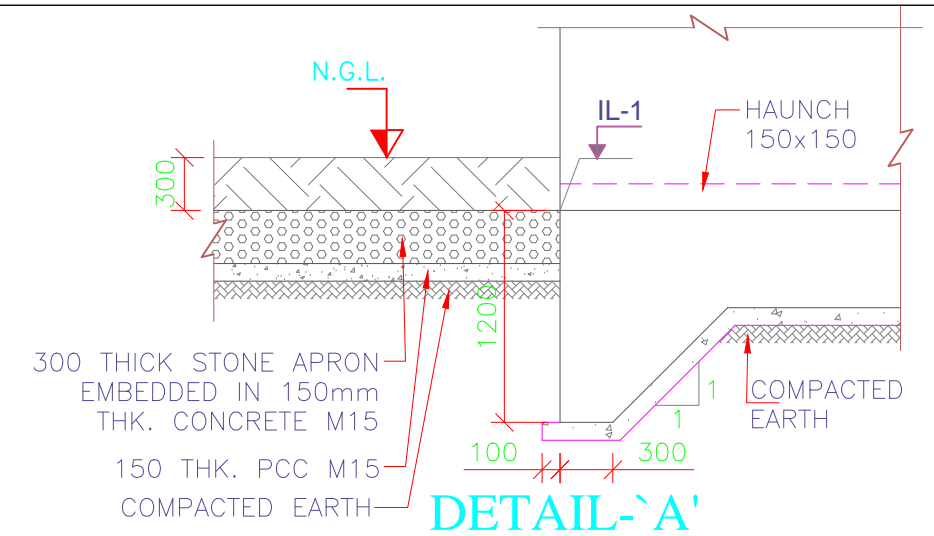
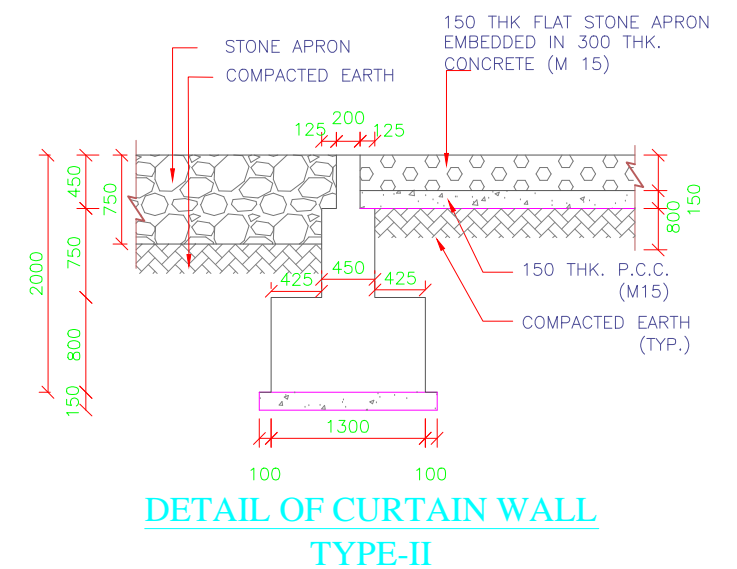
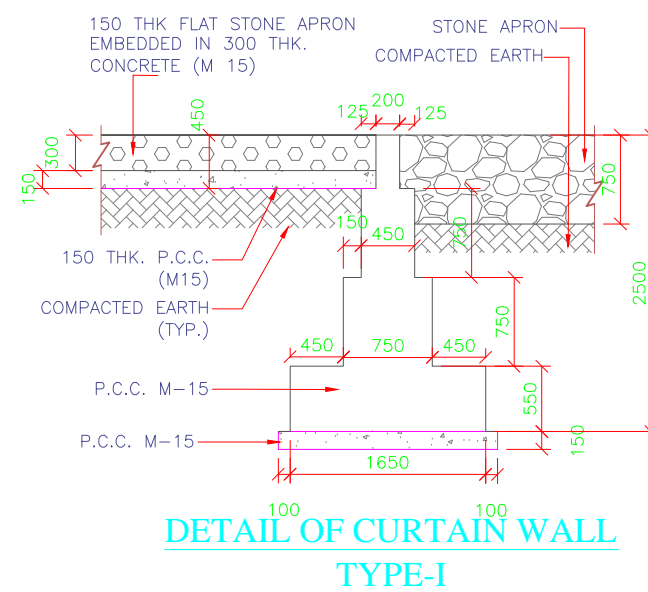
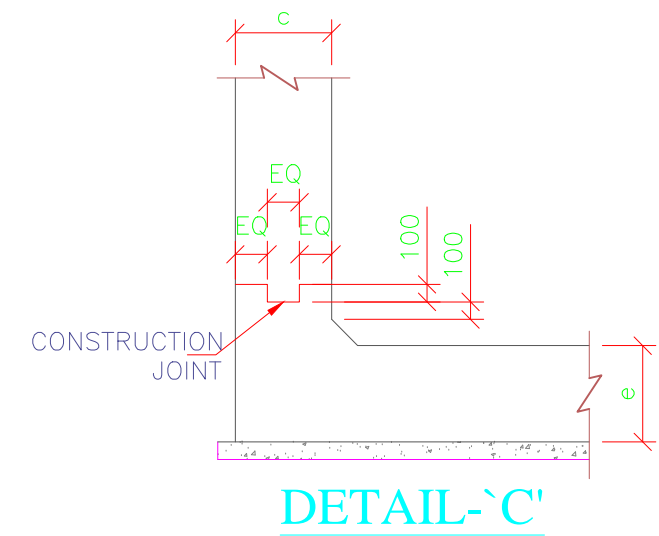
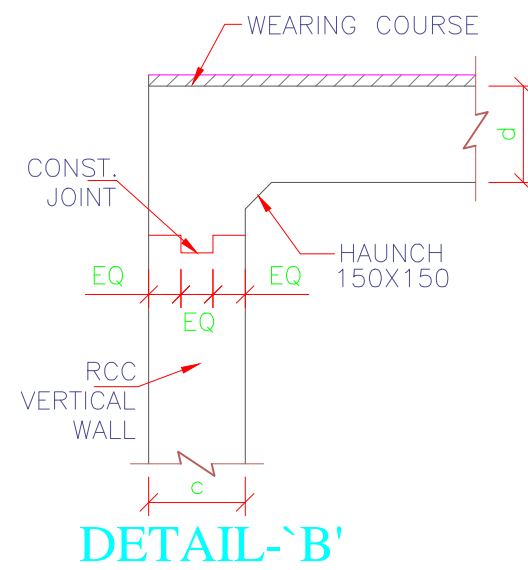
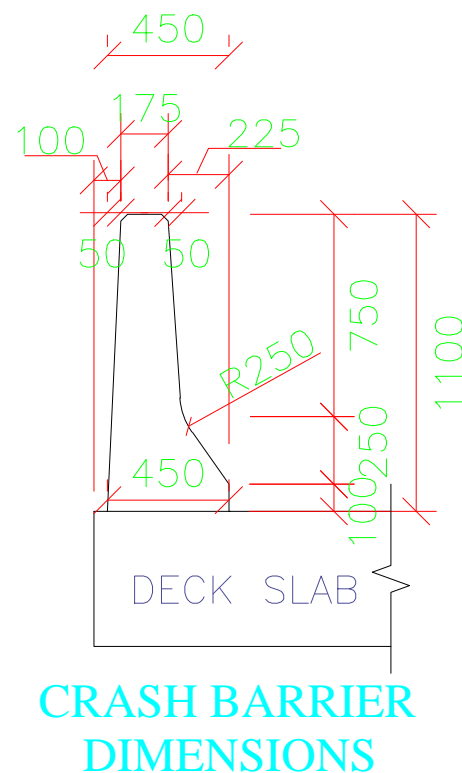
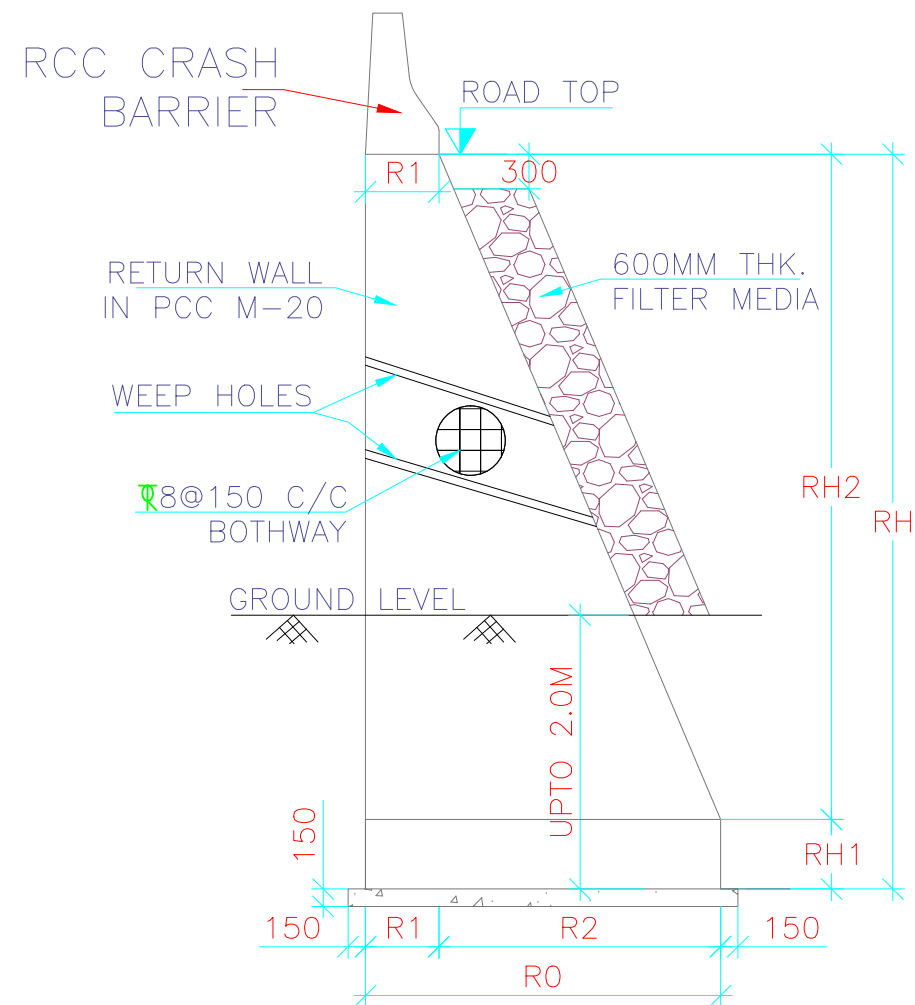
CROSS SECTION OF CHUTE



-: CONSULTANTS :-		-: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-:General Arrangement Drawing:-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.) 		<b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b> 					Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong Haflong Road In The State of Manipur on EPC Mode.	GAD Box-1X2X2 <b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b>
Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfraprojects@gmail.com">lninfraprojects@gmail.com</a>								



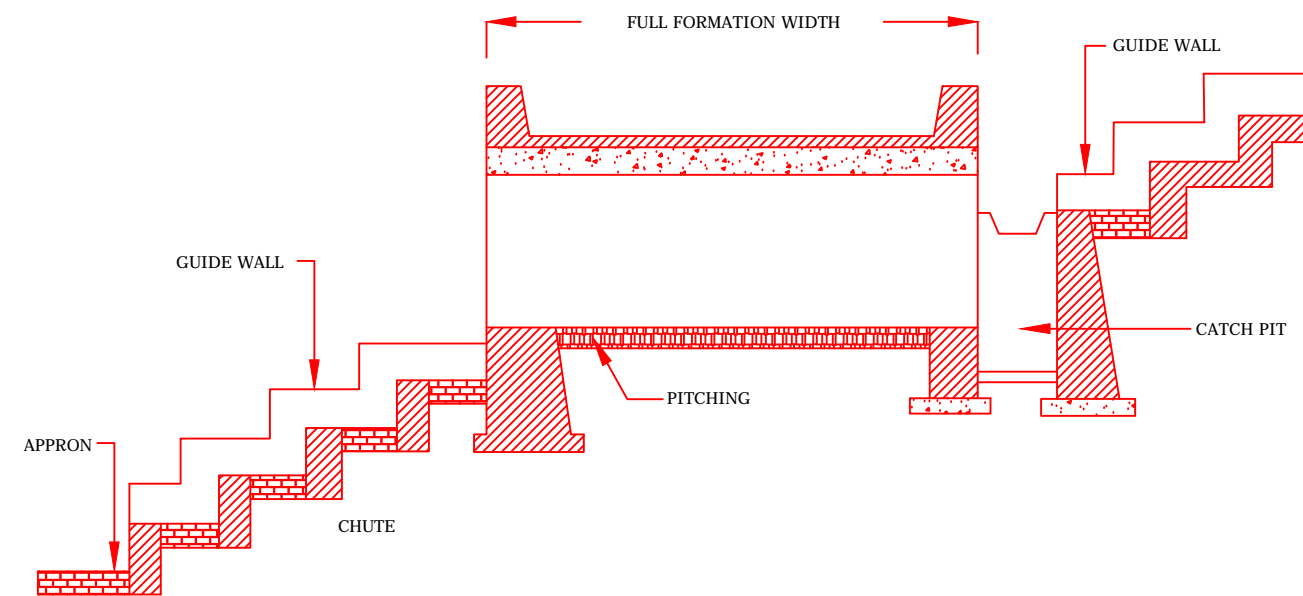




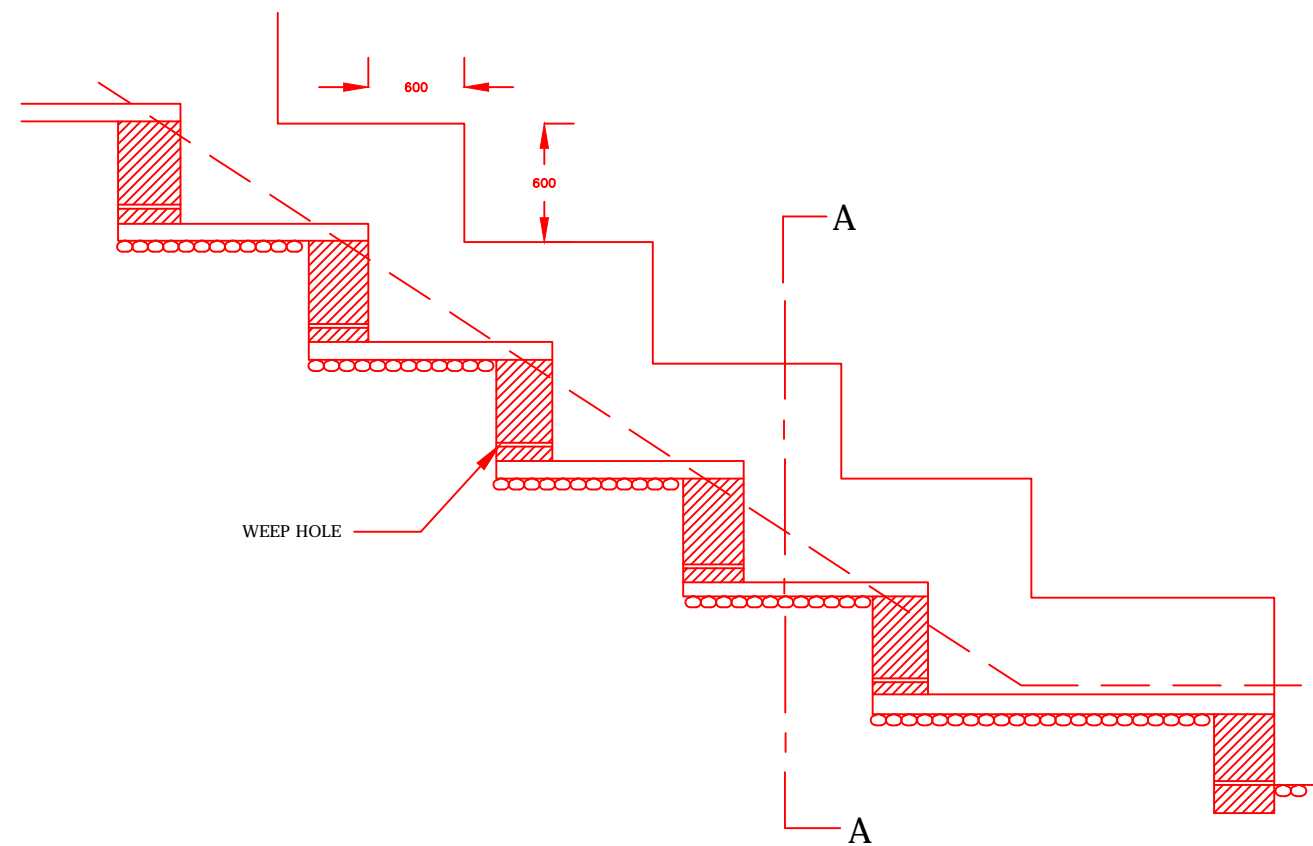


<p align="center">-: CONSULTANTS :-</p> <p><b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b></p> <p>T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)</p> <div>  <p>Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfraprojects@gmail.com">lninfraprojects@gmail.com</a></p> </div>		<p align="center">-: CLIENT :-</p> <p align="center"><b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b></p> <div>  </div>		<p align="center">DRG. NO. :</p>	<p align="center">DESIGNED BY.</p>	<p align="center">APPROVED BY.</p>	<p align="center">-: PROJECT TITLE :-</p> <p>Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong Haflong Road In The State of Manipur on EPC Mode.</p>	<p align="center">-:General Arrangement Drawing:-</p> <p align="center">BOX CULVERT    Span-1No. 3X3</p> <p align="center"><b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b></p>
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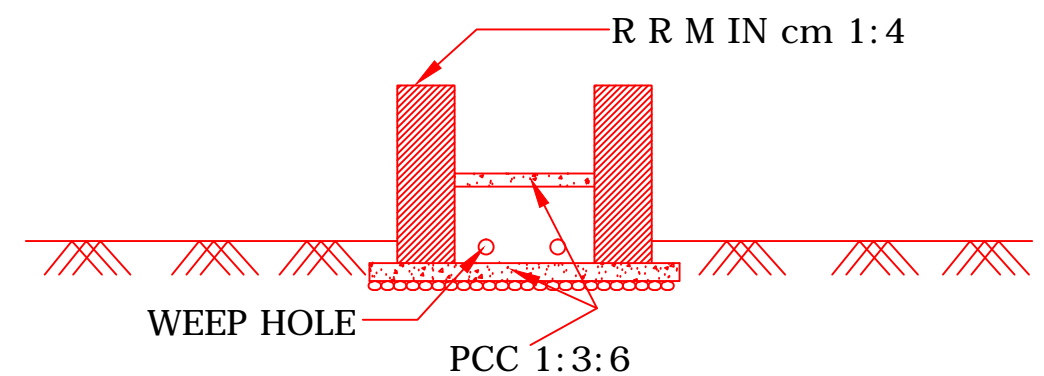




CULVERT WITH CATCH PIT, CHUTE, GUIDE WALL AND APPRON





LONGITUDINAL SECTION OF CHUTE

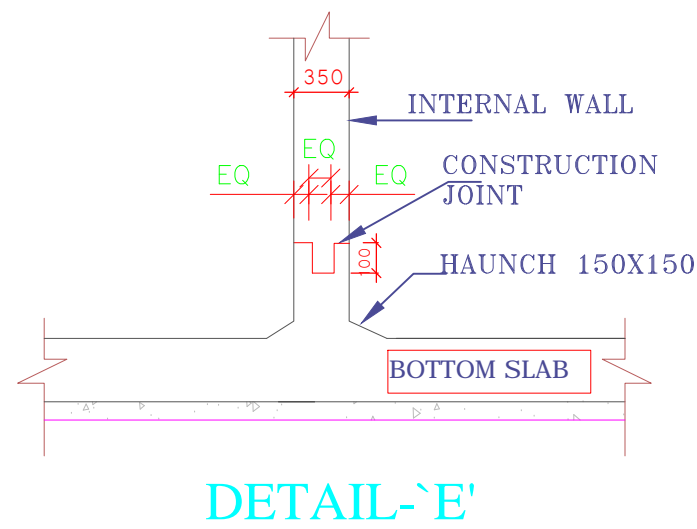
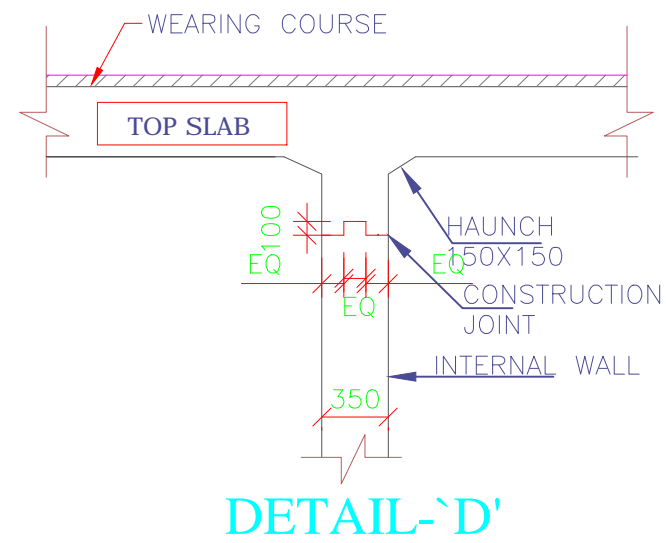
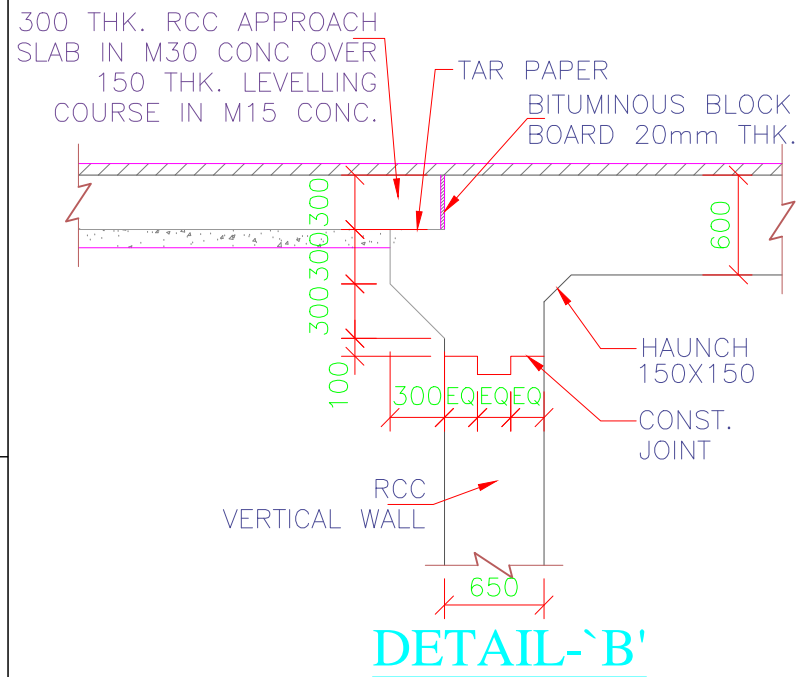
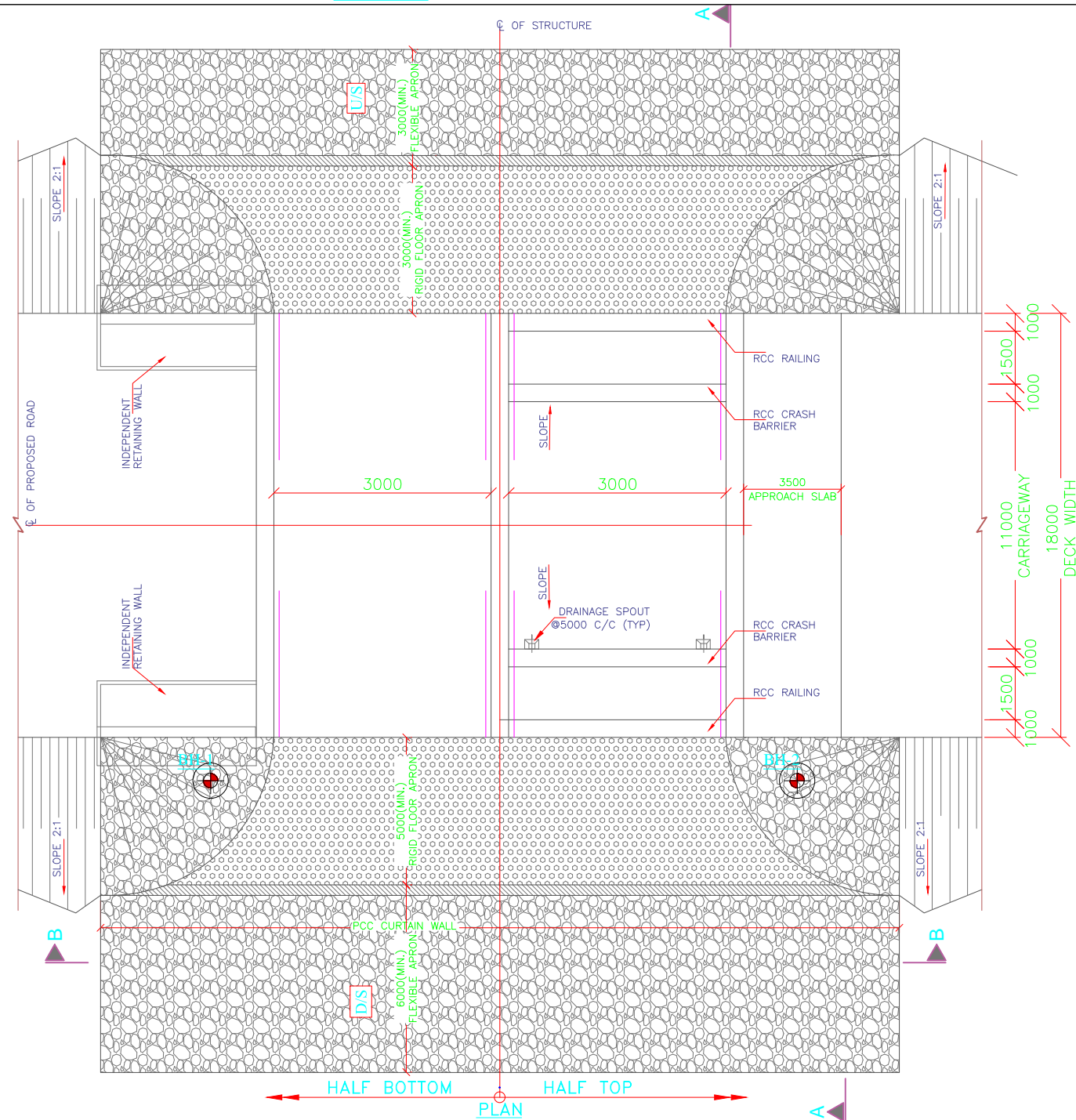
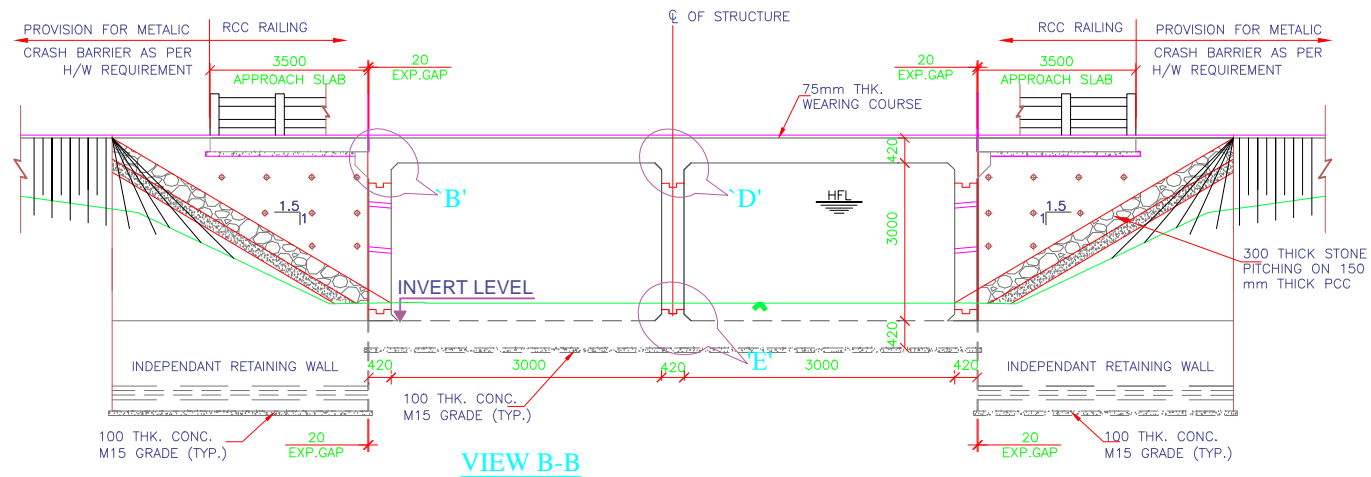


CROSS SECTION A - A

CROSS SECTION OF CHUTE

-: CONSULTANTS :-		-: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-:General Arrangement Drawing:-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.) 		 <b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b>					Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong Haflong Road In The State of Manipur on EPC Mode.	BOX CULVERT    Span-1No. 3X3  <b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b>
Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@projects@gmail.com">lninfra@projects@gmail.com</a>								





#### NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS ARE IN METER UNLESS MENTIONED OTHERWISE.
- DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- THE SAFE BEARING CAPACITY ASSUMED IN THE DESIGN IS 15T/M<sup>2</sup>. THIS SBC SHOULD BE VERIFIED AT SITE BEFORE EXECUTION. ANY VARIATION ON SITE SHOULD BE INFORMED TO THE DESIGN ENGINEER FOR NECESSARY ACTION.
- GRADE OF UNTENSIONED STEEL SHALL BE Fe 500, CONFIRMING TO IS:1786.
- CONCRETE SHALL BE OF DESIGN MIX AND SHALL HAVE MINIMUM 28 DAYS CHARACTERISTIC CUBE STRENGTH AS FOLLOWS:-
  - RCC BOX .....M30
  - RCC CRASH BARRIER/RAILING.....M40
  - RCC RETAINING WALL.....M30
  - PCC LEVELING COURSE.....M15
- THE RCC BOX SHOULD BE CONSTRUCTED FIRST AND THE SIDE FILLING & COMPACTION SHALL BE DONE AS PER MoRTH SPECIFICATIONS.
- THE BACKFILL MATERIAL BEHIND RCC BOX/RETAINING WALL SHALL HAVE FOLLOWING PROPERTIES  $\phi=30^\circ$ ,  $\gamma=2.0$  T/Cum
- DETAIL OF CAMBER/SUPER ELEVATION MAY BE VERIFIED WITH LATEST PLAN AND PROFILE DRAWING.
- FLOW DIRECTION SHOULD BE VERIFIED ON SITE BEFORE EXECUTION OF WORK. BED PROTECTION FOR UPSTREAM AND DOWN STREAM SHALL BE BASED ON THE FLOW DIRECTION IN SITE.
- FLEXIBLE APRON SHALL BE PROVIDED AS PER THE SPECIFICATION/DETAILS MENTIONED IN PLATE-22 OF IRC:SP:13-2004.
- DISCREPANCY IF ANY IS TO BE IMMEDIATELY BROUGHT IN TO THE NOTICE OF ENGINEER FOR NECESSARY MODIFICATION IN THE DRAWING.
- FOR THE PROPOSED BOX CULVERT, THE FLOW DIRECTION SHALL BE PROVIDED IN RETAINING WALL.
- 600mm THK. FILTER MEDIA SHALL BE PROVIDED BEHIND RETAINING WALL.
- ALL LEVELS SHOWN IN THIS DRAWING SHOULD BE VERIFIED AT SITE RESPECT TO PLAN & PROFILE BEFORE EXECUTION OF WORK.
- DIMENSIONS OF STRUCTURE ARE TENTATIVE AND SUBJECTED TO CHANGE ON DETAIL DESIGN.
- SHEAR KEY & CURTAIN WALL ARE NOT REQUIRED IF HARD ROCK IS FOUND AT GROUND LEVEL.

#### LEGEND:-

FRL	-	FINISHED ROAD LEVEL
GL	-	GROUND LEVEL
LVL	-	LEVEL
IL	-	INVERT LEVEL
FL	-	FOUNDING LEVEL
MSL	-	MAXIMUM SCOUR LEVEL
BH	-	BORE HOLE
*	-	AS PER HIGHWAY PROFILE
	-	BORE HOLE LOCATION

TABLE-1 SCHEDULE OF BOX CULVERT

S. No.	DESIGN CH: SCHEDULE	DESIGN CH: AS PER HIGHWAY	PROPOSAL	DIRECTION OF FLOW	SKEW ANGLE	TYPE	PROPOSED DETAILS				
							DIMENSION DETAILS OF BOX				
1			NEW CONSTRUCTION	R TO L	6°	BOX	a	b	c	d	e

TABLE-2 DIMENSION DETAILS OF PCC RETURN WALL

S. No.	DIMENSION DETAILS(mm)					
	R0	R1	R2	RH	RH1	RH2
1	4950	500	3950	6500	600	5900

GENERAL ARRANGEMENT DRAWING FOR BOX CULVERT AT CH. 116+435

#### :- CONSULTANTS :-

L.N. MALVIYA INFRA PROJECTS PVT. LTD.

T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-1, BHOPAL (M.P.)



Tel./Fax : 0755-4295421,  
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E-mail : lninfra@projects@gmail.com

#### :- CLIENT :-

NATIONAL HIGHWAYS INFRASTRUCTURE  
DEVELOPMENT CORPORATION LIMITED (NHIDCL)



#### DRG. NO. :

#### DESIGNED BY.

#### APPROVED BY.

#### :- PROJECT TITLE :-

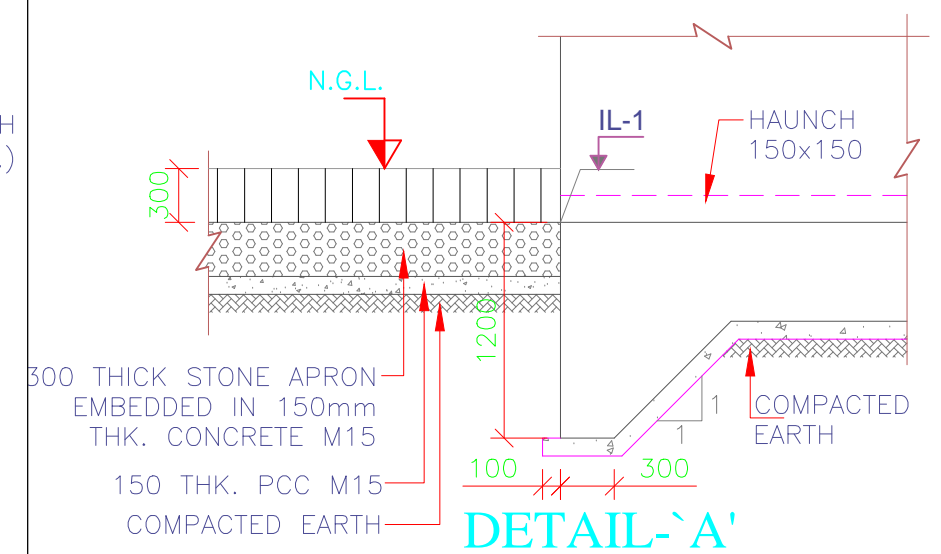
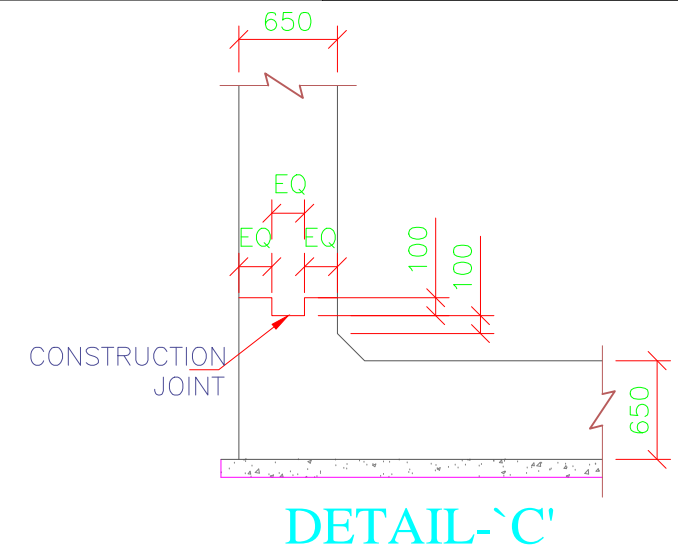
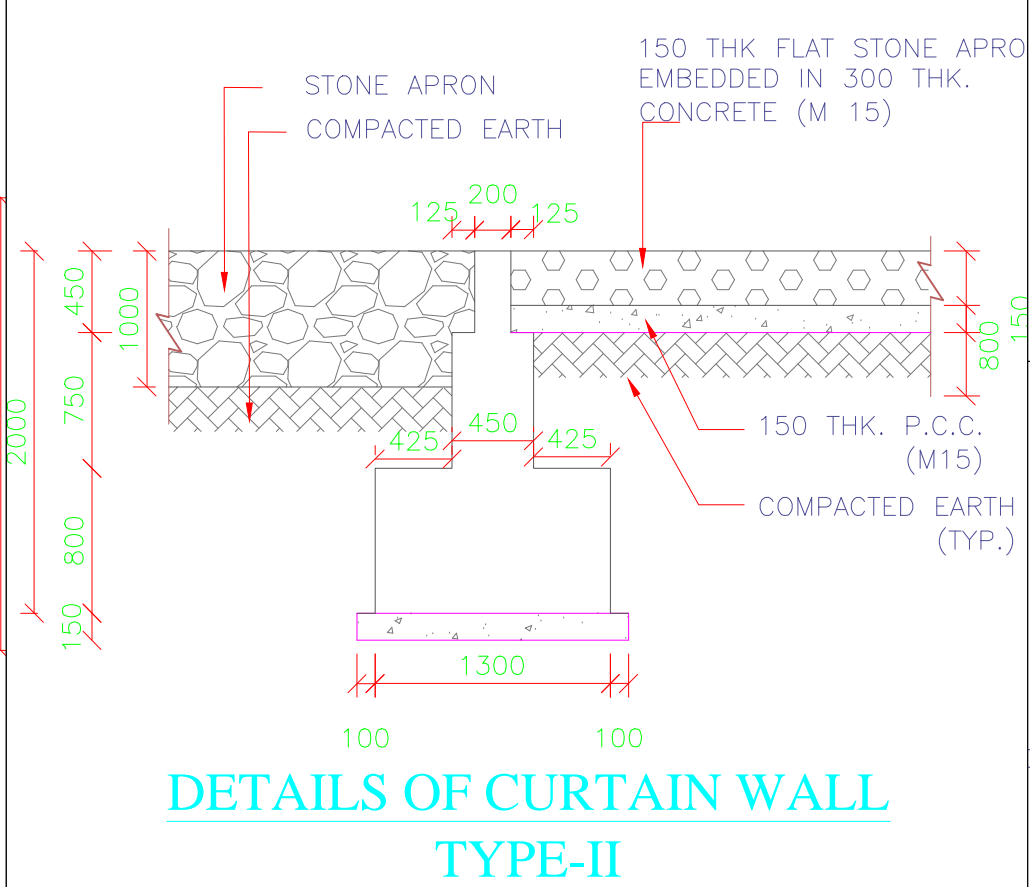
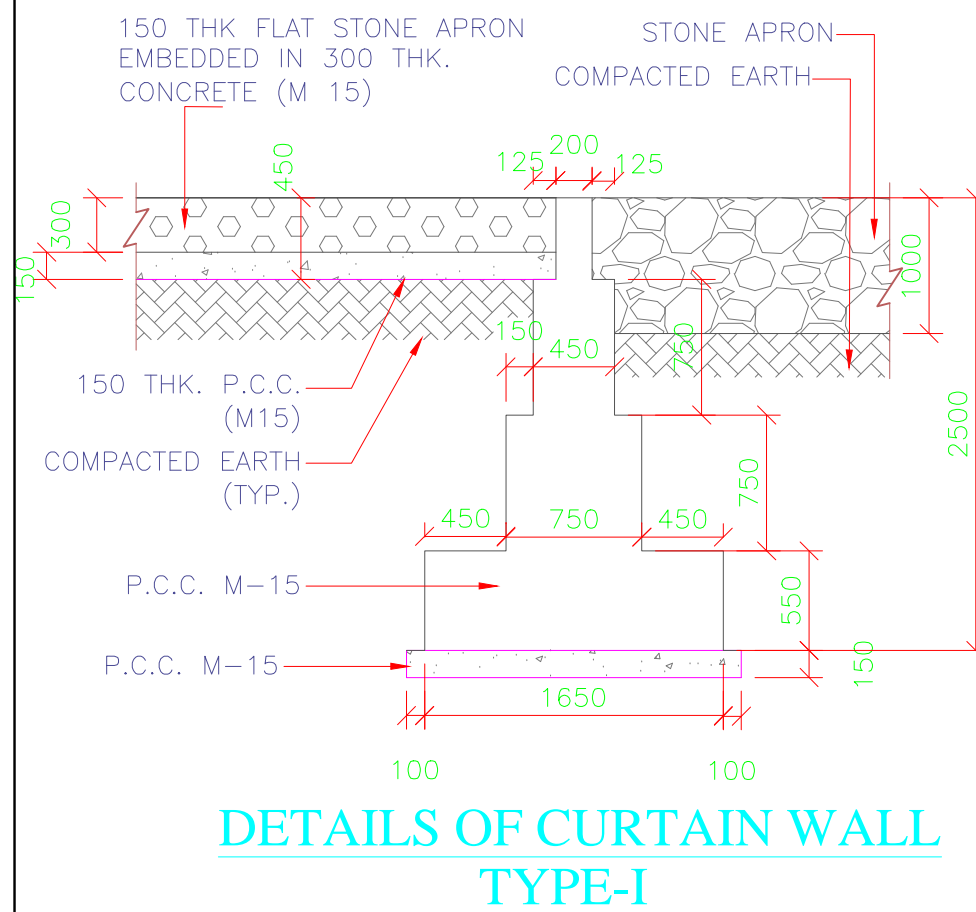
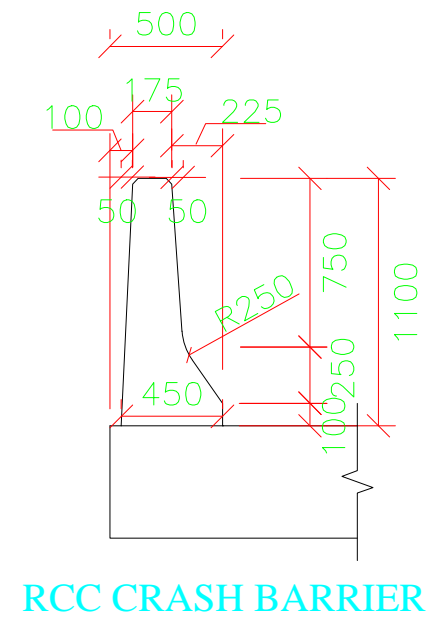
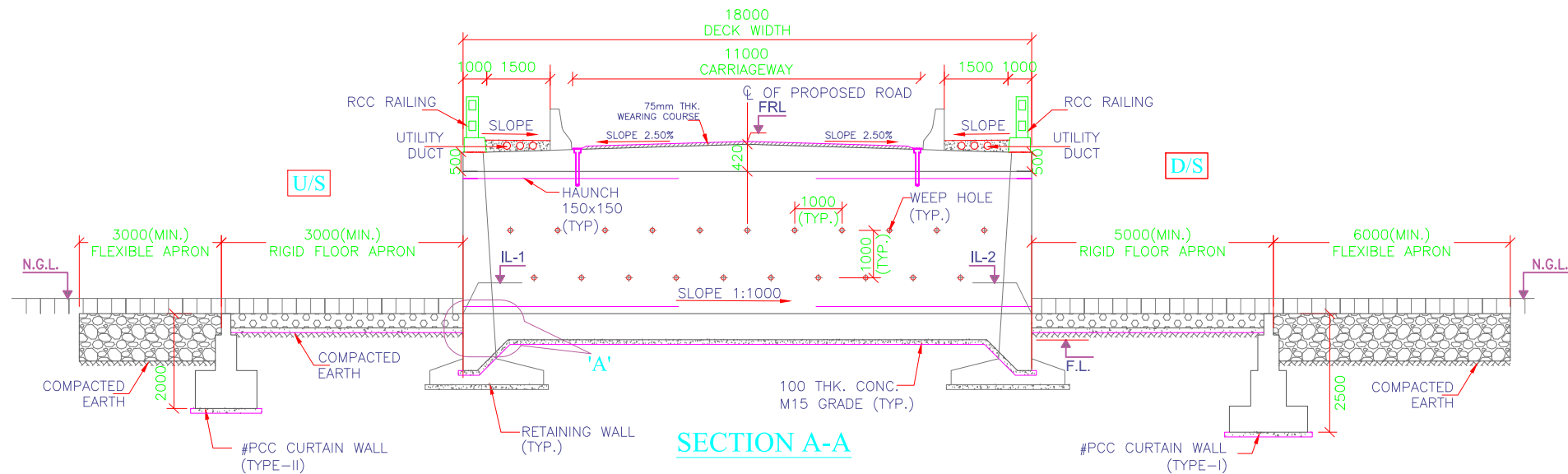
Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Mahur Road(NH-137) In The State of Manipur & Assam on EPC Mode.

#### :-General Arrangement Drawing:-

BOX MNB Span-2No. X3X3

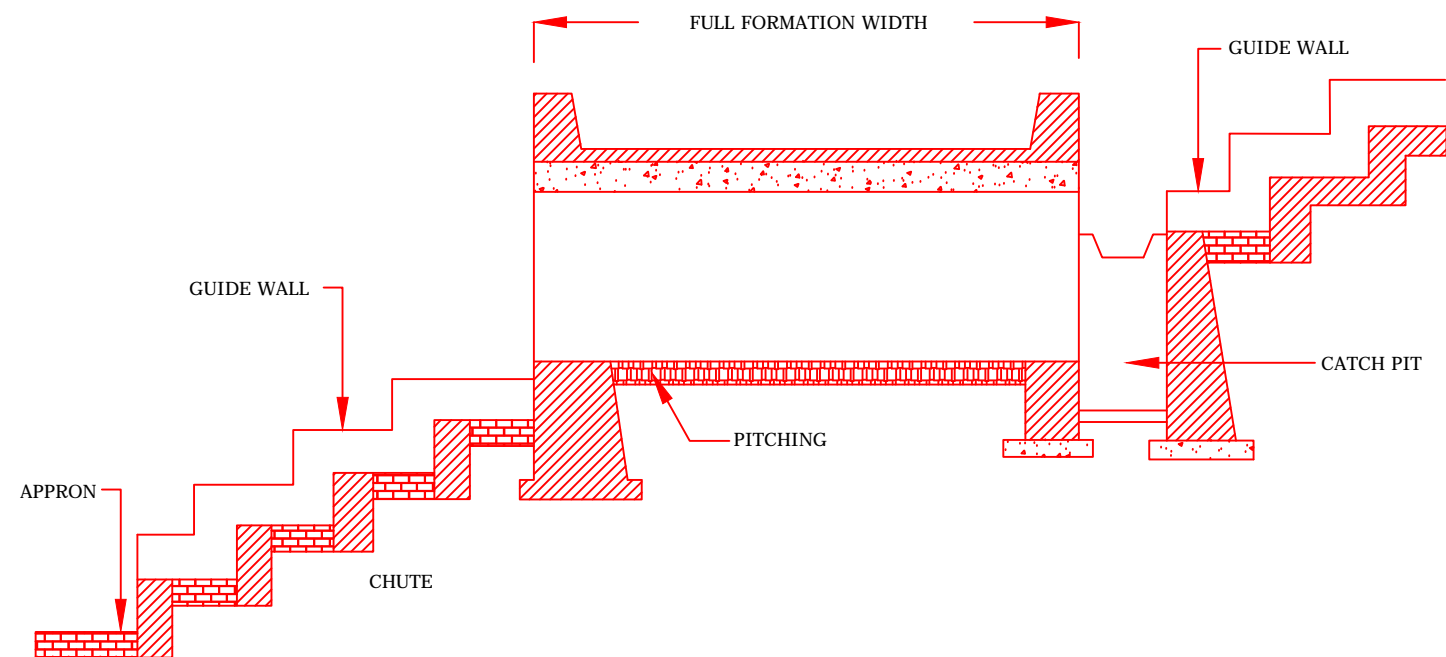
JIRI RIVER - HANGRUM SECTION  
(PACKAGE-7)



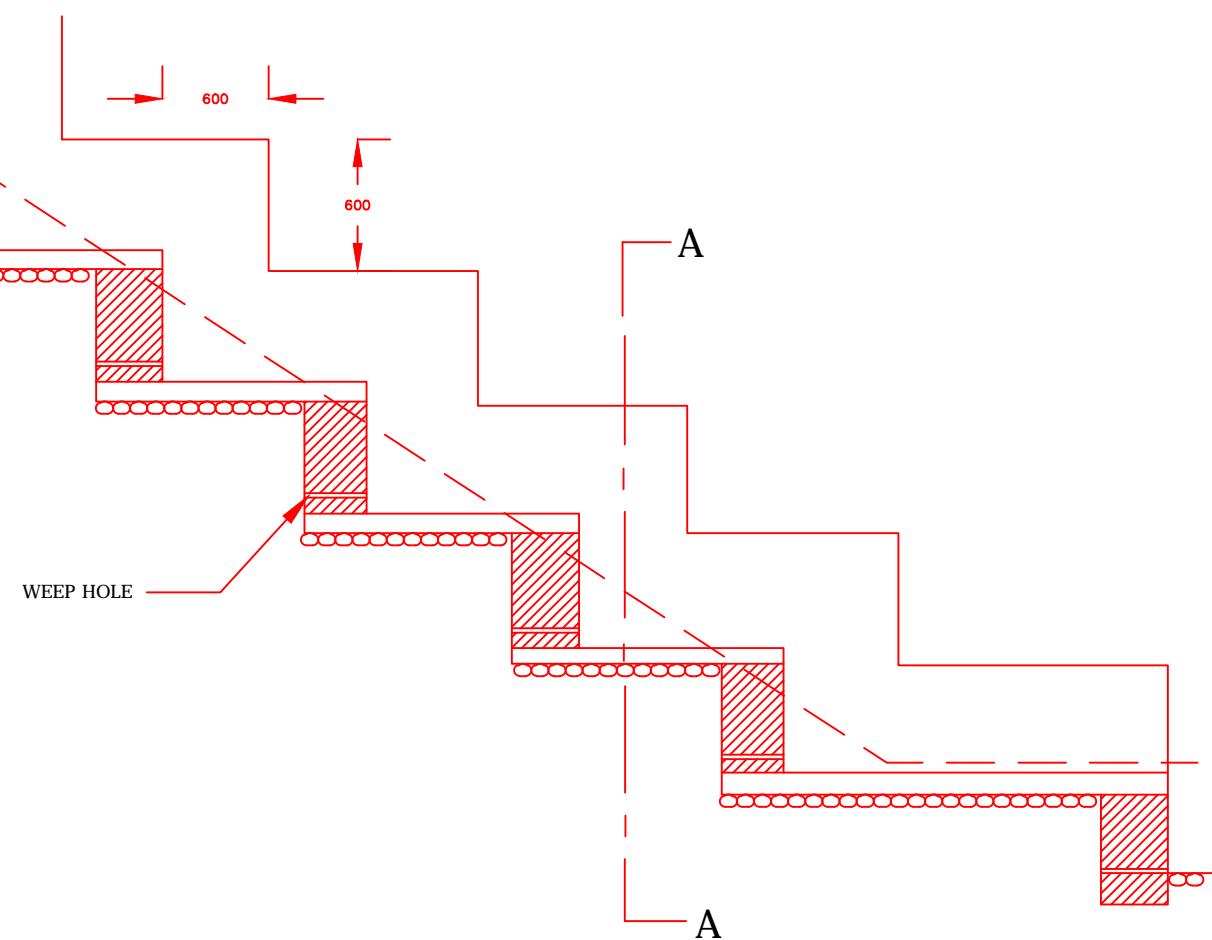


:- CONSULTANTS :-		:- CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	:- PROJECT TITLE :-		:-General Arrangement Drawing:-	
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.) Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@lninfra.com">lninfra@lninfra.com</a>		<b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b>					Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Mahur Road(NH-137) In The State of Manipur & Assam on EPC Mode.		<b>BOX MNB Span-2No. X3X3</b> <b>JIRI RIVER - HANGRUM SECTION</b> <b>(PACKAGE-7)</b>	

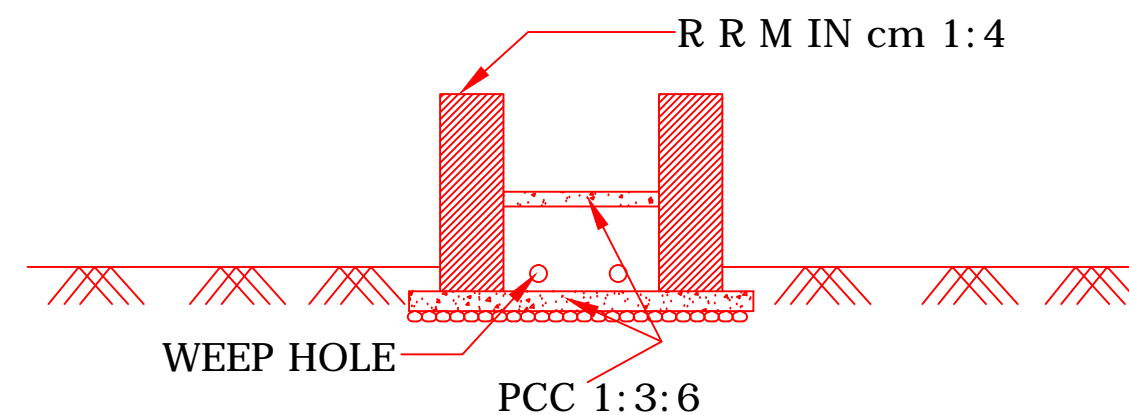




CULVERT WITH CATCH PIT, CHUTE, GUIDE WALL AND APRRON





LONGITUDINAL SECTION OF CHUTE



CROSS SECTION A - A

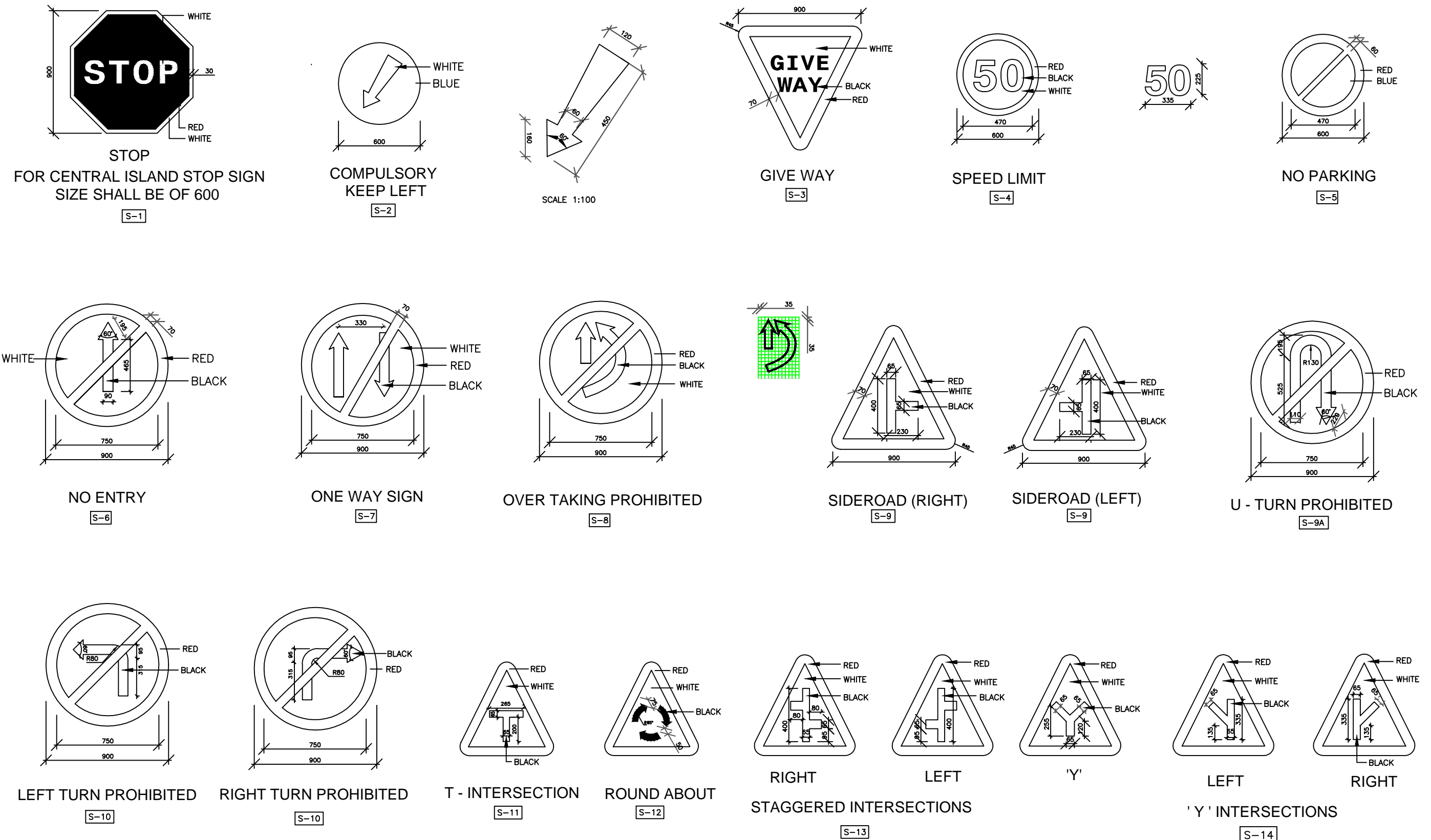
CROSS SECTION OF CHUTE

-: CONSULTANTS :-		-: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-:General Arrangement Drawing:-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-1, BHOPAL (M.P.) 		<b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b> 					Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Mahur Road(NH-137) In The State of Manipur & Assam on EPC Mode.	BOX MNB Span-2No. X3X3  <b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b>





## **6. TRAFFIC SIGNS & MISC DRAWINGS**



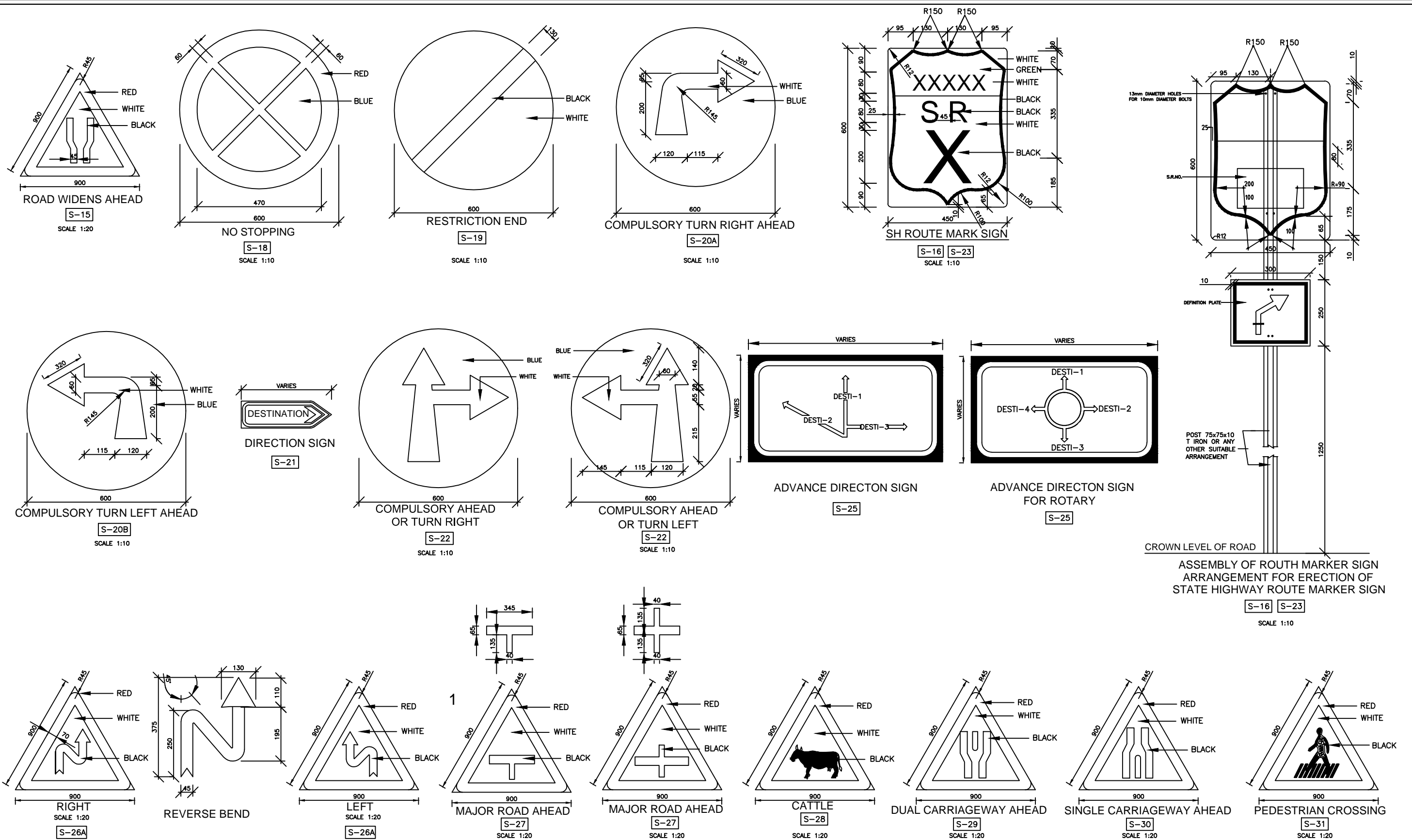


**Notes :**

- ALL THE DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE SPECIFIED.
- RETROREFLECTORISED SHEETING SHALL BE CONFORMING TO ASTM D-4956-01, TYPE VIII OR TYPE IX.
- SIGNS SHALL BE ERECTED AS PER DRAWING NO. ADB/MPDCSP/PH-II/P-ALL/05

-: CONSULTANTS :-		-: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-:TRAFFIC SIGNS:-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)  Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfraprojects@gmail.com">lninfraprojects@gmail.com</a>		<b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b> 		1			CConsultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Haflong Road In The State of Manipur on EPC Mode.	<b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b>





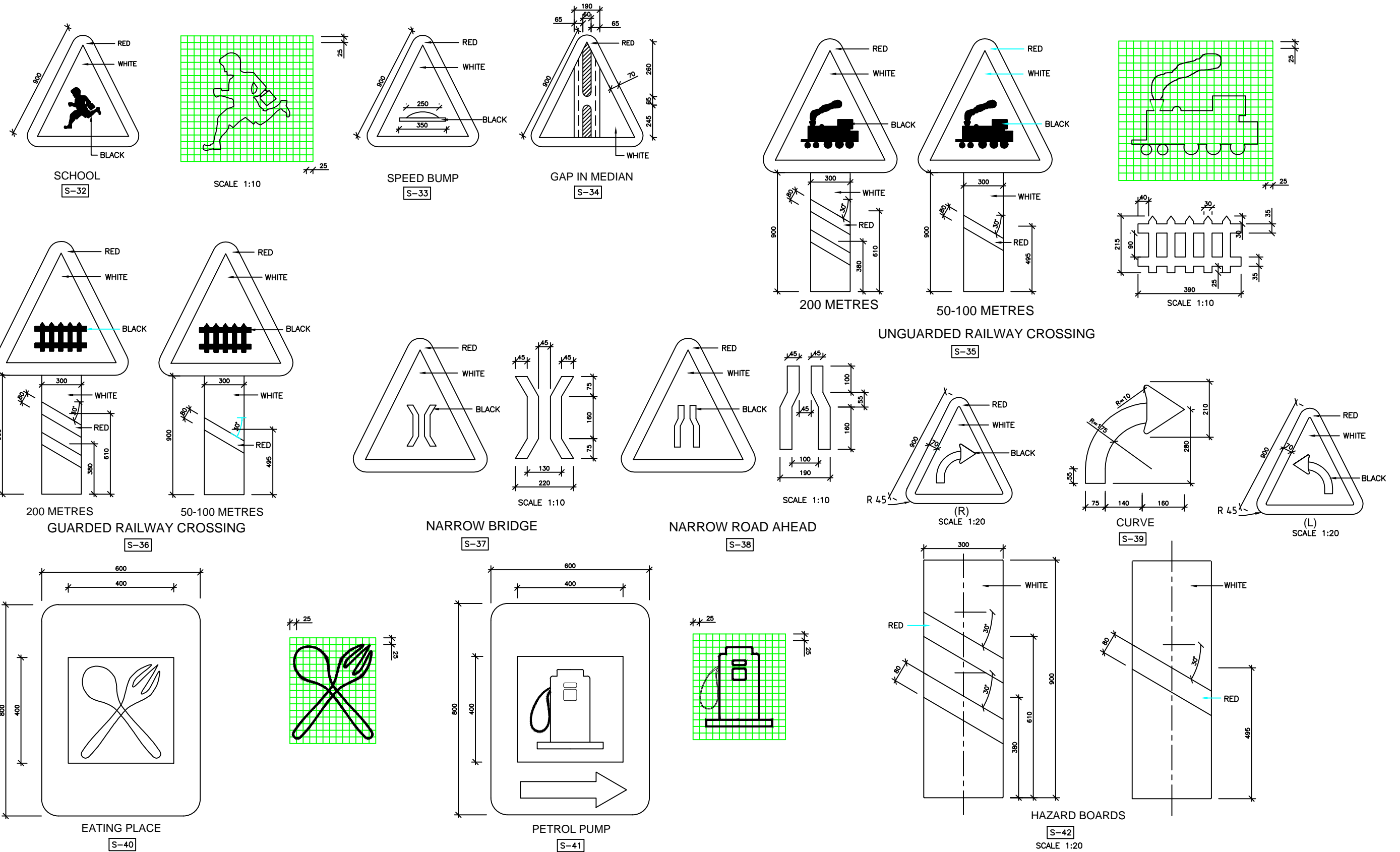
#### Notes :

- ALL THE DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE SPECIFIED.
- RETROREFLECTORISED SHEETING SHALL BE CONFORMING TO ASTM D-4956-01, TYPE VIII OR TYPE IX.

- SIGNS SHALL BE ERECTED AS PER DRAWING NO. ADB/MPDCSP/C/M/TYP-06

CONSULTANTS :-	CLIENT :-	DRG. NO. :	DESIGNED BY.	APPROVED BY.	PROJECT TITLE :-	TRAFFIC SIGNS:-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.) Tel/Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfraprojects@gmail.com">lninfraprojects@gmail.com</a>	<b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b>	2			Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Haflong Road In The State of Manipur on EPC Mode.	<b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b>



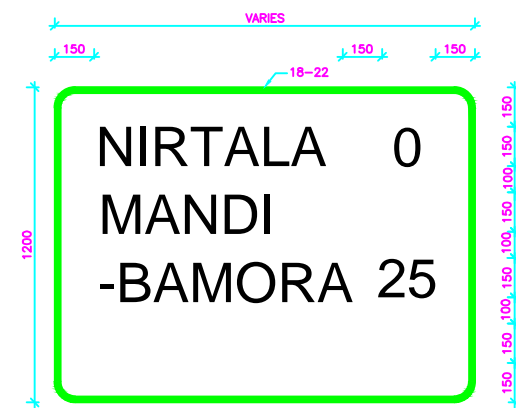


#### Notes :

- ALL THE DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE SPECIFIED.
- RETROREFLECTORISED SHEETING SHALL BE CONFORMING TO ASTM D-4956-01, TYPE VIII OR TYPE IX.
- SIGNS SHALL BE ERECTED AS PER DRAWING NO. ADB/MPDCSP/PH-II/P-ALL/05

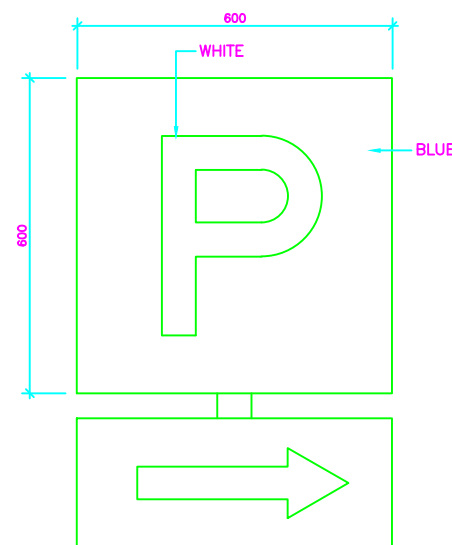
CONSULTANTS :-	CLIENT :-	DRG. NO. :	DESIGNED BY.	APPROVED BY.	PROJECT TITLE :-	TRAFFIC SIGN :-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.) Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@lninfra.com">lninfra@lninfra.com</a>	<b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b>	3			Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Haflong Road In The State of Manipur on EPC Mode.	<b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b>





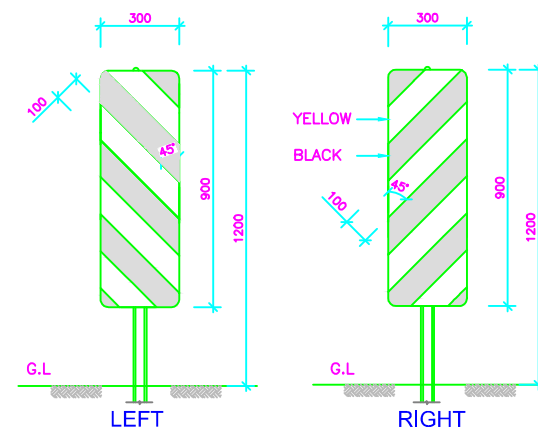
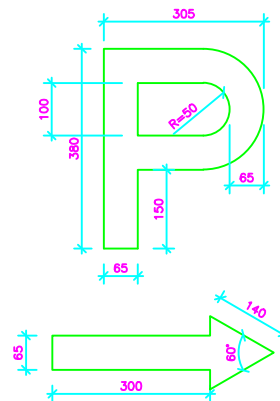
DESTINATION SIGN

S-43



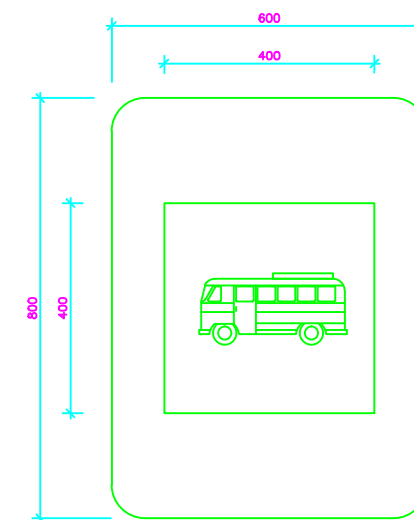
PARKING

S-44



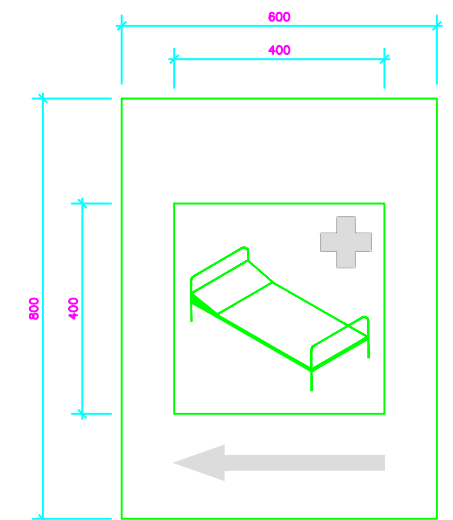
OBJECT HAZARD MARKERS

S-45  
SCALE 1:20



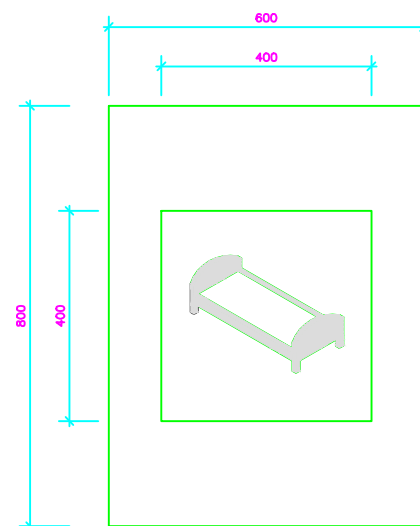
BUS STOP

S-46



HOSPITAL SIGN

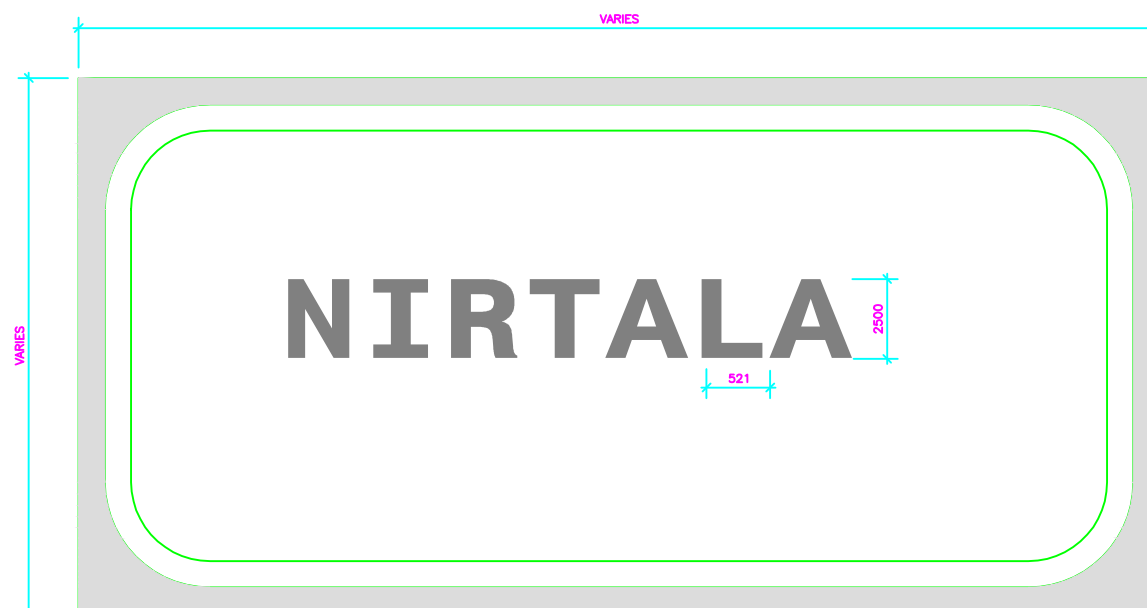
S-47  
SCALE 1:10



RESTING PLACE SIGN

S-48

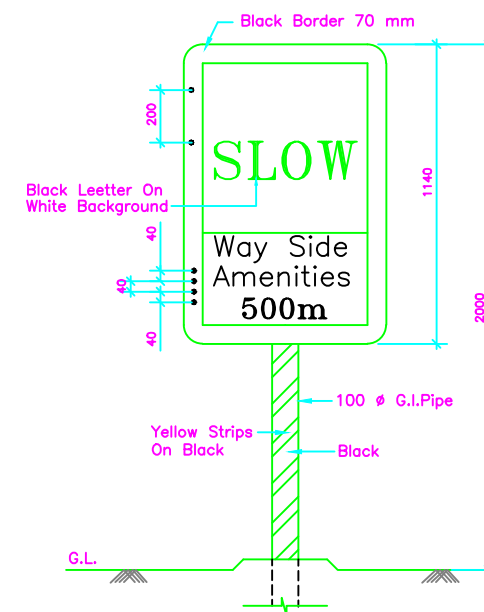
SCALE 1:10



PLACE IDENTIFICATION SIGN

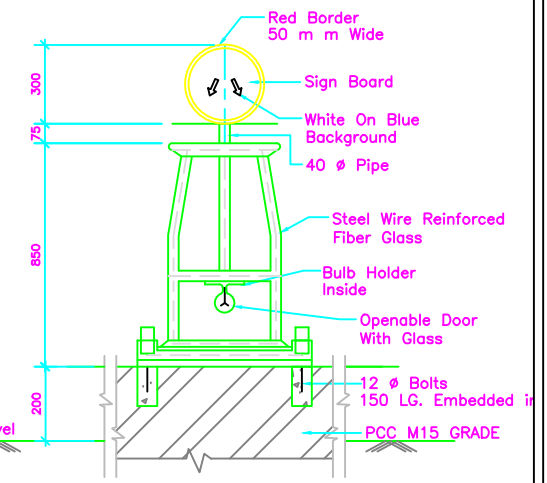
S-49

SCALE 1:10



ROAD SIGN TO BE PLACED AT 500M AHEAD

S-50  
SCALE 1:20



TYPICAL DETAILS OF BOLLARD

S-51  
SCALE 1:20

Notes :

1. ALL THE DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE SPECIFIED.
2. RETROREFLECTORISED SHEETING SHALL BE CONFORMING TO ASTM D-4956-01, TYPE VIII OR TYPE IX.
3. SIGNS SHALL BE ERECTED AS PER DRAWING NO. ADB/MPDCSP/PH-II/P-ALL/05
4. HAZARD MARKERS SHALL BE PRESSED INTO GROUND.
5. LOCAL LANGUAGE INSTEAD OF HINDI SHALL BE USED IF THE LOCAL LANGUAGE IS OTHER THAN HINDI

:- CONSULTANTS :-

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Mob.: 09826452711, 09977004686  
E-mail : lninfra@projects@gmail.com

:- CLIENT :-

**NATIONAL HIGHWAYS INFRASTRUCTURE  
DEVELOPMENT CORPORATION LIMITED (NHIDCL)**



DRG. NO. :

4

DESIGNED BY.

APPROVED BY.

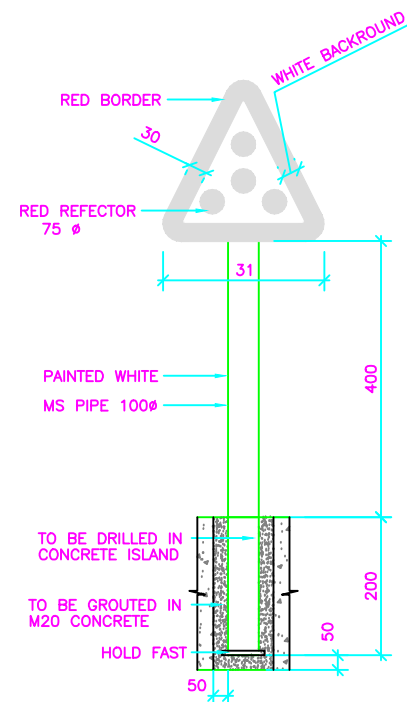
:- PROJECT TITLE :-

Consultancy Services for Preparation of  
Feasibility Study and Detailed Project Report For  
Two lane With Paved Shoulders of Tamenglong  
- Haflong Road In The State of Manipur on EPC  
Mode.

:-TRAFFIC SIGNS:-

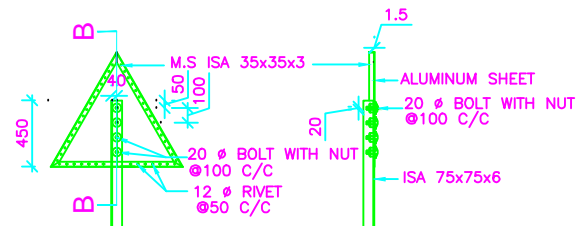
**JIRI RIVER - HANGRUM SECTION  
(PACKAGE-7)**





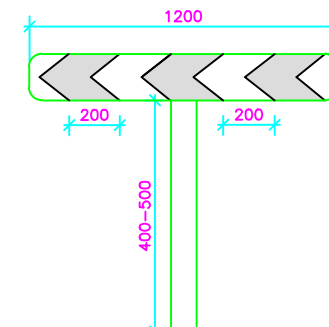
OBJECT MARKER

TA-1



DETAIL - X

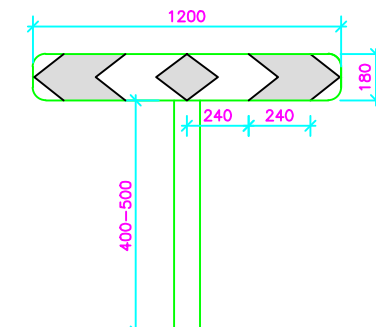
SECTION B-B



ONE-WAY HAZARD MARKER

TA-2

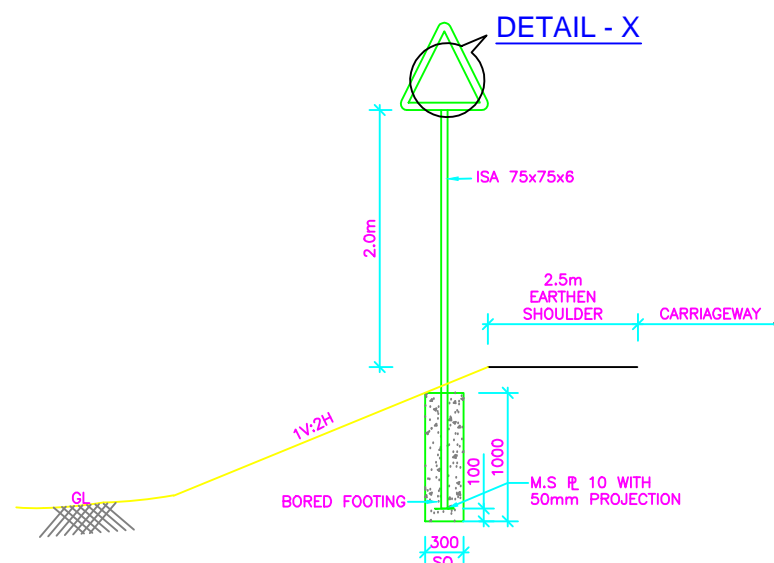
SCALE 1:20



TWO-WAY HAZARD MARKER

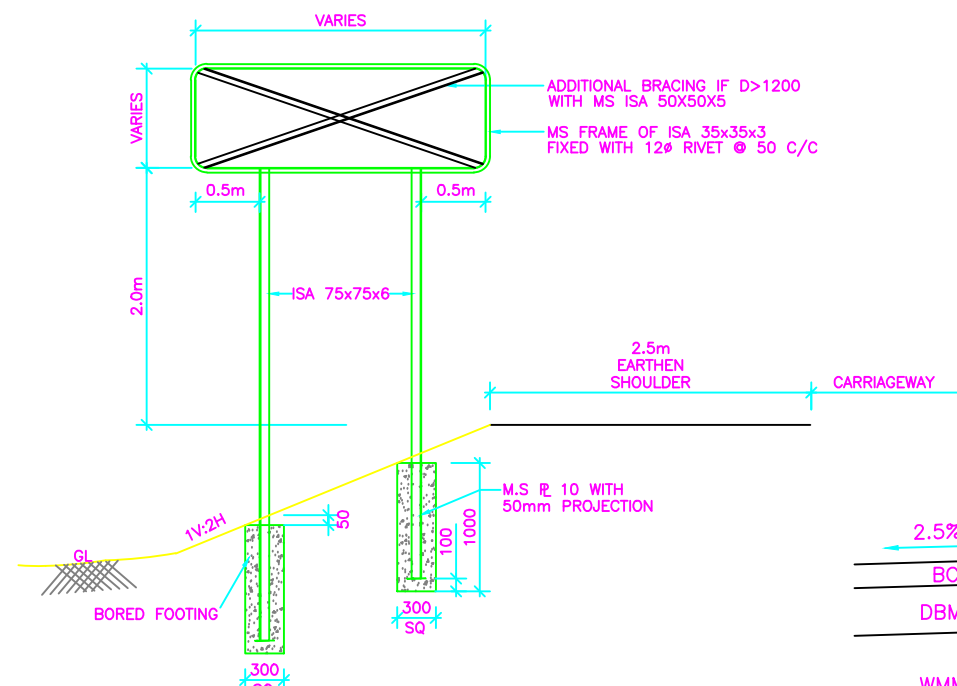
TA-3

SCALE 1:20



SINGLE LEAF SIGN

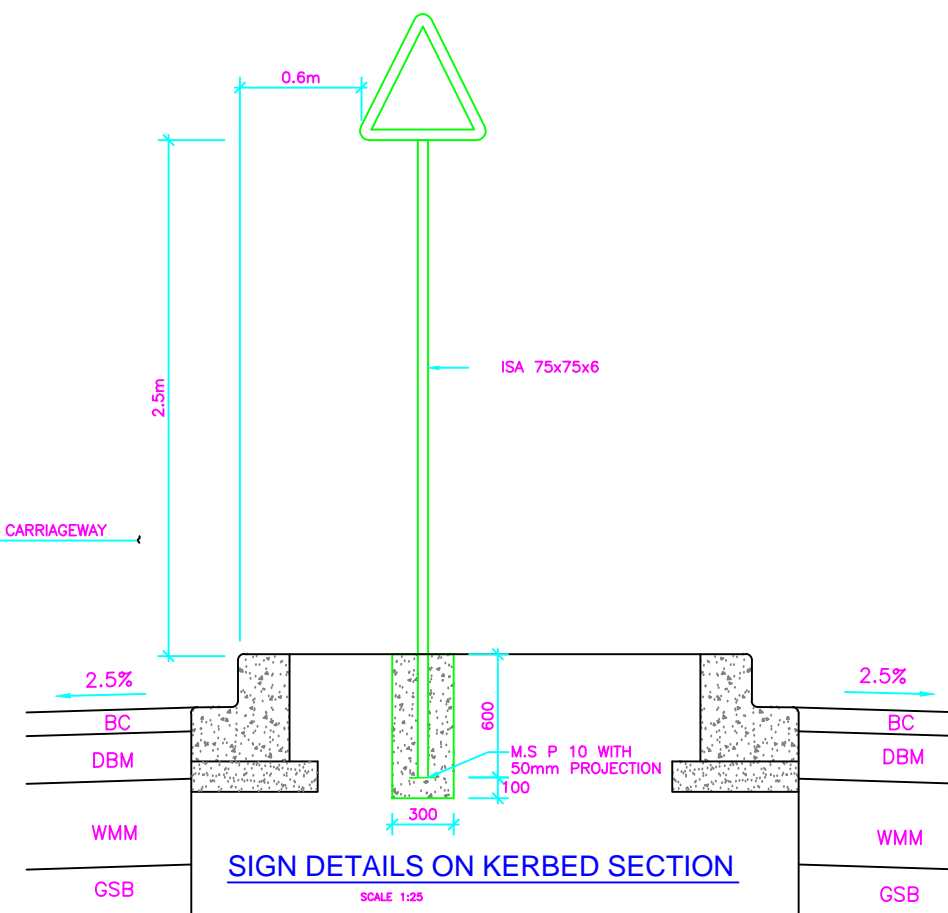
SCALE 1:40



DOUBLE LEAF SIGN

(WITH BORED FOOTING)

SCALE 1:40



SIGN DETAILS ON KERBED SECTION

SCALE 1:25

Notes :

- ALL THE DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE SPECIFIED.
- RETROREFLECTORISED SHEETING SHALL BE CONFORMING TO ASTM D-4956-01, TYPE VIII OR TYPE IX.
- THE SHEETING SHALL BE SECURELY BOLTED TO THE POST, THE REMAINING PORTION OF THE BOLT AFTER TIGHTENING THE NUT SHALL BE HAMMERED TO FORM RIVETING.
- IN CASE OF ROAD SIGNS, IRON POST SHALL BE PAINTED WITH ONE COAT OF EPOXY PRIMER AND TWO COATS OF EPOXY FINISH PAINT HAVING BLACK AND WHITE BANDS OF 250MM WIDTH.
- OBJECT MARKER SHALL BE SETBACK BY 500MM FROM THE FACE OF THE KERB. IT SHALL BE DRILLED INTO CONCRETE KERBS UPTO 600 MM DEPTH.
- ALL FOUNDATIONS SHALL BE IN M15 GRADE CEMENT CONCRETE.
- HAZARD MARKERS SHALL BE PRESSED INTO GROUND.
- BACK SIDE OF SIGN BOARD SHALL BE PAINTED WITH TWO COATS OF GRAY EPOXY PAINT.
- ALUMINUM SHEET SHALL BE 2mm THICK.
- ALL BLACK NUTS & BOLTS SHALL CONFORM TO IS:1353-1992
- RETRO REFLECTIVE SHEETING OF HIGH INTENSITY GRADE ENCAPSULATED TYPE SHALL BE AFFIXED TO ALUMINIUM SHEET BY PRESSURE SENSITIVE ADHESIVE.
- STEEL SECTION SHALL CONFORM TO IS:1977-1996 & SHALL BE SUITABLY PAINTED.

:- CONSULTANTS :-

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M.P. NAGAR, ZONE-I, BHOPAL (M.P.)



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Mob.: 09826452711, 09977004686  
E-mail : lninfra@projects@gmail.com

:- CLIENT :-

NATIONAL HIGHWAYS INFRASTRUCTURE  
DEVELOPMENT CORPORATION LIMITED (NHIDCL)



DRG. NO. :

5

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APPROVED BY.

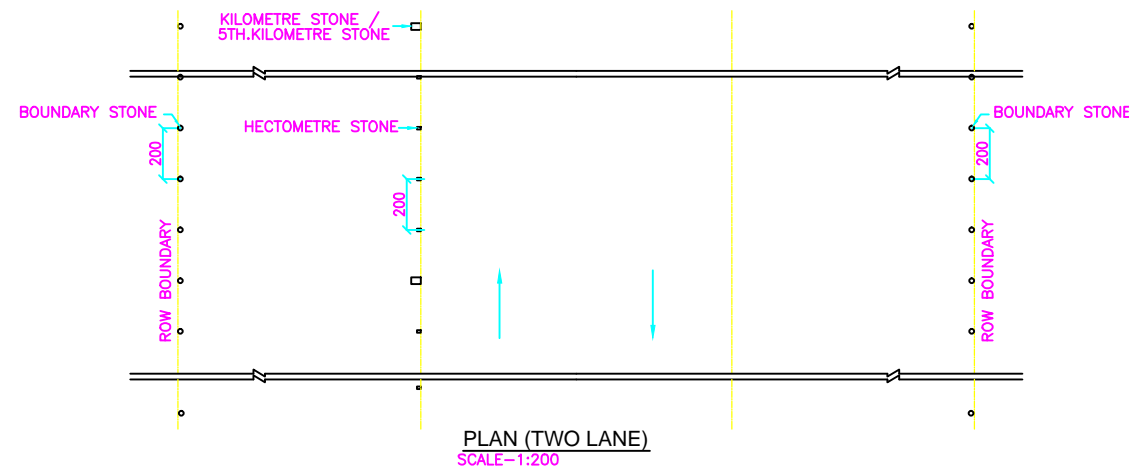
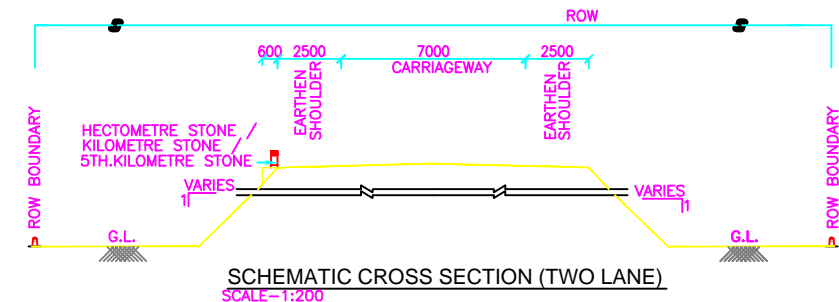
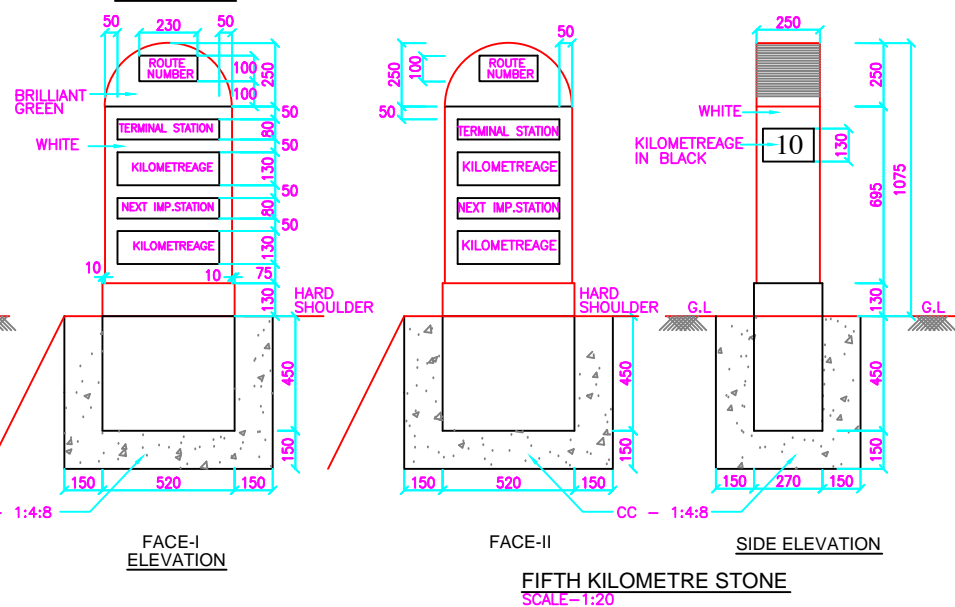
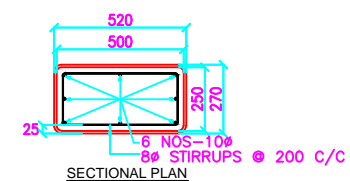
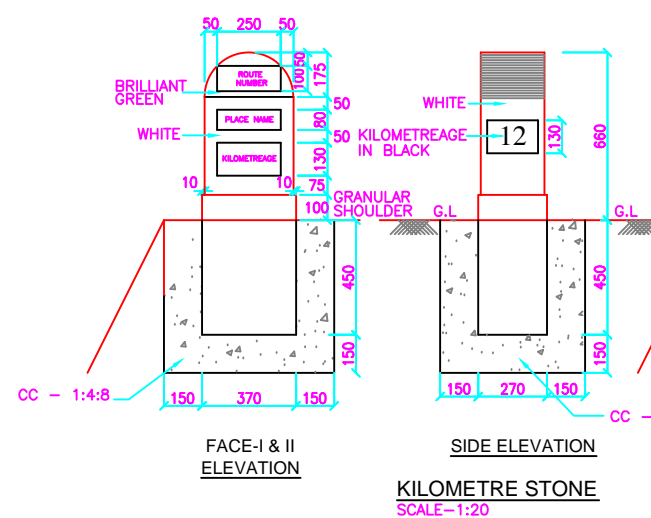
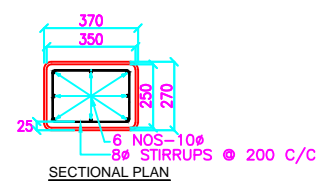
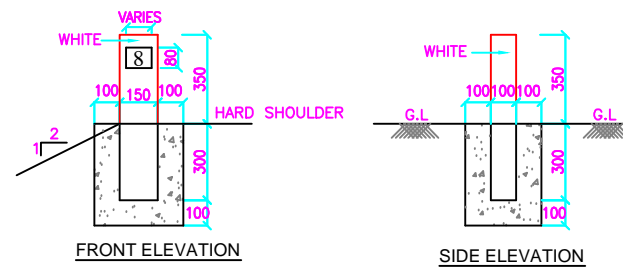
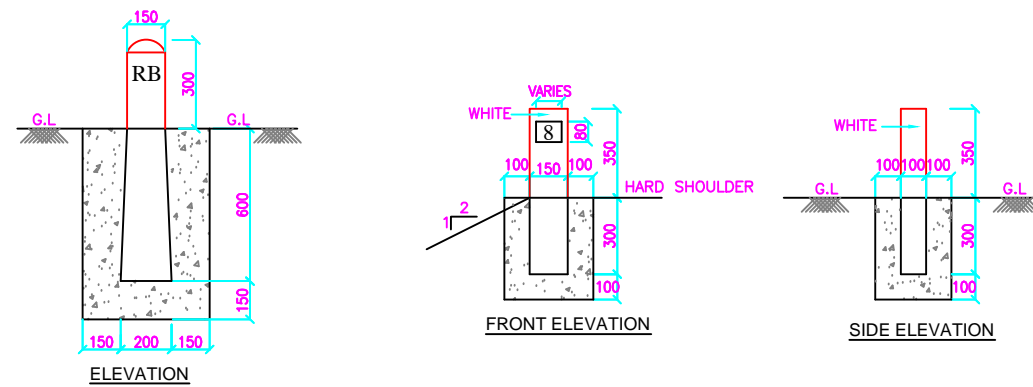
:- PROJECT TITLE :-

CConsultancy Services for Preparation of  
Feasibility Study and Detailed Project Report For  
Two lane With Paved Shoulders of Tamenglong  
- Haflong Road In The State of Manipur on EPC  
Mode.

:-TRAFFIC SIGNS:-

JIRI RIVER - HANGRUM SECTION  
(PACKAGE-7)





#### GENERAL NOTES :

- 1). ALL DIMENSIONS ARE IN MM, UNLESS OTHERWISE MENTIONED.
- 2). KILOMETRE STONE / HECTOMETRE STONE / FIFTH KILOMETRE STONE SHALL BE CONSTRUCTED IN RCC M:20 GRADE.
- 3). FOUNDATION OF KILOMETRE STONE / HECTOMETRE STONE / FIFTH KILOMETRE STONE SHALL BE IN PCC M:15 GRADE.
- 4). THE DISTANCE STONES SHALL BE PROVIDED ON LEFT SIDE OF THE ROAD AS SHOWN INDEPENDENT OF DIRECTION OF TRAFFIC FLOW.
- 5). ALL NUMERALS SHALL BE PAINTED BLACK.

- 6). SIZE OF LETTERS AND NUMERALS SHALL BE AS PER IRC: 8-1980.
- 7). STEEL REINFORCEMENT SHALL BE MILD STEEL Fe. 250.
- 8). NO PAINTING SHALL BE CARRIED OUT ON BOUNDARY STONES.
- 9). HECTOMETRE STONE SHALL BE PAINTED WHITE.
- 10). KILOMETRE STONE AND FIFTH KILOMETRE STONE SHALL BE PAINTED AS SHOWN.

:- CONSULTANTS :-

**L.N. MALVIYA INFRA PROJECTS PVT. LTD.**

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M.P. NAGAR, ZONE-I, BHOPAL (M.P.)



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Mob.: 09826452711, 09977004686  
E-mail : [lninfra@rediffmail.com](mailto:lninfra@rediffmail.com)

:- CLIENT :-

**NATIONAL HIGHWAYS INFRASTRUCTURE  
DEVELOPMENT CORPORATION LIMITED (NHIDCL)**



DRG. NO. :

**6**

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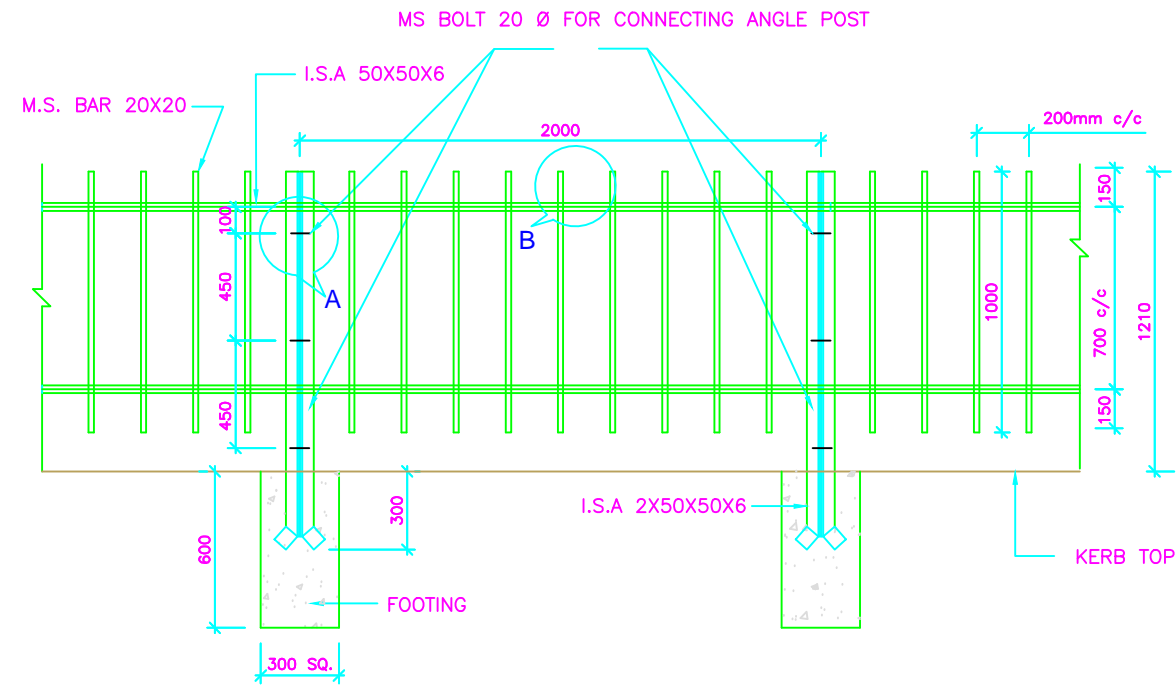
:- PROJECT TITLE :-

CConsultancy Services for Preparation of  
Feasibility Study and Detailed Project Report For  
Two lane With Paved Shoulders of Tamenglong  
- Haflong Road In The State of Manipur on EPC  
Mode.

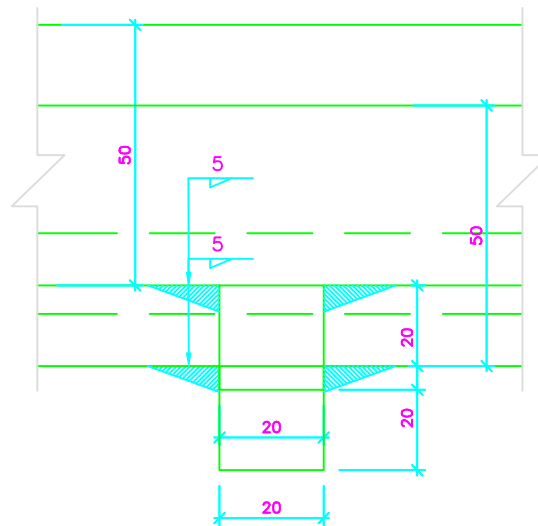
:- DISTANCE STONES :-

**JIRI RIVER - HANGRUM SECTION  
(PACKAGE-7)**

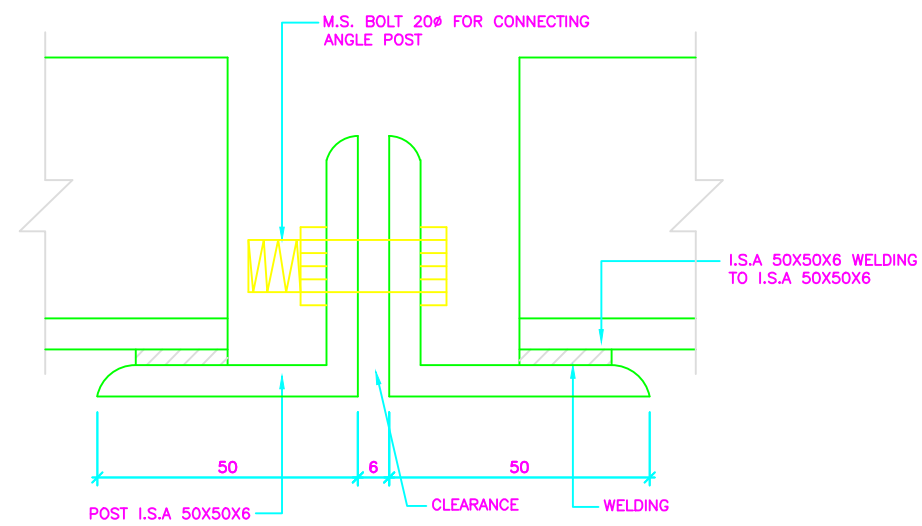




**PEDASTRIAN GUARD RAIL**  
(SCALE 1:20)





**DETAIL - B**  
(SCALE 1:1)



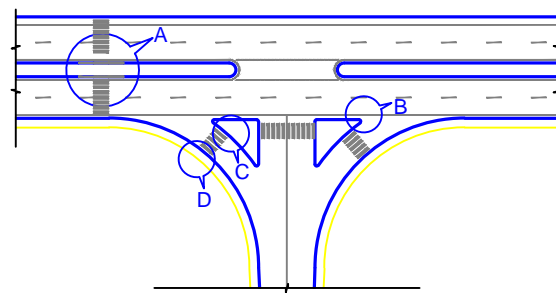
**DETAIL - A**  
(SCALE 1:1)

**NOTE:-**

1. ALL THE DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE SPECIFIED.
2. FOOTING SHALL BE IN PLAN CEMENT CONCRETE OF M15 GRADE.
3. HIGH STRENGTH BOLT SHALL CONFORM TO IS:4000-1992
4. 5mm WELD SHALL BE MADE WITH SINGLE PASS.
5. WELDING SHALL BE DONE BY ARC WELDING.
6. ELECTRODE USED SHALL CONFORM TO RELEVANT SPECIFICATIONS.
7. SLAG SHALL BE REMOVED BEFORE MEASURING THE DIMENSIONS OF FILLET WELD.
8. STRUCTURAL STEEL SHALL CONFORM TO IS: 1977-1996
9. SHADE OF ANTI CORROSIVE PAINT SHALL BE DECIDED BY ENGINEER-IN-CHARGE.
10. POST ENDS IN CONCRETE FOOTING SHALL BE BENDED TO SERVE THE PURPOSE OF HOLD FAST.

CLIENT :-	CONSULTANTS :-	CLIENT :-	DRG. NO. :	DESIGNED BY.	APPROVED BY.	PROJECT TITLE :-	GUARED RAIL :-
L.N. MALVIYA INFRA PROJECTS PVT. LTD.		NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)	7			CConsultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Haflong Road In The State of Manipur on EPC Mode.	JIRI RIVER - HANGRUM SECTION (PACKAGE-7)
T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)							
 Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@rediffmail.com">lninfra@rediffmail.com</a>		 BUILDING INFRASTRUCTURE - BUILDING THE NATION					

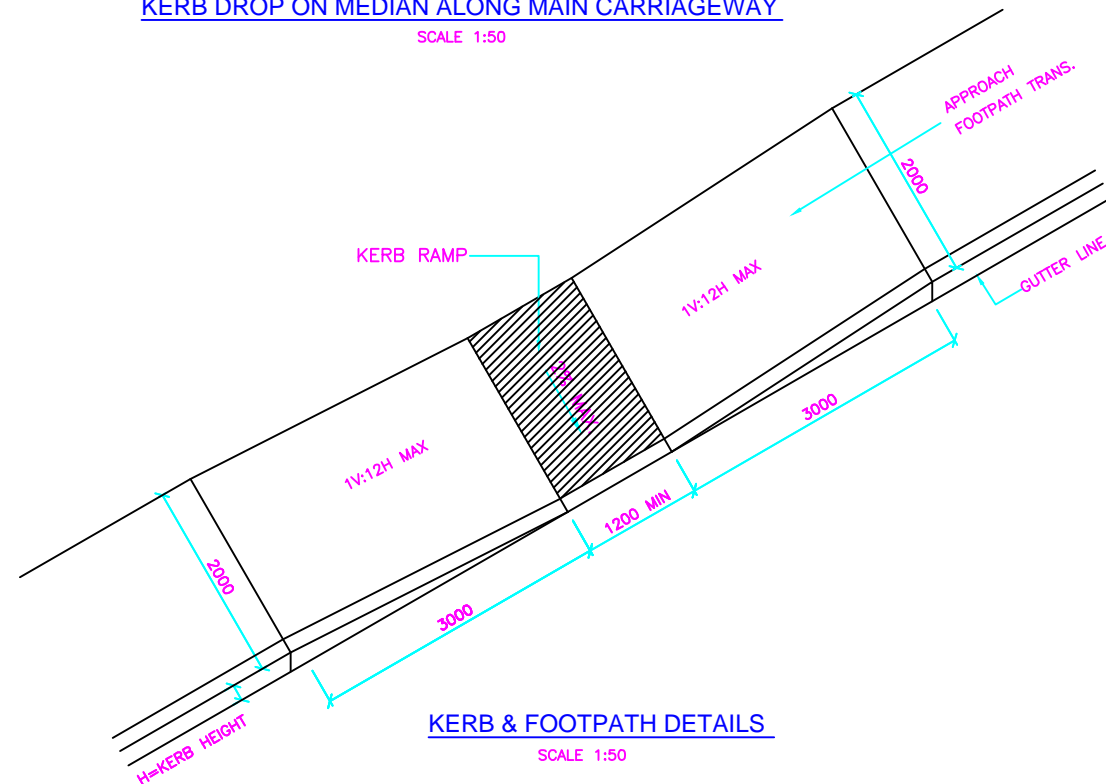




PLAN OF TYPICAL INTERSECTION ON MULTI-LANE CARRIAGEWAY  
N.T.S.



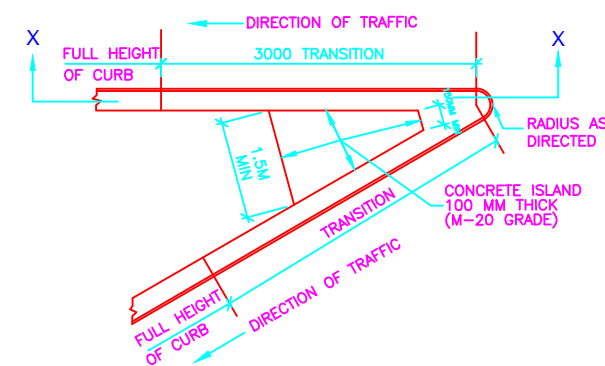
DETAIL A  
KERB DROP ON MEDIAN ALONG MAIN CARRIAGEWAY  
SCALE 1:50



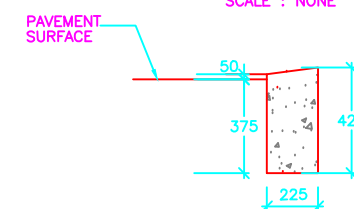
KERB & FOOTPATH DETAILS  
SCALE 1:50

NOTES:

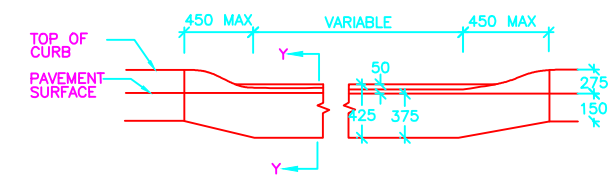
1. THIS DETAIL SHALL BE USED ONLY WHEN THE POSTED SPEED LIMIT DOES NOT EXCEED 60km/hr OR THE TERMINAL IS BEYOND THE CLEAR ZONE



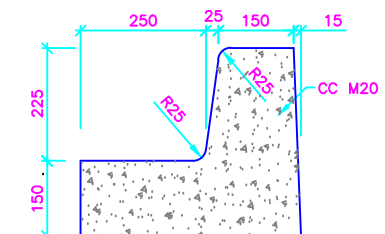
SECTION X-X  
DETAIL B  
KERB TRANSITION ON ISLANDS  
SCALE : NONE



DETAIL C  
METHOD OF DEPRESSING CURBS ON ISLANDS  
N.T.S.



SECTION Y-Y  
DETAIL C  
METHOD OF DEPRESSING CURBS ON ISLANDS  
SCALE : NONE



KERB DETAILS  
SCALE : 1:10

NOTES:

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. CONCRETE GRADE SHALL BE M-20 UNLESS OTHERWISE SPECIFIED.

-: CONSULTANTS :-

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Tel./Fax : 0755-4295421,  
Mob.: 09826452711, 09977004686  
E-mail : [lninfra@projects@gmail.com](mailto:lninfra@projects@gmail.com)

-: CLIENT :-

**NATIONAL HIGHWAYS INFRASTRUCTURE  
DEVELOPMENT CORPORATION LIMITED (NHIDCL)**



DRG. NO. :

**8**

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APPROVED BY.

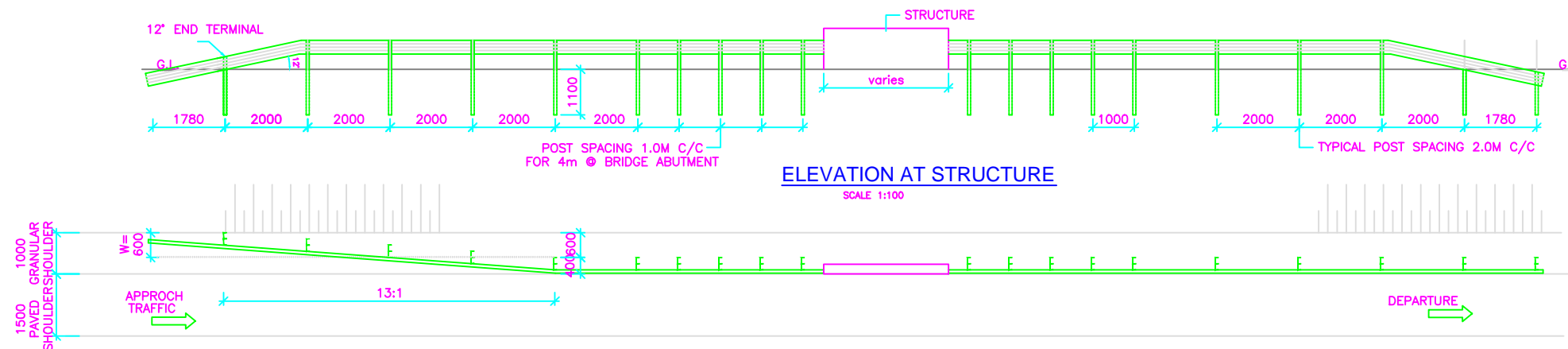
-: PROJECT TITLE :-

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Feasibility Study and Detailed Project Report For  
Two lane With Paved Shoulders of Tamenglong  
- Haflong Road In The State of Manipur on EPC  
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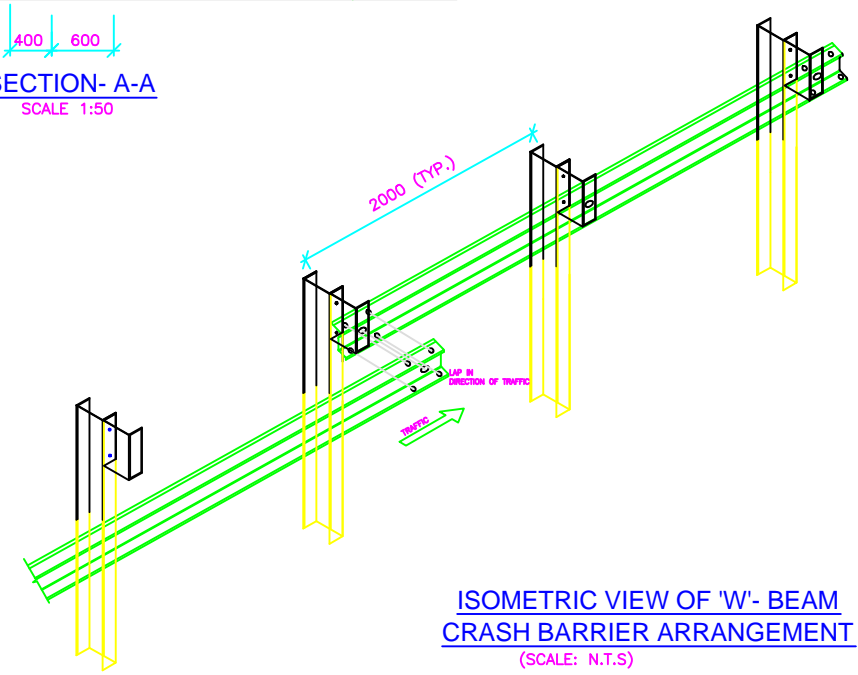
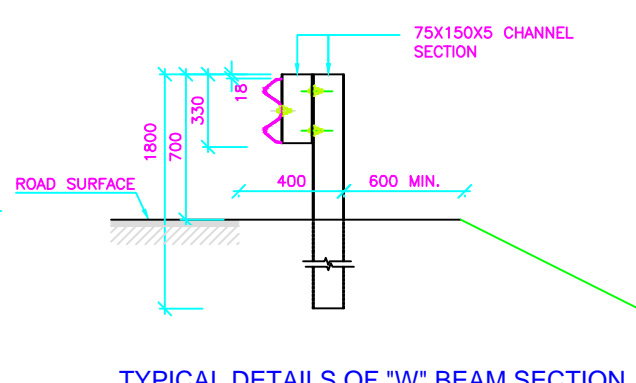
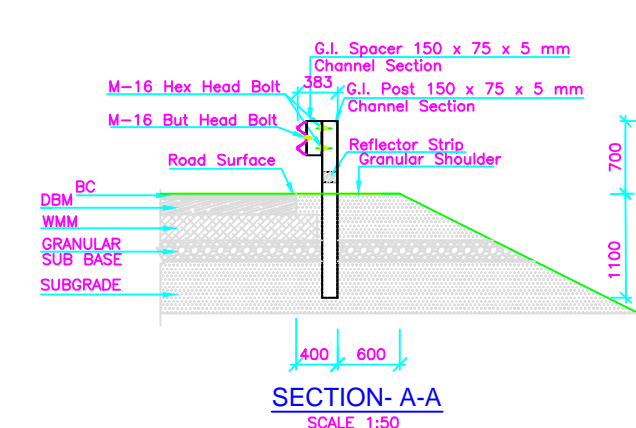
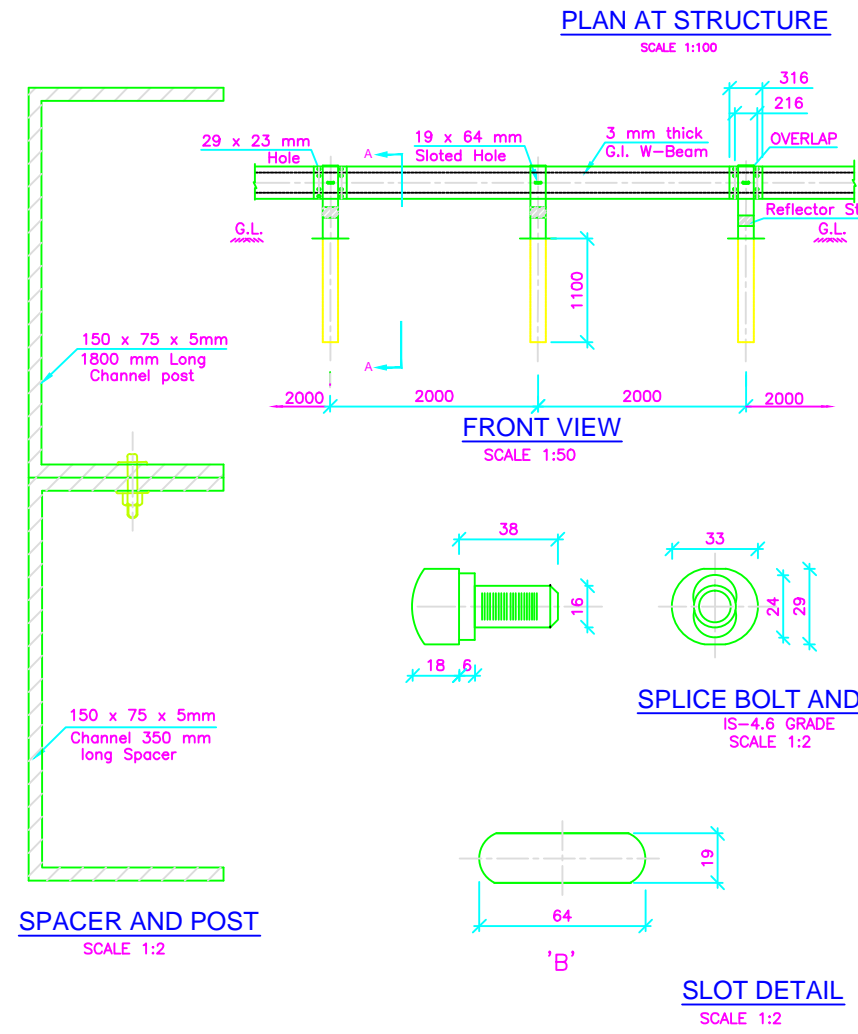
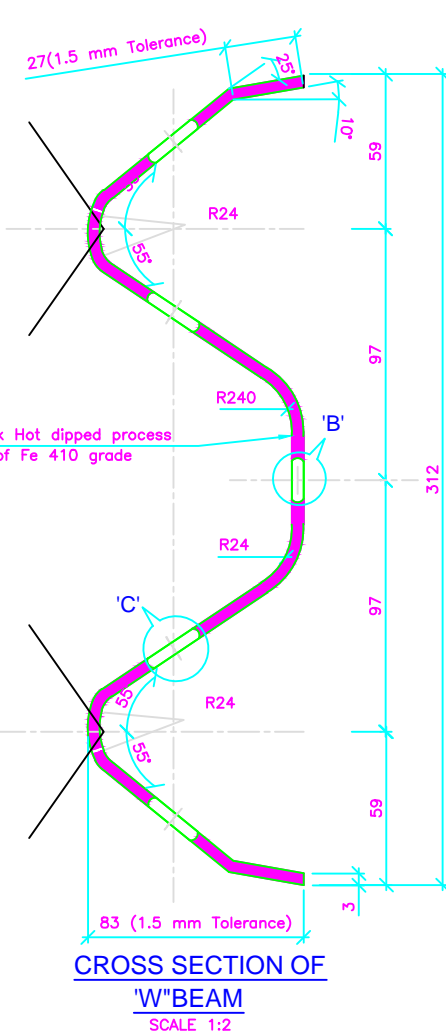
-:KERB & ISLANDS:-

**JIRI RIVER - HANGRUM SECTION  
(PACKAGE-7)**





SUGGESTED FLARE RATES FOR END TREATMENTS	
DESIGN SPEED (km/hr)	SEMI RIGID
100	13:1
80	11:1
65	9:1
50	7:1

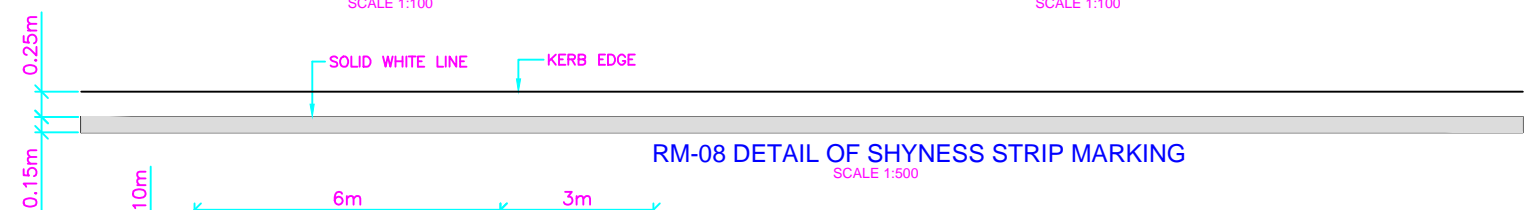
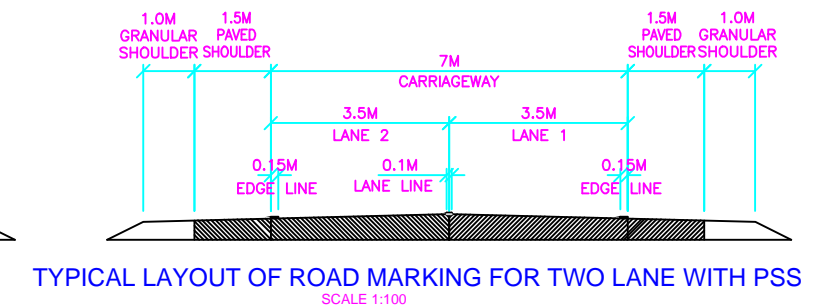
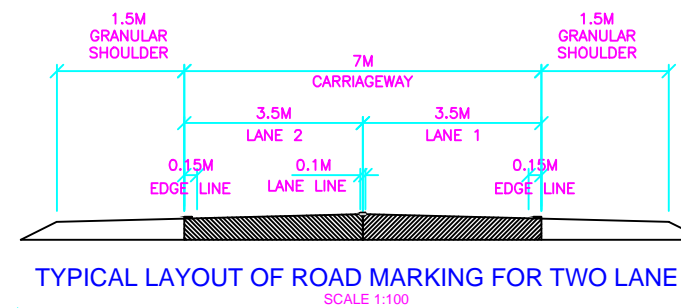
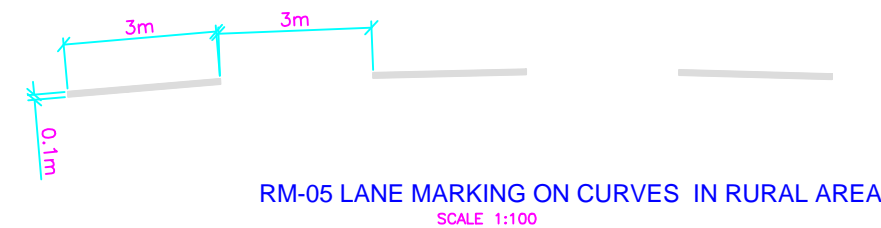
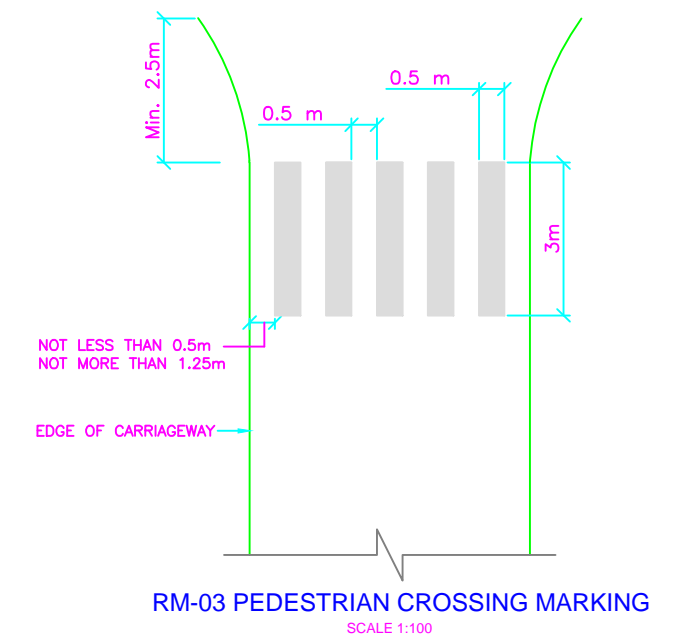
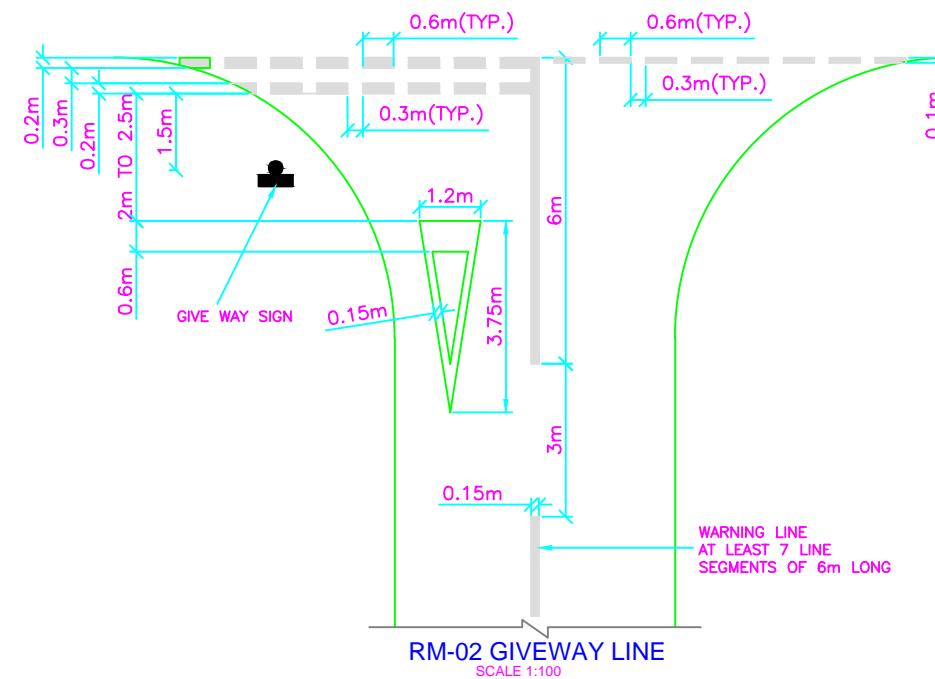
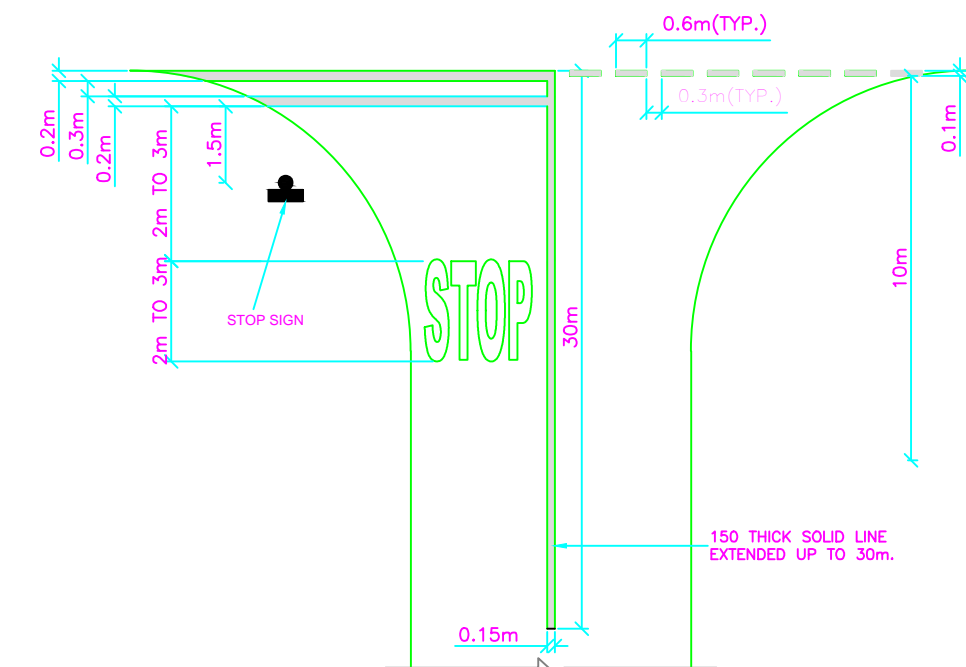


#### Notes :

- ALL THE DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE SPECIFIED.
- CORRUGATED METAL BEAM SHALL BE 3MM THICK.
- W-BEAM SHALL BE COLD ROLL FORMED SECTION.
- ALL RAW MATERIAL SHALL CONFORM TO IS 5986 (Gr.Fe 410:ST-42) HOT DIP GALVANISED TO 550 gm/Sqm.
- SPACERS SHALL BE AS PER IS :2062-1992
- EVERY CHANNEL POST SHALL BE 2M C/C APART EXCEPT STRUCTURE LOCATIONS.
- THE ENDS OF FASTNERS ARE TO BE FLARED BY PNEUMATIC OPERATION TO ENSURE THAT THE BOLTS ARE NOT REMOVABLE



-: CONSULTANTS :-		-: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-:MB CRASH BARRIER:-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.) Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : lninfra@projects@gmail.com		<b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b>		9			CConsultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Haflong Road In The State of Manipur on EPC Mode.	<b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b>



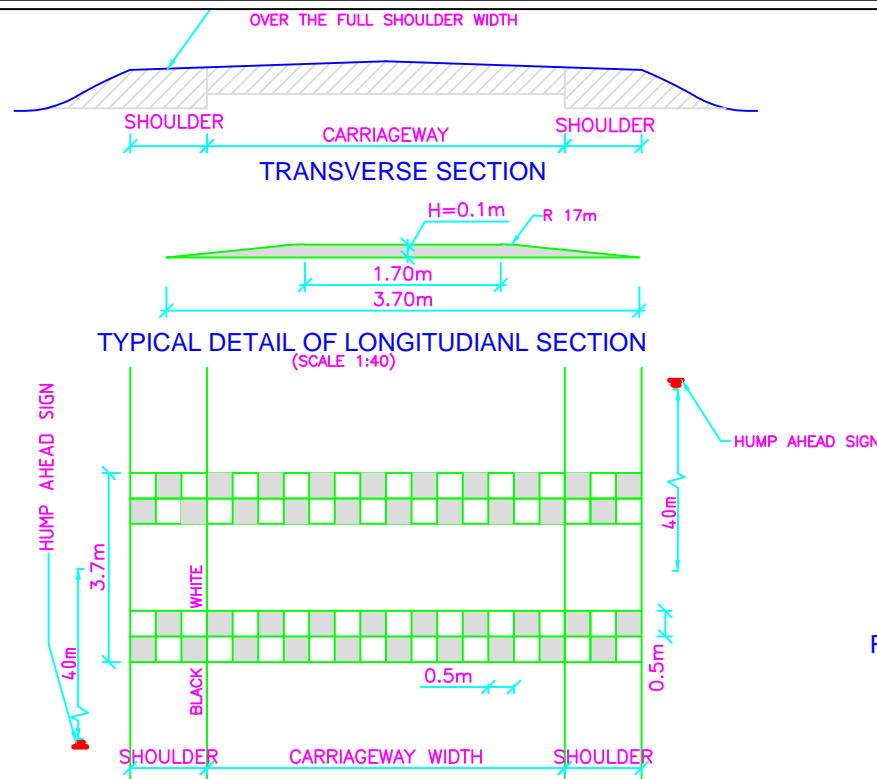


GENERAL NOTES :

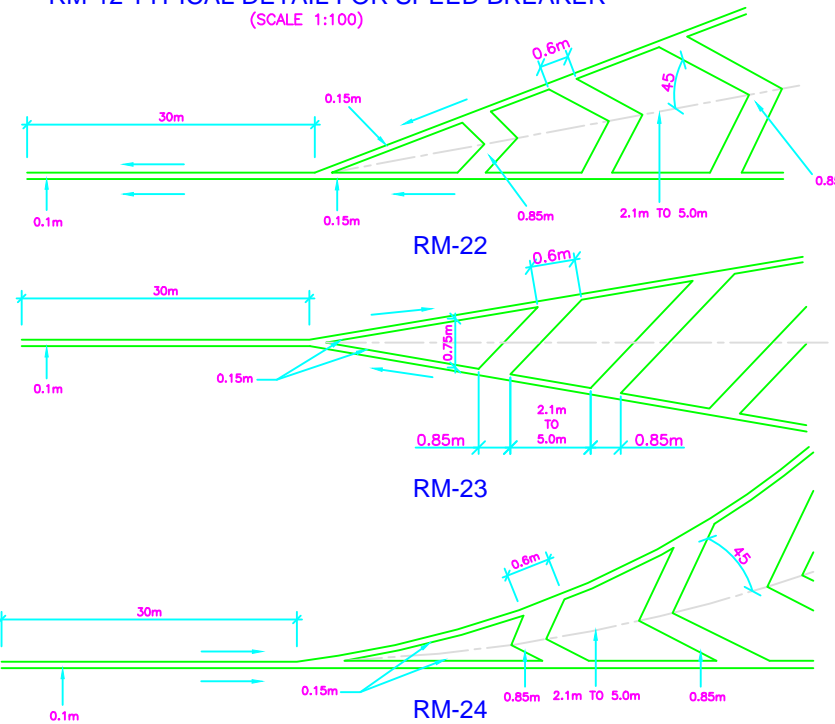
1. ROAD MARKING SHALL BE OF HOT APPLIED THERMOPLASTIC MATERIALS WITH GLASS REFLECTORISING BEADS OF TYPE 2 AS PER CLAUSES OF SECTION 803 OF MOSRTH SPECIFICATIONS.

<p align="center">-: CONSULTANTS :-</p> <p><b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b></p> <p align="center">T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)</p> <div align="center">  <p>Tel./Fax : 0755 -4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@projects@gmail.com">lninfra@projects@gmail.com</a></p> </div>	<p align="center">-: CLIENT :-</p> <p align="center"><b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b></p> <div align="center">  </div>	<p align="center">DRG. NO. :</p> <p align="center"><b>10</b></p>	<p align="center">DESIGNED BY.</p>	<p align="center">APPROVED BY.</p>	<p align="center">-: PROJECT TITLE :-</p> <p>CConsultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Haflong Road In The State of Manipur on EPC Mode.</p>	<p align="center">-:LANE MARKING:-</p> <p align="center"><b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b></p>
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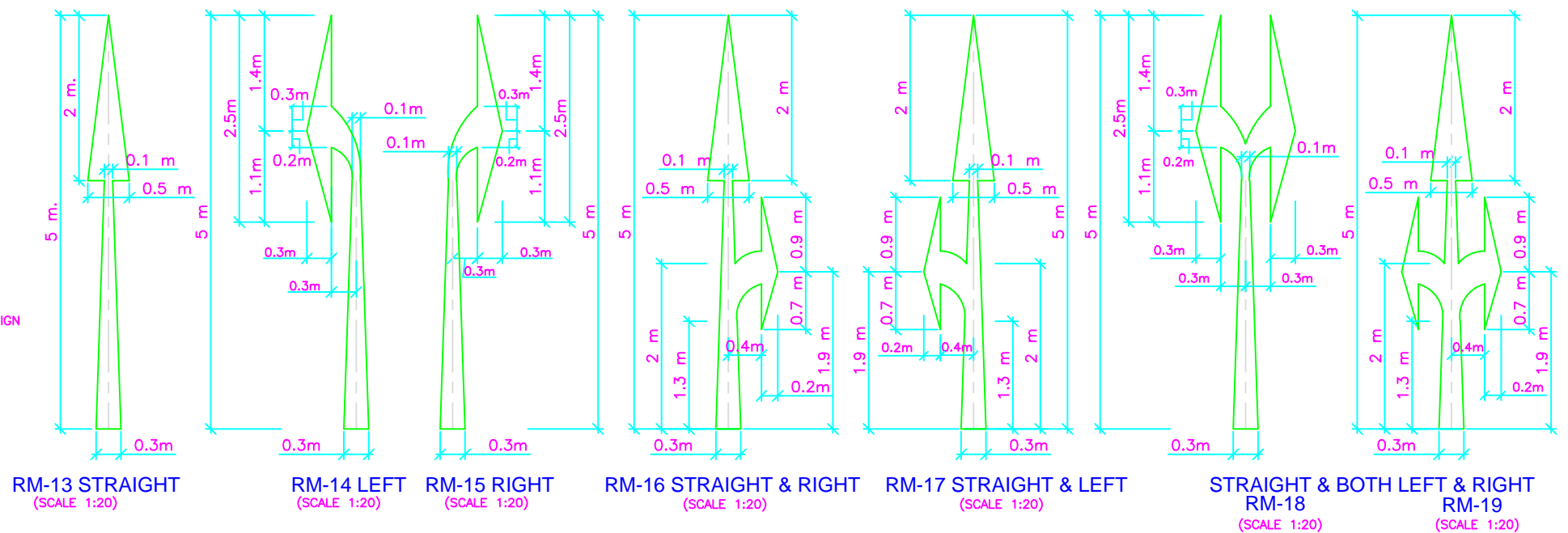




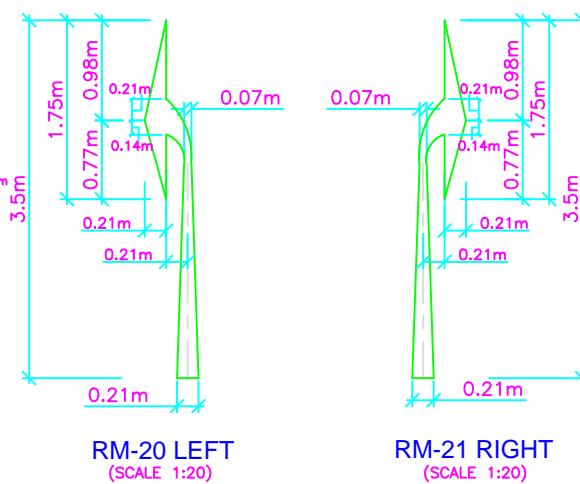
**RM-12 TYPICAL DETAIL FOR SPEED BREAKER (SCALE 1:100)**



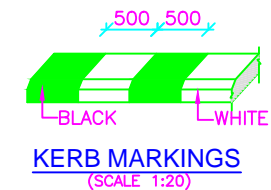
**DETAILS OF DIAGONAL AND CHEVRON MARKING**



**ARROW MARKING FOR ROUTE DIRECTION**



**DIAGONAL MARKING IN ADVANCE OF DIRECTIONAL ISLAND (SCALE 1:200)**



**GENERAL NOTES :**

1. ROAD MARKING SHALL BE OF HOT APPLIED THERMOPLASTIC MATERIALS WITH GLASS REFLECTORISING BEADS OF TYPE 2 AS PER CLAUSES OF SECTION 803 OF MOSRTH SPECIFICATIONS.

CONSULTANTS :-	CLIENT :-	DRG. NO. :	DESIGNED BY.	APPROVED BY.	PROJECT TITLE :-	LANE MARKING:-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.) Tel/Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : lninfra@lninfra.com	<b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b>	11			CConsultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Haflong Road In The State of Manipur on EPC Mode.	<b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b>



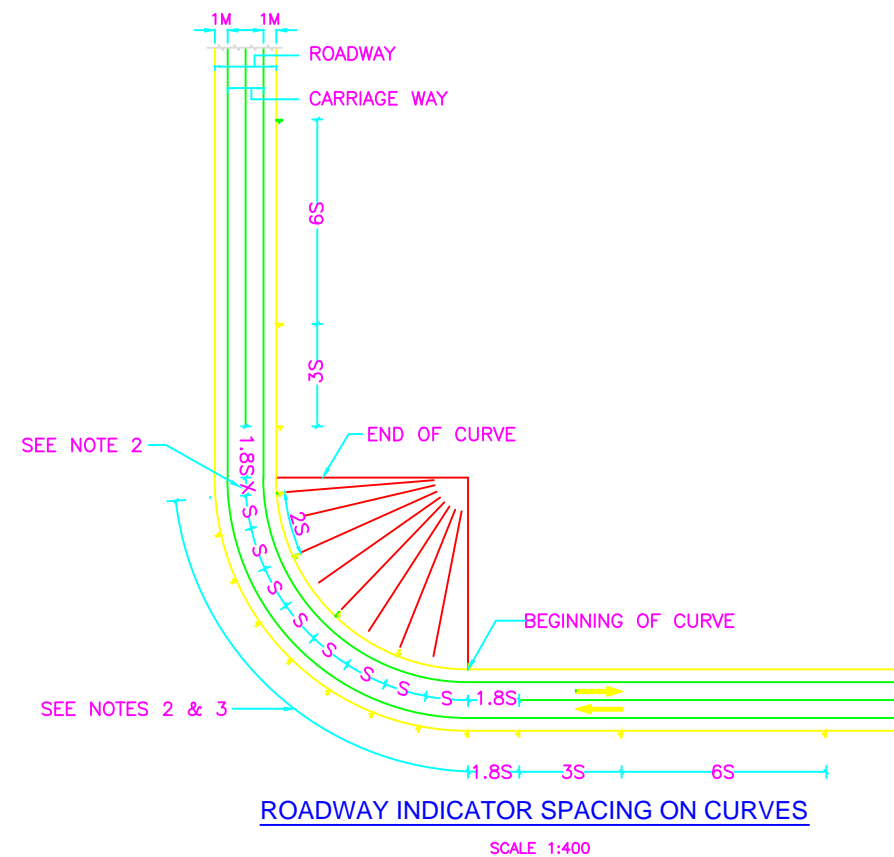
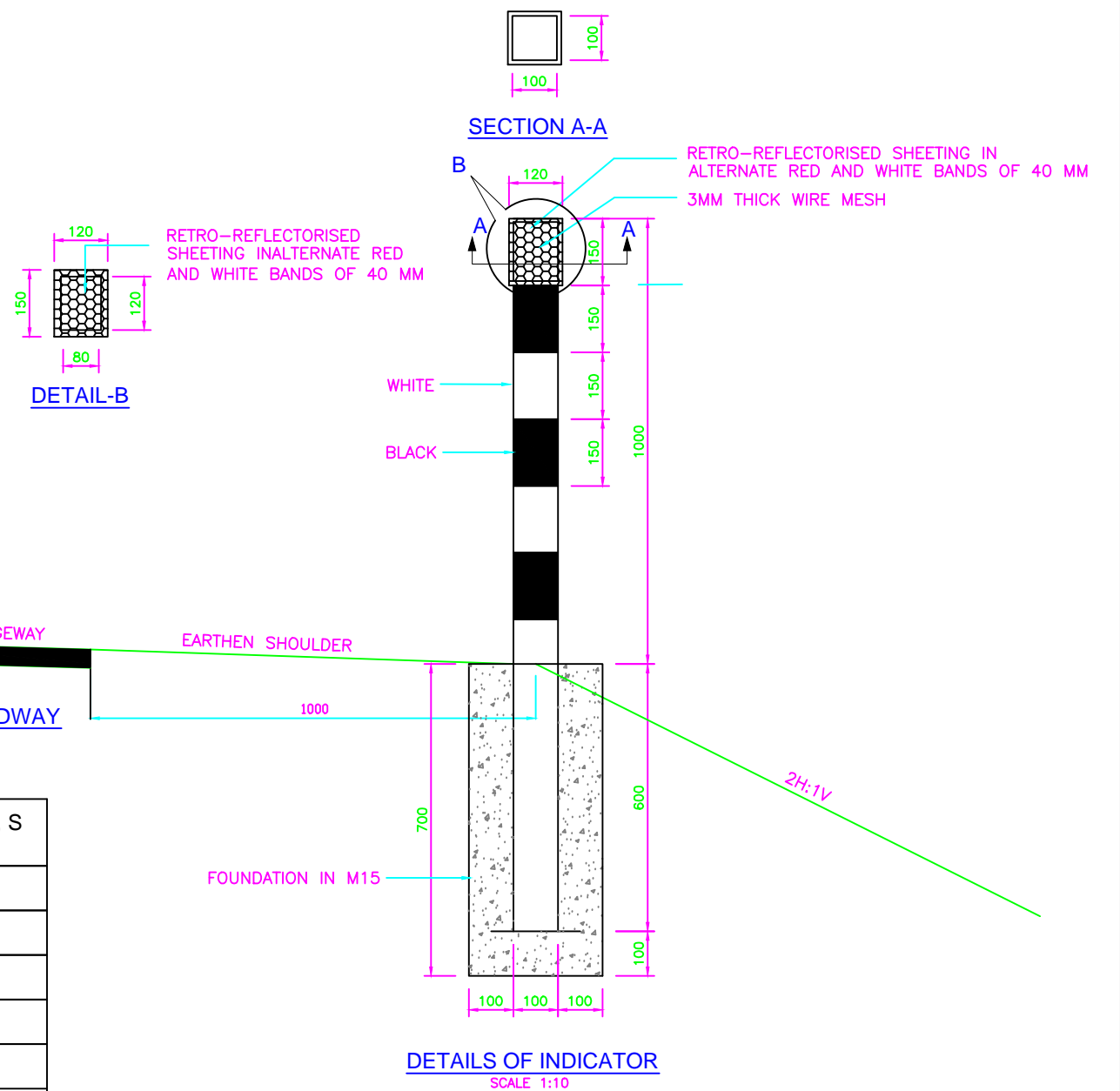


TABLE FOR RECOMMENDED SPACING FOR ROADWAY  
DELINEATORS ON HORIZONTAL CURVES

RADIUS OF CURVE (METERS)	SPACING ON CURVE, S (METERS)
300	25
400	30
500	35
600	38
700	42
800	45
900	48
1000	50



**Notes :**

- ALL THE DIMENSIONS ARE IN MILLIMETER UNLESS OTHERWISE SPECIFIED.
- ADJUST DISTANCE 'X' SUITABLY SO THAT THE LAST ROADWAY DELINEATOR IS AT THE END OF THE CURVE.
- INSTALL ALL DELINEATORS PERPENDICULAR TO THE ONCOMING TRAFFIC.
- SEE TABLE FOR VALUE OF 'S' i.e. SPACING OF DELINEATORS ON THE CURVE.
- THE SPACING OF FIRST, SECOND & THIRD DELINEATORS ON THE APPROACHES SHALL BE 1.85S, 3S & 6S RESPECTIVELY BUT NOT EXCEEDING 50m.
- INDICATORS SHALL BE DIE CAST IN ALUMINUM, RESISTANT TO CORROSIVE EFFECT OF SILT AND GRIT, FITTED WITH LENS REFLECTORS.
- STEEL REINFORCEMENT SHALL BE OF HYSD Fe 415 GRADE.

:- CONSULTANTS :-

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M.P. NAGAR, ZONE-I, BHOPAL (M.P.)  
Tel./Fax : 0755-4295421,  
Mob.: 09826452711, 09977004686  
E-mail : lninfra@projects@gmail.com

:- CLIENT :-

**NATIONAL HIGHWAYS INFRASTRUCTURE  
DEVELOPMENT CORPORATION LIMITED (NHIDCL)**



DRG. NO. :

12

DESIGNED BY:

APPROVED BY:

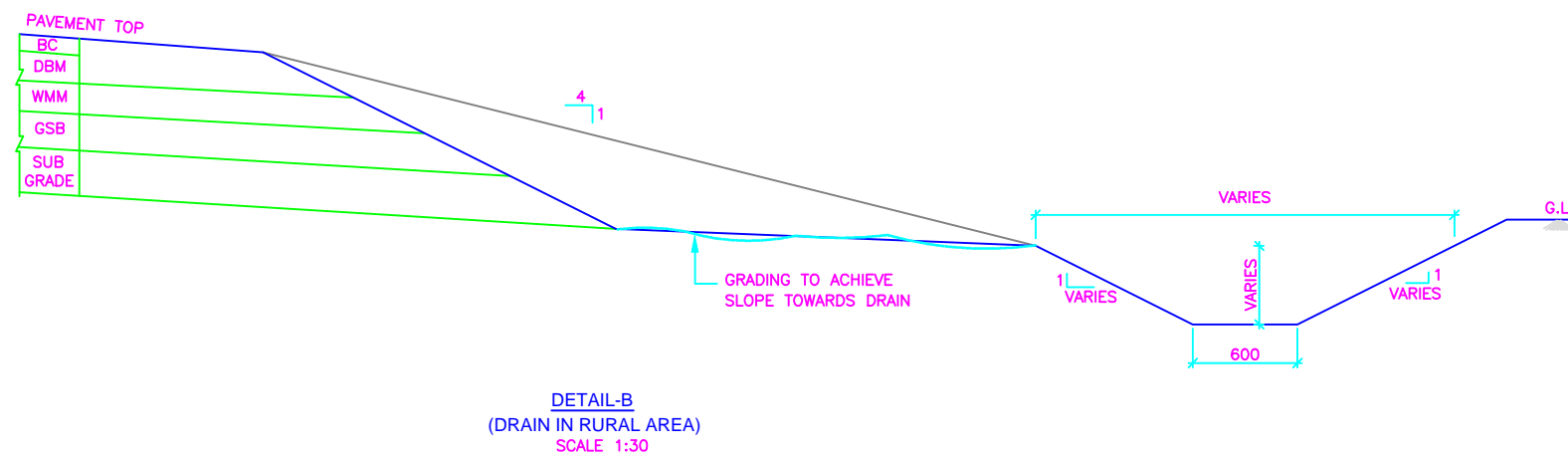
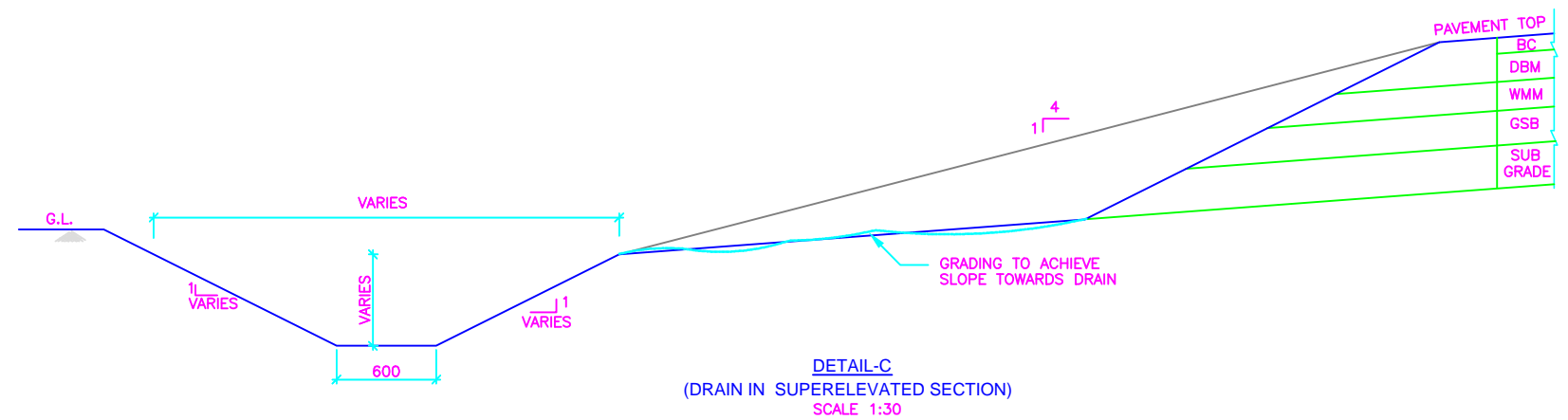
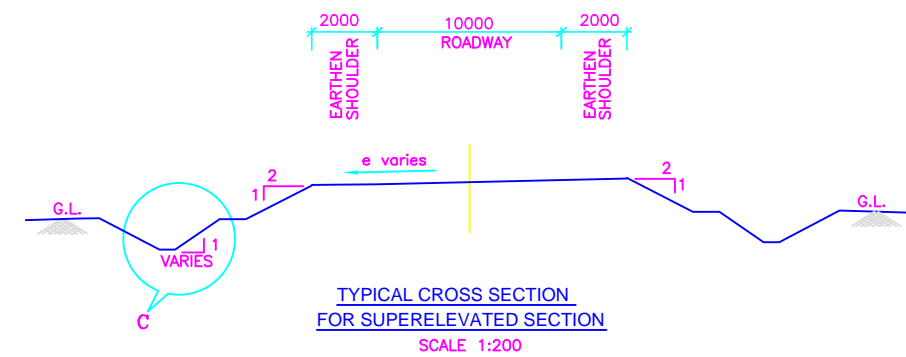
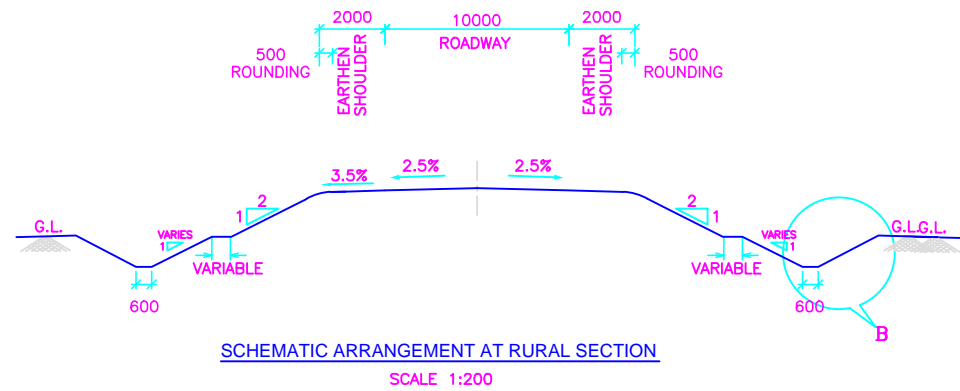
:- PROJECT TITLE :-

CConsultancy Services for Preparation of  
Feasibility Study and Detailed Project Report For  
Two lane With Paved Shoulders of Tamenglong  
- Haflong Road In The State of Manipur on EPC  
Mode.

:- INDICATOR :-

**JIRI RIVER - HANGRUM SECTION  
(PACKAGE-7)**





#### CONSTRUCTION NOTES :-

- 1). MEDIAN CUTS SHALL BE PROVIDED AT 15M C/C.
- 2). FOUNDATION OF LINED DRAIN SHALL BE CAST IN PCC OF CONCRETE GRADE M15.
- 3). BASE AND SIDE WALLS OF LINED DRAIN AND CATCH PIT SHALL BE CAST IN M20 GRADE.
- 4). CATCHPIT TO BE PROVIDED AT DESIGNATED LOCATION OF OUTFALL.
- 5). SITE SPECIFIC ADJUSTMENTS TO BE MADE IN HILLY TERRAINS. CONCRETE LINED DRAIN SHOULD BE PROVIDED IN PLACE OF EARTHEN DRAIN

#### :- CONSULTANTS :-

**L.N. MALVIYA INFRA PROJECTS PVT. LTD.**

T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1,  
M.P. NAGAR, ZONE-I, BHOPAL (M.P.)



Tel./Fax : 0755-4295421,  
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#### :- CLIENT :-

**NATIONAL HIGHWAYS INFRASTRUCTURE  
DEVELOPMENT CORPORATION LIMITED (NHIDCL)**



#### DRG. NO. :

**13**

#### DESIGNED BY.

#### APPROVED BY.

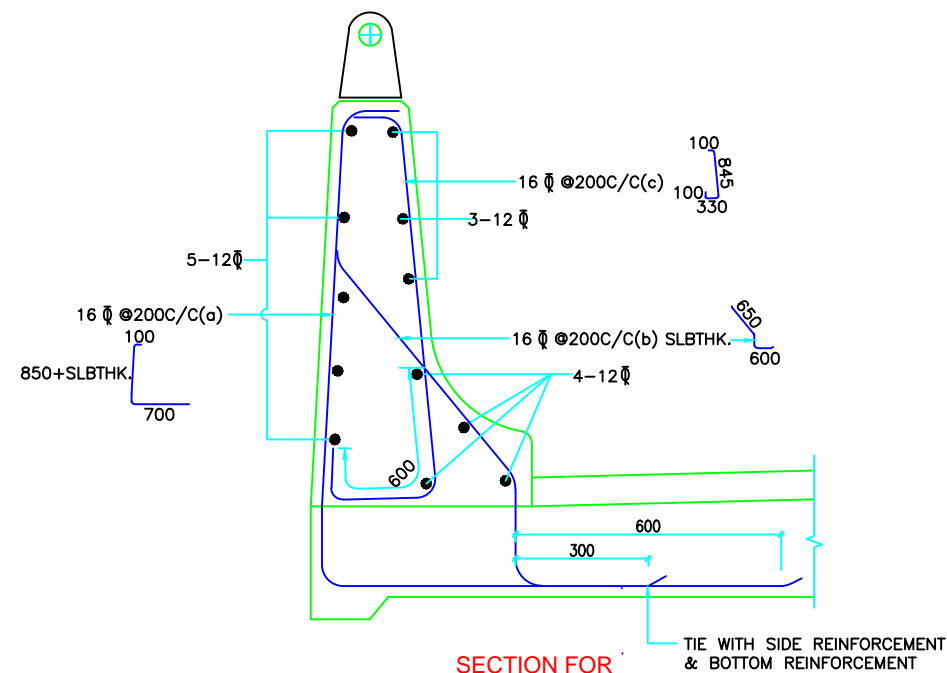
#### :- PROJECT TITLE :-

CConsultancy Services for Preparation of  
Feasibility Study and Detailed Project Report For  
Two lane With Paved Shoulders of Tamenglong  
- Haflong Road In The State of Manipur on EPC  
Mode.

#### :- EARTHEN DRAIN DRAWING :-

**JIRI RIVER - HANGRUM SECTION  
(PACKAGE-7)**





SECTION FOR  
CRASH BARRIER  
(REINFORCEMENT ONLY)

The diagram shows a rectangular plan view of a pedestal with overall dimensions of 140 units by 150 units. The horizontal dimensions are divided into five sections: 15, 25, 90, 25, and 15. The vertical dimension is divided into four equal sections of 25 units each. Key features include:

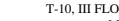

- 50Ø G.I. PIPE**: Indicated by two vertical green lines.
- 140X150X8 THK. M.S.PLATE @ 1000 C/C**: A thick black horizontal bar across the center.
- 8 THK. M.S. PLATE PEDESTAL @ 1000 C/C**: Two thin yellow horizontal bars above and below the thick plate.
- HOLE FOR FASTNER**: Four red circles at the intersections of the vertical green lines and the horizontal section lines.

**PLAN AT A-A**  
**SCALE 1:5**

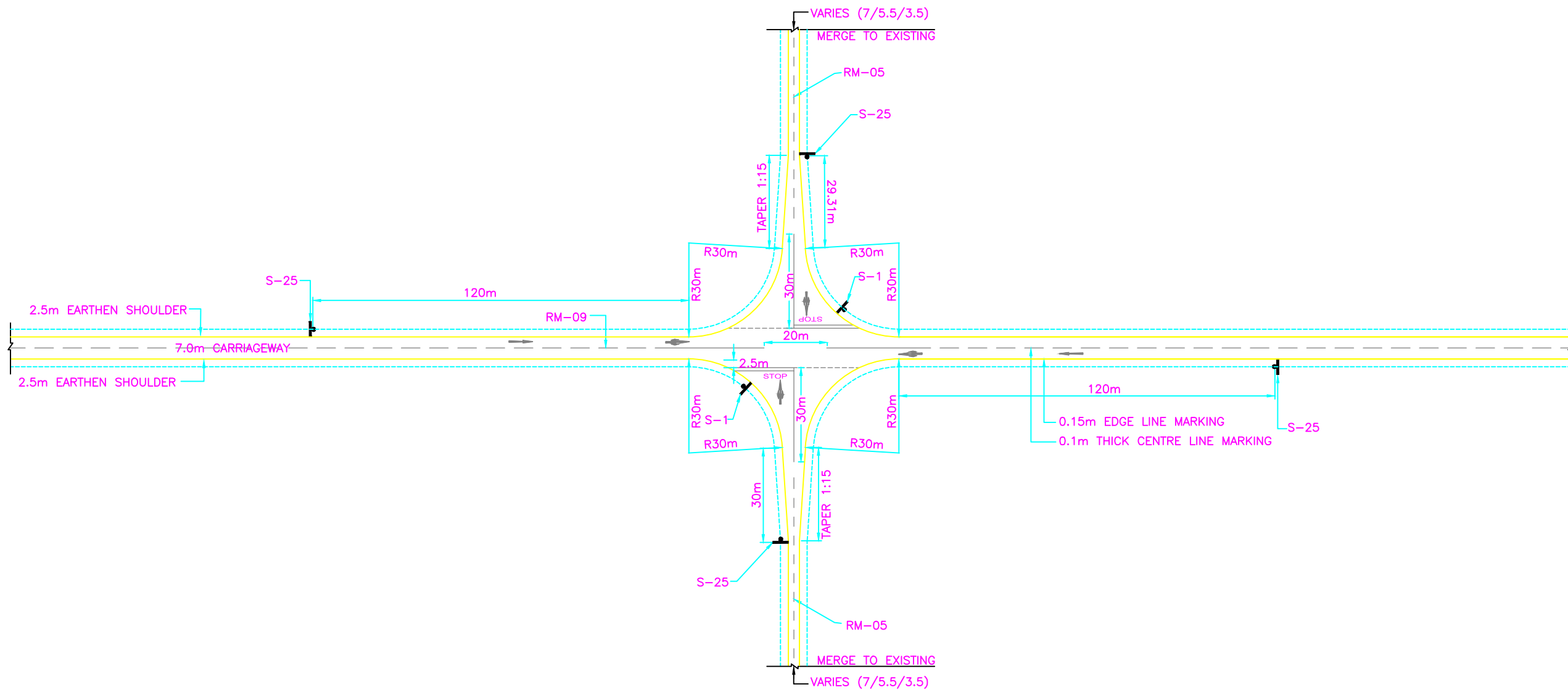
**DETAIL "X"**

SCALE 1:10





-: CONSULTANTS :-		-: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-:RCC CRASH BARRIER:-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)  Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@lninfra.com">lninfra@lninfra.com</a>		<b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b> 		14			CConsultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Haflong Road In The State of Manipur on EPC Mode.	<b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b>





TYPE - I

-: CONSULTANTS :-	-: CLIENT :-	DRG. NO. :	DESIGNED BY.	APPROVED BY.	-: PROJECT TITLE :-	-: Junction Improvement Drawing:-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)  Tel./Fax : 0755-4295421, Mob.: 09826452711, 09977004686 E-mail : <a href="mailto:lninfra@projects@gmail.com">lninfra@projects@gmail.com</a>	<b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b> 	15(a)			CConsultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Haflong Road In The State of Manipur on EPC Mode.	<b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b>

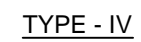


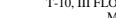





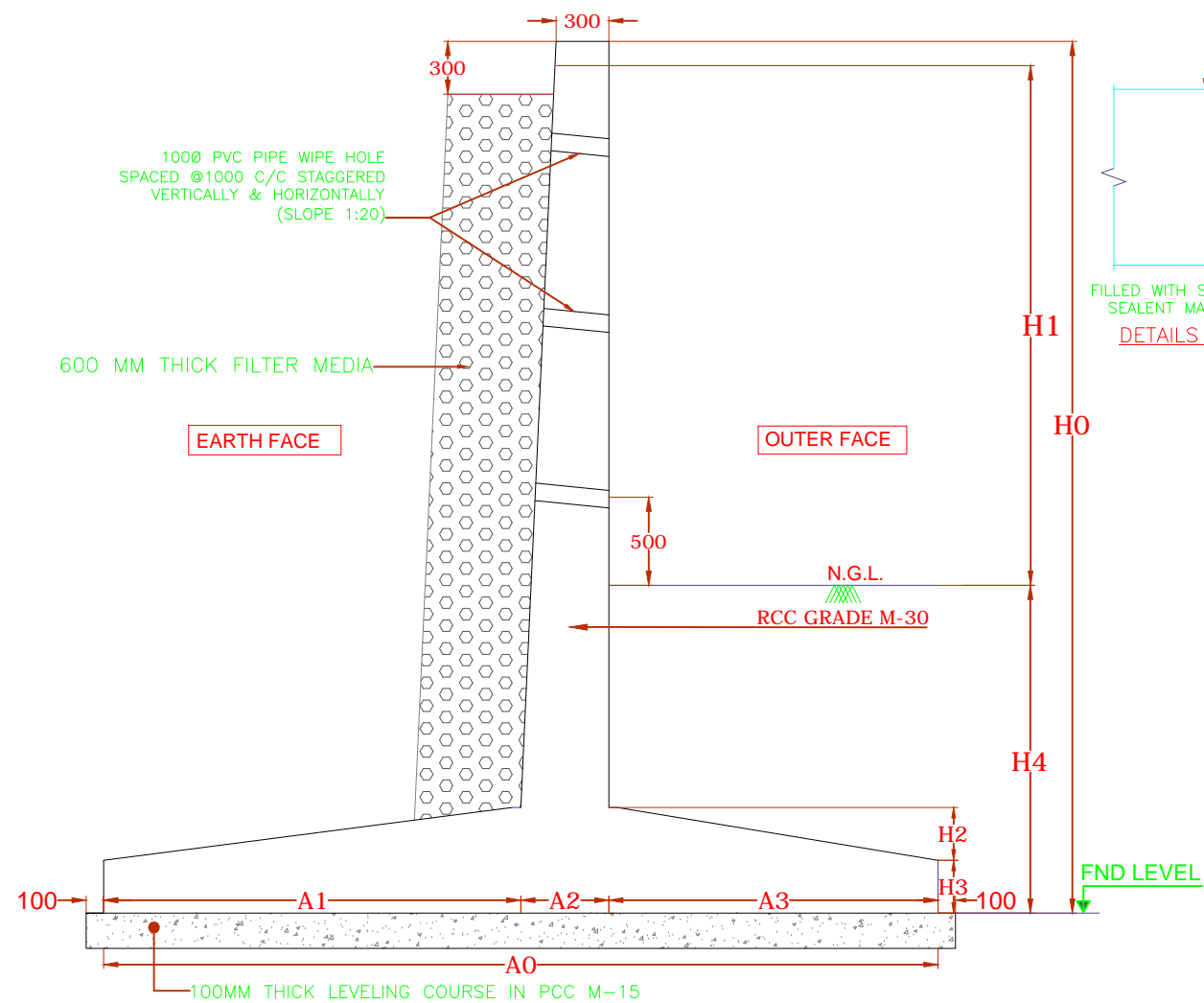






--: CONSULTANTS :-		--: CLIENT :-		DRG. NO. :	DESIGNED BY.	APPROVED BY.	--: PROJECT TITLE :-	--: Junction Improvement Drawing:-
<b>L.N. MALVIYA INFRA PROJECTS PVT. LTD.</b> T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-1, M.P. NAGAR, ZONE-I, BHOPAL (M.P.)  Tel./Fax : 0755-4295421, Mob.: 09826452711, 099777004686 E-mail : <a href="mailto:lninfra@lninfra.com">lninfra@lninfra.com</a>		<b>NATIONAL HIGHWAYS INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (NHIDCL)</b> 		<b>15(d)</b>			CConsultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Haflong Road In The State of Manipur on EPC Mode.	TYPICAL LAYOUT OF THREE LEGGED CHANNELISED JUNCTION  <b>JIRI RIVER - HANGRUM SECTION (PACKAGE-7)</b>

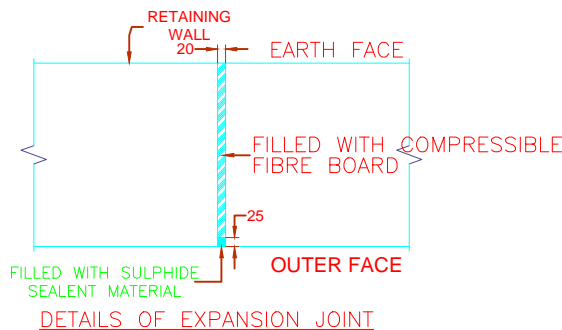




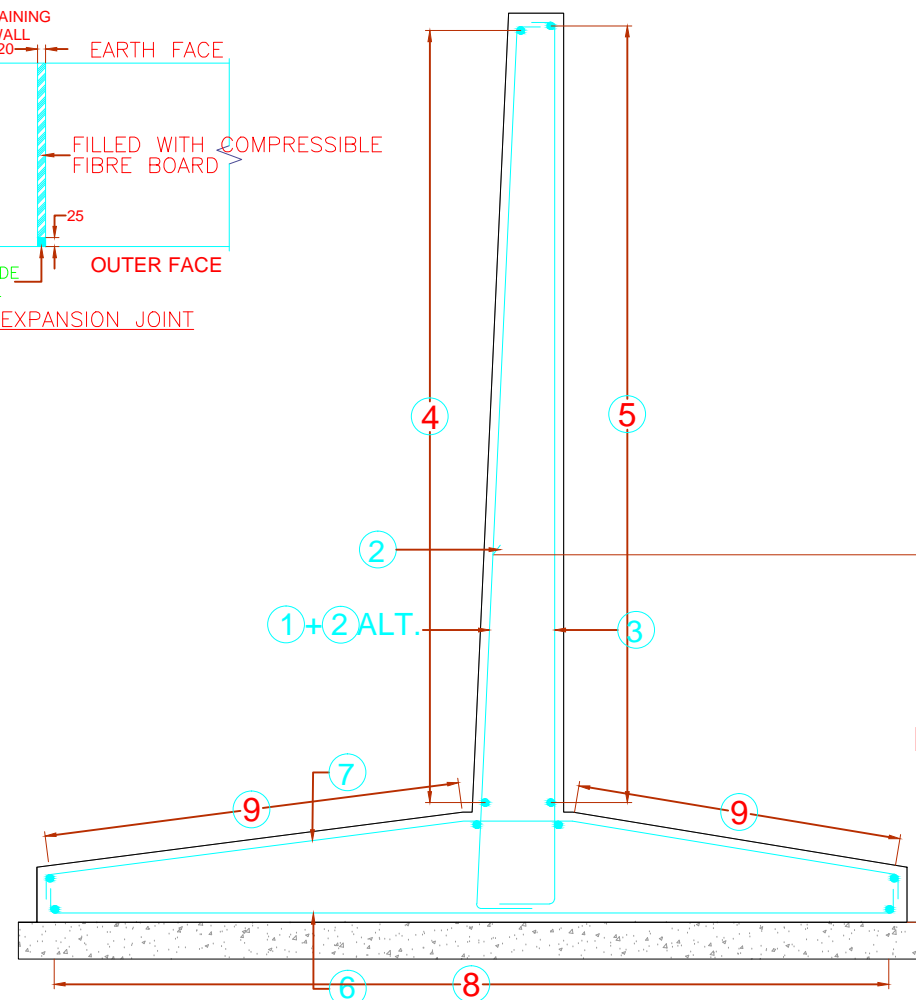
**DIMENSION DETAIL SECTION**

**DIMENSION DETAIL:-**

SERIAL NO.	OVERALL HEIGHT H0 (mm)	HEIGHT ABOVE OF GL H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)	A0 (mm)	A1 (mm)	A2 (mm)	A3 (mm)
1	5000	3000	500	300	2000	3500	1200	500	1800



**DETAILS OF EXPANSION JOINT**



**REINFORCEMENT DETAILS**

**NOTES:-**

- ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS MENTIONED OTHERWISE.
- NO DIMENSIONS SHALL BE SCALED FROM THE DRAWING. ONLY WRITTEN DIMENSION ARE TO BE FOLLOWED.
- LAYING COMPACTION AND EXTENT OF BACKFILL BEHIND RETAINING WALL SHALL CONFIRM TO APPENDIX - 6 IRC-78-2014
- WEEP HOLES OF DIAMETER 100mm. SHALL BE PROVIDED AT SUITABLE STAGGERED SPACING NOT EXCEEDING 1M IN BOTH DIRECTION FOR RETAINING WALL.
- GRADE FOR CONCRETE FOR RETAINING WALL IS M-30.
- BACKFILL GRANULAR SOIL MATERIAL BEHIND WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC: 78-2014. THE  $\text{DFCD9FH9G'5F9'7'1'SZ'1'2'SsZ''} = 20\text{KN/CU.M}$
- GRADE OF STEEL Fe 500 AS PER IS 1786.
- CLEAR COVER TO REINFORCEMENT SHALL BE AS FOLLOWS.
  - FOR STEM : OUTER FACE = 50mm AND EARTH FACE = 75mm
  - FOR BASE SLAB 75mm
- EARTH FILL ON BOTH SIDES OF RETAINING WALL SHALL BE DONE SIMULTANEOUSLY.
- SAND FILLING OF MIN. 300mm WILL BE DONE BELOW FOUNDATION WHEREVER CLAYEY SOIL IS PRESENT.
- DRAWING IS VALID FOR HORIZONTAL EARTH FACE ONLY.
- LAPPING OF REINFORCEMENT SHALL BE AVOIDED AS FAR AS POSSIBLE. IN CASE LAPPING OF BARS BECOMES UNAVOIDABLE MINIMUM LAP LENGTH OF REINFORCEMENT BARS SHALL BE CALCULATED AS FOLLOWS WITH MAXIMUM ALLOWABLE LAPPING
 

(p) OF 50% ONLY  
(IRC : 112:2011), (CLAUSE: 15.2.5.12)

LAP LENGTH  $\text{'g'1' \%VbYh}$   
 $\text{\%l' \%S' : CF'di @25\%}$   
 $\text{\%l' \%")' : CF' \& i @p\%33\%}$   
 $\text{\%l' \%(' : CF' ' '1 @p\%50\%}$

(IRC: 112=2011) (CLAUSE: 15.2.3.3)

DEVELOPMENT LENGTH (lbnet)  
 $\text{'VB9Hi "V'fi '1' \%SL}$   
 $\text{'V'1 _\<}$   
 $k = 40 \text{ FOR M30(Fe500)}$   
 $k = 36 \text{ FOR M35(Fe500)}$   
 $k = 34 \text{ FOR M40(Fe500)}$

FOR UNFAVORABLE BOND CONDITION THE lb SHOULD BE MULTIPLIED BY :  $\text{57HCF'C: \%(' : CF' \< 2' \& a a 'V\< CI @8}$   
 $\text{69=B7F95G98'6MAI @HD@MB; : 57HCF'fb\%S\%# \& l \< L"$

:- CONSULTANTS :-

**L.N. MALVIYA INFRA PROJECTS PVT. LTD.**

T-10, III FLOOR, CITY CENTER, PRESS COMPLEX, PLOT NO.-I,  
M.P. NAGAR, ZONE-I, BHOPAL (M.P.)



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:- CLIENT :-

**NATIONAL HIGHWAYS INFRASTRUCTURE  
DEVELOPMENT CORPORATION LIMITED (NHIDCL)**



DRG. NO. :

**16**

DESIGNED BY.

APPROVED BY.

:- PROJECT TITLE :-

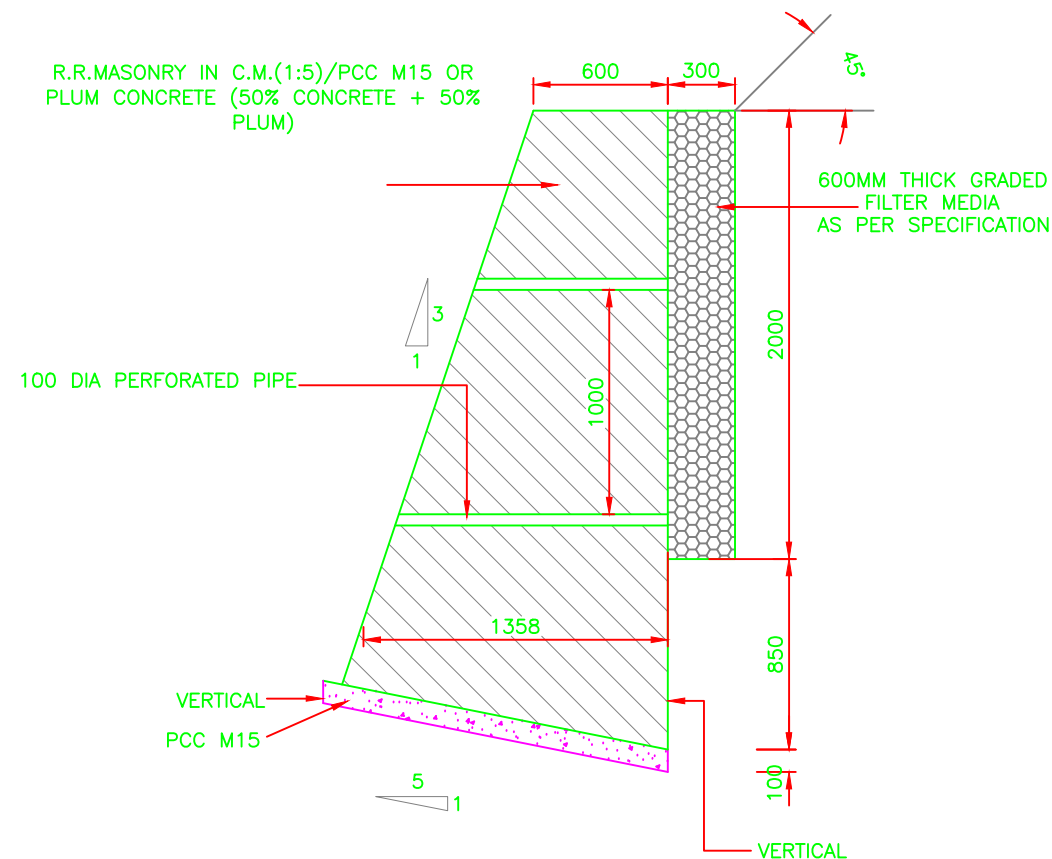
Consultancy Services for Preparation of Feasibility Study and Detailed Project Report For Two lane With Paved Shoulders of Tamenglong - Haflong Road In The State of Manipur on EPC Mode.

:-General Arrangement Drawing:-

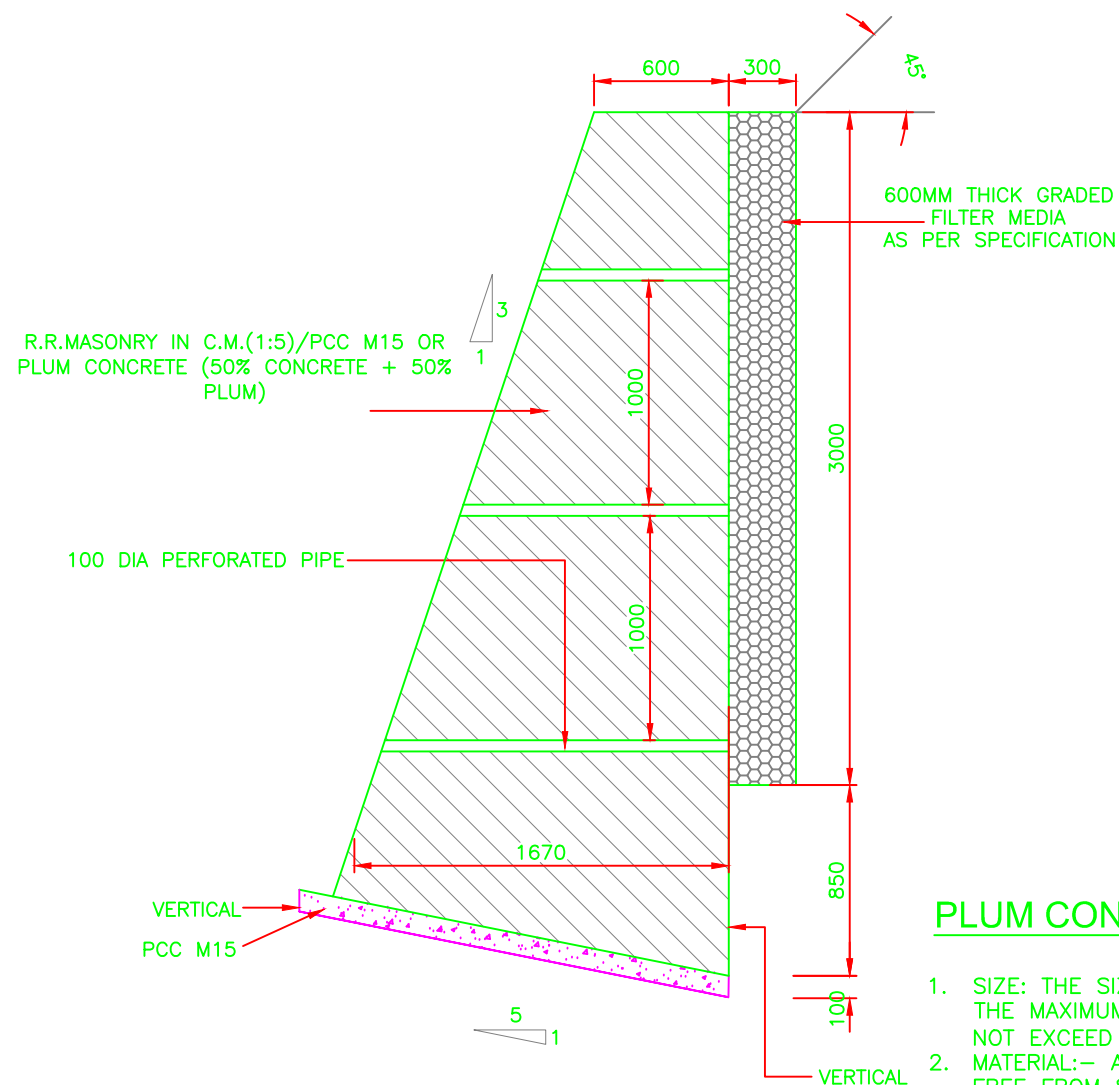
Retaining wall Drawing

**JIRI RIVER - HANGRUM SECTION  
(PACKAGE-7)**





**STANDARD 2.0m HIGH BREAST WALL**



**STANDARD 3.0m HIGH BREAST WALL**

### PLUM CONCRETE SPECIFICATIONS

1. SIZE: THE SIZE OF STONE PLUM MAY BE FROM 150–300MM. THE MAXIMUM DIMENSION OF THESE STONES OR PLUMS SHALL NOT EXCEED 1/3 RD THE LEAST DIMENSION OF THE MEMBER.
2. MATERIAL:– ALL PLUMS SHALL BE HARD, DURABLE CLEN AND FREE FROM SOFT MATERIALS OR LOOSE PIECES OR DELETERIOUS SUBSTANCE IN THEM & SHALL NOT HAVE SHARP CORNERS.
3. CONSTRUCTION OPERATIONS: DURING CONCRETING THE FIRST LAYER OF CONCRETE OF THE SPECIFIED MIX SHALL BE LAID TO A THE PLUM SHALL THEN BE LAID WHILE THE TOP PORTION OF THIS CONCRETE IS STILL GREEN BUT SUFFICIENTLY STIFF TO PREVENT COMPLETE SUBMERGENCE OF THE PLUM UNDER THEIR OWN WEIGHT. THESE PLUMS SHALL BE ABOUT HALF EMBEDDED IN THE CONCRETE & THE REMAINING PART EXPOSED SO AS T FORM A KEA WITH THE NEXT LAYER OF THE CONCRETE NO PLUM SHALL BE USED FOR CONCRETE LAND UNDER WATER
4. WHILE PLACING THE PLUMS, CARE SHALL BE TAKEN TO SEE THAT THE CLEAR DISTANCE BETWEEN ANY TWO PLUMS IS NOT LESS THAN EITHER THE WIDTH OR THICKNESS OF EITHER OF THE PLUMS. THE DISTANCE FROM THE PLUMS TO THE OUTER SURFACE FROM ANY STEEL REINFORCEMENT SHALL BE EQUAL TO GREATEST WIDTH OF PLUMS. IF PLUMS OF STRATIFIED STONE ARE USED THEY SHALL BE LAID ON THEIR NATURAL BED. STONES WITH CONCAVE FACES SHALL AND SUCCESSIVE LAYERS OF CONCRETE SHALL BE AT LEAST TWICE THAT OF THE LARGEST PLUM.
5. QUANTITY OF PLUM: THE TOTAL VOLUME OF PLUMS SHALL BOT EXCEED 50% OF THE VOLUME OF THE FINISHED CONCRETE.
6. MIX OF PLUM: PLUM CONCRETE 1:2:4 (1 CEMENT:2 SAND: 4 GRADED STONE AGGREGATE 40MM NOMINAL SIZE) WITH 50 % PLUMS.

:- CONSULTANTS :-

**L.N. MALVIYA INFRA PROJECTS PVT. LTD.**

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E-mail : [lninfraprojects@gmail.com](mailto:lninfraprojects@gmail.com)

:- CLIENT :-

**NATIONAL HIGHWAYS INFRASTRUCTURE  
DEVELOPMENT CORPORATION LIMITED (NHIDCL)**



DRG. NO. :

**17**

DESIGNED BY.

APPROVED BY.

:- PROJECT TITLE :-

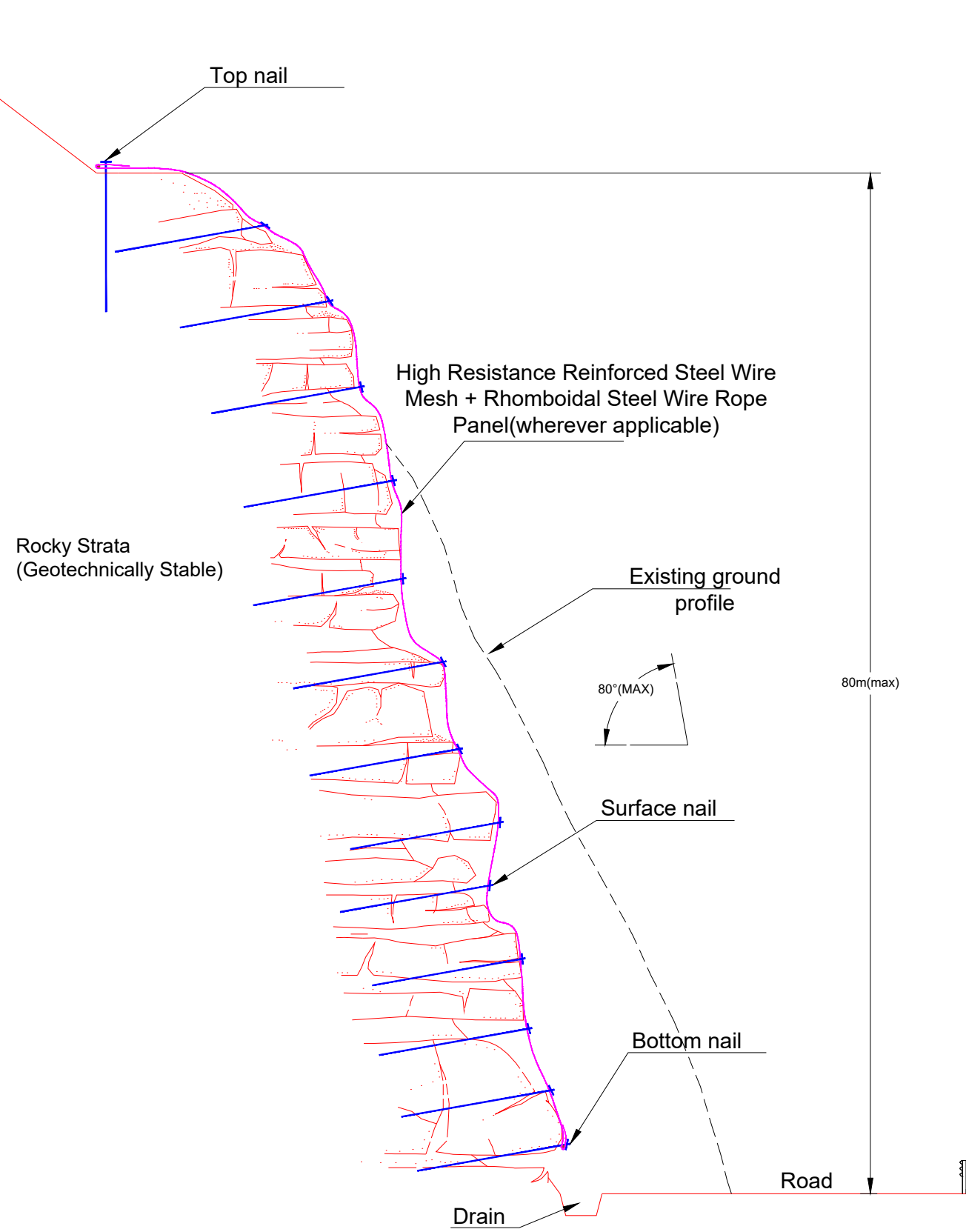
**CONSULTANCY SERVICES FOR PREPERATION OF FEASIBILITY  
REPORT & DETAILED PROJECT REPORT FOR TWO LANING  
WITH PAVED SHOULDER OF MANU-SIMLUNG SECTION OF  
NH-44A IN THE STATE OF TRIPURA ON EPC MODE.**

:-General Arrangement Drawing:-

**DETAIL OF BREAST WALL**

**JIRI RIVER - HANGRUM SECTION  
(PACKAGE-7)**





TYPICAL CROSS SECTION OF SECURED DRAPERY AT CH 118+500

- NOTES:**
- General**
1. The scheme shown is indicative only. Detailed engineering investigations shall be required for carrying out designs.
  2. The stability of the existing structures on crest / toe (if any) shall be ascertained by client and suitable foundation stabilization methods shall be separately taken up.
  3. The scheme shown is part of rockfall mitigation measures.
  4. Secured drapery aims at providing surficial stability and does not address global stability.
  5. At critical locations where detachment is anticipated, it is highly recommended to install dynamic rockfall barriers for catching the rocks as per site requirements. The number of lines, extent, capacity, height and position of rockfall barrier/s shall be finalised based on rockfall simulation
- Material Specifications**
1. High resistance steel grid geocomposite wire mesh shall be CE Certified and shall consist of hexagonal double twisted wire mesh type 8x10 woven with steel wire with a diameter of 2.70 mm (EN 10223-3; EN 10218), Zn-5%Al coated (EN 10244 - class A), longitudinally weaved with steel cable type 6x7+ WSC, grade 1770 MPa, having a diameter of 8 mm (EN 12385-4) ZI-5%Al coated (EN 10264 - class A), at a spacing of 0.3m(specifications as per clause 5.3.3 of IRC HRB Special Report 23), meeting the minimum requirement of longitudinal tensile strength of 170 kN/m.
  2. Rhomboidal wire rope panels of rope diameter shall be made of 10mm with steel core with the intersection of joints secured by a double knot connection having minimum tear capacity of 24 kN and mesh opening 300 x 300mm, meeting the minimum requirement of longitudinal tensile strength of 230 kN/m.
  3. Continuously treaded anchor (CTA) of 32mm dia. with yield load more than 400 kN and min.drill hole dia. 76mm, with suitable corrosion protection coating shall be used. Actual length, dia, etc shall be finalised based on detailed design.
- Construction**
1. Extent of mitigation/restoration measures for each system should be checked before starting the work.
  2. SDA bars of similar yield load shall be used in place of (CTA) bars wherever collapsible strata is encountered on the slope. Nail length, dia, type etc shall be finalized based on the detailed design.
  3. Before carrying out the installation of any of the solutions proposed above, it is recommended that loose scaling/trimming of the slope be done so as to remove the rock blocks which can be easily dislodged from the surface.
  4. The removal of debris/scree deposited at toe of slope or slope surface, to be carried out before the commencement of installation.
  5. Top anchoring shall be done utilizing anchor trench method where soil is encountered on crest side. Top anchoring using steel anchors is to be employed when the crest is of hard/rocky strata.
  6. Any vegetation on the slope as well as on the crest of the slope at location where top anchor to be installed / anchor trench to be made, if present, is also recommended to be removed.
  7. Work shall be carried out under expert supervision and strictly as per installation methodology.
  8. Construction sequence should be strictly followed as per site specific installation manual provided by manufacturer during time of construction as per specific situation at site.
  9. Periodic maintenance, inspection and repairs shall be carried out after each rockfall event by clearing off the debris collected at the bottom of the mesh (in client's scope). This shall aid in continued effective working of the system.

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