



Government of India

Ministry of Road Transport & Highways

National Highways Infrastructure Development Corporation Ltd.

Consultancy Services for preparation of Detailed Project Report for development of NH-54 from Km 0.0 to Km 125.0 in Mizoram to 2-lane Standards Under Phase 'B' of SARDP-NE_Package-1

FINAL DETAILED PROJECT REPORT

VOLUME - V
TECHNICAL SCHEDULES

December, 2015



Archtech Consultants Pvt. Ltd.

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Schedule - A

(See Clause 2.1 and 8.1)

SITE OF THE PROJECT

1 The Site

- 1.1 Site of the 2-lane with Paved Shoulder Project Highway shall include the land, buildings, Structures and road works as described in Annex-I of this Schedule-A.
- 1.2 The dates of handing over the Right of Way to the Contractor are specified in Annex-II of this Schedule-A.
- 1.3 An inventory of the Site including the land, buildings, Structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2.1 of this Agreement.
- 1.4 The alignment plans of the Project Highway are specified in Annex-III.
- 1.5 The status of the Environmental Clearances obtained or awaited is given in Annex-IV.

Annex - I
(Schedule-A)

SITE FOR TWO-LANING

1. Site

The Site of the 2-lane with Paved Shoulder Project Highway comprises the section of National Highway 54 commencing from Km 8.000 to Km 125.000 (design chainage km 110.263) i.e. the Aizwal - Keitum section in the States of Mizoram. The construction package for the project includes developing and strengthening of the existing single-lane /intermediate lane carriageway to 2-lane with paved shoulder carriageway. The land, carriageway and structures comprising the Site are described below.

2. Land

The Site of the Project Highway comprises the land described below:

Sl No	Existing Chainage (Km)		Proposed Chainage (Km)		ROW (M)			Remarks
	From	To	From	To	LHS	RHS	Total	
1	8+292	125+272	8+000	118+263	Varying	Varying	24.000	

3. Carriageway

The present carriageway of the Project Highway is a Single-lane/intermediate lane carriageway without paved shoulders in its entire length. The type of the existing pavement is flexible.

4. Major Bridges

The Site includes the following Tural Major Bridges:

Sl. No	Existing Chainage (Km)	Type of Structure	No. of Spans	Width (M)
1	24+659	RCC T- Beam Slab	2x11.85+1x47.10	7.50

5. Railway Over Bridges and Road Under Bridge

The Site includes the following Railway Over Bridges:

Sl. No.	Existing Chainage (Km)	Type of Structure	No. of Spans	Width (M)
NIL				

6. Grade Separator s

The Site includes the following Grade Separators:

Sl. No	Existing Chainage (KM)	Type of Structure	No. of Spans	Width (M)
NIL				

7. Minor Bridges

The Site includes the following Minor Bridges:

Sl. No	Existing Chainage (KM)	Type of Structure	No. of Spans	Width (M)
NIL				

8. Railway Level Crossings

The site includes the following railway level crossings.

Sl. No	Existing Chainage (KM)	Type of Structure	No. of Spans	Width (M)
NIL				

9. Culvert

The Site has the following culverts

<i>Sl.No</i>	<i>Existing Chainage (Km)</i>	<i>Type of Existing Culvert</i>	<i>Existing culvert span Arrangement (M)</i>	<i>Remarks</i>
1	8+405	Pipe	1 x ϕ 900mm	
2	9+072	Pipe	1 x ϕ 800mm	
3	9+183	Box	1.5 X 11 X 1.2	
4	9+329	Pipe	1 x ϕ 700mm	
5	9+567	Pipe	1 x ϕ 700mm	
6	9+692	Pipe	1 x ϕ 600mm	
7	9+742	Pipe	1 x ϕ 500mm	
8	9+956	Pipe	1 x ϕ 800mm	
9	10+190	Pipe	1 x ϕ 1000mm	
10	10+375	Box	1.5 X 10 X 0.8	
11	10+534	Box	1 X 8 X 1.1	
12	11+052	Pipe	1 x ϕ 800mm	
13	11+189	Pipe	1 x ϕ 1000mm	
14	11+375	Box	1.5 X 9.25 X 1.5	
15	11+496	Pipe	1 x ϕ 600mm	
16	11+600	Pipe	1 x ϕ 1000mm	
17	11+667	Pipe	1 x ϕ 800mm	
18	11+769	Box	0.5 X 9.75 X 0.5	
19	11+819	Box	2.5 X 12.5 X 2.9	
20	12+140	Pipe	2 x ϕ 900mm	
21	12+296	Box	1.25 X 7.0 X 0.9	
22	12+437	Pipe	1 x ϕ 900mm	
23	12+568	Pipe	1 x ϕ 800mm	
24	12+695	Pipe	1 x ϕ 1000mm	
25	12+765	Box	2.25 X 7.5 X 2.0	
26	12+842	Pipe	1 x ϕ 1000mm	
27	12+937	Box	0.8 X 8.8 X 0.45	
28	13+084	Box	1.0 X 10.25 X 1.1	
29	13+325	Pipe	1 x ϕ 1100mm	
30	13+553	Pipe	Abandoned	
31	14+099	Box	1.0 X 8.75 X 1.0	
32	14+263	Box	1.3 X 8.0 X 1.0	
33	14+379	Pipe	1 x ϕ 900mm	
34	14+510	Pipe	1 x ϕ 1100mm	
35	14+584	Pipe	1 x ϕ 1000mm	
36	14+658	Pipe	1 x ϕ 600mm	
37	14+790	Pipe	1 x ϕ 1000mm	
38	15+350	Pipe	1 x ϕ 1000mm	
39	15+425	Pipe	1 x ϕ 900mm	
40	15+566	Pipe	1 x ϕ 1200mm	
41	15+643	Pipe	1 x ϕ 600mm	
42	15+832	Pipe	1 x ϕ 500mm	

43	16+130	Pipe	1 x ϕ 600mm	
44	16+387	Pipe	1 x ϕ 600mm	
45	16+667	Pipe	1 x ϕ 1000mm	
46	16+820	Box	1.0 X 8.4 X 1.0	
47	16+886	Pipe	1 x ϕ 800mm	
48	17+097	Pipe	Abandoned	
49	17+287	Pipe	Abandoned	
50	17+613	Pipe	1 x ϕ 500mm	
51	17+759	Pipe	1 x ϕ 500mm	
52	17+917	Box	1.25 X 7.5 X 1.6	
53	18+128	Pipe	1 x ϕ 800mm	
54	18+180	Box	1.0 X 9.0 X 1.0	
55	18+316	Pipe	1 x ϕ 1000mm	
56	18+447	Pipe	1 x ϕ 500mm	
57	18+824	Pipe	1 x ϕ 1000mm	
58	19+066	Box	1.75 X 8.5 X 3.0	
59	19+352	Box	1.75 X 8.0 X 1.6	
60	19+437	Pipe	1 x ϕ 600mm	
61	19+676	Pipe	1 x ϕ 800mm	
62	19+757	Pipe	1 x ϕ 600mm	
63	19+777	Pipe	1 x ϕ 800mm	
64	20+087	Box	1.25 X 15.5 X 1.3	
65	20+254	Pipe	1 x ϕ 1000mm	
66	20+707	Pipe	1 x ϕ 1000mm	
67	20+864	Pipe	1 x ϕ 1000mm	
68	21+168	Pipe	1 x ϕ 1000mm	
69	21+222	Box	1.25 X 10.5 X 0.75	
70	21+375	Pipe	1 x ϕ 1200mm	
71	21+573	Pipe	1 x ϕ 1000mm	
72	21+600	Pipe	1 x ϕ 800mm	
73	22+011	Pipe	Abandoned	
74	22+100	Pipe	1 x ϕ 1000mm	
75	22+187	Pipe	1 x ϕ 1000mm	
76	22+358	Pipe	1 x ϕ 800mm	
77	22+492	Pipe	2 x ϕ 1000mm	
78	22+581	Pipe	1 x ϕ 600mm	
79	22+702	Box	1.0 X 10.0 X 1.1	
80	22+816	Pipe	1 x ϕ 1000mm	
81	23+134	Pipe	1 x ϕ 500mm	
82	23+381	Pipe	Abandoned	
83	23+444	Pipe	2 x ϕ 1000mm	
84	23+515	Pipe	1 x ϕ 800mm	
85	23+577	Pipe	1 x ϕ 900mm	
86	23+820	Pipe	1 x ϕ 600mm	
87	24+162	Box	0.8 X 7.5 X 2.1	
88	24+268	Pipe	1 x ϕ 1200mm	
89	24+464	Box	1.0 X 10.5X 2.1	
90	24+496	Pipe	Abandoned	
91	24+795	Pipe	Abandoned	
92	24+882	Box	0.6 X 9.0 X 0.6	
93	25+059	Pipe	1 x ϕ 1000mm	

94	25+208	Box	1.3 X7.5 X 1.6	
95	25+431	Box	1.3 X7.5 X 2.2	
96	25+710	Pipe	1 x ϕ 800mm	
97	25+894	Box	1.0 X9.25 X 1.8	
98	26+045	Pipe	1 x ϕ 1000mm	
99	26+336	Box	1.5X9.0 X 1.6	
100	26+561	Pipe	1 x ϕ 900mm	
101	27+087	Pipe	1 x ϕ 900mm	
102	27+180	Pipe	1 x ϕ 1000mm	
103	27+330	Pipe	Abandoned	
104	27+425	Pipe	1 x ϕ 1000mm	
105	27+616	Pipe	Abandoned	
106	27+667	Box	1.0 X8.5 X 1.0	
107	27+913	Pipe	1 x ϕ 1000mm	
108	28+152	Pipe	Abandoned	
109	28+185	Pipe	1 x ϕ 800mm	
110	28+262	Pipe	1 x ϕ 900mm	
111	28+370	Pipe	1 x ϕ 600mm	
112	28+735	Pipe	1 x ϕ 1000mm	
113	28+776	Pipe	1 x ϕ 1000mm	
114	29+085	Pipe	1 x ϕ 800mm	
115	29+230	Pipe	1 x ϕ 1000mm	
116	29+583	Pipe	1 x ϕ 900mm	
117	29+632	Pipe	1 x ϕ 1000mm	
118	29+865	Pipe	1 x ϕ 800mm	
119	30+042	Pipe	1 x ϕ 900mm	
120	30+223	Pipe	1 x ϕ 1000mm	
121	30+552	Pipe	1 x ϕ 800mm	
122	31+012	Pipe	1 x ϕ 900mm	
123	31+225	Box	1.0 X9.5 X 1.0	
124	31+366	Pipe	1 x ϕ 800mm	
125	31+647	Pipe	1 x ϕ 700mm	
126	31+968	Pipe	1 x ϕ 600mm	
127	32+179	Box	1.0 X8.25 X 1.0	
128	32+412	Pipe	1 x ϕ 600mm	
129	32+579	Pipe	1 x ϕ 1000mm	
130	33+220	Pipe	1 x ϕ 1000mm	
131	33+512	Pipe	1 x ϕ 1200mm	
132	33+778	Pipe	1 x ϕ 600mm	
133	33+835	Pipe	1 x ϕ 900mm	
134	33+970	Pipe	1 x ϕ 800mm	
135	34+207	Pipe	1 x ϕ 1000mm	
136	34+426	Box	2.0 X9.0 X 1.0	
137	34+722	Pipe	1 x ϕ 600mm	
138	34+797	Pipe	1 x ϕ 1000mm	
139	34+998	Pipe	1 x ϕ 1000mm	
140	35+100	Pipe	1 x ϕ 1000mm	
141	35+141	Pipe	1 x ϕ 1000mm	
142	35+350	Pipe	1 x ϕ 1000mm	
143	35+642	Pipe	1 x ϕ 1000mm	
144	35+762	Pipe	1 x ϕ 1000mm	

145	36+068	Pipe	1 x ϕ 1000mm	
146	36+138	Box	1.5 X7.0 X 2.0	
147	36+657	Pipe	1 x ϕ 1000mm	
148	36+757	Box	1.0 X7.0 X 0.6	
149	37+242	Pipe	1 x ϕ 700mm	
150	37+400	Pipe	1 x ϕ 600mm	
151	38+211	Box	1.0 X7.0 X 1.2	
152	38+705	Pipe	Abandoned	
153	39+026	Pipe	2 x ϕ 1000mm	
154	39+081	Pipe	2 x ϕ 1000mm	
155	39+213	Slab	1.5 X8.0 X 2.4	
156	39+476	Box	1.0 X7.0 X 1.7	
157	39+721	Pipe	Abandoned	
158	40+156	Pipe	1 x ϕ 1000mm	
159	40+338	Pipe	1 x ϕ 1000mm	
160	40+397	Pipe	Abandoned	
161	41+219	Pipe	1 x ϕ 600mm	
162	41+339	Pipe	1 x ϕ 600mm	
163	41+623	Slab	1.0 X10.0 X 0.8	
164	42+030	Pipe	1 x ϕ 1000mm	
165	42+279	Pipe	1 x ϕ 1200mm	
166	42+497	Pipe	1 x ϕ 1000mm	
167	42+842	Box	0.7 X9.0 X 0.8	
168	42+882	Pipe	1 x ϕ 1000mm	
169	43+023	Pipe	1 x ϕ 700mm	
170	43+233	Pipe	1 x ϕ 1000mm	
171	43+364	Pipe	1 x ϕ 1000mm	
172	43+830	Pipe	1 x ϕ 1000mm	
173	44+080	Pipe	Abandoned	
174	44+540	Box	Abandoned	
175	45+022	Pipe	1 x ϕ 1000mm	
176	45+280	Pipe	1 x ϕ 1000mm	
177	45+368	Pipe	1 x ϕ 800mm	
178	45+400	Pipe	1 x ϕ 1000mm	
179	45+526	Pipe	2 x ϕ 1000mm	
180	46+064	Pipe	1 x ϕ 1000mm	
181	46+284	Pipe	1 x ϕ 800mm	
182	46+326	Pipe	1 x ϕ 1000mm	
183	46+496	Pipe	1 x ϕ 1000mm	
184	46+576	Pipe	1 x ϕ 1000mm	
185	46+853	Box	1.75 X7.75 X 1.0	
186	47+044	Pipe	1 x ϕ 800mm	
187	47+508	Pipe	1 x ϕ 1000mm	
188	47+640	Pipe	1 x ϕ 1000mm	
189	47+695	Pipe	1 x ϕ 1000mm	
190	47+750	Box	1.3 X8.0 X 0.8	
191	48+230	Pipe	1 x ϕ 1000mm	
192	48+442	Pipe	1 x ϕ 1000mm	
193	48+578	Pipe	1 x ϕ 1000mm	
194	48+661	Pipe	1 x ϕ 750mm	
195	48+820	Pipe	1 x ϕ 1000mm	

196	49+068	Pipe	1 x ϕ 1000mm	
197	49+571	Pipe	1 x ϕ 1000mm	
198	49+754	Box	0.75X6.5 X 1.0	
199	49+860	Pipe	1 x ϕ 1000mm	
200	49+966	Box	1.5X7.5 X 1.3	
202	50+343	Pipe	1 x ϕ 1000mm	
203	50+486	Pipe	1 x ϕ 1000mm	
204	51+119	Pipe	1 x ϕ 1000mm	
205	51+240	Pipe	Abandoned	
206	51+362	Pipe	1 x ϕ 1000mm	
207	51+541	Pipe	1 x ϕ 1000mm	
208	51+770	Pipe	1 x ϕ 1000mm	
209	51+864	Pipe	1 x ϕ 1000mm	
210	52+174	Box	0.50X8.0X0.50	
211	52+311	Box	0.98X8.25X1.0	
212	52+553	Pipe	1 x ϕ 1000mm	
213	52+670	Pipe	1 x ϕ 1000mm	
214	52+946	Pipe	1 x ϕ 1000mm	
215	53+135	Pipe	1 x ϕ 1000mm	
216	53+297	Box	0.80X6.75 X0.7	
217	53+452	Box	0.87X6.75 X0.7	
218	53+616	Pipe	1 x ϕ 1000mm	
219	53+759	Slab	0.83X7.25 X1.0	
220	54+034	Pipe	1 x ϕ 500mm	
221	54+414	Box	0.89X6.5 X1.0	
222	54+698	Pipe	1 x ϕ 500mm	
223	55+016	Slab	0.85X7.50 X0.50	
224	55+200	Pipe	1 x ϕ 1000mm	
225	55+463	Slab	0.73X6.25 X0.60	
226	55+613	Slab	0.80X6.25 X0.50	
227	57+309	Pipe	1 x ϕ 500mm	
228	57+569	Pipe	1 x ϕ 1000mm	
229	57+683	Pipe	1 x ϕ 1000mm	
230	57+798	Slab	0.90X7.25 X1.00	
231	58+607	Pipe	1 x ϕ 1000mm	
232	58+813	Pipe	Abandoned	
233	59+175	Pipe	Abandoned	
234	59+593	Pipe	1 x ϕ 600mm	
235	59+782	Slab	1.0X7.00X1.00	
236	59+943	Box	1.2X8.00X1.30	
237	60+190	Box	1.2X7.50X1.50	
238	60+594	Pipe	Abandoned	
239	61+357	Pipe	Abandoned	
240	61+482	Pipe	1 x ϕ 1000mm	
241	61+566	Box	1.25X8.00X1.30	
242	61+644	Box	1.00X8.00X1.00	
243	61+791	Box	0.85X6.5X1.00	
244	61+948	Box	1.26X8.0X1.20	
245	62+088	Pipe	1 x ϕ 1000mm	
246	62+209	Box	1.25X7.0X1.00	
247	62+471	Slab	Abandoned	

248	62+592	Pipe	1 x ϕ 1000mm	
249	62+804	Pipe	1 x ϕ 1000mm	
250	62+931	Box	0.95X7.0X0.7	
251	63+165	Pipe	1 x ϕ 1000mm	
252	63+371	Pipe	1 x ϕ 1000mm	
253	63+441	Pipe	1 x ϕ 1000mm	
254	63+513	Pipe	1 x ϕ 1000mm	
255	63+726	Pipe	1 x ϕ 1000mm	
256	63+826	Box	1.00X6.25X1.00	
257	63+989	Pipe	Abandoned	
258	64+078	Box	1.00X7.0X1.30	
259	64+480	Pipe	Abandoned	
260	64+636	Box	0.8X8.0X0.7	
261	64+780	Pipe	1 x ϕ 1000mm	
262	65+598	Box	0.8X7.0X0.4	
263	65+772	Box	1.0X7.0X0.5	
264	66+079	Box	1.0X6.5X0.8	
265	66+166	Pipe	1 x ϕ 1000mm	
266	66+305	Pipe	1 x ϕ 1000mm	
267	66+662	Pipe	Abandoned	
268	67+457	Slab	0.65X6.5X0.6	
269	67+590	Slab	0.8X6.5X1.6	
270	67+730	Slab	1.0X7.0X0.8	
271	67+848	Slab	0.7X6.0X0.6	
272	67+958	Box	0.7X6.75X0.4	
273	68+224	Slab	0.75X6.25X0.45	
274	68+684	Slab	0.75X6.50X1.0	
275	68+772	Slab	0.75X6.50X0.6	
276	68+905	Pipe	1 x ϕ 500mm	
277	68+955	Slab	0.65X9.75X1.15	
278	69+208	Pipe	1 x ϕ 1000mm	
279	69+337	Pipe	1 x ϕ 1000mm	
280	69+509	Slab	0.75X7.0X0.9	
281	69+593	Pipe	1 x ϕ 900mm	
282	69+916	Box	0.75X7.5X1.0	
283	70+035	Slab	1.0X6.5X1.3	
284	70+181	Box	0.75X7.5X1.3	
285	70+345	Box	1X6.5X1.4	
286	70+506	Box	0.75X7.5X1.5	
287	70+634	Pipe	1 x ϕ 1200mm	
288	70+782	Box	1.0X6.5X0.6	
289	71+008	Slab	1.0X6.5X1.0	
290	71+213	Box	0.8X7.0X0.8	
291	71+393	Box	0.8X7.0X0.4	
292	71+682	Box	1.5X7.25X1.1	
293	71+807	Box	0.75X7.0X0.7	
294	71+976	Box	1.0X7.1X0.5	
295	72+068	Box	0.8X6.5X0.7	
296	72+173	Box	1.0X6.5X0.4	
297	72+544	Pipe	1 x ϕ 1000mm	
298	72+661	Box	1.2X7.5X0.9	

299	72+733	Box	1.0X6.75x1.0	
300	72+912	Pipe	1 x ϕ 1000mm	
301	73+126	Box	Abandoned	
302	73+332	Pipe	1 x ϕ 1000mm	
303	73+432	Box	0.8X6.75x0.4	
304	73+833	Pipe	Abandoned	
305	74+379	Pipe	Abandoned	
306	74+789	Box	1.2X6.75x0.4	
307	75+319	Box	0.8X6.75x0.4	
308	75+595	Box	0.8X7.25x1.0	
309	75+758	Box	1.0X6.5x0.4	
310	75+929	Box	1.0X6.5x1.0	
311	76+152	Box	0.8X6.75x1.0	
312	76+270	Box	0.8X8.75x0.6	
313	76+438	Box	1.0X6.5x0.8	
314	76+545	Box	0.9X7.0x0.3	
315	76+679	Pipe	1 x ϕ 1100mm	
316	76+912	Box	0.8X6.6x0.9	
317	77+092	Pipe	1 x ϕ 1000mm	
318	77+193	Box	0.8X6.75x1.5	
319	77+375	Box	0.9X6.50x0.75	
320	77+748	Box	1.0X6.50x1.0	
321	77+891	Pipe	1 x ϕ 1000mm	
322	78+089	Box	0.8X6.75x0.8	
323	78+304	Box	1.0X7.25x0.8	
324	78+425	Box	0.8X6.5x0.8	
325	78+520	Pipe	1 x ϕ 1000mm	
326	78+682	Box	0.8X6.5x1.9	
327	78+925	Box	1.0X6.5x1.0	
328	79+050	Pipe	1 x ϕ 1000mm	
329	79+152	Box	0.9X6.5x0.9	
330	79+320	Pipe	1 x ϕ 1000mm	
331	79+423	Box	0.8X6.5x0.9	
332	79+646	Box	1.1X6.5x0.4	
333	79+855	Box	1.1X6.75x0.5	
334	79+947	Box	1.0X9.5x0.4	
335	80+136	Box	1.0X10.0x1.5	
336	80+238	Box	1.0X8.25x0.8	
337	80+346	Box	1.0X10.0x0.6	
338	80+946	Box	0.75X9.75x0.9	
339	81+300	Box	1.15X8.25x1.5	
340	81+494	Box	1.0X10.0x1.8	
341	81+618	Box	1.0X10.0x0.4	
342	81+961	Box	1.0X10.0x1.1	
343	82+313	Box	0.6X6.75x1.4	
344	82+465	Box	1.0X10.0x1.1	
345	82+823	Box	1.0X6.75x1.0	
346	82+982	Box	0.75X10.0x0.3	
347	83+613	Box	1.0X10.0x2.0	
348	83+848	Box	0.8X7.25x1.6	
349	84+019	Box	0.8X7.25x1.0	

350	84+177	Pipe	1 x \varnothing 700mm	
351	84+384	Box	0.9X6.4x1.1	
352	84+598	Pipe	1 x \varnothing 600mm	
353	84+704	Box	1.0X7.25x0.8	
354	84+892	Box	1.25x6.75x1.5	
355	84+975	Pipe	1 x \varnothing 500mm	
356	85+164	Box	0.8x6.75x0.5	
357	85+344	Box	0.8x7.0x0.5	
358	85+843	Box	0.9x7.0x0.6	
359	85+942	Box	0.9x6.75x1.4	
360	86+116	Box	Abandoned	
361	86+279	Box	0.9x7.25x0.9	
362	86+423	Box	0.9x7.25x1.5	
363	86+508	Box	0.8x7.0x1.8	
364	86+700	Box	0.8x7.0x1.5	
365	86+870	Box	Abandoned	
366	87+090	Box	0.8x7.0x1.5	
367	87+198	Box	1.0x7.25x1.3	
368	87+281	Pipe	1 x \varnothing 700mm	
369	87+408	Box	1.0x7.25x0.7	
370	87+877	Box	0.75x6.75x0.9	
371	88+556	Box	0.8x6.75x0.8	
372	88+793	Box	0.8x7.25x2.2	
373	88+909	Box	0.8x7.25x1.3	
374	89+086	Box	0.8x7.25x1.4	
375	89+445	Box	1.0x7.25x1.0	
376	89+606	Box	1.0x7.0x1.1	
377	89+863	Box	0.8x7.25x1.2	
378	90+076	Box	0.8x7.25x0.8	
379	90+197	Box	0.8x7.0x0.7	
380	90+438	Box	0.7x6.4x0.7	
381	91+147	Box	Abandoned	
382	91+256	Box	1.0x6.475x1.8	
383	91+396	Pipe	1 x \varnothing 1000mm	
384	91+529	Box	0.6x6.4x1.0	
385	92+038	Box	0.8x6.25x1.1	
386	92+393	Pipe	1 x \varnothing 1000mm	
387	92+579	Box	0.8x8.25x1.4	
388	92+953	Pipe	1 x \varnothing 1000mm	
389	93+096	Box	0.5x6.5x1.4	
390	93+181	Slab	0.7x6.25x0.7	
391	93+326	Pipe	1 x \varnothing 1000mm	
392	93+500	Causeway	8.5 x 7.0	
393	93+556	Box	0.8x7.5x0.8	
394	93+778	Pipe	1 x \varnothing 1000mm	
395	93+939	Box	0.8x7.25x0.6	
396	94+027	Pipe	1 x \varnothing 1000mm	
397	94+161	Pipe	1 x \varnothing 1000mm	
398	94+350	Box	0.75x7.25x1.4	
399	94+588	Pipe	1 x \varnothing 1000mm	
400	94+729	Box	0.75x6.75x0.6	

401	94+863	Pipe	1 x ϕ 1000mm	
402	94+987	Box	1.0x7.0x0.3	
403	95+098	Pipe	1 x ϕ 1000mm	
404	95+186	Box	0.9x7.0x0.5	
405	95+330	Box	0.9x7.25x1.2	
406	95+809	Box	0.8x6.8x1.3	
407	96+220	Slab	0.8x11.25x1.5	
408	97+100	Slab	0.80x10.25x1.5	
409	97+225	Slab	0.80x10.50x1.2	
410	97+433	Slab	0.75x9.25x1.0	
411	97+575	Box	0.80x10.0x0.50	
412	97+638	Slab	1.5x11.0x0.50	
413	97+850	Slab	0.75x10.0x1.50	
414	98+119	Slab	1.0x9.50x1.50	
415	98+360	Box	0.80x10.25x1.30	
416	98+484	Box	0.80x11.25x1.50	
417	98+613	Box	1.0x10.0x0.40	
418	98+674	Slab	1.0x10.0x1.0	
419	98+746	Slab	1.0x10.0x0.60	
420	98+970	Box	1.0x10.0x2.80	
421	99+078	Box	0.75x10.75x1.50	
422	99+534	Box	Abandoned	
423	99+676	Slab	Abandoned	
424	99+894	Slab	1.3x12.0x1.7	
425	100+126	Slab	0.75x10.5x1.3	
426	100+563	Slab	Abandoned	
427	100+680	Box	0.75 x 10.0x1.1	
428	100+785	Box	1.0 x 10.2x0.8	
429	101+081	Box	1.0 x 10.25x1.4	
430	101+742	Box	0.75x11.25x1.0	
431	101+959	Pipe	Abandoned	
432	102+139	Box	Abandoned	
433	102+278	Box	0.8x7.0x0.5	
434	102+764	Box	0.8x7.0x0.4	
435	103+170	Pipe	1 x ϕ 700mm	
436	103+391	Pipe	Abandoned	
437	103+606	Box	0.75x7.0x1.3	
438	103+916	Box	1.0x6.75x0.4	
439	104+121	Pipe	Abandoned	
440	104+209	Pipe	Abandoned	
441	104+602	Pipe	1 x ϕ 1000mm	
442	104+733	Box	0.75x6.75x1.40	
443	104+825	Box	0.75x11.25x0.80	
444	104+966	Box	Abandoned	
445	105+070	Box	Abandoned	
446	105+426	Pipe	Abandoned	
447	105+676	Box	0.80x10.0x1.5	
448	106+005	Pipe	1 x ϕ 1000mm	
449	107+062	Pipe	1 x ϕ 1000mm	
450	107+214	Box	1.0x10.25x3.0	
451	107+360	Pipe	1 x ϕ 1500mm	

452	107+612	Pipe	1 x ϕ 1200mm	
453	107+818	Pipe	Abandoned	
454	108+032	Box	0.80x6.25x2.10	
455	108+405	Box	1.40x10.0x0.90	
456	108+566	Box	Abandoned	
457	108+785	Pipe	1 x ϕ 1000mm	
458	108+917	Pipe	1 x ϕ 700mm	
459	109+226	Box	Abandoned	
460	109+291	Box	0.50x7.25x1.10	
461	109+425	Pipe	1 x ϕ 1200mm	
462	109+529	Pipe	1 x ϕ 1200mm	
463	109+809	Box	Abandoned	
464	110+193	Pipe	1 x ϕ 1000mm	
465	110+430	Box	1.0x7.25x1.60	
466	110+566	Pipe	1 x ϕ 1100mm	
467	110+600	Box	0.75x7.25x1.60	
468	110+844	Box	0.80x11.0x1.10	
469	110+919	Pipe	1 x ϕ 1100mm	
471	111+300	Causeway	15.0x6.0	
472	111+330	Slab	Abandoned	
473	111+740	Box	1.0x10.0x0.70	
474	112+042	Box	1.4x11.0x0.50	
475	112+330	Box	1.0x10.50x1.30	
476	112+634	Pipe	1 x ϕ 1400mm	
477	112+753	Box	0.75x10.50x0.70	
478	112+890	Pipe	1 x ϕ 1100mm	
479	113+009	Box	1.0x10.0x0.40	
480	113+164	Box	3.50x10.0x3.10	
481	113+215	Box	1.50x7.5x1.10	
482	113+364	Box	1.00x9.0x1.0	
483	113+519	Box	1.00x11.0x1.0	
484	113+678	Box	0.80x10.0x1.30	
485	113+895	Box	1.25x10.25x0.40	
486	114+397	Pipe	1 x ϕ 900mm	
487	114+582	Box	1.0x6.6x1.0	
488	114+759	Box	0.8x7.75x1.3	
489	115+059	Pipe	1 x ϕ 1200mm	
490	115+304	Box	0.6x7.25x1.3	
491	115+677	Box	0.7x6.4x1.3	
492	115+820	Box	0.8x6.4x0.6	
493	115+569	Pipe	1 x ϕ 1000mm	
494	116+170	Box	0.8x7.0x1.7	
495	116+273	Box	2.0x7.75x0.4	
496	116+384	Pipe	1 x ϕ 1400mm	
497	116+553	Box	1.0x7.25x0.4	
498	116+675	Box	0.8x7.0x1.2	
499	116+862	Box	1.0x6.5x1.4	
500	117+259	Box	0.75x6.75x0.8	
501	117+596	Box	0.75x6.25x1.1	
502	117+725	Box	0.75x7.0x0.7	
503	117+892	Pipe	1 x ϕ 1000mm	

504	117+998	Box	1.0x7.25x0.4	
505	118+234	Box	1.5x6.75x2.0	
506	118+330	Box	1.8x7.5x3.5	
507	118+483	Box	1x9.25x2.2	
508	118+615	Pipe	1 x ϕ 1000mm	
509	118+912	Pipe	1 x ϕ 1200mm	
510	119+306	Slab	1.0x8.0x2.0	
511	119+757	Pipe	1 x ϕ 1000mm	
512	119+829	Box	Abandoned	
513	119+913	Box	1x6x1	
514	120+281	Box	0.5x6.25x0.7	
515	120+397	Box	0.5x5.25x0.3	
516	120+565	Box	0.6x6.75x1.2	
517	120+636	Box	0.8x6.75x0.4	
518	120+831	Pipe	1 x ϕ 1000mm	
519	120+926	Box	0.85x7.0x0.8	
520	121+152	Box	0.85x6.75x1.0	
521	121+294	Box	0.75x7x1.1	
522	121+680	Pipe	1 x ϕ 1000mm	
523	121+766	Box	1.0x7.0x0.3	
524	121+874	Box	0.75x7.25x1.7	
525	121+916	Pipe	1 x ϕ 1000mm	
526	122+053	Box	Abandoned	
527	122+382	Box	1.0x6.0x0.4	
528	122+574	Pipe	1 x ϕ 900mm	
529	122+635	Pipe	1 x ϕ 1000mm	
530	122+777	Pipe	1 x ϕ 1000mm	
531	122+937	Pipe	1 x ϕ 1000mm	
532	123+016	Box	1.0x8.0x0.4	
533	123+305	Pipe	1 x ϕ 1200mm	
534	123+422	Box	0.75 x 7.75x1.2	
535	123+577	Pipe	1 x ϕ 1300mm	
536	123+616	Pipe	1 x ϕ 1400mm	
537	123+716	Box	Abandoned	
538	123+852	Box	Abandoned	
539	124+346	Slab	0.75 x 11x0.6	
540	124+772	Slab	0.70x10.0x1.2	

10. Bus bays

The details of Bus bays on the site are as follows:

Sl. No.	Existing Chainage (Km)	Length (m)	Left Hand Side	Right Hand Side
NIL				

11. Truck Lay Bys

The details of truck lay bys are as follows:

Sl. No.	Existing Chainage (Km)	Length (m)	Left Hand Side	Right Hand Side
NIL				

12. Road Side Drains

The details of roadside drains are as follows:

Sl No	Location		Type	
	From (Km)	To (Km)	Masonry/CC (Pucca)	Earthen (Kutcha)
1	8+292	9+000	Pucca	Rest Kutcha
2	9+000	24+000	-	Kutcha
3	24+000	25+000	Pucca	Rest Kutcha
4	25+000	39+000	-	Kutcha
5	39+000	41+000	Pucca	Rest Kutcha
6	41+000	44+000	-	Kutcha
7	44+000	46+000	Pucca	Rest Kutcha
8	46+000	56+000	-	Kutcha
9	56+000	57+000	Pucca	Rest Kutcha
10	57+000	58+000	-	Kutcha
11	58+000	60+000	Pucca	Rest Kutcha
12	60+000	64+000	-	Kutcha
13	64+000	65+000	Pucca	Rest Kutcha
14	65+000	66+000	-	Kutcha
15	66+000	67+000	Pucca	Rest Kutcha
16	67+000	80+000	-	Kutcha
17	80+000	82+000	Pucca	Rest Kutcha
18	82+000	98+000	-	Kutcha
19	98+000	100+000	Pucca	Rest Kutcha
20	100+000	106+000	-	Kutcha
21	106+000	108+000	Pucca	Rest Kutcha
22	108+000	109+000	-	Kutcha
23	109+000	112+000	Pucca	Rest Kutcha
24	112+000	125+000	-	Kutcha

13. Major Junction

The details of major junctions are as follows:

SL No	Chainage (Km)		Side	Type of Junction	Remarks
	Existing	Proposed			
1	38+000	35+305	LHS	T	NH-150
2	40+856	38+000	LHS	Y	Champai
3	114+209	107+700	RHS	Y	Thenzawl
4	124+145	117+575	LHS	Y	Khawhlailung

14. Minor Junction

The details of minor junctions are as follows:

SL No	Chainage (Km)		Side	Type of Junction	Remarks
	Existing	Proposed			
1	14+501	13+500	LHS	T	Govt. Primary School
2	22+492	20+975	RHS	Y	Lapcha basti
3	40+625	37+775	LHS	Y	Assam Rifels
4	41+679	38+850	RHS	T	Selling govt. school
5	45+763	42+585	LHS	T	Telephone Office
6	59+531	55+335	RHS	Y	Benghun,Zotui
7	67+282	62+755	RHS	T	PMGSY Road
8	82+454	77+315	RHS	T	Village
9	87+596	82+300	LHS	Y	Huntha
10	99+199	93+325	RHS	T	Chhiahtlang Educational Centre
11	104+424	98+410	LHS	T	Village
12	106+177	100+085	LHS	T	Village
13	106+757	100+665	LHS	T	Army HQ
14	107+627	101+540	LHS	T	Serchhip Watson Division
15	110+026	103+800	LHS	T	Chandmari

15. Bypasses

The details of bypasses are as follows:

SL No	Name of Bypass	Existing Chainage (Km)		Length (Km)	Carriageway	
		From	To		Width (M)	Type
NIL						

16. Detail of any Other Structures

The details of any other structures are as follows:

SL No	Existing Chainage (Km)	Type of Structure	No. of Spans with Span Length (M)	Width (M)
NIL				

17. Existing References corresponding to Design Chainages

The relationship between the “Existing Chainage” and the “Design Chainage” as per field surveys is given below.

<i>Sl No.</i>	<i>Existing Chainage (Km)</i>	<i>Proposed Chainage (Km)</i>
1	8+292	8+000
2	9+000	8+400
3	10+000	9+380
4	11+000	10+232
5	12+000	11+050
6	13+000	12+019
7	15+000	13+807
8	16+000	14+840
9	17+000	15+804
10	18+000	17+202
11	19+000	17+736
12	20+000	18+896
13	21+000	19+782
14	22+000	20+482
15	23+000	21+478
16	24+000	22+296
17	25+000	23+375
18	26+000	10+336
19	27+000	25+139
20	28+000	26+060
21	29+000	26+804
22	30+000	27+692
23	31+000	28+625
24	32+000	29+589
25	33+000	30+498
26	34+000	31+475
27	35+000	32+489
28	36+000	33+481
29	37+000	34+464
30	40+000	37+161
31	41+000	38+136

32	42+000	38+975
33	43+000	40+005
34	44+000	41+002
35	46+000	41+981
36	47+000	43+757
37	48+000	44+682
38	49+000	45+677
39	50+000	46+648
40	51+000	47+343
41	52+000	48+256
42	53+000	49+187
43	54+000	50+107
44	55+000	51+048
45	56+000	52+018
46	57+000	53+017
47	58+000	53+975
48	59+000	54+808
49	60+000	55+762
50	62+000	57+726
51	63+000	58+586
52	64+000	59+525
53	65+000	60+491
54	66+000	64+485
55	67+000	62+471
56	68+000	63+456
57	69+000	64+412
58	70+000	65+334
59	72+000	67+273
60	73+000	68+249
61	75+000	70+216
62	76+000	71+175
63	77+000	72+082
64	78+000	73+025
65	80+000	74+975
66	81+000	75+891
67	82+000	76+872
68	83+000	77+848
69	84+000	78+812
70	85+000	79+804

71	86+000	80+791
72	87+000	81+741
73	88+000	82+691
74	90+000	84+586
75	91+000	85+575
76	92+000	86+523
77	93+000	87+456
78	94+000	88+382
79	95+000	89+364
80	96+000	90+333
81	97+000	91+233
82	98+000	92+186
83	99+000	93+130
84	100+000	94+095
85	101+000	95+075
86	104+000	97+986
87	105+000	98+946
88	106+000	99+909
89	108+000	101+900
90	109+000	102+782
91	110+000	103+770
92	111+000	104+741
93	112+000	105+656
94	113+000	106+587
95	114+000	107+494
96	115+000	108+481
97	116+000	109+462
98	117+000	110+448
99	118+000	111+456
100	119+000	112+303
101	120+000	113+246
102	121+000	114+208
103	122+000	119+190
104	123+000	116+150
105	124+000	117+118
106	125+000	117+961
107	125+272	118+263

18. Stretch passing through forest area*

The project stretch is passing through the forest area at the following locations.

SL No	Existing Chainage (Km)		Length (M)
	From	To	
NIL			

Annex II
(Schedule-A)

Dates for Providing Right of Way

The dates on which the Authority shall provide Right of Way to the Contractor on different parts of the Site are stated below:

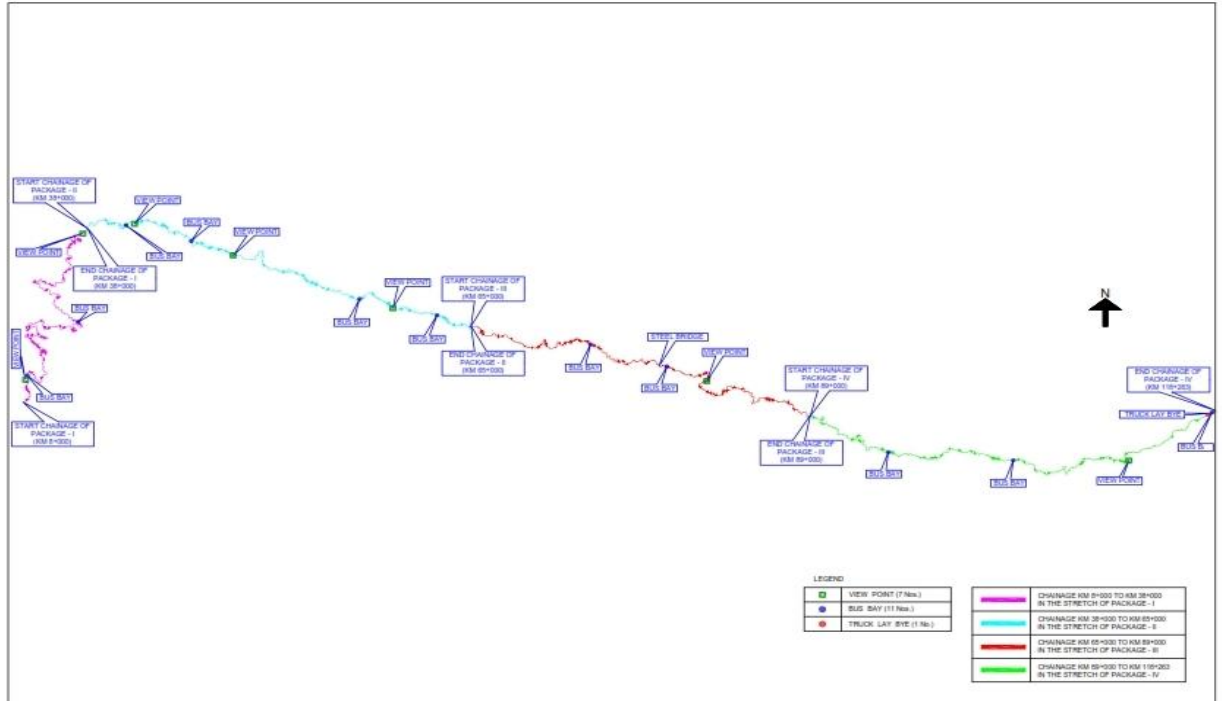
SL No	Existing Chainage (Km)		Length (Km)	Width (M)	Date of Providing ROW
	From	To			
As Decided By NHIDCL					

Annex – III (Schedule-A)

Alignment Plans

The existing alignment of the Project Highway shall be modified as per the alignment plan.

The alignment plan of the Project Highway is enclosed in digital form in CD.

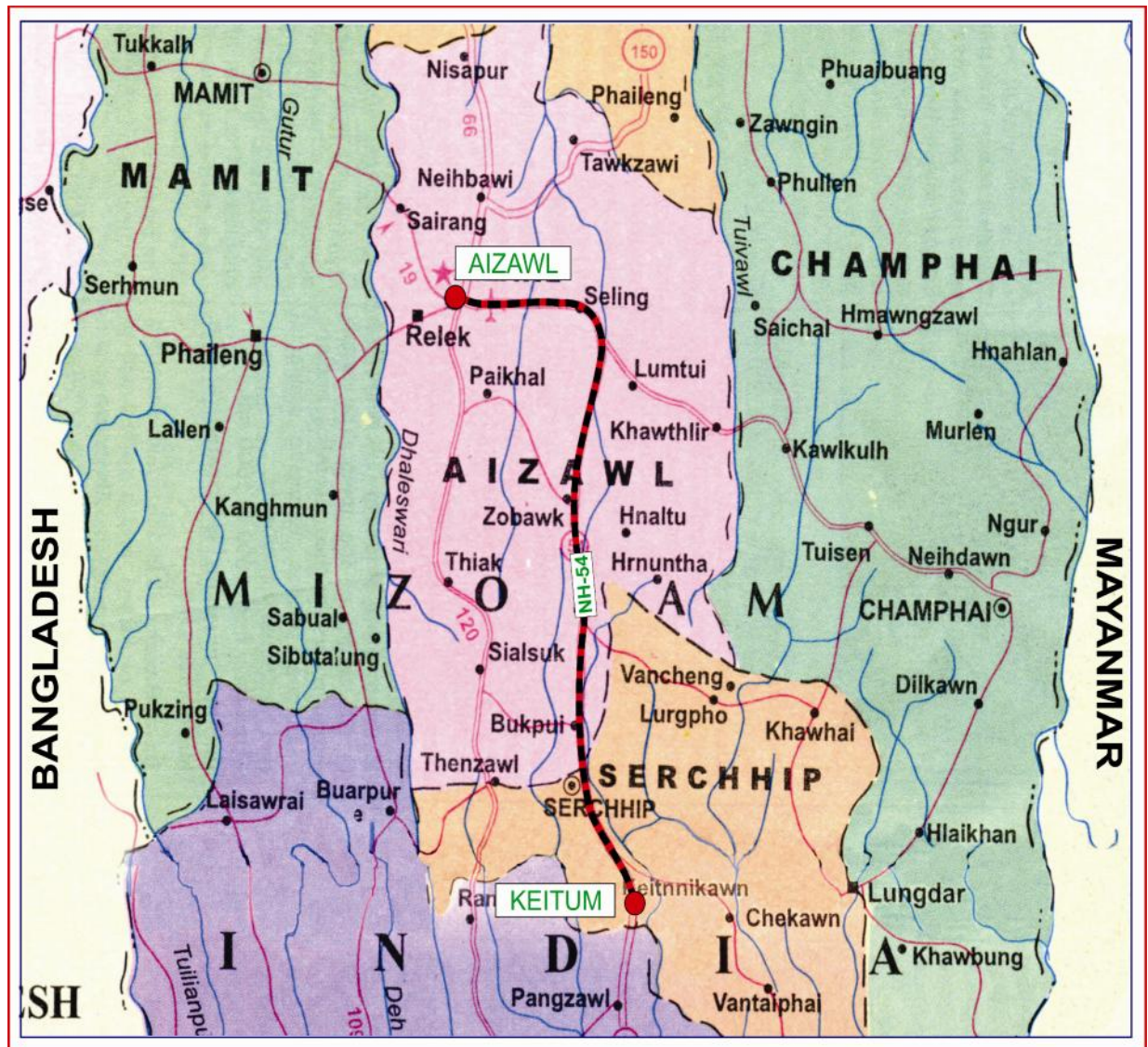


Annex – IV
(Schedule-A)

Environment Clearances

Environment Clearance to be obtained by NHIDCL

Index Map of Project Highway



Schedule - B

(See Clause 2.1)

DEVELOPMENT OF THE PROJECT HIGHWAY

1 Development of the Project Highway

Development of the Project Highway shall include design and construction of the Project Highway as described in this Schedule-B and in Schedule-C.

2 Two-Laning with Paved Shoulder

Two laning shall include widening and strengthening of the project Highway as described in Annex-I of this Schedule-B and in Schedule-C.

3 Specifications and Standards

The Project Highway shall be designed and constructed in conformity with the Specifications and Standards specified in Annex-I of Schedule-D.

Annex-I

(Schedule-B)

Description of Two-Laning with Paved Shoulder

**Two laning with paved shoulder of NH-54 Km 8.000 to Km 125.000 (Aizwal to Keitam)
(Length = 110.263 Km)**

1. Widening of the Existing Highway

- 1.1 The Project Highway shall follow the alignment specified in Annex III of Schedule-A. Geometric deficiencies, if any, in the existing horizontal and vertical profiles shall be corrected as per the prescribed standards for mountainous/rolling terrain to the extent land is available.

1.2 Width of Carriageway

- 1.2.1 The construction of Two Lane with paved shoulder from Km.8.000 to Km.125.000 km. of NH-54 shall be undertaken. The width of carriageway in open country, built up areas and approaches of grade separated structures shall be as per the Manual refer to in the Schedule-D (herein after called the 'Manual') unless otherwise specified in this Schedule-B and Schedule-D.
- 1.2.2 Locations of built-up areas as under. The cross section of carriageway to be adopted in the built-up areas shall be as indicated in the table below:

Sl. No.	Built-up areas	Design Chainage (Km)		Typical cross section of the Manual
		From	To	
1	Zemabawk	8+000	8+400	Typical Cross-section IRC:SP:73-2007
2	Tuirail	22+296	23+375	Typical Cross-section IRC:SP:73-2007
3	Seling	37+161	38+136	Typical Cross-section IRC:SP:73-2007
4	Thingsulthliah	41+002	41+981	Typical Cross-section IRC:SP:73-2007
5	Darlawng	52+081	53+017	Typical Cross-section IRC:SP:73-2007
6	Tlungvel	53+975	55+762	Typical Cross-section IRC:SP:73-2007
7	Phulmawi	59+525	60+491	Typical Cross-section IRC:SP:73-2007
8	Khumtung	64+485	62+471	Typical Cross-section IRC:SP:73-2007
9	Chingchip	74+975	76+872	Typical Cross-section IRC:SP:73-2007
10	Chhishtlang	92+186	94+095	Typical Cross-section IRC:SP:73-2007
11	New Serchip	99+909	101+900	Typical Cross-section IRC:SP:73-2007
12	Serchip	102+782	105+656	Typical Cross-section IRC:SP:73-2007
13	Keitum	117+118	117+961	Typical Cross-section IRC:SP:73-2007

- 1.2.3 Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1.2.

2 Geometric Design and General Features

2.1 General

Geometric design and general features of the Project Highway shall be in accordance with section 2 of the Manual.

2.2 Design Speed

The design speed shall be the ruling design speed of 30 km per hr for mountainous /rolling terrain.

2.3 Improvement of the Existing Road Geometrics

In the following sections, where improvement of the existing road geometrics to the prescribed standards is not possible, the existing road geometrics shall be improved to the extent possible within the given right of way and proper road signs and safety measures shall be provided:

S. No.	Stretch	Type of deficiency	Remark
NIL			

2.3.1 Details of proposed Realignments

Sl. No.	Design Chainage (Km)		Design Length (M)	Side	Remarks
	From	To			
1	8+750	12+300	3550	LHS	
2	13+025	13+775	750	RHS	
3	14+175	14+800	625	LHS	
4	15+900	16+475	575	LHS	
5	17+675	18+325	650	LHS	
6	19+075	19+850	775	LHS	
7	23+625	28+125	4500	LHS	
8	32+175	32+925	750	RHS	
9	33+500	35+350	1850	LHS	
10	43+000	44+700	1700	RHS	
11	46+125	46+725	600	RHS	
12	48+175	48+825	650	LHS	
13	49+225	50+000	775	RHS	
14	50+000	51+550	1550	RHS	
15	53+200	54+600	1400	LHS	
16	57+050	59+850	2800	LHS	
17	61+425	61+850	425	RHS	
18	62+725	63+350	625	LHS	
19	64+400	65+000	600	LHS	
20	65+000	66+000	1000	LHS	
21	66+425	68+200	1775	LHS	

22	68+725	70+000	1275	LHS	
23	70+675	73+175	2500	RHS	
24	73+725	76+550	2825	RHS	
25	77+375	79+700	2325	RHS	
26	80+425	80+925	500	LHS	
27	81+975	82+475	500	LHS	
28	84+025	85+000	975	RHS	
29	85+650	88+400	2750	RHS	
30	89+250	91+375	2125	RHS	
31	91+825	92+950	1125	LHS	
32	93+675	94+650	975	LHS	
33	98+275	99+625	1350	LHS	
34	101+900	102+625	725	RHS	
35	103+800	106+250	2450	RHS	
36	107+850	108+375	525	RHS	
37	109+375	109+800	425	RHS	
38	110+550	113+200	2650	RHS	
39	113+700	114+575	875	RHS	
40	116+350	117+325	975	RHS	

2.3.2 Details of proposed bypasses:

Sl. No.	Bypass Name	Bypass location w.r.t Project Alignment	Take off Chainage(km)	Merging Chainage(km)	Approx. Length (Km)
NIL					

2.4 Right of Way

Details of Right of Way are given in below:

Sl. No.	Design Chainage (Km)		Proposed ROW (Meters)	Remarks
	From	To		
1	8+000	118+263	24.00	

2.5 Service/Slip Roads

2.5.1 Service Roads:

Details of Service roads are given below :

Details of Service Roads

S. No.	Location of Service Road (Design Chainage)		RHS/LHS or Both Sides	Design Length (Km)
	From (Km.)	To (Km.)		
NIL				

2.5.2 Slip Roads:

NIL

2.6 Typical Cross-sections of the Project Highway

Typical cross sections alongwith different types of cross-section required to be developed in different segments of the project highway are indicated in **Appendix B-I**.

3 Intersections and Grade Separated structures

All intersections and grade separated structures shall be as per Section 3 of the Manual. Existing Intersections which are deficient shall be improved to the prescribed standards.

Properly designed intersections shall be provided at the locations and of the types and features given in the tables below:

(A) At-grade Intersections

Major Intersections

SL No	Location of Intersection, Km of Project High way		Type of Intersection	Other Features		Junction Layout as per the Manual
	Existing Chainage (Km)	Proposed Chainage (Km)		LHS	RHS	
1	38+000	35+305	T	NH-150	-	Fig 3.1
2	40+856	38+000	Y	Champai	-	Fig 3.1
3	114+209	107+700	Y	-	Thenzawl	Fig 3.1
4	124+145	117+575	Y	Khawlailung	-	Fig 3.1

Minor Junctions

SL No	Location of Intersection, Km of Project High way		Type of Intersection	Other Features		Junction Layout as per the Manual
	Existing Chainage (Km)	Proposed Chainage (Km)		LHS	RHS	
1	14+501	13+500	T	Govt. Primary School	-	As per Manual
2	22+492	20+975	Y	-	Lapcha basti	As per Manual
3	40+625	37+775	Y	Assam Rifels	-	As per Manual
4	41+679	38+850	T	-	Selling govt. school	As per Manual
5	45+763	42+585	T	Telephone Office	-	As per Manual
6	59+531	55+335	Y	-	Benghun,Zotui	As per Manual
7	67+282	62+755	T	-	PMGSY Road	As per Manual
8	82+454	77+315	T	-	Village	As per Manual
9	87+596	82+300	Y	Huntha	-	As per Manual
10	99+199	93+325	T	-	Chhiahtlang Educational Centre	As per Manual
11	104+424	98+410	T	Village	-	As per Manual
12	106+177	100+085	T	Village	-	As per Manual
13	106+757	100+665	T	Army HQ	-	As per Manual
14	107+627	101+540	T	Serchhip Watson Division	-	As per Manual
15	110+026	103+800	T	Chandmari	-	As per Manual

(B) Grade Separated Intersection

a) Vehicular Underpass

S. No.	Location of structure (km)	Junction layout below the structure
NIL		

b) Pedestrian Underpass

S. No.	Location of structure (km)	Vertical Clearance (m)
NIL		

4 Road Embankment and Cut Section

4.1 Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/cuttings shall conform to the standards and specifications given in Section 4 of the applicable and the specified cross sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

4.2 Raising of the Existing Road

As per the Drawing

5 Pavement Design

5.1 Pavement shall be designed in accordance with Section 5 of the Manual.

5.2 Type of Pavement

Flexible pavement shall be provided on entire project length.

5.3 Design Requirements

Pavement design shall be as per section 5 of the Manual and IRC: 37: 2012.

5.3.1 Design Period and strategy

Pavement shall be designed for a minimum 20 msa design period of 15 years. Stage construction shall not be permitted.

5.3.2 Design Traffic

Pavement shall be designed for 20 msa volume of traffic.

5.4 Reconstruction of Stretches

The entire project length is to be of Flexible Pavement.

6 Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per Section 6 of the Manual.

7 Design of Structures

7.1 General

7.1.1 All bridges, culverts and structures shall be designed and constructed in accordance with Section 7 of the Manual and shall conform to the cross-sectional features and other details specified therein.

7.1.2 The width of carriageway of new structures shall be as per provisions of the Manual

7.1.3 The following structures shall be provided with footpaths:
Provision of footpath on structures shall be governed by the provision of Manual.

7.1.4 All Bridges shall be high-level bridges:

7.1.5 Utility services to be carried over the structures

The following structures shall be designed to carry utility services specified in the table below:

S. No.	Bridge at km	Utility service to be carried	Remarks
As per Site condition and locations identified in consultation with independent consultant during the execution of the project highway.			

7.1.6 Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the typical cross-sections given in Section 7 of the Manual.

7.2 Culverts

7.2.1 Overall width of all culverts shall be equal to the roadway width of the approaches.

7.2.2 Reconstruction of Existing Culverts:

All the existing culverts at the following locations shall be re-constructed as new culverts: - **to be replaced with New One**

Sl.No	Proposed Chainage (Km)	Span Arrangement (M)	Type of Culvert	Remarks
1	8+114	1/1.2 dia	Pipe	
2	8+475	1/1.2 dia	Pipe	
3	8+590	1/1.2 dia	Pipe	
4	8+736	1/1.2 dia	Pipe	
5	8+970	1/1.2 dia	Pipe	
6	9+090	1/1.2 dia	Pipe	
7	9+145	1/1.2 dia	Pipe	
8	9+355	1/1.2 dia	Pipe	
9	9+565	1/1.2 dia	Pipe	
10	9+734	1/1.2 dia	Pipe	
11	9+892	1/1.2 dia	Pipe	
12	10+280	1/1.2 dia	Pipe	
13	10+415	1/1.2 dia	Pipe	
14	10+573	1/1.2 dia	Pipe	
15	10+680	1/1.2 dia	Pipe	
16	10+782	1/1.2 dia	Pipe	
17	10+845	1/1.2 dia	Pipe	
18	10+940	1/1.2 dia	Pipe	
19	10+988	1/1.2 dia	Pipe	
20	11+175	2.0 x 2.0	Box	
21	11+340	1/1.2 dia	Pipe	
22	11+477	1/1.2 dia	Pipe	
23	11+600	1/1.2 dia	Pipe	

24	11+712	1/1.2 dia	Pipe	
25	11+789	1/1.2 dia	Pipe	
26	11+868	1/1.2 dia	Pipe	
27	11+964	1/1.2 dia	Pipe	
28	12+091	1/1.2 dia	Pipe	
29	12+327	1/1.2 dia	Pipe	
30	12+558	1/1.2 dia	Pipe	
31	13+100	1/1.2 dia	Pipe	
32	13+230	1/1.2 dia	Pipe	
33	13+340	1/1.2 dia	Pipe	
34	13+512	1/1.2 dia	Pipe	
35	13+621	1/1.2 dia	Pipe	
36	13+696	1/1.2 dia	Pipe	
37	13+818	1/1.2 dia	Pipe	
38	14+170	1/1.2 dia	Pipe	
39	14+240	1/1.2 dia	Pipe	
40	14+369	1/1.2 dia	Pipe	
41	14+447	1/1.2 dia	Pipe	
42	14+632	1/1.2 dia	Pipe	
43	14+970	1/1.2 dia	Pipe	
44	15+220	1/1.2 dia	Pipe	
45	15+497	1/1.2 dia	Pipe	
46	15+648	1/1.2 dia	Pipe	
47	15+712	1/1.2 dia	Pipe	
48	15+902	1/1.2 dia	Pipe	
49	16+097	1/1.2 dia	Pipe	
50	16+448	1/1.2 dia	Pipe	
51	16+598	1/1.2 dia	Pipe	
52	16+748	1/1.2 dia	Pipe	
53	16+920	1/1.2 dia	Pipe	
54	16+970	1/1.2 dia	Pipe	
55	17+099	1/1.2 dia	Pipe	
56	17+210	1/1.2 dia	Pipe	
57	17+572	1/1.2 dia	Pipe	
58	17+817	2.0 x 2.0	Box	
59	18+353	2.0 x 2.0	Box	
60	18+436	1/1.2 dia	Pipe	
61	18+661	1/1.2 dia	Pipe	
62	18+740	1/1.2 dia	Pipe	
63	18+764	1/1.2 dia	Pipe	
64	18+950	1/1.2 dia	Pipe	
65	19+103	1/1.2 dia	Pipe	
66	19+544	1/1.2 dia	Pipe	
67	19+664	1/1.2 dia	Pipe	
68	19+940	3.0 x 3.0	Box	
69	19+993	1/1.2 dia	Pipe	

70	20+144	1/1.2 dia	Pipe	
71	20+340	1/1.2 dia	Pipe	
72	20+370	1/1.2 dia	Pipe	
73	20+495	1/1.2 dia	Pipe	
74	20+587	1/1.2 dia	Pipe	
75	20+676	1/1.2 dia	Pipe	
76	20+836	1/1.2 dia	Pipe	
77	20+971	1/1.2 dia	Pipe	
78	21+065	1/1.2 dia	Pipe	
79	21+187	1/1.2 dia	Pipe	
80	21+297	1/1.2 dia	Pipe	
81	21+610	1/1.2 dia	Pipe	
82	21+852	1/1.2 dia	Pipe	
83	21+925	3.0 x 3.0	Box	
84	21+987	1/1.2 dia	Pipe	
85	22+045	1/1.2 dia	Pipe	
86	22+290	1/1.2 dia	Pipe	
87	22+449	1/1.2 dia	Pipe	
88	22+551	1/1.2 dia	Pipe	
89	22+746	1/1.2 dia	Pipe	
90	22+778	1/1.2 dia	Pipe	
91	23+094	1/1.2 dia	Pipe	
92	23+182	1/1.2 dia	Pipe	
93	23+369	1/1.2 dia	Pipe	
94	23+583	1/1.2 dia	Pipe	
95	23+775	1/1.2 dia	Pipe	
96	24+029	1/1.2 dia	Pipe	
97	24+214	1/1.2 dia	Pipe	
98	24+420	1/1.2 dia	Pipe	
99	24+672	2.0 x 2.0	Box	
100	24+878	1/1.2 dia	Pipe	
101	25+229	1/1.2 dia	Pipe	
102	25+320	1/1.2 dia	Pipe	
103	25+439	1/1.2 dia	Pipe	
104	25+522	1/1.2 dia	Pipe	
105	25+714	1/1.2 dia	Pipe	
106	25+763	1/1.2 dia	Pipe	
107	25+997	1/1.2 dia	Pipe	
108	26+185	1/1.2 dia	Pipe	
109	26+218	1/1.2 dia	Pipe	
110	26+290	1/1.2 dia	Pipe	
111	26+380	1/1.2 dia	Pipe	
112	26+708	1/1.2 dia	Pipe	
113	26+751	1/1.2 dia	Pipe	
114	26+938	1/1.2 dia	Pipe	
115	27+070	1/1.2 dia	Pipe	

116	27+373	1/1.2 dia	Pipe	
117	27+424	1/1.2 dia	Pipe	
118	27+622	1/1.2 dia	Pipe	
119	27+714	1/1.2 dia	Pipe	
120	27+901	1/1.2 dia	Pipe	
121	28+240	1/1.2 dia	Pipe	
122	28+635	1/1.2 dia	Pipe	
123	28+828	1/1.2 dia	Pipe	
124	28+960	1/1.2 dia	Pipe	
125	29+242	1/1.2 dia	Pipe	
126	29+560	1/1.2 dia	Pipe	
127	29+754	1/1.2 dia	Pipe	
128	29+964	1/1.2 dia	Pipe	
129	30+138	1/1.2 dia	Pipe	
130	30+720	1/1.2 dia	Pipe	
131	31+006	1/1.2 dia	Pipe	
132	31+265	1/1.2 dia	Pipe	
133	31+330	1/1.2 dia	Pipe	
134	31+460	1/1.2 dia	Pipe	
135	31+688	1/1.2 dia	Pipe	
136	31+909	1/1.2 dia	Pipe	
137	32+208	1/1.2 dia	Pipe	
138	32+281	1/1.2 dia	Pipe	
139	32+483	1/1.2 dia	Pipe	
140	32+588	1/1.2 dia	Pipe	
141	32+632	1/1.2 dia	Pipe	
142	32+844	1/1.2 dia	Pipe	
143	33+144	1/1.2 dia	Pipe	
144	33+255	1/1.2 dia	Pipe	
145	33+548	1/1.2 dia	Pipe	
146	33+618	1/1.2 dia	Pipe	
147	34+265	1/1.2 dia	Pipe	
148	34+374	1/1.2 dia	Pipe	
149	34+708	1/1.2 dia	Pipe	
150	34+848	1/1.2 dia	Pipe	
151	35+517	1/1.2 dia	Pipe	
152	36+078	1/1.2 dia	Pipe	
153	36+339	1/1.2 dia	Pipe	
154	36+395	1/1.2 dia	Pipe	
155	36+538	1/1.2 dia	Pipe	
156	36+789	1/1.2 dia	Pipe	
157	37+033	1/1.2 dia	Pipe	
158	37+323	1/1.2 dia	Pipe	
159	37+499	1/1.2 dia	Pipe	
160	37+557	1/1.2 dia	Pipe	
161	38+408	1/1.2 dia	Pipe	

162	38+527	1/1.2 dia	Pipe	
163	38+795	1/1.2 dia	Pipe	
164	39+005	1/1.2 dia	Pipe	
165	39+250	1/1.2 dia	Pipe	
166	39+473	1/1.2 dia	Pipe	
167	39+818	1/1.2 dia	Pipe	
168	39+860	1/1.2 dia	Pipe	
169	40+001	1/1.2 dia	Pipe	
170	40+262	1/1.2 dia	Pipe	
171	40+411	1/1.2 dia	Pipe	
172	40+874	1/1.2 dia	Pipe	
173	41+076	1/1.2 dia	Pipe	
174	41+531	1/1.2 dia	Pipe	
175	42+004	1/1.2 dia	Pipe	
176	42+270	1/1.2 dia	Pipe	
177	42+362	1/1.2 dia	Pipe	
178	42+395	1/1.2 dia	Pipe	
179	42+518	1/1.2 dia	Pipe	
180	42+986	1/1.2 dia	Pipe	
181	43+071	1/1.2 dia	Pipe	
182	43+146	1/1.2 dia	Pipe	
183	43+314	1/1.2 dia	Pipe	
184	43+398	1/1.2 dia	Pipe	
185	43+666	1/1.2 dia	Pipe	
186	43+801	1/1.2 dia	Pipe	
187	44+267	1/1.2 dia	Pipe	
188	44+394	1/1.2 dia	Pipe	
189	44+448	1/1.2 dia	Pipe	
190	44+504	1/1.2 dia	Pipe	
191	44+912	1/1.2 dia	Pipe	
192	45+124	1/1.2 dia	Pipe	
193	45+260	1/1.2 dia	Pipe	
194	45+338	1/1.2 dia	Pipe	
195	45+498	1/1.2 dia	Pipe	
196	45+745	1/1.2 dia	Pipe	
197	46+247	1/1.2 dia	Pipe	
198	46+431	1/1.2 dia	Pipe	
199	46+539	1/1.2 dia	Pipe	
200	46+626	1/1.2 dia	Pipe	
201	46+984	1/1.2 dia	Pipe	
202	47+117	1/1.2 dia	Pipe	
203	47+460	1/1.2 dia	Pipe	
204	47+583	1/1.2 dia	Pipe	
205	47+694	1/1.2 dia	Pipe	
206	47+867	1/1.2 dia	Pipe	
207	48+071	1/1.2 dia	Pipe	

208	48+156	1/1.2 dia	Pipe	
209	48+418	1/1.2 dia	Pipe	
210	48+555	1/1.2 dia	Pipe	
211	48+769	1/1.2 dia	Pipe	
212	48+863	1/1.2 dia	Pipe	
213	49+144	1/1.2 dia	Pipe	
214	49+314	1/1.2 dia	Pipe	
215	49+473	1/1.2 dia	Pipe	
216	49+620	1/1.2 dia	Pipe	
217	49+779	1/1.2 dia	Pipe	
218	49+905	1/1.2 dia	Pipe	
219	50+141	1/1.2 dia	Pipe	
220	50+514	1/1.2 dia	Pipe	
221	50+780	1/1.2 dia	Pipe	
222	51+062	1/1.2 dia	Pipe	
223	51+236	1/1.2 dia	Pipe	
224	51+486	1/1.2 dia	Pipe	
225	51+688	1/1.2 dia	Pipe	
226	53+315	1/1.2 dia	Pipe	
227	53+568	1/1.2 dia	Pipe	
228	53+678	1/1.2 dia	Pipe	
229	53+891	1/1.2 dia	Pipe	
230	54+435	1/1.2 dia	Pipe	
231	54+634	1/1.2 dia	Pipe	
232	54+980	1/1.2 dia	Pipe	
233	55+398	1/1.2 dia	Pipe	
234	55+583	1/1.2 dia	Pipe	
235	55+742	1/1.2 dia	Pipe	
236	55+965	1/1.2 dia	Pipe	
237	56+370	1/1.2 dia	Pipe	
238	57+124	1/1.2 dia	Pipe	
239	57+234	1/1.2 dia	Pipe	
240	57+321	1/1.2 dia	Pipe	
241	57+398	1/1.2 dia	Pipe	
242	57+547	1/1.2 dia	Pipe	
243	57+694	1/1.2 dia	Pipe	
244	57+816	1/1.2 dia	Pipe	
245	57+934	1/1.2 dia	Pipe	
246	58+232	1/1.2 dia	Pipe	
247	58+357	1/1.2 dia	Pipe	
248	58+461	1/1.2 dia	Pipe	
249	58+580	1/1.2 dia	Pipe	
250	58+735	1/1.2 dia	Pipe	
251	58+921	1/1.2 dia	Pipe	
252	58+990	1/1.2 dia	Pipe	
253	59+058	1/1.2 dia	Pipe	

254	59+256	1/1.2 dia	Pipe	
255	59+358	1/1.2 dia	Pipe	
256	59+510	1/1.2 dia	Pipe	
257	59+600	1/1.2 dia	Pipe	
258	60+002	1/1.2 dia	Pipe	
259	60+157	1/1.2 dia	Pipe	
260	60+302	1/1.2 dia	Pipe	
261	61+088	1/1.2 dia	Pipe	
262	61+264	1/1.2 dia	Pipe	
263	61+563	1/1.2 dia	Pipe	
264	61+645	1/1.2 dia	Pipe	
265	61+775	1/1.2 dia	Pipe	
266	62+134	1/1.2 dia	Pipe	
267	62+929	1/1.2 dia	Pipe	
268	63+063	1/1.2 dia	Pipe	
269	63+199	1/1.2 dia	Pipe	
270	63+320	1/1.2 dia	Pipe	
271	63+428	1/1.2 dia	Pipe	
272	63+658	1/1.2 dia	Pipe	
273	64+117	1/1.2 dia	Pipe	
274	64+198	1/1.2 dia	Pipe	
275	64+326	1/1.2 dia	Pipe	
276	64+377	1/1.2 dia	Pipe	
277	64+612	1/1.2 dia	Pipe	
278	64+739	1/1.2 dia	Pipe	
279	64+886	1/1.2 dia	Pipe	
280	64+971	1/1.2 dia	Pipe	
281	65+288	1/1.2 dia	Pipe	
282	65+370	1/1.2 dia	Pipe	
283	65+492	1/1.2 dia	Pipe	
284	65+661	1/1.2 dia	Pipe	
285	65+815	1/1.2 dia	Pipe	
286	65+944	1/1.2 dia	Pipe	
287	66+082	1/1.2 dia	Pipe	
288	66+307	1/1.2 dia	Pipe	
289	66+519	1/1.2 dia	Pipe	
290	66+681	1/1.2 dia	Pipe	
291	66+914	1/1.2 dia	Pipe	
292	67+096	1/1.2 dia	Pipe	
293	67+254	1/1.2 dia	Pipe	
294	67+347	1/1.2 dia	Pipe	
295	67+463	1/1.2 dia	Pipe	
296	67+819	1/1.2 dia	Pipe	
297	67+927	1/1.2 dia	Pipe	
298	68+000	1/1.2 dia	Pipe	
299	68+177	1/1.2 dia	Pipe	

300	68+372	1/1.2 dia	Pipe	
301	68+576	1/1.2 dia	Pipe	
302	68+673	1/1.2 dia	Pipe	
303	69+076	1/1.2 dia	Pipe	
304	69+617	1/1.2 dia	Pipe	
305	70+019	1/1.2 dia	Pipe	
306	70+535	1/1.2 dia	Pipe	
307	70+798	1/1.2 dia	Pipe	
308	70+947	1/1.2 dia	Pipe	
309	71+120	1/1.2 dia	Pipe	
310	71+304	1/1.2 dia	Pipe	
311	71+423	1/1.2 dia	Pipe	
312	71+591	1/1.2 dia	Pipe	
313	71+676	1/1.2 dia	Pipe	
314	71+808	1/1.2 dia	Pipe	
315	72+012	1/1.2 dia	Pipe	
317	72+174	1/1.2 dia	Pipe	
318	72+278	1/1.2 dia	Pipe	
319	72+448	1/1.2 dia	Pipe	
320	72+847	1/1.2 dia	Pipe	
321	72+946	1/1.2 dia	Pipe	
322	73+113	1/1.2 dia	Pipe	
323	73+321	1/1.2 dia	Pipe	
324	73+441	1/1.2 dia	Pipe	
325	73+535	1/1.2 dia	Pipe	
326	73+693	1/1.2 dia	Pipe	
327	73+931	1/1.2 dia	Pipe	
328	74+058	1/1.2 dia	Pipe	
329	74+161	1/1.2 dia	Pipe	
330	74+330	1/1.2 dia	Pipe	
331	74+434	1/1.2 dia	Pipe	
332	74+653	1/1.2 dia	Pipe	
333	74+863	1/1.2 dia	Pipe	
334	74+952	1/1.2 dia	Pipe	
335	75+113	1/1.2 dia	Pipe	
336	75+218	1/1.2 dia	Pipe	
337	75+322	1/1.2 dia	Pipe	
338	75+859	1/1.2 dia	Pipe	
339	76+192	1/1.2 dia	Pipe	
340	76+380	1/1.2 dia	Pipe	
341	76+503	1/1.2 dia	Pipe	
342	76+842	1/1.2 dia	Pipe	
343	77+181	1/1.2 dia	Pipe	
344	77+326	1/1.2 dia	Pipe	
345	77+679	1/1.2 dia	Pipe	
346	77+827	1/1.2 dia	Pipe	

347	78+438	1/1.2 dia	Pipe	
348	78+675	1/1.2 dia	Pipe	
349	78+834	1/1.2 dia	Pipe	
350	78+993	1/1.2 dia	Pipe	
351	79+193	1/1.2 dia	Pipe	
352	79+408	1/1.2 dia	Pipe	
353	79+518	1/1.2 dia	Pipe	
354	79+708	1/1.2 dia	Pipe	
355	79+791	1/1.2 dia	Pipe	
356	79+966	1/1.2 dia	Pipe	
357	80+120	1/1.2 dia	Pipe	
358	80+643	1/1.2 dia	Pipe	
359	80+743	1/1.2 dia	Pipe	
360	80+909	1/1.2 dia	Pipe	
361	81+060	1/1.2 dia	Pipe	
362	81+204	1/1.2 dia	Pipe	
363	81+290	1/1.2 dia	Pipe	
364	81+480	1/1.2 dia	Pipe	
365	81+645	1/1.2 dia	Pipe	
366	81+807	1/1.2 dia	Pipe	
367	81+915	1/1.2 dia	Pipe	
368	81+996	1/1.2 dia	Pipe	
369	82+122	1/1.2 dia	Pipe	
370	82+573	1/1.2 dia	Pipe	
371	83+236	1/1.2 dia	Pipe	
372	83+470	1/1.2 dia	Pipe	
373	83+580	1/1.2 dia	Pipe	
374	83+750	1/1.2 dia	Pipe	
375	84+103	1/1.2 dia	Pipe	
376	84+254	1/1.2 dia	Pipe	
377	84+488	1/1.2 dia	Pipe	
378	84+660	1/1.2 dia	Pipe	
379	84+781	1/1.2 dia	Pipe	
380	85+020	1/1.2 dia	Pipe	
381	85+721	1/1.2 dia	Pipe	
382	85+831	1/1.2 dia	Pipe	
383	85+944	1/1.2 dia	Pipe	
384	86+077	1/1.2 dia	Pipe	
385	86+560	1/1.2 dia	Pipe	
386	86+864	1/1.2 dia	Pipe	
387	87+053	1/1.2 dia	Pipe	
388	87+416	1/1.2 dia	Pipe	
389	87+544	1/1.2 dia	Pipe	
390	87+629	1/1.2 dia	Pipe	
391	87+758	1/1.2 dia	Pipe	
392	87+921	1/1.2 dia	Pipe	

393	87+974	1/1.2 dia	Pipe	
394	88+190	1/1.2 dia	Pipe	
395	88+339	1/1.2 dia	Pipe	
396	88+408	1/1.2 dia	Pipe	
397	88+532	1/1.2 dia	Pipe	
398	88+724	1/1.2 dia	Pipe	
399	88+963	1/1.2 dia	Pipe	
400	89+107	1/1.2 dia	Pipe	
401	89+237	1/1.2 dia	Pipe	
402	89+359	1/1.2 dia	Pipe	
403	89+466	1/1.2 dia	Pipe	
404	89+562	1/1.2 dia	Pipe	
405	89+705	1/1.2 dia	Pipe	
406	90+170	1/1.2 dia	Pipe	
407	90+538	1/1.2 dia	Pipe	
408	91+319	1/1.2 dia	Pipe	
409	91+440	1/1.2 dia	Pipe	
410	91+650	1/1.2 dia	Pipe	
411	91+781	1/1.2 dia	Pipe	
413	91+845	1/1.2 dia	Pipe	
414	92+052	1/1.2 dia	Pipe	
415	92+297	1/1.2 dia	Pipe	
416	92+541	1/1.2 dia	Pipe	
417	92+644	1/1.2 dia	Pipe	
418	92+770	1/1.2 dia	Pipe	
419	92+835	1/1.2 dia	Pipe	
420	92+906	1/1.2 dia	Pipe	
421	93+120	1/1.2 dia	Pipe	
422	93+206	1/1.2 dia	Pipe	
423	93+669	1/1.2 dia	Pipe	
424	93+799	1/1.2 dia	Pipe	
425	94+019	1/1.2 dia	Pipe	
426	94+224	1/1.2 dia	Pipe	
427	94+671	1/1.2 dia	Pipe	
428	94+791	1/1.2 dia	Pipe	
429	94+894	1/1.2 dia	Pipe	
430	95+156	1/1.2 dia	Pipe	
431	95+813	1/1.2 dia	Pipe	
432	96+008	1/1.2 dia	Pipe	
433	96+191	1/1.2 dia	Pipe	
434	96+329	1/1.2 dia	Pipe	
435	96+808	1/1.2 dia	Pipe	
436	97+440	1/1.2 dia	Pipe	
437	97+663	1/1.2 dia	Pipe	
438	97+963	1/1.2 dia	Pipe	
439	98+109	1/1.2 dia	Pipe	

440	98+198	1/1.2 dia	Pipe	
441	98+590	1/1.2 dia	Pipe	
442	98+711	1/1.2 dia	Pipe	
443	98+799	1/1.2 dia	Pipe	
444	98+938	1/1.2 dia	Pipe	
445	99+011	1/1.2 dia	Pipe	
446	99+361	1/1.2 dia	Pipe	
447	99+612	1/1.2 dia	Pipe	
448	99+916	1/1.2 dia	Pipe	
449	100+976	1/1.2 dia	Pipe	
450	101+132	1/1.2 dia	Pipe	
451	101+278	1/1.2 dia	Pipe	
452	101+514	1/1.2 dia	Pipe	
453	101+721	1/1.2 dia	Pipe	
454	101+931	1/1.2 dia	Pipe	
455	102+300	1/1.2 dia	Pipe	
456	102+459	1/1.2 dia	Pipe	
457	102+653	1/1.2 dia	Pipe	
458	102+752	1/1.2 dia	Pipe	
459	103+006	1/1.2 dia	Pipe	
460	103+068	1/1.2 dia	Pipe	
461	103+203	1/1.2 dia	Pipe	
462	103+306	1/1.2 dia	Pipe	
463	103+589	1/1.2 dia	Pipe	
464	103+963	1/1.2 dia	Pipe	
465	104+209	1/1.2 dia	Pipe	
466	104+340	1/1.2 dia	Pipe	
467	104+379	1/1.2 dia	Pipe	
468	104+624	1/1.2 dia	Pipe	
469	104+696	1/1.2 dia	Pipe	
470	104+996	2.0 x 2.0	Box	
471	105+037	1/1.2 dia	Pipe	
472	105+428	1/1.2 dia	Pipe	
473	105+703	1/1.2 dia	Pipe	
474	105+983	1/1.2 dia	Pipe	
475	106+272	1/1.2 dia	Pipe	
476	106+360	1/1.2 dia	Pipe	
477	106+496	1/1.2 dia	Pipe	
478	106+595	1/1.2 dia	Pipe	
479	106+754	2.0 x 2.0	Box	
480	106+809	1/1.2 dia	Pipe	
481	106+960	1/1.2 dia	Pipe	
482	107+087	1/1.2 dia	Pipe	
483	107+238	1/1.2 dia	Pipe	
484	107+435	1/1.2 dia	Pipe	
485	107+890	1/1.2 dia	Pipe	

486	108+076	1/1.2 dia	Pipe	
487	108+249	1/1.2 dia	Pipe	
488	108+540	1/1.2 dia	Pipe	
489	108+784	1/1.2 dia	Pipe	
490	109+157	1/1.2 dia	Pipe	
491	109+297	1/1.2 dia	Pipe	
492	109+444	1/1.2 dia	Pipe	
493	109+632	1/1.2 dia	Pipe	
494	109+736	1/1.2 dia	Pipe	
495	109+847	1/1.2 dia	Pipe	
496	110+013	1/1.2 dia	Pipe	
497	110+136	1/1.2 dia	Pipe	
498	110+323	1/1.2 dia	Pipe	
499	110+706	1/1.2 dia	Pipe	
500	111+036	1/1.2 dia	Pipe	
501	111+165	1/1.2 dia	Pipe	
502	111+323	1/1.2 dia	Pipe	
503	111+422	1/1.2 dia	Pipe	
504	111+674	1/1.2 dia	Pipe	
505	111+773	1/1.2 dia	Pipe	
506	111+909	1/1.2 dia	Pipe	
507	112+036	1/1.2 dia	Pipe	
508	112+290	1/1.2 dia	Pipe	
509	112+605	1/1.2 dia	Pipe	
510	113+038	1/1.2 dia	Pipe	
511	113+104	1/1.2 dia	Pipe	
512	113+189	1/1.2 dia	Pipe	
513	113+521	1/1.2 dia	Pipe	
514	113+640	1/1.2 dia	Pipe	
515	113+806	1/1.2 dia	Pipe	
516	113+874	1/1.2 dia	Pipe	
517	114+063	1/1.2 dia	Pipe	
518	114+157	1/1.2 dia	Pipe	
519	114+361	1/1.2 dia	Pipe	
520	114+503	1/1.2 dia	Pipe	
521	114+825	1/1.2 dia	Pipe	
522	114+889	1/1.2 dia	Pipe	
523	114+971	1/1.2 dia	Pipe	
524	115+081	1/1.2 dia	Pipe	
525	115+124	1/1.2 dia	Pipe	
526	115+243	1/1.2 dia	Pipe	
527	115+573	1/1.2 dia	Pipe	
528	115+768	1/1.2 dia	Pipe	
529	115+826	1/1.2 dia	Pipe	
530	115+950	1/1.2 dia	Pipe	
531	116+110	1/1.2 dia	Pipe	

532	116+166	1/1.2 dia	Pipe	
533	116+455	1/1.2 dia	Pipe	
534	116+569	1/1.2 dia	Pipe	
535	116+716	1/1.2 dia	Pipe	
536	116+754	1/1.2 dia	Pipe	
537	116+850	1/1.2 dia	Pipe	
538	116+987	1/1.2 dia	Pipe	
539	117+463	1/1.2 dia	Pipe	
540	117+885	1/1.2 dia	Pipe	

7.2.3 Widening of Existing Culverts

NIL

7.2.4 Additional new culverts shall be constructed as per particulars given in the table below:

<i>Sl.No</i>	<i>Proposed Chainage (Km)</i>	<i>Span Arrangement (M)</i>	<i>Type of Culvert</i>	<i>Remarks</i>
1	8+180	1/1.2 dia	Pipe	
2	8+350	1/1.2 dia	Pipe	
3	10+037	1/1.2 dia	Pipe	
4	12+180	1/1.2 dia	Pipe	
5	12+448	1/1.2 dia	Pipe	
6	12+855	1/1.2 dia	Pipe	
7	14+011	1/1.2 dia	Pipe	
8	15+058	1/1.2 dia	Pipe	
9	16+277	1/1.2 dia	Pipe	
10	17+410	1/1.2 dia	Pipe	
11	17+650	1/1.2 dia	Pipe	
12	19+375	1/1.2 dia	Pipe	
13	23+955	1/1.2 dia	Pipe	
14	24+530	1/1.2 dia	Pipe	
15	26+492	2.0 x 2.0	Box	
16	28+090	1/1.2 dia	Pipe	
17	28+470	1/1.2 dia	Pipe	
18	29+390	1/1.2 dia	Pipe	
19	29+861	1/1.2 dia	Pipe	
20	30+285	1/1.2 dia	Pipe	
21	30+413	1/1.2 dia	Pipe	
22	30+575	1/1.2 dia	Pipe	
23	30+870	1/1.2 dia	Pipe	
24	33+415	1/1.2 dia	Pipe	
25	33+925	1/1.2 dia	Pipe	
26	34+526	1/1.2 dia	Pipe	
27	34+942	1/1.2 dia	Pipe	
28	35+020	1/1.2 dia	Pipe	

29	35+213	1/1.2 dia	Pipe	
30	35+280	1/1.2 dia	Pipe	
31	35+723	1/1.2 dia	Pipe	
32	35+933	1/1.2 dia	Pipe	
33	36+635	1/1.2 dia	Pipe	
34	37+225	1/1.2 dia	Pipe	
35	37+810	1/1.2 dia	Pipe	
36	38+185	1/1.2 dia	Pipe	
37	38+290	1/1.2 dia	Pipe	
38	38+670	1/1.2 dia	Pipe	
39	39+638	1/1.2 dia	Pipe	
40	40+585	1/1.2 dia	Pipe	
41	40+905	1/1.2 dia	Pipe	
42	41+202	1/1.2 dia	Pipe	
43	41+345	1/1.2 dia	Pipe	
44	41+710	1/1.2 dia	Pipe	
45	41+834	1/1.2 dia	Pipe	
46	44+075	1/1.2 dia	Pipe	
47	44+696	1/1.2 dia	Pipe	
48	45+163	1/1.2 dia	Pipe	
49	46+870	1/1.2 dia	Pipe	
50	47+290	1/1.2 dia	Pipe	
51	50+341	1/1.2 dia	Pipe	
52	50+632	1/1.2 dia	Pipe	
53	50+870	1/1.2 dia	Pipe	
54	51+363	1/1.2 dia	Pipe	
55	51+931	1/1.2 dia	Pipe	
56	52+080	1/1.2 dia	Pipe	
57	52+170	1/1.2 dia	Pipe	
58	52+250	1/1.2 dia	Pipe	
59	52+433	1/1.2 dia	Pipe	
60	52+598	1/1.2 dia	Pipe	
61	52+729	1/1.2 dia	Pipe	
62	53+029	1/1.2 dia	Pipe	
63	53+401	1/1.2 dia	Pipe	
64	54+079	1/1.2 dia	Pipe	
65	54+290	1/1.2 dia	Pipe	
66	54+760	1/1.2 dia	Pipe	
67	55+495	1/1.2 dia	Pipe	
68	55+836	1/1.2 dia	Pipe	
69	56+200	1/1.2 dia	Pipe	
70	56+500	1/1.2 dia	Pipe	
71	56+675	1/1.2 dia	Pipe	
72	56+827	1/1.2 dia	Pipe	
73	56+960	1/1.2 dia	Pipe	
74	59+790	1/1.2 dia	Pipe	

75	60+523	1/1.2 dia	Pipe	
76	60+755	1/1.2 dia	Pipe	
77	60+975	1/1.2 dia	Pipe	
78	61+870	1/1.2 dia	Pipe	
79	62+377	1/1.2 dia	Pipe	
80	62+595	1/1.2 dia	Pipe	
81	62+690	1/1.2 dia	Pipe	
82	62+833	1/1.2 dia	Pipe	
83	63+855	1/1.2 dia	Pipe	
84	66+800	1/1.2 dia	Pipe	
85	68+880	1/1.2 dia	Pipe	
86	69+295	1/1.2 dia	Pipe	
87	69+485	1/1.2 dia	Pipe	
88	69+747	1/1.2 dia	Pipe	
89	69+856	1/1.2 dia	Pipe	
90	70+190	1/1.2 dia	Pipe	
91	70+392	1/1.2 dia	Pipe	
92	72+730	1/1.2 dia	Pipe	
93	75+646	1/1.2 dia	Pipe	
94	75+983	1/1.2 dia	Pipe	
95	76+957	1/1.2 dia	Pipe	
96	77+096	1/1.2 dia	Pipe	
97	77+564	1/1.2 dia	Pipe	
98	78+056	1/1.2 dia	Pipe	
99	78+246	1/1.2 dia	Pipe	
100	78+761	1/1.2 dia	Pipe	
101	80+465	1/1.2 dia	Pipe	
102	82+271	1/1.2 dia	Pipe	
103	82+676	1/1.2 dia	Pipe	
104	82+776	1/1.2 dia	Pipe	
105	82+922	1/1.2 dia	Pipe	
106	83+076	1/1.2 dia	Pipe	
107	83+901	1/1.2 dia	Pipe	
107	84+881	1/1.2 dia	Pipe	
108	85+351	1/1.2 dia	Pipe	
109	85+547	1/1.2 dia	Pipe	
110	86+216	1/1.2 dia	Pipe	
111	86+385	1/1.2 dia	Pipe	
112	86+736	1/1.2 dia	Pipe	
113	87+226	1/1.2 dia	Pipe	
114	89+947	1/1.2 dia	Pipe	
115	90+341	1/1.2 dia	Pipe	
116	90+426	1/1.2 dia	Pipe	
117	90+817	1/1.2 dia	Pipe	
118	90+942	1/1.2 dia	Pipe	
119	91+144	1/1.2 dia	Pipe	

120	93+001	1/1.2 dia	Pipe	
121	93+388	1/1.2 dia	Pipe	
122	93+599	1/1.2 dia	Pipe	
123	94+486	1/1.2 dia	Pipe	
124	95+043	1/1.2 dia	Pipe	
125	95+333	1/1.2 dia	Pipe	
126	95+644	1/1.2 dia	Pipe	
127	95+943	1/1.2 dia	Pipe	
128	96+442	1/1.2 dia	Pipe	
129	96+587	1/1.2 dia	Pipe	
130	96+979	1/1.2 dia	Pipe	
131	97+856	1/1.2 dia	Pipe	
132	98+376	1/1.2 dia	Pipe	
133	99+164	1/1.2 dia	Pipe	
134	99+496	1/1.2 dia	Pipe	
135	99+735	1/1.2 dia	Pipe	
136	100+341	1/1.2 dia	Pipe	
137	100+406	1/1.2 dia	Pipe	
138	100+541	1/1.2 dia	Pipe	
139	100+741	1/1.2 dia	Pipe	
140	100+901	1/1.2 dia	Pipe	
141	102+061	1/1.2 dia	Pipe	
142	103+758	1/1.2 dia	Pipe	
143	104+800	2.0 x 2.0	Box	
144	105+135	1/1.2 dia	Pipe	
145	105+266	1/1.2 dia	Pipe	
146	105+812	1/1.2 dia	Pipe	
147	107+586	1/1.2 dia	Pipe	
148	107+661	1/1.2 dia	Pipe	
149	108+381	1/1.2 dia	Pipe	
150	108+676	1/1.2 dia	Pipe	
151	108+956	1/1.2 dia	Pipe	
152	110+539	1/1.2 dia	Pipe	
153	110+870	1/1.2 dia	Pipe	
154	112+182	1/1.2 dia	Pipe	
155	112+848	1/1.2 dia	Pipe	
156	113+301	1/1.2 dia	Pipe	
157	114+648	1/1.2 dia	Pipe	
158	117+156	1/1.2 dia	Pipe	
159	117+301	1/1.2 dia	Pipe	
160	117+744	1/1.2 dia	Pipe	
161	117+996	1/1.2 dia	Pipe	
162	118+191	1/1.2 dia	Pipe	

- 7.2.5** Repairs/replacements of railing/parapets, flooring and protection works of the existing culverts shall be undertaken as follows:

Sl. No.	Location (Km.)	Type of repair required
NIL		

- 7.2.6** Floor protection works shall be as specified in the relevant IRC Codes and Specifications

7.3 Bridges

- 7.3.1** Apart from one existing Turial Bridge, one new Steel Arch Bridge shall be constructed new.

(i) The existing bridges at the following locations shall be re-constructed as new structures:

S. No.	Bridge Location (km)	Salient details of existing bridge	Adequacy or otherwise of the existing waterway, vertical clearance, etc.	Remarks
NIL				

7.3.2 Additional New Bridges

One no 130.00m long Steel Arch Bridge at Design Chainage 75+445 (Km) is to be constructed.

- 7.3.3** The railings of existing bridges shall be replaced by crash barriers at the following locations:

S. No.	Location at km	Remarks
NIL		

- 7.3.4** Repairs/Rehabilitation of the existing bridges shall be undertaken as follows:

NIL

7.3.5 Drainage System for Bridge Decks

An effective drainage system for bridge decks shall be provided as specified in paragraph 7.20 of the Manual.

7.3.6 Structures in Marine Environment

S. No.	Location at km	Remarks
NIL		

7.4 Rail-road bridges

- 7.4.1** Design, there is no ROB/RUB

- 7.4.2** Road over bridges (road over rail) shall be provided at the following location.

Road Over Bridges

S. No.	Location of Level Crossing (Km)	Proposed span arrangement (m)	Total Width of the Structure (m)
NIL			

7.4.3 There is no RUB.

Road Under Bridges

S. No.	Location of level crossing	Number and length of span
NIL		

7.4.4 Location where Railway Level Crossings not to be Replaced with ROBs/RUBs

NIL

7.5 Grade Separated Structures

NIL

7.6 Repairs and strengthening of structures

The existing structures to be repaired/strengthened, and the nature and extent of repairs / strengthening required are given below:

A – Bridges

Sl. No.	Location of bridge (km)	Nature and extent of repairs/strengthening to be carried out
NIL		

B – ROB / RUB

Sl. No.	Location of structure (km)	Nature and extent of repairs/strengthening to be carried out
NIL		

C – Overpasses/Underpasses and other structures

Sl. No.	Location of structure (km)	Nature and extent of repairs/strengthening to be carried out
NIL		

7.7 List of Major Bridges and Structures

The following is the list of the Major Bridges and Structures:

S. No.	Location Design Chainage (Km)	Remarks
1	75+445	Steel Arch Bridge

8 Traffic Control Devices and Road Safety Works

8.1 Traffic control devices and road safety works shall be provided in accordance with Section 9 of the Manual.

a) Traffic Signs:

Traffic signs include roadside signs, overhead signs and curb mounted signs along the entire Project Highway.

b) Pavement Marking: Pavement markings shall cover road marking for the entire Project Highway.

c) Safety Barrier:

Provide W-beam crash barrier along the project highway at the locations as suggested in the Manual.

8.2 Specifications of the Reflecting Sheeting

Retro reflective sheeting should be of high intensity grade with encapsulated lens or with micro prismatic retro reflective element in accordance with ASTM Standard D 4956-04.

9 Roadside Furniture

Roadside furniture shall be provided in accordance with the provisions of Section 9 of the Manual.

a) Road Boundary Stone: for the entire Project Highway.

b) Pedestrian Guard Rail:

The pedestrian facilities shall include the provision of the;

- Pedestrian guardrail: Provide pedestrian guardrail at each bus stop location.
- Pedestrian Crossings: Provide pedestrian crossing facilities on service roads.

c) Overhead traffic signs: location and size

- Full width Overhead signs: 2 nos. (Start and end of Project road)

d) Delineators: Delineators for the entire Project Highway at the locations as suggested in Schedule D.

e) MS Railing: MS Railing for separation of main carriageway and the service road along the urban sections given below and at the locations as suggested in Schedule D.

10 Compulsory Afforestation

The number of trees which are required to be planted by the Agency as compensatory afforestation should be as per Forest Conservation Act, thrice the number of trees to be cut.

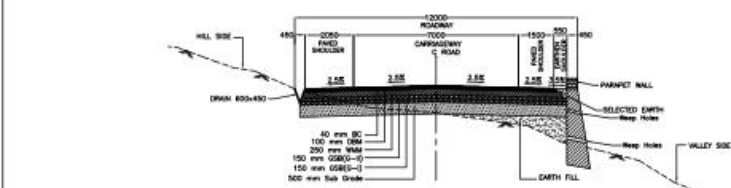
11 Hazardous Locations

The safety barriers shall also be provided at the following hazardous locations:

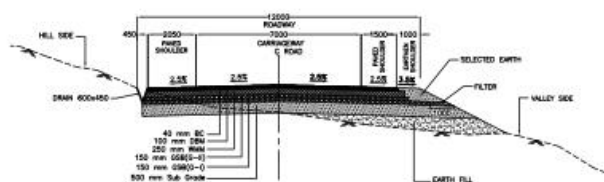
S. No.	Design Chainage (km.)		LHS/RHS
	From	To	
NIL			

12 Change of Scope

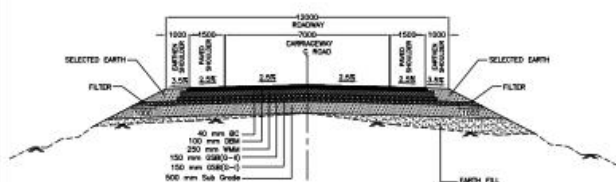
The length of structures and bridges specified hereinabove shall be treated as an approximate assessment. The actual lengths as required on the basis of detailed investigations shall be determined by the Contractor in consultation with Authority Engineer and in accordance with the Specifications and Standards. Any variations in the lengths specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.



TYPICAL CROSS SECTION FOR
REALIGNMENT & NEW CONSTRUCTION
(WITH DRAIN & PARAPET WALL)

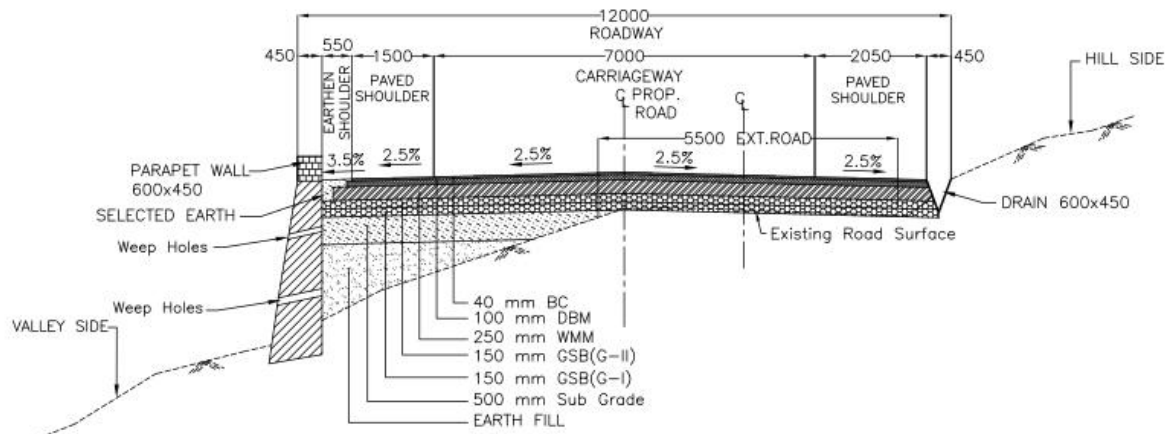


TYPICAL CROSS SECTION FOR
REALIGNMENT & NEW CONSTRUCTION
(WITH DRAIN & WITHOUT PARAPET WALL)



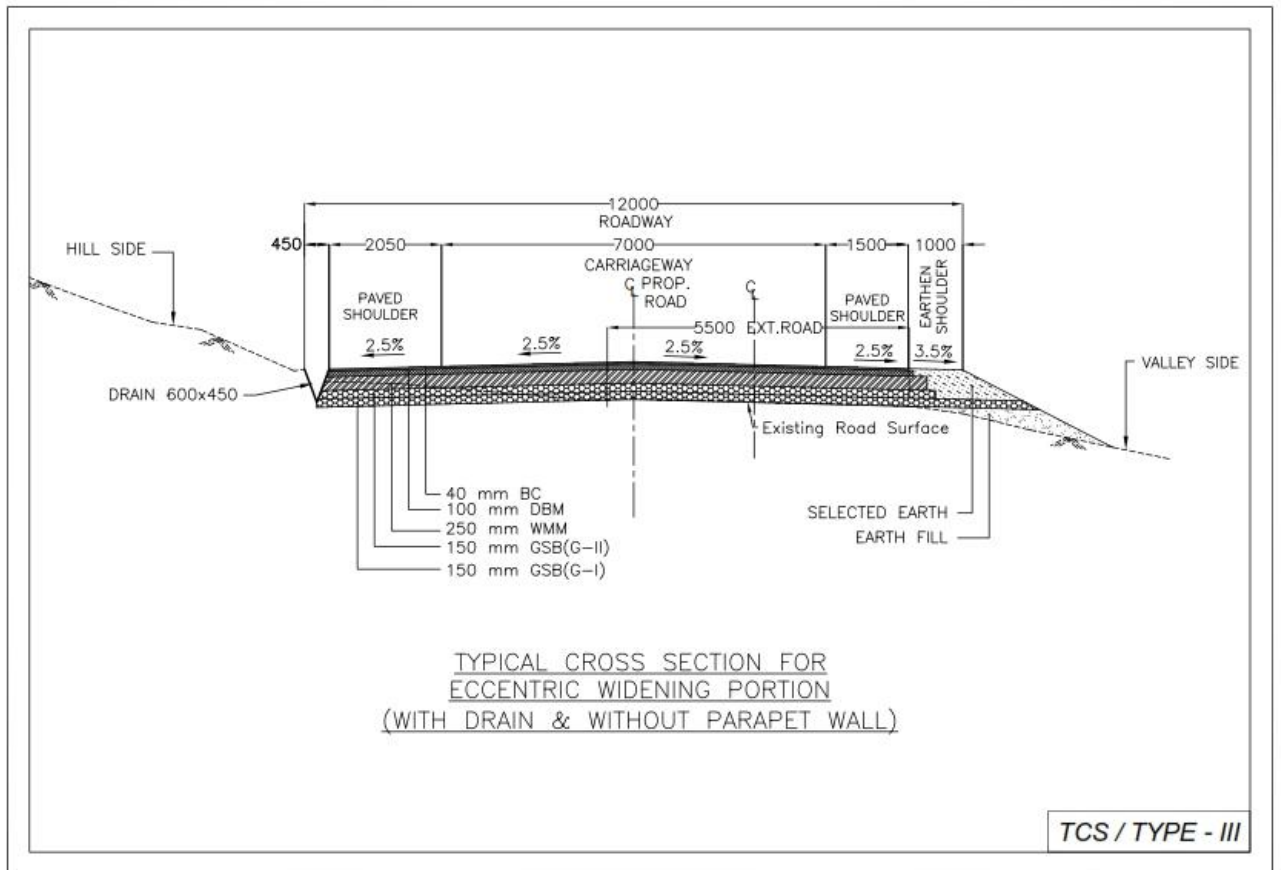
TYPICAL CROSS SECTION FOR
REALIGNMENT & NEW CONSTRUCTION
(WITHOUT DRAIN & PARAPET WALL)

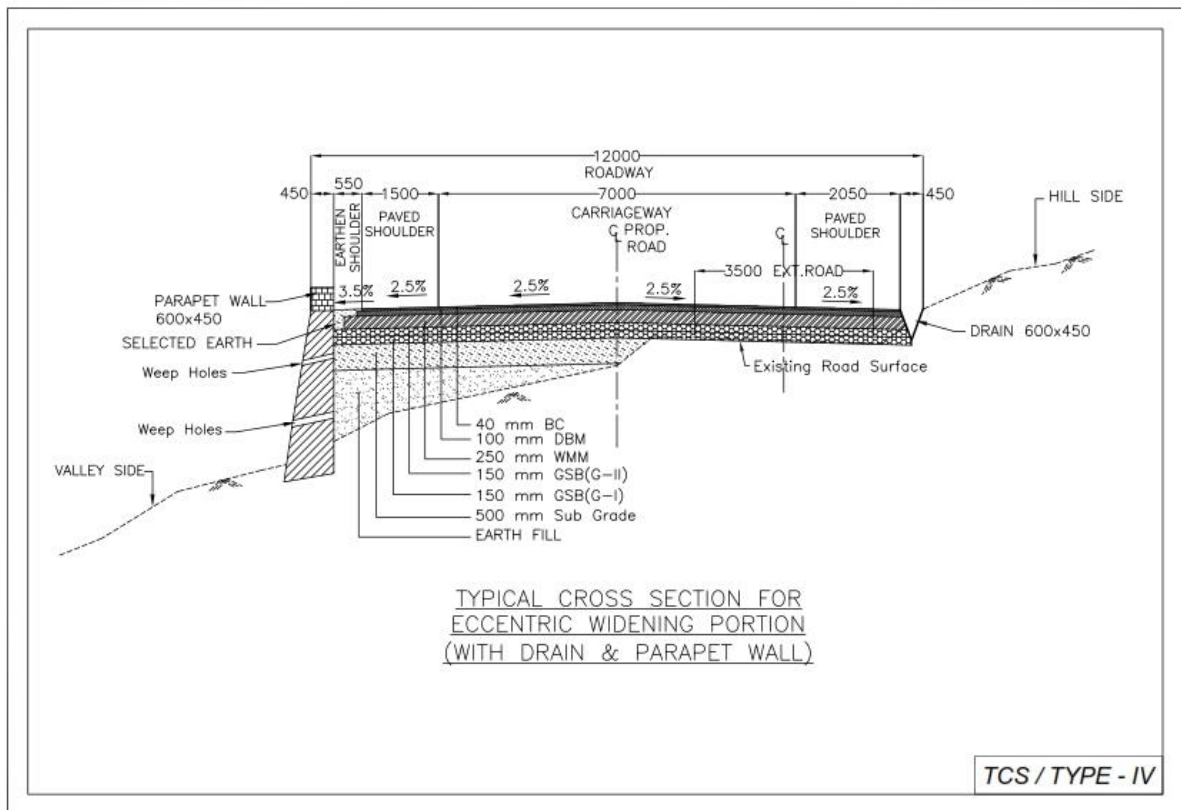
TCS / TYPE - I

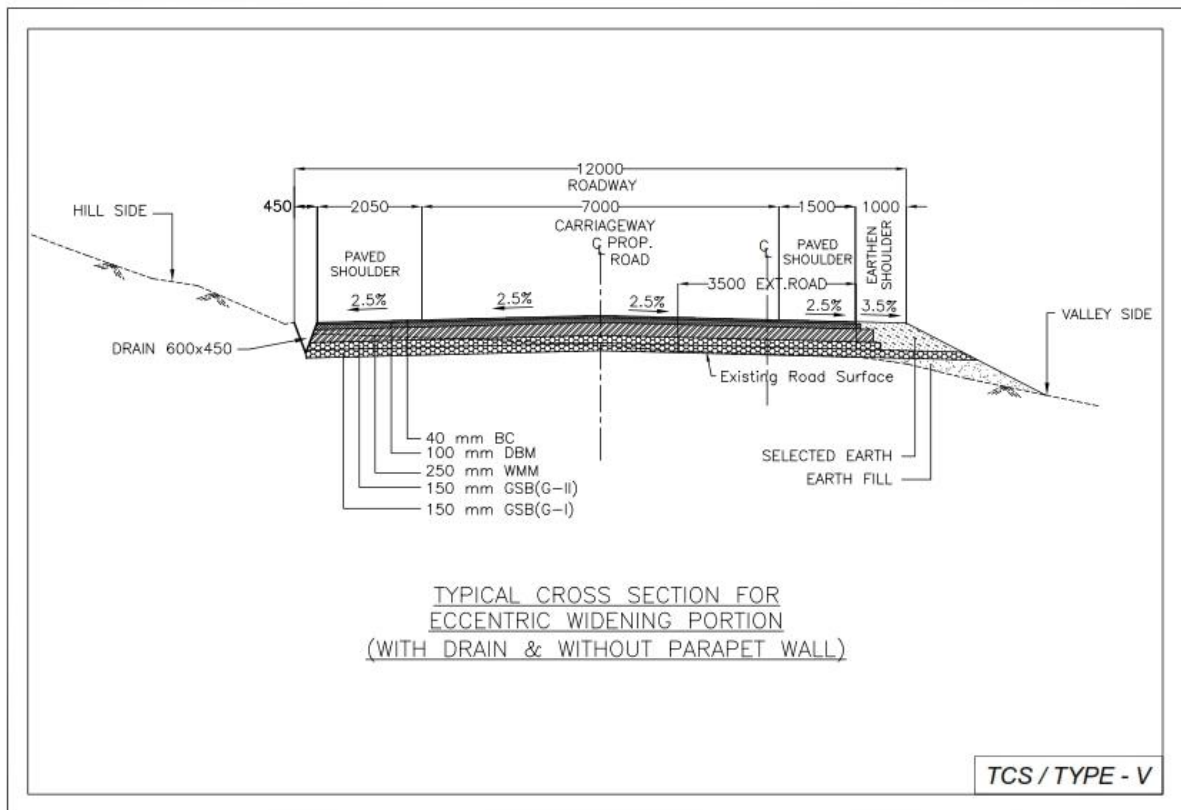


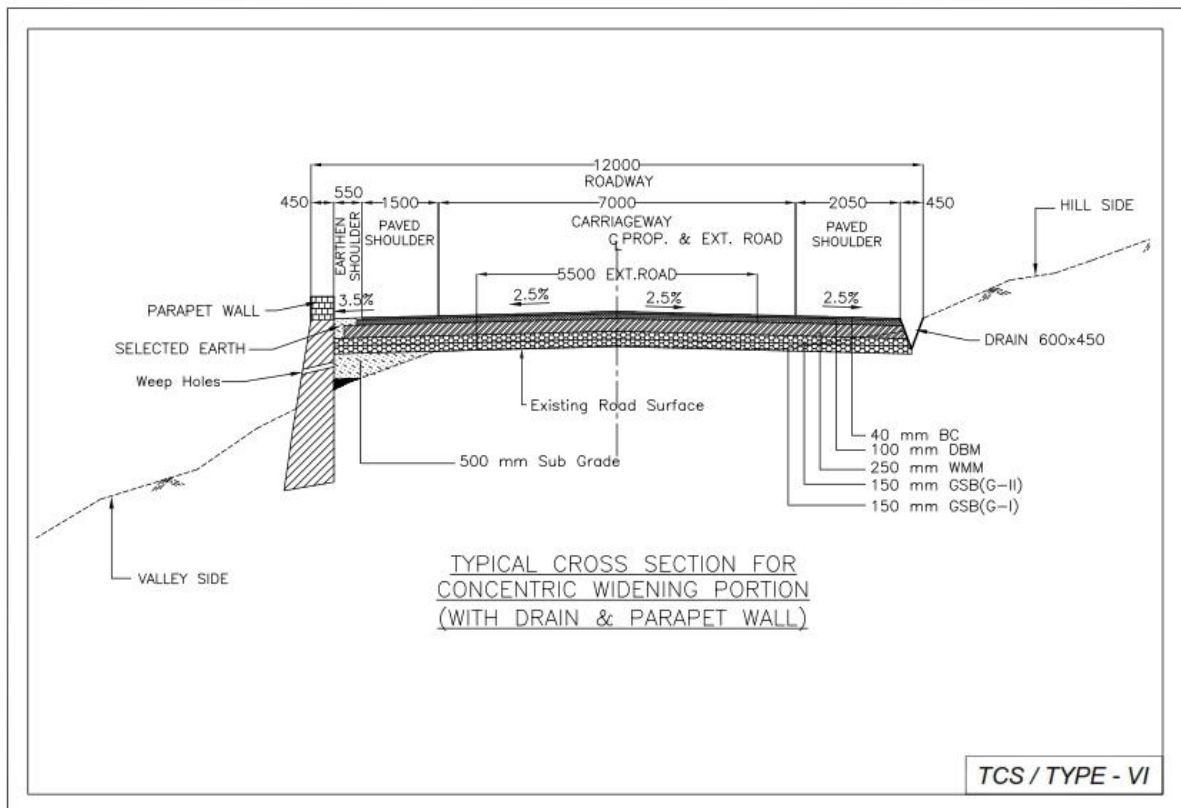
TYPICAL CROSS SECTION FOR
ECCENTRIC WIDENING PORTION
(WITH DRAIN & PARAPET WALL)

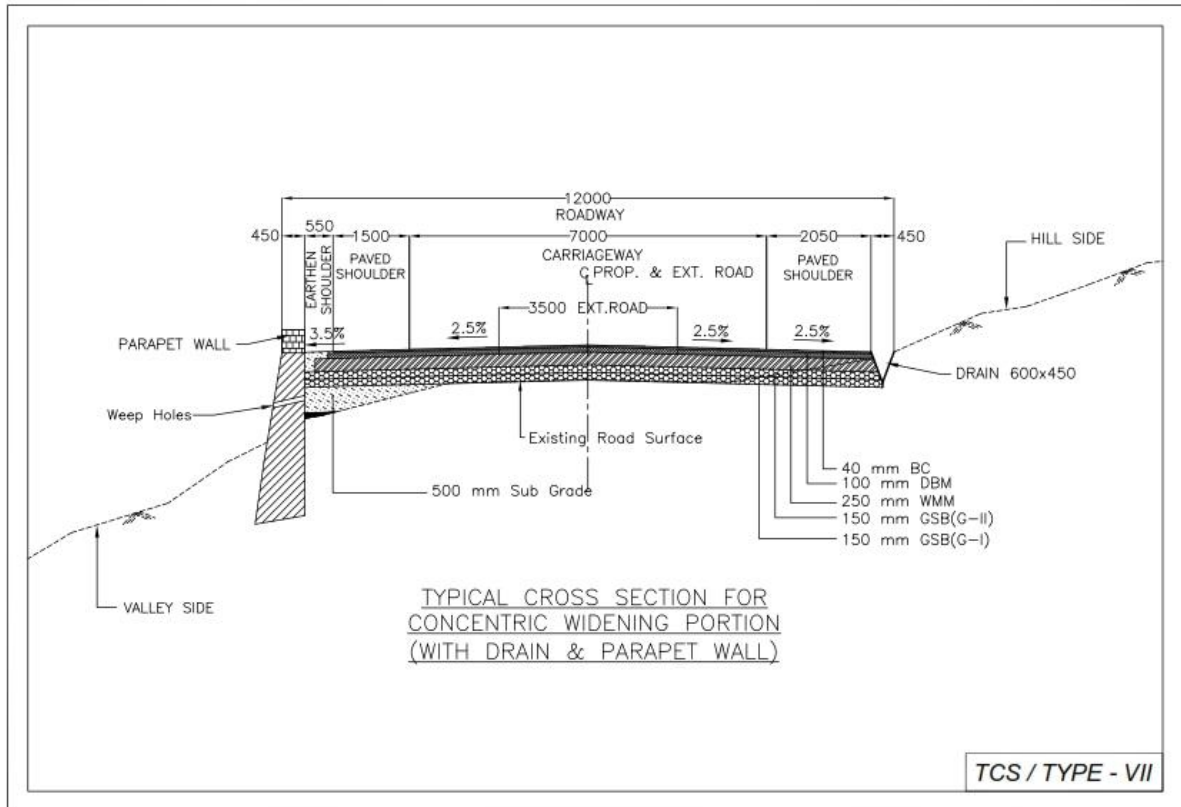
TCS / TYPE - II











Appendix B1
Applicable Stretches of Typical Cross-section

<i>Sl. No.</i>	<i>CH</i>		<i>Length (M)</i>	<i>Widening Side</i>	<i>Type of Construction</i>	<i>TCS TYPE</i>	<i>Remarks</i>
	<i>From (M)</i>	<i>To (M)</i>					
1	8000	8325	325	LHS	Eccentric	TCS-II	
2	8325	8750	425	-	Concentric	TCS-VI	
3	8750	12300	3550	-	Realignment	TCS- I	
4	12300	13025	725	LHS	Eccentric	TCS-II	
5	13025	13775	750	-	Realignment	TCS- I	
6	13775	14175	400	LHS	Eccentric	TCS-II	
7	14175	14800	625	-	Realignment	TCS- I	
8	14800	15375	575	-	Concentric	TCS-VI	
9	15375	15900	525	LHS	Eccentric	TCS-II	
10	15900	16475	575	-	Realignment	TCS- I	
11	16475	16950	475	LHS	Eccentric	TCS-III	
12	16950	17675	725	-	Concentric	TCS-VI	
13	17675	18325	650	-	Realignment	TCS- I	
14	18325	19075	750	RHS	Eccentric	TCS-III	
15	19075	19850	775	-	Realignment	TCS- I	
16	19850	23625	3775	-	Concentric	TCS-VI	
17	23625	28125	4500	-	Realignment	TCS- I	
18	28125	28675	550	LHS	Eccentric	TCS-II	
19	28675	29525	850	-	Concentric	TCS-VI	
20	29525	30300	775	LHS	Eccentric	TCS-II	
21	30300	32175	1875	-	Concentric	TCS-VI	
22	32175	32925	750	-	Realignment	TCS- I	
23	32925	33500	575	-	Concentric	TCS-VI	
24	33500	35350	1850	-	Realignment	TCS- I	
25	35350	36025	675	-	Concentric	TCS-VI	
26	36025	37075	1050	RHS	Eccentric	TCS-II	
27	37075	38000	925	-	Concentric	TCS-VI	
28	38000	38500	500	-	Concentric	TCS-VI	
29	38500	39325	825	RHS	Eccentric	TCS-II	
30	39325	41300	1975	-	Concentric	TCS-VI	
31	41300	42450	1150	RHS	Eccentric	TCS-II	
32	42450	43000	550	-	Concentric	TCS-VI	
33	43000	44700	1700	-	Realignment	TCS- I	
34	44700	46125	1425	RHS	Eccentric	TCS-II	
35	46125	46725	600	-	Realignment	TCS- I	
36	46725	47175	450	RHS	Eccentric	TCS-III	
37	47175	48175	1000	-	Concentric	TCS-VI	
38	48175	48825	650	-	Realignment	TCS- I	
39	48825	49225	400	-	Concentric	TCS-VI	
40	49225	50000	775	-	Realignment	TCS- I	

41	50000	51550	1550	-	Realignment	TCS- I	
42	51550	53200	1650	-	Concentric	TCS-VII	
43	53200	54600	1400	-	Realignment	TCS- I	
44	54600	57050	2450	-	Concentric	TCS-VII	
45	57050	59850	2800	-	Realignment	TCS- I	
46	59850	61425	1575	-	Concentric	TCS-VII	
47	61425	61850	425	-	Realignment	TCS- I	
48	61850	62725	875	-	Concentric	TCS-VII	
49	62725	63350	625	-	Realignment	TCS- I	
50	63350	64400	1050	LHS	Eccentric	TCS- IV	
51	64400	65000	600	-	Realignment	TCS- I	
52	65000	66000	1000	-	Realignment	TCS- I	
53	66000	66425	425	LHS	Eccentric	TCS- IV	
54	66425	68200	1775	-	Realignment	TCS- I	
55	68200	68725	525	RHS	Eccentric	TCS-V	
56	68725	70000	1275	-	Realignment	TCS- I	
57	70000	70675	675	LHS	Eccentric	TCS-V	
58	70675	73175	2500	-	Realignment	TCS- I	
59	73175	73725	550	-	Concentric	TCS-VII	
60	73725	76550	2825	-	Realignment	TCS- I	
61	76550	77375	825	-	Concentric	TCS-VII	
62	77375	79700	2325	-	Realignment	TCS- I	
63	79700	80425	725	LHS	Eccentric	TCS- IV	
64	80425	80925	500	-	Realignment	TCS- I	
65	80925	81975	1050	-	Concentric	TCS-VII	
66	81975	82475	500	-	Realignment	TCS- I	
67	82475	82900	425	-	Concentric	TCS-VII	
68	82900	84025	1125	LHS	Eccentric	TCS-V	
69	84025	85000	975	-	Realignment	TCS- I	
70	85000	85650	650	-	Concentric	TCS-VII	
71	85650	88400	2750	-	Realignment	TCS- I	
72	88400	89000	600	-	Concentric	TCS-VII	
73	89000	89250	250	-	Concentric	TCS-VII	
74	89250	91375	2125	-	Realignment	TCS- I	
75	91375	91825	450	-	Concentric	TCS-VII	
76	91825	92950	1125	-	Realignment	TCS- I	
77	92950	93675	725	-	Concentric	TCS-VII	
78	93675	94650	975	-	Realignment	TCS- I	
79	94650	95725	1075	-	Concentric	TCS-VII	
80	95725	96750	1025	LHS	Eccentric	TCS- IV	
81	96750	98275	1525	-	Concentric	TCS-VII	
82	98275	99625	1350	-	Realignment	TCS- I	
83	99625	101900	2275	-	Concentric	TCS-VII	
84	101900	102625	725	-	Realignment	TCS- I	
85	102625	103800	1175	-	Concentric	TCS-VII	
86	103800	106250	2450	-	Realignment	TCS- I	

87	106250	107850	1600	-	Concentric	TCS-VII	
88	107850	108375	525	-	Realignment	TCS- I	
89	108375	109025	650	RHS	Eccentric	TCS- IV	
90	109025	109375	350	-	Concentric	TCS-VII	
91	109375	109800	425	-	Realignment	TCS- I	
92	109800	110550	750	-	Concentric	TCS-VII	
93	110550	113200	2650	-	Realignment	TCS- I	
94	113200	113700	500	RHS	Eccentric	TCS- IV	
95	113700	114575	875	-	Realignment	TCS- I	
96	114575	115575	1000	RHS	Eccentric	TCS- IV	
97	115575	116350	775	-	Concentric	TCS-VII	
98	116350	117325	975	-	Realignment	TCS- I	
99	117325	118263	938	-	Concentric	TCS-VII	

SCHEDULE - C
(See Clause 2.1)

PROJECT FACILITIES

1 Project Facilities

The Contractor shall construct the Project Facilities in accordance with the provisions of this Agreement. Such Project Facilities shall include:

- (1) Roadside furniture;
- (2) Tree plantation;
- (3) Bus-bays (one side)
- (4) Truck lay-byes
- (5) Others to be specified
 - (a) View Point
 - (b) Highway Lighting
 - (c) Spoil Bank
 - (d) Anchor Bolt
 - (e) Rock Bolt
 - (f) Reinforced Earth wall

2 Description of Project Facilities

Each of the Project Facilities is described below: (SP:73-2007)

Sl No	Project Facility	Location	Design Requirements	Others Essential Details
1	Road Side furniture includes 1] Traffic Signs, Pavement Markings	To be finalised as per site requirement	As per section 9 & 11 of Manual	
	2] Concrete Crash Barriers	For entire Road Length		
	3] Separator / M S Railings Traffic Safety, Devices			
	4] Boundary Stones Hectometer/Kilometer stone, Traffic, Blinker , Studs, Delineator etc.			

2	Tree Plantation and Landscaping	To be done for the entire highway	As per section 12 of Manual	
3	Bus-bays (one side)	As per Appendix C-I & typical drawing.	As per section 13 of Manual	
4	Truck lay-byes	As per Appendix C-II & typical drawing.	As per section 13 of Manual	
5	Others to be specified (a) View Point	As per Appendix C-III & typical drawing.	As per section 13 of Manual	
	(b) Highway Lighting	In all major bridges, congested built up areas etc.	As per section 14 of manual	
	(c) Spoil Bank	In 41 earmarked places (Appendix C-IV) excess spoil is to be carried, spread and compacted. The areas are to be surrounded by Breast/Retaining wall all round in cement Rubble Masonry of height as necessary to accommodate true to required level & as per specification		
	(d) Anchor Bolt	To be finalised as per site requirement		
	(e)Rock Bolt			
	(f)Reinforced Earth wall			

Note: Provide adequate details of each Project Facility to ensure their design and completion in accordance with the project-specific requirements and the provisions of the Manual.

Appendix C - I

Locations of Proposed Bus-bays

SL No	Chainage (Km)		Location	Side	Number of Buses at Stop	Length (M)
	Existing	Proposed				
1	10+460	9+840	Zemabawk	RHS	2	70.70
2	25+125	23+500	Tuirial	RHS	2	70.70
3	41+971	38+946	Seling	LHS	2	70.70
4	46+503	43+260	Thingsulthlih	LHS	2	70.70
5	59+236	55+044	Tlungvel	LHS	2	70.70
6	64+569	60+060	Phulmawi	LHS	2	70.70
7	74+716	69+932	Buhkang Kawn	RHS	2	70.70
8	81+043	75+934	Chhingchhip	RHS	2	70.70
9	101+131	95+206	Chhiahtlang	LHS	2	70.70
10	108+794	102+576	New Serchhip	LHS	2	70.70
11	124+078	117+196	Keitum	LHS	2	70.70

Appendix C - II

Locations of Proposed Truck lay-byes

SL No	Chainage (Km)		Location	Side	Number of Truck at Stop	Length (M)
	Existing	Proposed				
1	117+346	110+794	Keitum	LHS	5	150

Appendix C - III

Locations of Proposed View Point

SL No	Chainage (Km)		Location	Side	Number of Car at Stop	Length (M)
	Existing	Proposed				
1	10+245	9+625	Zemabawk	LHS	3	29.00
2	38+136	35+600	Seling	RHS	3	29.00
3	42+620	39+625	Seling	RHS	3	29.00
4	49+198	45+875	Thingsulthlih	RHS	3	29.00
5	61+449	57+175	Tlungvel	LHS	3	29.00
6	84+214	79+026	Chhingchhip	LHS	3	29.00
7	117+478	110+926	Keitum	RHS	3	29.00

Appendix C - IV

Locations of Spoil Bank

SL No	Chainage (Km)		Location	Side	Capacity of Soil (Cum)	Remarks
	Existing	Proposed				
1	11+400	10+600	Zemabawk	RHS	75900.00	
2	14+238	13+200	Bungbangla	LHS	68250.00	
3	16+673	15+500	Bungbangla	LHS	24553.00	
4	20+137	19+000	Airfield	RHS	167913.00	
5	23+222	21+700	Airfield	LHS	247680.00	
6	27+290	25+400	Tuirial	RHS	66640.00	
7	31+908	29+500	Tuirial	RHS	50460.00	
8	36+120	33+600	Tuirial	RHS	92810.00	
9	39+385	36+700	Seling	LHS	47266.00	
10	40+442	37+600	Seling	LHS	203286.00	
11	41+209	38+400	Seling	RHS	11090.00	
12	42+025	39+000	Seling	-	120000.00	

13	43+167	40+200	Thingsulthlih	LHS	38326.00	
14	45+118	42+100	Thingsulthlih	LHS	28120.00	
15	47+352	44+100	Thingsulthlih	RHS	60060.00	
16	47+946	44+700	Thingsulthlih	LHS	26666.00	
17	48+925	45+600	Thingsulthlih	RHS	98666.00	
18	49+419	46+100	Thingsulthlih	LHS	14186.00	
19	52+483	48+700	Darlawng	RHS	53760.00	
20	53+220	49+400	Darlawng	LHS	46666.00	
21	54+449	50+600	Darlawng	RHS	45013.00	
22	57+087	53+100	Darlawng	LHS	8970.00	
23	57+601	53+600	Darlawng	RHS	19110.00	
24	63+452	59+000	Phulmawi	LHS	93620.00	
25	70+067	65+400	Khumtung	RHS	73670.00	
26	73+658	68+900	Khumtung	LHS	13770.00	
27	78+077	73+100	Buhkang Kawn	RHS	54370.00	
28	83+988	78+800	Chhingchhip	LHS	84370.00	
29	84+784	79+600	Chhingchhip	RHS	31666.00	
30	86+720	81+500	Chhingchhip	LHS	99750.00	
31	87+386	82+100	Chhingchhip	RHS	43120.00	
32	88+618	83+300	Chhingchhip	RHS	19370.00	
33	89+136	83+800	Chhingchhip	LHS	62500.00	
34	94+128	88+500	Chhingchhip	RHS	18120.00	
35	94+528	88+900	Chhingchhip	LHS	31250.00	
36	96+382	90+700	Chhingchhip	RHS	50000.00	
37	99+273	93+400	Chhiahtlang	LHS	23750.00	
38	100+201	94+300	Chhiahtlang	RHS	46666.00	
39	103+750	97+800	Chhiahtlang	LHS	37500.00	
40	112+136	105+800	Serchhip	LHS	17273.00	
41	117+560	111+000	Keitum	LHS	13960.00	

SCHEDULE - D
(See Clause 2.1)

SPECIFICATIONS AND STANDARDS

1 Construction

The Contractor shall comply with the Specifications and Standards set forth in Annex-I of this Schedule-D for construction of the Project Highway.

2 Design Standards

The Project Highway including Project Facilities shall conform to design requirements set out in the following documents:

Manual of Standards & Specification for two laning of State Highways (IRC: SP-73-2007) referred to herein as the Manual]

[Note: Specify the relevant Manual, Specifications and Standards]

Specifications and Standards for Construction

1 Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Standards & Specification for two laning of State Highways (IRC: SP-73-2007), referred to as the Manual, and MORTH Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2 Deviations from the Specifications and Standards

2.1 The terms "Concessionaire", "Independent Engineer" and "Concession Agreement" used in the Manual shall be deemed to be substituted by the terms "Contractor", "Authority's Engineer" and "Agreement" respectively.

2.2 [Notwithstanding anything to the contrary contained in Paragraph 1 above, the following Specifications and Standards shall apply to the Project Highway, and for purposes of this Agreement, the aforesaid Specifications and Standards shall be deemed to be amended to the extent set forth below:]

[Note 1: Deviations from the aforesaid Specifications and Standards shall be listed out here. Such deviations shall be specified only if they are considered essential in view of project-specific requirements.]

<i>Sl No</i>	<i>Clause referred in Manual</i>	<i>Item</i>	<i>Provisions as per Manual</i>	<i>Modified Provisions</i>
1	7.3	7.3.2(ii)	The bridges which are sound but narrower than 7.5m width (carriageway) shall be widened where specified in Schedule-B of the Concession Agreement	The existing bridge retained without widening and proposed to be repaired and rehabilitated as specified
2	13.5	13.5.3(ii)	For hilly areas, where there is a general constraint on space, the layout indicated in fig 13.3 may be adopted for Bus bay	The width & Length has been designed as available in field.
3	13.4	13.4.2	Truck lay byes shall, in general, be located near check barriers, interstate borders, places of conventional stop of the truck operators, etc. The places be identified on the basis of field survey and shall have adequate space for facilities as specified in subsequent para 13.4.3 and future growth	The width & Length has been designed as available in field.
4			View Point	The width & Length has been designed as available in field.

5			Steel Arch Bridge	As the depth of gorge is quite high pre stressed RC bridge has not been considered & so Steel Arch Bridge to be designed as Proposed
6			Rock Anchor Bolt	As the site needs this type of Typical arrangement, necessary typical drawing has been given in drawing volume to be executed by Manufacturer / expert designer as per their design standard needed as per site condition
7	7.16	7.16.1	Reinforced Earth retaining structures shall not be provided for height more than 6m and near water bodies. Such structures should be given special attention in design, construction, maintenance and selection of system/system design	As the site needs this type of Typical arrangement, necessary typical drawing has been given in drawing volume to be executed by Manufacturer / expert designer as per their design standard needed as per site condition
8			Rock Bolt Work	As the site needs this type of Typical arrangement, necessary typical drawing has been given in drawing volume to be executed by Manufacturer / expert designer as per their design standard needed as per site condition

SCHEDULE - H
(See Clauses 10.1.4 and 19.3)

Contract Price Weightages

- 1.2 Proportions of the Contract Price for different stages of Construction of the Project Highway shall be as specified below:

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
Road works including Junctions , Road Appurtenances/ others Traffic Amenities	64.98%	A- Widening and strengthening of existing Road & New/Realignment (1) Site Clearance and Dismantling (2) Earth work (3) Sub-Base and Base Courses (4) Bituminous Courses (5) Junction (6) Road Appurtenances/ others Traffic Amenities	1.04% 23.58% 36.23% 35.82% 0.93% 2.40%
Culverts	5.53%	B-New Culverts (1) Pipe (2) Box	90.10% 9.90%
Drainage & Protection Works	19.20%	C-Drainage & Protection Work (1) Drain (2) RCC Retaining wall/RE wall (3) Breast wall (4) Anchor work (5) Rock bolt work	4.56% 38.40% 52.45% 4.48% 0.11%
Major Bridge (Steel Arch)	1.64%	D- New Major Bridges (1) Foundation (2) Sub-structure (3) Super-structure	14.05 49.85% 36.10%
Other works	8.65%	E- Other works (1) Miscellaneous A. Bus Bays B. Truck Lay Bys C. View Point D. Others (2) Maintenance of Road for 36 months (3) Repair & Rehabilitation	16.64% 47.21% 22.78% 17.36% 12.66% 80.49% 2.87%

* The above list is illustrative and may require modification as per the scope of the Work.

1.3 Procedure of estimating the value of work done

1.3.1 Road works including, Junctions, Protection works, Road Appurtenances/ others Traffic Amenities

Procedure for estimating the value of road work done shall be as follows:

Table 1.3.1

Stage of Payment	Percentage - weightage	Payment Procedure
A- Widening and strengthening of existing Road & New/Realignment		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length.
(1) Site Clearance and Dismantling	1.04%	
(2) Earth work	23.58%	
(3) Sub-Base and Base Courses	36.23%	
(4) Bituminous Courses	35.82%	
(5) Junction	0.93%	
(6) Road Appurtenances/ others Traffic Amenities	2.40%	

@. For example, if the total length of flexible Pavement to be done is 100 km, the cost per km of flexible Pavement shall be determined as follows:

Cost per km = P x weightage for road work x weightage for flexible work x (1/L)

Where P= Contract Price

L = Total length in km

1.3.2 New Culverts

Procedure for estimating the value of Culverts table 1.3.2:

Table 1.3.2

Stage of Payment	Percentage - weightage	Payment Procedure
A- New Culverts		Cost of each culvert shall be determined on pro rate basis with respect to the total number of culverts. Payment shall be made on the completion of five culverts in separate bunch of pipe or box culverts.
(1) Pipe	90.10%	
(2) Box	9.90%	

1.3.3 Drainage & Protection works.

Procedure for estimating the value of Drainage & Protection works done shall be as stated in table 1.3.3

Table 1.3.3

Stage of Payment	Percentage - weightage	Payment Procedure
A- Drainage & Protection works		
(1) Drainage	4.56%	Payment shall be made on pro rata basis for completed facilities. Payment shall be made for completed items
(2) RCC Retaining Wall/ Reinforced earth wall	38.40%	
(3) Breast Wall	52.45%	
(4) Anchor Work	4.48%	
(5) Rock bolt work	0.11%	

1.3.4 New Major Bridge works

Procedure for estimating the value of Major Bridge works table 1.3.4:

Table 1.3.4

Stage of Payment	Percentage - weightage	Payment Procedure
A- New Major Bridge		
(1) Foundation: On completion of the foundation work including foundations for curtain , wing and return walls	14.05%	Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridges. Payment shall be made on completion of each stage of a Major Bridge as per the weightage given in this table
(2) Sub-structure: On completion of abutments, piers up to the abutment/pier cap	49.85%	
(3) Super-structure: On completion of the super structure in all respects including hand rails/crash barriers, wing walls, return walls, guide bunds, if any, tests on completion etc., complete in all respects and fit for use	36.10%	

1.3.5 Other works.

Procedure for estimating the value of other works done shall be as stated in table 1.3.5

Table 1.3.5

Stage of Payment	Percentage - weightage	Payment Procedure
A- Other Works		
(1) Miscellaneous	16.64%	Payment shall be made on pro rata basis for completed facilities. Payment shall be made for completed items
(a) Bus Bays	47.21%	
(b) Truck Lay Bys	22.78%	
(c) View Point	17.36%	
(d) Other	12.66%	
(2) Maintenance of Road for 36months	80.49%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 20% (twenty per cent) of the total length.
(3) Repair & Rehabilitation (On Existing Bridge)	2.87%	

2. Procedure for payment for Maintenance

- 2.1 The cost for maintenance of the existing road during 1st year of construction period has been included in the estimate.
- 2.2 The cost for maintenance shall be as stated in Clause 14.1.1.
- 2.3 Payment for Maintenance shall be made in quarterly installments in accordance with the provisions of Clause 19.7.

End of the Document