

**NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.**  
**(Ministry of Road, Transport & Highways)**  
**Government of India**

**Schedule A, B, D and H**

**FOR**

**“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”**

**Engineering, Procurement & Construction (EPC) Mode**

**BID DOCUMENT**

**February 2018**



**National Highways & Infrastructure Development Corporation Ltd**  
**(A Government of India Undertaking)**

**“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”**

**SCHEDULE - A**  
*(See Clauses 2.1 and 8.1)*

**SITE OF THE PROJECT**

**1 The Site**

- 1.1 Site of the Two-Laning of Existing **Pfutsero-Phek Road** on EPC basis from Existing km 0+000 to km 19+900 (Design km 0+000 to km 20+000) in the state of Nagaland under SARDP-NE, Project Highway shall include the land, buildings, structures and road works as described in **Annex-I** of this Schedule-A.

The Project alignment is approachable for all location for execution of works.

- 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's 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**. In the case of sections where no modification in the existing alignment of the Project Highway is contemplated, the alignment plan has not been provided. Alignment plans have only been given for sections where the existing alignment is proposed to be upgraded. The proposed profile of the Project Highways shall be followed by the contractor with minimum FRL as indicated in the alignment plan. The Contractor, however, may improve/upgrade the road profile as indicated in Annexure-III based on site/design requirement.
- 1.5 The status of the environment clearances obtained or awaited is given in **Annex-IV**.

## Annex I (Schedule-A)

### 1. Site

- 1.1 Existing **Pfutsero-Phek Road** is 65.30 Km in length and after DPR preparation the designated length is 62.558 Km. The complete road has been divided into three Packages for construction. The packages are as follow-

S. No.	Package Name	Existing Chainage(Km)		Design Chainage(Km)		Design Length (Km)
		From	To	From	To	
1	Package-1	0+000	19+900	0+000	20+000	20.00
2	Package-2	19+900	40+090	20+000	40+000	20.00
3	Package-3	40+090	65+300	40+000	62+558	22.558

The site for the instant work i.e. design Km 0.00 to design Km 20.00 is either single lane or proposed for re-alignments. The Site of the [Single Lane] Project Highway comprises of **Pfutsero - Phek** road commencing from Existing km 0.000 to km 19+900 (Design km **0+000 to km 20+000**). The road is of sub-standard single lane with poor road surface, passing through mountainous/steep terrain, in general. The road is deficient in geometric features at almost all locations. The stretch lies within Phek district of Nagaland State.

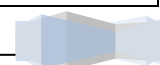
The project corridor i.e. **Pfutsero - Phek** road passes through Pfutsero, Porba and Sakarba villages.

There are certain stretches along Project Highway wherein construction activities (earthwork in excavation) have been commenced by agency under previously awarded terminated works.

The consolidated statement of Existing Chainage, Design Chainage, Improvement Proposal and Construction carried out fully or partially by Previous Contractor is as tabulated below-

	Existing Chainage			Design Chainage			Improvement Proposal	Construction Carried out by Previous Contractor
	From	To	Length	From	To	Length		
1	0+000	0+305	305	0+000	0+300	300	Widening and Strengthening	No Work done
2	0+305	0+343	38	0+300	0+330	30	Realignment	No Work done
3	0+343	0+971	628	0+330	0+920	590	Widening and Strengthening	No Work done
4	0+971	1+024	53	0+920	0+970	50	Realignment	No Work done
5	1+024	1+891	867	0+970	1+840	870	Widening and Strengthening	No Work done
6	1+891	1+987	96	1+840	1+920	80	Realignment	No Work done <sup>1</sup>

“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”



	Existing Chainage		Length	Design Chainage		Length	Improvement Proposal	Construction Carried out by Previous Contractor
	From	To		From	To			
7	1+987	2+300	313	1+920	2+220	300	Widening and Strengthening	No Work done
8	2+300	2+458	158	2+220	2+360	140	Realignment	No Work done
9	2+458	2+510	52	2+360	2+415	55	Widening and Strengthening	No Work done
10	2+510	3+055	545	2+415	2+940	525	Widening and Strengthening	Earthwork in Excavation
11	3+055	3+095	40	2+940	2+960	20	Realignment	Earthwork in Excavation
12	3+095	4+250	1155	2+960	4+090	1130	Widening and Strengthening	Earthwork in Excavation
13	4+250	4+295	45	4+090	4+110	20	Realignment	Earthwork in Excavation
14	4+295	5+360	1065	4+110	5+160	1050	Widening and Strengthening	Earthwork in Excavation
15	5+360	5+700	340	5+160	5+520	360	Realignment	Earthwork in Excavation
16	5+700	6+415	715	5+520	6+240	720	Widening and Strengthening	Earthwork in Excavation
17	6+415	6+445	30	6+240	6+270	30	Realignment	Earthwork in Excavation
18	6+445	6+505	60	6+270	6+320	50	Widening and Strengthening	Earthwork in Excavation
19	6+505	6+543	38	6+320	6+350	30	Realignment	Earthwork in Excavation
20	6+543	6+750	207	6+350	6+610	260	Widening and Strengthening	Earthwork in Excavation
21	6+750	6+800	50	6+610	6+660	50	Realignment	Earthwork in Excavation
22	6+800	8+000	1200	6+660	7+950	1290	Widening and Strengthening	Earthwork in Excavation
23	8+000	8+130	130	7+950	8+100	150	Realignment	Earthwork in Excavation
24	8+130	9+250	1120	8+100	9+245	1145	Widening and Strengthening	Earthwork in Excavation
25	9+250	9+556	306	9+245	9+590	345	Widening and Strengthening	No Work done
26	9+556	9+615	59	9+590	9+630	40	Realignment	No Work done
27	9+615	10+010	395	9+630	10+020	390	Widening and Strengthening	No Work done
28	10+010	11+150	1140	10+020	11+155	1135	Widening and Strengthening	Earthwork in Excavation
29	11+150	11+200	50	11+155	11+220	65	Widening and Strengthening	No Work done
30	11+200	11+246	46	11+220	11+300	80	Widening and Strengthening	Earthwork in Excavation
31	11+246	11+268	22	11+300	11+350	50	Realignment	Earthwork in Excavation
32	11+268	11+331	63	11+350	11+420	70	Widening and Strengthening	Earthwork in Excavation
33	11+331	11+434	103	11+420	11+500	80	Realignment	Earthwork in Excavation
34	11+434	11+580	146	11+500	11+650	150	Widening and Strengthening	Earthwork in Excavation
35	11+580	11+741	161	11+650	11+800	150	Realignment	Earthwork in Excavation

“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

	Existing Chainage		Length	Design Chainage		Length	Improvement Proposal	Construction Carried out by Previous Contractor
	From	To		From	To			
36	11+741	12+080	339	11+800	12+130	330	Widening and Strengthening	Earthwork in Excavation
37	12+080	12+320	240	12+130	12+380	250	Widening and Strengthening	No Work done
38	12+320	12+650	330	12+380	12+690	310	Widening and Strengthening	Earthwork in Excavation
39	12+650	12+740	90	12+690	12+785	95	Widening and Strengthening	No Work done
40	12+740	12+753	13	12+785	12+800	15	Widening and Strengthening	Earthwork in Excavation
41	12+753	12+800	47	12+800	12+850	50	Realignment	Earthwork in Excavation
42	12+800	12+852	52	12+850	12+900	50	Widening and Strengthening	Earthwork in Excavation
43	12+852	12+940	88	12+900	12+935	35	Realignment	Earthwork in Excavation
44	12+940	13+000	60	12+935	12+960	25	Widening and Strengthening	Earthwork in Excavation
45	13+000	13+030	30	12+960	12+990	30	Widening and Strengthening	No Work done
46	13+030	13+070	40	12+990	13+030	40	Widening and Strengthening	Earthwork in Excavation
47	13+070	13+270	200	13+030	13+230	200	Widening and Strengthening	No Work done
48	13+270	13+510	240	13+230	13+465	235	Widening and Strengthening	Earthwork in Excavation
49	13+510	13+600	90	13+465	13+550	85	Widening and Strengthening	No Work done
50	13+600	13+640	40	13+550	13+590	40	Realignment	No Work done
51	13+640	13+665	25	13+590	13+630	40	Realignment	Earthwork in Excavation
52	13+665	14+160	495	13+630	14+120	490	Widening and Strengthening	Earthwork in Excavation
53	14+160	14+210	50	14+120	14+180	60	Widening and Strengthening	No Work done
54	14+210	14+482	272	14+180	14+560	380	Widening and Strengthening	Earthwork in Excavation
55	14+482	14+505	23	14+560	14+580	20	Realignment	Earthwork in Excavation
56	14+505	14+940	435	14+580	15+000	420	Widening and Strengthening	Earthwork in Excavation
57	14+940	14+995	55	15+000	15+050	50	Realignment	Earthwork in Excavation
58	14+995	15+055	60	15+050	15+110	60	Widening and Strengthening	Earthwork in Excavation
59	15+055	15+115	60	15+110	15+170	60	Realignment	Earthwork in Excavation
60	15+115	15+684	569	15+170	15+750	580	Widening and Strengthening	Earthwork in Excavation
61	15+684	15+730	46	15+750	15+770	20	Realignment	Earthwork in Excavation
62	15+730	16+250	520	15+770	16+255	485	Widening and Strengthening	Earthwork in Excavation
63	16+250	17+010	760	16+255	17+010	755	Widening and Strengthening	No Work done
64	17+010	18+042	1032	17+010	18+050	1040	Widening and Strengthening	Earthwork in Excavation

“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

	Existing Chainage		Length	Design Chainage		Length	Improvement Proposal	Construction Carried out by Previous Contractor
	From	To		From	To			
65	18+042	18+065	23	18+050	18+070	20	Realignment	Earthwork in Excavation
66	18+065	18+750	685	18+070	18+760	690	Widening and Strengthening	Earthwork in Excavation
67	18+750	18+800	50	18+760	18+800	40	Realignment	Earthwork in Excavation
68	18+800	19+100	300	18+800	19+130	330	Widening and Strengthening	Earthwork in Excavation
69	19+100	19+200	100	19+130	19+275	145	Realignment	Earthwork in Excavation
70	19+200	20+500	1300	19+275	20+630	1355	Widening and Strengthening	Earthwork in Excavation
71	20+500	20+560	60	20+630	20+720	90	Widening and Strengthening	No Work done
72	20+560	21+330	770	20+720	21+470	750	Widening and Strengthening	Earthwork in Excavation
73	21+330	21+350	20	21+470	21+500	30	Realignment	Earthwork in Excavation
74	21+350	21+700	350	21+500	21+840	340	Widening and Strengthening	Earthwork in Excavation
75	21+700	21+720	20	21+840	21+870	30	Realignment	Earthwork in Excavation
76	21+720	21+890	170	21+870	22+050	180	Widening and Strengthening	Earthwork in Excavation
77	21+890	21+970	80	22+050	22+140	90	Widening and Strengthening	No Work done
78	21+970	22+010	40	22+140	22+215	75	Realignment	No Work done
79	22+010	22+125	115	22+215	22+330	115	Realignment	Earthwork in Excavation
80	22+125	22+300	175	22+330	22+500	170	Widening and Strengthening	Earthwork in Excavation
81	22+300	22+355	55	22+500	22+550	50	Realignment	Earthwork in Excavation
82	22+355	23+010	655	22+550	23+200	650	Widening and Strengthening	Earthwork in Excavation
83	23+010	24+619	1609	23+200	24+800	1600	Widening and Strengthening	No Work done
84	24+619	24+679	60	24+800	24+870	70	Realignment	No Work done
85	24+679	25+000	321	24+870	25+200	330	Widening and Strengthening	No Work done
86	25+000	25+435	435	25+200	25+660	460	Widening and Strengthening	Earthwork in Excavation
87	25+435	25+500	65	25+660	25+720	60	Realignment	Earthwork in Excavation
88	25+500	25+835	335	25+720	26+110	390	Widening and Strengthening	Earthwork in Excavation
89	25+835	25+898	63	26+110	26+160	50	Realignment	Earthwork in Excavation
90	25+898	26+010	112	26+160	26+270	110	Widening and Strengthening	Earthwork in Excavation
91	26+010	26+860	850	26+270	27+110	840	Widening and Strengthening	No Work done
92	26+860	27+010	150	27+110	27+260	150	Realignment	No Work done
93	27+010	27+200	190	27+260	27+500	240	Widening and Strengthening	No Work done

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	Existing Chainage		Length	Design Chainage		Length	Improvement Proposal	Construction Carried out by Previous Contractor
	From	To		From	To			
94	27+200	27+255	55	27+500	27+560	60	Realignment	No Work done
95	27+255	27+358	103	27+560	27+700	140	Widening and Strengthening	No Work done
96	27+358	27+409	51	27+700	27+750	50	Realignment	No Work done
97	27+409	29+141	1732	27+750	29+460	1710	Widening and Strengthening	No Work done
98	29+141	29+225	84	29+460	29+540	80	Realignment	No Work done
99	29+225	30+000	775	29+540	30+320	780	Widening and Strengthening	No Work done
100	30+000	30+205	205	30+320	30+550	230	Widening and Strengthening	Earthwork in Excavation
101	30+205	31+465	1260	30+550	31+700	1150	Realignment	Earthwork in Excavation
102	31+465	31+760	295	31+700	32+000	300	Widening and Strengthening	Earthwork in Excavation
103	31+760	32+704	944	32+000	32+960	960	Widening and Strengthening	Earthwork in Excavation
104	32+704	32+745	41	32+960	33+000	40	Realignment	Earthwork in Excavation
105	32+745	33+010	265	33+000	33+250	250	Widening and Strengthening	Earthwork in Excavation
106	33+010	33+565	555	33+250	33+790	540	Widening and Strengthening	No Work done
107	33+565	33+698	133	33+790	33+910	120	Realignment	No Work done
108	33+698	33+843	145	33+910	34+050	140	Widening and Strengthening	No Work done
109	33+843	33+900	57	34+050	34+100	50	Realignment	No Work done
110	33+900	34+174	274	34+100	34+350	250	Widening and Strengthening	No Work done
111	34+174	34+449	275	34+350	34+600	250	Realignment	No Work done
112	34+449	35+018	569	34+600	35+160	560	Widening and Strengthening	No Work done
113	35+018	35+062	44	35+160	35+200	40	Realignment	No Work done
114	35+062	36+010	948	35+200	36+150	950	Widening and Strengthening	No Work done
115	36+010	37+730	1720	36+150	37+850	1700	Widening and Strengthening	Earthwork in Excavation
116	37+730	37+782	52	37+850	37+880	30	Realignment	Earthwork in Excavation
117	37+782	39+000	1218	37+880	39+050	1170	Widening and Strengthening	Earthwork in Excavation
118	39+000	40+988	1988	39+050	40+850	1800	Widening and Strengthening	No Work done
119	40+988	41+070	82	40+850	40+940	90	Realignment	No Work done
120	41+070	41+391	321	40+940	41+240	300	Widening and Strengthening	No Work done
121	41+391	41+435	44	41+240	41+290	50	Realignment	No Work done
122	41+435	43+210	1775	41+290	43+060	1770	Widening and Strengthening	No Work done

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	Existing Chainage		Length	Design Chainage		Length	Improvement Proposal	Construction Carried out by Previous Contractor
	From	To		From	To			
123	43+210	43+252	42	43+060	43+100	40	Realignment	No Work done
124	43+252	43+816	564	43+100	43+660	560	Widening and Strengthening	No Work done
125	43+816	43+860	44	43+660	43+700	40	Realignment	No Work done
126	43+860	44+125	265	43+700	43+960	260	Widening and Strengthening	No Work done
127	44+125	44+178	53	43+960	44+010	50	Realignment	No Work done
128	44+178	44+225	47	44+010	44+050	40	Widening and Strengthening	No Work done
129	44+225	44+262	37	44+050	44+090	40	Realignment	No Work done
130	44+262	44+370	108	44+090	44+190	100	Widening and Strengthening	No Work done
131	44+370	44+385	15	44+190	44+210	20	Realignment	No Work done
132	44+385	44+951	566	44+210	44+800	590	Widening and Strengthening	No Work done
133	44+951	44+993	42	44+800	44+840	40	Realignment	No Work done
134	44+993	45+087	94	44+840	44+940	100	Widening and Strengthening	No Work done
135	45+087	45+120	33	44+940	44+970	30	Realignment	No Work done
136	45+120	45+518	398	44+970	45+350	380	Widening and Strengthening	No Work done
137	45+518	45+570	52	45+350	45+400	50	Realignment	No Work done
138	45+570	45+621	51	45+400	45+450	50	Widening and Strengthening	No Work done
139	45+621	45+678	57	45+450	45+500	50	Realignment	No Work done
140	45+678	46+000	322	45+500	45+810	310	Widening and Strengthening	No Work done
141	46+000	46+045	45	45+810	45+850	40	Realignment	No Work done
142	46+045	46+157	112	45+850	45+950	100	Widening and Strengthening	No Work done
143	46+157	46+182	25	45+950	45+980	30	Realignment	No Work done
144	46+182	46+595	413	45+980	46+390	410	Widening and Strengthening	No Work done
145	46+595	46+663	68	46+390	46+460	70	Realignment	No Work done
146	46+663	47+206	543	46+460	47+030	570	Widening and Strengthening	No Work done
147	47+206	47+235	29	47+030	47+060	30	Realignment	No Work done
148	47+235	47+754	519	47+060	47+550	490	Widening and Strengthening	No Work done
149	47+754	47+820	66	47+550	47+620	70	Realignment	No Work done
150	47+820	47+935	115	47+620	47+740	120	Widening and Strengthening	No Work done
151	47+935	47+988	53	47+740	47+790	50	Realignment	No Work done

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	Existing Chainage		Length	Design Chainage		Length	Improvement Proposal	Construction Carried out by Previous Contractor
	From	To		From	To			
152	47+988	48+200	212	47+790	47+990	200	Widening and Strengthening	No Work done
153	48+200	48+338	138	47+990	48+100	110	Realignment	No Work done
154	48+338	48+423	85	48+100	48+190	90	Widening and Strengthening	No Work done
155	48+423	48+504	81	48+190	48+260	70	Realignment	No Work done
156	48+504	49+190	686	48+260	48+950	690	Widening and Strengthening	No Work done
157	49+190	49+334	144	48+950	49+000	50	Realignment	No Work done
158	49+334	49+795	461	49+000	49+450	450	Widening and Strengthening	No Work done
159	49+795	49+830	35	49+450	49+500	50	Realignment	No Work done
160	49+830	49+977	147	49+500	49+650	150	Widening and Strengthening	No Work done
161	49+977	52+056	2079	49+650	49+820	170	Losami Realignment	No Work done
162	52+056	53+490	1434	49+820	51+260	1440	Widening and Strengthening	No Work done
163	53+490	53+550	60	51+260	51+300	40	Realignment	No Work done
164	53+550	53+720	170	51+300	51+470	170	Widening and Strengthening	No Work done
165	53+720	53+868	148	51+470	51+530	60	Realignment	No Work done
166	53+868	55+836	1968	51+530	53+460	1930	Widening and Strengthening	No Work done
167	55+836	55+860	24	53+460	53+480	20	Realignment	No Work done
168	55+860	55+900	40	53+480	53+530	50	Widening and Strengthening	No Work done
169	55+900	55+930	30	53+530	53+560	30	Realignment	No Work done
170	55+930	55+970	40	53+560	53+610	50	Widening and Strengthening	No Work done
171	55+970	56+010	40	53+610	53+650	40	Realignment	No Work done
172	56+010	56+062	52	53+650	53+700	50	Widening and Strengthening	No Work done
173	56+062	56+131	69	53+700	53+750	50	Realignment	No Work done
174	56+131	56+593	462	53+750	54+210	460	Widening and Strengthening	No Work done
175	56+593	56+700	107	54+210	54+300	90	Realignment	No Work done
176	56+700	58+382	1682	54+300	55+980	1680	Widening and Strengthening	No Work done
177	58+382	58+407	25	55+980	56+010	30	Realignment	No Work done
178	58+407	59+060	653	56+010	56+550	540	Widening and Strengthening	No Work done
179	59+060	59+096	36	56+550	56+580	30	Realignment	No Work done
180	59+096	59+594	498	56+580	57+090	510	Widening and Strengthening	No Work done

“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

	Existing Chainage		Length	Design Chainage		Length	Improvement Proposal	Construction Carried out by Previous Contractor
	From	To		From	To			
181	59+594	59+631	37	57+090	57+120	30	Realignment	No Work done
182	59+631	59+830	199	57+120	57+320	200	Widening and Strengthening	No Work done
183	59+830	59+880	50	57+320	57+350	30	Realignment	No Work done
184	59+880	59+926	46	57+350	57+400	50	Widening and Strengthening	No Work done
185	59+926	59+980	54	57+400	57+460	60	Realignment	No Work done
186	59+980	60+415	435	57+460	57+900	440	Widening and Strengthening	No Work done
187	60+415	60+448	33	57+900	57+940	40	Realignment	No Work done
188	60+448	61+544	1096	57+940	59+000	1060	Widening and Strengthening	No Work done
189	61+544	61+759	215	59+000	59+060	60	Realignment	No Work done
190	61+759	62+340	581	59+060	59+650	590	Widening and Strengthening	No Work done
191	62+340	62+387	47	59+650	59+700	50	Realignment	No Work done
192	62+387	62+705	318	59+700	60+010	310	Widening and Strengthening	No Work done
193	62+705	62+782	77	60+010	60+080	70	Realignment	No Work done
194	62+782	63+894	1112	60+080	61+210	1130	Widening and Strengthening	No Work done
195	63+894	63+930	36	61+210	61+260	50	Realignment	No Work done
196	63+930	64+271	341	61+260	61+600	340	Widening and Strengthening	No Work done
197	64+271	64+297	26	61+600	61+630	30	Realignment	No Work done
198	64+297	64+549	252	61+630	61+900	270	Widening and Strengthening	No Work done
199	64+549	64+669	120	61+900	62+000	100	Realignment	No Work done
200	64+669	65+247	578	62+000	62+558	558	Widening and Strengthening	No Work done

The Index Map is appended at the end of this **Schedule-A**.

## 1.2 Chainage References (Existing Vs Design)

“Existing Chainage” means distance measured from Pfutsero along existing roadway/vehicle pathway on the Project Highway. **There are no Km stones along project Highway.** During topography survey, observations are made to these locations and after finalization of alignment by improving the existing geometry the chainage has been referred to “Design Chainage”. The relationship between the “Existing Chainage” and the “Design Chainage” as per field surveys of the location for the “Project Highway” is given below:

Sl. No.	Existing Chainage (Km)	Design Chainage (Km)	Remarks
1.	0+000	0+000	
2.	0+305	0+300	
3.	1+024	0+970	
4.	2+458	2+360	
5.	3+055	2+940	
6.	4+295	4+110	
7.	5+360	5+160	
8.	6+800	6+660	
9.	7+200	7+080	
10.	8+000	7+950	
11.	9+556	9+590	
12.	10+000	9+980	
13.	11+741	11+800	
14.	12+753	12+800	
15.	13+665	13+720	
16.	14+482	14+560	
17.	15+730	15+770	
18.	16+110	16+120	
19.	17+560	17+560	
20.	18+750	18+760	
21.	19+200	19+220	
22.	19+900	20+000	

## 2. Land

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

Sl. No.	Existing Chainage (km)		Design Chainage (km)		Length in m (Design)	Existing/Av available ROW (m)	Remarks
	From	To	From	To			
1	0+000	19+900	0+000	20+000	20000	3.0 to 3.5	No ROW available in realignment stretches of total 1.740 km. as given in Para 2.3.1 of Annexure-1 Schedule-B.

## 3. Carriageway

The present carriageway of the Project Highway is substandard single lane configuration. The type of the existing pavement is flexible.

**4. Major Bridges**

The Site includes the following Medium Size Bridge:

Sl. No.	Design Chainage (km)	Type of Structures			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-Structure	Super structure		
NIL						

**5. Road over-bridges (ROB)/Road under Bridges (RUB)**

The Site includes the following Railway Over Bridges

Sl. No.	Chainage (km)	Type of Structures			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-Structure	Superstructure		
NIL						

**6. Grade Separators**

The Site includes the following Grade separators

Sl. No.	Chainage (km)	Type of Structures			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-Structure	Super structure		
NIL						

**7. Minor Bridges**

The Site includes the following minor Bridges:

Sl. No.	Road Segment	Existing Chainage (km)	Type of Structures			No. of Spans with Span Length (m)	Total Width (m)
			Foundation	Sub-Structure	Super Structure		
NIL							

**8. Railway level crossings / Railway Track**

The Site includes the following railway level crossings:

Sl. No.	Road Segment	Existing Chainage (km)	Remarks
Nil			

**9. Underpasses (vehicular, Non Vehicular)**

The Site includes the following underpasses:

Sl. No.	Road Segment	Existing Chainage (km)	Type of Structure	No. of Spans with Span Length (m)	Width (m)
Nil					

**10. Culverts**

The Site includes the 35 Nos. of culverts at the following locations and types:

Sl. No.	Existing Chainage (km)	Type of Structure	Span / Dia. (m)	Width of Structure (m)	Remarks
1	0+150	PIPE	1X0.9	7.60	
2	0+175	PIPE	1X0.9	7.60	
3	0+415	PIPE	1X0.9	9.50	
4	0+530	PIPE	1X0.9	7.50	
5	0+740	PIPE	1X1.5	9.00	
6	0+970	PIPE	1X0.9	7.50	
7	1+253	PIPE	1X0.9	10.00	
8	1+432	PIPE	1X0.9	-	
9	1+925	PIPE	1X0.9	8.00	
10	1+975	PIPE	1X0.9	9.00	
11	2+224	PIPE	1X0.9	8.50	
12	2+313	PIPE	1X0.9	9.00	
13	2+670	PIPE	1X0.9	15.00	
14	3+108	PIPE	1X0.9	12.00	
15	4+405	SLAB	1X3.0	7.00	
16	4+750	PIPE	1X0.9	7.00	
17	5+540	PIPE	1X0.9	15.00	
18	6+775	PIPE	1X0.9	7.00	
19	8+135	SLAB	1X2.0	5.00	
20	8+225	PIPE	1X0.9	5.50	
21	8+336	BOX	1X3.0	6.70	
22	8+436	PIPE	1X0.9	8.50	
23	8+529	PIPE	1X0.9	3.50	
24	8+638	PIPE	1X0.9	5.00	
25	8+685	PIPE	1X0.9	6.00	
26	8+865	PIPE	1X0.9	9.00	

Sl. No.	Existing Chainage (km)	Type of Structure	Span / Dia. (m)	Width of Structure (m)	Remarks
27	9+110	PIPE	1X0.9	8.00	
28	11+497	PIPE	1X0.9	5.00	
29	11+935	SLAB	1X3.0	7.00	
30	15+515	PIPE	1X0.9	6.00	
31	15+950	PIPE	1X0.9	5.00	
32	16+035	PIPE	1X0.9	7.00	
33	16+124	PIPE	1X0.9	5.00	
34	16+262	PIPE	1X0.9	7.00	
35	16+351	PIPE	1X0.9	8.00	

**11. Bus Bays**

The details of bus bays on the Site are as follows:

Sl. No.	Road Segment	Existing Chainage (km)	Length (m)	Left Hand Side	Right Hand Side
NIL					

**12. Truck Lay Bye**

The details of truck lay byes on the Site are as follows:

Sl. No.	Road Segment	Existing Chainage (km)	Length (m)	Left Hand Side	Right Hand Side
NIL					

**13. Road side drains.**

The details of the road side drains on the Site are as follows:

Sl. No.	Existing Location		Side	Type	
	From (km)	To (km)		Masonry/CC (Pucca)	Earthen (Kutcha)
1	0+000	0+500	Right		Earthen (Kutcha)
2	0+700	0+800	Right		Earthen (Kutcha)
3	15+900	16+100	Left		Earthen (Kutcha)
4	16+300	16+400	Left	Masonry	

**14. Major Junctions**

The details of major junctions are as follows:

Sl. No.	Location		At Grade	Separated	Category of Cross Roads			
	Existing km	Design km			NH	SH	MDR	Others
1	0+000	0+000	At Grade	-	NH			

(NH: National Highway, SH: State Highway, MDR: Major District Road)

**15. Minor Junctions**

The details of minor junctions are as follows:

Sl. No.	Existing Chainage (Km)	Design Chainage (Km)	Type	
			'T' Junction	Cross Road both sides
1	0+255	0+280	T Junction	
2	1+200	1+180	T Junction	
3	9+130	8+780	T Junction	
4	16+035	16+010	T Junction	
5	16+405	16+380	T Junction	

**16. Bypasses**

The details of bypass are as follows:

Sl. No.	Name of Proposed Bypass (Town)	Road Segment	Existing Chainage		Length (km)	Carriageway	
			From (km)	To (km)		Width m)	Type
NIL							

**17. Other Structures/Details**

The details of other structures are as follows:

Sl. No.	Type	Existing Chainage (km)	Length (m)	Width
Nil				

**Annex-II**  
**(Schedule-A)**

**Details for Providing Right of Way**

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

Sl. No	Design Chainage		Length (Km)	Proposed ROW Width (m)	Date of Providing proposed ROW
	From	To			
i) 90% of ROW (full width)	0+000	20+000	20	Varying ROW from minimum 24m to maximum 45 m at different locations as per cross section in DPR	At Appointed Date
ii) Balance Right of way (width)	0+000	20+000	20	Varying ROW from minimum 24m to maximum 45 m at different locations as per cross section in DPR	Within 150 days after the appointed date





**Annex-III**  
*(Schedule-A)*

**Alignment Plans**

The existing alignment of the Project Highway shall be modified in the following sections as per the alignment plan indicated below:

**ENCLOSED**



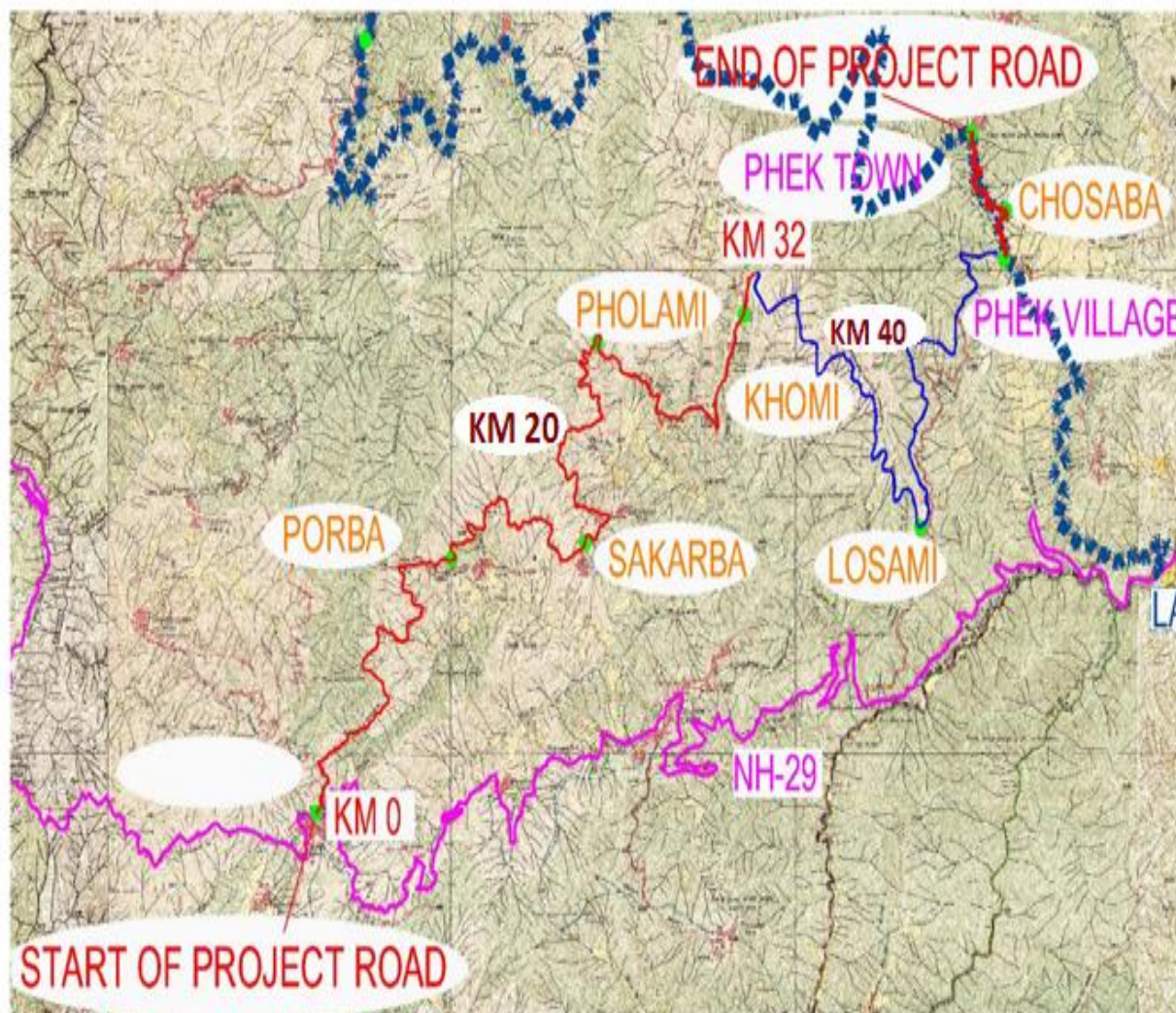
**Annex-IV**  
*(Schedule-A)*

**Environmental Clearances**

The project Highway does not require Environment Clearance as per M o E F corrigendum dated 22.08.2013.



## INDEX MAP OF PROJECT HIGHWAY SECTION



**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 Rehabilitation and augmentation**

Rehabilitation and augmentation shall include [Two-Laning 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

The particulars specified in this Schedule-B are listed below as per the requirements of the Manual of Specifications and Standards for Two Laning of Highways (IRC SP:73-2015); referred to as the Manual. If any standards, specifications or details are not given in the Manual, the minimum design/construction requirements are specified in this Schedule or Schedule D.

Refer remarks column of table under Para 1.1 of Annex I of Schedule A, construction carried out by previous contractor has been indicated. The contractor has to satisfy himself about the site conditions, quantity and quality of work done. He will be accordingly fully responsible for further requirement of design and construction of 2 lane with hard shoulders.

#### 1.0 WIDENING OF THE EXISTING HIGHWAY

1.1 The Project Highway shall follow the existing alignment unless otherwise specified by the Authority and shown in the alignment plans 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 [plain/rolling/hilly] terrain to the extent land is available.

#### 1.2 WIDTH OF CARRIAGEWAY

1.2.1 Two-Laning with hard shoulders shall be undertaken. The paved carriageway shall be 7 (seven) m wide in accordance with the typical cross-sections drawings in the Manual.

Provided that in the built-up areas [refer to paragraphs 2.1 (ii) of the Manual and provide necessary details]: the width of the carriageway shall be as specified in the following table:

Sl. No.	Built-up stretch (Township)	Location(Design Chainage)		Width (m)	Typical cross section
		From (Km)	To (Km)		
1	Pfutsero	0+000	1+750	10	TCS IV and V
2	Porba	8+170	9+830	10	
3	Sarkaba	14+860	15+160	10	
4	Sarkaba	15+750	16+570	10	

1.2.2 Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1.2.1 above.

- 1.2.3 On horizontal curves with radius upto 300 metres width of pavement and Roadway shall be increased as follows-

S. No.	Radius of Curve	Extra width of Carriageway
1	21 to 40	1.5
2	41 to 60	1.2
3	61 to 100	0.9
4	101 to 300	0.6

- 1.2.4 At hairpin bends the roadway width of 11.5 m should be surfaced as per Section 13.4 of the Manual for minimum length of 50m.

## 2.0 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 as per IRC SP 73: 2015 however in exceptional cases the minimum design speed can be 30 km per hour for hilly and mountainous terrain and 20 km per hour for hair pin bend locations.

### 2.3 Improvement of the existing road geometrics

[Refer to paragraph 2.1 (vi) of the Manual and provide details]

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 in accordance with Section 13 of the Manual within the given right of way and proper road signs and safety measures shall be provided and in other sections it shall be designed in accordance with Section 2 of the Manual.

Sl. No.	Design Chainage(m)		Side	Type of Deficiency	Remarks
	From	To			
1	00+613.779	00+674.452	RIGHT	Radius<40	
2	00+755.702	00+813.025	LEFT	Radius<40	
3	01+881.107	01+942.226	RIGHT	Radius<40	
4	02+359.309	02+418.231	RIGHT	Radius<40	
5	02+918.716	02+998.699	LEFT	Radius<40	
6	04+067.274	04+122.870	LEFT	Radius<40	
7	04+309.126	04+377.833	RIGHT	Radius<40	
8	05+147.945	05+257.819	LEFT	Radius<40	



Sl. No.	Design Chainage(m)		Side	Type of Deficiency	Remarks
	From	To			
9	05+257.819	05+317.033	RIGHT	Radius<40	
10	05+708.425	05+794.980	LEFT	Radius<40	
11	05+794.980	05+871.643	RIGHT	Radius<40	
12	09+251.132	09+339.631	LEFT	Radius<40	
13	09+339.631	09+398.791	RIGHT	Radius<40	
14	09+565.789	09+644.356	LEFT	Radius<40	
15	11+018.864	11+072.385	LEFT	Radius<40	
16	11+304.436	11+378.067	RIGHT	Radius<40	
17	11+480.262	11+548.634	RIGHT	Radius<40	
18	11+663.337	11+740.925	RIGHT	Radius<40	
19	12+166.190	12+225.672	RIGHT	Radius<40	
20	12+598.070	12+672.260	LEFT	Radius<40	
21	12+885.630	12+960.120	LEFT	Radius<40	
22	14+339.243	14+383.867	RIGHT	Radius<40	
23	16+356.712	16+433.616	LEFT	Radius<40	
24	17+323.954	17+375.939	LEFT	Radius<40	
25	18+031.601	18+101.703	LEFT	Radius<40	
26	18+245.274	18+325.435	RIGHT	Radius<40	
27	18+782.376	18+863.167	RIGHT	Radius<40	
28	19+043.338	19+134.251	LEFT	Radius<40	
29	19+134.251	19+237.825	RIGHT	Radius<40	
30	19+365.053	19+406.306	LEFT	Radius<40	
31	19+455.836	19+539.769	RIGHT	Radius<40	

### 2.3.1 Improvement due to Realignment:

Sl. No.	Existing Chainage (Km)		Design Chainage (Km)		Length (m)
	From	To	From	To	
1	0+305	0+343	0+300	0+330	30
2	0+971	1+024	0+920	0+970	50
3	1+891	1+987	1+840	1+920	80
4	2+300	2+458	2+220	2+360	140
5	3+055	3+095	2+940	2+960	20
6	4+250	4+295	4+090	4+110	20
7	5+360	5+700	5+160	5+520	360
8	6+415	6+445	6+240	6+270	30
9	6+505	6+543	6+320	6+350	30
10	6+750	6+800	6+610	6+660	50

Sl. No.	Existing Chainage (Km)		Design Chainage (Km)		Length (m)
	From	To	From	To	
11	8+000	8+130	7+950	8+100	150
12	9+556	9+615	9+590	9+630	40
13	11+246	11+268	11+300	11+350	50
14	11+331	11+434	11+420	11+500	80
15	11+580	11+741	11+650	11+800	150
16	12+753	12+800	12+800	12+850	50
17	12+852	12+900	12+900	12+950	50
18	13+600	13+665	13+660	13+720	60
19	14+482	14+505	14+560	14+580	20
20	14+940	14+995	15+000	15+050	50
21	15+055	15+115	15+110	15+170	60
22	15+684	15+730	15+750	15+770	20
23	18+042	18+065	18+050	18+070	20
24	18+750	18+800	18+760	18+800	40
25	19+100	19+200	19+130	19+220	90
<b>Total</b>					<b>1740</b>

## 2.4 Proposed Right of Way

[Refer to paragraph 2.3 of the Manual]. Details of the Right of way are given in Annex-II of Schedule A.

Contractor has to design and construct the road, if required by provision of retaining walls and/or breast walls/slope stabilization/protection measures within the Right of Way given above and provision of the same shall not constitute a change of scope.

## 2.5 Type of Shoulders

(a) In built-up sections, footpaths/fully paved shoulders shall be provided in accordance with Clause 1.2.1 above.

(b) In open country, Hard Shoulder with GSB having thickness of 200mm, total 3 metre wide including both sides shall be provided and balance width shall be covered with 150 mm thick compacted layer of granular material.

(c) Design and specifications of paved shoulders and granular material shall conform to the requirements specified in paragraphs 5.10 and 5.11 of the Manual.

## 2.6 Lateral and vertical clearances at underpasses

### 2.6.1 Lateral and vertical clearances at underpasses and provision of guardrails/crash

“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”



barriers shall be as per paragraph 2.10 of the Manual.

- 2.6.2 Lateral Clearance:** The width of the opening at the underpasses shall be as follows:

Sl. No.	Location [Chainage (km)]		Span/Opening (m)	Remarks
	From	To		
Nil				

## 2.7 Lateral and vertical clearances at overpasses

- 2.7.1 Lateral and vertical clearances at overpasses shall be as per paragraph 2.11 of the Manual.

- 2.7.2 Lateral clearance: The width of the opening at the overpasses shall be as follows:

Sl No.	Location [Chainage(km)]		Span/Opening (m)	Remarks
	From	To		
Nil				

## 2.8 Service roads

Service roads shall be constructed at the locations and for the lengths indicated below:[Refer to paragraph 2.12 of the Manual and provide details]

Sl. No.	Location of Service Road (km)		Right Hand Side (RHS) / Left Hand Side (LHS) / Both Sides	Length (km) of Service Road
	From	To		
Nil				

## 2.9 Grade Separated Structures

- 2.9.1 Grade separated structures shall be provided as per paragraph 2.13 of the Manual. The requisite particulars are given below:

[Refer to paragraphs 2.13.3 of the Manual and provide details]

Sl. No.	Location of Structure	Length (m)	Number and Length of Spans (m)	Approach Gradient	Remarks, if any
Nil					

- 2.9.2 In the case of grade separated structures, the type of structure and the level of the Project Highway and the cross roads shall be as follows: [Refer to paragraphs 2.13.1 of the Manual and specify the type of vehicular under pass/ overpass structure and whether the cross road is to be carried at the existing level, raised or lowered].

Sl No.	Location	Type of Structure/Length (m)	Cross Road at			Remarks, if any
			Existing Level	Raised Level	Lowered Level	
Nil						

## 2.10 Cattle and pedestrian underpass / Overpass

Cattle and pedestrian underpass/overpass shall be constructed as follows:  
[Refer to paragraph 2.13.2 of the Manual and specify the requirements of cattle and pedestrian underpass/overpass.

Sl. No.	Location	Type of Crossing
Nil		

## 2.11 Typical cross-sections of the Project Highway

The proposed cross sections for various situations are given in Fig.B-1 to B-6. These illustrate the cross sectional improvement proposals for the project highway. The Project Highway (length 20.000 km) shall be 2-lane carriageway with 3 m wide Hard shoulders facility including both sides.

Following typical cross sections shall be provided for the Project Highway However to be designed as per manual.

- TCS I (a): Typical Cross Section for project road sections in Hill / Valley locations  
TCS I (b): Typical Cross Section for Project Road Sections requiring Fill on Valley Side  
TCS II: Typical Cross Section for project road section on ridge  
TCS III: Typical Cross Section for Project Road Sections through Box Cut Locations  
TCS IV: Typical Cross Section for Project Road Section through Town with Hill Valley Combination  
TCS V: Typical Cross Section for Project Road Section through Town on Ridge

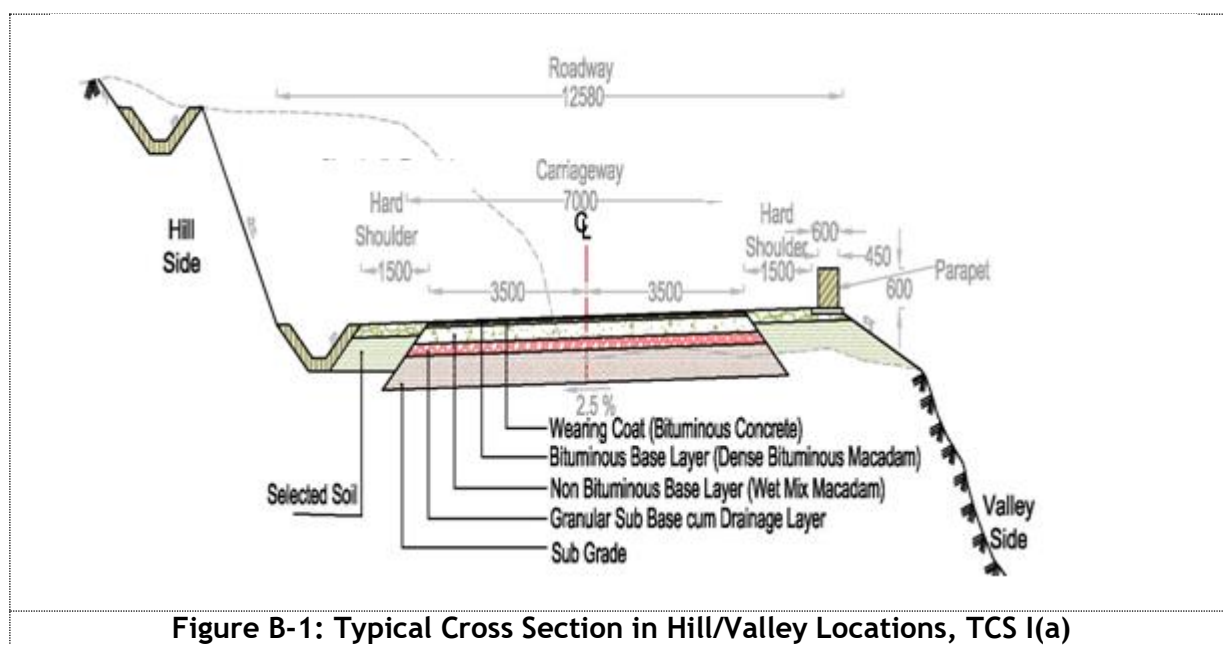
The cross section schedule shall be as follows:

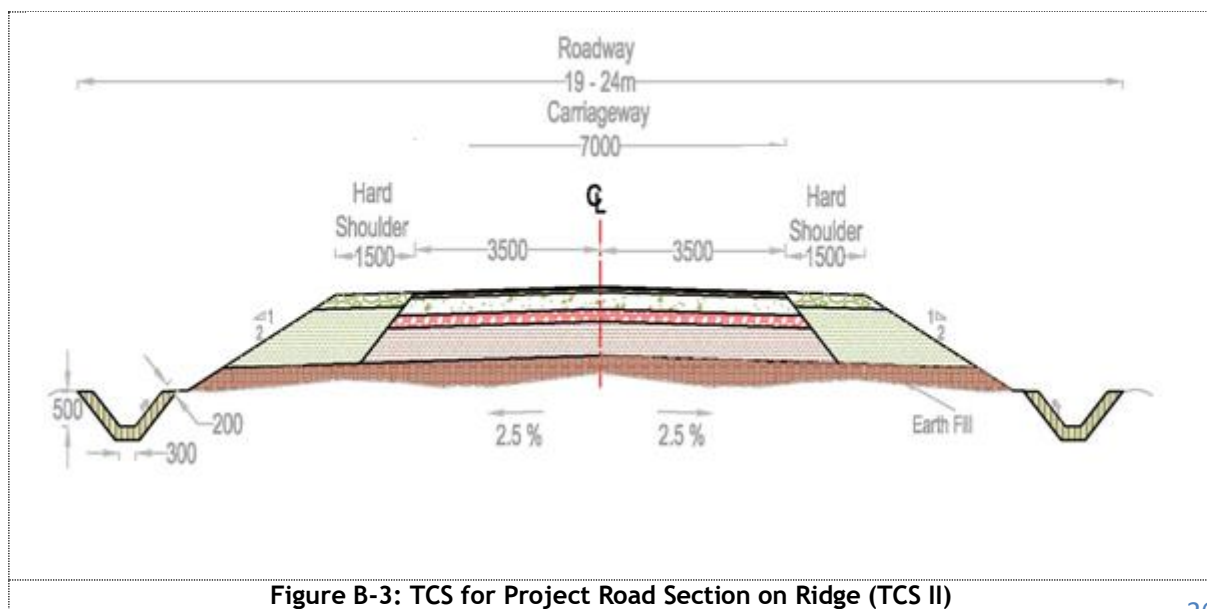
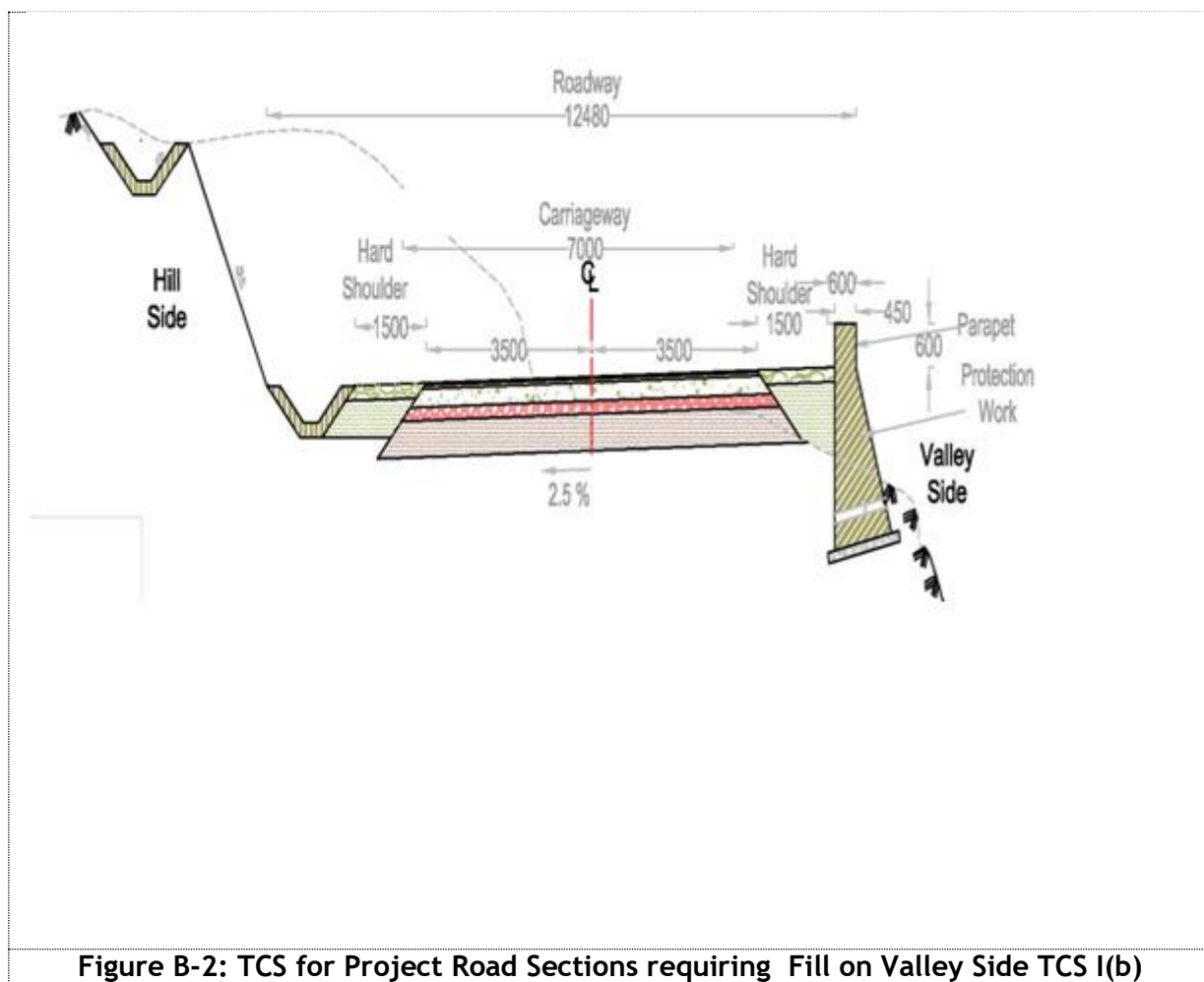
SL. No.	Chainage (km)		Length (m)	Type	Remarks
	From	To			
1	0+000	0+655	655	IV	
2	0+655	1+125	470	I	
3	1+125	1+225	100	II	
4	1+225	2+315	1090	I	
5	2+315	2+360	45	III	
6	2+360	5+320	2960	I	

SL. No.	Chainage (km)		Length (m)	Type	Remarks
	From	To			
7	5+320	5+440	120	III	
8	5+440	7+960	2520	I	
9	7+960	8+090	130	III	
10	8+090	11+440	3350	I	
11	11+440	11+470	30	III	
12	11+470	15+800	4330	I	
13	15+800	16+370	570	IV	
14	16+370	19+140	2770	I	
15	19+140	19+160	20	III	
16	19+160	20+000	840	I	

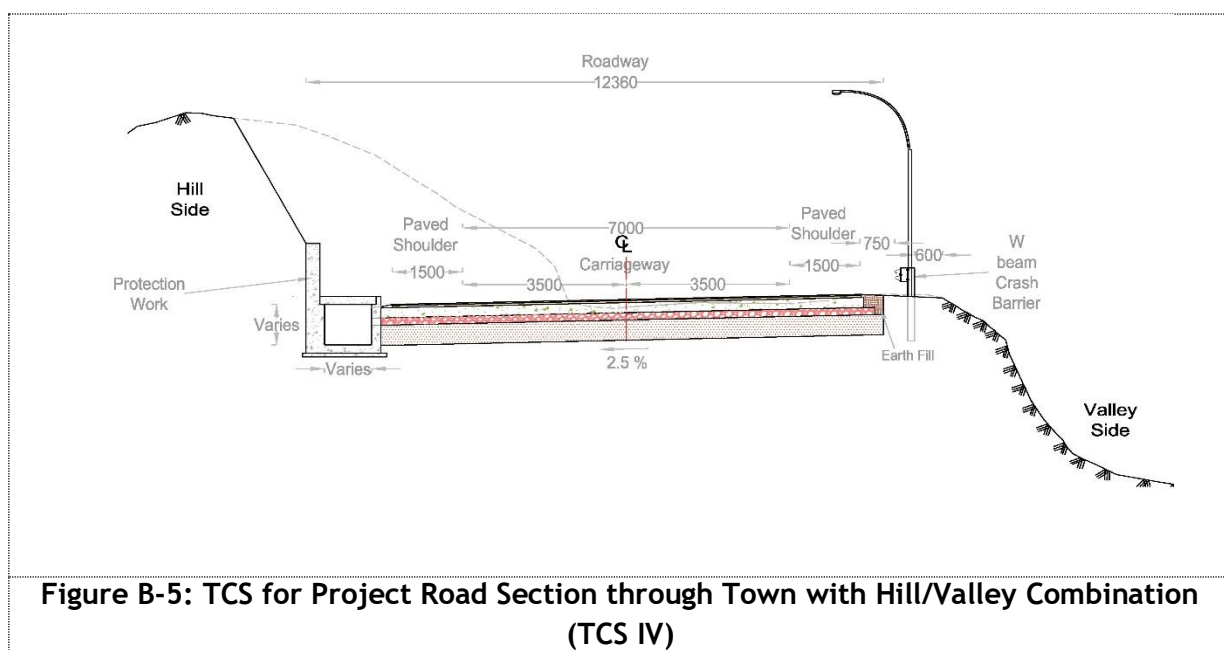
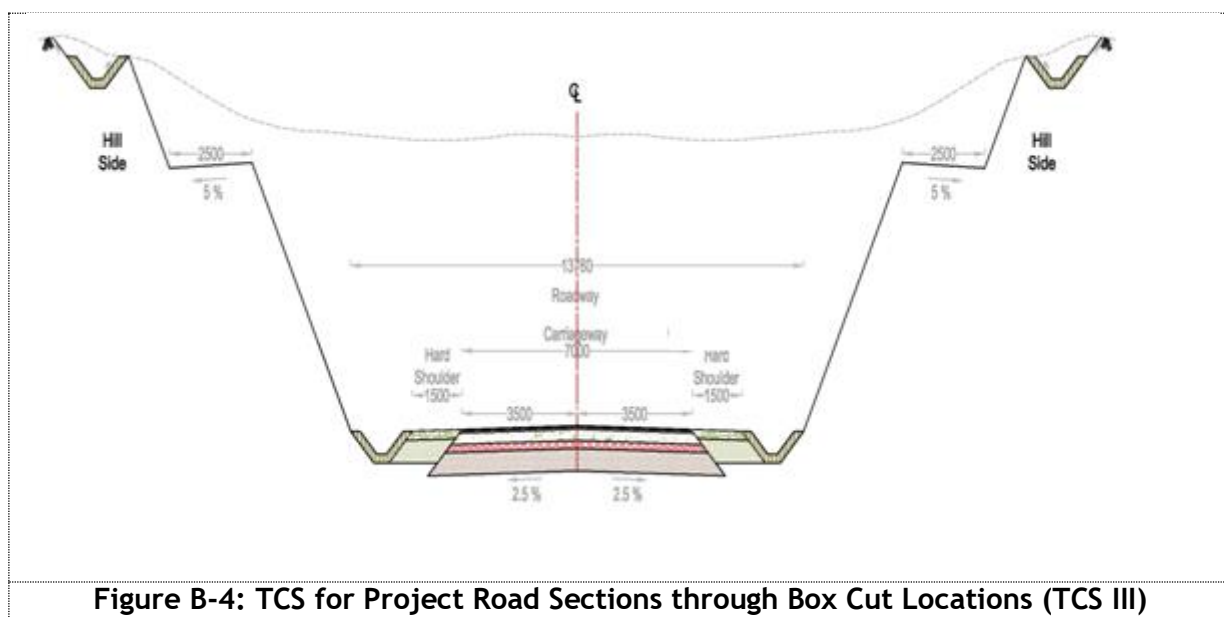
Note: The extent of cross section type is indicative and shall be reviewed in consultation with the Authority Engineer at the time of construction as per the site condition. Type I Cross section consist of two variants as I (a) without retaining wall on valley side and 1(b) with retaining wall on valley side as detailed in figure B1 & B2 respectively. For locations please refer designed cross section @ 20 m interval detailed in Annexure III of Schedule A.

The alternative cross section of the Project Highway at the cross drainage structures shall follow the typical cross section in consultation with the Authority Engineer at the time of construction.





“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”





### 3.0 INTERSECTIONS AND GRADE SEPARATORS

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

[Refer to paragraphs 3.1.1, 3.1.2 and 3.3 of the Manual and specify the requirements. Explain where necessary with drawings/sketches/general arrangement].

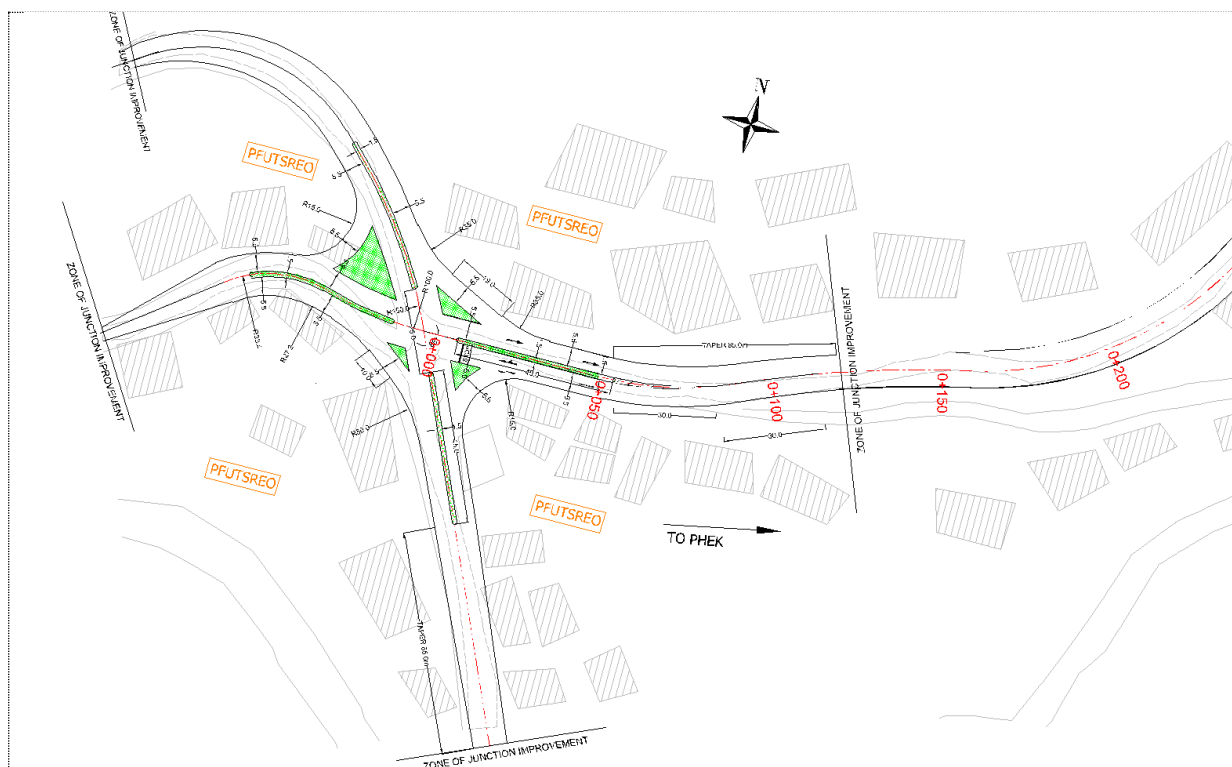
Properly designed intersections shall be provided at the locations and of the types and features given in the tables below:

#### (a) At-grade Intersections

##### (i) Major Intersections

Sl. No.	Location of Intersection	Intersection Towards	Type of Intersection	Figure No.	Other Features
01	0+000	Chizami	Cross	B 7	As per Figure

Details of junction improvements shall be as per IRC SP: 73-2015.



**Figure B-7: Junction Improvement Proposal for Junction with NH 29 and P P Road at Km 0/000**

**(ii) Minor Intersections**

Sl. No.	Location of Intersection (Design Chainage, km)	Type of Intersection	Side
1	0+280	T	Right
2	1+180	T	Left
3	8+780	T	Right
4	16+010	T	Right
5	16+380	T	Right

Details of junction improvements shall be as per IRC SP: 73-2015.

**(b) Grade Separated Intersections with/without Ramps**

Sl No.	Location (km)	Salient Features	Minimum Length of Viaduct to be Provided (m)	Road to be Carried Over/Under the Structures
Nil				

“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”



**4.0 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 Specifications and Standards given in section 4 of the Manual 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 [Refer to paragraph 4.2 of the Manual and specify sections to be raised].

The existing road shall be raised in the following sections:

Sl No.	Section (km)		Length (km)	Extent of Raising [Top of finished road level]
	From	To		
			Nil	

**5.0 PAVEMENT DESIGN**

- 5.1 Pavement design shall be carried out in accordance with section 5 of the Manual.

**5.2 Type of pavement**

Flexible pavement shall be adopted for Project Highway. Notwithstanding anything contrary contained in this Agreement or the Manual, the pavement shall be designed as given below.

**5.3 Design Requirements -**

The granular layers (base and sub base) shall be designed for minimum 20 msa. The bituminous courses (Dense Bituminous Macadam and Bituminous Concrete) shall be designed for minimum 5 msa. Bituminous Concrete shall be minimum 40 mm thick.

Bituminous Grade VG 40 shall be used for BC.

**5.4 Reconstructions of stretches/ Realignment/ Bypass of sections**

- 5.4.1 [Refer to paragraph 5.9.7 of the manual and specify the stretches, if any, to be reconstructed.]
- 5.4.2 The following stretches of the existing road shall be reconstructed. These shall be designed as new pavement.

Sl. No.	Existing Section (km)		Remarks
	From	To	
1	0+000	19+900	Poor condition of existing pavement and or Realignment Section

“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”



**5.4.3 Rigid Pavement**

No rigid pavement has been considered for the Project Highway.

**6.0 ROAD SIDE DRAINAGE**

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

The improvements in the drainage and the slope erosion shall be made as per the following norms:

**6.1 Drainage Measures**

Following measures shall be adopted:

- i) Minimum length of Covered RCC Drain with Kerb Channel on Hill Side = 1225 Rm
- ii) Minimum length of Road Side Drains=17488 Rm

RCC Lined drains having rectangular shape have also been proposed in urban/semi urban/intersection stretches. The concrete drains shall be covered in reaches along commercial establishments and intersections. The drains outfall into the natural water courses i.e. either in culverts or bridges. Table below gives the location of lined drains.

These are guidelines for minimum provisions. However, contractor has to design as per requirement of road in accordance with manual.

**Details of Drains**

Sl. No.	Design Chainage		Length (M)	Remarks
	From	To		
1	0+000	0+660	660	RCC Covered Drain on Hill Side
2	0+660	1+130	470	V-shaped PCC Drain on Hill Side
3	1+130	1+230	100	V-shaped PCC Drain on Both Sides
4	1+230	2+320	1090	V-shaped PCC Drain on Hill Side
5	2+320	2+360	40	V-shaped PCC Drain on Both Sides
6	2+360	5+320	2960	V-shaped PCC Drain on Hill Side
7	5+320	5+440	120	V-shaped PCC Drain on Both Sides
8	5+440	7+960	2520	V-shaped PCC Drain on Hill Side
9	7+960	8+090	130	V-shaped PCC Drain on Both Sides
10	8+090	11+440	3350	V-shaped PCC Drain on Hill Side
11	11+440	11+470	30	V-shaped PCC Drain on Both Sides
12	11+470	15+800	4330	V-shaped PCC Drain on Hill Side

Sl. No.	Design Chainage		Length (M)	Remarks
	From	To		
13	15+800	16+370	570	RCC Covered Drain on Hill Side
14	16+370	19+140	2770	V-shaped PCC Drain on Hill Side
15	19+140	19+160	20	V-shaped PCC Drain on Both Sides
16	19+160	20+000	840	V-shaped PCC Drain on Hill Side

**Note:** (i) Road side drain shall preferably be V-shaped having wetted area of 0.4 sqm

(ii) The above locations shall be reviewed in consultation with the Authority Engineer at the time of construction as per the site condition.

## 7.0 DESIGN OF STRUCTURES

### 7.1 General

7.1.1 The Project road from Phek to Pfutsero from Km 0.000 to Km 20.000 (design chainages), includes provision of **117 box culverts**. 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 Width of the carriageway of new bridges and Structures shall be as per Clause 7.3 of the Manual.

7.1.3 All bridges shall be high-level bridges.

[Refer to paragraph 7.1(iii) of the Manual and state if there is any exception]

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

[Refer to paragraph 7.1 (viii) of the Manual and provide details]

Sl. No.	Bridge at Km	Utility service to be carried	Remarks
NIL			

7.1.5 Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the typical cross sections given in the 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. Catch water pit at every culvert location shall be provided as per IRC standard and Breast wall of varying height shall also be provided at the end of catchpit along hill side to protect against hill toe erosion. All box culverts

(excluding the box culverts in cushion) shall be provided with approach slabs on both sides.

Minimum no. of box culverts with Span arrangement are given herein under:

S. No.	Span (m)	No. of culverts
1	1.5	40
2	2.0	45
3	3.0	19
4	4.0	9
5.	5.0	4

### 7.2.2 Reconstruction of existing culverts

The existing culverts at the following locations shall be re-constructed as new culverts:

[Refer to paragraph 7.3 (iii) of the Manual and provide details]. These are guidelines for minimum provisions. However, contractor has to design as per requirement of road in accordance with manual.

\* Specify modifications, if any, required in the road level etc.

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Proposed Span (m)	Proposal
1	0+150	0+130	1.5	RCC Box
2	0+175	0+230	1.5	RCC Box
3	0+415	0+480	1.5	RCC Box
4	0+530	0+580	2.0	RCC Box
5	0+740	0+770	2.0	RCC Box
6	0+970	0+990	2.0	RCC Box
7	1+253	1+260	2.0	RCC Box
8	1+432	1+410	3.0	RCC Box
9	1+925	1+865	3.0	RCC Box
10	1+975	1+910	2.0	RCC Box
11	2+224	2+090	2.0	RCC Box
12	2+313	2+200	2.0	RCC Box
13	2+670	2+620	3.0	RCC Box
14	3+108	3+030	3.0	RCC Box
15	4+405	4+320	4.0	RCC Box
16	4+750	4+695	3.0	RCC Box
17	5+540	5+500	2.0	RCC Box
18	6+775	6+585	3.0	RCC Box
19	8+135	8+122	5.0	RCC Box
20	8+225	8+240	3.0	RCC Box
21	8+336	8+322	5.0	RCC Box
22	8+436	8+470	1.5	RCC Box
23	8+529	8+530	3.0	RCC Box
24	8+638	8+620	3.0	RCC Box
25	8+685	8+710	2.0	RCC Box
26	8+865	8+840	2.0	RCC Box
27	9+110	9+080	2.0	RCC Box

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Proposed Span (m)	Proposal
28	11+497	11+510	3.0	RCC Box
29	11+935	11+970	5.0	RCC Box
30	15+515	15+485	2.0	RCC Box
31	15+950	15+925	2.0	RCC Box
32	16+035	15+995	2.0	RCC Box
33	16+124	16+080	2.0	RCC Box
34	16+262	16+228	2.0	RCC Box
35	16+351	16+328	2.0	RCC Box

\* All box culverts (excluding the box culverts in cushion) shall be provided with approach slabs on both sides. Moreover upstream and downstream protection works, including connecting stream with the culvert, catch pits; baffle piers/blocks etc. shall be provided which must be ascertained as per the site conditions and details given in drawings of culvert.

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

#### BOX CULVERT DETAILS

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Proposed Span (m)	Proposal
1	0+615	0+630	1.5	RCC Box
2	0+875	0+925	1.5	RCC Box
3	2+450	2+380	4.0	RCC Box
4	2+975	2+950	2.0	RCC Box
5	3+200	3+122	2.0	RCC Box
6	3+310	3+260	2.0	RCC Box
7	3+415	3+380	2.0	RCC Box
8	3+510	3+550	2.0	RCC Box
9	3+805	3+680	2.0	RCC Box
10	3+980	3+890	3.0	RCC Box
11	4+225	4+090	2.0	RCC Box
12	4+500	4+445	2.0	RCC Box
13	4+625	4+570	2.0	RCC Box
14	4+825	4+830	1.5	RCC Box
15	4+915	4+900	5.0	RCC Box
16	5+500	5+190	4.0	RCC Box
17	5+650	5+630	4.0	RCC Box
18	5+880	5+820	3.0	RCC Box
19	6+215	6+165	2.0	RCC Box
20	6+350	6+290	1.5	RCC Box
21	6+550	6+490	2.0	RCC Box
22	6+850	6+820	2.0	RCC Box
23	7+060	7+040	1.5	RCC Box
24	7+300	7+230	3.0	RCC Box
25	7+405	7+370	3.0	RCC Box
26	7+615	7+575	3.0	RCC Box
27	7+850	7+810	1.5	RCC Box

“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Proposed Span (m)	Proposal
28	7+975	7+920	1.5	RCC Box
29	9+225	9+170	1.5	RCC Box
30	9+420	9+360	2.0	RCC Box
31	9+560	9+590	1.5	RCC Box
32	9+710	9+710	1.5	RCC Box
33	9+800	9+830	1.5	RCC Box
34	9+895	9+885	4.0	RCC Box
35	9+990	9+970	3.0	RCC Box
36	10+150	10+150	1.5	RCC Box
37	10+220	10+230	3.0	RCC Box
38	10+350	10+300	1.5	RCC Box
39	10+715	10+720	4.0	RCC Box
40	10+775	10+775	3.0	RCC Box
41	11+160	11+150	1.5	RCC Box
42	11+253	11+250	2.0	RCC Box
43	11+307	11+340	4.0	RCC Box
44	11+675	11+690	4.0	RCC Box
45	11+880	11+890	2.0	RCC Box
46	12+290	12+210	1.5	RCC Box
47	12+450	12+410	1.5	RCC Box
48	12+550	12+500	1.5	RCC Box
49	12+770	12+790	1.5	RCC Box
50	12+985	12+910	1.5	RCC Box
51	13+070	13+000	2.0	RCC Box
52	13+295	13+230	2.0	RCC Box
53	13+390	13+340	1.5	RCC Box
54	13+550	13+490	1.5	RCC Box
55	13+660	13+640	2.0	RCC Box
56	13+750	13+720	2.0	RCC Box
57	13+950	13+910	1.5	RCC Box
58	14+130	14+090	1.5	RCC Box
59	14+270	14+265	2.0	RCC Box
60	14+395	14+360	2.0	RCC Box
61	14+475	14+500	1.5	RCC Box
62	14+660	14+610	1.5	RCC Box
63	14+925	14+910	2.0	RCC Box
64	15+020	14+970	1.5	RCC Box
65	15+250	15+150	1.5	RCC Box
66	15+425	15+430	1.5	RCC Box
67	15+550	15+610	1.5	RCC Box
68	16+625	16+660	1.5	RCC Box
69	16+815	16+760	2.0	RCC Box
70	17+020	17+000	2.0	RCC Box
71	17+265	17+230	2.0	RCC Box
72	17+450	17+460	2.0	RCC Box
73	17+590	17+670	2.0	RCC Box
74	17+940	17+960	1.5	RCC Box
75	18+210	18+290	1.5	RCC Box
76	18+415	18+430	1.5	RCC Box

“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Proposed Span (m)	Proposal
77	18+785	18+810	4.0	RCC Box
78	18+950	19+000	1.5	RCC Box
79	19+125	19+190	3.0	RCC Box
80	19+405	19+490	2.0	RCC Box
81	19+700	19+710	1.5	RCC Box
82	19+890	19+890	1.5	RCC Box

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

[Refer to paragraph 7.22 of the Manual and provide details]

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Proposal	Proposed Span
NIL				

7.2.5 Floor protection works shall be as specified in the relevant IRC Codes and Specifications.

### 7.3 Bridges

7.3.1 The existing bridges to be re-constructed/widened

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

[Refer to paragraph 7.3 (iv) of the Manual and provide details]

Sl. No	Bridge Location (km)	Salient Details of Existing Bridge					Adequacy or Otherwise of the Existing Waterway, Vertical Clearance etc.	Remarks
		Span Arrangement (m)	Carriageway Width (m)	Total Width (m)	Type of Superstructure	Type of Foundation		
NIL								

#### 7.3.2 Additional New Bridges

- (i) Minor Bridges

[Specify additional new minor bridges if required, and attach GAD]

New minor bridges at the following locations on the project highways shall be constructed. GADs for the new minor bridges are attached in the drawings folder.

Sl. No.	Location Designed (km)	Total Length (m)	Remarks
NIL			

**(ii) Major bridges**

[Specify additional new major bridges if required, and attach GAD]

New major bridges at the following locations on the project highways shall be constructed. GADs for the new major bridges are attached in the drawings folder.

Sl. No.	Location Designed (km)	Total Length (m)	Remarks
NIL			

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

[Refer to paragraph 7.17 (iv) of the Manual and provide details]

Sl. No.	Location (km)	Remarks
Nil		

**7.3.4 Repairs/replacements of railings/parapets of the existing bridges shall be undertaken as follows:**

[Refer to paragraph 7.17 (v) of the Manual and provide details]

Sl. No.	Location (km)	Remarks
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**

[Refer to paragraph 7.21 of the Manual and specify the necessary measures /



treatments for protecting structures in marine environment, where applicable]

#### 7.4 Rail-road Bridges

7.4.1 Design, construction and detailing of ROB/RUB shall be as specified in section 7 of the Manual. [Refer to paragraph 7.18 of the Manual and specify modification, if any]

##### 7.4.2 Road over-bridges

Road over-bridges (road over rail) shall be provided at the following level crossings, as per GAD drawings attached:

SI No.	Location of Level Crossing (km)	Length of Bridge (m)
Nil		

##### 7.4.3 Road under-bridges

Road under-bridges (road under railway line) shall be provided at the following level crossings, as per GAD drawings attached:

SI No.	Location of Level Crossing (km)	Number and Length of Span (m)
Nil		

#### 7.5 Grade Separated Structures

[Refer to paragraph 7.19 of the Manual]

The grade separated structures shall be provided at the locations and of the type and length specified in paragraphs 2.9 and 3 of this Annex-I.

##### 7.5.1 Underpasses/Overpasses

There is no Underpass/Overpass proposed on the Project Highway.

#### 7.6 Repairs and strengthening of bridges and structures

[Refer to paragraph 7.22 of the Manual and provide details]

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

##### A. Bridges

SI No.	Location of Bridge (km)	Nature and Extent of Repairs/Strengthening to be Carried out
Nil		



**B. ROB / RUB**

SI No.	Location of ROB/RUB (km)	Nature and Extent of Repairs/Strengthening to be Carried out
Nil		

**C. Overpasses / Underpasses and Other Structures**

SI No.	Location 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 Major Bridges and Structures

SI No.	Location Design (km)
NIL	

**8.0 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.
- 8.2 Specifications of the reflective sheeting [Refer to paragraph 9.2 of the Manual and specify]
- 8.3 The minimum quantity of Traffic signages and pavement marking are tabulated here for Package

Traffic Signage's, Road Marking and other appurtenances	unit	Quantity
Road Marking on Centre line & Edge	sqm	6930
Direction & Place Identification up to 0.9 sqm	sqm	38
Direction & Place Identification more than 0.9 sqm	sqm	3
60 cm Equilateral Triangle	Number	154
60 cm Circular	Number	36

<b>Traffic Signage's, Road Marking and other appurtenances</b>	<b>unit</b>	<b>Quantity</b>
60 cm High Octagon	Number	18
60 cm X 45 cm Rectangular	Number	13
60 cm X 50 cm Chevron Sign	Number	722
Hectometer Stone	Number	80
Km stone	Number	16
5 <sup>th</sup> km stone	Number	3
Boundary Stone (as per clause 13 herein under)	Number	199
Road Delineators	Number	1559
Road Marker/ Road Stud	Number	10000
Hazard Marker	Number	246
PCC kerbs (duly painted) in bus bays and Islands	Rm	1772

## 9.0 ROAD SIDE FURNITURE

9.1 Roadside furniture shall be provided in accordance with the provisions of Section 11 of the Manual IRC: SP: 73-2007 and corresponding updates as per IRC:SP 73 -2015

9.2 Overhead traffic signs: location and size

[Refer to paragraph 9.2.5 of the Manual and provide details]

The overhead signs shall be the reflectorized type with high intensity retro-reflective sheeting conforming to ASTM D 4956-01, type VIII and /or type IX of micro prismatic type. The retro reflected sheets of Engineering Grade and high intensity grade (ordinary) shall not be used. The height, lateral clearance, location and installation shall be as per relevant clauses of MoRTH specifications. Overhead sign shall be installed ahead of major intersections and urban areas as per detailed design requirements. The minimum number of overhead signs shall be 02 (01 No. of gantry and 01 No. of Cantilever) as per this manual. Location shall be given by the AE.

## 10.0 COMPULSORY AFFORESTATION

[Refer to Section 11 of the Manual and specify the number of trees which are required to be planted by the Contractor as compensatory afforestation.]

Minimum 2000 nos. trees with deep and broad roots are required to be planted for soil conservation, in consultation with the Forest Department and AE for type and location.

## 11.0 HAZARDOUS LOCATIONS

Metal Beam crash barrier length of minimum 3445 (single runner, heavy duty and W-shape) or equivalent shall be provided at the locations of bridge approaches, built up sections, high embankments (3.0m and more) and at sharp curves. Heavy duty metal beam crash barriers shall be provided on this project by the Construction Contractor at the locations finalized in consultation with NHIDCL. Typical details of metal crash barrier are given in as per manual. Location of sharp curves are tabulated below.

Sl. No.	Design Chainage(m)		Length	Remarks
	From	To		
1	00+613.779	00+674.452	61	Radius<40
2	00+755.702	00+813.025	58	Radius<40
3	01+881.107	01+942.226	62	Radius<40
4	02+359.309	02+418.231	59	Radius<40
5	02+918.716	02+998.699	80	Radius<40
6	04+067.274	04+122.870	56	Radius<40
7	04+309.126	04+377.833	69	Radius<40
8	05+147.945	05+257.819	110	Radius<40
9	05+257.819	05+317.033	60	Radius<40
10	05+708.425	05+794.980	87	Radius<40
11	05+794.980	05+871.643	77	Radius<40
12	09+251.132	09+339.631	89	Radius<40
13	09+339.631	09+398.791	60	Radius<40
14	09+565.789	09+644.356	79	Radius<40
15	11+018.864	11+072.385	54	Radius<40
16	11+304.436	11+378.067	74	Radius<40
17	11+480.262	11+548.634	69	Radius<40
18	11+663.337	11+740.925	78	Radius<40
19	12+166.190	12+225.672	60	Radius<40
20	12+598.070	12+672.260	75	Radius<40
21	12+885.630	12+960.120	75	Radius<40
22	14+339.243	14+383.867	45	Radius<40
23	16+356.712	16+433.616	77	Radius<40
24	17+323.954	17+375.939	52	Radius<40
25	18+031.601	18+101.703	71	Radius<40
26	18+245.274	18+325.435	81	Radius<40
27	18+782.376	18+863.167	81	Radius<40

Sl. No.	Design Chainage(m)		Length	Remarks
	From	To		
28	19+043.338	19+134.251	91	Radius<40
29	19+134.251	19+237.825	104	Radius<40
30	19+365.053	19+406.306	42	Radius<40
31	19+455.836	19+539.769	84	Radius<40
Total			2220	

## 12.0 SPECIAL REQUIREMENT FOR HILL ROADS

In accordance with section 13 of the manual, IRC: SP: 48-1998 and Recommended practices for Treatment of Embankment and Roadside slopes for Erosion control (First Revision), IRC: 56-2011 and relevant IRC codes.

### 12.1 Slope Protection

As the project involves cutting of existing hill slopes, it is imperative that slopes are stabilized for ensuring longevity of the slope and the road. Slope stability, erosion control and landslide correction shall be accomplished in accordance with IRC: SP: 48-1998. Reference may be drawn from IRC: 56-2011.

The **minimum quantity** of protection work to be taken as below:

Type of Protection Work		
Protection Work	Unit	Minimum Quantity
Parapet Wall having size 0.45mX0.7m with 0.7 m spacing between two parapets	Rm	4,697
Breast wall of PCC/RCC/Gabion/Cement Masonry having minimum height of 1.5 m	Rm	1,733
Retaining Structure on valley side of PCC/RCC/Gabion/Cement Masonry of varying height between 1 to 6 metre depending upon the slope with parapet walls	Rm	7,840
Subsurface drain with perforated pipe for collection of seepage water to avoid sinking of pavement	Rm	2,394
Seeding and Mulching with Jute Net	Sqm	138,954
Hydro seeding	Sqm	58,247
Catch Water Drain (Unlined)	Rm	19,020

**Note-** The Contractor shall be responsible for accurate assessment of the actual requirement as per site situation & prepare designs for slope protection & stabilization as per the specifications & standards stipulated in schedule 'D' and

*submit the same to the AE for review through the proof consultant and implement it accordingly thereafter.*

**Any increase in quantity (length, breadth and height) over and above the tentative quantity as mentioned in above table or change in specifications will not be considered as change of scope. Therefore contractor shall make thorough investigation at site and assess the requirement of slope protection and slide prone zone and other safety features at his own before submission of bid.**

**12.1.1 Summary of Retaining Structure on valley side of varying height between 1 to 6 metre depending upon the slope**

Sl. No.	Height of Retaining Structure	Aggregate Length
1	Upto 2 m	5597
2	2 m to 4 m	2155
3	4 m to 6 m	98

**12.1.2 Tentative Locations and Length**

S. No.	From Chainage (in m)	Design To Design Chainage (in m)	Length (m)
1	0+005	0+195	190
2	0+365	0+625	260
3	0+645	0+835	190
4	0+965	1+005	40
5	1+035	1+128	93
6	1+130	1+135	5
7	1+335	1+365	30
8	1+565	1+615	50
9	1+668	1+715	47
10	1+765	1+846	81
11	1+995	2+065	70
12	2+100	2+135	35
13	2+195	2+215	20
14	3+385	3+405	20
15	3+539	3+617	78
16	3+705	3+715	10
17	3+795	3+803	8
18	3+866	3+878	13
19	4+415	4+425	10
20	4+995	5+035	40

21	5+157	5+175	18
22	5+225	5+265	40
23	5+733	5+755	22
24	5+911	5+955	44
25	5+965	5+985	20
26	6+065	6+085	20
27	6+115	6+165	50
28	6+195	6+205	10
29	6+275	6+325	50
30	6+345	6+395	50
31	6+469	6+505	36
32	6+551	6+605	54
33	6+675	6+686	11
34	7+095	7+113	18
35	7+125	7+165	40
36	7+307	7+325	18
37	7+335	7+425	90
38	7+436	7+475	39
39	7+495	7+515	20
40	7+585	7+595	10
41	7+665	7+675	10
42	7+682	7+695	13
43	7+745	7+862	117
44	7+866	7+945	79
45	8+115	8+130	15
46	8+133	8+165	32
47	8+185	8+195	10
48	8+223	8+263	40
49	8+315	8+405	90
50	8+425	8+435	10
51	8+445	8+467	22
52	8+485	8+495	10
53	8+515	8+531	16
54	8+535	8+545	10
55	8+555	8+565	10
56	8+725	8+785	60
57	8+895	8+965	70
58	9+025	9+045	20
59	9+061	9+085	24
60	9+158	9+195	37
61	9+251	9+355	104

“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

62	9+485	9+575	90
63	9+705	9+715	10
64	9+895	9+935	40
65	10+126	10+139	12
66	10+139	10+175	36
67	10+315	10+355	40
68	10+425	10+475	50
69	10+533	10+605	72
70	10+615	10+625	10
71	10+705	10+745	40
72	10+817	10+831	14
73	10+836	10+846	10
74	10+957	10+965	8
75	11+135	11+286	151
76	11+375	11+405	30
77	11+567	11+646	79
78	11+687	11+705	18
79	11+745	11+825	80
80	11+885	11+905	20
81	11+955	11+975	20
82	12+043	12+046	3
83	12+048	12+105	57
84	12+407	12+465	58
85	12+475	12+594	119
86	12+665	12+701	36
87	12+735	12+785	50
88	12+875	12+895	20
89	12+945	13+035	90
90	13+072	13+073	2
91	13+077	13+145	68
92	13+155	13+365	210
93	13+425	13+457	32
94	13+515	13+535	20
95	13+755	13+785	30
96	13+825	13+845	20
97	13+985	13+989	5
98	13+995	14+002	7
99	14+007	14+013	7
100	14+018	14+035	17
101	14+085	14+117	32
102	14+119	14+255	136

103	14+314	14+395	81
104	14+433	14+505	72
105	14+655	14+665	10
106	14+745	14+795	50
107	15+067	15+085	18
108	15+165	15+245	80
109	15+285	15+335	50
110	15+365	15+445	80
111	15+465	15+495	30
112	15+551	15+556	5
113	15+565	15+605	40
114	15+674	15+735	61
115	15+782	15+805	23
116	15+815	16+185	370
117	16+195	16+353	158
118	16+405	16+825	420
119	16+866	16+925	59
120	17+005	17+300	295
121	17+300	17+425	125
122	17+435	17+565	130
123	17+585	17+726	141
124	17+728	17+865	137
125	17+885	17+945	60
126	18+085	18+155	70
127	18+335	18+362	27
128	18+366	18+449	83
129	18+462	18+545	83
130	18+567	18+596	29
131	18+605	18+765	160
132	18+885	19+001	116
133	19+085	19+117	32
134	19+265	19+375	110
135	19+395	19+424	29
136	19+565	19+575	10
137	19+975	19+988	13
	<b>Total</b>		<b>7840</b>

12.1.3 **Subsurface Drains: Location of** Subsurface drain with perforated pipe are provided at water seepage locations for collection of seepage water to avoid sinking of pavement





**Water Seepage Locations**

Sr. No.	Existing Location	Design Chainage
1	4.050	3.785
2	6.650	6.630
3	8.336	8.340
4	8.640	8.640
5	9.900	9.895
6	11.650	11.515
7	12.100	11.945
8	15.650	15.630
9	16.800	16.780
10	17.600	17.600
11	17.700	17.700
12	18.300	18.335
13	18.900	18.970
14	19.400	19.475

**12.2 ROAD LAND BOUNDARY (Clause 12.2 IRC SP: 73 : 2015)**

Road land (ROW) boundary shall be demarcated by putting RCC boundary pillars of size 60cm x 15cm x 15 cm embedded in concrete (as per IRC:25) along the Project Highway at 50 m interval on both sides. All the components used in delineating road land boundary shall be aesthetically pleasing, sturdy and vandal proof. The road land boundary shall be demarcated in consultation with NHIDCL.

**12.3 Disposal of Debris: - As per Manual****13.0 CHANGE OF SCOPE**

The size of Structures, bridges, culverts and slope protection works whatsoever in terms of retaining wall, breast wall, gabion wall, RE wall, chute drain, catch pit, baffle piers/blocks etc. under special requirement of hill slope specified hereinabove shall be treated as an approximate assessment. The actual lengths, heights and widths as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths, heights and widths and specifications in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length, height and width arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.



**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 confirm to design requirements set out in the following documents:

Two Lane Manual (IRC: SP 73 - 2015) of Specifications and Standards for Two Laning published by IRC and Hill Road Manual IRC SP 48:1998



Annex - I  
(Schedule - D)**Specifications and Standards for Construction****1 Specifications and Standards**

All materials, works and construction operations shall confirm to the Two Lane Manual (IRC: SP 73 - 2015) of Specifications and Standards for Two Laning (IRC: SP: 73 - 2015), referred as the Two Lane Manual (IRC: SP: 73 - 2015), and MORTH Specifications for Road and Bridge Works (Fifth Edition) with upto date amendments/modifications/additions, IRC: SP: 48-1998 and IRC 56-2011. 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 Two Lane Manual (IRC: SP 73- 2015) 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 the Paragraph 1 above, the following deviation in Specifications and Standards shall apply to the Project Highway, and for purposes of this Agreement, aforesaid Specifications and Standards of following clauses shall be deemed to be amended to the extent set forth below:

S. No.	Clause	Provision as per Manual ( IRC:SP:73-2015)	Modified Provision
1	2.2	<b>Design Speed:</b> Ruling or minimum Design speed shall be followed	Design speed shall be 30 km/h for project highway where the radius is less than 40m. The same is mentioned in the Plan & Profile drawings given in <b>Annexure-III of Schedule A.</b>
2	2.7.2	<b>Roadway Width:</b> On horizontal curves with radius up to 300 m width of pavement and roadway shall be increased as per Table 2.4	On horizontal Curves with radius up to 300 m width of pavement and roadway shall be increased as per Plan & Profile drawings given in Annexure - III of Schedule A
3	2.9.4	<b>Radius of Horizontal Curves:</b>	Radius of Horizontal curves shall be as per the alignment plan shown in Plan & Profile drawings given in <b>Annexure-III of Schedule A.</b>

S. No.	Clause	Provision as per Manual ( IRC:SP:73-2015)	Modified Provision
4	2.6	Type of Shoulder in open country	As given in Schedule B
5	5.1	Pavement crust thickness	As given in Schedule B
6	7.3 (ii)	New Bridges:	The minimum width of footpath clear of crash barrier and railings shall be 1.3 m as detailed in GAD drawings for Bridges as per Annexure-III of Schedule A.



**SCHEDULE – H****(See Clauses 10.1.4 and 19.3)****Contract Price Weightages**

1.1 The Contract Price for this Agreement is Rs...../-

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

<b>ITEM</b>	<b>WEIGHT AGE IN PERCENTAGE TO THE CONTRACT PRICE</b>	<b>STAGE OF PAYMENT</b>	<b>PERCENTAGE WEIGHTAGE</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>5</b>
<b>Road works including Culverts, widening and Repair of Culverts.</b>	<b>68.61%</b>	<b>A- Widening and strengthening of existing road</b>	
		(1) Earthwork upto top of the Sub-grade including excavation in soil/ soft rock/ hard rock and clearing & grubbing	<b>11.22%</b>
		(2) Sub-Base Course.	<b>6.88%</b>
		(3) Non Bituminous Base Course.	<b>9.38%</b>
		(4) Bituminous Base Course	<b>5.52%</b>
		(5) Wearing Coat.	<b>3.55%</b>
		(6) Widening and repair of culverts	<b>0.00%</b>
		(7) Hard Shoulder	<b>2.05%</b>
		<b>B.1- Reconstruction/New 2 lane realignment/bypass (Flexible pavement)</b>	
		(1) Earthwork upto top of the Sub-grade including excavation in soil/ soft rock/ hard rock and clearing & grubbing	<b>3.51%</b>
		(2) Sub-Base Course.	<b>0.65%</b>
		(3) Non Bituminous Base Course.	<b>0.88%</b>
		(4) Bituminous Base Course	<b>0.52%</b>
		(5) Wearing Coat.	<b>0.33%</b>
		(6) Hard Shoulder	<b>0.21%</b>
		<b>B.2- Reconstruction/New 2 lane realignment/bypass (Rigid pavement)</b>	

		(1) Earthwork upto top of the Sub-grade including excavation in soil, soft rock and hard rock including clearing & grubbing with required site clearance etc.	<b>0.00%</b>
		(2) Sub-Base Course.	<b>0.00%</b>
		(3) Dry Lean Concrete (DLC) Course	<b>0.00%</b>
		(4) Pavement Quality Control (PQC) Course	<b>0.00%</b>
		<b><i>C.1-Reconstruction /New Service road (Flexible Pavement)</i></b>	
		(1) Earthwork upto top of the Sub-grade including excavation in soil/ soft rock/ hard rock and clearing & grubbing	<b>0.00%</b>
		(2) Sub-Base Course.	<b>0.00%</b>
		(3) Non Bituminous Base Course.	<b>0.00%</b>
		(4) Bituminous Base Course	<b>0.00%</b>
		(5) Wearing Coat.	<b>0.00%</b>
		<b><i>C.2-Reconstruction /New Service road (Rigid Pavement)</i></b>	
		(1) Earthwork upto top of the Sub-grade including excavation in soil, soft rock and hard rock including clearing & grubbing with required site clearance etc.	<b>0.00%</b>
		(2) Sub-Base Course.	<b>0.00%</b>
		(3) Dry Lean Concrete (DLC) Course	<b>0.00%</b>
		(4) Pavement Quality Control (PQC) Course	<b>0.00%</b>
<b>Minor Bridges /Underpasses/ Overpasses</b>	<b>0.00%</b>	<b><i>D-Re-construction and New culverts on existing road, realignment, bypasses.</i></b>	
		(1) Culverts (Length < 6m)	<b>23.91%</b>
		<b><i>A.1-Widening and Repair of Minor Bridges (length&gt;6m and &lt;60m)</i></b>	
		(1) Minor Bridges	<b>0.00%</b>
		<b><i>A.2-New Minor Bridges (length &gt;6m and &lt;60m)</i></b>	
		(1) <b>Foundation + Sub Structure</b> : On completion of the foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap	<b>0.00%</b>
		(2) <b>Super Structure</b> : On completion of the super structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	<b>0.00%</b>



		(3) <b>Approaches:</b> On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	<b>0.00%</b>
		(4) <b>Guide Bunds and River Training Works:</b> On completion of Guide Bunds and river Training works complete in all respects.	<b>0.00%</b>
		<b>B.1-Widening and Repair of underpasses/overpasses</b>	
		(1) Underpasses / Overpasses	<b>0.00%</b>
		<b>B.2-New Underpasses / Overpasses</b>	
		(1) <b>Foundation + Sub Structure :</b> On completion of the foundation work including foundation for wing and return walls, abutments, piers upto the abutment/pier cap	<b>0.00%</b>
		(2) <b>Super Structure:</b> On completion of the super structure in all respects including wearing coat, bearing, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. Complete in all respect.  Wearing Coat (a) in case of overpass-wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass-rigid pavement including drainage facility complete in all respects as specified.	<b>0.00%</b>
		(3) <b>Approaches:</b> On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	<b>0.00%</b>
<b>Major Bridge (length &gt;60m works and ROB/RUB/elevated sections /flyovers including voiducts, if any</b>	<b>0.00%</b>	<b>A.1-Widening and repairs of Major Bridges</b>	
		(1) Foundation	<b>0.00%</b>
		(2) Sub-structure	<b>0.00%</b>
		(3) Super-structure (including bearings)	<b>0.00%</b>
		(4) Wearing Coat including expansion joints	<b>0.00%</b>
		(5) Miscellaneous items like hand rails, crash barriers, road marking etc	<b>0.00%</b>
		(6) Wing walls/return walls	<b>0.00%</b>
		(7) Guide Bunds, River Training works etc	<b>0.00%</b>
		(8) Approaches (including Retaining walls, stone pitching and protection works)	<b>0.00%</b>
		<b>A.2-New Major Bridges</b>	
		(1) Foundation	<b>0.00%</b>
		(2) Sub-structure	<b>0.00%</b>

“Construction of two-Lane with hard shoulders of Pfutsero-Phek Road on EPC basis from existing Km 0.000 to Km 19.900 [Design Km. 0.000 to Km.20.000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”



		(3) Super-structure (including bearings)	<b>0.00%</b>
		(4) Wearing Coat including expansion joints	<b>0.00%</b>
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	<b>0.00%</b>
		(6) Wing walls/return walls	<b>0.00%</b>
		(7) Guide Bunds, River Training works etc	<b>0.00%</b>
		(8) Approaches (including Retaining walls, stone pitching and protection works)	<b>0.00%</b>
		<b><i>B.1-Widening and Repair of</i></b>	
		<b><i>(a) ROB</i></b>	
		<b><i>(b) RUB</i></b>	
		(1) Foundation	<b>0.00%</b>
		(2) Sub-structure	<b>0.00%</b>
		(3) Super-structure (including bearings)	<b>0.00%</b>
		(4) Wearing Coat (a) in case of ROB-wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	<b>0.00%</b>
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	<b>0.00%</b>
		(6) wing walls/return walls	<b>0.00%</b>
		(7) Approaches (including Retaining walls, stone pitching and protection works)	<b>0.00%</b>
		<b><i>B.2-New ROB/RUB</i></b>	
		<b><i>(a) ROB</i></b>	
		<b><i>(b) RUB</i></b>	
		(1) Foundation	<b>0.00%</b>
		(2) Sub-structure	<b>0.00%</b>
		(3) Super-structure (including bearings)	<b>0.00%</b>
		(4) Wearing Coat (a) in case of ROB-wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	<b>0.00%</b>
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	<b>0.00%</b>
		(6) Wing walls/return walls	<b>0.00%</b>
		(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	<b>0.00%</b>
		<b><i>C.1-Widening and repair of Elevated Section/Flyovers/Grade Separators</i></b>	
		(1) Foundation	<b>0.00%</b>

		(2) Sub-structure	<b>0.00%</b>
		(3) Super-structure (including bearings)	<b>0.00%</b>
		(4) Wearing Coat including expansion joints	<b>0.00%</b>
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	<b>0.00%</b>
		(6) Wing walls/return walls	<b>0.00%</b>
		(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	<b>0.00%</b>
		<b><i>C.2-New Elevated Section/Flyovers/Grade Separators</i></b>	
		(1) Foundation	<b>0.00%</b>
		(2) Sub-structure	<b>0.00%</b>
		(3) Super-structure (including bearings)	<b>0.00%</b>
		(4) Wearing Coat including expansion joints	<b>0.00%</b>
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	<b>0.00%</b>
		(6) wing walls/return walls	<b>0.00%</b>
		(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	<b>0.00%</b>
<b>Other Works</b>	<b>31.39%</b>		
		(i)Toll Plaza	<b>0.00%</b>
		(ii)Road side drains	<b>3.09%</b>
		(iii) Road signs, markings, Km stones, Safety devices etc.	
		(a) Pavement Markings	<b>1.40%</b>
		(b) Crash Barriers/ W metal crash Barriers	<b>0.78%</b>
		(c) Road/Traffic Sign	<b>0.36%</b>
		(d) Road Boundary stones, km Stones, 5th km stones and hectometer stones, rumble strip, other items etc.	<b>0.03%</b>
		(e) Traffic blinker LED delineators, studs, reflective pavement markers, tree reflectors	<b>1.56%</b>
		(f) Road furniture (overhead signboard etc.)	<b>0.04%</b>
		(iv)Project facilities	
		(a)Bus bays / Bus Shelter	<b>0.19%</b>
		(b) Junctions (Major & Minor)	<b>1.65%</b>
		(c) Rest areas	<b>0.00%</b>
		(v) Road side Plantation	<b>0.01%</b>



	(vi) Repair of protection works other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROB's /RUBs	<b>0.00%</b>
	(vii) Safety and traffic management during construction	<b>0.00%</b>
	(viii) Slope Protection Works as special requirement for hill road	
	(a) Hydro Seeding	<b>0.07%</b>
	(b) Seeding and Mulching with Jute net	<b>3.01%</b>
	(c) Catch water Drains	<b>0.08%</b>
	(d) Retaining Structure on valley side of PCC/RCC/Gabion/Cement Masonry of varying height between 1 to 6 metre with parapet walls	<b>15.45%</b>
	(e) Reinforced Earth wall	<b>0.00%</b>
	(f) Breast wall with PCC/RCC/Gabion/Cement Masonry	<b>2.75%</b>
	(g) Sub Surface drain with perforated pipe	<b>0.39%</b>
	(h) Parapet wall	<b>0.53%</b>
	<b>Total %</b>	<b>100.00%</b>



## 1.3 Procedure of estimating the value of work done.

## 1.3.1 Road works

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

<b>TABLE 1.3.1</b>		
<b>STAGE OF PAYMENT</b>	<b>PERCENTAGE WEIGHTAGE</b>	<b>PAYMENT PROCEDURE</b>
<b>A- Widening and strengthening of existing road</b>		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) Earthwork upto top of the Sub-grade including excavation in soil/ soft rock/ hard rock and clearing & grubbing	<b>11.22%</b>	Further, If existing road length (excluding bypasses, re-alignment, structure) is say 'L' Km and the unencumbered length along the existing road as handed over on the appointed date is 'L1' Km and the balance length i.e. 'L2' Km (L-L1) is to be handed over on a later date as per the memorandum signed under provision of clause 8.2.1 of the contract document, then the stage payment shall be worked out for the 'L1' Km length handed over on the appointed date. The stage payment for the remaining 'L2' Km shall be worked out on prorata basis from the date of handing over of such length.
(2) Sub-Base Course.	<b>6.88%</b>	
(3) Non Bituminous Base Course.	<b>9.38%</b>	
(4) Bituminous Base Course	<b>5.52%</b>	
(5) Wearing Coat.	<b>3.55%</b>	
(6) Widening and repair of culverts	<b>0.00%</b>	Cost of completed culverts shall be determined pro rata basis with respect to the total no. of culverts. The payment shall be made on the completion of at least five culverts.
(7) Hard Shoulder	<b>2.05%</b>	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. Further, If existing road length (excluding bypasses, re-alignment, structure) is say 'L' Km and the unencumbered length along the existing road as handed over on the appointed date is 'L1' Km and the balance length i.e. 'L2' Km (L-L1) is to be handed over on a later date as per the memorandum signed under provision of clause 8.2.1 of the contract document, then the stage payment shall be worked out for

		the 'L1' Km length handed over on the appointed date. The stage payment for the remaining 'L2' Km shall be worked out on prorata basis from the date of handing over of such length.
<b>B.1- Reconstruction/New 2lane realignment/bypass (Flexible pavement)</b>		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) Earthwork upto top of the Sub-grade including excavation in soil/ soft rock/ hard rock and clearing & grubbing	<b>3.51%</b>	Further, Unit of Measurement is linear length of each Bypass/ realignment (excluding structures) and payment of each stage shall be made on prorata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length of each bypass/ realignment taken separately.
(2) Sub-Base Course.	<b>0.65%</b>	
(3) Non Bituminous Base Course.	<b>0.88%</b>	
(4) Bituminous Base Course	<b>0.52%</b>	
(5) Wearing Coat.	<b>0.33%</b>	
(6) Hard Shoulder	<b>0.21%</b>	
<b>B.2- Reconstruction/New 2lane realignment/bypass (Rigid pavement)</b>		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km. length, whichever is less.
(1) Earthwork upto top of the Sub-grade including excavation in soil/ soft rock/ hard rock and clearing & grubbing	<b>0.00%</b>	Further, Unit of Measurement is linear length of each Bypass/ realignment (excluding structures) and payment of each stage shall be made on prorata basis on completion of a stage in full length or 5 (Five) Km length of each bypass/ realignment taken separately.
(2) Sub-Base Course.	<b>0.00%</b>	
(3) Dry Lean Concrete (DLC) Course	<b>0.00%</b>	
(4) Pavement Quality Control (PQC) Course	<b>0.00%</b>	
<b>C.1-Reconstruction /New Service road (Flexible Pavement)</b>		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km. length, whichever is less.
(1) Earthwork upto top of the Sub-grade including excavation in soil/ soft rock/ hard rock and clearing & grubbing	<b>0.00%</b>	
(2) Sub-Base Course.	<b>0.00%</b>	
(3) Non Bituminous Base Course.	<b>0.00%</b>	
(4) Bituminous Base Course	<b>0.00%</b>	
(5) Wearing Coat.	<b>0.00%</b>	
<b>C.2-Reconstruction /New Service road (Rigid Pavement)</b>		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km. length, whichever is less.
(1) Earthwork upto top of the Sub-grade including excavation in soil, soft rock and hard rock including clearing & grubbing with required site clearance etc.	<b>0.00%</b>	

(2) Sub-Base Course.	<b>0.00%</b>	
(3) Dry Lean Concrete (DLC) Course	<b>0.00%</b>	
(4) Pavement Quality Control (PQC) Course	<b>0.00%</b>	
<b>D-Re-construction and New culverts on existing road, realignment, bypasses.</b>		Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of at least five culverts.
(1) Culverts (Length < 6m)	<b>23.91%</b>	

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

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

Where P= Contract Price

L = Total length in km

Similarly, the rates per km for other stages shall be worked out accordingly.

***Note: The length affected due to law and order problems or litigation during execution due to which the contractor is unable to execute the work, may be deducted from the total project length for payment purposes. The total length calculated here is only for payment purposes and will not affect and referred in other clauses of the contract Agreement.***



## 1.3.2 Minor Bridge and Underpasses/Overpasses

Procedure for estimating the value of Minor Bridge and Underpasses/Overpasses shall be as stated in table 1.3.2:

TABLE 1.3.2		
STAGE OF PAYMENT	PERCENTAGE WEIGHTAGE	PAYMENT PROCEDURE
<b>A.1-Widening and Repair of Minor Bridges (length&gt;6m and &lt;60m)</b>	0.00%	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of widening & repair works of a minor bridge.
<b>A.2-New Minor Bridges (length &gt;6m and &lt;60m)</b>		
(i) <b>Foundation + Sub Structure</b> : On completion of the foundation work including foundation for wing and return walls, abutments, piers upto the abutment/pier cap	0.00%	(i) <b>Foundation + Sub Structure</b> : Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length(m) of the minor bridges. Payment against foundation + sub structure shall be made on pro rata basis on completion of a stage i.e not less than 25% of the scope of foundation + sub structure of each bridge subject to completion of at least two foundations along with sub structure up to abutment/pier cap level of each bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) <b>Super Structure</b> : On completion of the super structure in all respects including wearing coat, bearing, expansion joint, hand rail, crash barriers, road signs & markings, tests on completion etc. Complete in all respect.	0.00%	(ii) <b>Super Structure</b> : Payment shall be made on pro rata basis on completion of a stage i.e completion of super structure of at least one span in all respects as specified in the column of "Stage of Payment" in this sub clause.
(iii) <b>Approaches</b> : On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	0.00%	(iii) <b>Approaches</b> : Payment shall be made on pro rata basis on completion of a stage i.e completion of approaches in all respect as specified in the column of "Stage of Payment" in this sub clause.
(iv) <b>Guide Bunds and River Training Works</b> : On completion of Guide Bunds and river Training works complete in all respects.	0.00%	(iv) <b>Guide Bunds and River Training Works</b> : Payment shall be made on pro rata basis on completion of a stage i.e completion of Guide Bunds and River Training Works in all respects as specified.



<b>B.1-Widening and Repair of underpasses/ overpasses</b>	0.00%	Cost of each underpass/overpass shall be determined on pro rata basis with respect to the total linear length of the underpasses/overpasses. Payment shall be made on the completion of widening & repair works of a underpass/overpass
<b>B.2-New Underpasses / Overpasses</b>		
(i) <b>Foundation + Sub Structure</b> : On completion of the foundation work including foundation for wing and return walls, abutments, piers up to the abutment/pier cap	0.00%	(i) <b>Foundation + Sub Structure</b> : Cost of each Underpass/Overpass shall be determined on pro rata basis with respect to the total linear length (m) of the Underpasses/Overpasses. Payment against foundation + sub structure shall be made on pro rata basis on completion of a stage i.e not less than 25% of the scope of foundation + sub structure of each underpasses/overpasses subject to completion of at least two foundation along with sub structure up to abutment/pier cap level each underpass/overpass. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) <b>Super Structure</b> : On completion of the super structure in all respects including wearing coat, bearing, expansion joint, hand rail, crash barriers, road signs & marking, tests on completion etc. Complete in all respect.  Wearing Coat (a) in case of overpass-wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass-rigid pavement including drainage facility complete in all respects as specified as specified.	0.00%	(ii) <b>Super Structure</b> : Payment shall be made on pro rata basis on completion of a stage i.e completion of super structure of at least one span in all respects as specified in the column of " Stage of Payment" in this sub clause.
(iii) <b>Approaches</b> : On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	0.00%	(iii) <b>Approaches</b> : Payment shall be made on pro rata basis on completion of stage i.e completion of approaches in all respect as specified.

## 1.3.3 Major Bridge works, ROB/RUB and Structures.

Procedure for estimating the value of Major Bridge works, ROB/RUB and Structures shall be as stated in table 1.3.3:

TABLE 1.3.3			
STAGE OF PAYMENT	PERCENTAGE WEIGHTAGE	PAYMENT PROCEDURE	
A.1-Widening and repairs of Major Bridges			
(i) Foundation	0.00%	(i) <b>Foundation:</b> Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro rata basis on completion of a stage i.e not less than 25% of the scope of foundation of the major bridge subject to completion of atleast two foundation of the Major Bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.	
(ii) Sub-structure	0.00%	(ii) <b>Sub Structure :</b> Payment against Sub Structure shall be made on pro rata basis on completion of a stage i.e not less than 25% of the scope of sub structure of the major bridge subject to completion of atleast two sub structure of abutment/piers upto abutment/pier cap level of the major bridge.	
(iii) Super-structure (including bearings)	0.00%	(iii) <b>Super Structure:</b> Payment shall be made pro rata basis on completion of a stage i.e completion of super structure including bearings of atleast one span in all respect as specified.	
(iv) Wearing Coat including expansion joints	0.00%	(iv) <b>Wearing Coat:</b> Payment shall be made on completion of wearing coat including expansion joint complete in all respects as specified.	
(v) Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%	(v) <b>Miscellaneous :</b> Payment shall be made on completion of all miscellaneous work like hand rail, crash barriers, road marking etc. complete in all respect as specified.	
(vi) wing walls/return walls	0.00%	(vi) <b>Wing walls/return walls:</b> Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.	
(vii) Guide Bunds, River Training works etc	0.00%	(vii) <b>Guide Bunds, River Training works:</b> Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.	

(viii) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	(viii) <b>Approaches:</b> Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respect as specified.
<b>A.2-New Major Bridges</b>		
(i) Foundation	0.00%	(i) <b>Foundation:</b> Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro rata basis on completion of stage i.e not less than 25% of the scope of foundation of the major bridge subject to completion of at least two foundation of the major bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00%	(ii) <b>Sub Structure:</b> Payment against Sub-structure shall be made on pro rata basis on completion of a stage i.e not less than 25% of scope of sub structure of the major bridge subject to completion of atleast two sub structure of abutment/piers upto abutment/pier cap level of the major bridge.
(iii) Super-structure (including bearings)	0.00%	(iii) <b>Sup Structure :</b> Payment shall be be made on pro rata basis on completion of a stage i.e completion of super structure including bearing of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	0.00%	(iv) <b>Wearing Coat:</b> Payment shall be made on completion of wearing coat including expansion joint complete in all respects as specified.
(v) Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%	(v) <b>Miscellaneous :</b> Payment shall be made on completion of all miscellaneous work like hand rail, crash barriers, road marking etc. Complete in all respects as specified.
(vi) wing walls/return walls	0.00%	(vi) <b>Wing walls/Return walls :</b> Payment shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Guide Bunds, River Training works etc	0.00%	(vii) <b>Guide Bunds, River Training works :</b> Payment shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(viii) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	(viii) <b>Approaches:</b> Payment shall be made on completion of both approaches including stone pitching, protection works, etc complete in all respects as specified.

<b>B.1-Widening and Repair of</b>		
<b>(a) ROB</b>		
<b>(b) RUB</b>		
(i) Foundation	0.00%	(i) <b>Foundation:</b> Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total liner length (m) of the ROB/RUBs. Payment against foundation shall be made on pro rata basis on completion of a stage i.e not less than 25% of the scope of foundation of the ROB/RUB subject to completion of at least two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00%	(ii) <b>Sub Structure:</b> Payment against sub structure shall be made on pro rata basis on completion of a stage i.e not less than 25% of the scope of sub structure of the ROB/RUB subject to completion of atleast two sub structure of abutments/piers upto abutment/pier cap level of the ROB/RUB.
(iii) Super-structure (including bearings)	0.00%	(iii) <b>Super Structure :</b> Payment shall be made on pro rata basis on completion of a stage i.e completion of super structure including bearing of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints in case of ROB. In case of RUB, rigid pavement under RUB including drainage facility as specified	0.00%	(iv) <b>Wearing Coat :</b> Payment shall be made on completion of (a) in case of ROB-wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified as specified.
(v) Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%	(v) <b>Miscellaneous:</b> Payment shall be made on completion of all miscellaneous work like hand rail, crash barriers, road marking etc. Complete in all respects as specified.
(vi) wing walls/return walls	0.00%	(vi) <b>Wing walls/return walls:</b> Payment shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (including Retaining walls, stone pitching and protection works	0.00%	(vii) <b>Approaches:</b> Payment shall be made on completion of both approaches including stone pitching, protection works, etc complete in all respect as specified.

<b>B.2-New ROB/RUB</b>		
<b>(a) ROB</b>		
<b>(b) RUB</b>		
(i) Foundation	0.00%	(i) <b>Foundation:</b> Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total liner length (m) of the ROB/RUBs. Payment against foundation shall be made on pro rata basis on completion of a stage i.e not less than 25% of the scope of foundation of the ROB/RUB subject to completion of at least two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00%	(ii) <b>Sub Structure :</b> Payment against sub structure shall be made on pro rata basis on completion of a stage i.e not less than 25% of the scope of sub structure of the ROB/RUB subject to completion of at least two sub structures of abutments/piers upto abutment/pier cap level of the ROB/RUB.
(iii) Super-structure (including bearings)	0.00%	(iii) <b>Super Structure:</b> Payment shall be made on pro rata basis on completion of a stage i.e completion of super structure including bearing of at least one span in all respects as specified.
(iv) Wearing Coat including expansion joints in case of ROB. In case of RUB, rigid pavement under RUB including drainage facility as specified	0.00%	(iv) <b>Wearing Coat :</b> Payment shall be made on completion of (a) in case of ROB-wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified as specified.
(v) Miscellaneous items like hand rails, crash barriers, road marking etc	0.00%	(v) <b>Miscellaneous :</b> Payment shall be made on completion of all miscellaneous work like hand rail, crash barriers, road marking etc. Complete in all respects as specified.
(vi) wing wall/return walls	0.00%	(vi) <b>Wing walls/return walls :</b> Payment shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection work	0.00%	(vii) <b>Approaches :</b> Payment shall be made on completion of both approaches including stone pitching, protection works, etc complete in all respect as specified.

<b>C.1-Widening and repairs of Elevated Section/Flyovers/Grade Separators</b>		
(i) Foundation	0.00%	(i) <b>Foundation</b> : Cost of each structure shall be determined on pro rata basis with respect to the total liner length (m) of the structure Payment against foundation shall be made on pro rata basis on completion of a stage i.e not less than 25% of the scope of foundations of the structure subject to completion of atleast two foundation of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00%	(ii) <b>Sub Structure</b> : Payment against sub structure shall be made on pro rata basis on completion of a stage i.e not less than 25% of the scope of sub structure of the structure subject to completion of atleast two sub structures of abutments/piers upto abutment/pier cap level of the structure.
(iii) Super-structure (including bearings)	0.00%	(iii) <b>Super Structure</b> : Payment shall be made on pro rata basis on completion of a stage i.e completion of super structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	0.00%	(iv) <b>Wearing Coat</b> : Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(v) Miscellaneous items like hand rails, crash barriers, road marking etc	0.00%	(v) <b>Miscellaneous</b> : Payment shall be made on completion of all miscellaneous work like hand rail, crash barriers, road marking etc. Complete in all respects as specified.
(vi) wing wall/return walls	0.00%	(vi) <b>Wing walls/return walls</b> : Payment shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection work)	0.00%	(vii) <b>Approaches</b> : Payment shall be made on completion of both approaches including stone pitching, protection works, etc complete in all respect as specified.
<b>C.2-New Elevated Section/Flyovers/Grade Separators</b>		
(i) Foundation	0.00%	(i) <b>Foundation</b> : Cost of each structure shall be determined on pro rata basis with respect to the total liner length (m) of the structure Payment against foundation shall be made on pro rata basis on completion of a stage i.e not less than 25% of the scope of foundation of the structure subject to completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.

(ii) Sub-structure	0.00%	(ii) <b>Sub Structure</b> : Payment against sub structure shall be made on pro rata basis on completion of a stage i.e not less than 25% of the scope of sub structure of the structure subject to completion of atleast two sub structures of abutments/piers upto abutment/pier cap level of the structure.
(iii) Super-structure (including bearings)	0.00%	(iii) <b>Super Structure</b> : Payment shall be made on pro rata basis on completion of a stage i.e completion of super structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	0.00%	(iv) <b>Wearing Coat</b> : Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified
(v) Miscellaneous items like hand rails, crash barriers, road marking etc	0.00%	(v) <b>Miscellaneous</b> : Payment shall be made on completion of all miscellaneous work like hand rail, crash barriers, road marking etc. Complete in all respects as specified.
(vi) wing wall/return walls	0.00%	(vi) <b>Wing walls/return walls</b> : Payment shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection work)	0.00%	(vii) <b>Approaches</b> : Payment shall be made on completion of both approaches including stone pitching, protection works, etc complete in all respect as specified.

**Note: (1) In case of innovate Major Bridge projects like cable suspension/cable stayed/Extra Dozed and exceptionally long span bridges, the schedule may be modified as per site requirements before bidding with due approval of DG (RD) & SS, MoRT&H.**

**Note: (2) The Schedule for exclusive tunnel project may be prepared as per site requirement before bidding with due approval of DG (RD) & SS, MoRT&H**





## 1.3.4 Others works

Procedure for estimating the value of others works done shall be as stated in table **1.3.4**:

<b>TABLE 1.3.4</b>		
<b>STAGE OF PAYMENT</b>	<b>PERCENTAGE WEIGHTAGE</b>	<b>PAYMENT PROCEDURE</b>
(i)Toll Plaza	<b>0.00%</b>	Unit of measurement is each completed toll plaza. Payment of each toll plaza shall be made on pro rata basis with respect to the total of all toll plazas.
(ii)Road side drains	<b>3.09%</b>	Unit of measurement is linear length in Km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(iii) Road signs, markings, Km stones, Safety devices etc.		
(a) Pavement Markings	<b>1.40%</b>	
(b) Crash Barriers/ W metal crash Barriers	<b>0.78%</b>	
(c) Road/Traffic Sign	<b>0.36%</b>	
(d) Road Boundary stones, km Stones, 5th km stones and hectometre stone, rumble strip, other items	<b>0.03%</b>	
(e) Traffic blinker LED delineator, stud, reflective pavement marker, tree reflector	<b>1.56%</b>	
(f) Road furniture (overhead signboard etc.)	<b>0.04%</b>	
(iv)Project facilities		Payment shall be made on pro rata basis for completed facilities.
(a)Bus bays & Bus Shelter	<b>0.19%</b>	
(b) Junctions (Major & Minor)	<b>1.65%</b>	
(c) Rest areas	<b>0.00%</b>	
(v) Road side Plantation	<b>0.01%</b>	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 10% (ten per cent) of the total length.
(vi) Repair of protection works other than approaches to the bridges, elevated section/flyovers/grade separators and ROBs/RUBs	<b>0.00%</b>	
(vii) Safety and traffic management during construction	<b>0.00%</b>	Payment shall be made on pro rata basis every six month.
(viii) Slope Protection Works as special requirement for hill road		Unit of measurement is linear length in Km. Payment shall be made on pro rata basis on completion of a stage in a length
(a) Hydro Seeding	<b>0.07%</b>	

(b) Seeding and Mulching with Jute net	<b>3.01%</b>	of not less than 10% (ten per cent) of the total length.
(c) Catch water Drains	<b>0.08%</b>	
(d) Retaining Structure on valley side of PCC/RCC/Gabion/Cement Masonry of varying height between 1 to 6 metre with parapet walls	<b>15.45%</b>	
(e) Reinforced Earth wall	<b>0.00%</b>	
(f) Breast wall with PCC/RCC/Gabion/Cement Masonry	<b>2.75%</b>	
(g) Sub Surface drain with perforated pipe	<b>0.39%</b>	
(h) Parapet wall	<b>0.53%</b>	

## 2. Procedure for payment for Maintenance

2.1 The cost for maintenance shall be as stated in Clause 14.1.1

2.2 Payment for Maintenance shall be made in quarterly installment in accordance with the provisions of Clause 19.7

