

**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 Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+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 Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+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 **Merangkong - Tamlu - Mon Road** on EPC basis from Existing km 20+456 to km 41+065 (Design km 20+000 to km 40+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 **Merangkong-Tamlu-Mon Road** is 98.065 Km in length and after DPR preparation the designated length is 86.835 Km. The complete road has been divided into four Packages for construction. The packages are as follows-

S. No.	Package Name	Existing Chainage(Km)		Design Chainage(Km)		Design Length (Km)
		From	To	From	To	
1	Package-1	0+000	20+456	0+000	20+000	20.000
2	Package-2	20+456	41+065	20+000	40+000	20.000
3	Package-3	41+065	60+345	40+000	59+000	19.000
4	Package-4	60+345	98+065	59+000	86+835	27.835

The site for the instant work i.e. design Km 20.00 to design Km 40.00 is either single lane or proposed for re-alignments. The Site of the [Single Lane] Project Highway comprises of Merangkong - Tamlu - Mon Road commencing from Existing km 20.456 to km 41.065 (Design km 20+000 to km 40+000) in the state of Nagaland. 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 Mokokchung, Longleng and Mon districts of Nagaland State.

The project corridor passes through Namsang Town.

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-

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
1	0+000	0+020	20	0+000	0+190	190	Realignment	No Work Done
2	0+020	0+600	580	0+190	0+730	540	Widening and Strengthening	No Work Done
3	0+600	0+650	50	0+730	0+760	30	Realignment	No Work Done
4	0+650	0+725	75	0+760	0+850	90	Widening and Strengthening	No Work Done
5	0+725	0+795	70	0+850	0+910	60	Realignment	No Work Done

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
6	0+795	0+990	195	0+910	1+110	200	Widening and Strengthening	No Work Done
7	0+990	1+040	50	1+110	1+150	40	Realignment	No Work Done
8	1+040	1+205	165	1+150	1+330	180	Widening and Strengthening	No Work Done
9	1+205	1+240	35	1+330	1+360	30	Realignment	No Work Done
10	1+240	2+250	1010	1+360	2+310	950	Widening and Strengthening	No Work Done
11	2+250	2+300	50	2+310	2+355	45	Realignment	No Work Done
12	2+300	2+345	45	2+355	2+400	45	Widening and Strengthening	No Work Done
13	2+345	2+420	75	2+400	2+465	65	Realignment	No Work Done
14	2+420	2+455	35	2+465	2+500	35	Widening and Strengthening	No Work Done
15	2+455	2+495	40	2+500	2+540	40	Realignment	No Work Done
16	2+495	3+000	505	2+540	3+050	510	Widening and Strengthening	No Work Done
17	3+000	3+045	45	3+050	3+080	30	Realignment	No Work Done
18	3+045	3+448	403	3+080	3+455	375	Widening and Strengthening	No Work Done
19	3+448	3+480	32	3+455	3+480	25	Realignment	No Work Done
20	3+480	3+880	400	3+480	3+850	370	Widening and Strengthening	No Work Done
21	3+880	3+930	50	3+850	3+895	45	Realignment	No Work Done
22	3+930	4+000	70	3+895	3+965	70	Widening and Strengthening	No Work Done
23	4+000	4+200	200	3+965	4+210	245	Widening and Strengthening	Earthwork in Excavation
24	4+200	4+520	320	4+210	4+600	390	Realignment	Earthwork in Excavation
25	4+520	4+725	205	4+600	4+800	200	Widening and Strengthening	Earthwork in Excavation

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
26	4+725	4+830	105	4+800	4+950	150	Realignment	Earthwork in Excavation
27	4+830	5+230	400	4+950	5+325	375	Widening and Strengthening	Earthwork in Excavation
28	5+230	5+320	90	5+325	5+420	95	Realignment	Earthwork in Excavation
29	5+320	5+680	360	5+420	5+765	345	Widening and Strengthening	Earthwork in Excavation
30	5+680	5+750	70	5+765	5+825	60	Realignment	Earthwork in Excavation
31	5+750	6+156	406	5+825	6+230	405	Widening and Strengthening	Earthwork in Excavation
32	6+156	6+230	74	6+230	6+300	70	Realignment	Earthwork in Excavation
33	6+230	6+500	270	6+300	6+555	255	Widening and Strengthening	Earthwork in Excavation
34	6+500	6+600	100	6+555	6+650	95	Realignment	Earthwork in Excavation
35	6+600	6+625	25	6+650	6+670	20	Widening and Strengthening	Earthwork in Excavation
36	6+625	6+700	75	6+670	6+750	80	Realignment	Earthwork in Excavation
37	6+700	6+940	240	6+750	6+995	245	Widening and Strengthening	Earthwork in Excavation
38	6+940	7+000	60	6+995	7+060	65	Realignment	Earthwork in Excavation
39	7+000	7+110	110	7+060	7+165	105	Widening and Strengthening	Earthwork in Excavation
40	7+110	7+635	525	7+165	7+555	390	Realignment	Earthwork in Excavation
41	7+635	7+852	217	7+555	7+775	220	Widening and Strengthening	Earthwork in Excavation
42	7+852	8+053	201	7+775	8+020	245	Realignment	Earthwork in Excavation
43	8+053	8+590	537	8+020	8+540	520	Widening and Strengthening	Earthwork in Excavation
44	8+590	8+768	178	8+540	8+710	170	Realignment	Earthwork in Excavation
45	8+768	9+170	402	8+710	9+140	430	Widening and Strengthening	Earthwork in Excavation
46	9+170	9+200	30	9+140	9+175	35	Realignment	Earthwork in Excavation

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
47	9+200	9+394	194	9+175	9+350	175	Widening and Strengthening	Earthwork in Excavation
48	9+394	9+725	331	9+350	9+730	380	Realignment	Earthwork in Excavation
49	9+725	9+960	235	9+730	9+960	230	Widening and Strengthening	Earthwork in Excavation
50	9+960	10+040	80	9+960	10+030	70	Realignment	Earthwork in Excavation
51	10+040	10+180	140	10+030	10+170	140	Widening and Strengthening	Earthwork in Excavation
52	10+180	10+470	290	10+170	10+470	300	Realignment	Earthwork in Excavation
53	10+470	10+875	405	10+470	10+850	380	Widening and Strengthening	Earthwork in Excavation
54	10+875	11+030	155	10+850	10+990	140	Realignment	Earthwork in Excavation
55	11+030	11+146	116	10+990	11+100	110	Widening and Strengthening	Earthwork in Excavation
56	11+146	11+230	84	11+100	11+175	75	Realignment	Earthwork in Excavation
57	11+230	11+270	40	11+175	11+220	45	Realignment	No Work Done
58	11+270	11+305	35	11+220	11+250	30	Realignment	Earthwork in Excavation
59	11+305	11+355	50	11+250	11+300	50	Widening and Strengthening	Earthwork in Excavation
60	11+355	11+450	95	11+300	11+400	100	Realignment	Earthwork in Excavation
61	11+450	11+712	262	11+400	11+655	255	Widening and Strengthening	Earthwork in Excavation
62	11+712	11+790	78	11+655	11+750	95	Realignment	Earthwork in Excavation
63	11+790	11+800	10	11+750	11+765	15	Realignment	No Work Done
64	11+800	11+830	30	11+765	11+800	35	Widening and Strengthening	No Work Done
65	11+830	12+040	210	11+800	11+990	190	Widening and Strengthening	Earthwork in Excavation
66	12+040	12+270	230	11+990	12+220	230	Widening and Strengthening	No Work Done
67	12+270	12+300	30	12+220	12+250	30	Widening and	Earthwork in Excavation

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
							Strengthening	
68	12+300	12+400	100	12+250	12+345	95	Realignment	Earthwork in Excavation
69	12+400	13+090	690	12+345	13+000	655	Widening and Strengthening	Earthwork in Excavation
70	13+090	13+180	90	13+000	13+090	90	Realignment	Earthwork in Excavation
71	13+180	13+838	658	13+090	13+755	665	Widening and Strengthening	Earthwork in Excavation
72	13+838	13+890	52	13+755	13+800	45	Realignment	Earthwork in Excavation
73	13+890	13+980	90	13+800	13+890	90	Widening and Strengthening	Earthwork in Excavation
74	13+980	14+310	330	13+890	14+170	280	Realignment	Earthwork in Excavation
75	14+310	14+480	170	14+170	14+340	170	Widening and Strengthening	Earthwork in Excavation
76	14+480	14+540	60	14+340	14+405	65	Realignment	Earthwork in Excavation
77	14+540	14+860	320	14+405	14+730	325	Widening and Strengthening	Earthwork in Excavation
78	14+860	14+930	70	14+730	14+790	60	Realignment	Earthwork in Excavation
79	14+930	14+990	60	14+790	14+840	50	Widening and Strengthening	Earthwork in Excavation
80	14+990	15+010	20	14+840	14+865	25	Realignment	Earthwork in Excavation
81	15+010	15+100	90	14+865	14+940	75	Realignment	No Work Done
82	15+100	15+200	100	14+940	15+040	100	Widening and Strengthening	No Work Done
83	15+200	15+352	152	15+040	15+215	175	Realignment	No Work Done
84	15+352	15+670	318	15+215	15+515	300	Widening and Strengthening	No Work Done
85	15+670	15+720	50	15+515	15+560	45	Realignment	No Work Done
86	15+720	17+552	1832	15+560	17+460	1900	Widening and Strengthening	No Work Done
87	17+552	17+672	120	17+460	17+550	90	Realignment	No Work Done

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
88	17+672	18+000	328	17+550	17+875	325	Widening and Strengthening	No Work Done
89	18+000	18+010	10	17+875	17+880	5	Widening and Strengthening	Earthwork in Excavation
90	18+010	18+050	40	17+880	17+910	30	Realignment	Earthwork in Excavation
91	18+050	18+445	395	17+910	18+285	375	Widening and Strengthening	Earthwork in Excavation
92	18+445	18+740	295	18+285	18+450	165	Realignment	Earthwork in Excavation
93	18+740	18+770	30	18+450	18+480	30	Widening and Strengthening	Earthwork in Excavation
94	18+770	19+160	390	18+480	18+750	270	Realignment	Earthwork in Excavation
95	19+160	19+265	105	18+750	18+850	100	Widening and Strengthening	Earthwork in Excavation
96	19+265	19+430	165	18+850	19+000	150	Realignment	Earthwork in Excavation
97	19+430	20+175	745	19+000	19+740	740	Widening and Strengthening	Earthwork in Excavation
98	20+175	20+250	75	19+740	19+805	65	Realignment	Earthwork in Excavation
99	20+250	20+290	40	19+805	19+850	45	Widening and Strengthening	Earthwork in Excavation
100	20+290	20+485	195	19+850	20+035	185	Realignment	Earthwork in Excavation
101	20+485	20+660	175	20+035	20+200	165	Widening and Strengthening	Earthwork in Excavation
102	20+660	20+725	65	20+200	20+245	45	Realignment	Earthwork in Excavation
103	20+725	20+825	100	20+245	20+350	105	Widening and Strengthening	Earthwork in Excavation
104	20+825	20+880	55	20+350	20+395	45	Realignment	Earthwork in Excavation
105	20+880	21+240	360	20+395	20+715	320	Widening and Strengthening	Earthwork in Excavation
106	21+240	21+360	120	20+715	20+800	85	Realignment	Earthwork in Excavation
107	21+360	21+500	140	20+800	20+940	140	Widening and Strengthening	Earthwork in Excavation

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
108	21+500	21+600	100	20+940	21+030	90	Realignment	Earthwork in Excavation
109	21+600	21+920	320	21+030	21+350	320	Widening and Strengthening	Earthwork in Excavation
110	21+920	22+050	130	21+350	21+450	100	Realignment	Earthwork in Excavation
111	22+050	22+350	300	21+450	21+740	290	Widening and Strengthening	Earthwork in Excavation
112	22+350	22+390	40	21+740	21+770	30	Realignment	Earthwork in Excavation
113	22+390	22+590	200	21+770	21+990	220	Widening and Strengthening	Earthwork in Excavation
114	22+590	22+740	150	21+990	22+130	140	Realignment	Earthwork in Excavation
115	22+740	23+910	1170	22+130	23+335	1205	Widening and Strengthening	Earthwork in Excavation
116	23+910	23+980	70	23+335	23+400	65	Realignment	Earthwork in Excavation
117	23+980	24+440	460	23+400	23+840	440	Widening and Strengthening	Earthwork in Excavation
118	24+440	24+470	30	23+840	23+865	25	Realignment	Earthwork in Excavation
119	24+470	24+640	170	23+865	24+035	170	Widening and Strengthening	Earthwork in Excavation
120	24+640	24+680	40	24+035	24+065	30	Realignment	Earthwork in Excavation
121	24+680	24+900	220	24+065	24+260	195	Widening and Strengthening	Earthwork in Excavation
122	24+900	25+020	120	24+260	24+355	95	Realignment	Earthwork in Excavation
123	25+020	25+400	380	24+355	24+725	370	Widening and Strengthening	Earthwork in Excavation
124	25+400	25+700	300	24+725	25+000	275	Realignment	Earthwork in Excavation
125	25+700	26+140	440	25+000	25+440	440	Widening and Strengthening	Earthwork in Excavation
126	26+140	26+170	30	25+440	25+465	25	Realignment	Earthwork in Excavation
127	26+170	26+270	100	25+465	25+560	95	Widening and Strengthening	Earthwork in Excavation
128	26+270	26+340	70	25+560	25+620	60	Realignment	Earthwork in Excavation

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SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
129	26+340	26+565	225	25+620	25+850	230	Widening and Strengthening	Earthwork in Excavation
130	26+565	26+800	235	25+850	26+100	250	Realignment	Earthwork in Excavation
131	26+800	26+940	140	26+100	26+235	135	Widening and Strengthening	Earthwork in Excavation
132	26+940	27+020	80	26+235	26+325	90	Realignment	Earthwork in Excavation
133	27+020	27+230	210	26+325	26+460	135	Realignment	No Work Done
134	27+230	27+475	245	26+460	26+700	240	Widening and Strengthening	No Work Done
135	27+475	27+510	35	26+700	26+730	30	Realignment	No Work Done
136	27+510	27+690	180	26+730	26+905	175	Widening and Strengthening	No Work Done
137	27+690	27+750	60	26+905	26+955	50	Realignment	No Work Done
138	27+750	28+410	660	26+955	27+600	645	Widening and Strengthening	No Work Done
139	28+410	28+520	110	27+600	27+750	150	Realignment	No Work Done
140	28+520	28+625	105	27+750	27+850	100	Widening and Strengthening	No Work Done
141	28+625	28+680	55	27+850	27+900	50	Realignment	No Work Done
142	28+680	29+000	320	27+900	28+225	325	Widening and Strengthening	No Work Done
143	29+000	29+150	150	28+225	28+360	135	Widening and Strengthening	Earthwork in Excavation
144	29+150	29+210	60	28+360	28+410	50	Realignment	Earthwork in Excavation
145	29+210	29+290	80	28+410	28+490	80	Widening and Strengthening	Earthwork in Excavation
146	29+290	29+515	225	28+490	28+700	210	Realignment	Earthwork in Excavation
147	29+515	30+390	875	28+700	29+490	790	Widening and Strengthening	Earthwork in Excavation
148	30+390	30+450	60	29+490	29+540	50	Realignment	Earthwork in Excavation
149	30+450	30+661	211	29+540	29+750	210	Widening and	Earthwork in Excavation

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SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
							Strengthening	
150	30+661	30+930	269	29+750	30+110	360	Realignment	Earthwork in Excavation
151	30+930	31+020	90	30+110	30+190	80	Widening and Strengthening	Earthwork in Excavation
152	31+020	31+040	20	30+190	30+205	15	Widening and Strengthening	No Work Done
153	31+040	31+320	280	30+205	30+470	265	Realignment	No Work Done
154	31+320	32+160	840	30+470	31+300	830	Widening and Strengthening	No Work Done
155	32+160	32+500	340	31+300	31+620	320	Realignment	No Work Done
156	32+500	32+840	340	31+620	31+960	340	Widening and Strengthening	No Work Done
157	32+840	32+980	140	31+960	32+100	140	Realignment	No Work Done
158	32+980	33+120	140	32+100	32+240	140	Widening and Strengthening	No Work Done
159	33+120	33+195	75	32+240	32+310	70	Realignment	No Work Done
160	33+195	33+285	90	32+310	32+400	90	Widening and Strengthening	No Work Done
161	33+285	33+330	45	32+400	32+440	40	Realignment	No Work Done
162	33+330	33+450	120	32+440	32+545	105	Widening and Strengthening	No Work Done
163	33+450	33+615	165	32+545	32+665	120	Realignment	No Work Done
164	33+615	33+690	75	32+665	32+740	75	Widening and Strengthening	No Work Done
165	33+690	33+750	60	32+740	32+790	50	Realignment	No Work Done
166	33+750	33+880	130	32+790	32+900	110	Widening and Strengthening	No Work Done
167	33+880	33+950	70	32+900	32+960	60	Realignment	No Work Done
168	33+950	34+360	410	32+960	33+360	400	Widening and Strengthening	No Work Done
169	34+360	34+500	140	33+360	33+500	140	Realignment	No Work Done

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
170	34+500	35+535	1035	33+500	34+450	950	Widening and Strengthening	No Work Done
171	35+535	35+755	220	34+450	34+640	190	Realignment	No Work Done
172	35+755	35+795	40	34+640	34+670	30	Widening and Strengthening	No Work Done
173	35+795	35+845	50	34+670	34+715	45	Realignment	No Work Done
174	35+845	35+940	95	34+715	34+810	95	Widening and Strengthening	No Work Done
175	35+940	35+995	55	34+810	34+855	45	Realignment	No Work Done
176	35+995	36+360	365	34+855	35+235	380	Widening and Strengthening	No Work Done
177	36+360	36+390	30	35+235	35+260	25	Realignment	No Work Done
178	36+390	36+530	140	35+260	35+400	140	Widening and Strengthening	No Work Done
179	36+530	36+590	60	35+400	35+450	50	Realignment	No Work Done
180	36+590	36+620	30	35+450	35+480	30	Widening and Strengthening	No Work Done
181	36+620	36+645	25	35+480	35+505	25	Realignment	No Work Done
182	36+645	36+725	80	35+505	35+590	85	Widening and Strengthening	No Work Done
183	36+725	36+835	110	35+590	35+690	100	Realignment	No Work Done
184	36+835	37+035	200	35+690	35+890	200	Widening and Strengthening	No Work Done
185	37+035	37+185	150	35+890	36+030	140	Realignment	No Work Done
186	37+185	37+305	120	36+030	36+155	125	Widening and Strengthening	No Work Done
187	37+305	37+445	140	36+155	36+280	125	Realignment	No Work Done
188	37+445	37+485	40	36+280	36+320	40	Widening and Strengthening	No Work Done
189	37+485	37+570	85	36+320	36+400	80	Realignment	No Work Done
190	37+570	37+620	50	36+400	36+450	50	Widening and	No Work Done

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
							Strengthening	
191	37+620	37+675	55	36+450	36+490	40	Realignment	No Work Done
192	37+675	37+780	105	36+490	36+595	105	Widening and Strengthening	No Work Done
193	37+780	37+870	90	36+595	36+670	75	Realignment	No Work Done
194	37+870	38+250	380	36+670	37+060	390	Widening and Strengthening	No Work Done
195	38+250	38+300	50	37+060	37+100	40	Realignment	No Work Done
196	38+300	39+430	1130	37+100	38+215	1115	Widening and Strengthening	No Work Done
197	39+430	39+500	70	38+215	38+275	60	Realignment	No Work Done
198	39+500	39+540	40	38+275	38+315	40	Widening and Strengthening	No Work Done
199	39+540	39+630	90	38+315	38+400	85	Realignment	No Work Done
200	39+630	39+770	140	38+400	38+560	160	Widening and Strengthening	No Work Done
201	39+770	40+055	285	38+560	38+850	290	Realignment	No Work Done
202	40+055	40+200	145	38+850	38+990	140	Widening and Strengthening	No Work Done
203	40+200	42+322	2122	38+990	40+910	1920	Realignment	No Work Done
204	42+322	42+385	63	40+910	40+975	65	Widening and Strengthening	No Work Done
205	42+385	42+635	250	40+975	41+160	185	Realignment	No Work Done
206	42+635	42+760	125	41+160	41+280	120	Widening and Strengthening	No Work Done
207	42+760	45+620	2860	41+280	45+050	3770	Realignment	No Work Done
208	45+620	45+645	25	45+050	45+070	20	Widening and Strengthening	No Work Done
209	45+645	46+185	540	45+070	45+540	470	Realignment	No Work Done
210	46+185	46+700	515	45+540	46+040	500	Widening and Strengthening	No Work Done

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
211	46+700	46+750	50	46+040	46+080	40	Realignment	No Work Done
212	46+750	47+000	250	46+080	46+320	240	Widening and Strengthening	No Work Done
213	47+000	47+490	490	46+320	46+805	485	Widening and Strengthening	Earthwork in Excavation
214	47+490	47+540	50	46+805	46+850	45	Realignment	Earthwork in Excavation
215	47+540	48+600	1060	46+850	47+845	995	Widening and Strengthening	Earthwork in Excavation
216	48+600	48+710	110	47+845	47+950	105	Realignment	Earthwork in Excavation
217	48+710	48+920	210	47+950	48+150	200	Widening and Strengthening	Earthwork in Excavation
218	48+920	48+980	60	48+150	48+200	50	Realignment	Earthwork in Excavation
219	48+980	49+860	880	48+200	49+040	840	Widening and Strengthening	Earthwork in Excavation
220	49+860	49+900	40	49+040	49+065	25	Realignment	Earthwork in Excavation
221	49+900	50+830	930	49+065	49+960	895	Widening and Strengthening	Earthwork in Excavation
222	50+830	50+890	60	49+960	50+010	50	Realignment	Earthwork in Excavation
223	50+890	51+220	330	50+010	50+350	340	Widening and Strengthening	Earthwork in Excavation
224	51+220	51+300	80	50+350	50+410	60	Realignment	Earthwork in Excavation
225	51+300	51+500	200	50+410	50+600	190	Widening and Strengthening	Earthwork in Excavation
226	51+500	51+570	70	50+600	50+655	55	Realignment	Earthwork in Excavation
227	51+570	51+750	180	50+655	50+840	185	Widening and Strengthening	Earthwork in Excavation
228	51+750	51+830	80	50+840	50+900	60	Realignment	Earthwork in Excavation
229	51+830	52+390	560	50+900	51+405	505	Widening and Strengthening	Earthwork in Excavation
230	52+390	52+690	300	51+405	51+710	305	Realignment	Earthwork in Excavation
231	52+690	53+420	730	51+710	52+440	730	Widening and	Earthwork in Excavation

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
							Strengthening	
232	53+420	53+450	30	52+440	52+460	20	Realignment	Earthwork in Excavation
233	53+450	53+780	330	52+460	52+800	340	Widening and Strengthening	Earthwork in Excavation
234	53+780	53+900	120	52+800	52+900	100	Realignment	Earthwork in Excavation
235	53+900	54+050	150	52+900	53+050	150	Widening and Strengthening	Earthwork in Excavation
236	54+050	54+110	60	53+050	53+105	55	Realignment	Earthwork in Excavation
237	54+110	54+260	150	53+105	53+245	140	Widening and Strengthening	Earthwork in Excavation
238	54+260	54+370	110	53+245	53+345	100	Realignment	Earthwork in Excavation
239	54+370	54+400	30	53+345	53+370	25	Widening and Strengthening	Earthwork in Excavation
240	54+400	54+660	260	53+370	53+600	230	Realignment	Earthwork in Excavation
241	54+660	54+860	200	53+600	53+805	205	Widening and Strengthening	Earthwork in Excavation
242	54+860	54+920	60	53+805	53+850	45	Realignment	Earthwork in Excavation
243	54+920	55+370	450	53+850	54+300	450	Widening and Strengthening	Earthwork in Excavation
244	55+370	55+500	130	54+300	54+430	130	Realignment	Earthwork in Excavation
245	55+500	55+780	280	54+430	54+665	235	Widening and Strengthening	Earthwork in Excavation
246	55+780	55+830	50	54+665	54+705	40	Realignment	Earthwork in Excavation
247	55+830	56+380	550	54+705	55+280	575	Widening and Strengthening	Earthwork in Excavation
248	56+380	56+450	70	55+280	55+335	55	Realignment	Earthwork in Excavation
249	56+450	56+800	350	55+335	55+770	435	Widening and Strengthening	Earthwork in Excavation
250	56+800	56+840	40	55+770	55+800	30	Realignment	Earthwork in Excavation
251	56+840	58+030	1190	55+800	56+740	940	Widening and Strengthening	Earthwork in Excavation

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
252	58+030	58+065	35	56+740	56+770	30	Realignment	Earthwork in Excavation
253	58+065	58+220	155	56+770	56+940	170	Widening and Strengthening	Earthwork in Excavation
254	58+220	58+350	130	56+940	57+060	120	Realignment	Earthwork in Excavation
255	58+350	58+450	100	57+060	57+150	90	Widening and Strengthening	Earthwork in Excavation
256	58+450	58+525	75	57+150	57+210	60	Realignment	Earthwork in Excavation
257	58+525	58+720	195	57+210	57+395	185	Widening and Strengthening	Earthwork in Excavation
258	58+720	58+780	60	57+395	57+445	50	Realignment	Earthwork in Excavation
259	58+780	59+490	710	57+445	58+160	715	Widening and Strengthening	Earthwork in Excavation
260	59+490	59+570	80	58+160	58+235	75	Realignment	Earthwork in Excavation
261	59+570	59+640	70	58+235	58+300	65	Widening and Strengthening	Earthwork in Excavation
262	59+640	59+700	60	58+300	58+345	45	Realignment	Earthwork in Excavation
263	59+700	60+490	790	58+345	59+150	805	Widening and Strengthening	Earthwork in Excavation
264	60+490	73+400	12910	59+150	63+790	4640	Bypass	No Work Done
265	73+400	73+960	560	63+790	64+330	540	Widening and Strengthening	Earthwork in Excavation
266	73+960	73+995	35	64+330	64+360	30	Realignment	Earthwork in Excavation
267	73+995	74+090	95	64+360	64+450	90	Widening and Strengthening	Earthwork in Excavation
268	74+090	74+160	70	64+450	64+510	60	Realignment	Earthwork in Excavation
269	74+160	74+330	170	64+510	64+660	150	Widening and Strengthening	Earthwork in Excavation
270	74+330	74+430	100	64+660	64+750	90	Realignment	Earthwork in Excavation
271	74+430	74+920	490	64+750	65+245	495	Widening and Strengthening	Earthwork in Excavation
272	74+920	74+960	40	65+245	65+275	30	Realignment	Earthwork in Excavation

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
273	74+960	75+280	320	65+275	65+600	325	Widening and Strengthening	Earthwork in Excavation
274	75+280	75+410	130	65+600	65+710	110	Realignment	Earthwork in Excavation
275	75+410	76+480	1070	65+710	66+750	1040	Widening and Strengthening	Earthwork in Excavation
276	76+480	76+710	230	66+750	66+930	180	Realignment	Earthwork in Excavation
277	76+710	76+830	120	66+930	67+050	120	Widening and Strengthening	Earthwork in Excavation
278	76+830	77+000	170	67+050	67+200	150	Realignment	Earthwork in Excavation
279	77+000	77+200	200	67+200	67+390	190	Widening and Strengthening	No Work Done
280	77+200	77+265	65	67+390	67+445	55	Realignment	No Work Done
281	77+265	77+420	155	67+445	67+605	160	Widening and Strengthening	No Work Done
282	77+420	77+500	80	67+605	67+675	70	Realignment	No Work Done
283	77+500	77+520	20	67+675	67+700	25	Realignment	Earthwork in Excavation
284	77+520	77+620	100	67+700	67+810	110	Widening and Strengthening	Earthwork in Excavation
285	77+620	77+820	200	67+810	67+960	150	Realignment	Earthwork in Excavation
286	77+820	77+890	70	67+960	68+030	70	Widening and Strengthening	No Work Done
287	77+890	77+920	30	68+030	68+060	30	Realignment	No Work Done
288	77+920	78+000	80	68+060	68+175	115	Widening and Strengthening	No Work Done
289	78+000	78+270	270	68+175	68+405	230	Widening and Strengthening	Earthwork in Excavation
290	78+270	78+320	50	68+405	68+450	45	Realignment	Earthwork in Excavation
291	78+320	78+360	40	68+450	68+495	45	Widening and Strengthening	Earthwork in Excavation
292	78+360	78+470	110	68+495	68+595	100	Realignment	Earthwork in Excavation
293	78+470	79+000	530	68+595	69+130	535	Widening and	Earthwork in Excavation

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
							Strengthening	
294	79+000	79+130	130	69+130	69+245	115	Realignment	Earthwork in Excavation
295	79+130	79+220	90	69+245	69+330	85	Widening and Strengthening	Earthwork in Excavation
296	79+220	79+270	50	69+330	69+375	45	Realignment	Earthwork in Excavation
297	79+270	79+440	170	69+375	69+550	175	Widening and Strengthening	Earthwork in Excavation
298	79+440	79+570	130	69+550	69+650	100	Realignment	Earthwork in Excavation
299	79+570	79+670	100	69+650	69+740	90	Widening and Strengthening	Earthwork in Excavation
300	79+670	79+860	190	69+740	69+910	170	Realignment	Earthwork in Excavation
301	79+860	80+020	160	69+910	70+080	170	Widening and Strengthening	Earthwork in Excavation
302	80+020	80+080	60	70+080	70+135	55	Widening and Strengthening	No Work Done
303	80+080	80+160	80	70+135	70+190	55	Realignment	No Work Done
304	80+160	80+220	60	70+190	70+250	60	Widening and Strengthening	No Work Done
305	80+220	80+370	150	70+250	70+310	60	Realignment	No Work Done
306	80+370	80+530	160	70+310	70+475	165	Widening and Strengthening	No Work Done
307	80+530	80+590	60	70+475	70+515	40	Realignment	No Work Done
308	80+590	80+860	270	70+515	70+790	275	Widening and Strengthening	No Work Done
309	80+860	81+220	360	70+790	71+060	270	Realignment	No Work Done
310	81+220	81+470	250	71+060	71+300	240	Widening and Strengthening	No Work Done
311	81+470	81+585	115	71+300	71+400	100	Realignment	No Work Done
312	81+585	81+620	35	71+400	71+440	40	Widening and Strengthening	No Work Done
313	81+620	81+690	70	71+440	71+500	60	Realignment	No Work Done

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
314	81+690	82+000	310	71+500	71+815	315	Widening and Strengthening	No Work Done
315	82+000	82+125	125	71+815	71+950	135	Widening and Strengthening	Earthwork in Excavation
316	82+125	82+320	195	71+950	72+100	150	Realignment	Earthwork in Excavation
317	82+320	83+040	720	72+100	72+800	700	Widening and Strengthening	Earthwork in Excavation
318	83+040	83+120	80	72+800	72+865	65	Realignment	Earthwork in Excavation
319	83+120	83+220	100	72+865	72+965	100	Widening and Strengthening	Earthwork in Excavation
320	83+220	83+270	50	72+965	73+005	40	Realignment	Earthwork in Excavation
321	83+270	83+520	250	73+005	73+250	245	Widening and Strengthening	Earthwork in Excavation
322	83+520	83+540	20	73+250	73+255	5	Widening and Strengthening	No Work Done
323	83+540	83+600	60	73+255	73+305	50	Realignment	No Work Done
324	83+600	83+940	340	73+305	73+650	345	Widening and Strengthening	No Work Done
325	83+940	84+090	150	73+650	73+760	110	Realignment	No Work Done
326	84+090	84+180	90	73+760	73+850	90	Widening and Strengthening	No Work Done
327	84+180	84+240	60	73+850	73+905	55	Realignment	No Work Done
328	84+240	84+600	360	73+905	74+255	350	Widening and Strengthening	No Work Done
329	84+600	84+660	60	74+255	74+295	40	Realignment	No Work Done
330	84+660	85+060	400	74+295	74+735	440	Widening and Strengthening	No Work Done
331	85+060	85+310	250	74+735	74+920	185	Realignment	No Work Done
332	85+310	85+360	50	74+920	74+970	50	Widening and Strengthening	No Work Done
333	85+360	85+770	410	74+970	75+260	290	Realignment	No Work Done

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
334	85+770	85+900	130	75+260	75+390	130	Widening and Strengthening	No Work Done
335	85+900	86+160	260	75+390	75+555	165	Realignment	No Work Done
336	86+160	86+200	40	75+555	75+600	45	Widening and Strengthening	No Work Done
337	86+200	86+360	160	75+600	75+690	90	Realignment	No Work Done
338	86+360	86+475	115	75+690	75+800	110	Widening and Strengthening	No Work Done
339	86+475	86+570	95	75+800	75+870	70	Realignment	No Work Done
340	86+570	86+750	180	75+870	76+050	180	Widening and Strengthening	No Work Done
341	86+750	86+820	70	76+050	76+110	60	Realignment	No Work Done
342	86+820	87+130	310	76+110	76+400	290	Widening and Strengthening	No Work Done
343	87+130	87+180	50	76+400	76+445	45	Realignment	No Work Done
344	87+180	87+330	150	76+445	76+600	155	Widening and Strengthening	No Work Done
345	87+330	87+400	70	76+600	76+660	60	Realignment	No Work Done
346	87+400	87+940	540	76+660	77+190	530	Widening and Strengthening	No Work Done
347	87+940	88+000	60	77+190	77+240	50	Realignment	No Work Done
348	88+000	88+320	320	77+240	77+500	260	Realignment	Earthwork in Excavation
349	88+320	88+380	60	77+500	77+560	60	Widening and Strengthening	Earthwork in Excavation
350	88+380	88+550	170	77+560	77+700	140	Realignment	Earthwork in Excavation
351	88+550	88+700	150	77+700	77+850	150	Widening and Strengthening	Earthwork in Excavation
352	88+700	88+890	190	77+850	78+000	150	Realignment	Earthwork in Excavation
353	88+890	89+390	500	78+000	78+500	500	Widening and Strengthening	Earthwork in Excavation
354	89+390	89+440	50	78+500	78+540	40	Realignment	Earthwork in Excavation

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
355	89+440	89+470	30	78+540	78+565	25	Widening and Strengthening	Earthwork in Excavation
356	89+470	89+640	170	78+565	78+705	140	Realignment	Earthwork in Excavation
357	89+640	89+690	50	78+705	78+750	45	Widening and Strengthening	Earthwork in Excavation
358	89+690	89+750	60	78+750	78+790	40	Realignment	Earthwork in Excavation
359	89+750	89+870	120	78+790	78+945	155	Widening and Strengthening	Earthwork in Excavation
360	89+870	89+990	120	78+945	79+110	165	Realignment	Earthwork in Excavation
361	89+990	90+540	550	79+110	79+650	540	Widening and Strengthening	Earthwork in Excavation
362	90+540	90+600	60	79+650	79+700	50	Realignment	Earthwork in Excavation
363	90+600	90+650	50	79+700	79+750	50	Widening and Strengthening	Earthwork in Excavation
364	90+650	91+170	520	79+750	80+160	410	Realignment	Earthwork in Excavation
365	91+170	91+330	160	80+160	80+340	180	Widening and Strengthening	Earthwork in Excavation
366	91+330	91+420	90	80+340	80+420	80	Realignment	Earthwork in Excavation
367	91+420	91+600	180	80+420	80+600	180	Widening and Strengthening	Earthwork in Excavation
368	91+600	91+610	10	80+600	80+615	15	Realignment	Earthwork in Excavation
369	91+610	91+660	50	80+615	80+640	25	Realignment	No Work Done
370	91+660	91+760	100	80+640	80+750	110	Widening and Strengthening	No Work Done
371	91+760	91+820	60	80+750	80+800	50	Realignment	No Work Done
372	91+820	92+105	285	80+800	81+095	295	Widening and Strengthening	No Work Done
373	92+105	92+240	135	81+095	81+200	105	Realignment	No Work Done
374	92+240	92+290	50	81+200	81+250	50	Widening and Strengthening	No Work Done
375	92+290	92+350	60	81+250	81+305	55	Realignment	No Work Done

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

SL. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
376	92+350	92+580	230	81+305	81+540	235	Widening and Strengthening	No Work Done
377	92+580	92+770	190	81+540	81+760	220	Realignment	No Work Done
378	92+770	92+880	110	81+760	81+870	110	Widening and Strengthening	No Work Done
379	92+880	93+005	125	81+870	81+965	95	Realignment	No Work Done
380	93+005	93+480	475	81+965	82+440	475	Widening and Strengthening	No Work Done
381	93+480	93+520	40	82+440	82+465	25	Realignment	No Work Done
382	93+520	97+890	4370	82+465	86+835	4370	No Geometric Improvement	No Work Done

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

2. Chainage References (Existing Vs Design)

“Existing Chainage” means distance measured along existing roadway/vehicle pathway on the 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	20+456	20+000	
2	21+920	21+350	
3	22+050	21+450	
4	23+980	23+400	
5	24+440	23+840	
6	25+400	24+725	
7	26+565	25+850	
8	27+475	26+700	
9	28+520	27+750	
10	29+290	28+490	
11	30+930	30+110	
12	31+320	30+470	
13	32+160	31+300	
14	33+285	32+400	
15	34+500	33+500	
16	35+535	34+450	

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Remarks
17	36+390	35+260	
18	37+305	36+155	
19	38+300	37+100	
20	39+630	38+400	
21	39+770	38+560	
22	40+055	38+850	
23	41+065	40+000	

3. 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/ Available ROW (m)	Remarks
	From	To	From	To			
1	20+456	41+065	20+000	40+000	20000	3.0 to 3.5	No ROW available in realignment stretches of total 6.200 km. as given in para 2.3.1 of Annexure-1 Schedule-B.

4. Carriageway

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

5. 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						

6. Railway over-bridges (ROB)

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						

7. Grade Separators

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

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						

8. 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		
1	Merangkong - Mon	32.467	Open Foundation	Stone Masonry	Steel Truss	1 x 31.7	5.4
2	Merangkong - Mon	35.570	Not Visible	Stone Masonry	RCC Slab	1 x 6.1	6.9
3	Merangkong - Mon	39.912	Not Visible	Stone Masonry	Steel Truss	1 x 16.5	3.9

9. Railway level crossings / Railway Track

The Site includes the following railway level crossings:

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

10. 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

11. Culverts

The Site includes 56 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	21+105	Pipe	1 x 1.2	8.2	
2	21+240	Pipe	1 x 1.2	7.3	
3	21+927	Pipe	1 x 1.2	7.5	
4	22+175	Pipe	1 x 0.9	7.3	
5	22+355	Pipe	2 x 0.8	6.2	
6	22+440	Pipe	1 x 0.9	6.0	
7	22+623	Pipe	2 x 0.6	6.8	
8	23+535	Pipe	2 x 0.8	6.7	
9	24+184	Pipe	2 x 0.6	6.6	
10	24+697	Slab	1x3.0	7.1	
11	25+425	Pipe	1 x 0.9	6.8	
12	25+660	Pipe	1 x 0.9	7.5	
13	25+780	Not visible	Not visible	7.0	
14	26+025	Slab	1x3.0	8.2	
15	26+170	Pipe	1 x 0.9	7.0	
16	26+425	Pipe	1 x 0.9	6.4	
17	26+665	Pipe	1 x 0.9	6.5	
18	27+249	Pipe	1 x 0.8	4.9	
19	27+535	Pipe	1 x 0.8	6.8	
20	27+585	Pipe	2 x 0.9	7.4	
21	27+691	Slab	1x3.0	6.9	
22	28+045	Pipe	Not visible	7.0	
23	28+289	Pipe	Not visible	9.4	
24	28+530	Pipe	2 x 0.9	4.9	
25	28+700	Pipe	2 x 0.9	7.2	
26	29+723	Slab	1x3.3	6.8	
27	30+080	Pipe	1 x 0.9	7.8	
28	30+233	Pipe	1 x 1.2	9.0	
29	31+125	Pipe	1 x 0.9	7.3	
30	31+206	Pipe	1 x 1.0	12.7	
31	31+570	Slab	1x1.0	6.2	
32	32+606	Slab	1x0.9	6.2	
33	32+638	Slab	1x0.9	6.4	
34	32+850	Slab	1x3.0	7.3	
35	33+335	Pipe	1 x 0.9	7.8	
36	33+637	Slab	1x3.0	6.4	
37	34+400	Slab	1x4.5	7.2	
38	34+700	Pipe	2 x 0.9	6.7	
39	35+128	Pipe	1 x 0.9	7.0	
40	35+218	Pipe	1 x 0.9	6.6	
41	35+675	Slab	1x1.5	4.6	
42	36+675	Pipe	1 x 0.9	7.2	
43	36+825	Pipe	2 x 0.9	7.2	
44	37+090	Pipe	2 x 0.8	7.4	

Sl. No.	Existing Chainage (km)	Type of Structure	Span / Dia. (m)	Width of Structure (m)	Remarks
45	37+210	Pipe	1 x 0.9	6.6	
46	37+825	Pipe	2 x 0.9	7.5	
47	37+975	Pipe	2 x 0.9	7.2	
48	38+050	Pipe	1 x 0.9	7.2	
49	38+175	Pipe	2 x 0.8	7.3	
50	38+290	Pipe	2 x 0.9	7.0	
51	38+570	Pipe	2 x 0.9	7.4	
52	38+675	Pipe	2 x 0.8	7.3	
53	38+890	Pipe	2 x 0.9	6.4	
54	39+045	Pipe	1 x 0.9	6.7	
55	39+298	Pipe	1 x 0.9	7.0	
56	39+621	Pipe	1 x 0.9	7.0	

12. Bus Shelters

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

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

13. 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					

14. 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	20+600	22+100	Left		Earthen (Kutcha)
2	22+200	22+600	Left		Earthen (Kutcha)
3	22+700	23+000	Left		Earthen (Kutcha)
4	29+400	29+600	Left		Earthen (Kutcha)
5	31+700	31+900	Right		Earthen (Kutcha)
6	33+800	33+900	Left		Earthen (Kutcha)

15. 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
NIL								

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

16. 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
NIL				

17. 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							

18. Other Structures/Details

The details of other structures are as follows:

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

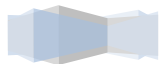


Annex-II
(Schedule-A)

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)	20+000	40+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)	20+000	40+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



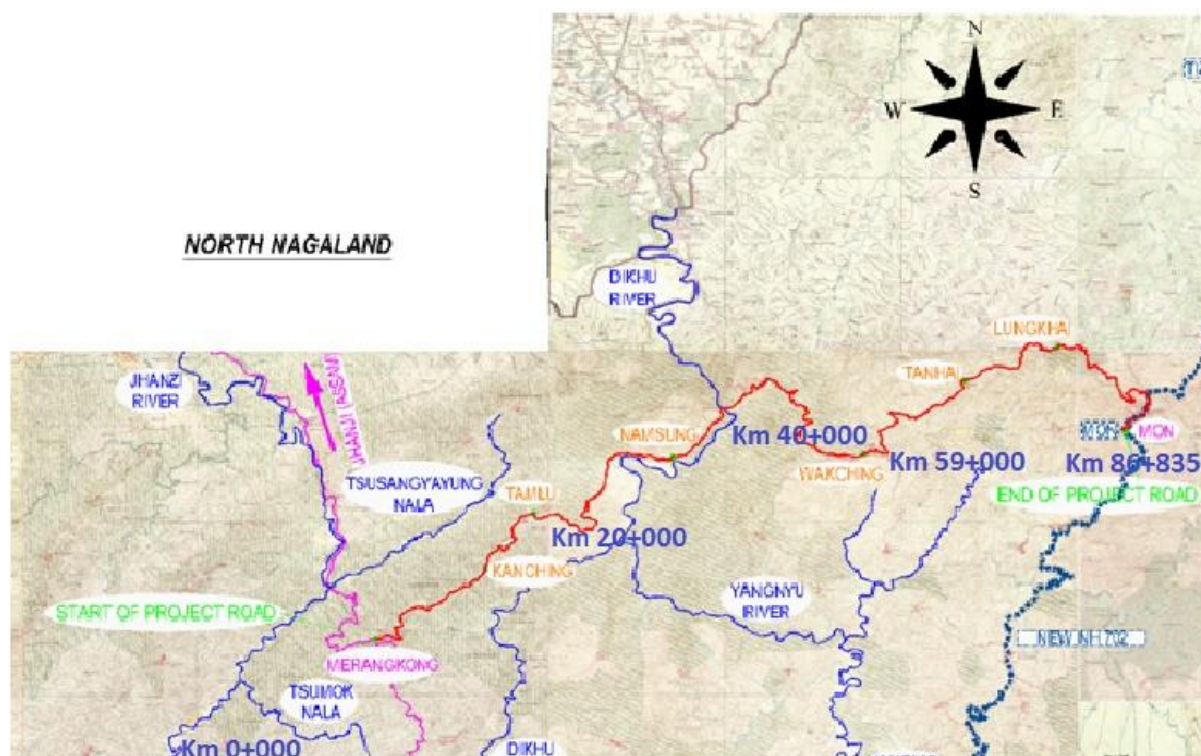
Annex-IV
(Schedule-A)

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



“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

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	Namsang	32+320	32+420	10	TCS IV and V

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	20194.28	20269.06	Left	Radius<40	
2	21182.46	21241.40	Left	Radius<40	
3	21338.07	21397.79	Right	Radius<40	
4	21397.79	21469.36	Left	Radius<40	
5	22030.25	22089.35	Right	Radius<40	
6	23012.81	23086.99	Left	Radius<40	
7	23530.96	23591.45	Right	Radius<40	
8	23787.46	23896.79	Left	Radius<40	
9	24017.90	24089.36	Right	Radius<40	
10	24368.75	24428.12	Left	Radius<40	
11	24972.54	25031.77	Right	Radius<40	
12	25238.27	25275.33	Right	Radius<40	
13	25381.73	25420.53	Right	Radius<40	
14	25691.35	25755.40	Left	Radius<40	

Sl. No.	Design Chainage(m)		Side	Type of Deficiency	Remarks
	From	To			
15	25798.48	25881.27	Right	Radius<40	
16	26085.32	26123.30	Right	Radius<40	
17	27274.04	27329.58	Right	Radius<40	
18	27607.86	27667.05	Left	Radius<40	
19	27708.72	27785.38	Left	Radius<40	
20	27785.38	27865.41	Right	Radius<40	
21	28529.32	28575.24	Right	Radius<40	
22	28665.86	28729.24	Right	Radius<40	
23	29421.93	29492.58	Left	Radius<40	
24	29492.58	29555.88	Right	Radius<40	
25	29882.24	29951.80	Right	Radius<40	
26	30032.32	30104.78	Left	Radius<40	
27	30433.65	30486.75	Right	Radius<40	
28	32410.62	32451.79	Right	Radius<40	
29	32656.36	32721.10	Right	Radius<40	
30	32721.10	32795.65	Left	Radius<40	
31	33131.68	33159.74	Left	Radius<40	
32	33244.37	33270.27	Left	Radius<40	
33	33321.07	33381.67	Right	Radius<40	
34	33503.90	33551.20	Left	Radius<40	
35	34613.74	34657.94	Left	Radius<40	
36	37636.98	37703.49	Right	Radius<40	
37	37798.35	37820.41	Left	Radius<40	
38	38640.72	38703.38	Right	Radius<40	

2.3.1 Improvement due to Realignments:

Sl. No.	Existing Chainage (km)		Length (m)	Design Chainage (km)		Length (m)
	From	To		From	To	
1	20+456	20+485	20	20+000	20+035	35
2	20+660	20+725	65	20+200	20+245	45
3	20+825	20+880	55	20+350	20+395	45
4	21+240	21+360	120	20+715	20+800	85
5	21+500	21+600	100	20+940	21+030	90
6	21+920	22+050	130	21+350	21+450	100
7	22+350	22+390	40	21+740	21+770	30
8	22+590	22+740	150	21+990	22+130	140
9	23+910	23+980	70	23+335	23+400	65
10	24+440	24+470	30	23+840	23+865	25
11	24+640	24+680	40	24+035	24+065	30

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

Sl. No.	Existing Chainage (km)		Length (m)	Design Chainage (km)		Length (m)
	From	To		From	To	
12	24+900	25+020	120	24+260	24+355	95
13	25+400	25+700	300	24+725	25+000	275
14	26+140	26+170	30	25+440	25+465	25
15	26+270	26+340	70	25+560	25+620	60
16	26+565	26+800	235	25+850	26+100	250
17	26+940	27+230	290	26+235	26+460	225
18	27+475	27+510	35	26+700	26+730	30
19	27+690	27+750	60	26+905	26+955	50
20	28+410	28+520	110	27+600	27+750	150
21	28+625	28+680	55	27+850	27+900	50
22	29+150	29+210	60	28+360	28+410	50
23	29+290	29+515	225	28+490	28+700	210
24	30+390	30+450	60	29+490	29+540	50
25	30+661	30+930	269	29+750	30+110	360
26	31+040	31+320	280	30+205	30+470	265
27	32+160	32+500	340	31+300	31+620	320
28	32+840	32+980	140	31+960	32+100	140
29	33+120	33+195	75	32+240	32+310	70
30	33+285	33+330	45	32+400	32+440	40
31	33+450	33+615	165	32+545	32+665	120
32	33+690	33+750	60	32+740	32+790	50
33	33+880	33+950	70	32+900	32+960	60
34	34+360	34+500	140	33+360	33+500	140
35	35+535	35+755	220	34+450	34+640	190
36	35+795	35+845	50	34+670	34+715	45
37	35+940	35+995	55	34+810	34+855	45
38	36+360	36+390	30	35+235	35+260	25
39	36+530	36+590	60	35+400	35+450	50
40	36+620	36+645	25	35+480	35+505	25
41	36+725	36+835	110	35+590	35+690	100
42	37+035	37+185	150	35+890	36+030	140
43	37+305	37+445	140	36+155	36+280	125
44	37+485	37+570	85	36+320	36+400	80
45	37+620	37+675	55	36+450	36+490	40
46	37+780	37+870	90	36+595	36+670	75
47	38+250	38+300	50	37+060	37+100	40
48	39+430	39+500	70	38+215	38+275	60
49	39+540	39+630	90	38+315	38+400	85
50	39+770	40+055	285	38+560	38+850	290
51	40+200	41+065	865	38+990	40+000	1010

Sl. No.	Existing Chainage (km)		Length (m)	Design Chainage (km)		Length (m)
	From	To		From	To	
				Total		6200

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 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

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”



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

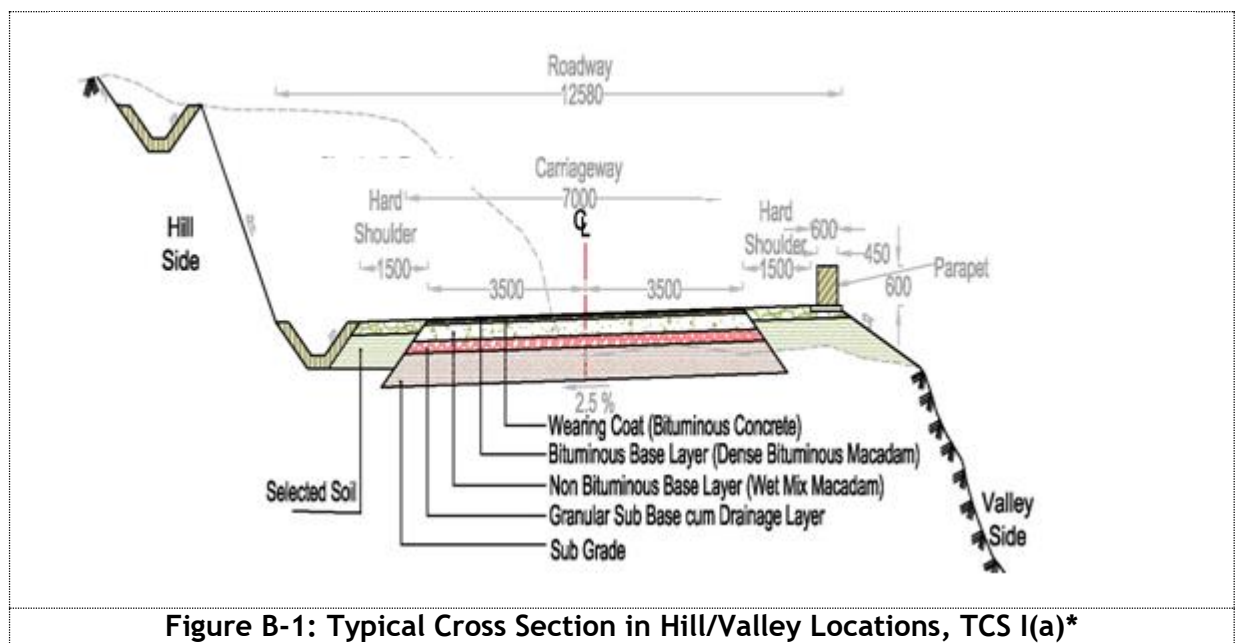
The cross section schedule shall be as follows:

Sl. No.	Chainage (Km)		Length (m)	Type	Remarks
	From	To			
1	20+000	20+215	215	I	
2	20+215	20+220	5	III	
3	20+220	24+780	4560	I	
4	24+780	24+785	5	III	
5	24+785	26+265	1480	I	
6	26+265	26+275	10	III	
7	26+275	27+645	1370	I	
8	27+645	27+725	80	III	
9	27+725	28+410	685	I	
10	28+410	28+470	60	III	
11	28+470	28+535	65	I	
12	28+535	28+545	10	III	
13	28+545	28+565	20	I	
14	28+565	28+630	65	III	
15	28+630	29+430	800	I	
16	29+430	29+550	120	II	
17	29+550	29+980	430	I	
18	29+980	30+110	130	III	
19	30+110	30+245	135	I	
20	30+245	30+260	15	III	
21	30+260	30+500	240	I	
22	30+500	31+990	1490	II	

Sl. No.	Chainage (Km)		Length (m)	Type	Remarks
	From	To			
23	31+990	32+630	640	I	
24	32+630	32+650	20	III	
25	32+650	33+505	855	I	
26	33+505	33+525	20	III	
27	33+525	36+375	2850	I	
28	36+375	36+445	70	III	
29	36+445	38+820	2375	I	
30	38+820	39+030	210	I	
31	39+030	39+060	30	III	
32	39+060	40+000	940	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.



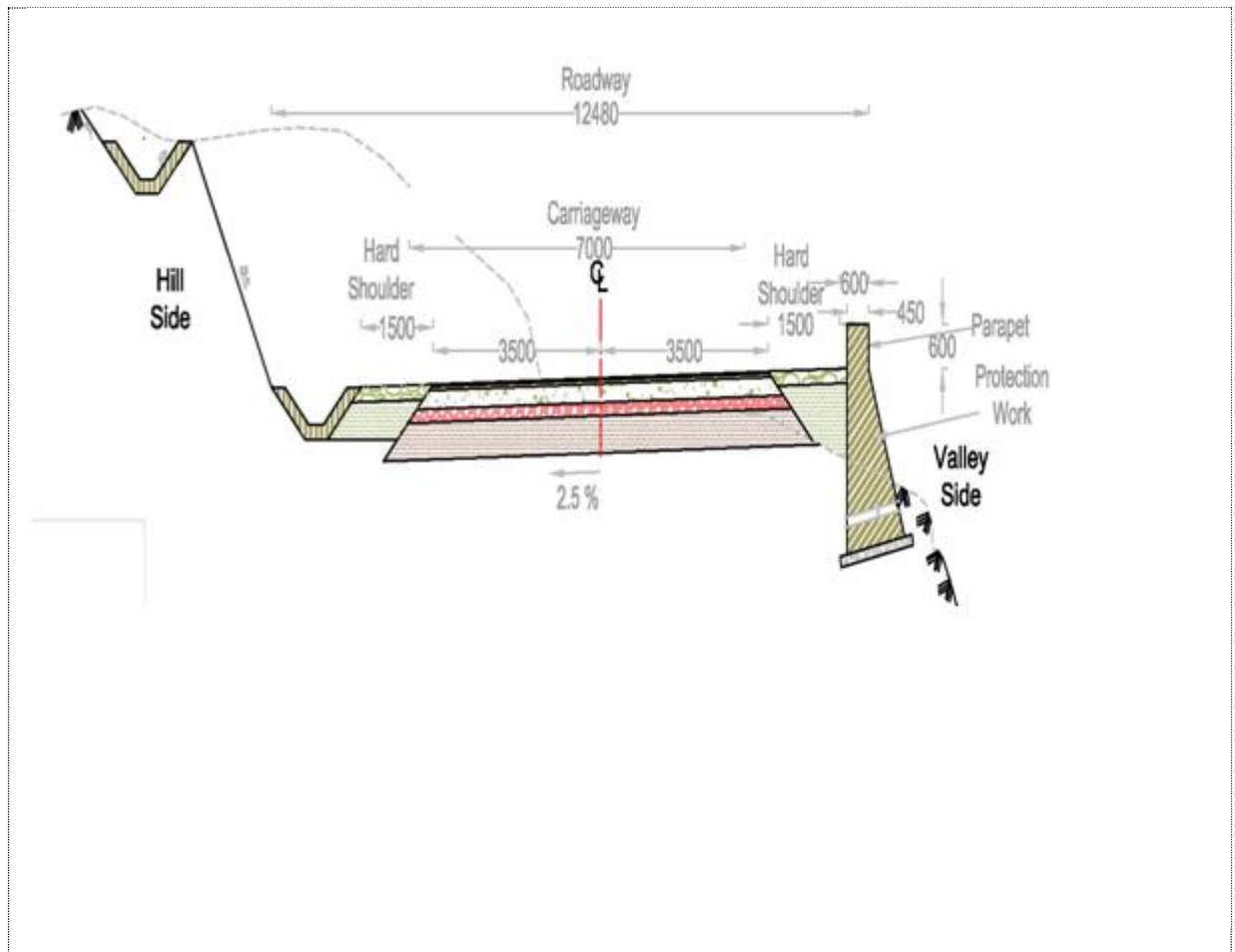


Figure B-2: TCS for Project Road Sections requiring Fill on Valley Side TCS I(b)*

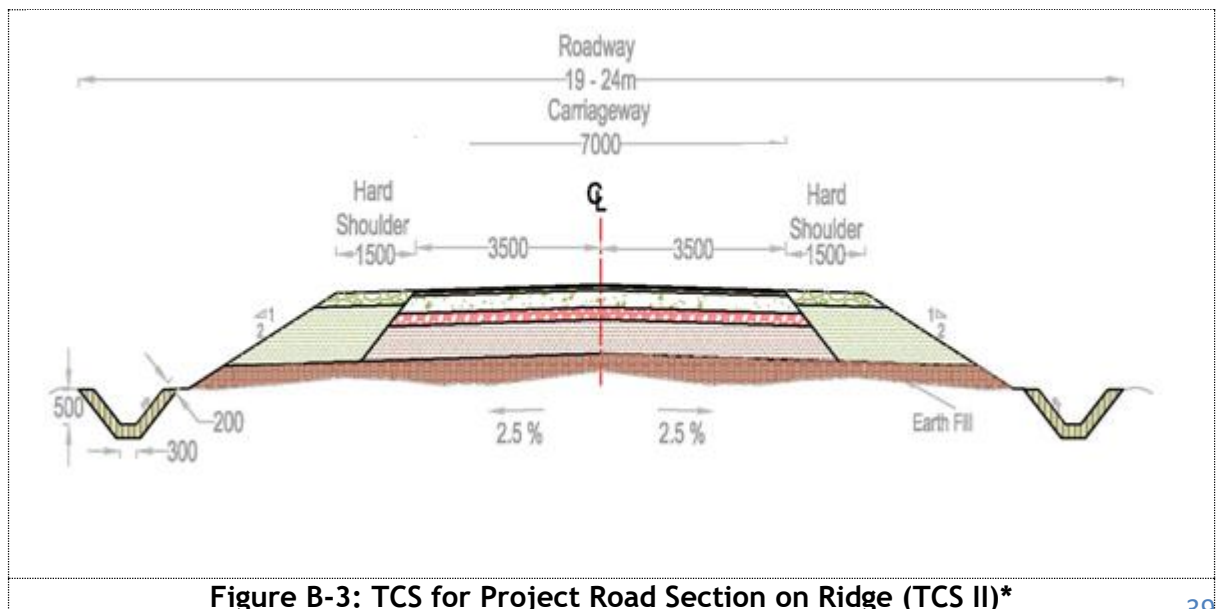
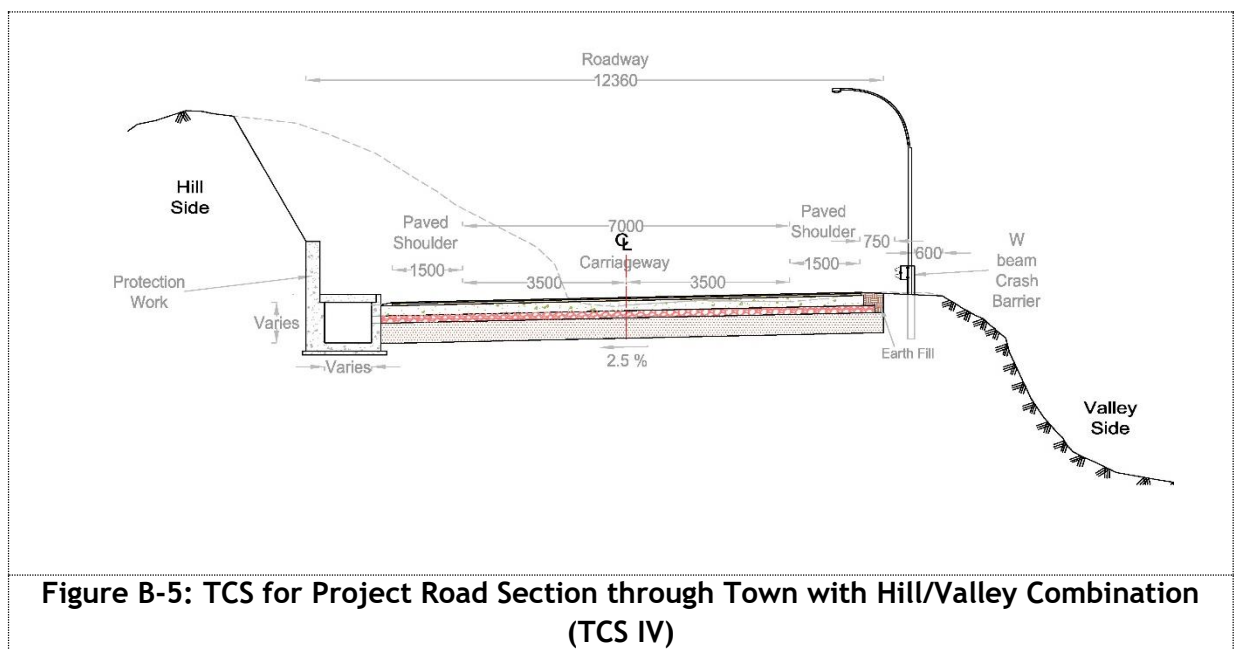
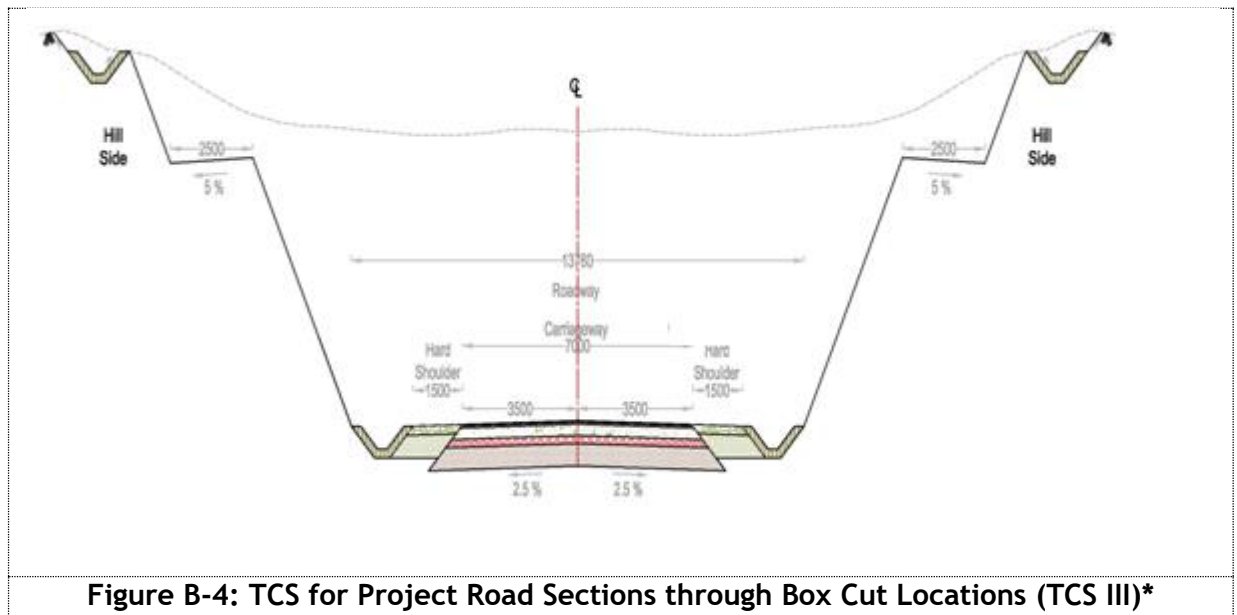
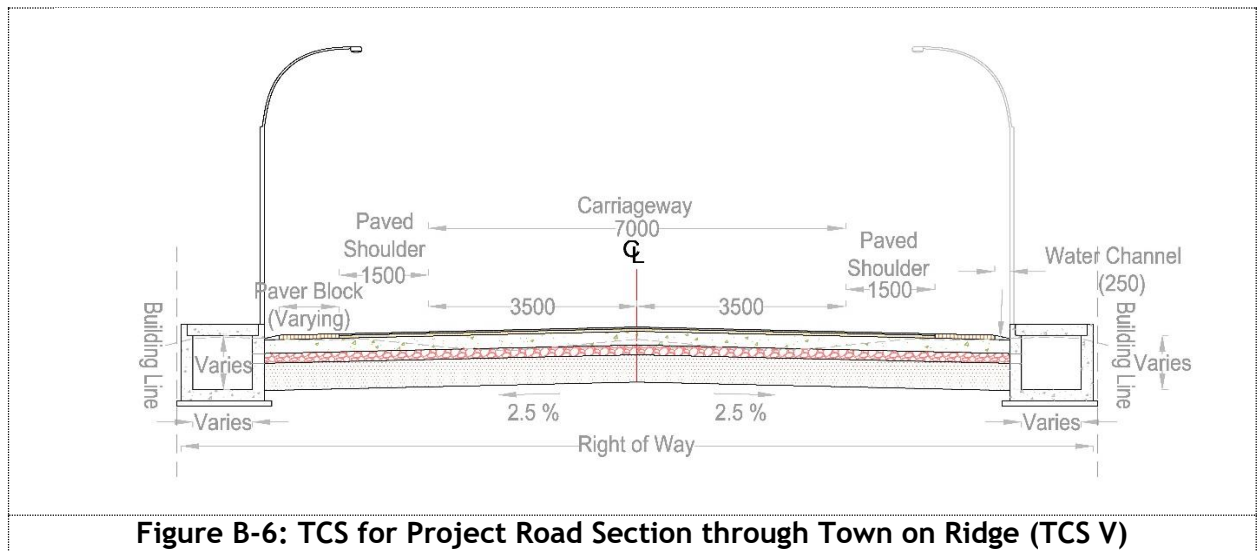


Figure B-3: TCS for Project Road Section on Ridge (TCS II)*





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
NIL					

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

(ii) Minor Intersections

Sl. No.	Location of Intersection (Design Chainage, km)	Type of Intersection	Side
NIL			

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				

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	20+456	41+065	Poor condition of existing pavement and or Realignment Section

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 Road Side Drains=19741 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.	Chainage (Km)		Length (m)	Remarks
	From	To		
1	20+000	20+215	215	V-shaped PCC Drain on Hill Side
2	20+215	20+220	5	V-shaped PCC Drain on Both Sides
3	20+220	24+780	4560	V-shaped PCC Drain on Hill Side
4	24+780	24+785	5	V-shaped PCC Drain on Both Sides
5	24+785	26+265	1480	V-shaped PCC Drain on Hill Side
6	26+265	26+275	10	V-shaped PCC Drain on Both Sides
7	26+275	27+645	1370	V-shaped PCC Drain on Hill Side
8	27+645	27+725	80	V-shaped PCC Drain on Both Sides
9	27+725	28+410	685	V-shaped PCC Drain on Hill Side
10	28+410	28+470	60	V-shaped PCC Drain on Both Sides

Sl. No.	Chainage (Km)		Length (m)	Remarks
	From	To		
11	28+470	28+535	65	V-shaped PCC Drain on Hill Side
12	28+535	28+545	10	V-shaped PCC Drain on Both Sides
13	28+545	28+565	20	V-shaped PCC Drain on Hill Side
14	28+565	28+630	65	V-shaped PCC Drain on Both Sides
15	28+630	29+430	800	V-shaped PCC Drain on Hill Side
16	29+430	29+550	120	V-shaped PCC Drain on Both Sides
17	29+550	29+980	430	V-shaped PCC Drain on Hill Side
18	29+980	30+110	130	V-shaped PCC Drain on Both Sides
19	30+110	30+245	135	V-shaped PCC Drain on Hill Side
20	30+245	30+260	15	V-shaped PCC Drain on Both Sides
21	30+260	30+500	240	V-shaped PCC Drain on Hill Side
22	30+500	31+990	1490	V-shaped PCC Drain on Both Sides
23	31+990	32+630	640	V-shaped PCC Drain on Hill Side
24	32+630	32+650	20	V-shaped PCC Drain on Both Sides
25	32+650	33+505	855	V-shaped PCC Drain on Hill Side
26	33+505	33+525	20	V-shaped PCC Drain on Both Sides
27	33+525	36+375	2850	V-shaped PCC Drain on Hill Side
28	36+375	36+445	70	V-shaped PCC Drain on Both Sides
29	36+445	38+820	2375	V-shaped PCC Drain on Hill Side
30	38+820	39+030	210	V-shaped PCC Drain on Hill Side
31	39+030	39+060	30	V-shaped PCC Drain on Both Sides
32	39+060	40+000	940	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 Merangkong to Mon from Km. 20.000 to Km.40.000 (design chainages), includes provision of **3 minor bridges** (span<60m), and **88 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	44
2	2.0	25
3	3.0	14`
4	4.0	1
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	21+105	20+615	1.5	RCC Box
2	21+240	20+740	3.0	RCC Box
3	21+927	21+375	1.5	RCC Box
4	22+175	21+610	1.5	RCC Box
5	22+355	21+790	3.0	RCC Box
6	22+440	21+865	1.5	RCC Box



Sl. No.	Existing Chainage (km)	Design Chainage (km)	Proposed Span (m)	Proposal
7	22+623	22+040	2.0	RCC Box
8	23+535	22+940	3.0	RCC Box
9	24+184	23+730	3.0	RCC Box
10	24+697	24+050	5.0	RCC Box
11	25+425	24+740	1.5	RCC Box
12	25+660	24+905	3.0	RCC Box
13	25+780	25+000	2.0	RCC Box
14	26+025	25+250	3.0	RCC Box
15	26+170	25+395	1.5	RCC Box
16	26+425	25+640	1.5	RCC Box
17	26+665	25+820	1.5	RCC Box
18	27+249	26+410	1.5	RCC Box
19	27+535	26+680	1.5	RCC Box
20	27+585	26+730	2.0	RCC Box
21	27+691	26+840	4.0	RCC Box
22	28+045	27+160	1.5	RCC Box
23	28+289	27+400	1.5	RCC Box
24	28+530	27+640	3.0	RCC Box
25	28+700	27+830	3.0	RCC Box
26	29+723	28+810	5.0	RCC Box
27	30+080	29+203	1.5	RCC Box
28	30+233	29+350	1.5	RCC Box
29	31+125	29+903	1.5	RCC Box
30	31+206	30+360	1.5	RCC Box
31	31+570	30+687	2.0	RCC Box
32	32+606	31+700	2.0	RCC Box
33	32+638	31+740	2.0	RCC Box
34	32+850	31+950	3.0	RCC Box
35	33+335	32+425	2.0	RCC Box
36	33+637	32+680	5.0	RCC Box
37	34+400	33+370	5.0	RCC Box
38	34+700	33+640	2.0	RCC Box
39	35+128	34+055	1.5	RCC Box
40	35+218	34+140	1.5	RCC Box
41	35+675	34+580	2.0	RCC Box
42	36+675	35+595	1.5	RCC Box
43	36+825	35+690	2.0	RCC Box
44	37+090	35+945	2.0	RCC Box
45	37+210	36+055	1.5	RCC Box
46	37+825	36+640	2.0	RCC Box
47	37+975	36+785	2.0	RCC Box
48	38+050	36+860	1.5	RCC Box
49	38+175	36+980	2.0	RCC Box
50	38+290	37+100	2.0	RCC Box
51	38+570	37+370	2.0	RCC Box
52	38+675	37+475	1.5	RCC Box
53	38+890	37+695	3.0	RCC Box
54	39+045	37+845	1.5	RCC Box



“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+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
55	39+298	38+095	1.5	RCC Box
56	39+621	38+420	1.5	RCC Box
57	41+075	39+970	1.5	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	20+440	20+030	1.5	RCC Box
2	20+960	20+460	1.5	RCC Box
3	23+250	22+660	1.5	RCC Box
4	23+805	23+200	2.0	RCC Box
5	24+575	23+890	1.5	RCC Box
6	24+995	24+320	3.0	RCC Box
7	27+110	26+310	2.0	RCC Box
8	27+785	26+900	1.5	RCC Box
9	29+025	28+140	2.0	RCC Box
10	29+278	28+380	1.5	RCC Box
11	29+435	28+530	3.0	RCC Box
12	29+830	28+910	2.0	RCC Box
13	29+955	29+080	1.5	RCC Box
14	30+908	29+810	1.5	RCC Box
15	33+045	32+140	3.0	RCC Box
16	34+006	33+030	2.0	RCC Box
17	35+050	33+905	2.0	RCC Box
18	35+380	34+325	1.5	RCC Box
19	36+105	34+980	2.0	RCC Box
20	36+360	35+240	2.0	RCC Box
21	36+555	35+460	1.5	RCC Box
22	37+165	36+020	1.5	RCC Box
23	37+370	36+210	3.0	RCC Box
24	38+520	37+280	2.0	RCC Box
25	39+515	38+305	1.5	RCC Box
26	39+711	38+51	1.5	RCC Box
27	40+200	39+030	1.5	RCC Box
28	40+460	39+240	1.5	RCC Box
29	40+810	39+590	1.5	RCC Box



“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+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
30	40+920	39+700	1.5	RCC Box
31	41+020	39+920	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 Bridges					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		
1	32.467	1 x 31.7	3.35	5.4	Steel Truss	Open Foundation	Inadequate	Reconstruction
2	35.570	1 x 6.1	6.1	6.9	RCC Slab	Not Visible	Inadequate	Reconstruction
3	39.912	1 x 16.5	3.3	3.9	Steel Truss	Not Visible	Inadequate	Reconstruction

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

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”



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:

Sl 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:

Sl 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

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

B. ROB / RUB

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

C. Overpasses / Underpasses and Other Structures

Sl 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

Sl 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	6,850
Direction & Place Identification up to 0.9 sqm	sqm	8
Direction & Place Identification more than 0.9 sqm	sqm	NIL

Traffic Signage's, Road Marking and other appurtenances	unit	Quantity
60 cm Equilateral Triangle	Number	156
60 cm Circular	Number	36
60 cm High Octagon	Number	7
60 cm X 45 cm Rectangular	Number	8
60 cm X 50 cm Chevron Sign	Number	643
Hectometer Stone	Number	80
Km stone	Number	16
5 th km stone	Number	4
Boundary Stone (as per clause 13 herein under)	Number	200
Road Delineators	Number	1,235
Road Marker/ Road Stud	Number	10,000
Hazard Marker	Number	176

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.

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 2287 (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.

SI No.	Design Chainage(m)		Length(m)	Remarks
	From	To		
1	20194.28	20269.06	75	Radius<40
2	21182.46	21241.40	59	Radius<40
3	21338.07	21397.79	60	Radius<40
4	21397.79	21469.36	72	Radius<40
5	22030.25	22089.35	60	Radius<40
6	23012.81	23086.99	75	Radius<40
7	23530.96	23591.45	61	Radius<40
8	23787.46	23896.79	110	Radius<40
9	24017.90	24089.36	72	Radius<40
10	24368.75	24428.12	60	Radius<40
11	24972.54	25031.77	60	Radius<40
12	25238.27	25275.33	38	Radius<40
13	25381.73	25420.53	39	Radius<40
14	25691.35	25755.40	65	Radius<40
15	25798.48	25881.27	83	Radius<40
16	26085.32	26123.30	38	Radius<40
17	27274.04	27329.58	56	Radius<40
18	27607.86	27667.05	60	Radius<40
19	27708.72	27785.38	77	Radius<40
20	27785.38	27865.41	81	Radius<40
21	28529.32	28575.24	46	Radius<40
22	28665.86	28729.24	64	Radius<40
23	29421.93	29492.58	71	Radius<40
24	29492.58	29555.88	64	Radius<40
25	29882.24	29951.80	70	Radius<40
26	30032.32	30104.78	73	Radius<40
27	30433.65	30486.75	54	Radius<40
28	32410.62	32451.79	42	Radius<40
29	32656.36	32721.10	65	Radius<40
30	32721.10	32795.65	75	Radius<40

Sl No.	Design Chainage(m)		Length(m)	Remarks
	From	To		
31	33131.68	33159.74	29	Radius<40
32	33244.37	33270.27	26	Radius<40
33	33321.07	33381.67	61	Radius<40
34	33503.90	33551.20	48	Radius<40
35	34613.74	34657.94	45	Radius<40
36	37636.98	37703.49	67	Radius<40
37	37798.35	37820.41	23	Radius<40
38	38640.72	38703.38	63	Radius<40

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.

(i) 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	5,780
Breast wall of PCC/RCC/Gabion/Cement masonry having minimum height of 1.5 m	Rm	2,429
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	6,450
RE Wall in PCC	Rm	359
Subsurface drain with perforated pipe for collection of seepage water to avoid sinking of pavement	Rm	865
Seeding and Mulching with Jute Net	Sqm	64,123
Hydro seeding	Sqm	17,634
Catch Water Drain (Unlined)	Rm	18,910

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	2747
2	2 m to 4 m	3005
3	4 m to 6 m	698

- 12.1.2 Tentative Locations and Length

Sl. No.	From Design Chainage (in m)	To Design Chainage (in m)	Length (m)
1	20+005	20+195	190
2	20+225	20+287	62
3	20+303	20+355	52
4	20+385	20+475	90
5	20+545	20+625	80
6	20+805	20+835	30
7	21+035	21+095	60
8	21+115	21+195	80
9	21+205	21+232	27
10	21+365	21+399	34
11	21+485	21+505	20
12	21+655	21+664	9

13	21+772	21+815	43
14	21+834	21+868	34
15	22+146	22+215	69
16	22+235	22+255	20
17	22+305	22+325	20
18	22+445	22+485	40
19	22+555	22+625	70
20	22+708	22+785	77
21	22+815	22+847	32
22	22+945	22+955	10
23	22+965	22+975	10
24	23+006	23+045	39
25	23+085	23+174	89
26	23+205	23+226	21
27	23+405	23+455	50
28	23+515	23+525	10
29	23+545	23+555	10
30	23+725	23+755	30
31	23+797	23+825	28
32	23+865	23+998	133
33	24+016	24+081	65
34	24+146	24+205	59
35	24+229	24+245	16
36	24+255	24+265	10
37	24+315	24+375	60
38	24+495	24+515	20
39	24+564	24+585	21

40	24+605	24+635	30
41	24+675	24+755	80
42	24+825	24+875	50
43	24+915	24+935	20
44	24+997	25+045	48
45	25+086	25+115	29
46	25+145	25+184	39
47	25+231	25+264	33
48	25+378	25+412	34
49	25+505	25+545	40
50	25+633	25+645	12
51	25+705	25+796	91
52	25+808	25+835	27
53	26+055	26+075	20
54	26+122	26+225	103
55	26+323	26+335	12
56	26+385	26+416	31
57	26+465	26+507	42
58	26+538	26+565	27
59	26+677	26+684	7
60	26+725	26+745	20
61	26+825	26+832	7
62	26+837	26+855	18
63	26+994	27+065	71
64	27+075	27+115	40
65	27+135	27+153	18
66	27+305	27+338	33

67	27+345	27+411	66
68	27+465	27+475	10
69	27+805	27+845	40
70	27+955	28+015	60
71	28+065	28+085	20
72	28+124	28+165	41
73	28+216	28+255	39
74	28+378	28+385	7
75	28+676	28+685	9
76	28+695	28+765	70
77	28+795	28+815	20
78	28+888	28+935	47
79	29+245	29+265	20
80	30+123	30+155	32
81	30+165	30+205	40
82	30+274	30+285	11
83	30+296	30+315	19
84	30+345	30+395	50
85	30+605	30+615	10
86	30+705	30+715	10
87	30+925	30+936	11
88	31+295	31+315	20
89	31+345	31+425	80
90	31+465	31+471	6
91	31+601	31+605	5
92	31+735	31+755	20
93	32+195	32+245	50

94	32+265	32+295	30
95	32+402	32+425	23
96	32+497	32+534	37
97	32+855	32+875	20
98	33+025	33+048	23
99	33+262	33+285	23
100	33+355	33+377	22
101	33+446	33+481	35
102	33+547	33+905	358
103	33+965	34+082	117
104	34+115	34+137	22
105	34+175	34+205	30
106	34+225	34+235	10
107	34+285	34+319	34
108	34+385	34+415	30
109	34+575	34+615	40
110	34+695	34+725	30
111	34+972	34+985	13
112	35+125	35+131	6
113	35+525	35+613	88
114	35+695	35+765	70
115	35+845	35+877	32
116	35+925	35+945	20
117	35+955	35+965	10
118	36+205	36+245	40
119	36+475	36+485	10
120	36+505	36+555	50

121	36+855	36+865	10
122	36+915	36+944	29
123	37+015	37+047	32
124	37+063	37+095	32
125	37+205	37+215	10
126	37+315	37+330	15
127	37+355	37+385	30
128	37+555	37+565	10
129	37+654	37+705	51
130	37+735	37+773	38
131	37+823	37+875	52
132	37+895	37+903	8
133	37+925	38+055	130
134	38+085	38+095	10
135	38+135	38+145	10
136	38+165	38+225	60
137	38+305	38+315	10
138	38+395	38+545	150
139	38+605	38+675	70
140	38+805	38+845	40
141	38+872	39+005	133
142	39+095	39+115	20
143	39+166	39+275	109
144	39+295	39+305	10
145	39+313	39+325	12
146	39+395	39+556	161
147	39+575	39+705	130

148	39+745	39+985	240
Total			6450

12.1.3 Reinforced Earth Wall

The locations for providing RE wall are listed in the table below.

Improvement Proposals: Reinforced Earth Wall Length

S. No.	From Chainage (in m)	To Chainage (in m)	Length (m)
1	20+287	20+296	9
2	24+805	24+825	20
3	24+895	24+915	20
4	30+435	30+605	170
5	31+605	31+695	90
6	31+705	31+735	30
7	32+245	32+265	20
Total			359

- 12.1.4 **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

Sl. No.	Existing Location From	New Design Chainage From
1	24+697	24+055
2	33+045	32+140
3	35+675	34+580

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 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	Design Speed: 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 Annexure-III of Schedule A.
2	2.7.2	Roadway Width: 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	Radius of Horizontal Curves:	Radius of Horizontal curves shall be as per the alignment plan shown in Plan & Profile drawings given in Annexure-III of Schedule A.
4	2.6	Type of Shoulder in open country	As given in Schedule B

S. No.	Clause	Provision as per Manual (IRC:SP:73-2015)	Modified Provision
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:

ITEM	WEIGHT AGE IN PERCENT TAGE TO THE CONTRACT PRICE	STAGE OF PAYMENT	PERCENTAGE WEIGHTAGE
1	2	3	5
Road works including Culverts, widening and Repair of Culverts.	60.11%	A- Widening and strengthening of existing road	
		(1) Earthwork upto top of the Sub-grade including excavation in soil/ soft rock/ hard rock and clearing & grubbing	5.48%
		(2) Sub-Base Course.	5.51%
		(3) Non Bituminous Base Course.	7.52%
		(4) Bituminous Base Course	4.26%
		(5) Wearing Coat.	2.73%
		(6) Widening and repair of culverts	0.00%
		(7) Hard Shoulder	1.76%
		B.1- Reconstruction/New 2 lane realignment/bypass (Flexible pavement)	
		(1) Earthwork upto top of the Sub-grade including excavation in soil/ soft rock/ hard rock and clearing & grubbing	5.27%
		(2) Sub-Base Course.	2.43%
		(3) Non Bituminous Base Course.	3.33%
		(4) Bituminous Base Course	1.89%
		(5) Wearing Coat.	1.21%
		(6) Hard Shoulder	0.83%
		B.2- Reconstruction/New 2 lane realignment/bypass (Rigid pavement)	
		(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.	0.00%
		(2) Sub-Base Course.	0.00%

“Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A”

		(3) Dry Lean Concrete (DLC) Course	0.00%
		(4) Pavement Quality Control (PQC) Course	0.00%
		<i>C.1-Reconstruction /New Service road (Flexible Pavement)</i>	
		(1) Earthwork upto top of the Sub-grade including excavation in soil/ soft rock/ hard rock and clearing & grubbing	0.00%
		(2) Sub-Base Course.	0.00%
		(3) Non Bituminous Base Course.	0.00%
		(4) Bituminous Base Course	0.00%
		(5) Wearing Coat.	0.00%
		<i>C.2-Reconstruction /New Service road (Rigid Pavement)</i>	
		(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.	0.00%
		(2) Sub-Base Course.	0.00%
		(3) Dry Lean Concrete (DLC) Course	0.00%
		(4) Pavement Quality Control (PQC) Course	0.00%
		<i>D-Re-construction and New culverts on existing road, realignment, bypasses.</i>	
		(1) Culverts (Length < 6m)	17.89%
Minor Bridges /Underpasses/ Overpasses	5.81%	<i>A.1-Widening and Repair of Minor Bridges (length>6m and <60m)</i>	
		(1) Minor Bridges	0.00%
		<i>A.2-New Minor Bridges (length >6m and <60m)</i>	
		(1) Foundation + Sub Structure : On completion of the foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap	3.84%
		(2) Super Structure : 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.	1.33%
		(3) Approaches : On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	0.64%
		(4) Guide Bunds and River Training Works : On completion of Guide Bunds and river Training works complete in all respects.	0.00%

		B.1-Widening and Repair of underpasses/overpasses	
		(1) Underpasses / Overpasses	0.00%
		B.2-New Underpasses / Overpasses	
		(1) Foundation + Sub Structure : On completion of the foundation work including foundation for wing and return walls, abutments, piers upto the abutment/pier cap	0.00%
		(2) Super Structure : 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.	0.00%
		(3) Approaches : On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	0.00%
Major Bridge (length >60m works and ROB/RUB/elevated sections /flyovers including voiducts, if any	0.00%	A.1-Widening and repairs of Major Bridges	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road marking etc	0.00%
		(6) Wing walls/return walls	0.00%
		(7) Guide Bunds, River Training works etc	0.00%
		(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
		A.2-New Major Bridges	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%
		(6) Wing walls/return walls	0.00%
		(7) Guide Bunds, River Training works etc	0.00%
		(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%

		<i>B.1-Widening and Repair of</i> <i>(a) ROB</i> <i>(b) RUB</i>	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(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	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%
		(6) wing walls/return walls	0.00%
		(7) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
		<i>B.2-New ROB/RUB</i> <i>(a) ROB</i> <i>(b) RUB</i>	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(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	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%
		(6) Wing walls/return walls	0.00%
		(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%
		<i>C.1-Widening and repair of Elevated Section/Flyovers/Grade Separators</i>	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%
		(6) Wing walls/return walls	0.00%
		(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%

		<i>C.2-New Elevated Section/Flyovers/Grade Separators</i>	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%
		(6) wing walls/return walls	0.00%
		(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%
Other Works	34.08%		
		(i)Toll Plaza	0.00%
		(ii)Road side drains	2.09%
		(iii) Road signs, markings, Km stones, Safety devices etc.	
		(a) Pavement Markings	1.30%
		(b) Crash Barriers/ W metal crash Barriers	0.53%
		(c) Road/Traffic Sign	0.28%
		(d) Road Boundary stones, km Stones, 5th km stones and hectometer stones, rumble strip, other items etc.	0.03%
		(e) Traffic blinker LED delineators, studs, reflective pavement markers, tree reflectors	1.43%
		(f) Road furniture (overhead signboard etc.)	0.00%
		(iv)Project facilities	
		(a)Bus bays / Bus Shelter	0.05%
		(b) Junctions (Major & Minor)	0.00%
		(c) Others including Cable duct & Lighting on Bridges, etc.	0.00%
		(v) Road side Plantation	0.01%
		(vi) Repair of protection works other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs /RUBs	0.00%
		(vii) Safety and traffic management during construction	0.00%
		(viii) Slope Protection Works as special requirement for hill road	
		(a) Hydro Seeding	0.02%
		(b)Seeding and Mulching with Jute net	1.50%
		(c) Catch water Drains	0.09%

		(d) Retaining Structure on valley side of PCC/RCC/Gabion/Cement Masonry of varying height between 1 to 6 metre with parapet walls	21.45%
		(e) Reinforced Earth wall	1.36%
		(f) Breast wall with PCC/RCC/Gabion/Cement Masonry	3.24%
		(g) Sub Surface drain with perforated pipe	0.03%
		(h) Parapet wall	0.67%
		Total %	100.00%



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:

TABLE 1.3.1		
STAGE OF PAYMENT	PERCENTAGE WEIGHTAGE	PAYMENT PROCEDURE
A- Widening and strengthening of existing road		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	5.48%	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.	5.51%	
(3) Non Bituminous Base Course.	7.52%	
(4) Bituminous Base Course	4.26%	
(5) Wearing Coat.	2.73%	
(6) Widening and repair of culverts	0.00%	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	1.76%	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 prorate basis from the date of handing over of such length.
B.1- Reconstruction/New 2lane realignment/bypass (Flexible pavement)		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	5.27%	Further, Unit of Measurement is linear length of each Bypass/ realignment (excluding structures) and payment of each stage shall be made on prorate 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.	2.43%	
(3) Non Bituminous Base Course.	3.33%	
(4) Bituminous Base Course	1.89%	
(5) Wearing Coat.	1.21%	
(6) Hard Shoulder	0.83%	
B.2- Reconstruction/New 2lane realignment/bypass (Rigid pavement)		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	0.00%	Further, Unit of Measurement is linear length of each Bypass/ realignment (excluding structures) and payment of each stage shall be made on prorate basis on completion of a stage in full length or 5 (Five) Km length of each bypass/ realignment taken separately.
(2) Sub-Base Course.	0.00%	
(3) Dry Lean Concrete (DLC) Course	0.00%	
(4) Pavement Quality Control (PQC) Course	0.00%	
C.1-Reconstruction /New Service road (Flexible Pavement)		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	0.00%	
(2) Sub-Base Course.	0.00%	
(3) Non Bituminous Base Course.	0.00%	
(4) Bituminous Base Course	0.00%	
(5) Wearing Coat.	0.00%	
C.2-Reconstruction /New Service road (Rigid Pavement)		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.	0.00%	
(2) Sub-Base Course.	0.00%	
(3) Dry Lean Concrete (DLC) Course	0.00%	
(4) Pavement Quality Control (PQC)	0.00%	

"Construction of two-Lane with hard shoulders of Merangkong - Tamlu - Mon Road on EPC basis from existing Km 20.456 to Km 41.065 [Design Km. 20+000 to Km. 40+000] (Design Length - 20.000 Km) in the state of Nagaland under SARDP-NE Phase A"

Course		
D-Re-construction and New culverts on existing road, realignment, bypasses.		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)	17.89%	

@. 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
A.1-Widening and Repair of Minor Bridges (length>6m and <60m)	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.
A.2-New Minor Bridges (length >6m and <60m)		
(i) Foundation + Sub Structure : On completion of the foundation work including foundation for wing and return walls, abutments, piers upto the abutment/pier cap	3.84%	(i) Foundation + Sub Structure : 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) Super Structure : 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.	1.33%	(ii) Super Structure : 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) Approaches : On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	0.64%	(iii) Approaches : 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) Guide Bunds and River Training Works : On completion of Guide Bunds and river Training works complete in all respects.	0.00%	(iv) Guide Bunds and River Training Works : 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.1-Widening and Repair of underpasses/ overpasses	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.2-New Underpasses / Overpasses		
(i) Foundation + Sub Structure : On completion of the foundation work including foundation for wing and return walls, abutments, piers up to the abutment/pier cap	0.00%	(i) Foundation + Sub Structure : 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) Super Structure : 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) Super Structure : 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) Approaches : 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) Approaches : 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) Foundation: 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) Sub Structure : 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) Super Structure: 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) Wearing Coat: 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) Miscellaneous : 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) Wing walls/return walls: 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) Guide Bunds, River Training works: 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) Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respect as specified.	

A.2-New Major Bridges		
(i) Foundation	0.00%	(i) Foundation: 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) Sub Structure: 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) Sup Structure : 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	0.00%	(iv) Wearing Coat: 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) Miscellaneous: 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) Wing walls/Return walls : 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) Guide Bunds, River Training works : 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) Approaches: Payment shall be made on completion of both approaches including stone pitching, protection works, etc complete in all respects as specified.
B.1-Widening and Repair of		
(a) ROB		
(b) RUB		
(i) Foundation	0.00%	(i) Foundation: 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) Sub Structure : 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) Super Structure : 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) Wearing Coat : 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) Miscellaneous : 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) Wing walls/return walls : 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) Approaches : Payment shall be made on completion of both approaches including stone pitching, protection works, etc complete in all respect as specified.
B.2-New ROB/RUB		
(a) ROB		
(b) RUB		
(i) Foundation	0.00%	(i) Foundation : 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 atleast 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) Sub Structure : 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 structures of abutments/piers upto abutment/pier cap level of the ROB/RUB.
(iii) Super-structure (including bearings)	0.00%	(iii) Super Structure : 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) Wearing Coat : 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.
(v) Miscellaneous items like hand rails, crash barriers, road marking etc	0.00%	(v) Miscellaneous : 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) Wing walls/return walls : 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) Approaches : Payment shall be made on completion of both approaches including stone pitching, protection works, etc complete in all respect as specified.
C.1-Widening and repairs of Elevated Section/Flyovers/Grade Separators		
(i) Foundation	0.00%	(i) Foundation : 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) Sub Structure : 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) Super Structure : 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) Wearing Coat : 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) Miscellaneous: 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) Wing walls/return walls: 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) Approaches: Payment shall be made on completion of both approaches including stone pitching, protection works, etc complete in all respect as specified.
C.2-New Elevated Section/Flyovers/Grade Separators		
(i) Foundation	0.00%	(i) Foundation: 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) Sub Structure : 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) Super Structure : 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) Wearing Coat : 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) Miscellaneous: 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) Wing walls/return walls : 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) Approaches: 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:

TABLE 1.3.4		
STAGE OF PAYMENT	PERCENTAGE WEIGHTAGE	PAYMENT PROCEDURE
(i)Toll Plaza	0.00%	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	2.09%	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	1.30%	
(b) Crash Barriers/ W metal crash Barriers	0.53%	
(c) Road/Traffic Sign	0.28%	
(d) Road Boundary stones, km Stones, 5th km stones and hectometre stone, rumble strip, other items	0.03%	
(e) Traffic blinker LED delineator, stud, reflective pavement marker, tree reflector	1.43%	
(f) Road furniture (overhead signboard etc.)	0.00%	
(iv)Project facilities		Payment shall be made on pro rata basis for completed facilities.
(a)Bus bays & Bus Shelter	0.05%	
(b) Junctions (Major & Minor)	0.00%	
(c) Others including Cable duct & Lighting on Bridges, etc.	0.00%	
(v) Road side Plantation	0.01%	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 ROB/RUBs	0.00%	
(vii) Safety and traffic management during construction	0.00%	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 of not less than 10% (ten per cent) of the total length.
(a) Hydro Seeding	0.02%	
(b)Seeding and Mulching with Jute net	1.50%	

(c) Catch water Drains	0.09%	
(d) Retaining Structure on valley side of PCC/RCC/Gabion/Cement Masonry of varying height between 1 to 6 metre with parapet walls	21.45%	
(e) Reinforced Earth wall	1.36%	
(f) Breast wall with PCC/RCC/Gabion/Cement Masonry	3.24%	
(g) Sub Surface drain with perforated pipe	0.03%	
(h) Parapet wall	0.67%	

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

