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

Schedules

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

November 2017

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

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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
5	0+725	0+795	70	0+850	0+910	60	Realignment	No Work Done
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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 Strengthening	Earthwork in Excavation
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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 Strengthening	Earthwork in Excavation
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	No Work Done

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
							Strengthening	
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
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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 Strengthening	No Work Done
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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 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)		
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
251	56+840	58+030	1190	55+800	56+740	940	Widening and Strengthening	Earthwork in Excavation
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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 Strengthening	Earthwork in Excavation
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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
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	No Work Done

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
							Strengthening	
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
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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
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

Sl. No.	Existing Chainage			Design Chainage			Improvement Proposal	Details of Work done by Previous Contractor
	From	To	Length (m)	From	To	Length (m)		
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
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	
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	-	No ROW available in realignment stretches of total 6.200 km. as given in para 2.1.3 of

Sl. No.	Existing Chainage (km)		Design Chainage (km)		Length in m (Design)	Existing/ Available ROW (m)	Remarks
	From	To	From	To			
							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.

Sl. No.	Existing Chainage (km)		Design Chainage (km)		Length in m (Design)	Existing Lane Width* (m)	Remarks
	From	To	From	To			
1	20+456	41+065	20+000	40+000	20000	3.0 to 3.5	Lane width other than realignment portion

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

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	Adequate & in Fair Condition
2	21+240	Pipe	1 x 1.2	7.3	Inadequate & in Poor Condition
3	21+927	Pipe	1 x 1.2	7.5	Inadequate & in Fair Condition
4	22+175	Pipe	1 x 0.9	7.3	Inadequate & in Poor Condition

Sl. No.	Existing Chainage (km)	Type of Structure	Span / Dia. (m)	Width of Structure (m)	Remarks
5	22+355	Pipe	2 x 0.8	6.2	Inadequate & in Poor Condition
6	22+440	Pipe	1 x 0.9	6.0	Inadequate & in Poor Condition
7	22+623	Pipe	2 x 0.6	6.8	Inadequate & in Poor Condition
8	23+535	Pipe	2 x 0.8	6.7	Inadequate & in Poor Condition
9	24+184	Pipe	2 x 0.6	6.6	Inadequate & in Poor Condition
10	24+697	Slab	1x3.0	7.1	Inadequate & in Poor Condition
11	25+425	Pipe	1 x 0.9	6.8	Inadequate & in Poor Condition
12	25+660	Pipe	1 x 0.9	7.5	Inadequate & in Poor Condition
13	25+780	Not visible	Not visible	7.0	Inadequate & in Poor Condition
14	26+025	Slab	1x3.0	8.2	Inadequate & in Fair Condition
15	26+170	Pipe	1 x 0.9	7.0	Inadequate & in Poor Condition
16	26+425	Pipe	1 x 0.9	6.4	Inadequate & in Fair Condition
17	26+665	Pipe	1 x 0.9	6.5	Inadequate & in Fair Condition
18	27+249	Pipe	1 x 0.8	4.9	Inadequate & in Poor Condition
19	27+535	Pipe	1 x 0.8	6.8	Inadequate & in Poor Condition
20	27+585	Pipe	2 x 0.9	7.4	Inadequate & in Poor Condition
21	27+691	Slab	1x3.0	6.9	Adequate & in Fair Condition
22	28+045	Pipe	Not visible	7.0	Inadequate & in Poor Condition
23	28+289	Pipe	Not visible	9.4	Inadequate & in Poor Condition
24	28+530	Pipe	2 x 0.9	4.9	Inadequate & in Poor Condition
25	28+700	Pipe	2 x 0.9	7.2	Inadequate & in Fair Condition
26	29+723	Slab	1x3.3	6.8	Inadequate & in Poor Condition
27	30+080	Pipe	1 x 0.9	7.8	Inadequate & in Fair Condition
28	30+233	Pipe	1 x 1.2	9.0	Adequate & in Good Condition
29	31+125	Pipe	1 x 0.9	7.3	Inadequate & in Fair Condition
30	31+206	Pipe	1 x 1.0	12.7	Adequate & in Good Condition
31	31+570	Slab	1x1.0	6.2	Adequate & in Fair

Sl. No.	Existing Chainage (km)	Type of Structure	Span / Dia. (m)	Width of Structure (m)	Remarks
					Condition
32	32+606	Slab	1x0.9	6.2	Adequate & in Fair Condition
33	32+638	Slab	1x0.9	6.4	Adequate & in Fair Condition
34	32+850	Slab	1x3.0	7.3	Adequate & in Fair Condition
35	33+335	Pipe	1 x 0.9	7.8	Inadequate & in Poor Condition
36	33+637	Slab	1x3.0	6.4	Inadequate & in Poor Condition
37	34+400	Slab	1x4.5	7.2	Inadequate & in Poor Condition
38	34+700	Pipe	2 x 0.9	6.7	Inadequate & in Poor Condition
39	35+128	Pipe	1 x 0.9	7.0	Inadequate & in Fair Condition
40	35+218	Pipe	1 x 0.9	6.6	Inadequate & in Fair Condition
41	35+675	Slab	1x1.5	4.6	Inadequate & in Poor Condition
42	36+675	Pipe	1 x 0.9	7.2	Inadequate & in Poor Condition
43	36+825	Pipe	2 x 0.9	7.2	Inadequate & in Fair Condition
44	37+090	Pipe	2 x 0.8	7.4	Inadequate & in Poor Condition
45	37+210	Pipe	1 x 0.9	6.6	Inadequate & in Poor Condition
46	37+825	Pipe	2 x 0.9	7.5	Inadequate & in Poor Condition
47	37+975	Pipe	2 x 0.9	7.2	Inadequate & in Poor Condition
48	38+050	Pipe	1 x 0.9	7.2	Inadequate & in Poor Condition
49	38+175	Pipe	2 x 0.8	7.3	Inadequate & in Poor Condition
50	38+290	Pipe	2 x 0.9	7.0	Inadequate & in Fair Condition
51	38+570	Pipe	2 x 0.9	7.4	Inadequate & in Poor Condition
52	38+675	Pipe	2 x 0.8	7.3	Inadequate & in Poor Condition
53	38+890	Pipe	2 x 0.9	6.4	Inadequate & in Poor Condition
54	39+045	Pipe	1 x 0.9	6.7	Inadequate & in Poor Condition
55	39+298	Pipe	1 x 0.9	7.0	Inadequate & in Poor Condition
56	39+621	Pipe	1 x 0.9	7.0	Inadequate & in Poor Condition

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)	Existing ROW as per Clause 3 of Schedule A	Proposed ROW Width (m)	Date of Providing proposed ROW
	From	To				
i) 90% of ROW (full width)	20+000	40+000	20		24 to 50	At Appointed Date
ii) Balance Right of way (width)	20+000	40+000	20		24 to 50	Within 150 days after the appointed date

Annex-III
(Schedule-A)

Alignment Plans

The existing alignment Plan, Plan & Profile drawing and GAD drawings for bridges of the Project Highway shall be modified in the following sections as per the enclosed alignment plan.

ENCLOSED

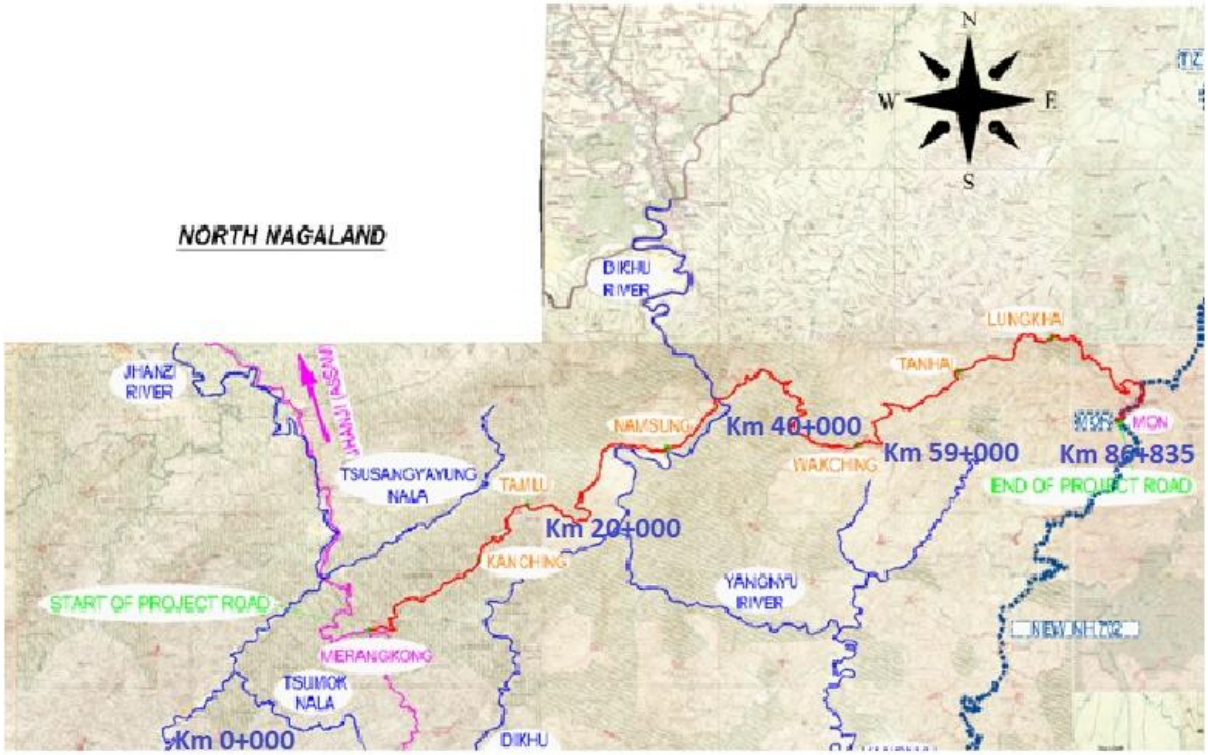
Annex-IV
(Schedule-A)

Environmental Clearances

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

The muck dumping sites in forest area stand identified and freezed by Forest department to be abided by agency during dumping of muck as stated in Schedule 'F']

INDEX MAP OF PROJECT HIGHWAY SECTION



SCHEDULE – B

(See Clause 2.1)

DEVELOPMENT OF THE PROJECT HIGHWAY

1 Development of the Project Highway

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

2 Rehabilitation and augmentation

Rehabilitation and augmentation shall include [Two-Laning and strengthening] of the Project Highway as described in Annex-I of this Schedule-B and in Schedule-C.

3 Specifications and Standards

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

Annex I
(Schedule-B)

Description of Two Laning

Project is construction/improvement of the existing single lane road to two lane with hard shoulder in accordance with IRC- SP:73: 2015, IRC-SP: 48: 1998 and other relevant codes including standard good practice of the road construction as per Schedule D.

1.0 SCOPE OF THE PROJECT

1.1 GENERAL

The following sections of this schedule briefly highlight the scope of the work of the 'Project'. The descriptions of the requirements for the various elements of the Project Highway given here in under are the bare minimum requirements for the 'Project'.

In the planning, design and execution of the works and other works in connection with the repair, maintenance or improvement of the Project Highway and functions associated with the construction of the Project Highway and roadside facilities, the Construction Contractor shall take all such actions and do all such things (including, but not limiting to, organizing itself, adopting measures and standards, executing procedures, including inspection procedures and highway patrol, and engaging and managing agents and employees) as will;

a. enable the NHIDCL to provide an acceptably safe highway in respect of its condition (structural safety) and use (road safety);

b. enable the NHIDCL to fulfill its statutory and common law obligations;

c. enable the NHIDCL to provide a congestion free uninterrupted flow of traffic on the Project Highway;

d. enable the NHIDCL to provide a level of highway service to the public not inferior to that provided on the trunk road during construction or improvement works;

e. enable the police, local authorities, and others with statutory duties or functions in relation to the Project Highway or adjoining roads to fulfill those duties and functions;

f. minimize the occurrence and adverse effects of accidents and ensure that all accidents and emergencies are responded to as quickly as possible;

g. minimize the risk of damage, destruction or disturbance to third party property;

h. ensure that members of the public are treated with all due courtesy and consideration;

i. provide a safe, clear and informative system of road signs;

j. comply with any specified programme requirements, including for the completion of the new road;

k. enable standards of reliability, durability, accessibility, maintainability, quality control and assurance, and fitness for purpose appropriate to a highway of the character of the Project Highway to be achieved throughout the Contract Period;

l. ensure adequate off-street parking facilities for both passenger and goods vehicles;

m. provide adequate bus bays for stopping of buses and bus shelters for commuters to wait under protection;

n. achieve a high standard in the appearance and aesthetic quality of the Project Highway and achieve integration of the Project Highway with the character of the surrounding landscape through both sensitive design and sensitive management of all visible elements including those on the existing road;

o. Undertake proper safety audit through an appropriate consultant (i.e. apart from the Authority Engineer)

p. Carry out accident recording and reporting (to NHIDCL) by type on regular basis; and

q. Ensure adequate safety of the Project Workers on the work site.

2.0 GEOMETRIC DESIGN AND GENERAL FEATURES

2.1.1 General

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

2.1.2 WIDENING OF THE EXISTING HIGHWAY

Notwithstanding the basic alignment plans enclosed with this document the Construction Contractor shall himself carryout and be responsible for engineering surveys, investigation and detailed engineering designs and prepare the working drawings for all the components relevant for the improvement and up-gradation of the Project Highway to fulfill the scope of the project as envisaged herein under. These shall comply with design specifications and standards given in **Schedule-D.** The designs for different project facilities shall follow the locations and indicative designs given in **Schedule-C** and shall comply with design specifications and standards outlined in **Schedule-D.** All the designs and drawings shall be reviewed by the Authority Engineer prior to execution.

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] terrain to the extent land is available.

2.1.3 Improvement of the existing road geometries

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

The hilly gradients shall be corrected in such a way so as to attain a limiting gradient of 6% in order to achieve longitudinal drainage. Also vertical curves shall be improved / introduced so that the vertical curves meet IRC: SP-73 - 2015 standards.

The horizontal alignment of the Project Highway shall be improved as per the standards set out in **Schedule-D.**

The improvement shall be done in consultation with the Authority Engineer / Project Company ensuring that the proposed improvements are accommodated within the land width available as far as practical otherwise action to acquire more land shall be resorted to through NHIDCL.

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

Improvement due to Realignments/Bypass:

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
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

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

Probable location of Sharp Curves having radius less than 40 m:

Sl No.	Design Chainage(km)		Side	Remarks
	From	To		
1	20194.28	20269.06	Left	Radius<40
2	21182.46	21241.40	Left	Radius<40

Sl No.	Design Chainage(km)		Side	Remarks
	From	To		
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
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

The design speed shall be as per IRC SP 73: 2015 however in exceptional cases the minimum design speed of [30 km per hour for hilly and mountainous terrain

and 20 km per hour for hair pin bend locations]. The Location of Hair Pin Bends have been shown in Plan & Profile Drawings.

2.2 Proposed Right of Way

[Refer to paragraph 2.3 of the Manual].

Details of the proposed Right of Way are tabulated below.

Sl. No	Design Chainage (km)		Length (km)	Width (m)
	From	To		
1.	20+000	40+000	20	24 – 50 m

2.2.1 The Scheduled date on which the Authority shall provide ROW to the contractor is given in Annexure-II of Schedule A

2.3 Type of Shoulders

Hard Shoulder: Cementitious base for hard shoulder (Total 3 metre wide including both sides having thickness 200mm)

[Refer to paragraph 2.6.1 of the Manual and specify]

2.4 Width of Carriageway/Roadway width

2.5.1 Two-Laning with hard shoulders shall be undertaken.

2.5.2 Except as otherwise provided in this Agreement, the width of the hard shoulder carriageway and cross-sectional features shall conform to Para 2.7 of the manual.

2.5.3 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

2.5 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 2.11 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				

2.6 Lateral and vertical clearances at overpasses

2.7.1 Lateral and vertical clearances at overpasses shall be as per paragraph 2.12 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				

2.7 Service roads

Service roads shall be constructed at the locations and for the lengths indicated below:[Refer to paragraph 2.13 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				

2.8 Grade Separated Structures

2.9.1 Grade separated structures shall be provided as per paragraph 2.14 of the Manual. The requisite particulars are given below:

[Refer to paragraphs 2.14.1 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 2.14.2 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						

2.9.3 Cattle and pedestrian underpass / Overpass

Cattle and pedestrian underpass/overpass shall be constructed as follows: [Refer to paragraph 2.14.3 of the Manual and specify the requirements of cattle and pedestrian underpass/overpass.

Sl. No.	Location	Type of Crossing
Nil		

2.9 Typical cross-sections of the Project Highway

Typical cross-sections to be followed as per IRC: SP-73-2015 and in addition the proposed cross section 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 km) shall be 2-lane carriageway with 1.5m wide Hard shoulders facility.

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
Type 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	

Sl. No.	Chainage (Km)		Length (m)	Type	Remarks
	From	To			
11	28+470	28+535	65	I	TCS V to be provided in road section through town/ built up area on ridge
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	
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. The locations please refer designed cross section @ 50 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.

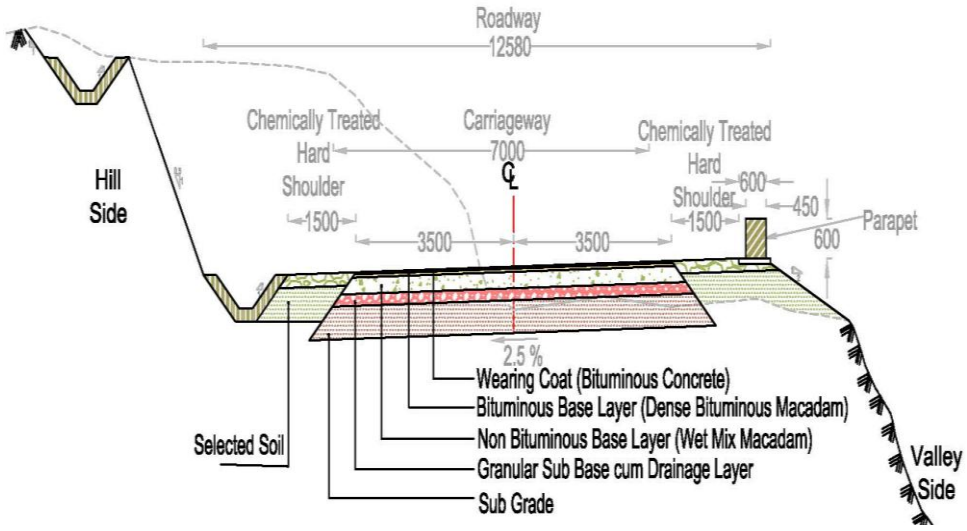


Figure B-1: Typical Cross Section in Hill/Valley Locations, TCS I(a)

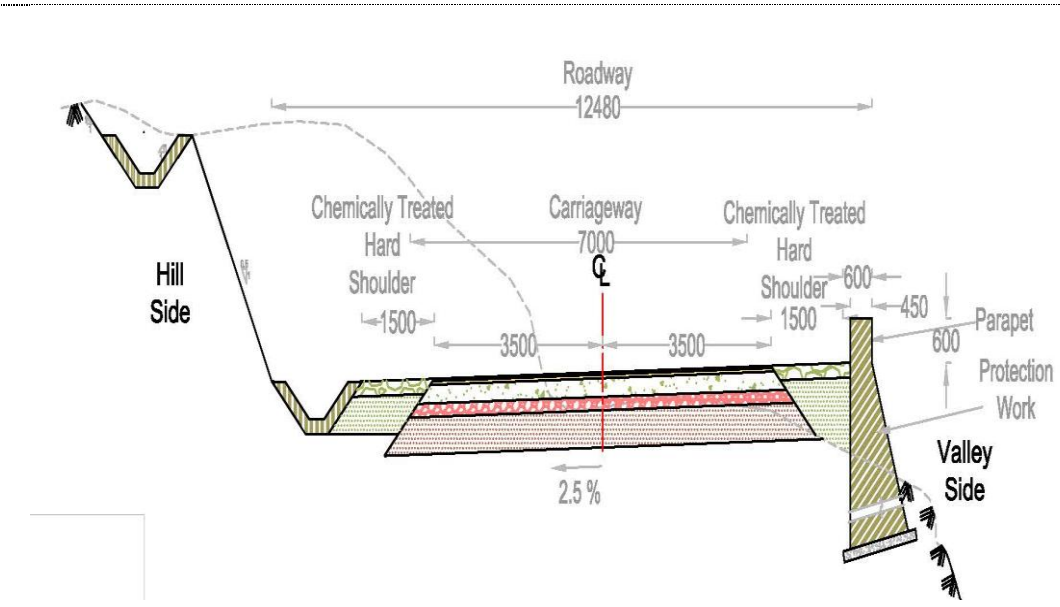


Figure B-2: TCS for Project Road Sections requiring Fill on Valley Side TCS I(b)

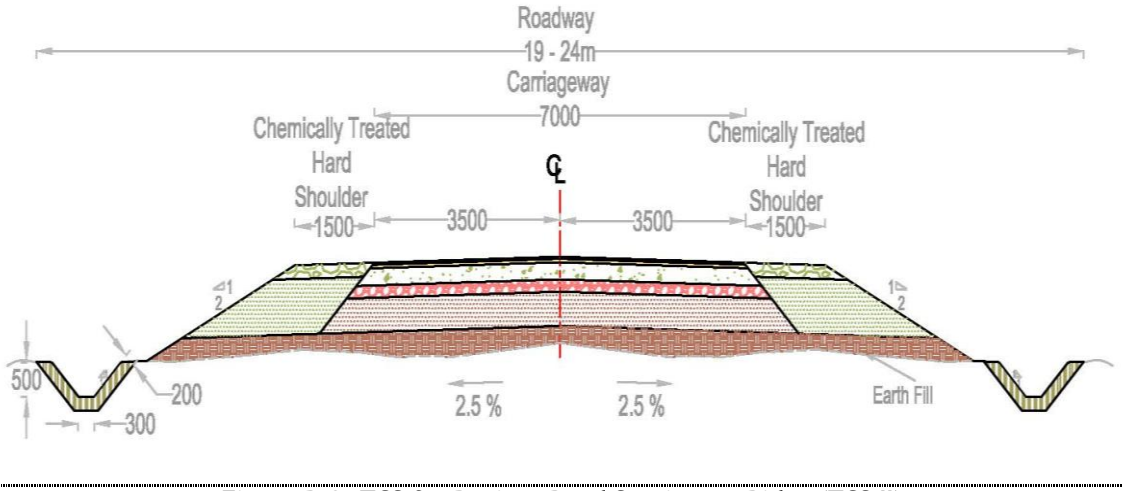


Figure B-3: TCS for Project Road Section on Ridge (TCS II)

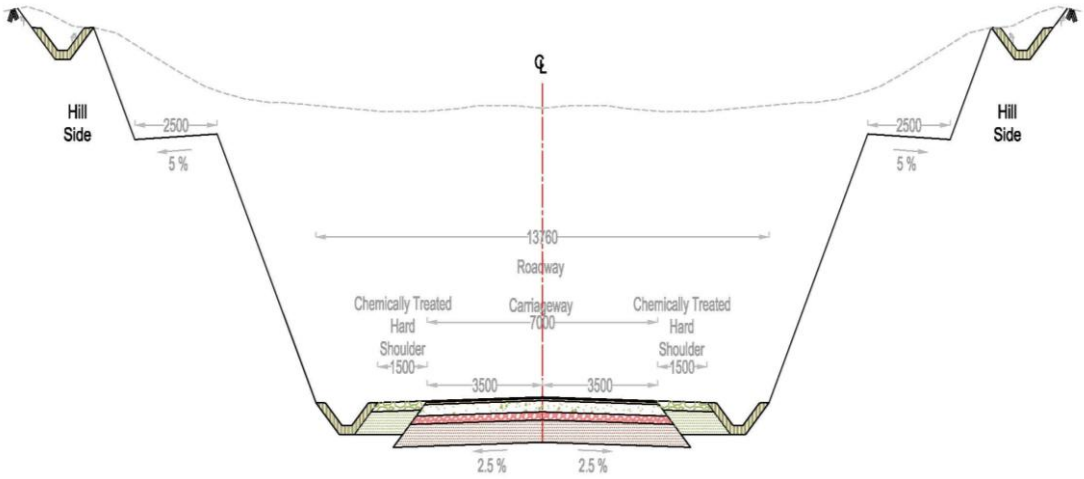


Figure B-4: TCS for Project Road Sections through Box Cut Locations (TCS III)

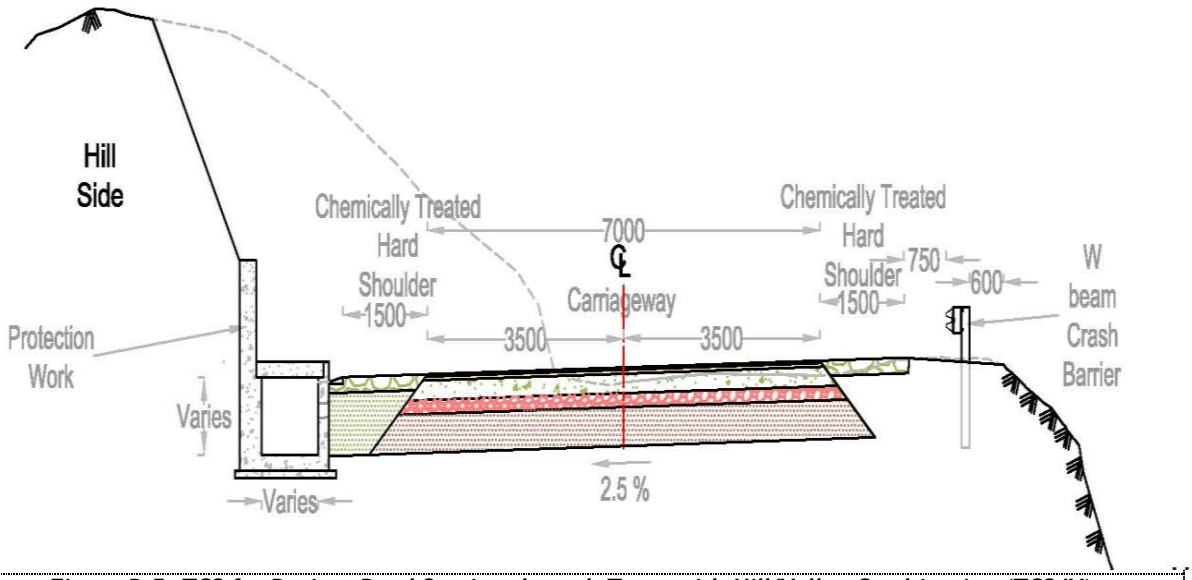


Figure B-5: TCS for Project Road Section through Town with Hill/Valley Combination (TCS IV)

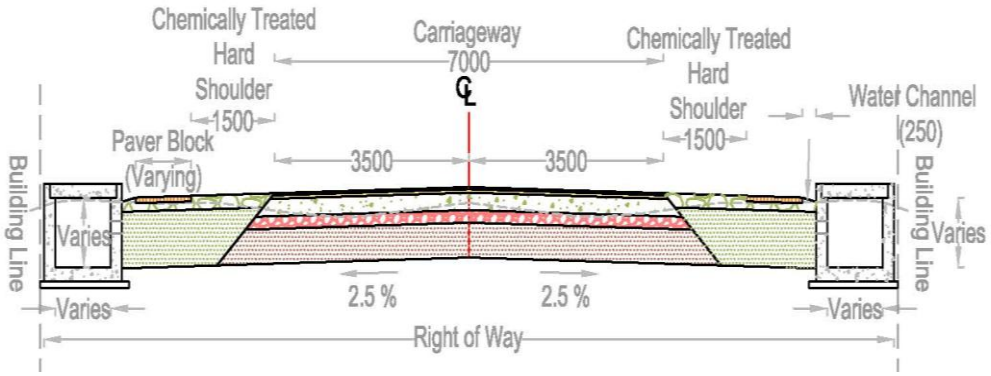


Figure B-6: TCS for Project Road Section through Town on Ridge (TCS V)

2.10 Longitudinal Section

As a minimum, the Construction Contractor shall achieve the proposed finished road level as indicated in the plan and profile drawings for this purpose in FFSR. However, the final finished road levels (FRL) will be finalized as per site conditions in consultation with NHIDCL.

2.11 Built-Up Areas

The alignment passes through Built up areas as tabulated below.

Sl. No.	Existing Chainage (Km)		Design Chainage (Km)		Name of Village /town
	From	To	From	To	
1	33+200	33+300	32+320	32+420	Namsang

3.0 INTERSECTIONS AND GRADE SEPARATORS

3.1 Introduction

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].

There are no intersections with cross roads having bituminous surfacing. The cross roads fall into the category VRs. The Construction Contractor has to construct the following:

i) Typical junction treatments as specified in Final Project Report shall be applied. Design types of intersections are as given below:

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

3.2 At-grade Intersections

(a) Major Intersections

Sl. No.	Location of Intersection	Intersection Towards	Existing Configurations				Type of Intersection	Figure No.	Other Features
			Location	Type	Width (m)	Surface			
NIL									

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

(b) 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.

3.3 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 4.2.2 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*	Remarks
	From	To			
Nil					

* Difference between levels at proposed c/l and existing road/ground below proposed c/l

5.0 PAVEMENT DESIGN

5.1 General

Pavement design shall be carried out in accordance with section 5 of the Manual. The detailed pavement design including overlay and pavement characteristics requirements of the Project Highway shall be done in accordance with Schedule D. Flexible pavement shall be considered for the project road. Flexible Pavement design shall be carried out in accordance with Section 5 of the Two Lane Manual (IRC: SP 73 -2015).

5.2 Type of pavement

Flexible pavement shall be adopted for Project Highway in accordance with IRC: 37-2012. Clause 2.2 of IRC: 37-2012 identifies five type of flexible pavements. The estimated cost of civil works is based on flexible pavements consisting of Granular base, Sub base, DBM and BC. Since, the successful bidders under EPC mode can use any type of five flexible pavements mentioned Clause2.2 of IRC: 37-2012, they may carry out their own diligence to arrive at project cost before submitting bids. The minimum thickness of wearing coat (BC) shall be 40 mm.

5.3 Design requirements

[Refer to paragraph 5.4, 5.9 and 5.10 of the Manual and specify design requirements and strategy]

5.3.1 Design Period and strategy

Flexible pavement for new pavement or for widening and strengthening of the existing pavement shall be designed for a minimum design period of 15 years.

Stage construction shall not be permitted.

5.4 Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for design traffic of 5 million standard axles as follows.

PACKAGE	Design Chainage (km)		Length (km)	15Year MSA*
	From	To		
Package 2	20+ 000	40+000	20	5

*As per 5.4.1 of IRC: SP: 73-2015

5.5 Design Parameters

The flexible pavement for the main carriageway is a 2-lane carriageway having 1.5 m wide hard shoulder and 1.0 m wide earthen shoulder in some stretches. This shall be designed using the IRC SP 37: 2012 method for the 5 msa for 15 years and the construction period of 36 months.

5.5.1 The Project highway will be a light-trafficked section connecting the major arterial network of the country. The design exercise should therefore duly take into account the importance of the road, the performance level and the maintenance requirements during the performance period. The provision of Wet Mix Macadam (granular base)/cement-treated base/ sub-base (crushed stone only)/ sub grade layer(s) and the use of VG 30 Bitumen in bituminous base layers and preferably polymer modified bitumen in wearing course shall be considered while deciding about the composition of the pavement structure. The design should also accompany the Quality Assurance Plan (QAP) along with its implementation scheme for the construction of the pavement structure.

5.5.2 However, in case of a change in the pavement design at the detailed engineering stage, the same shall not be considered as a change in scope of work nor shall qualify for a variation order.

5.5.3 Hard shoulders of 3.0 m width including both sides having cementitious base of thickness 200 mm shall be provided.

5.5.4 Contractor shall design the pavement for design traffic of 5 million standard axles corresponding sub grade CBR.

5.5.5 Rigid Pavement

No rigid pavement has been considered for the Project Highway.

5.6 Reconstruction / Realignment/ Bypass of sections

[Refer to paragraph 5.9.7 of the Manual and specify the sections, if any, to be reconstructed.]

The following sections 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

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 m

RCC Lined drains have slopes 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
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

Sl. No.	Chainage (Km)		Length (m)	Remarks
	From	To		
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

*** Road side drain shall preferably be V-shaped having wetted area of 0.4 sqm**

Note: (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

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 culverts and other 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. New bridges and culverts shall be constructed wide enough to accommodate the adjacent road cross section as given in this Schedule-B. The details of existing culverts are given in Schedule–A.

The details of culverts shall be provided by the EPC Contractor. Minimum compulsory requirement of the culverts are given in Para 7.2.1 herein under.

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. Moreover upstream and downstream protection works, including catch pit connecting stream with the culvert, catch pits; baffle piers/blocks etc. shall be provided which must be ascertained as per the site conditions.

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**

Minimum 88 Nos. of box culverts shall be constructed as given above in Para 7.2.1 including new, reconstruction etc.

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

NIL

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

[Refer to paragraph 8.2.3 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 reconstructed/widened

(i) The existing bridges at the following locations shall be reconstructed as new structures (Minor / Major Bridges)

Sl No.	Existing Chainage (KM)	Design Chainage (KM)	Proposed Span(m)	Proposed Width(m)	Remarks
1	32.467	31.565	2 x 23.0	12.0	
2	35.570	34.485	1 x 14.0	13.5	

3	39.912	38.722	1 x 23.0	12.0	

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 The following structures shall be provided with footpaths:

Sl. No.	Location (km)	Remarks
NIL		

7.3.3 **Additional New Minor Bridges**

New minor bridges at the following locations on the project highways shall be constructed in Package as per manual

Sr. No.	Designed Chainage (km)	River/ Nallah Name	Proposed Span Arrangement (m)
NIL			

7.3.4 **Additional new Major bridges**

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

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

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

[Refer to paragraph 7.18 (iv) of the Manual and provide details]

Sl. No.	Location (km)	Remarks
Nil		

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

[Refer to paragraph 7.18 (v) of the Manual and provide details]

Sl. No.	Location (km)	Remarks
Nil		

7.3.7 Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in paragraph 8.21 of the Manual

7.3.8 Structures in marine environment

[Refer to paragraph 7.22 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 8.19 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 7.20 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.

7.6 Underpasses/Overpasses

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

7.7 Repairs and strengthening of bridges and structures

[Refer to paragraph 8.23 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 Bridge (km)	Nature and Extent of Repairs/Strengthening to be Carried out
Nil		

C. Overpasses / Underpasses and Other Structures

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

7.8 List of Major Bridges and Structures

The following is the list of Major Bridges on Package

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

8.0 TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

8.1 General

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

Specifications of the reflective sheeting [Refer to paragraph 9.3 of the Manual and specify]

Traffic signs and pavements markings shall include roadside signs, overhead signs, curve amounted signs and road marking along the Project Highway. The design and marking for the project Highway shall be as per design standards indicated in **Schedule-D** and the location for various treatments shall be finalized in consultation with the Authority Engineer and Project Company.

The road markings shall be applied to lane lines, road center lines, edge lines, continuity line, stop lines, give way lines, directional arrows, diagonal/chevron markings, and Zebra crossings at parking areas.

8.2 Road/Traffic Signs

(i) A complete range of permanent retro-reflective traffic signs as per the requirements defined in but not limited to the FPR, for the safe and efficient movement of traffic. These sign are to be of regulatory, warning and informatory types and placed on the roadside except at the start and end of the project road and start and end of two bypasses where overhead directional and lane designation signs shall be mounted on the steels portals.

(ii) Temporary traffic and construction signs are to be provided during construction and maintenance operations for traffic diversion and pedestrian safety.

8.3 Pavement Marking

Retro-reflective thermoplastic paint is proposed for use.
The road markings shall be applied to lane lines, road center lines, edge lines, continuity line, stop lines, give way lines, diagonal/chevron markings, Zebra crossings and at parking areas.

i) Delineators' bollards and other safety devices shall be provided on entire project Highway and other locations as directed by NHIDCL.

ii) All 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. All sign boards of size more than 1.2 m and less than 0.9 m shall be provided at the locations finalized in consultation with NHIDCL.

iii) Cautionary sign boards (900mm Equilateral Triangle), stop sign (900mm Octagonal) mandatory sign boards(600mm dia), Village name boards

(600X900mm), Hazard Plate (300X900mm), chevron signboard (600X750mm), Facility information sign (600X800mm), Advance direction sign (1800X1200mm), Place identification sign (1200X900mm) shall be provided by the Construction Contractor with suitable interval in consultation with NHIDCL.

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
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
W Type metal Crash Barrier	Rm	2,287

9.0 ROAD SIDE FURNITURE

9.1.1 Roadside furniture shall be provided in accordance with the provisions of Section 11of the Manual IRC: SP: 73-2015.

9.1.2 Overhead traffic signs: location and size

[Refer to paragraph 11.5 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 instillation 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 paragraph 11.1 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 are required to be planted.

11.0 HAZARDOUS LOCATIONS

i) Metal Beam crash barrier length of minimum 2287 (single runner, heavy duty and W-shape) shall be provided at the locations of bridge approaches and high embankments (3.0m and more), at sharp curves on both sides. 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.

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

Sl 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

Sl No.	Design Chainage(m)		Length(m)	Remarks
	From	To		
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
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

The safety barriers, protective works shall also be provided at the hazardous location/lengths.

12.0 SPECIAL REQUIREMENT FOR HILL ROADS

In accordance with section 13 of the manual (from IRC: SP: 73-2015), 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 may be taken as below:

Type of Protection Work		
Protection Work	**Unit**	**Quantity**
Parapet Wall	Rm	5,780

Type of Protection Work		
Protection Work	**Unit**	**Quantity**
Breast wall with PCC	Rm	2,429
Reinforced Earth/Soil Nailing/Gabion Structure on hill side/valley side of varying height between 1 to 6 metre depending upon the slope	cum	6,450
RE Wall	sqm	359
Subsurface drain with perforated pipe for collection of seepage water to avoid sinking of pavement	m	865
Seeding and Mulching with Jute Net	sqm	64,123
Hydroseeding	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 over and above the tentative qty. ***as mentioned in above table or through 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.*

12.2 Rip rap Protection:

The **minimum quantity** of riprap protection or similar work to be provided at valley side shoulder in the following locations as special safety feature on valley side on curves locations detailed in para 11.0

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

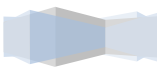
Road land (ROW) boundary shall be demarcated by putting RCC boundary pillars of size 60cm x 15cm x 15 cm embedded in concrete (as per IRC:25) along the Project Highway at 200 m interval on both sides. All the components used in delineating road land boundary shall be aesthetically pleasing, sturdy and vandal proof. The road land boundary shall be demarcated in consultation with NHIDCL.

12.4 Disposal of Debris: - As per Manual

13.0 CHANGE OF SCOPE

The length 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. are under special requirement of hill slope specified hereinabove shall be treated as an approximate

assessment. The actual lengths as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths and specifications in this Schedule-B shall not constitute a Change of Scope.



SCHEDULE – C

(See Clause 2.1)

PROJECT FACILITIES

4 Project Facilities

This schedule indicates the minimum spatial and functional requirements of the facilities to be provided on the **Project Highway (Total length of 20 km)** with an aim to cater to the envisaged demand till the end of the concession period.

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

(a) Roadside furniture

(b) Pedestrian facilities

(c) Tree plantation

(d) Bus shelters and Bus Bays

(e) Passing Places

(f) Truck lay byes and

(g) Others to be specified

5 Description of Project Facilities

Toll Plaza

NIL

Bus Bays Shelters

To ensure orderly movement of the through traffic, bus shelters have been proposed outside the residential area, away from bridges, and high embankments and not too close to the road intersections. The bus stops have been proposed on one side of the road.

Bus shelters shall be provided on the Project Highway at 2 locations as mentioned herein under. Bus shelters shall be constructed as per Manual on both sides of the Project Highway. These bus shelters will also have passenger shelter.

Details of Bus shelters

Sl. No.	Project Facility (in Pair)	Design Chainage (km)
1	Bus Shelter	32+380

Pedestrian Facilities

Pedestrian facilities shall be provided at the locations of urban sections in order to ensure safety of pedestrians while crossing in consultation with NHIDCL. This should include (a) minimum Zebra Crossing with flashing Beacon or (b) Zebra Crossing with separate pedestrian phase or (c) any other provision as approved by NHIDCL.

Landscaping

Landscape treatment of the Project Highway shall be undertaken through planting of trees and ground cover of appropriate varieties and landscaping on surplus land in the ROW. The Construction Contractor should plant at least 2000 nos. of trees with tree guard made up of MS sections.

Plantation scheme shall be prepared in consultation with the Forest Department of the Government of Nagaland, and the Independent Consultant/ NHIDCL.

Environment

The Project Highway during design, construction and maintenance during implementation period shall conform to the environmental rules and regulations in force. The Construction Contractor shall be responsible for the same.

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 excepting hair pin bend locations wherein design speed shall be 20 km/h. 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.**

S. No.	Clause	Provision as per Manual (IRC:SP:73-2015)	Modified Provision
4	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 - E
(See Clauses 2.1 and 14.2)

MAINTENANCE REQUIREMENTS

1 **Maintenance Requirements**

1.1 The Contractor shall, at all times maintain the Project Highway in accordance with the provisions of this Agreement, Applicable Laws and Applicable Permits.

1.2 The Contractor shall repair or rectify any Defect or deficiency set forth in Paragraph 2 of this Schedule-E within the time limit specified therein and any failure in this behalf shall constitute non-fulfillment of the Maintenance obligations by the Contractor. Upon occurrence of any breach hereunder, the Authority shall be entitled to effect reduction in monthly lump sum payment as set forth in Clause 14.6 of this Agreement, without prejudice to the rights of the Authority under this Agreement, including Termination thereof.

1.3 All Materials, works and construction operations shall conform to the MORTH Specifications for Road and Bridge Works, and the relevant IRC publications. Where the specifications for a work are not given, Good Industry Practice shall be adopted.

2 **Repair/rectification of Defects and deficiencies**

The obligations of the Contractor in respect of Maintenance Requirements shall include repair and rectification of the Defects and deficiencies specified in Annex - I of this Schedule-E within the time limit set forth therein.

3 **Other Defects and deficiencies**

In respect of any Defect or deficiency not specified in Annex - I of this Schedule-E, the Authority's Engineer may, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards, and any deviation or deterioration beyond the permissible limit shall be repaired or rectified by the Contractor within the time limit specified by the Authority's Engineer.

4 **Extension of time limit**

Notwithstanding anything to the contrary specified in this Schedule-E, if the nature and extent of any Defect or deficiency justifies more time for its repair or rectification than the time specified herein, the Contractor shall be entitled to additional time in conformity with Good Industry Practice. Such additional time shall be determined by the Authority's Engineer and conveyed to the Contractor and the Authority with

reasons thereof.

5 **Emergency repairs/restoration**

Notwithstanding anything to the contrary contained in this Schedule-E, if any Defect, deficiency or deterioration in the Project Highway poses a hazard to safety or risk of damage to property, the Contractor shall promptly take all reasonable measures for eliminating or minimizing such danger.

6 **Daily inspection by the Contractor**

The Contractor shall, through its engineer, undertake a daily visual inspection of the Project Highway and maintain a record thereof in a register to be kept in such form and manner as the Authority's Engineer may specify. Such record shall be kept in safe custody of the Contractor and shall be open to inspection by the Authority and the Authority's Engineer at any time during office hours.

7. Pre-monsoon inspection / Post-monsoon inspection

The Contractor shall carry out a detailed pre-monsoon inspection of all bridges, culverts and drainage system before [1st June] every year in accordance with the guidelines contained in IRC: SP : 35. Report of this inspection together with details of proposed maintenance works as required on the basis of this inspection shall be sent to the Authority's Engineer before the [10th June] every year. The Contractor shall complete the required repairs before the onset of the monsoon and send to the Authority's Engineer a compliance report. Post monsoon inspection shall be done by the [30th September] and the inspection report together with details of any damages observed and proposed action to remedy the same shall be sent to the Authority's Engineer.

8. Repairs on account of natural calamities

All damages occurring to the Project Highway on account of a Force Majeure Event or default or neglect of the Authority shall be undertaken by the Authority at its own cost. The Authority may instruct the Contractor to undertake the repairs at the rates agreed between the Parties.

Annex - I
(Schedule -E)

Repair/rectification of Defects and deficiencies

The Contractor shall repair and rectify the Defects and deficiencies specified in this Annex-I of Schedule-E within the time limit set forth in the table below.

Nature of Defects or deficiency		Time limit for repair/rectification
Roads		
a	**Carriageway and Hard shoulders**	
I	Breach or blockade	Temporary restoration of traffic within 24 hours; permanent restoration within 15 (fifteen) days
II	Roughness value exceeding 2,200 mm in a stretch of 1 km (as measured by a calibrated bump integrator)	120 (one hundred and twenty) days
III	Pot holes	24 hours
IV	Any cracks in road surface	15(fifteen) days
V	Any depressions, rutting exceeding 10 mm in road surface	30 (thirty) days
VI	Bleeding/skidding	7 (seven) days
VII	Any other defect/ distress on the road	15(fifteen) days
VIII	Damage to pavement edges	15(fifteen) days
IX	Removal of debris, dead animals	6 hours

Nature of Defects or deficiency		Time limit for repair/rectification
b	**Granular earth shoulders, side slopes, drains and culverts**	
I	Variation by more than 1 % in the prescribed slope of camber/cross fall (shall not be less than the camber on the main carriageway)	7 (seven) days
Nature of defects or deficiency		**Time limit for repair/rectificaation**
II	Edge drop at shoulders exceeding 40mm	7 (seven) days
III	Variation by more than 15% in the prescribed side (embankment) slopes	30 (thirty) days
IV	Rain cuts/gullies in slope	7 (seven) days
V	Damage to or silting of culverts and side drains	7 (seven) days
VI	Desilting of drains in urban/semi-urban areas	24 hours
VII	Railing, parapets, crash barrier	7 (seven) days (restore immediately if causing safety hazard.
c	**Road side furniture including road sign and pavement marking**	

Nature of Defects or deficiency		Time limit for repair/rectification
I	Damage to shape or position, poor visibility or loss of retro-reflectivity	48 hours
II	Painting of km stone, railing, parapets/crash barrier	As and when required /once every year
III	Damaged/missing road signs requiring replacement	7 (seven) days
IV	Damage to road mark ups	7 (seven) days
d	**Road lighting**	
I	Any major failure of the system	24 hours
II	Faults and minor failures	8 hours
e	**Trees and plantation**	
I	Obstruction in a minimum head-room of 5 m above carriageway or obstruction in visibility of road signs	24 hours
II	Removal of fallen trees from carriageway	4 hours
III	Deterioration in health of trees and bushes	Timely watering and treatment
IV	Trees and bushes requiring replacement	30 (thirty) days
V	Removal of vegetation affecting sight line and road	15 (fifteen) days

Nature of Defects or deficiency		Time limit for repair/rectification
	structures	
f	**Rest Area**	
I	Cleaning of toilets	Every 4 hours
II	Defects in electrical, water and sanitary installations	24 hours
g	**Toll Plazas**	
h	**Other project facilities and approach roads**	
I	Damage in approach roads, pedestrian facilities, truck lay-byes, bus-bays, bus -bays, cattle crossings, Traffic Aid Posts, Medical Aid Posts and service roads	15 (fifteen) days
II	Damaged vehicles or debris on the road	4 (Four) hours
III	Malfunctioning crane	4 (Four) hours
BRIDGES		
a	**Superstructures**	
I	Any damage, cracks, spalling/scaling Temporary measures Permanent measures	within 48 hours within 15 (fifteen) days or as specified by

Nature of Defects or deficiency		Time limit for repair/rectification
		the Authority's Engineer
b	**Foundation**	
I	Scouring and/or cavitation	15 (fifteen) days
c	**Piers, abutments, return walls and wing walls**	
I	Cracks and damages including settlement and tilting, spalling, scaling	30 (thirty) days
d	**Bearing (metallic) of bridges**	
I	Deformation, damages, tilting or shifting of bearings	14 (fifteen) days Greasing of metallic bearings once in a year
e	**Joints**	
I	Malfunctioning of joints	15 (fifteen) days
f	**Other items**	
I	Deforming of pads in elastomeric bearings	7 (seven) days
II	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3 (three) days
III	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)

Nature of Defects or deficiency		Time limit for repair/rectification
IV	Rain cuts or erosion of banks of the side slopes of approaches	7 (seven) days
V	Damage to wearing coat	15 (fifteen) days
VI	Damage or deterioration in Approach slabs, pitching, apron, toes, floor or guide bunds	30 (thirty) days
VII	Growth of vegetation affecting the Structure or obstructing the waterway	15 (fifteen) days
g	**Hill Roads**	
I	Damage to retaining wall/breast wall	7 (seven) days
II	Landslides requiring clearance	12 (Twelve) hours
III	Snow requiring clearance	24 (Twenty four) hours

Note: Where necessary, the Authority may modify the time limit for repair/rectification, or add to the nature of Defect or deficiency before issuing the bidding document, with the approval of the competent authority.

SCHEDULE - F
(See Clause 3.1.7(a))

APPLICABLE PERMITS

1 **Applicable Permits**

1.1 The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:

(a) Permission of the State Government for extraction of boulders from quarry;

(b) Permission of Village Panchayats and Pollution Control Board for installation of crushers;

(c) License for use of explosives;

(d) Permission of the State Government for drawing water from river/reservoir;

(e) License from inspector of factories or other competent Authority for setting up batching plant;

(f) Clearance of Pollution Control Board for setting up batching plant;

(g) Clearance of Village Panchayats and Pollution Control Board for setting up asphalt plant;

(h) Permission of Village Panchayats and State Government for borrow earth; and

(i) Any other permits or clearances required under Applicable Laws.

1.2 Applicable Permits, as required, relating to environmental protection and conservation shall have been procured by the Authority in accordance with the provisions of this Agreement.

2. The agency need to ensure compliance of AIP and FC stated in schedules 'A' Annexure – IV. The necessary certifications need to be obtained from competent local forest department.

3. Muck dumping locations in forest area to be freezed in consultation with the forest department, the necessary certifications from local competent forest department is to be submitted.

SCHEDULE - G

(See Clauses 7.1.1, 7.5.3 and 19.2)

FORM OF BANK GUARANTEE

Annex-I
(See Clause 7.1.1)
[Performance Security/Additional Performance Security]

The Managing Director,
National Highways & Infrastructural Development Corporation Ltd.
PTI Building, 3rd Floor,
4, Parliament Street
New Delhi - 110001

WHEREAS:

(A) _____ [name and address of contractor] (hereinafter called the "Contractor") and National Highways and Infrastructure Development Corporation Ltd. , (hereinafter called the "Authority") have entered into an agreement (hereinafter called the "Agreement") for the construction of **"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"** subject to and in accordance with the provisions of the Agreement

(B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the {Construction Period/ Defects Liability Period and Maintenance Period} (as defined in the Agreement) in a sum of Rs….. cr. (Rupees ……..….. crore) (**the "Guarantee Amount** ").

(C) We, …….. through our branch at ……. (the "Bank") have agreed to furnish this bank guarantee (hereinafter called the "Guarantee") by way of Performance Security.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and

without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of General Manager in the National Highways & Infrastructure Development Corporation Limited, that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfillment and/ or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the

Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Agreement or for the fulfillment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect on ……[$]. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

[$] Insert date being 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 7.2 of the Agreement).

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

12. This guarantee shall also be operatable at our…….. Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being

invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

13. Bank Guarantee has been sent to authority's bank through SFMS gateway as per the details below: -

Sl. No	Particulars	Details
1	Name of the Beneficiary	National Highways and Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Syndicate Bank, Transport Bhawan, 1st Parliament street, New Delhi-110001

Signed and sealed this ……. day of …….., 20…… at ……..
SIGNED , SEALED AND DELIVERED

For and on behalf of the bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

Notes:

(i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

(ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

Annex – II
(Schedule - G)
(See Clause 7.5.3)

Form for Guarantee for Withdrawal of Retention Money

The Managing Director,
National Highways & Infrastructural Development Corporation Ltd.
PTI Building, 3rd Floor,
4, Parliament Street
New Delhi - 110001

WHEREAS:

(A) [name and address of contractor] (hereinafter called the "Contractor") has executed an agreement (hereinafter called the "Agreement") with the National Highways and Infrastructure Development Corporation Ltd., (hereinafter called the "Authority") for the "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" subject to and in accordance with the provisions of the Agreement.

(B) In accordance with Clause 7.5.3 of the Agreement, the Contractor may withdraw the retention money (hereinafter called the "Retention Money") after furnishing to the Authority a bank guarantee for an amount equal to the proposed withdrawal.

(C) We, …….. through our branch at ……. (the "Bank") have agreed to furnish this bank guarantee (hereinafter called the "Guarantee") for the amount of Rs. --------
- cr. (Rs.----------crore) (the "**Guarantee Amount**").

NOW, THEREFORE, the Bank hereby unconditionally and irrevocably guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of General Manager in the National Highways & Infrastructure Development Corporation Limited, that the Contractor has committed default in the due and faithful performance of all or any of its obligations for under and in accordance with the

Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Retention Money and any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Retention Money.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the

Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect 90 (ninety) days after the date of the Completion Certificate specified in Clause 12.4 of the Agreement.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

12. This guarantee shall also be operatable at our…….. Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

13. Bank Guarantee has been sent to authority's bank through SFMS gateway as per the details below:-

Sl. No	Particulars	Details
1	Name of the Beneficiary	National Highways and Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659

3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Syndicate Bank, Transport Bhawan, 1st Parliament street, New Delhi-110001

Signed and sealed this ……. day of …….., 20…… at ……..
SIGNED , SEALED AND DELIVERED

For and on behalf of the bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

Notes:

(iii) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

(iv) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch

Annex – III
(Schedule - G)
(See Clause 19.2)

Form for Guarantee for Advance Payment

The Managing Director,
National Highways & Infrastructural Development Corporation Ltd.
PTI Building, 3rd Floor,
4, Parliament Street
New Delhi - 110001

WHEREAS:

(A) [name and address of contractor] (hereinafter called the "Contractor") has executed an agreement (hereinafter called the "Agreement") with the National Highways and Infrastructure Corporation Ltd., (hereinafter called the "Authority") for the **"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"** subject to and in accordance with the provisions of the Agreement

(B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing (@ Bank Rate) advance payment (herein after called " Advance Payment") equal to 10% (ten per cent) of the Contract Price; and that the Advance Payment shall be made in two installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} installment of the Advance Payment is Rs. --- --- cr. (Rupees ------ crore) and the amount of this Guarantee is Rs. ------- cr. (Rupees ------ crore) (the "Guarantee Amount")[$] .

[$] *The Guarantee Amount should be equivalent to 110% of the value of the applicable instalment.*

(C) We, …….. through our branch at ……. (the "Bank") have agreed to furnish this bank guarantee (hereinafter called the "Guarantee") for the Guarantee Amount.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and

affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid installment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the Authority, under the hand of an officer not below the rank of General Manager in the National Highways & Infrastructure Development Corporation Limited, that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the instalment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.
3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available

to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Advance Payment.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect on ****.[$] Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.

[$] Insert a date being 90 (ninety) days after the end of one year from the date of payment of the Advance payment to the Contractor (in accordance with Clause 19.2 of the Agreement).

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

12. This guarantee shall also be operatable at our…….. Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

13. Bank Guarantee has been sent to authority's bank through SFMS gateway as per the details below:-

Sl. No	Particulars	Details
1	Name of the Beneficiary	National Highways and Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Syndicate Bank, Transport Bhawan, 1st Parliament street, New Delhi-110001

Signed and sealed this ……. day of ……., 20…… at ……..
SIGNED , SEALED AND DELIVERED

For and on behalf of the bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

Notes:

i. The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

ii. The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

SCHEDULE – H

(See Clauses 10.1.4 and 19.3)

Contract Price Weightages

1.1 The Contract Price for this Agreement ……../-

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

ITEM	WEIGHTAGE IN PERCENTAGE TO THE CONTRACT PRICE	STAGE OF PAYMENT	PERCENTAGE WEIGHTAGE	PERCENTAGE WEIGHTAGE vis a vis OVERALL PROJECT
1	2	3	4	5
Road works including Culverts, widening and Repair of Culverts.	**58.56%**	***A- Widening and strengthening of existing road***		
		(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.	9.73%	5.70%
		(2) Sub-Base Course.	7.26%	4.25%
		(3) Non Bituminous Base Course.	13.22%	7.74%
		(4) Bituminous Base Course	7.50%	4.39%
		(5) Wearing Coat.	4.82%	2.82%
		(6) Widening and repair of culverts	0.00%	0.00%
		(7) Hard Shoulder	1.18%	0.69%
		B.1- Reconstruction/New 2lane realignment/bypass (Flexible 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.	9.36%	5.48%
		(2) Sub-Base Course.	3.24%	1.90%
		(3) Non Bituminous Base Course.	5.91%	3.46%
		(4) Bituminous Base Course	3.36%	1.97%
		(5) Wearing Coat.	2.15%	1.26%
		(6) Hard Shoulder	0.53%	0.31%
		B.2- Reconstruction/New 2lane realignment/bypass (Rigid pavement)		
		(1) Earthwork upto top of the Sub-grade including excavation in soil, soft rock and hard rock including clearing	0.00%	0.00%

		& grubbing with required site clearance etc.		
		(2) Sub-Base Course.	0.00%	0.00%
		(3) Dry Lean Concrete (DLC) Course	0.00%	0.00%
		(4) Pavement Quality Control (PQC) Course	0.00%	0.00%
		C.1-Reconstruction /New Service road (Flexible 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%	0.00%
		(2) Sub-Base Course.	0.00%	0.00%
		(3) Non Bituminous Base Course.	0.00%	0.00%
		(4) Bituminous Base Course	0.00%	0.00%
		(5) Wearing Coat.	0.00%	0.00%
		C.2-Reconstruction /New Service road (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%	0.00%
		(2) Sub-Base Course.	0.00%	0.00%
		(3) Dry Lean Concrete (DLC) Course	0.00%	0.00%
		(4) Pavement Quality Control (PQC) Course	0.00%	0.00%
		D-Re-construction and New culverts on existing road, realignment, bypasses.		
		(1) Culverts (Length < 6m)	31.75%	18.59%
Minor Bridges /Underpasses/ Overpasses	**6.03%**	***A.1-Widening and Repair of Minor Bridges (length>6m and <60m)***		
		(1) Minor Bridges	0.00%	0.00%
		A.2-New Minor Bridges (length >6m and <60m)		
		(1) **Foundation + Sub Structure** : On completion of the foundation work including foundation for wing and return walls, abutments, piers up to the abutment/pier cap	66.17%	3.99%
		(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.	22.89%	1.38%

		(3) **Approaches**: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	10.95%	0.66%
		(4) **Guide Bunds and River Training Works**: On completion of Guide Bunds and river Training works complete in all respects.	0.00%	0.00%
		B.1-Widening and Repair of underpasses/overpasses		
		(1) Underpasses / Overpasses	0.00%	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%	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 facility complete in all respects as specified.	0.00%	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%	0.00%
Major Bridge (length >60m works and ROB/RUB/elevated sections /flyovers including vaiducts, if any	**0.00%**	**A.1-Widening and repairs of Major Bridges**		
		(1) Foundation	0.00%	0.00%
		(2) Sub-structure	0.00%	0.00%
		(3) Super-structure (including bearings)	0.00%	0.00%
		(4) Wearing Coat including expansion joints	0.00%	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road marking etc	0.00%	0.00%

		(6) wing walls/return walls	0.00%	0.00%
		(7) Guide Bunds, River Training works etc	0.00%	0.00%
		(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	0.00%
		A.2-New Major Bridges		
		(1) Foundation	0.00%	0.00%
		(2) Sub-structure	0.00%	0.00%
		(3) Super-structure (including bearings)	0.00%	0.00%
		(4) Wearing Coat including expansion joints	0.00%	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road marking etc	0.00%	0.00%
		(6) wing walls/return walls	0.00%	0.00%
		(7) Guide Bunds, River Training works etc	0.00%	0.00%
		(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	0.00%
		B.1-Widening and Repair of ***(a) ROB*** ***(b) RUB***		
		(1) Foundation	0.00%	0.00%
		(2) Sub-structure	0.00%	0.00%
		(3) Super-structure (including bearings)	0.00%	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%	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%	0.00%
		(6) wing walls/return walls	0.00%	0.00%
		(7) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	0.00%
		B.2-New ROB/RUB ***(a) ROB*** ***(b) RUB***		
		(1) Foundation	0.00%	0.00%
		(2) Sub-structure	0.00%	0.00%

		(3) Super-structure (including bearings)	0.00%	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%	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%	0.00%
		(6) wing walls/return walls	0.00%	0.00%
		(7) Approaches (including Retaining walls/Reinforced earth wall, stone pitching and protection works)	0.00%	0.00%
		C.1-Widening and repair of Elevated Section/Flyovers/Grade Separators		
		(1) Foundation	0.00%	0.00%
		(2) Sub-structure	0.00%	0.00%
		(3) Super-structure (including bearings)	0.00%	0.00%
		(4) Wearing Coat including expansion joints	0.00%	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%	0.00%
		(6) wing walls/return walls	0.00%	0.00%
		(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%	0.00%
		C.2-New Elevated Section/Flyovers/Grade Separators		
		(1) Foundation	0.00%	0.00%
		(2) Sub-structure	0.00%	0.00%
		(3) Super-structure (including bearings)	0.00%	0.00%
		(4) Wearing Coat including expansion joints	0.00%	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%	0.00%
		(6) wing walls/return walls	0.00%	0.00%
		(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%	0.00%
Other Works	**35.41%**			
		(i)Toll Plaza	0.00%	0.00%
		(ii)Road side drain	6.13%	2.17%
		(iii) Road signs, marking, Km stones, Safety devices etc.		

		(a) Pavement Marking	3.81%	1.35%
		(b) Crash Barrier/ W metal crash Barrier	1.55%	0.55%
		(c) Traffic Sign	0.85%	0.30%
		(d) Road Boundary stone, km Stone, 5th km stone and hectometre stone	0.08%	0.03%
		(e) Traffic blinker LED delineator, stud, reflective payment marker, tree reflector	4.18%	1.48%
		(f) Traffic impact Attenuators at Abutments and Piers traffic island	0.00%	0.00%
		(g) Road furniture (overhead signboard etc.)	0.00%	0.00%
		(h) Others including construction of median & median kerb with channel, paint, rumble strip, Road side Plantation etc.	0.03%	0.01%
		(iv)Project facilities	0.00%	0.00%
		(a)Bus bays & Bus Shelter	0.14%	0.05%
		(b)Truck lay-byes	0.00%	0.00%
		(c,) Rest areas	0.00%	0.00%
		(d) Others	0.00%	0.00%
		(e) Junctions (Major & Minor)	0.00%	0.00%
		(v) Road side Plantation	0.00%	0.00%
		(vi) Repair of protection works other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs /RUBs	0.00%	0.00%
		(vii) Safety and traffic management during construction	0.00%	0.00%
		(viii) Slope Protection Works as special requirement for hill road		
		(a) Hydro Seeding of Cut Slopes in Soil	0.06%	0.02%
		(b)Seeding and Mulching with Jute net all along the perpetual slide locations	4.41%	1.56%
		(c) Catch water Drain	0.25%	0.09%
		(d) Gabion Structure on hill side/valley side of varying height between 1 to 6 metre depending upon the slope	62.95%	22.29%
		(e) Reinforced earth wall	3.98%	1.41%
		(e) Breast wall	9.52%	3.37%

		(f) Sub Surface drain with perforated pipe for collection of seepage water to avoid sinking of pavement	0.08%	0.03%
		(g) Parapet wall	1.98%	0.70%
		(h) Toe wall	0.00%	0.00%
		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. 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.
(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.	5.70%	
(2) Sub-Base Course.	4.25%	
(3) Non Bituminous Base Course.	7.74%	
(4) Bituminous Base Course	4.39%	
(5) Wearing Coat.	2.82%	
(6) Widening and repair of culverts	0.00%	Cost of completed culverts shall be determined pro rate 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	0.69%	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 full length or 5(five) Km. length, whichever is less. 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.
(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.	5.48%	
(2) Sub-Base Course.	1.90%	
(3) Non Bituminous Base Course.	3.46%	
(4) Bituminous Base Course	1.97%	
(5) Wearing Coat.	1.26%	
(6) Hard Shoulder	0.31%	
B.2- Reconstruction/New 2lane realignment/bypass (Rigid pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rate basis on completion of a stage in full length or 5(five) km. length, whichever is less. 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.
(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%	
C.1-Reconstruction /New Service road (Flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rate 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) 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 rate 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) Course	0.00%	
D-Re-construction and New culverts on existing road, realignment, bypasses.		Cost of each culvert shall be determined on pro rate basis with respect to the total number of culverts. Payment shall be made on the completion of at least five culverts.
(1) Culverts (Length < 6m)	18.59%	

@. 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 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 rate 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	3.99%	(i) **Foundation + Sub Structure** : Cost of each minor bridge shall be determined on pro rate basis with respect to the total linear length(m) of the minor bridges. Payment against foundation + sub structure shall be made on pro rate 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 structures in all respects including wearing coat, bearing, expansion joint, hand rail, crash barriers, road signs & markings, tests on completion etc. Complete in all respect.	1.38%	(ii) **Super Structure**: Payment shall be made on pro rate 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.	0.66%	(iii) **Approaches**: Payment shall be made on pro rate 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 rate 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 rate 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 rate basis with respect to the total linear length (m) of the Underpasses/Overpasses. Payment against foundation + sub structure shall be made on pro rate 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 structures 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 facility complete in all respects as specified as specified.	0.00%	(ii) **Super Structure:** Payment shall be made on pro rate 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 rate 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 rate basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro rate 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 rate 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 rate basis on completion of a stage i.e completion of super structure including bearing 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 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 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 rate basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro rate 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 rate 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 atlest two sub structure of abutment/piers upto abutment/pier cal level of the major bridge.
(iii) Super-structure (including bearings)	0.00%	(iii) **Sup Structure** : Payment shall be be made on pro rate 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 rate basis with respect to the total liner length (m) of the ROBs/RUBs. Payment foundation shall be made on pro rate 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 foundation 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 rate 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 rate 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 (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	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 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 rate basis with respect to the total liner length (m) of the ROBs/RUBs. Payment foundation shall be made on pro rate 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 foundation 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 rate 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 rate 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 (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	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 including drainage facility complete in all respects as specified as specified.
(v) Miscellaneous items like hand rails, crash barriers, road marking etc	0.00%	(v) **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, 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 rate basis with respect to the total liner length (m) of the structure Payment against foundation shall be made on pro rate 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 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 rate 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 structure 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 rate 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 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 rate basis with respect to the total liner length (m) of the structure Payment against foundation shall be made on pro rate 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 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 rate 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 structure 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 rate 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 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 rate basis with respect to the total of all toll plazas.
(ii)Road side drain	2.17%	Unit of measurement is linear length in Km. Payment shall be made on pro rate basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(iii) Road signs, marking, Km stones, Safety devices etc.		
(a) Pavement Marking	1.35%	
(b) Crash Barrier/ W metal crash Barrier	0.55%	
(c) Traffic Sign	0.30%	
(d) Road Boundary stone, km Stone, 5th km stone and hectometre stone	0.03%	
(e) Traffic blinker LED delineator, stud, reflective payment marker, tree reflector	1.48%	
(f) Traffic impact Attenuators at Abutments and Piers traffic island	0.00%	
(g) Road furniture (overhead signboard etc.)	0.00%	
(h) Others including construction of median & median kerb with channel, paint, rumble strip, Road side Plantation etc.	0.01%	
(iv)Project facilities	0.00%	Payment shall be made on pro rate basis for completed facilities.
(a)Bus bays & Bus Shelter	0.05%	
(b)Truck lay-byes	0.00%	
(c,) Rest areas	0.00%	
(d) Others	0.00%	
(e) Junctions (Major & Minor)	0.00%	
(v) Road side Plantation	0.00%	Unit of measurement is linear

(vi) Repair of protection works other than approaches to the bridges elevated section/flyovers/grade separators and ROBs/RUBs	0.00%	length. Payment shall be made on pro rate basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(vii) Safety and traffic management during construction	0.00%	Payment shall be made on pro rate 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 rate basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(a)Hydro Seeding of Cut Slopes in Soil	0.02%	
(b)Seeding and Mulching with Jute net all along the perpetual slide locations	1.56%	
(c) Catch water Drain	0.09%	
(d) Gabion Structure on hill side/valley side of varying height between 1 to 6 metre depending upon the slope	22.29%	
(e) Reinforced earth wall	1.41%	
(e) Breast wall	3.37%	
(f) Sub Surface drain with perforated pipe for collection of seepage water to avoid sinking of pavement	0.03%	
(g) Parapet wall	0.70%	
(h) Toe wall	0.00%	

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

SCHEDULE - I
(See Clause 10.2.4)
DRAWINGS

1 **Drawings**

In compliance of the obligations set forth in Clause 10.2 of this Agreement, the Contractor shall furnish to the Authority's Engineer, free of cost, all Drawings listed in Annex-I of this Schedule-I.

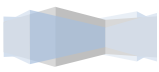
2 **Additional Drawings**

If the Authority's Engineer determines that for discharging its duties and functions under this Agreement, it requires any drawings other than those listed in Annex-I, it may by notice require the Contractor to prepare and furnish such drawings forthwith. Upon receiving a requisition to this effect, the Contractor shall promptly prepare and furnish such drawings to the Authority's Engineer, as if such drawings formed part of Annex-I of this Schedule-I.

Annex - I
(Schedule - I)

List of Drawings

[Note : The Contractor is required to furnish all the drawings as per the manual and clause 10.2]



SCHEDULE - J
(See Clause 10.3.2)

PROJECT COMPLETION SCHEDULE

1 **Project Completion Schedule**

During Construction period, the Contractor shall comply with the requirements set forth in this Schedule-J for each of the Project Milestones and the Scheduled Completion Date. Within 15 (fifteen) days of the date of each Project Milestone, the Contractor shall notify the Authority of such compliance along with necessary particulars thereof. Further, Ministry circular no. RW/NH-39013/23/2015/NHDP-IVA dated-16.08.2017 shall constitute a part of Contract Agreement.

2 **Project Milestone-I**

2.1 Project Milestone-I shall occur on the date falling on the 180th (one hundred and eightieth) day from the Appointed Date (the "Project Milestone-I").

2.2 Prior to the occurrence of Project Milestone-I, the Contractor shall have commenced construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 10% (ten per cent) of the Contract Price.

3 **Project Milestone-II**

3.1 Project Milestone-II shall occur on the date falling on the 550th (Five hundred and fiftieth) day from the Appointed Date (the "Project Milestone-II").

3.2 Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 40% (Fourty per cent) of the Contract Price.

4 **Project Milestone-III**

4.1 Project Milestone-III shall occur on the date falling on the 915th (Nine hundred and fifteenth) day from the Appointed Date (the "Project Milestone- III").

4.2 Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 80% (Eighty per cent) of the Contract Price.

5 **Scheduled Completion Date**

5.1 The Scheduled Completion Date shall occur on the 1095th (one thousand ninety fifth) day from the Appointed Date.

5.2 On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

6 **Extension of time**

Upon extension of any or all of the aforesaid Project Milestones or the Scheduled Completion Date, as the case may be, under and in accordance with the provisions of this Agreement, the Project Completion Schedule shall be deemed to have been amended accordingly.

SCHEDULE – K
(See Clause 12.1.2)
Tests on Completion

1 **Schedule for Tests**

1.1 The Contractor shall, no later than 30 (thirty) days prior to the likely completion of construction, notify the Authority's Engineer and the Authority of its intent to subject the Project Highway to Tests, and no later than 10 (ten) days prior to the actual date of Tests, furnish to the Authority's Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Works.

1.2 The Contractor shall notify the Authority's Engineer of its readiness to subject the Project Highway to Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the Authority's Engineer shall, in consultation with the Contractor, determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority's Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule-K.

2 **Tests**

2.1 Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include all the tests required for quality control or as decided in consultation with the Authority's Engineer at the time of physical tests as per relevant IRC code Manual .

2.2 Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator and the maximum permissible roughness for purposes of this Test shall be 2,000 (two thousand) mm for each kilometer.

2.3 Tests for bridges: All major and minor bridges shall be subjected to the rebound hammer and ultrasonic pulse velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on Non destructive Testing Techniques, at two spots in every span, to be chosen at random by the Authority's Engineer. Bridges with a span of 15 (fifteen) metres or more shall also be subjected to load testing.

2.4 Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and

Standards.

2.5 Environmental audit: The Authority's Engineer shall carry out a check to determine conformity of the Project Highway with the environmental requirements set forth in Applicable Laws and Applicable Permits.

2.6 Safety Audit: The Authority's Engineer shall carry out, or cause to be carried out, a safety audit to determine conformity of the Project Highway with the safety requirements and Good Industry Practice.

3 **Agency for conducting Tests**

The Authority's Engineer or such other agency or person shall conduct all Tests set forth in this Schedule-K as it may specify in consultation with the Authority.

4 **Completion Certificate**

Upon successful completion of Tests, the Authority's Engineer shall issue the Completion Certificate in accordance with the provisions of Article 12.

SCHEDULE - L
(See Clause 12.2 and 12.4)
PROVISIONAL CERTIFICATE

1 I, ……. (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated ……. (the "Agreement"), 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"** on Engineering, Procurement and Construction (EPC) basis through …… (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been undertaken to determine compliance of the Project Highway with the provisions of the Agreement.

2 Works that are incomplete on account of Time Extension have been specified in the Punch List appended hereto, and the Contractor has agreed and accepted that it shall complete all such works in the time and manner set forth in the Agreement. In addition, certain minor works are incomplete and these are not likely to cause material inconvenience to the Users of the Project Highway or affect their safety. The Contractor has agreed and accepted that as a condition of this Provisional Certificate, it shall complete such minor works within 30 (thirty) days hereof. These minor works have also been specified in the aforesaid Punch List.

3 In view of the foregoing, I am satisfied that the **"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"** can be safely and reliably placed in service of the Users thereof, and in terms of the Agreement, the Project Highway is hereby provisionally declared fit for entry into operation on this the …… day of …….. 20…...

ACCEPTED, SIGNED, SEALED And DELIVERED For and on behalf of CONTRACTOR by:	SIGNED, SEALED and DELIVERED For and on behalf of AUTHORITY ENGINEER by:

COMPLETION CERTIFICATE

1 I, ……. (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated …… (the "Agreement"), 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"** on Engineering, Procurement and Construction (EPC) basis through ……. (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

2 It is certified that, in terms of the aforesaid Agreement, all works forming part of Project Highway have been completed, and the Project Highway is hereby declared fit for entry into operation on this the …… day of …… 20…..

SIGNED, SEALED AND DELIVERED

For and on behalf of the Authority's Engineer by:

(Signature)

(Name)

(Designation)

(Address)

SCHEDULE - M
(See Clauses 14.6, 15.2 and 19.7)

PAYMENT REDUCTION FOR NON-COMPLIANCE

1. Payment reduction for non-compliance with the Maintenance Requirements

1.1 Monthly lump sum payments for maintenance shall be reduced in the case of non-compliance with the Maintenance Requirements set forth in Schedule-E.

1.2 Any deduction made on account of non-compliance with the Maintenance Requirements shall not be paid even after compliance subsequently. The deductions shall continue to be made every month until compliance is done.

1.3 The Authority's Engineer shall calculate the amount of payment reduction on the basis of weightage in percentage assigned to non-conforming items as given in Paragraph 2.

2. Percentage reductions in lump sum payments

2.1 The following percentages shall govern the payment reduction:

Sl No	Item/Defect/Deficiency	Percentage (%)
a	**Carriageway/Pavement**	
I	Potholes, cracks, other surface defects	15
II	Repair of edges, rutting	5
b	**Road, Embankment, Cuttings,Shoulders**	
I	Edge drop, inadequate crossfall, undulations, settlement, potholes, ponding, obstructions	10
II	Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees	5
c	**Bridges and Culverts**	
I	Desilting, Cleaning, vegetation, growth, damaged pitching,	20

Sl No	Item/Defect/Deficiency	Percentage (%)
	flooring, parapets, wearing course, footpaths, any damage to foundations	
II	Any Defects in superstructures, bearings and sub-structures	10
III	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers.	5
d	**Roadside drains**	
I	Cleaning and repair of drains	5
e	**Road Furniture**	
I	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th km stones.	5
f	**Miscellaneous Items**	
I	Removal of dead animals, broken down/accidented vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10
II	Any other Defects in accordance with paragraph 1.	5
g	**Defects in Other Project Facilities**	5

The amount to be deducted from monthly lump-sum payment for non compliance of particular item shall be calculated as under:

R=P/IOO x M x L1/L

Where P = Percentage of particular item/Defect/deficiency for deduction

M = Monthly lump-sum payment in accordance with the Bid

L1 = Non-complying Length

L = Total length of the road

R = Reduction (the amount to be deducted for non-compliance for a particular item/Defect/deficiency)

The total amount of reduction shall be arrived at by summation of reductions for such items/Defects/deficiency or non-compliance.

For any Defect in a part of one kilometre, the non-conforming length shall be taken as one kilometre.

SCHEDULE - N
(See Clause 18.1.1)

SELECTION OF AUTHORITY'S ENGINEER

1 **Selection of Authority's Engineer**

1.1 The provisions of the Model Request for Proposal for Selection of Technical Consultants, issued by the Ministry of Finance in May 2009, or any substitute thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority's Engineer.

1.2 In the event of termination of the Technical Consultants appointed in accordance with the provisions of Paragraph 1.1, the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of this Schedule -N.

2 **Terms of Reference**

The Terms of Reference for the Authority's Engineer (the "TOR") shall substantially conform with Annex 1 to this Schedule N.

3 **Appointment of Government entity as Authority's Engineer**

Notwithstanding anything to the contrary contained in this Schedule, the Authority may in its discretion appoint a government-owned entity as the Authority's Engineer; provided that such entity shall be a body corporate having as one of its primary functions the provision of consulting, advisory and supervisory services for engineering projects; provided further that a government-owned entity which is owned or controlled by the Authority shall not be eligible for appointment as Authority's Engineer.

Annex – I
(Schedule - N)
TERMS OF REFERENCE FOR AUTHORITY'S ENGINEER

1 **Scope**

1.1 These Terms of Reference (the "TOR") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "Agreement), which has been entered into between the National Highways and Infrastructure Development Corporation Ltd. (the "Authority") and ..... (the "Contractor") for the **"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"** on Engineering, Procurement, Construction (EPC) basis, and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

1.2 The TOR shall apply to construction and maintenance of the Project Highway.

2 **Definitions and interpretation**

2.1 The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Agreement.

2.2 References to Articles, Clauses and Schedules in this TOR shall, except where the context otherwise requires, be deemed to be references to the Articles, Clauses and Schedules of the Agreement, and references to Paragraphs shall be deemed to be references to Paragraphs of this TOR.

2.3 The rules of interpretation stated in Clauses 1.2, 1.3 and 1.4 of the Agreement shall apply, mutatis mutandis, to this TOR.

3. General

3.1 The Authority's Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.

3.2 The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement, but subject to obtaining prior written approval of the Authority before determining:

(a) any Time Extension;

(b) any additional cost to be paid by the Authority to the Contractor;

(c) the Termination Payment; or

(d) any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding Rs. 5,000,000 (Rs. fifty lakh).

3.3 The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.

3.4 The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2.

3.5 The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.

3.6 In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

4 **Construction Period**

4.1 During the Construction Period, the Authority's Engineer shall review the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1.6. The Authority's Engineer shall complete such review and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and

Standards.

4.2 The Authority's Engineer shall review any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.

4.3 The Authority's Engineer shall review the Quality Assurance Plan submitted by the Contractor and shall convey its comments to the Contractor within a period of 21 (twenty-one) days stating the modifications, if any, required thereto.

4.4 The Authority's Engineer shall complete the review of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.

4.5 The Authority's Engineer shall grant written approval to the Contractor, where necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Project Highway for purposes of maintenance during the Construction Period in accordance with the provisions of Clause 10.4.

4.6 The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.

4.7 The Authority's Engineer shall inspect the Construction Works and the Project Highway and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular, the Authority's Engineer shall include in its Inspection Report, the compliance of the recommendations made by the Safety Consultant.

4.8 The Authority's Engineer shall conduct the pre-construction review of manufacturer's test reports and standard samples of manufactured Materials, and such other Materials as the Authority's Engineer may require.

4.9 For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4.9, the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any modification/substitution thereof shall be deemed to be tests

conforming to Good Industry Practice for quality assurance.

4.10 The Authority's Engineer shall test check at least 20 (twenty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

4.11 The timing of tests referred to in Paragraph 4.9, and the criteria for acceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.

4.12 In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works, the Authority's Engineer shall require the Contractor to carry out remedial measures.

4.13 The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project Highway, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 shall apply.

4.14 In the event that the Contractor fails to achieve any of the Project Milestones, the Authority's Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Authority's Engineer shall determine that completion of the Project Highway is not feasible within the time specified in the Agreement, it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority's Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.

4.15 The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.4.

4.16 Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measure, the Authority's Engineer shall

inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.

4.17 In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.

4.18 The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate or Provisional Certificate, as the case may be. For carrying out its functions under this Paragraph 4.18 and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

5. Maintenance Period

5.1 The Authority's Engineer shall aid and advise the Contractor in the preparation of its monthly Maintenance Programme and for this purpose carry out a joint monthly inspection with the Contractor.

5.2 The Authority's Engineer shall undertake regular inspections, at least once every month, to evaluate compliance with the Maintenance Requirements and submit a Maintenance Inspection Report to the Authority and the Contractor.

5.3 The Authority's Engineer shall specify the tests, if any, that the Contractor shall carry out, or cause to be carried out, for the purpose of determining that the Project Highway is in conformity with the Maintenance Requirements. It shall monitor and review the results of such tests and the remedial measures, if any, taken by the Contractor in this behalf.

5.4 In respect of any defect or deficiency referred to in Paragraph 3 of Schedule-E, the Authority's Engineer shall, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards and shall also specify the time limit for repair or rectification of any deviation or deterioration beyond the permissible limit.

5.5 The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of the Project Highway for undertaking maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5

(five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure, the Authority's Engineer shall monitor the reopening of such lane(s), and in case of delay, determine the Damages payable by the Contractor to the Authority under Clause 14.5.

6 **Determination of costs and time**

6.1 The Authority's Engineer shall determine the costs, and/or their reasonableness, that are required to be determined by it under the Agreement.

6.2 The Authority's Engineer shall determine the period of Time Extension that is required to be determined by it under the Agreement.

6.3 The Authority's Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause 18.5.

7. Payments

7.1 The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2.4 (d).

7.2 Authority's Engineer shall -

(a) within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment, pending issue of the Interim Payment Certificate; and

(b) within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor, after adjustments in accordance with the provisions of Clause 19.10.

7.3 The Authority's Engineer shall, within 15 (fifteen) days of receipt of the Monthly Maintenance Statement from the Contractor pursuant to Clause 19.6, verify the Contractor's monthly statement and certify the amount to be paid to the Contractor in accordance with the provisions of the Agreement.

7.4 The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the

provisions of Clause 19.16.

8. Other duties and functions

The Authority's Engineer shall perform all other duties and functions as specified in the Agreement.

9 **Miscellaneous**

9.1 A copy of all communications, comments, instructions, Drawings or Documents sent by the Authority's Engineer to the Contractor pursuant to this TOR, and a copy of all the test results with comments of the Authority's Engineer thereon, shall be furnished by the Authority's Engineer to the Authority forthwith.

9.2 The Authority's Engineer shall retain at least one copy each of all Drawings and Documents received by it, including 'as-built' Drawings, and keep them in its safe custody.

9.3 Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as-built Drawings, in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Project Highway as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project Highway and setback lines, if any, of the buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.

9.4 The Authority's Engineer, if called upon by the Authority or the Contractor or both, shall mediate and assist the Parties in arriving at an amicable settlement of any Dispute between the Parties.

9.5 The Authority's Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.

SCHEDULE - O

(*See Clauses 19.4.1, 19.6.1, and 19.8.1***)**

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

(a) The estimated amount for the Works executed in accordance with Clause 19.3.1 subsequent to the last claim;

(b) Amounts reflecting adjustments in price for the aforesaid claim;

(c) The estimated amount of each Change of Scope Order executed subsequent to the last claim

(d) Amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2.3 (a);

(e) Total of (a), (b), (c) and (d) above;

(f) Deductions:

(i) Any amount to be deducted in accordance with the provisions of the Agreement

except taxes;

(ii) Any amount towards deduction of taxes; and

(iii) Total of (i) and (ii) above.

(g) Net claim: (e) – (f) (iii);

(h) The amounts received by the Contractor up to the last claim:

(i) For the Works executed (excluding Change of Scope orders);

(ii) For Change of Scope Orders, and

(iii) Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

(a) the monthly payment admissible in accordance with the provisions of the Agreement;

(b) the deductions for maintenance work not done;

(c) net payment for maintenance due, (a) minus (b);

(d) amounts reflecting adjustments in price under Clause 19.12; and

(e) amount towards deduction of taxes

3. Contractor's claim for Damages

Note: The Contractor shall submit its claims in a form acceptable to the Authority.

SCHEDULE - P

(See Clause 20.1)

INSURANCE

1. Insurance during Construction Period

1.1 The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the Completion Certificate, the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:

(a) Insurance of Works, Plant and Materials and an additional sum of 15 (fifteen) per cent of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and

(b) Insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.

1.2 The insurance under paragraph 1.1 (a) and (b) above shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

2. Insurance for Contractor's Defects Liability

The Contractor shall effect and maintain insurance cover for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and which arises from a cause occurring prior to the issue of the Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage to property

3.1 The Contractor shall insure against its liability for any loss, damage, death or bodily injury, or damage to any property (except things insured under Paragraphs 1 and 2 of this

Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences. The insurance cover shall be not less than the project cost.

3.2 The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor's performance of this Agreement excluding:

(a) The Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and

(b) Damage which is an unavoidable result of the Contractor's obligations to execute the Works.

4. Insurance to be in joint names

The insurance under paragraphs 1 to 3 above shall be in the joint names of the Contractor and the Authority.