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

Schedules

FOR

"Construction of two-Lane with hard shoulders of Pfutsero – Phek Road on EPC basis from existing Km 40.090 to Km 65.300 [Design Km. 40.000 to Km. 62.558] (Design Length –22.558 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 **Pfutsero-Phek Road** on EPC basis from Existing km 40+090 to km 65+300 (Design **km 40+000 to km 62+558)**in the state of Nagaland under SARDP-NE, Project Highway shall include the land, buildings, structures and road works as described in **Annex-I** of this Schedule-A.

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

1.2 The dates of handing over the Right of Way to the Contractor are specified in **Annex-II** of this Schedule-A.

1.3 An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority's Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2.1 of this Agreement.

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

1.5 The status of the environment clearances obtained or awaited is given in **Annex-IV**.

Annex I
(Schedule-A)

1. Site

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

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

The site for the instant work i.e. design Km 40.00 to design Km 62.558 is either single lane or proposed for re-alignments. The Site of the [Single Lane] Project Highway comprises of **Pfutsero - Phek** road commencing from Existing km 40.090 to km 65+300 (Design **km 40+000 to km 62+558)** 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 Phek district of Nagaland State.

The project corridor passes through Chosaba village.

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	Construction Carried out by Previous Contractor
	From	To	Length	From	To	Length		
1	0+000	0+305	305	0+000	0+300	300	Widening and Strengthening	No Work done
2	0+305	0+343	38	0+300	0+330	30	Realignment	No Work done
3	0+343	0+971	628	0+330	0+920	590	Widening and Strengthening	No Work done
4	0+971	1+024	53	0+920	0+970	50	Realignment	No Work done
5	1+024	1+891	867	0+970	1+840	870	Widening and Strengthening	No Work done
6	1+891	1+987	96	1+840	1+920	80	Realignment	No Work done
7	1+987	2+300	313	1+920	2+220	300	Widening and Strengthening	No Work done

Sl no	Existing Chainage			Design Chainage			Improvement Proposal	Construction Carried out by Previous Contractor
	From	To	Length	From	To	Length		
8	2+300	2+458	158	2+220	2+360	140	Realignment	No Work done
9	2+458	2+510	52	2+360	2+415	55	Widening and Strengthening	No Work done
10	2+510	3+055	545	2+415	2+940	525	Widening and Strengthening	Earthwork in Excavation
11	3+055	3+095	40	2+940	2+960	20	Realignment	Earthwork in Excavation
12	3+095	4+250	1155	2+960	4+090	1130	Widening and Strengthening	Earthwork in Excavation
13	4+250	4+295	45	4+090	4+110	20	Realignment	Earthwork in Excavation
14	4+295	5+360	1065	4+110	5+160	1050	Widening and Strengthening	Earthwork in Excavation
15	5+360	5+700	340	5+160	5+520	360	Realignment	Earthwork in Excavation
16	5+700	6+415	715	5+520	6+240	720	Widening and Strengthening	Earthwork in Excavation
17	6+415	6+445	30	6+240	6+270	30	Realignment	Earthwork in Excavation
18	6+445	6+505	60	6+270	6+320	50	Widening and Strengthening	Earthwork in Excavation
19	6+505	6+543	38	6+320	6+350	30	Realignment	Earthwork in Excavation
20	6+543	6+750	207	6+350	6+610	260	Widening and Strengthening	Earthwork in Excavation
21	6+750	6+800	50	6+610	6+660	50	Realignment	Earthwork in Excavation
22	6+800	8+000	1200	6+660	7+950	1290	Widening and Strengthening	Earthwork in Excavation
23	8+000	8+130	130	7+950	8+100	150	Realignment	Earthwork in Excavation
24	8+130	9+250	1120	8+100	9+245	1145	Widening and Strengthening	Earthwork in Excavation
25	9+250	9+556	306	9+245	9+590	345	Widening and Strengthening	No Work done
26	9+556	9+615	59	9+590	9+630	40	Realignment	No Work done
27	9+615	10+010	395	9+630	10+020	390	Widening and Strengthening	No Work done
28	10+010	11+150	1140	10+020	11+155	1135	Widening and Strengthening	Earthwork in Excavation
29	11+150	11+200	50	11+155	11+220	65	Widening and Strengthening	No Work done
30	11+200	11+246	46	11+220	11+300	80	Widening and Strengthening	Earthwork in Excavation
31	11+246	11+268	22	11+300	11+350	50	Realignment	Earthwork in Excavation
32	11+268	11+331	63	11+350	11+420	70	Widening and Strengthening	Earthwork in Excavation
33	11+331	11+434	103	11+420	11+500	80	Realignment	Earthwork in Excavation
34	11+434	11+580	146	11+500	11+650	150	Widening and Strengthening	Earthwork in Excavation
35	11+580	11+741	161	11+650	11+800	150	Realignment	Earthwork in Excavation
36	11+741	12+080	339	11+800	12+130	330	Widening and Strengthening	Earthwork in Excavation

Sl no	Existing Chainage			Design Chainage			Improvement Proposal	Construction Carried out by Previous Contractor
	From	To	Length	From	To	Length		
37	12+080	12+320	240	12+130	12+380	250	Widening and Strengthening	No Work done
38	12+320	12+650	330	12+380	12+690	310	Widening and Strengthening	Earthwork in Excavation
39	12+650	12+740	90	12+690	12+785	95	Widening and Strengthening	No Work done
40	12+740	12+753	13	12+785	12+800	15	Widening and Strengthening	Earthwork in Excavation
41	12+753	12+800	47	12+800	12+850	50	Realignment	Earthwork in Excavation
42	12+800	12+852	52	12+850	12+900	50	Widening and Strengthening	Earthwork in Excavation
43	12+852	12+940	88	12+900	12+935	35	Realignment	Earthwork in Excavation
44	12+940	13+000	60	12+935	12+960	25	Widening and Strengthening	Earthwork in Excavation
45	13+000	13+030	30	12+960	12+990	30	Widening and Strengthening	No Work done
46	13+030	13+070	40	12+990	13+030	40	Widening and Strengthening	Earthwork in Excavation
47	13+070	13+270	200	13+030	13+230	200	Widening and Strengthening	No Work done
48	13+270	13+510	240	13+230	13+465	235	Widening and Strengthening	Earthwork in Excavation
49	13+510	13+600	90	13+465	13+550	85	Widening and Strengthening	No Work done
50	13+600	13+640	40	13+550	13+590	40	Realignment	No Work done
51	13+640	13+665	25	13+590	13+630	40	Realignment	Earthwork in Excavation
52	13+665	14+160	495	13+630	14+120	490	Widening and Strengthening	Earthwork in Excavation
53	14+160	14+210	50	14+120	14+180	60	Widening and Strengthening	No Work done
54	14+210	14+482	272	14+180	14+560	380	Widening and Strengthening	Earthwork in Excavation
55	14+482	14+505	23	14+560	14+580	20	Realignment	Earthwork in Excavation
56	14+505	14+940	435	14+580	15+000	420	Widening and Strengthening	Earthwork in Excavation
57	14+940	14+995	55	15+000	15+050	50	Realignment	Earthwork in Excavation
58	14+995	15+055	60	15+050	15+110	60	Widening and Strengthening	Earthwork in Excavation
59	15+055	15+115	60	15+110	15+170	60	Realignment	Earthwork in Excavation
60	15+115	15+684	569	15+170	15+750	580	Widening and Strengthening	Earthwork in Excavation
61	15+684	15+730	46	15+750	15+770	20	Realignment	Earthwork in Excavation
62	15+730	16+250	520	15+770	16+255	485	Widening and Strengthening	Earthwork in Excavation
63	16+250	17+010	760	16+255	17+010	755	Widening and Strengthening	No Work done
64	17+010	18+042	1032	17+010	18+050	1040	Widening and Strengthening	Earthwork in Excavation
65	18+042	18+065	23	18+050	18+070	20	Realignment	Earthwork in Excavation

Sl no	Existing Chainage			Design Chainage			Improvement Proposal	Construction Carried out by Previous Contractor
	From	To	Length	From	To	Length		
66	18+065	18+750	685	18+070	18+760	690	Widening and Strengthening	Earthwork in Excavation
67	18+750	18+800	50	18+760	18+800	40	Realignment	Earthwork in Excavation
68	18+800	19+100	300	18+800	19+130	330	Widening and Strengthening	Earthwork in Excavation
69	19+100	19+200	100	19+130	19+275	145	Realignment	Earthwork in Excavation
70	19+200	20+500	1300	19+275	20+630	1355	Widening and Strengthening	Earthwork in Excavation
71	20+500	20+560	60	20+630	20+720	90	Widening and Strengthening	No Work done
72	20+560	21+330	770	20+720	21+470	750	Widening and Strengthening	Earthwork in Excavation
73	21+330	21+350	20	21+470	21+500	30	Realignment	Earthwork in Excavation
74	21+350	21+700	350	21+500	21+840	340	Widening and Strengthening	Earthwork in Excavation
75	21+700	21+720	20	21+840	21+870	30	Realignment	Earthwork in Excavation
76	21+720	21+890	170	21+870	22+050	180	Widening and Strengthening	Earthwork in Excavation
77	21+890	21+970	80	22+050	22+140	90	Widening and Strengthening	No Work done
78	21+970	22+010	40	22+140	22+215	75	Realignment	No Work done
79	22+010	22+125	115	22+215	22+330	115	Realignment	Earthwork in Excavation
80	22+125	22+300	175	22+330	22+500	170	Widening and Strengthening	Earthwork in Excavation
81	22+300	22+355	55	22+500	22+550	50	Realignment	Earthwork in Excavation
82	22+355	23+010	655	22+550	23+200	650	Widening and Strengthening	Earthwork in Excavation
83	23+010	24+619	1609	23+200	24+800	1600	Widening and Strengthening	No Work done
84	24+619	24+679	60	24+800	24+870	70	Realignment	No Work done
85	24+679	25+000	321	24+870	25+200	330	Widening and Strengthening	No Work done
86	25+000	25+435	435	25+200	25+660	460	Widening and Strengthening	Earthwork in Excavation
87	25+435	25+500	65	25+660	25+720	60	Realignment	Earthwork in Excavation
88	25+500	25+835	335	25+720	26+110	390	Widening and Strengthening	Earthwork in Excavation
89	25+835	25+898	63	26+110	26+160	50	Realignment	Earthwork in Excavation
90	25+898	26+010	112	26+160	26+270	110	Widening and Strengthening	Earthwork in Excavation
91	26+010	26+860	850	26+270	27+110	840	Widening and Strengthening	No Work done
92	26+860	27+010	150	27+110	27+260	150	Realignment	No Work done
93	27+010	27+200	190	27+260	27+500	240	Widening and Strengthening	No Work done
94	27+200	27+255	55	27+500	27+560	60	Realignment	No Work done

Sl no	Existing Chainage			Design Chainage			Improvement Proposal	Construction Carried out by Previous Contractor
	From	To	Length	From	To	Length		
95	27+255	27+358	103	27+560	27+700	140	Widening and Strengthening	No Work done
96	27+358	27+409	51	27+700	27+750	50	Realignment	No Work done
97	27+409	29+141	1732	27+750	29+460	1710	Widening and Strengthening	No Work done
98	29+141	29+225	84	29+460	29+540	80	Realignment	No Work done
99	29+225	30+000	775	29+540	30+320	780	Widening and Strengthening	No Work done
100	30+000	30+205	205	30+320	30+550	230	Widening and Strengthening	Earthwork in Excavation
101	30+205	31+465	1260	30+550	31+700	1150	Realignment	Earthwork in Excavation
102	31+465	31+760	295	31+700	32+000	300	Widening and Strengthening	Earthwork in Excavation
103	31+760	32+704	944	32+000	32+960	960	Widening and Strengthening	Earthwork in Excavation
104	32+704	32+745	41	32+960	33+000	40	Realignment	Earthwork in Excavation
105	32+745	33+010	265	33+000	33+250	250	Widening and Strengthening	Earthwork in Excavation
106	33+010	33+565	555	33+250	33+790	540	Widening and Strengthening	No Work done
107	33+565	33+698	133	33+790	33+910	120	Realignment	No Work done
108	33+698	33+843	145	33+910	34+050	140	Widening and Strengthening	No Work done
109	33+843	33+900	57	34+050	34+100	50	Realignment	No Work done
110	33+900	34+174	274	34+100	34+350	250	Widening and Strengthening	No Work done
111	34+174	34+449	275	34+350	34+600	250	Realignment	No Work done
112	34+449	35+018	569	34+600	35+160	560	Widening and Strengthening	No Work done
113	35+018	35+062	44	35+160	35+200	40	Realignment	No Work done
114	35+062	36+010	948	35+200	36+150	950	Widening and Strengthening	No Work done
115	36+010	37+730	1720	36+150	37+850	1700	Widening and Strengthening	Earthwork in Excavation
116	37+730	37+782	52	37+850	37+880	30	Realignment	Earthwork in Excavation
117	37+782	39+000	1218	37+880	39+050	1170	Widening and Strengthening	Earthwork in Excavation
118	39+000	40+988	1988	39+050	40+850	1800	Widening and Strengthening	No Work done
119	40+988	41+070	82	40+850	40+940	90	Realignment	No Work done
120	41+070	41+391	321	40+940	41+240	300	Widening and Strengthening	No Work done
121	41+391	41+435	44	41+240	41+290	50	Realignment	No Work done
122	41+435	43+210	1775	41+290	43+060	1770	Widening and Strengthening	No Work done
123	43+210	43+252	42	43+060	43+100	40	Realignment	No Work done

Sl no	Existing Chainage			Design Chainage			Improvement Proposal	Construction Carried out by Previous Contractor
	From	To	Length	From	To	Length		
124	43+252	43+816	564	43+100	43+660	560	Widening and Strengthening	No Work done
125	43+816	43+860	44	43+660	43+700	40	Realignment	No Work done
126	43+860	44+125	265	43+700	43+960	260	Widening and Strengthening	No Work done
127	44+125	44+178	53	43+960	44+010	50	Realignment	No Work done
128	44+178	44+225	47	44+010	44+050	40	Widening and Strengthening	No Work done
129	44+225	44+262	37	44+050	44+090	40	Realignment	No Work done
130	44+262	44+370	108	44+090	44+190	100	Widening and Strengthening	No Work done
131	44+370	44+385	15	44+190	44+210	20	Realignment	No Work done
132	44+385	44+951	566	44+210	44+800	590	Widening and Strengthening	No Work done
133	44+951	44+993	42	44+800	44+840	40	Realignment	No Work done
134	44+993	45+087	94	44+840	44+940	100	Widening and Strengthening	No Work done
135	45+087	45+120	33	44+940	44+970	30	Realignment	No Work done
136	45+120	45+518	398	44+970	45+350	380	Widening and Strengthening	No Work done
137	45+518	45+570	52	45+350	45+400	50	Realignment	No Work done
138	45+570	45+621	51	45+400	45+450	50	Widening and Strengthening	No Work done
139	45+621	45+678	57	45+450	45+500	50	Realignment	No Work done
140	45+678	46+000	322	45+500	45+810	310	Widening and Strengthening	No Work done
141	46+000	46+045	45	45+810	45+850	40	Realignment	No Work done
142	46+045	46+157	112	45+850	45+950	100	Widening and Strengthening	No Work done
143	46+157	46+182	25	45+950	45+980	30	Realignment	No Work done
144	46+182	46+595	413	45+980	46+390	410	Widening and Strengthening	No Work done
145	46+595	46+663	68	46+390	46+460	70	Realignment	No Work done
146	46+663	47+206	543	46+460	47+030	570	Widening and Strengthening	No Work done
147	47+206	47+235	29	47+030	47+060	30	Realignment	No Work done
148	47+235	47+754	519	47+060	47+550	490	Widening and Strengthening	No Work done
149	47+754	47+820	66	47+550	47+620	70	Realignment	No Work done
150	47+820	47+935	115	47+620	47+740	120	Widening and Strengthening	No Work done
151	47+935	47+988	53	47+740	47+790	50	Realignment	No Work done
152	47+988	48+200	212	47+790	47+990	200	Widening and Strengthening	No Work done

Sl no	Existing Chainage			Design Chainage			Improvement Proposal	Construction Carried out by Previous Contractor
	From	To	Length	From	To	Length		
153	48+200	48+338	138	47+990	48+100	110	Realignment	No Work done
154	48+338	48+423	85	48+100	48+190	90	Widening and Strengthening	No Work done
155	48+423	48+504	81	48+190	48+260	70	Realignment	No Work done
156	48+504	49+190	686	48+260	48+950	690	Widening and Strengthening	No Work done
157	49+190	49+334	144	48+950	49+000	50	Realignment	No Work done
158	49+334	49+795	461	49+000	49+450	450	Widening and Strengthening	No Work done
159	49+795	49+830	35	49+450	49+500	50	Realignment	No Work done
160	49+830	49+977	147	49+500	49+650	150	Widening and Strengthening	No Work done
161	49+977	52+056	2079	49+650	49+820	170	Losami Realignment	No Work done
162	52+056	53+490	1434	49+820	51+260	1440	Widening and Strengthening	No Work done
163	53+490	53+550	60	51+260	51+300	40	Realignment	No Work done
164	53+550	53+720	170	51+300	51+470	170	Widening and Strengthening	No Work done
165	53+720	53+868	148	51+470	51+530	60	Realignment	No Work done
166	53+868	55+836	1968	51+530	53+460	1930	Widening and Strengthening	No Work done
167	55+836	55+860	24	53+460	53+480	20	Realignment	No Work done
168	55+860	55+900	40	53+480	53+530	50	Widening and Strengthening	No Work done
169	55+900	55+930	30	53+530	53+560	30	Realignment	No Work done
170	55+930	55+970	40	53+560	53+610	50	Widening and Strengthening	No Work done
171	55+970	56+010	40	53+610	53+650	40	Realignment	No Work done
172	56+010	56+062	52	53+650	53+700	50	Widening and Strengthening	No Work done
173	56+062	56+131	69	53+700	53+750	50	Realignment	No Work done
174	56+131	56+593	462	53+750	54+210	460	Widening and Strengthening	No Work done
175	56+593	56+700	107	54+210	54+300	90	Realignment	No Work done
176	56+700	58+382	1682	54+300	55+980	1680	Widening and Strengthening	No Work done
177	58+382	58+407	25	55+980	56+010	30	Realignment	No Work done
178	58+407	59+060	653	56+010	56+550	540	Widening and Strengthening	No Work done
179	59+060	59+096	36	56+550	56+580	30	Realignment	No Work done
180	59+096	59+594	498	56+580	57+090	510	Widening and Strengthening	No Work done
181	59+594	59+631	37	57+090	57+120	30	Realignment	No Work done

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

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

2. Chainage References (Existing Vs Design)

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

Sl. No.	Existing Chainage (Km)	Design Chainage (Km)	Remarks
1.	40+900	40+000	
2.	40+988	40+850	
3.	41+391	41+240	
4.	42+400	42+260	
5.	43+860	43+700	
6.	44+951	44+800	
7.	45+621	45+450	
8.	46+595	46+390	
9.	47+820	47+620	
10.	48+504	48+260	
11.	49+830	49+500	
12.	52+056	49+820	
13.	53+490	51+260	
14.	54+600	52+230	
15.	55+836	53+460	
16.	56+593	54+210	
17.	57+125	54+710	
18.	58+407	56+010	
19.	59+631	57+120	
20.	60+448	57+940	
21.	61+544	59+000	
22.	62+782	60+080	
23.	63+930	61+260	
24.	64+549	61+900	
25.	65+300	62+588	

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	40+090	65+300	40+000	62+558	22558	-	No ROW available in realignment stretches of total 1.98 km. as given in para 2.1.3 of Annexure-1 Schedule-B.

4. Carriageway

The present carriageway of the Project Highway is substandard single lane

configuration. The type of the existing pavement is flexible.

Sl. No.	Existing Chainage (km)		Design Chainage (km)		Length in m (Design)	Existing Lane Width* (m)	Remarks
	From	To	From	To			
1	40+090	65+300	40+000	62+558	22558	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.	Road	Existing	Type of Structures	No. of Spans	Total

No.	Segment	Chainage (km)	Foundation	Sub-Structure	Super Structure	with Span Length (m)	Width (m)
NIL							

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 the 136 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	40+185	PIPE	1X0.6	7.50	Inadequate and in Fair Condition
2	40+500	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
3	40+577	PIPE	1X0.9	8.00	Inadequate and in Fair Condition
4	40+702	PIPE	1X0.6	7.50	Inadequate and in Fair Condition
5	41+030	PIPE	1X0.6	7.50	Inadequate and in Fair Condition
6	41+098	PIPE	1X0.9	-	Inadequate and in Poor Condition
7	41+150	PIPE	1X0.6	5.00	Inadequate and in Fair Condition
8	41+265	PIPE	1X0.6	6.00	Inadequate and in Poor Condition
9	41+360	PIPE	1X0.9	7.00	Inadequate and in Fair Condition
10	41+485	PIPE	1X0.9	7.50	Inadequate and in Good Condition
11	41+640	PIPE	1X0.9	6.70	Inadequate and in Poor Condition
12	41+905	PIPE	1X0.9	6.70	Inadequate and in Poor Condition
13	41+995	PIPE	1X0.9	7.00	Inadequate and in Fair Condition
14	42+071	PIPE	1X0.6	7.00	Inadequate and in Poor Condition

Sl. No.	Existing Chainage (km)	Type of Structure	Span / Dia. (m)	Width of Structure (m)	Remarks
15	42+200	PIPE	1X0.9	7.00	Inadequate and in Fair Condition
16	42+290	PIPE	1X0.6	6.50	Inadequate and in Fair Condition
17	42+385	PIPE	1X0.9	7.00	Inadequate and in Poor Condition
18	42+830	PIPE	1X0.9	5.00	Inadequate and in Poor Condition
19	42+865	PIPE	1X0.9	7.00	Inadequate and in Poor Condition
20	42+965	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
21	43+115	PIPE	1X0.9	7.50	Inadequate and in Fair Condition
22	43+283	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
23	43+535	PIPE	Blocked / Not Visible	-	Blocked / Not Visible
24	43+575	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
25	43+745	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
26	43+872	PIPE	1X0.6	7.50	Inadequate and in Fair Condition
27	44+010	PIPE	1X0.6	7.00	Inadequate and in Poor Condition
28	44+103	PIPE	1X0.9	6.00	Inadequate and in Poor Condition
29	44+180	PIPE	1X0.9	3.50	Inadequate and in Poor Condition
30	44+255	PIPE	1X0.9	-	Inadequate and in Poor Condition
31	44+277	PIPE	1X0.9	-	Inadequate and in Poor Condition
32	44+318	PIPE	1X0.9	7.00	Inadequate and in Fair Condition
33	44+378	PIPE	1X0.6	6.50	Inadequate and in Fair Condition
34	44+540	PIPE	1X0.9	6.00	Inadequate and in Poor Condition
35	44+575	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
36	44+625	PIPE	1X0.9	6.00	Inadequate and in Poor Condition
37	44+660	PIPE	1X0.9	7.10	Inadequate and in Fair Condition
38	44+772	PIPE	1X0.6	6.00	Inadequate and in Fair Condition
39	44+940	PIPE	1X0.6	6.00	Inadequate and in Fair Condition
40	45+073	PIPE	1X1.5	9.20	Adequate and in Fair Condition
41	45+145	PIPE	1X1.5	9.40	Inadequate and in Fair Condition
42	45+260	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
43	45+320	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
44	45+490	PIPE	1X0.6	7.20	Inadequate and in Fair Condition
45	45+595	PIPE	1X0.9	6.00	Inadequate and in Fair Condition
46	45+685	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
47	45+745	PIPE	1X1.5	12.50	Adequate and in Fair Condition
48	45+800	PIPE	1X0.6	7.10	Inadequate and in Fair Condition
49	45+837	PIPE	1X0.9	7.00	Inadequate and in Fair Condition
50	45+958	PIPE	1X0.9	9.50	Inadequate and in Fair Condition
51	46+040	PIPE	1X1.5	9.00	Inadequate and in Fair Condition

Sl. No.	Existing Chainage (km)	Type of Structure	Span / Dia. (m)	Width of Structure (m)	Remarks
52	46+145	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
53	46+248	PIPE	1X0.6	7.00	Adequate and in Fair Condition
54	46+345	PIPE	1X0.9	7.00	Inadequate and in Fair Condition
55	46+554	PIPE	1X0.6	6.00	Inadequate and in Fair Condition
56	46+800	PIPE	1X0.6	6.00	Inadequate and in Fair Condition
57	46+940	PIPE	1X0.6	7.00	Inadequate and in Poor Condition
58	47+060	PIPE	1X0.45	6.00	Inadequate and in Fair Condition
59	47+237	PIPE	1X0.6	7.20	Inadequate and in Fair Condition
60	47+542	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
61	47+603	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
62	47+710	PIPE	1X0.9	12.30	Inadequate and in Fair Condition
63	47+755	PIPE	1X0.6	7.40	Inadequate and in Poor Condition
64	47+850	PIPE	1X1.5	3.50	Inadequate and in Poor Condition
65	48+020	PIPE	1X0.9	-	Inadequate and in Poor Condition
66	48+130	PIPE	1X0.6	7.00	Inadequate and in Poor Condition
67	48+415	PIPE	1X0.9	9.00	Inadequate and in Fair Condition
68	48+557	PIPE	1X0.6	6.80	Inadequate and in Poor Condition
69	48+590	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
70	48+750	PIPE	1X0.9	7.00	Inadequate and in Fair Condition
71	48+905	PIPE	1X0.6	6.00	Inadequate and in Fair Condition
72	48+985	PIPE	1X0.6	6.00	Inadequate and in Fair Condition
73	49+153	PIPE	1X0.6	6.50	Inadequate and in Fair Condition
74	49+255	PIPE	1X0.6	6.00	Inadequate and in Poor Condition
75	49+355	PIPE	1X0.6	6.50	Inadequate and in Fair Condition
76	49+473	PIPE	1X0.6	6.50	Inadequate and in Fair Condition
77	49+602	PIPE	1X0.6	7.50	Inadequate and in Fair Condition
78	49+740	PIPE	1X0.6	6.50	Inadequate and in Fair Condition
79	49+825	PIPE	1X1.5	12.00	Adequate and in Fair Condition
80	49+895	PIPE	1X0.6	5.00	Inadequate and in Fair Condition
81	49+980	PIPE	1X0.9	9.20	Inadequate and in Fair Condition
82	52+170	PIPE	1X0.6	6.00	Inadequate and in Fair Condition
83	52+352	PIPE	1X0.6	5.50	Inadequate and in Fair Condition
84	52+680	PIPE	1X0.7	7.00	Inadequate and in Fair Condition
85	52+720	PIPE	1X0.9	6.50	Inadequate and in Fair Condition
86	52+870	PIPE	1X0.9	7.00	Adequate and in Fair Condition
87	53+000	PIPE	1X0.6	6.00	Inadequate and in Fair Condition
88	53+212	PIPE	1X0.9	9.60	Inadequate and in Fair Condition
89	53+357	PIPE	1X0.9	10.00	Inadequate and in Fair Condition

Sl. No.	Existing Chainage (km)	Type of Structure	Span / Dia. (m)	Width of Structure (m)	Remarks
90	53+497	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
91	53+675	PIPE	1X1.2	10.00	Inadequate and in Fair Condition
92	53+878	PIPE	1X0.9	6.00	Inadequate and in Poor Condition
93	53+975	PIPE	1X0.9	6.50	Inadequate and in Fair Condition
94	54+455	PIPE	1X0.9	7.20	Inadequate and in Fair Condition
95	54+500	PIPE	1X0.9	10.00	Inadequate and in Poor Condition
96	54+615	PIPE	1X0.9	7.00	Inadequate and in Poor Condition
97	54+685	PIPE	1X0.9	7.00	Inadequate and in Fair Condition
98	54+970	PIPE	1X0.9	8.40	Inadequate and in Fair Condition
99	54+995	PIPE	1X0.6	6.00	Inadequate and in Fair Condition
100	55+420	SLAB	1X1.5	9.10	Inadequate and in Fair Condition
101	55+835	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
102	55+890	PIPE	1X0.9	8.30	Adequate and in Fair Condition
103	55+940	SLAB	1X3.0	7.00	Inadequate and in Fair Condition
104	56+156	PIPE	1X1.2	8.00	Inadequate and in Fair Condition
105	56+545	PIPE	1X0.9	5.00	Adequate and in Poor Condition
106	56+570	PIPE	1X0.9	7.00	Adequate and in Good Condition
107	56+710	PIPE	1X0.9	10.00	Inadequate and in Fair Condition
108	56+932	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
109	57+078	PIPE	1X1.2	9.50	Inadequate and in Fair Condition
110	57+100	PIPE	1X0.6	9.00	Inadequate and in Fair Condition
111	57+260	PIPE	1X0.9	9.00	Inadequate and in Fair Condition
112	58+425	PIPE	1X0.6	11.00	Inadequate and in Fair Condition
113	58+780	PIPE	1X0.9	7.00	Adequate and in Fair Condition
114	58+870	PIPE	1X0.9	10.80	Inadequate and in Fair Condition
115	59+095	PIPE	1X0.6	7.60	Inadequate and in Fair Condition
116	59+545	PIPE	1X0.45	7.00	Inadequate and in Poor Condition
117	59+920	PIPE	1X0.6	7.00	Inadequate and in Fair Condition
118	60+005	PIPE	1X1.2	10.00	Inadequate and in Fair Condition
119	60+400	SLAB	1X1.0	10.00	Adequate and in Fair Condition
120	60+420	PIPE	1X1.0	10.20	Adequate and in Fair Condition
121	60+790	PIPE	1X0.9	9.40	Adequate and in Fair Condition
122	61+025	PIPE	1X0.9	8.00	Inadequate and in Fair Condition
123	61+210	PIPE	1X0.9	7.00	Inadequate and in Fair Condition
124	61+630	PIPE	1X0.6	40.00	Adequate and in Good Condition
125	62+005	PIPE	1X0.45	7.00	Inadequate and in Poor Condition
126	62+205	PIPE	1X0.45	7.00	Inadequate and in Poor Condition
127	62+270	PIPE	1X1.0	9.00	Adequate and in Fair Condition

Sl. No.	Existing Chainage (km)	Type of Structure	Span / Dia. (m)	Width of Structure (m)	Remarks
128	62+320	PIPE	1X0.7	7.00	Inadequate and in Fair Condition
129	63+153	PIPE	1X0.45	9.00	Inadequate and in Poor Condition
130	63+570	PIPE	1X0.9	7.20	Adequate and in Fair Condition
131	63+767	PIPE	1X0.9	9.00	Adequate and in Fair Condition
132	63+925	SLAB	1X2.0	7.80	Adequate and in Fair Condition
133	64+112	PIPE	1X0.45	8.00	Inadequate and in Poor Condition
134	64+515	PIPE	1X0.6	11.10	Inadequate and in Fair Condition
135	64+590	PIPE	1X1.2	9.00	Inadequate and in Fair Condition
136	64+700	PIPE	1X1.2	16.70	Inadequate and in Fair Condition

12. Bus Bays

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

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

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	51+000	53+800	Left		Earthen (Kutcha)
2	56+000	57+500	Left		Earthen (Kutcha)
3	61+200	61+600	Left	Masonry	
4	61+600	65+300	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
1	61+620	59+050	At Grade	-	NH			
2	65+247	62+558	At Grade	-	NH			

(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
1	50+000	49+650	T Junction	

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)	40+000	62+558	22.558		24 to 50	At Appointed Date
ii) Balance Right of way (width)	40+000	62+558	22.558		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

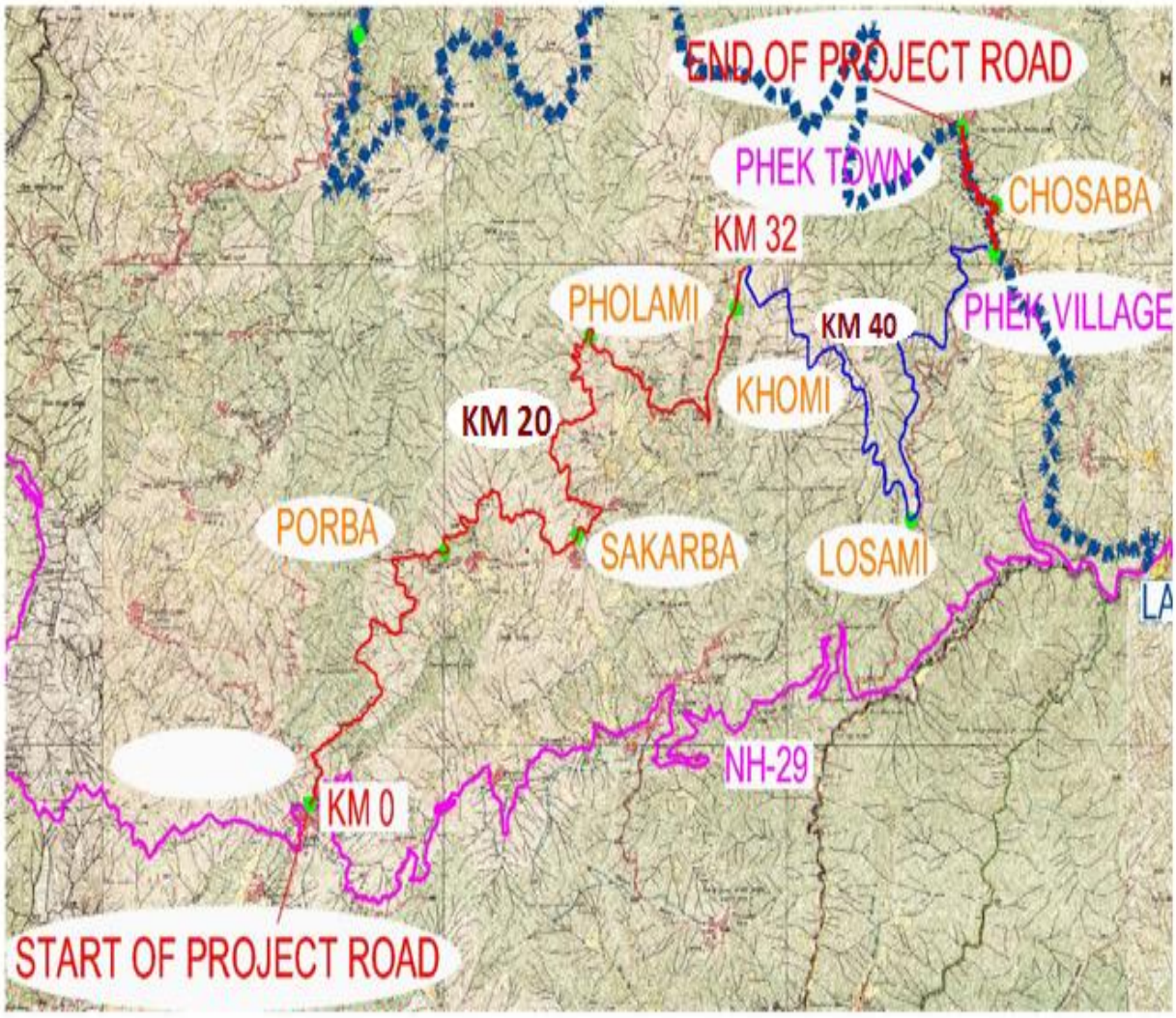
Annex-IV
(Schedule-A)

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 bays 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:

Sl. No.	Existing Chainage (Km)		Design Chainage (Km)		Length (m)
	From	To	From	To	
1	40+988	41+070	40+850	40+940	90
2	41+391	41+435	41+240	41+290	50
3	43+210	43+252	43+060	43+100	40
4	43+816	43+860	43+660	43+700	40
5	44+125	44+178	43+960	44+010	50
6	44+225	44+262	44+050	44+090	40
7	44+370	44+385	44+190	44+210	20
8	44+951	44+993	44+800	44+840	40
9	45+087	45+120	44+940	44+970	30
10	45+518	45+570	45+350	45+400	50
11	45+621	45+678	45+450	45+500	50
12	46+000	46+045	45+810	45+850	40
13	46+157	46+182	45+950	45+980	30

Sl. No.	Existing Chainage (Km)		Design Chainage (Km)		Length (m)
	From	To	From	To	
14	46+595	46+663	46+390	46+460	70
15	47+206	47+235	47+030	47+060	30
16	47+754	47+820	47+550	47+620	70
17	47+935	47+988	47+740	47+790	50
18	48+200	48+338	47+990	48+100	110
19	48+423	48+504	48+190	48+260	70
20	49+190	49+334	48+950	49+000	50
21	49+795	49+830	49+450	49+500	50
22	53+490	53+550	51+260	51+300	40
23	53+720	53+868	51+470	51+530	60
24	55+836	55+860	53+460	53+480	20
25	55+900	55+930	53+530	53+560	30
26	55+970	56+010	53+610	53+650	40
27	56+062	56+131	53+700	53+750	50
28	56+593	56+700	54+210	54+300	90
29	58+382	58+407	55+980	56+010	30
30	59+060	59+096	56+550	56+580	30
31	59+594	59+631	57+090	57+120	30
32	59+830	59+880	57+320	57+350	30
33	59+926	59+980	57+400	57+460	60
34	60+415	60+448	57+900	57+940	40
35	61+544	61+759	59+000	59+060	60
36	62+340	62+387	59+650	59+700	50
37	62+705	62+782	60+010	60+080	70
38	63+894	63+930	61+210	61+260	50
39	64+271	64+297	61+600	61+630	30
40	64+549	64+669	61+900	62+000	100
Total					1980

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

Sl. No.	Design Chainage(m)		Side	Remarks
	From	To		
1	40+293.289	40+413.104	LEFT	Radius<40
2	40+898.586	40+991.060	RIGHT	Radius<40
3	41+293.146	41+319.393	RIGHT	Radius<40
4	42+693.038	42+748.475	RIGHT	Radius<40
5	43+267.837	43+342.673	LEFT	Radius<40

Sl. No.	Design Chainage(m)		Side	Remarks
	From	To		
6	44+108.361	44+174.900	RIGHT	Radius<40
7	44+437.114	44+507.423	RIGHT	Radius<40
8	44+761.903	44+858.494	LEFT	Radius<40
9	45+860.246	45+928.470	RIGHT	Radius<40
10	46+267.317	46+326.793	LEFT	Radius<40
11	46+813.515	46+887.325	LEFT	Radius<40
12	47+012.217	47+086.711	LEFT	Radius<40
13	47+271.380	47+354.302	RIGHT	Radius<40
14	47+354.302	47+464.630	LEFT	Radius<40
15	47+464.630	47+559.983	RIGHT	Radius<40
16	47+981.070	48+028.209	LEFT	Radius<40
17	48+302.996	48+365.415	RIGHT	Radius<40
18	48+890.011	49+011.127	LEFT	Radius<40
19	49+223.742	49+292.534	RIGHT	Radius<40
20	49+362.317	49+451.471	LEFT	Radius<40
21	49+451.471	49+542.961	RIGHT	Radius<40
22	51+246.598	51+323.642	LEFT	Radius<40
23	51+470.565	51+533.327	LEFT	Radius<40
24	52+084.599	52+141.149	RIGHT	Radius<40
25	53+005.492	53+102.646	RIGHT	Radius<40
26	53+211.868	53+260.696	LEFT	Radius<40
27	53+515.737	53+606.925	RIGHT	Radius<40
28	54+030.167	54+052.648	LEFT	Radius<40
29	54+257.132	54+339.200	RIGHT	Radius<40
30	54+641.209	54+711.082	RIGHT	Radius<40
31	54+812.211	54+872.821	RIGHT	Radius<40
32	55+311.180	55+421.652	LEFT	Radius<40
33	57+519.762	57+573.394	LEFT	Radius<40
34	57+828.394	57+932.719	RIGHT	Radius<40
35	58+394.629	58+466.882	LEFT	Radius<40
36	59+022.584	59+062.192	LEFT	Radius<40
37	59+540.677	59+573.745	RIGHT	Radius<40
38	59+946.940	60+025.989	LEFT	Radius<40
39	60+555.892	60+619.240	RIGHT	Radius<40
40	60+711.489	60+770.534	LEFT	Radius<40

2.2 Design speed

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].

2.3 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		Length (km)	Width (m)
	From	To		
1.	40+000	62+558	22.558	24 – 50 m

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

2.4 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]

2.5 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

2.6 Lateral and vertical clearances at underpasses

2.6.1 Lateral and vertical clearances at underpasses and provision of guardrails/crash barriers shall be as per paragraph 2.11 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				

2.7 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				

2.8 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				

2.9 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		

2.10 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 22.558 km) shall be 2-lane carriageway with 3m wide Hard shoulders facility including both sides.

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

TCS I (a): Typical Cross Section for project road sections in Hill / Valley locations
TCS I (b): Typical Cross Section for Project Road Sections requiring Fill on Valley Side
TCS II: Typical Cross Section for project road section on ridge
TCS III: Typical Cross Section for Project Road Sections through Box Cut Locations
TCS IV: Typical Cross Section for Project Road Section through Town with Hill Valley Combination
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	40+865	40+905	40	III	
2	40+905	43+975	3070	I	
3	43+975	44+005	30	III	

SL. No.	Chainage (km)		Length (m)	Type	Remarks
	From	To			
4	44+005	46+400	2395	I	TCS V to be provided in road section through town/ built up area on ridge
5	46+400	46+435	35	III	
6	46+435	47+755	1320	I	
7	47+755	47+785	30	III	
8	47+785	49+670	1885	I	
9	49+670	49+760	90	III	
10	49+760	51+500	1740	I	
11	51+500	51+510	10	III	
12	51+510	62+250	10740	I	
13	62+250	62+558	308	IV	

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.

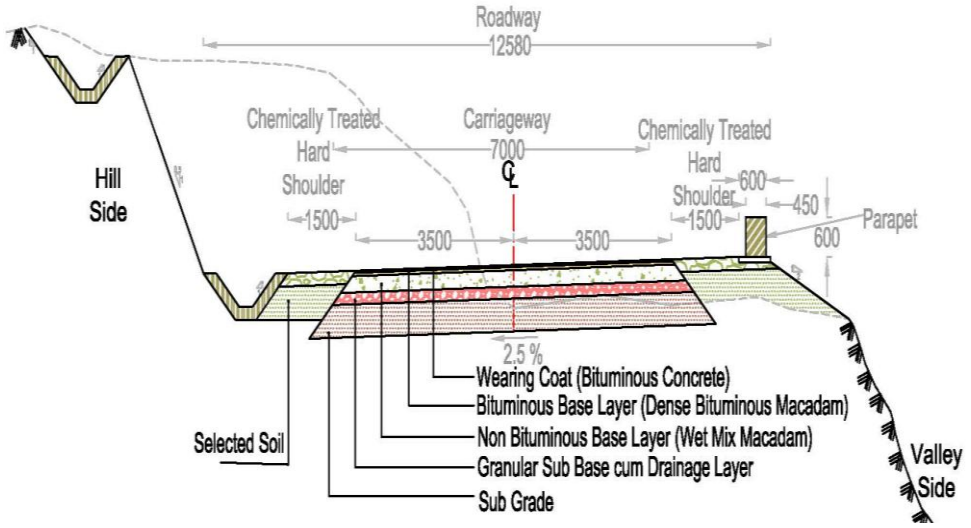


Figure B-1: Typical Cross Section in Hill/Valley Locations, TCS I(a)

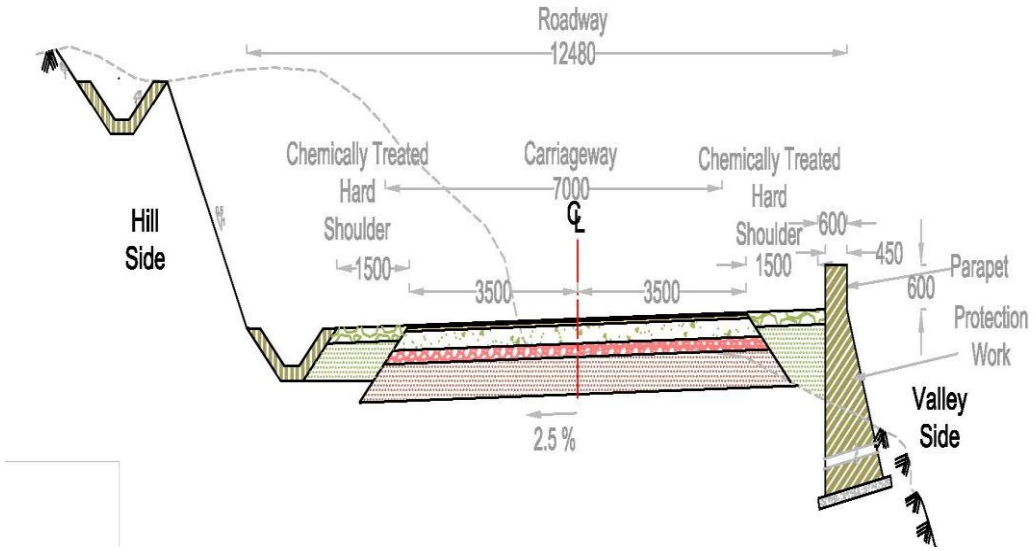


Figure B-2: TCS for Project Road Sections requiring Fill on Valley Side TCS I(b)

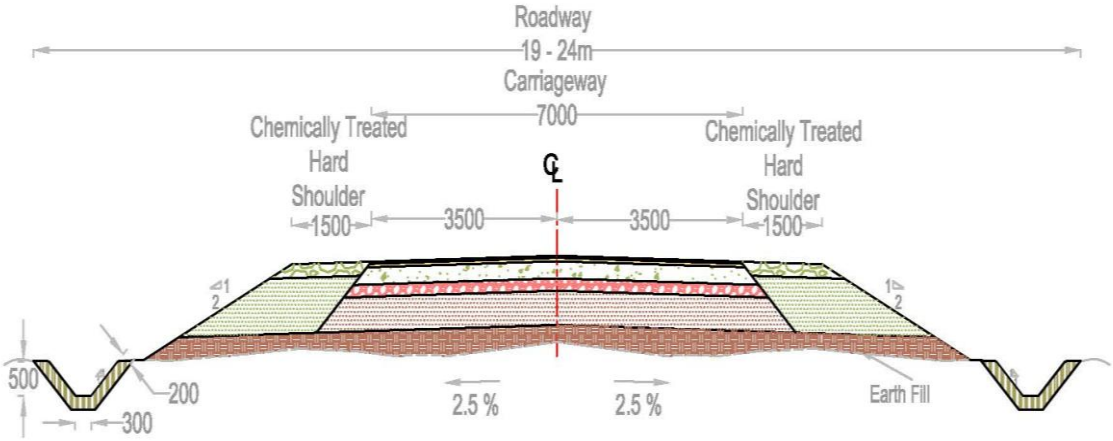


Figure B-3: TCS for Project Road Section on Ridge (TCS II)

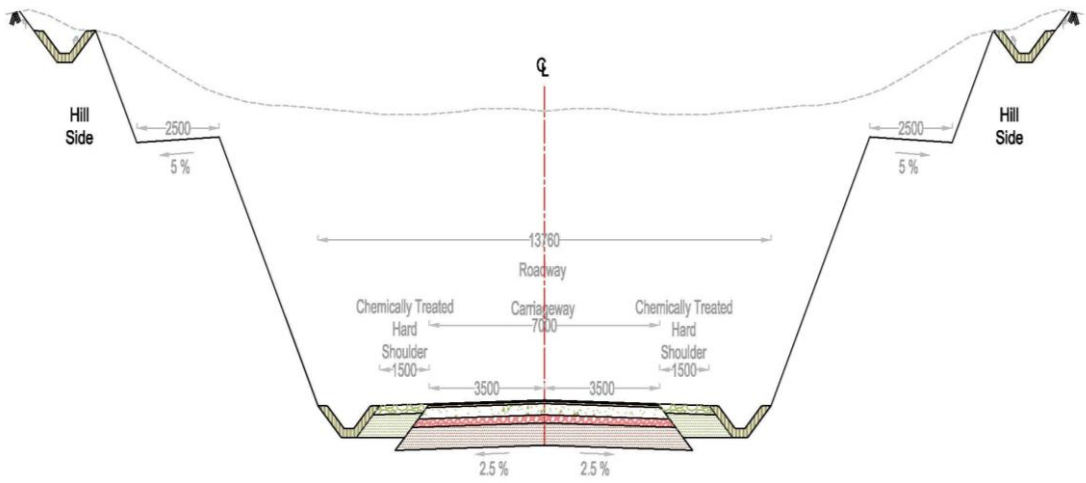


Figure B-4: TCS for Project Road Sections through Box Cut Locations (TCS III)

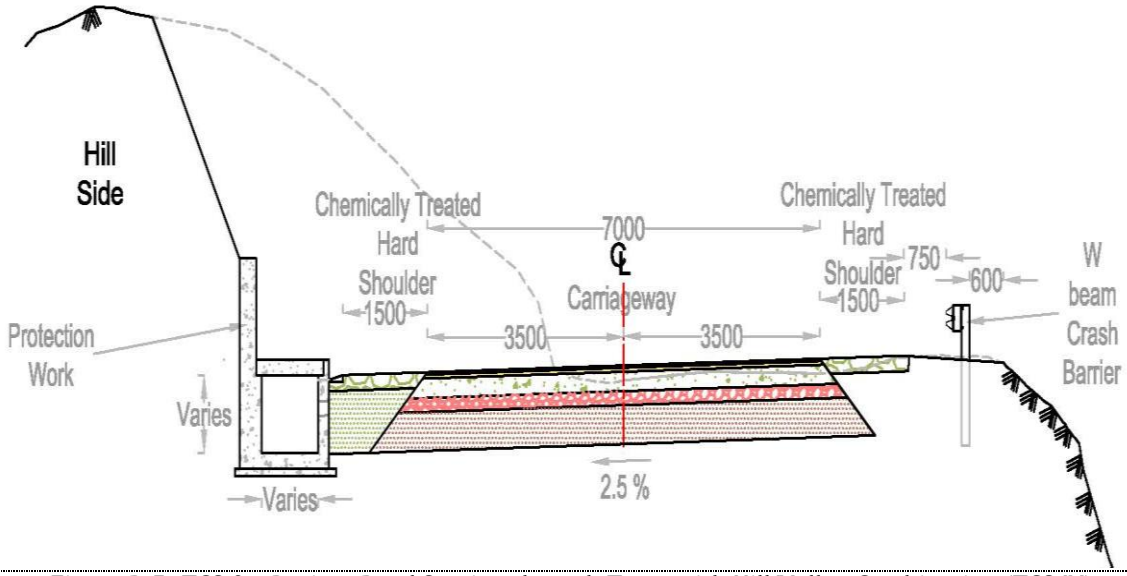


Figure B-5: TCS for Project Road Section through Town with Hill/Valley Combination (TCS IV)

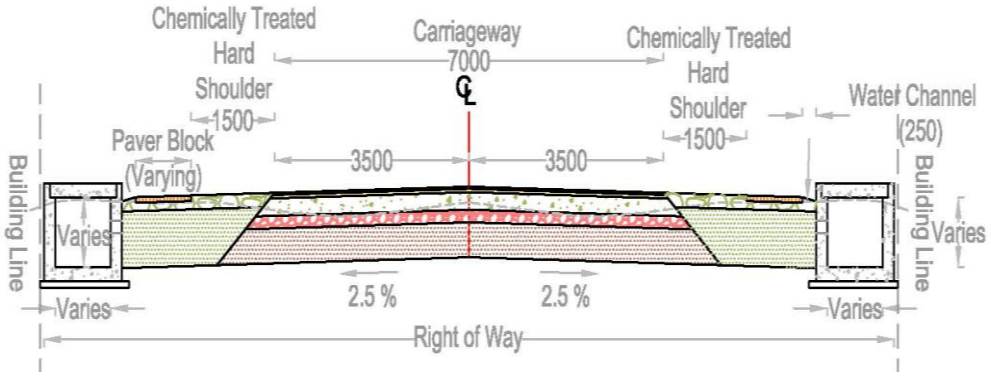


Figure B-6: TCS for Project Road Section through Town on Ridge (TCS V)

2.11 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.

2.12 Built-Up Areas

The alignment passes through Built up areas as tabulated below.

Sl. No.	Existing Chainage		Design Chainage		Name of Village/town
	From(km)	TO(km)	From(km)	To (Km)	
1	62+500	62+700	59+815	60+000	Chosaba
2	64+000	65+247	61+330	62+558	Phek, Town

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			
01	59+050	Phek Village	61+620	T	3.5	BT	Y	B 8	As per Figure
02	62+558	Local	65+247	T	3.5	BT	Cross	B 9	As per Figure

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

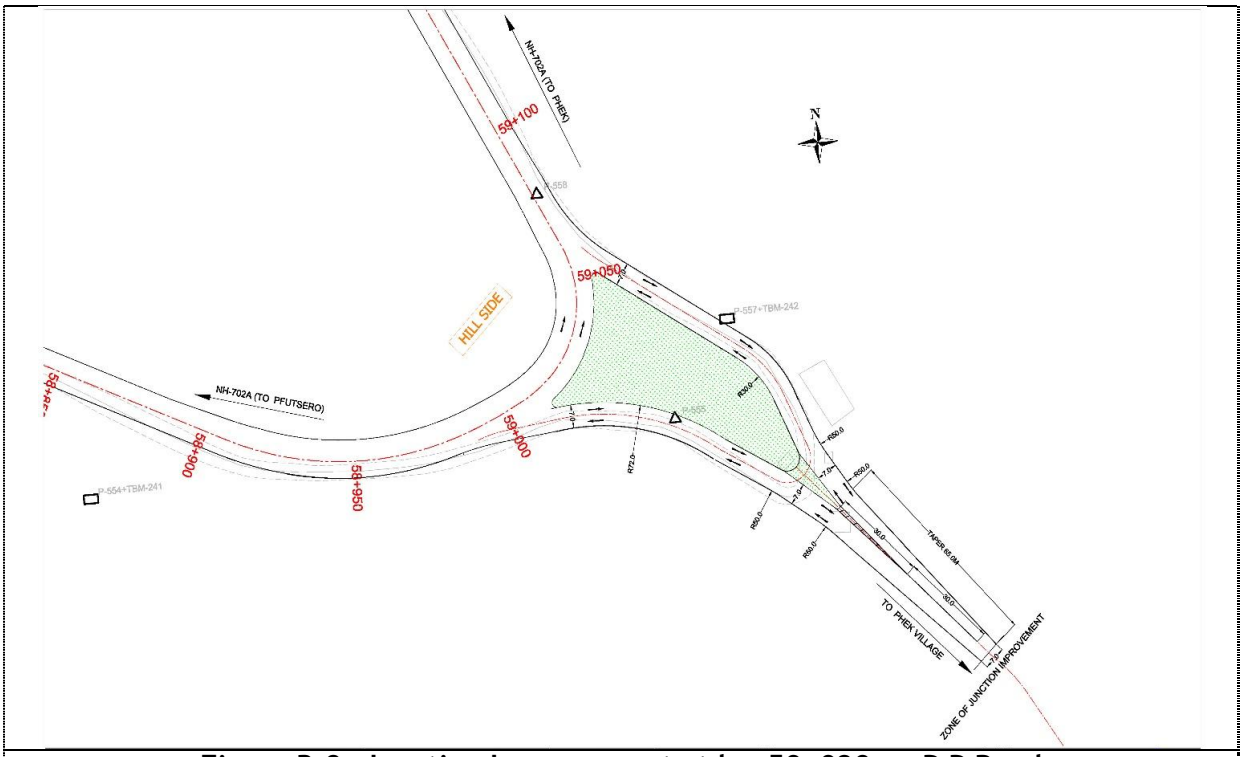


Figure B-8: Junction Improvement at km 59+030 on P P Road

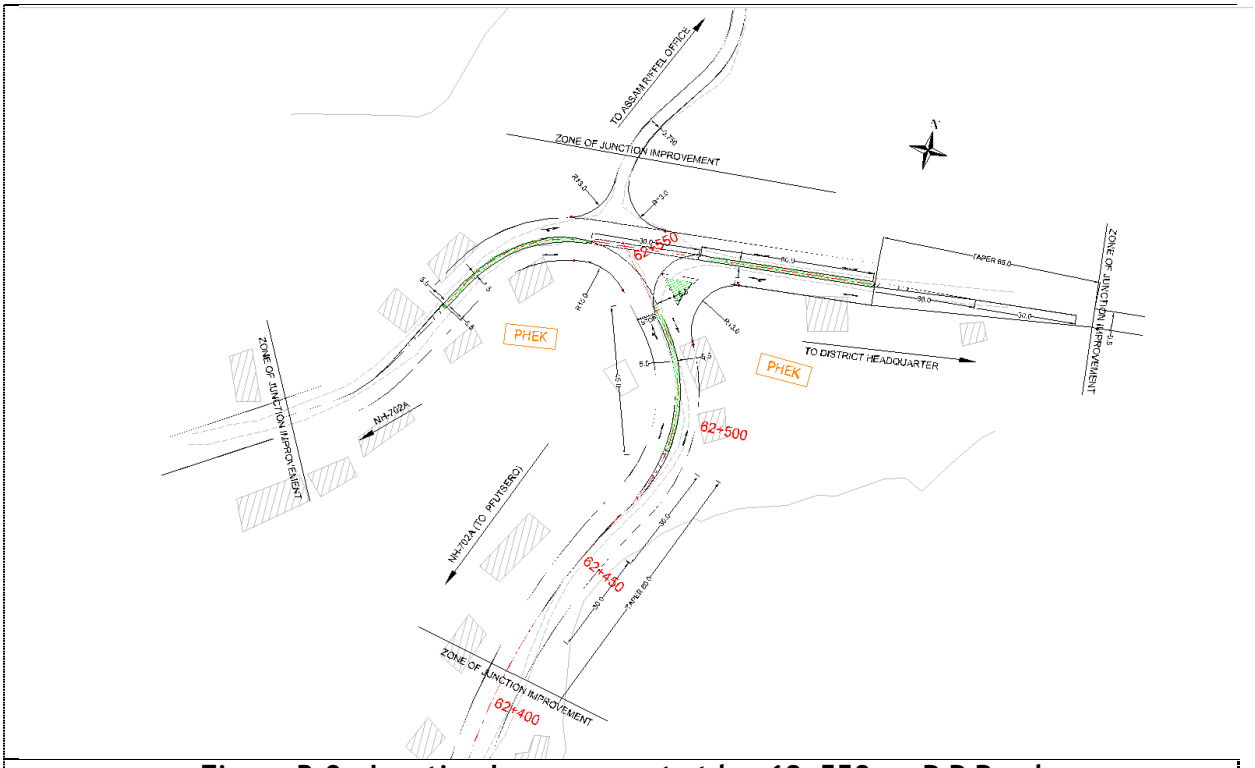


Figure B-9: Junction Improvement at km 62+558 on P P Road

(b) Minor Intersections

Sl. No.	Location of Intersection (Design Chainage, km)	Type of Intersection	Side
1	49+650	T	Right
2	49+800	T	Right

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 types 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 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		
	40+ 000	62+558	22.558	5

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 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	40+090	62+558	Poor condition of existing pavement

Sl. No.	Existing Section (km)		Remarks
	From	To	
			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 Covered RCC Drain with Kerb Channel on Hill Side=308 Rm

ii) Minimum length of Road Side Drains=19934 Rm

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.	Design Chainage		Length (M)	Remarks
	From	To		
1	40+865	40+905	40	V-shaped* PCC Drain on Both Sides
2	40+905	43+975	3070	V-shaped PCC Drain on Hill Side
3	43+975	44+005	30	V-shaped PCC Drain on Both Sides
4	44+005	46+400	2395	V-shaped PCC Drain on Hill Side
5	46+400	46+435	35	V-shaped PCC Drain on Both Sides
6	46+435	47+755	1320	V-shaped PCC Drain on Hill Side
7	47+755	47+785	30	V-shaped PCC Drain on Both Sides
8	47+785	49+670	1885	V-shaped PCC Drain on Hill Side
9	49+670	49+760	90	V-shaped PCC Drain on Both Sides
10	49+760	51+500	1740	V-shaped PCC Drain on Hill Side

Sl. No.	Design Chainage		Length (M)	Remarks
	From	To		
11	51+500	51+510	10	V-shaped PCC Drain on Both Sides
12	51+510	62+250	10740	V-shaped PCC Drain on Hill Side
13	62+250	62+558	308	RCC Covered 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 Phek to Pfutsero from Km.40.000 to Km.62.558 (design chainages), includes provision of **190 box culverts.** All culverts and other structures shall be designed and constructed in accordance with section 7 of the Manual/Ministry's Standard Design 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	130
2	2.0	45
3	3.0	13
4	4.0	1
5.	5.0	1

7.2.2 **Reconstruction of existing culverts**

Minimum 190 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 Bridge)

Sl No.	Existing Chainage (KM)	Design Chainage (KM)	Proposed Span(m)	Proposed Width(m)	Remarks
NIL					

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

NIL

7.3.2 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

Sl. 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.

PCC kerbs (duly painted) approximately 308 RM (minimum) shall be provided by EPC Contractor in bus bays and Islands.

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

5. 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	7,816
Direction & Place Identification up to 0.9 sqm	sqm	20
Direction & Place Identification more than 0.9 sqm	sqm	6
60 cm Equilateral Triangle	Number	180
60 cm Circular	Number	33
60 cm High Octagon	Number	14
60 cm X 45 cm Rectangular	Number	16
60 cm X 50 cm Chevron Sign	Number	852
Hectometer Stone	Number	90
Km stone	Number	18
5^{th} km stone	Number	4
Boundary Stone (as per clause 13 herein under)	Number	225
Road Delineators	Number	1,879
Road Marker/ Road Stud	Number	11,280
Hazard Marker	Number	380
W Type metal Crash Barrier	Rm	3,261

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. The minimum number of overhead signs shall be 02 (01 No. of gantry and 01 No. of Cantilever) as per this manual.

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 2260 nos. trees are required to be planted.

11.0 HAZARDOUS LOCATIONS

i) Metal Beam crash barrier length of minimum 3261 (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	Remarks
	From	To		
1	40+293.289	40+413.104	120	Radius<40
2	40+898.586	40+991.060	93	Radius<40
3	41+293.146	41+319.393	27	Radius<40
4	42+693.038	42+748.475	56	Radius<40
5	43+267.837	43+342.673	75	Radius<40
6	44+108.361	44+174.900	67	Radius<40
7	44+437.114	44+507.423	71	Radius<40
8	44+761.903	44+858.494	97	Radius<40
9	45+860.246	45+928.470	69	Radius<40
10	46+267.317	46+326.793	60	Radius<40
11	46+813.515	46+887.325	74	Radius<40
12	47+012.217	47+086.711	75	Radius<40
13	47+271.380	47+354.302	83	Radius<40
14	47+354.302	47+464.630	111	Radius<40
15	47+464.630	47+559.983	96	Radius<40
16	47+981.070	48+028.209	48	Radius<40
17	48+302.996	48+365.415	63	Radius<40

Sl. No.	Design Chainage(m)		Length	Remarks
	From	To		
18	48+890.011	49+011.127	122	Radius<40
19	49+223.742	49+292.534	69	Radius<40
20	49+362.317	49+451.471	90	Radius<40
21	49+451.471	49+542.961	92	Radius<40
22	51+246.598	51+323.642	78	Radius<40
23	51+470.565	51+533.327	63	Radius<40
24	52+084.599	52+141.149	57	Radius<40
25	53+005.492	53+102.646	98	Radius<40
26	53+211.868	53+260.696	49	Radius<40
27	53+515.737	53+606.925	92	Radius<40
28	54+030.167	54+052.648	23	Radius<40
29	54+257.132	54+339.200	83	Radius<40
30	54+641.209	54+711.082	70	Radius<40
31	54+812.211	54+872.821	61	Radius<40
32	55+311.180	55+421.652	111	Radius<40
33	57+519.762	57+573.394	54	Radius<40
34	57+828.394	57+932.719	105	Radius<40
35	58+394.629	58+466.882	73	Radius<40
36	59+022.584	59+062.192	40	Radius<40
37	59+540.677	59+573.745	34	Radius<40
38	59+946.940	60+025.989	80	Radius<40
39	60+555.892	60+619.240	64	Radius<40
40	60+711.489	60+770.534	60	Radius<40
Total			2953	

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**	**Minimum Quantity**
Parapet Wall	Rm	6,451
Breast wall with PCC	Rm	2,484
Reinforced Earth/Soil Nailing/Gabion Structure on hill side/valley side of varying height between 1 to 6 metre depending upon the slope	Rm	8,938
RE Wall	Rm	140
Subsurface drain with perforated pipe for collection of seepage water to avoid sinking of pavement	Rm	357
Seeding and Mulching with Jute Net	Sqm	63,051
Hydro seeding	Sqm	1,44,904
Catch Water Drain (Unlined)	Rm	22,485

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 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 22.558 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 – III shall include:

(a) Roadside furniture

(b) Pedestrian facilities

(c) Tree plantation

(d) Bus bays and Bus Shelters

(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 bays shall be provided on the Project Highway at 3 locations as mentioned herein under. Bus bays shall be constructed as per Manual on both sides of the Project Highway. These bus bays will also have passenger bay.

Details of Bus Shelters

Sl. No.	Project Facility (in Pair)	Design Chainage (km)
1	Bus Shelter	50+900
2	Bus Shelter	62+558
3	Bus Shelter	64+600

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 2260 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

Nature of Defects or deficiency		Time limit for repair/rectification
V	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
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	

Nature of Defects or deficiency		Time limit for repair/rectification
	Temporary measures Permanent measures	within 48 hours within 15 (fifteen) days or as specified by 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

Nature of Defects or deficiency		Time limit for repair/rectification
III	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
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 Pfutsero-Phek Road on EPC basis from existing Km 40.090 to Km 65.300 [Design Km. 40.000 to Km.62.558] (Design Length - 22.558 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 Authority of India, 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)

(Adress)

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 Pfutsero-Phek Road on EPC basis from existing Km 40.090 to Km 65.300 [Design Km. 40.000 to Km.62.558] (Design Length - 22.558 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 Authority of India, 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 Pfutsero-Phek Road on EPC basis from existing Km 40.090 to Km 65.300 [Design Km. 40.000 to Km.62.558] (Design Length - 22.558 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 Authority of India, 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)

(Adress)

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 is Rs. 19718,42,436/-

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.	**67.91%**	***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.	17.04%	11.57%
		(2) Sub-Base Course.	6.92%	4.70%
		(3) Non Bituminous Base Course.	12.75%	8.66%
		(4) Bituminous Base Course	7.51%	5.10%
		(5) Wearing Coat.	4.83%	3.28%
		(6) Widening and repair of culverts	0.00%	0.00%
		(7) Hard Shoulder	1.27%	0.86%
		B.1- Reconstruction/New 4lane 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.	3.92%	2.66%
		(2) Sub-Base Course.	0.75%	0.51%
		(3) Non Bituminous Base Course.	1.35%	0.92%
		(4) Bituminous Base Course	0.81%	0.55%
		(5) Wearing Coat.	0.52%	0.35%
		(6) Hard Shoulder	0.12%	0.08%

		B.2- Reconstruction/New 4lane realignment/bypass (Rigid pavement)		
		(1) Earthwork upto top of the Sub-grade including excavation in soil, soft rock and hard rock including clearing & grubbing with required site clearance etc.	0.00%	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%
		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)	42.22%	28.67%
Minor Bridges /Underpasses /Overpasses	**0.00%**	***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	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.	0.00%	0.00%
		(3) **Approaches**: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	0.00%	0.00%
		(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	0.00%	0.00%

		of underpass-rigid pavement including facility complete in all respects as specified.		
		(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	**32.09%**			
		(i)Toll Plaza	0.00%	0.00%
		(ii)Road side drain	5.89%	1.89%
		(iii) Road signs, marking, Km stones, Safety devices etc.		
		(a) Pavement Marking	4.27%	1.37%
		(b) Crash Barrier/ W metal crash Barrier	1.99%	0.64%
		(c) Traffic Sign	1.09%	0.35%

		(d) Road Boundary stone, km Stone, 5th km stone and hectometre stone	0.09%	0.03%
		(e) Traffic blinker LED delineator, stud, reflective payment marker, tree reflector	4.89%	1.57%
		(f) Traffic impact Attenuators at Abutments and Piers traffic island	0.00%	0.00%
		(g) Road furniture (overhead signboard etc.)	0.09%	0.03%
		(h) Others including construction of median & median kerb with channel, paint, rumble strip, roadside plantation etc.	0.06%	0.02%
		(iv)Project facilities	0.00%	0.00%
		(a)Bus bays & Bus Shelter	0.50%	0.16%
		(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)	3.40%	1.09%
		(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	0.00%	
		(a) Hydro Seeding of Cut Slopes in Soil	0.19%	0.06%
		(b)Seeding and Mulching with Jute net all along the perpetual slide locations	8.51%	2.73%
		(c) Catch water Drain	0.25%	0.08%
		(d) Gabion Structure on hill side/valley side of varying height between 1 to 6 metre depending upon the slope	54.16%	17.38%
		(e) Reinforced earth wall	1.81%	0.58%
		(e) Breast wall	10.63%	3.41%

		(f) Sub Surface drain with perforated pipe for collection of seepage water to avoid sinking of pavement	0.19%	0.06%
		(g) Parapet wall	1.99%	0.64%
		(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.	11.57%	
(2) Sub-Base Course.	4.70%	
(3) Non Bituminous Base Course.	8.66%	
(4) Bituminous Base Course	5.10%	
(5) Wearing Coat.	3.28%	
(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	0.86%	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.	2.66%	
(2) Sub-Base Course.	0.51%	
(3) Non Bituminous Base Course.	0.92%	
(4) Bituminous Base Course	0.55%	
(5) Wearing Coat.	0.35%	
(6) Hard Shoulder	0.08%	
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)	28.67%	

@. 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	0.00%	(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.	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, 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 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	1.89%	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
(iii) Road signs, marking, Km stones, Safety devices etc.	0.00%	
(a) Pavement Marking	1.37%	

(b) Crash Barrier/ W metal crash Barrier	0.64%	not less than 10% (ten per cent) of the total length.
(c) Traffic Sign	0.35%	
(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	1.57%	
(f) Traffic impact Attenuators at Abutments and Piers traffic island	0.00%	
(g) Road furniture (overhead signboard etc.)	0.03%	
(h) Others including construction of median & median kerb with channel, paint, rumble strip, roadside plantation etc.	0.02%	
(iv)Project facilities		Payment shall be made on pro rate basis for completed facilities.
(a)Bus bays & Bus Shelter	0.16%	
(b)Truck lay-byes	0.00%	
(c,) Rest areas	0.00%	
(d) Others	0.00%	
(e) Junctions (Major & Minor)	1.09%	
(v) Road side Plantation	0.00%	Unit of measurement is linear 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.
(vi) Repair of protection works other than approaches to the bridges elevated section/flyovers/grade separators and ROBs/RUBs	0.00%	
(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	0.00%	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	0.06%	
(b)Seeding and Mulching with Jute net all along the perpetual slide locations	2.73%	
(c) Catch water Drain	0.08%	
(d) Gabion Structure on hill side/valley side of varying height between 1 to 6 metre depending upon the slope	17.38%	
(e) Reinforced earth wall	0.58%	
(e) Breast wall	3.41%	
(f) Sub Surface drain with perforated pipe for collection of seepage water to avoid sinking of pavement	0.06%	
(g) Parapet wall	0.64%	

(h) Toe wall		

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 instalment 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 Pfutsero-Phek Road on EPC basis from existing Km 40.090 to Km 65.300 [Design Km. 40.000 to Km.62.558] (Design Length - 22.558 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 Pfutsero-Phek Road on EPC basis from existing Km 40.090 to Km 65.300 [Design Km. 40.000 to Km.62.558] (Design Length - 22.558 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 Pfutsero-Phek Road on EPC basis from existing Km 40.090 to Km 65.300 [Design Km. 40.000 to Km.62.558] (Design Length - 22.558 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**	

Sl No	Item/Defect/Deficiency	Percentage (%)
I	Desilting, Cleaning, vegetation, growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20
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 Pfutsero-Phek Road on EPC basis from existing Km 40.090 to Km 65.300 [Design Km. 40.000 to Km.62.558] (Design Length - 22.558 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.