Schedule-A

(See Clauses 2.1and 8.1)

Site of the Project

1 The Site

(i) Site of the [Two-Lane] Project Highway shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.

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

(iii) An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause8.2 (i) of this Agreement.

(iv) 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, improve/upgrade the Road Profile as indicated in Annex-III based onsite/design requirement.

(v) The status of the environment clearances obtained or awaited is given in Annex-IV.

Annex –I

(Schedule-A)

Site

Note: Through suitable drawings and description in words, the land, buildings, structures and road works comprising the Site shall be specified briefly but precisely in this Annex-I. All the chainages/location referred to in Annex-I to Schedule-A shall be existing chainages.

1. Site

The Site of the [Two-Lane] Project Highway comprises the section of NH-102Bcommencing from km 14+210 to km 34+800i.e. M. Lunmual Vilage to Singngat Village in the state of Manipur.
The land, carriageway and structures comprising the Site are described below.

2. Land

The Site of the Project Highway comprises the land (sum of land already in possession and land to be possessed) as described below:

SL No.	Chainage (Km)		Right of Way (m)	Remarks
	From	To		
1	14+200	14+300	9.5	
2	14+300	14+400	10.1	
3	14+400	14+500	9.6	
4	14+500	14+600	12.9	
5	14+600	14+700	12.2	
6	14+700	14+800	10.9	
7	14+800	14+900	11.5	
8	14+900	15+000	7.9	
9	15+000	15+100	10.1	
10	15+100	15+200	7.6	
11	15+200	15+300	8.2	
12	15+300	15+400	9.6	
13	15+400	15+500	10.5	
14	15+500	15+600	10.1	
15	15+600	15+700	9.7	
16	15+700	15+800	11.9	
17	15+800	15+900	8.0	
18	15+900	16+000	8.4	
19	16+000	16+100	11.2	
20	16+100	16+200	9.1	
21	16+200	16+300	9.6	
22	16+300	16+400	8.7	
23	16+400	16+500	9.5	
24	16+500	16+600	10.0	
25	16+600	16+700	11.1	
26	16+700	16+800	8.5	
27	16+800	16+900	11.4	
28	16+900	17+000	9.9	
29	17+000	17+100	10.6	
30	17+100	17+200	12.5	
31	17+200	17+300	7.1	

SL No.	Chainage (Km)		Right of Way (m)	Remarks
	From	To		
32	17+300	17+400	10.9	
33	17+400	17+500	9.5	
34	17+500	17+600	7.2	
35	17+600	17+700	10.8	
36	17+700	17+800	9.7	
37	17+800	17+900	10.1	
38	17+900	18+000	10.3	
39	18+000	18+100	8.9	
40	18+100	18+200	10.0	
41	18+200	18+300	10.7	
42	18+300	18+400	11.4	
43	18+400	18+500	9.0	
44	18+500	18+600	9.8	
45	18+600	18+700	10.2	
46	18+700	18+800	9.0	
47	18+800	18+900	9.5	
48	18+900	19+000	8.2	
49	19+000	19+100	9.2	
50	19+100	19+200	10.0	
51	19+200	19+300	8.8	
52	19+300	19+400	9.9	
53	19+400	19+500	7.4	
54	19+500	19+600	7.1	
55	19+600	19+700	8.1	
56	19+700	19+800	7.8	
57	19+800	19+900	7.7	
58	19+900	20+000	7.8	
59	20+000	20+100	8.1	
60	20+100	20+200	8.5	
61	20+200	20+300	8.5	
62	20+300	20+400	8.9	
63	20+400	20+500	7.6	
64	20+500	20+600	9.7	
65	20+600	20+700	9.3	
66	20+700	20+800	8.4	
67	20+800	20+900	9.7	
68	20+900	21+000	8.5	
69	21+000	21+100	10.6	
70	21+100	21+200	10.4	
71	21+200	21+300	9.5	
72	21+300	21+400	12.6	
73	21+400	21+500	10.6	
74	21+500	21+600	9.1	
75	21+600	21+700	10.7	
76	21+700	21+800	8.4	
77	21+800	21+900	10.0	
78	21+900	22+000	10.6	
79	22+000	22+100	10.0	
80	22+100	22+200	10.2	
81	22+200	22+300	8.7	
82	22+300	22+400	10.0	
83	22+400	22+500	8.6	
84	22+500	22+600	10.0	
85	22+600	22+700	9.3	

SL No.	Chainage (Km)		Right of Way (m)	Remarks
	From	To		
86	22+700	22+800	8.6	
87	22+800	22+900	9.7	
88	22+900	23+000	8.3	
89	23+000	23+100	9.7	
90	23+100	23+200	8.0	
91	23+200	23+300	9.6	
92	23+300	23+400	9.6	
93	23+400	23+500	9.9	
94	23+500	23+600	9.0	
95	23+600	23+700	7.6	
96	23+700	23+800	10.3	
97	23+800	23+900	7.6	
98	23+900	24+000	8.2	
99	24+000	24+100	7.3	
100	24+100	24+200	10.2	
101	24+200	24+300	12.8	
102	24+300	24+400	10.5	
103	24+400	24+500	8.8	
104	24+500	24+600	8.4	
105	24+600	24+700	9.1	
106	24+700	24+800	11.1	
107	24+800	24+900	7.9	
108	24+900	25+000	11.5	
109	25+000	25+100	8.8	
110	25+100	25+200	8.8	
111	25+200	25+300	16.6	
112	25+300	25+400	8.4	
113	25+400	25+500	8.8	
114	25+500	25+600	8.1	
115	25+600	25+700	11.3	
116	25+700	25+800	9.5	
117	25+800	25+900	15.3	
118	25+900	26+000	9.9	
119	26+000	26+100	9.0	
120	26+100	26+200	8.6	
121	26+200	26+300	8.7	
122	26+300	26+400	8.5	
123	26+400	26+500	7.2	
124	26+500	26+600	8.0	
125	26+600	26+700	7.0	
126	26+700	26+800	6.0	
127	26+800	26+900	7.5	
128	26+900	27+000	12.1	
129	27+000	27+100	9.9	
130	27+100	27+200	12.1	
131	27+200	27+300	9.1	
132	27+300	27+400	8.8	
133	27+400	27+500	9.2	
134	27+500	27+600	8.8	
135	27+600	27+700	8.7	
136	27+700	27+800	13.0	
137	27+800	27+900	9.3	
138	27+900	28+000	8.8	
139	28+000	28+100	8.3	

SL No.	Chainage (Km)		Right of Way (m)	Remarks
	From	To		
140	28+100	28+200	7.6	
141	28+200	28+300	6.9	
142	28+300	28+400	5.9	
143	28+400	28+500	10	
144	28+500	28+600	12.6	
145	28+600	28+700	11.8	
146	28+700	28+800	12.5	
147	28+800	28+900	11.4	
148	28+900	29+000	9.6	
149	29+000	29+100	10.5	
150	29+100	29+200	9.3	
151	29+200	29+300	8.5	
152	29+300	29+400	10.3	
153	29+400	29+500	11.1	
154	29+500	29+600	9.1	
155	29+600	29+700	10.1	
156	29+700	29+800	13.3	
157	29+800	29+900	7.8	
158	29+900	30+000	7.7	
159	30+000	30+100	6.4	
160	30+100	30+200	8.8	
161	30+200	30+300	7.6	
162	30+300	30+400	8.6	
163	30+400	30+500	9.1	
164	30+500	30+600	8.3	
165	30+600	30+700	9.3	
166	30+700	30+800	7.7	
167	30+800	30+900	9	
168	30+900	31+000	9.6	
169	31+000	31+100	7.3	
170	31+100	31+200	6.5	
171	31+200	31+300	9	
172	31+300	31+400	8.5	
173	31+400	31+500	7.5	
174	31+500	31+600	9.5	
175	31+600	31+700	7.2	
176	31+700	31+800	7.2	
177	31+800	31+900	6.7	
178	31+900	32+000	7.8	
179	32+000	32+100	7.1	
180	32+100	32+200	8	
181	32+200	32+300	8.1	
182	32+300	32+400	8.4	
183	32+400	32+500	10.2	
184	32+500	32+600	8.8	
185	32+600	32+700	8.1	
186	32+700	32+800	9.8	
187	32+800	32+900	8.2	
188	32+900	33+000	8.3	
189	33+000	33+100	9.2	
190	33+100	33+200	9.4	
191	33+200	33+300	8.7	
192	33+300	33+400	9.2	
193	33+400	33+500	7.3	

SL No.	Chainage (Km)		Right of Way (m)	Remarks
	From	To		
194	33+500	33+600	6.3	
195	33+600	33+700	7	
196	33+700	33+800	6.9	
197	33+800	33+900	8.1	
198	33+900	34+000	6.8	
199	34+000	34+100	6.2	
200	34+100	34+200	7.3	
201	34+200	34+300	6	
202	34+300	34+400	6.3	
203	34+400	34+500	6.9	
204	34+500	34+600	8	
205	34+600	34+700	7.2	

3. Carriageway

The present carriage way of the Project Highway is Two Lane from km 14+210 to km 34+800. The type of the existing pavement is [flexible].

4. Major Bridges

The Site includes the following Major Bridges: -

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

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

The Site includes the following ROB (road over railway line)/RUB (road under railway line):

S. No.	Chainage (km)	Type of Structure		No. of Spans with span length(m)	Width (m)	ROB/ RUB
		Foundation	Superstructure			
Nil						

6. Grade separators
The Site includes the following grade separators:

S. No.	Chainage (km)	Type of Structure		No. of Spans with span length(m)	Width (m)
		Foundation	Superstructure		
Nil					

7. Minor bridges

The Site includes the following minor bridges:

S. No.	Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-structure	Super- structure		
1	14.690	Open	Wall	RCC Slab Bridge	1x7.6	8
2	17.928	Open	Wall	RCC Slab Bridge	2X4.55	7.5
3	22.230	Open	Wall	RCC Slab Bridge	1x7.40	8.4

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location(km)	Remarks
Nil		

9. Underpasses(vehicular, non- vehicular)

The Site includes the following underpasses:

S. No.	Chainage (km)	Type of Structure	No. of Spans with span length (m)	Width (m)
Nil				

10. Culverts

The Site has the following culverts:

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length	Width of Culvert (m)
1	14.320	R.C.C SLAB	1x0.70	3.5
2	14.520	R.C.C SLAB	1x1.00	4
3	14.550	R.C.C SLAB	1x0.60	4.5
4	15.015	R.C.C SLAB	1x2.50	4.3
5	15.200	R.C.C SLAB	1x0.76	4.6
6	15.290	R.C.C SLAB	1x2.20	4.5
7	15.805	R.C.C SLAB	1x0.90	4
8	15.900	R.C.C SLAB(NALLAH)	1x3.80	4.5
9	16.055	R.C.C SLAB	1x1.20	5
10	16.120	R.C.C SLAB(NALLAH)	1x4.20	4.8
11	16.675	R.C.C SLAB	1x1.00	4.5
12	16.900	R.C.C SLAB(NALLAH)	1x4.00	4
13	17.050	R.C.C SLAB	1X1.6	4.5
14	17.210	R.C.C SLAB	1x4.20	4.5
15	17.450	R.C.C SLAB	1X1.5	4
16	17.555	R.C.C SLAB	1x0.80	4
17	17.675	R.C.C SLAB	1x2.40	5
18	18.003	R.C.C SLAB	1x1.00	4.7
19	18.240	R.C.C SLAB	1X1.8	4.8
20	18.475	R.C.C SLAB	1x1.00	4.2
21	18.630	R.C.C SLAB	1x1.80	4.8
22	18.825	A culvert may present but not clearly visible due to buss & soil		
23	18.900	R.C.C SLAB	1x1.10	4.5

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length	Width of Culvert (m)
24	19.420	R.C.C SLAB	1X1.8	4.6
25	19.515	R.C.C SLAB	1x1.20	5
26	19.675	R.C.C SLAB	1x3.30	4.5
27	19.915	R.C.C SLAB	1x1.50	4.5
28	19.960	R.C.C SLAB(Catch-Pit)	1x1.20	4.5
29	20.225	R.C.C SLAB	1x1.90	4.6
30	20.350	R.C.C SLAB	1x2.00	5
31	20.540	R.C.C SLAB	1x1.00	4.5
32	20.825	R.C.C SLAB(NALLAH)	1x5.00	4.5
33	21.360	R.C.C SLAB	1x1.20	4
34	21.610	R.C.C SLAB	1x1.70	5.5
35	21.800	R.C.C SLAB(Catch-Pit)	1x1.00	5.3
36	21.920	R.C.C SLAB(Catch-Pit)	1x1.00	4.7
37	22.525	R.C.C SLAB	1X1.3	5.3
38	22.675	R.C.C SLAB(Catch-Pit)	1x0.90	4.4
39	22.890	R.C.C SLAB	1x0.90	4.4
40	23.325	R.C.C SLAB	1x2.00	4.5
41	23.365	R.C.C SLAB	1x1.00	5
42	23.675	R.C.C SLAB	1x1.30	4.5
43	23.810	R.C.C SLAB	1x2.50	5.7
44	24.115	R.C.C SLAB	1x1.00	5
45	24.530	R.C.C SLAB	1x1.20	4.5
46	24.715	R.C.C SLAB	1x1.10	4.2
47	25.420	R.C.C SLAB	1x2.00	4
48	26.005	R.C.C SLAB	1x1.50	3.8
49	26.140	R.C.C SLAB	1x1.40	4.5
50	27.440	R.C.C SLAB	1x1.00	4.5
51	28.280	R.C.C SLAB	1X1.5	5
52	28.410	R.C.C SLAB	1x1.00	4
53	28.690	R.C.C SLAB	1x2.5	4.5
54	29.660	R.C.C SLAB	1x0.80	4.2
55	29.890	R.C.C SLAB	1x1.10	4.5
56	29.975	R.C.C SLAB	1x1.10	4.5
57	30.195	SLAB CULVERT	1x2.5	4.3
58	30.400	R.C.C SLAB	1x1.80	4.7
59	30.590	R.C.C SLAB	1x2.00	5
60	30.760	R.C.C SLAB	1x2.00	4.2
61	30.860	R.C.C SLAB	1x1.60	4.7
62	31.040	R.C.C SLAB	1x1.00	4.5
63	31.455	R.C.C SLAB	1X1.5	
64	31.620	R.C.C SLAB(NALLAH)	1x4.30	4.4
65	31.880	R.C.C SLAB	1X1.8	4.5
66	32.110	R.C.C SLAB	1x1.2	4.2
67	32.200	R.C.C SLAB	1x1.50	4.2
68	32.455	R.C.C SLAB	1x1.90	4.8
69	32.560	R.C.C SLAB	1x1.00	5
70	32.875	R.C.C SLAB	1x1.30	6
71	33.140	R.C.C SLAB	1x0.90	4.6

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length	Width of Culvert (m)
72	33.330	R.C.C SLAB	1x1.00	4.8
73	33.475	R.C.C SLAB	1x1.50	5.3
74	33.510	R.C.C SLAB	1x1.00	5
75	33.725	R.C.C SLAB	1x1.00	4.2
76	33.800	R.C.C SLAB	1x1.00	5.5
77	33.975	R.C.C SLAB	1x1.00	4.4
78	34.430	R.C.C SLAB	1x1.2	7.4
79	34.625	SLAB	1x1.40	4.5

11. Busbays

The details of bus bays onthe Site are as follows:

S. No.	Chainage (km)	Length (m)	Left Hand Side	Right HandSide
Nil				

12. Truck Lay byes

The details of truck lay byes are as follows:

S. No.	Chainage (km)	Length (m)	Left Hand Side	Right HandSide
Nil				

13. Road side drains

The details of the roadside drains are as follows:

Sl. No.	Location		Type	
	From km	To km	Masonry/cc (Pucca)	Earthen (Kutcha)
1	14+210	34+800	Earthen (Hill Side)	

14. Major junctions

The details of major junctions are as follows:

S. No.	Location		At grade	Separated	Category of Cross Road			
	From km	to km			NH	SH	MDR	Others
1	34.175		✓					PHC Singngat Village

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

15. Minor junctions

The details of the minor junctions are as follows:

Sl. No.	Location		Type of intersection	
	From Km	To Km	T-Junction	Cross Road
1	13+750		X	4-Legged
2	13+850		T	3-Legged
3	13+895		T	3-Legged
4	14+630		T	3-Legged
5	14+870		Y	3-Legged
6	14+990		T	3-Legged
7	15+735		Y	3-Legged
8	19+330		Y	3-Legged
9	19+980		T	3-Legged
10	20+030		T	3-Legged
11	20+135		Y	3-Legged
12	20+270		T	3-Legged
13	20+320		T	3-Legged
14	28+060		Y	3-Legged
15	28+200		Y	3-Legged
16	28+465		Y	3-Legged
17	29+575		T	3-Legged

16. Bypasses

The details of the existing road sections proposed to be bypassed are as follows:

S.No.	Name of bypass (town)	Chainage(km)From km to km	Length(in Km)
Nil			

17. Otherstructures

[Provide details of other structures, if any.]

Annex – II

(As per Clause 8.3 (i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

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

S.No.	From (Km)	To (Km)	Length (m)	Total RoW Width (m)	Date of providing RoW
1	13.747	32.835	19088	14-24 m	To be filled by NHIDCL

Annex-III

(Schedule-A)

Alignment Plans

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

(i) The alignment of the Project Highway is enclosed in alignment plan. Finished road level indicated in the alignment plan shall be followed by the contractor as minimum FRL .In any case, the finished road level of the project highway shall not be less than those indicated in the alignment plan. The contractor shall, however, improve/upgrade the Road profile as indicated in Annex-III based onsite/design requirement.

(ii) TrafficSignageplanoftheProjectHighwayshowingnumbers&locationoftraffic signs is enclosed. The contractor shall, however, improve/ upgrade upon the traffic signage plan as indicated in Annex-III based on site/design requirement as per the relevant specifications/IRC Codes/Manual.

Annex – IV

(Schedule-A)

Environment Clearances

The Forest Clearance is awaited for the project.

Environmental Clearances are not required for the project.

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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-Lanning 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 Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 13.747 to Km 32.835 (Package 1B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode

Note: Description of the Project Highway shall be given by the Authority in detail together with explanatory drawings (where necessary) to explain the Authority's requirements precisely in order to avoid subsequent changes in the Scope of the Project. The particulars that must be specified in this Schedule-B are listed below as per the requirements of the Manual of Specifications and Standards for Two Lanning of Highways (IRC: SP: 73-2015) referred to as the Manual. If any standards specifications or details are not given in the Manual the minimum design/construction requirements shall be specified in this Schedule. In addition to these particulars all other essential project specific details as required should be provided in order to define the Scope of the Project clearly and precisely.

1. Widening of the Existing Highway

(i) 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 hilly terrain to the extent land is available.

(ii) Width of Carriageway

(a) Two-Lanning with hard shoulders shall be undertaken. The paved carriageway shall be 7(seven) m wide. Provided that in the built-up areas: the width of the carriageway shall be as specified in the following table:

Sl. No.	Built-up stretch (Township)	Location		Width (m)	Typical Cross Section (Refer to Manual)	Remarks
1	M Lunmual	13+747	14+225	7	As per attached TCS drawing	7 m Carriageway
2	S Kullian	14+255	14+500	7		7 m Carriageway
3	S Phaiza	14+500	14+730	7		7 m Carriageway
4	Hiangdung	14+730	15+180	7		7 m Carriageway
5	Panglian	15+180	16+090	7		7 m Carriageway
6	S Munhoi	16+090	17+780	7		7 m Carriageway
7	S Geltui	17+780	19+717	7		7 m Carriageway
8	S Zezaw	19+717	21+103	7		7 m Carriageway
9	L Phaimol	21+103	22+550	7		7 m Carriageway
10	N Khonom	21+103	22+630	7		7 m Carriageway
11	Muallum	23+246	26+900	7		7 m Carriageway
12	M Buangmun Lamkhai	23+425	24+115	7		7 m Carriageway
13	S Belpuan	26+900	27+660	7		7 m Carriageway
14	Haijang	27+660	28+445	7		7 m Carriageway
15	Sumchinvum	28+445	29+855	7		7 m Carriageway
16	Singngat	29+855	32+835	7		7 m Carriageway

(b) Except as otherwise provided in this Agreement the width of the paved carriageway

and cross-sectional features shall conform to paragraph 1.1 above.

2. GeometricDesign andGeneralFeatures

(i) General

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

(ii) Design speed

For Mountainous terrain design speed shall be the minimum design speed of 40-60 km/hr and for sharp curve and hair pin bend locations speed reduces up to 30kmph & 20 kmph respectively.

(iii) Improvement of the existing road geometrics

The stretches where design speed reduces below 40 kmph are summarized below:

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
1	13+745 to 13+782	Sharp Bend	Design Speed = 30 Kmph
2	13+843 to 13+872	Sharp Bend	Design Speed = 30 Kmph
3	14+009 to 14+035	Sharp Bend	Design Speed = 30 Kmph
4	14+192 to 14+228	Sharp Bend	Design Speed = 20 Kmph
5	14+326 to 14+373	Sharp Bend	Design Speed = 30 Kmph
6	14+487 to 14+524	Sharp Bend	Design Speed = 30 Kmph
7	14+62 to 14+63	Sharp Bend	Design Speed = 30 Kmph
8	14+708 to 14+755	Sharp Bend	Design Speed = 30 Kmph
9	14+874 to 14+894	Sharp Bend	Design Speed = 30 Kmph
10	14+99 to 15+021	Sharp Bend	Design Speed = 30 Kmph
11	15+146 to 15+236	Sharp Bend	Design Speed = 20 Kmph
12	15+307 to 15+367	Sharp Bend	Design Speed = 20 Kmph
13	15+53 to 15+561	Sharp Bend	Design Speed = 20 Kmph
14	15+727 to 15+817	Sharp Bend	Design Speed = 30 Kmph
15	15+955 to 15+959	Sharp Bend	Design Speed = 20 Kmph
16	16+041 to 16+121	Sharp Bend	Design Speed = 30 Kmph
17	16+267 to 16+292	Sharp Bend	Design Speed = 30 Kmph
18	16+344 to 16+402	Sharp Bend	Design Speed = 20 Kmph
19	16+498 to 16+583	Sharp Bend	Design Speed = 20 Kmph
20	16+663 to 16+697	Sharp Bend	Design Speed = 20 Kmph
21	16+749 to 16+78	Sharp Bend	Design Speed = 20 Kmph
22	16+869 to 16+892	Sharp Bend	Design Speed = 20 Kmph
23	16+979 to 17+049	Sharp Bend	Design Speed = 20 Kmph
24	17+19 to 17+247	Sharp Bend	Design Speed = 30 Kmph
25	17+391 to 17+422	Sharp Bend	Design Speed = 30 Kmph
26	17+502 to 17+545	Sharp Bend	Design Speed = 30 Kmph
27	17+59 to 17+619	Sharp Bend	Design Speed = 30 Kmph
28	17+796 to 17+831	Sharp Bend	Design Speed = 20 Kmph
29	17+994 to 18+051	Sharp Bend	Design Speed = 20 Kmph
30	18+102 to 18+122	Sharp Bend	Design Speed = 30 Kmph
31	18+194 to 18+231	Sharp Bend	Design Speed = 20 Kmph
32	18+346 to 18+407	Sharp Bend	Design Speed = 20 Kmph
33	18+590 to 18+599	Sharp Bend	Design Speed = 20 Kmph
34	18+668 to 18+690	Sharp Bend	Design Speed = 30 Kmph
35	18+813 to 18+847	Sharp Bend	Design Speed = 20 Kmph
36	18+950 to 18+996	Sharp Bend	Design Speed = 20 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
37	19+073 to 19+095	Sharp Bend	Design Speed = 20 Kmph
38	19+234 to 19+327	Sharp Bend	Design Speed = 30 Kmph
39	19+404 to 19+435	Sharp Bend	Design Speed = 30 Kmph
40	19+496 to 19+513	Sharp Bend	Design Speed = 20 Kmph
41	19+694 to 19+731	Sharp Bend	Design Speed = 20 Kmph
42	19+791 to 19+837	Sharp Bend	Design Speed = 30 Kmph
43	19+924 to 20+143	Sharp Bend	Design Speed = 30 Kmph
44	20+223 to 20+258	Sharp Bend	Design Speed = 20 Kmph
45	20+373 to 20+422	Sharp Bend	Design Speed = 30 Kmph
46	20+491 to 20+500	Sharp Bend	Design Speed = 30 Kmph
47	20+572 to 20+626	Sharp Bend	Design Speed = 30 Kmph
48	20+715 to 20+768	Sharp Bend	Design Speed = 20 Kmph
49	20+844 to 20+862	Sharp Bend	Design Speed = 20 Kmph
50	20+939 to 20+978	Sharp Bend	Design Speed = 20 Kmph
51	21+118 to 21+184	Sharp Bend	Design Speed = 20 Kmph
52	21+232 to 21+265	Sharp Bend	Design Speed = 30 Kmph
53	21+339 to 21+357	Sharp Bend	Design Speed = 20 Kmph
54	21+570 to 21+606	Sharp Bend	Design Speed = 20 Kmph
55	21+668 to 21+725	Sharp Bend	Design Speed = 20 Kmph
56	21+762 to 21+805	Sharp Bend	Design Speed = 20 Kmph
57	21+847 to 21+922	Sharp Bend	Design Speed = 20 Kmph
58	22+129 to 22+170	Sharp Bend	Design Speed = 20 Kmph
59	22+207 to 22+223	Sharp Bend	Design Speed = 20 Kmph
60	22+289 to 22+364	Sharp Bend	Design Speed = 30 Kmph
61	22+426 to 22+444	Sharp Bend	Design Speed = 20 Kmph
62	22+547 to 22+574	Sharp Bend	Design Speed = 20 Kmph
63	22+610 to 22+643	Sharp Bend	Design Speed = 20 Kmph
64	22+684 to 22+701	Sharp Bend	Design Speed = 30 Kmph
65	22+769 to 22+785	Sharp Bend	Design Speed = 20 Kmph
66	22+828 to 22+851	Sharp Bend	Design Speed = 20 Kmph
67	23+017 to 23+048	Sharp Bend	Design Speed = 30 Kmph
68	23+102 to 23+111	Sharp Bend	Design Speed = 20 Kmph
69	23+228 to 23+244	Sharp Bend	Design Speed = 20 Kmph
70	23+279 to 23+31	Sharp Bend	Design Speed = 30 Kmph
71	24+445 to 24+45	Sharp Bend	Design Speed = 20 Kmph
72	24+519 to 24+538	Sharp Bend	Design Speed = 30 Kmph
73	24+597 to 24+613	Sharp Bend	Design Speed = 30 Kmph
74	24+675 to 24+787	Sharp Bend	Design Speed = 20 Kmph
75	24+880 to 24+945	Sharp Bend	Design Speed = 30 Kmph
76	25+007 to 25+041	Sharp Bend	Design Speed = 30 Kmph
77	25+079 to 25+125	Sharp Bend	Design Speed = 30 Kmph
78	25+150 to 25+280	Sharp Bend	Design Speed = 20 Kmph
79	25+352 to 25+367	Sharp Bend	Design Speed = 20 Kmph
80	25+506 to 25+579	Sharp Bend	Design Speed = 20 Kmph
81	25+664 to 25+676	Sharp Bend	Design Speed = 30 Kmph
82	25+749 to 25+752	Sharp Bend	Design Speed = 20 Kmph
83	25+929 to 25+966	Sharp Bend	Design Speed = 20 Kmph
84	26+092 to 26+116	Sharp Bend	Design Speed = 30 Kmph
85	26+413 to 26+438	Sharp Bend	Design Speed = 30 Kmph
86	26+487 to 26+518	Sharp Bend	Design Speed = 20 Kmph
87	26+631 to 26+653	Sharp Bend	Design Speed = 20 Kmph
88	26+729 to 26+741	Sharp Bend	Design Speed = 20 Kmph
89	26+866 to 26+889	Sharp Bend	Design Speed = 20 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
90	26+964 to 26+969	Sharp Bend	Design Speed = 20 Kmph
91	27+065 to 27+083	Sharp Bend	Design Speed = 20 Kmph
92	27+172 to 27+182	Sharp Bend	Design Speed = 20 Kmph
93	27+273 to 27+297	Sharp Bend	Design Speed = 20 Kmph
94	27+454 to 27+465	Sharp Bend	Design Speed = 20 Kmph
95	28+207 to 28+287	Sharp Bend	Design Speed = 20 Kmph
96	28+332 to 28+379	Sharp Bend	Design Speed = 30 Kmph
97	28+461 to 28+465	Sharp Bend	Design Speed = 30 Kmph
98	28+636 to 28+654	Sharp Bend	Design Speed = 30 Kmph
99	28+739 to 28+757	Sharp Bend	Design Speed = 30 Kmph
100	28+949 to 28+98	Sharp Bend	Design Speed = 20 Kmph
101	29+054 to 29+078	Sharp Bend	Design Speed = 30 Kmph
102	29+14 to 29+161	Sharp Bend	Design Speed = 20 Kmph
103	29+28 to 29+299	Sharp Bend	Design Speed = 30 Kmph
104	29+387 to 29+391	Sharp Bend	Design Speed = 20 Kmph
105	29+451 to 29+483	Sharp Bend	Design Speed = 30 Kmph
106	29+65 to 29+687	Sharp Bend	Design Speed = 30 Kmph
107	29+78 to 29+803	Sharp Bend	Design Speed = 30 Kmph
108	29+871 to 29+876	Sharp Bend	Design Speed = 20 Kmph
109	29+954 to 29+961	Sharp Bend	Design Speed = 30 Kmph
110	30+033 to 30+04	Sharp Bend	Design Speed = 20 Kmph
111	30+12 to 30+183	Sharp Bend	Design Speed = 20 Kmph
112	30+325 to 30+336	Sharp Bend	Design Speed = 30 Kmph
113	30+397 to 30+415	Sharp Bend	Design Speed = 30 Kmph
114	30+49 to 30+498	Sharp Bend	Design Speed = 20 Kmph
115	30+587 to 30+593	Sharp Bend	Design Speed = 20 Kmph
116	30+656 to 30+678	Sharp Bend	Design Speed = 20 Kmph
117	30+739 to 30+762	Sharp Bend	Design Speed = 30 Kmph
118	30+947 to 30+996	Sharp Bend	Design Speed = 20 Kmph
119	31+05 to 31+072	Sharp Bend	Design Speed = 30 Kmph
120	31+126 to 31+164	Sharp Bend	Design Speed = 30 Kmph
121	31+24 to 31+263	Sharp Bend	Design Speed = 20 Kmph
122	31+361 to 31+397	Sharp Bend	Design Speed = 30 Kmph
123	31+463 to 31+514	Sharp Bend	Design Speed = 30 Kmph
124	31+6 to 31+61	Sharp Bend	Design Speed = 20 Kmph
125	31+662 to 31+693	Sharp Bend	Design Speed = 20 Kmph
126	31+788 to 31+803	Sharp Bend	Design Speed = 30 Kmph
127	31+85 to 31+89	Sharp Bend	Design Speed = 20 Kmph
128	31+951 to 31+964	Sharp Bend	Design Speed = 20 Kmph
129	32+071 to 32+081	Sharp Bend	Design Speed = 30 Kmph
130	32+146 to 32+157	Sharp Bend	Design Speed = 20 Kmph
131	32+21 to 32+22	Sharp Bend	Design Speed = 20 Kmph
132	32+267 to 32+286	Sharp Bend	Design Speed = 20 Kmph
133	32+334 to 32+342	Sharp Bend	Design Speed = 20 Kmph
134	32+419 to 32+443	Sharp Bend	Design Speed = 20 Kmph
135	32+532 to 32+554	Sharp Bend	Design Speed = 30 Kmph
136	32+683 to 32+733	Sharp Bend	Design Speed = 30 Kmph

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 existing right of way and proper road signs and safety Measures shall be provided.

(iv) Right of Way

[Refer to provision of relevant Manual Details of the Right of Way are given in Annex-II of Schedule-A.

(v) Type of shoulders
[Refer to provision of relevant Manual and specify]

(a) In built-up sections. footpaths/fully paved shoulders shall be provided in the following stretches:

Sl. No.	Stretch (from Km to Km)	Fully Paved shoulders/footpaths	Reference to cross section
1	24+850 to 25+610	2 X 1.0 m width Footpath	TCS-1
2	31+780 to 32+835	2 X 1.0 m width Footpath	TCS-1

(b) Hard shoulders of 1.5 m width shall be provided with selected earth wherever applicable as per TCS drawing.

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

(vi) Lateral and vertical clearances at underpasses

(a) Lateral and vertical clearances at underpasses and provision of guardrails/crash barriers shall be as per requirements specified in the relevant Manual.

(b) Lateral clearance: The width of the opening at the under passes shall be as follows:

Sl.No.	Location (Chainage) (from km to km)	Span/opening(m)	Remarks
Nil			

(vii) Lateral and vertical clearances at overpasses

(a) Lateralandverticalclearancesatoverpassesshallbeasperrequirementsspecifiedinthe relevant Manual.

(b) Lateral clearance :The width of the opening at the overpasses shall be as follows:

Sl. No.	Location (Chainage) (from km to km)	Span/Opening (m)	Remarks
Nil			

(viii) Service roads

Service roads shall be constructed at the locations and for the lengths indicated below:
[Refer requirements specified in the relevant Manual]

Sl. No.	Location of service road(from km to km)	Right hand side(RHS)/Left hand side(LHS)/or Both sides	Length(km)of service road
Nil			

(ix) Grade separated structures

(a) Grade separated structures shall be provided as per provision of the Manual. The requisite particulars are given below:

[Refer to requirements specified in the relevant Manual]

Sl. No.	Location of Structure (VUP)	Length (m)	Number and length of spans	Approach gradient	Remarks. if any

Nil

(b) 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 provision of the Manual and specify the type of vehicular underpass/ 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						

(x) Cattle and pedestrian underpass /overpass

Cattle and pedestrian underpass/overpass shall be constructed as follows: [Refer to provision of the relevant Manual and specify the requirements of cattle and pedestrian underpass/overpass]

Sl.No.	Location	Type of crossing
Nil		

(xi) Typical cross-sections of the Project Highway

[Give typical cross-sections of the Project Highway by reference to the Manual]As per attached Drawings

TCS TYPE	DESCRIPTION	Length (m)
TCS 1	Two-Lane carriageway with hard shoulder in built up area with both side footpath cum RCC covered drain (existing pavement)	1815
TCS 2	Two-Lane carriageway with hard shoulder and one side toe wall & one side ret wall (existing pavement)	350
TCS 3	Two-Lane carriageway with hard shoulder and one side toe wall (existing pavement)	250
TCS 4	Two-Lane carriageway with hard shoulder in rural area (existing pavement)	2333
TCS 4A	Two-Lane carriageway with hard shoulder in rural area (realignment stretch)	0
TCS 5	Two-Lane carriageway with hard shoulder and one side toe wall & one side trapezoidal drain (existing pavement)	340
TCS 6	Two-Lane carriageway with hard shoulder and both side trapezoidal drain (existing pavement)	5600
TCS 6A	Two-Lane carriageway with hard shoulder and both side trapezoidal drain (realignment stretch)	0
TCS 7	Two-Lane carriageway with hard shoulder and one side trapezoidal drain (existing pavement)	3620
TCS 8	Two-Lane carriageway with hard shoulder and one side breast wall (existing pavement)	500
TCS 9	Two-Lane carriageway with hard shoulder and one side breast wall & one side drain (existing pavement)	2040
TCS 10	Two-Lane carriageway with hard shoulder and one side ret wall (existing pavement)	560
TCS 10A	Two-Lane carriageway with hard shoulder and one side ret wall (realignment stretch)	0
TCS 11	Two-Lane carriageway with hard shoulder and one side ret wall & one side drain (existing pavement)	900
TCS 12	Two-Lane carriageway with hard shoulder and one side ret wall & one breast wall (existing pavement)	530
TCS 13	Two-Lane carriageway with hard shoulder and both side retaining wall (existing pavement)	250

Chainage (Km)		Length of CD	Net Length (m)	TCS No.
From	To			
13747	13830		83	TCS-4
13830	14120	15.2	274.8	TCS-7
14120	14270		150	TCS-4
14270	14420		150	TCS-7

Chainage (Km)		Length of CD	Net Length (m)	TCS No.
From	To			
14420	14520	2.7	97.3	TCS-3
14520	14720		200	TCS-6
14720	15120	10.3	389.7	TCS-7
15120	15220	2.7	97.3	TCS-2
15220	15370	2.6	147.4	TCS-7
15370	15470	9	91	TCS-2
15470	15570		100	TCS-7
15570	15620	2.6	47.4	TCS-10
15620	15820		200	TCS-6
15820	15870		50	TCS-10
15870	15920	2.7	47.3	TCS-4
15920	16030		110	TCS-9
16030	16080		50	TCS-4
16080	16130	5	45	TCS-10
16130	16230	2.6	97.4	TCS-6
16230	16780	7.9	542.1	TCS-7
16780	16870	2.6	87.4	TCS-11
16870	16970		100	TCS-8
16970	17070	2.6	97.4	TCS-4
17070	17270		200	TCS-6
17270	17320	2.6	47.4	TCS-10
17320	17520	3.96	196.04	TCS-6
17520	17610		90	TCS-5
17610	17820	2.6	207.4	TCS-6
17820	18020	14.5	185.5	TCS-11
18020	18170		150	TCS-6
18170	18220	2.6	47.4	TCS-10
18220	18420	2.6	197.4	TCS-6
18420	18830	7.6	402.4	TCS-9
18830	18920	2.7	87.3	TCS-4
18920	19030		110	TCS-9
19030	19220	2.6	187.4	TCS-7
19220	19520	5.3	294.7	TCS-6
19520	19820	5	295	TCS-8
19820	19920		100	TCS-5
19920	20460	2.6	537.4	TCS-7
20460	20570	2.6	107.4	TCS-4
20570	20620		50	TCS-10
20620	21070	5.4	444.6	TCS-7
21070	21120		50	TCS-10
21120	21270		150	TCS-2
21270	21370		100	TCS-13
21370	21520	5.3	144.7	TCS-11
21520	21670		150	TCS-9
21670	21720	2.6	47.4	TCS-4
21720	21770		50	TCS-8
21770	22070		300	TCS-12
22070	22120		50	TCS-8
22120	22420	10	290	TCS-7
22420	22520	2.6	97.4	TCS-6
22520	22570	2.6	47.4	TCS-13
22570	22620		50	TCS-11
22620	22970		350	TCS-9
22970	23120		150	TCS-6
23120	23230		110	TCS-11

Chainage (Km)		Length of CD	Net Length (m)	TCS No.
From	To			
23230	23920	5.2	684.8	TCS-6
23920	24070		150	TCS-11
24070	24170	6.4	93.6	TCS-10
24170	24220		50	TCS-7
24220	24320		100	TCS-5
24320	24420	2.7	97.3	TCS-3
24420	24520		100	TCS-6
24520	24620		100	TCS-7
24620	24850	5.2	224.8	TCS-12
24850	25610		760	TCS-1
25610	25720	2.7	107.3	TCS-10
25720	26070	3.96	346.04	TCS-6
26070	26170		100	TCS-13
26170	26220		50	TCS-7
26220	26320		100	TCS-9
26320	26570		250	TCS-6
26570	26620		50	TCS-11
26620	26770		150	TCS-4
26770	26870		100	TCS-6
26870	27020	2.7	147.3	TCS-7
27020	27320	5.4	294.6	TCS-4
27320	27670		350	TCS-6
27670	27820		150	TCS-4
27820	27870		50	TCS-5
27870	28070		200	TCS-6
28070	28220	2.7	147.3	TCS-4
28220	28420		200	TCS-6
28420	28520	2.6	97.4	TCS-4
28520	28670	2.7	147.3	TCS-7
28670	28820	2.6	147.4	TCS-4
28820	28870		50	TCS-9
28870	29320	7.8	442.2	TCS-6
29320	29520	2.6	197.4	TCS-4
29520	29770		250	TCS-6
29770	29870	2.7	97.3	TCS-4
29870	29970		100	TCS-11
29970	30020	5	45	TCS-3
30020	30120		100	TCS-4
30120	30720		600	TCS-9
30720	30820	2.6	97.4	TCS-4
30820	31070	2.6	247.4	TCS-6
31070	31220	2.7	147.3	TCS-4
31220	31620	2.6	397.4	TCS-6
31620	31780		160	TCS-9
31780	32835	7.8	1047.2	TCS-1

3. Intersections and Grade Separators

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

[Refer to provision of the relevant Manual and specify the requirements. Explain where necessary with drawings/sketches/general arrangement]

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

(i) At-grade intersections

Major Intersections

Sl. No.	Location of intersection (Km)	Type of intersection	Other features	Remarks
1	32.155	3 Legged	RHS-Towards Singngat Village	At-grade improvement proposed

Minor Intersections

Sl. No.	Location of intersection (Km)	Type of intersection	Other features
1	13+750	X	4-Legged
2	13+850	T	3-Legged
3	13+895	T	3-Legged
4	14+630	T	3-Legged
5	14+870	Y	3-Legged
6	14+990	T	3-Legged
7	15+735	Y	3-Legged
8	19+330	Y	3-Legged
9	19+980	T	3-Legged
10	20+030	T	3-Legged
11	20+135	Y	3-Legged
12	20+270	T	3-Legged
13	20+320	T	3-Legged
14	28+060	Y	3-Legged
15	28+200	Y	3-Legged
16	28+465	Y	3-Legged
17	29+575	T	3-Legged

(ii) Grade separated intersection with/without ramps

Sl. No.	Location	Salient features	Minimumlengthof viaduct tobe provided	Roadtobecarried over/underthe structures
Nil				

4. Road Embankment and Cut Section

(i) 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.

(ii) Raising of the existing road [Refer to provision of the relevant Manual and specify sections to be raised]

The existing road shall be raised in the following sections:

Sl. No.	Section (from km to km)	Length (km)	Extent of raising [Top of finished road level]

Nil

5. Pavement Design

(i) Pavement design shall be carried out in accordance with provision of the relevant manual.

(ii) Type of pavement

Flexible Pavement

(iii) Design requirements

[Refer to provision of the relevant Manual and specify design requirements and strategy]

(a) 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 20 years. Stage construction shall not be permitted.

(b) Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual. The Contractor shall design the pavement for design traffic of 20 msa.

(iv) Reconstruction of stretches

[Refer to provision of the relevant Manual and specify the stretches if any to be reconstructed.]

The following stretches of the existing road shall be reconstructed. These shall be designed as new pavement.

SL NO.	Stretch from Km to Km	Remarks	TCS Type
1	13+747 to 13+830	Reconstruction	TCS-4
2	13+830 to 14+120	Reconstruction	TCS-7
3	14+120 to 14+270	Reconstruction	TCS-4
4	14+270 to 14+420	Reconstruction	TCS-7
5	14+420 to 14+520	Reconstruction	TCS-3
6	14+520 to 14+720	Reconstruction	TCS-6
7	14+720 to 15+120	Reconstruction	TCS-7
8	15+120 to 15+220	Reconstruction	TCS-2
9	15+220 to 15+370	Reconstruction	TCS-7
10	15+370 to 15+470	Reconstruction	TCS-2
11	15+470 to 15+570	Reconstruction	TCS-7
12	15+570 to 15+620	Reconstruction	TCS-10
13	15+620 to 15+820	Reconstruction	TCS-6
14	15+820 to 15+870	Reconstruction	TCS-10
15	15+870 to 15+920	Reconstruction	TCS-4
16	15+920 to 16+030	Reconstruction	TCS-9
17	16+030 to 16+080	Reconstruction	TCS-4
18	16+080 to 16+130	Reconstruction	TCS-10
19	16+130 to 16+230	Reconstruction	TCS-6
20	16+230 to 16+780	Reconstruction	TCS-7
21	16+780 to 16+870	Reconstruction	TCS-11
22	16+870 to 16+970	Reconstruction	TCS-8
23	16+970 to 17+070	Reconstruction	TCS-4
24	17+070 to 17+270	Reconstruction	TCS-6
25	17+270 to 17+320	Reconstruction	TCS-10
26	17+320 to 17+520	Reconstruction	TCS-6

SL NO.	Stretch from Km to Km	Remarks	TCS Type
27	17+520 to 17+610	Reconstruction	TCS-5
28	17+610 to 17+820	Reconstruction	TCS-6
29	17+820 to 18+020	Reconstruction	TCS-11
30	18+020 to 18+170	Reconstruction	TCS-6
31	18+170 to 18+220	Reconstruction	TCS-10
32	18+220 to 18+420	Reconstruction	TCS-6
33	18+420 to 18+830	Reconstruction	TCS-9
34	18+830 to 18+920	Reconstruction	TCS-4
35	18+920 to 19+030	Reconstruction	TCS-9
36	19+030 to 19+220	Reconstruction	TCS-7
37	19+220 to 19+520	Reconstruction	TCS-6
38	19+520 to 19+820	Reconstruction	TCS-8
39	19+820 to 19+920	Reconstruction	TCS-5
40	19+920 to 20+460	Reconstruction	TCS-7
41	20+460 to 20+570	Reconstruction	TCS-4
42	20+570 to 20+620	Reconstruction	TCS-10
43	20+620 to 21+070	Reconstruction	TCS-7
44	21+070 to 21+120	Reconstruction	TCS-10
45	21+120 to 21+270	Reconstruction	TCS-2
46	21+270 to 21+370	Reconstruction	TCS-13
47	21+370 to 21+520	Reconstruction	TCS-11
48	21+520 to 21+670	Reconstruction	TCS-9
49	21+670 to 21+720	Reconstruction	TCS-4
50	21+720 to 21+770	Reconstruction	TCS-8
51	21+770 to 22+070	Reconstruction	TCS-12
52	22+070 to 22+120	Reconstruction	TCS-8
53	22+120 to 22+420	Reconstruction	TCS-7
54	22+420 to 22+520	Reconstruction	TCS-6
55	22+520 to 22+570	Reconstruction	TCS-13
56	22+570 to 22+620	Reconstruction	TCS-11
57	22+620 to 22+970	Reconstruction	TCS-9
58	22+970 to 23+120	Reconstruction	TCS-6
59	23+120 to 23+230	Reconstruction	TCS-11
60	23+230 to 23+920	Reconstruction	TCS-6
61	23+920 to 24+070	Reconstruction	TCS-11
62	24+070 to 24+170	Reconstruction	TCS-10
63	24+170 to 24+220	Reconstruction	TCS-7
64	24+220 to 24+320	Reconstruction	TCS-5
65	24+320 to 24+420	Reconstruction	TCS-3
66	24+420 to 24+520	Reconstruction	TCS-6
67	24+520 to 24+620	Reconstruction	TCS-7
68	24+620 to 24+850	Reconstruction	TCS-12
69	24+850 to 25+610	Reconstruction	TCS-1
70	25+610 to 25+720	Reconstruction	TCS-10
71	25+720 to 26+070	Reconstruction	TCS-6
72	26+070 to 26+170	Reconstruction	TCS-13
73	26+170 to 26+220	Reconstruction	TCS-7
74	26+220 to 26+320	Reconstruction	TCS-9
75	26+320 to 26+570	Reconstruction	TCS-6
76	26+570 to 26+620	Reconstruction	TCS-11
77	26+620 to 26+770	Reconstruction	TCS-4
78	26+770 to 26+870	Reconstruction	TCS-6
79	26+870 to 27+020	Reconstruction	TCS-7
80	27+020 to 27+320	Reconstruction	TCS-4
81	27+320 to 27+670	Reconstruction	TCS-6
82	27+670 to 27+820	Reconstruction	TCS-4

SL NO.	Stretch from Km to Km	Remarks	TCS Type
83	27+820 to 27+870	Reconstruction	TCS-5
84	27+870 to 28+070	Reconstruction	TCS-6
85	28+070 to 28+220	Reconstruction	TCS-4
86	28+220 to 28+420	Reconstruction	TCS-6
87	28+420 to 28+520	Reconstruction	TCS-4
88	28+520 to 28+670	Reconstruction	TCS-7
89	28+670 to 28+820	Reconstruction	TCS-4
90	28+820 to 28+870	Reconstruction	TCS-9
91	28+870 to 29+320	Reconstruction	TCS-6
92	29+320 to 29+520	Reconstruction	TCS-4
93	29+520 to 29+770	Reconstruction	TCS-6
94	29+770 to 29+870	Reconstruction	TCS-4
95	29+870 to 29+970	Reconstruction	TCS-11
96	29+970 to 30+020	Reconstruction	TCS-3
97	30+020 to 30+120	Reconstruction	TCS-4
98	30+120 to 30+720	Reconstruction	TCS-9
99	30+720 to 30+820	Reconstruction	TCS-4
100	30+820 to 31+070	Reconstruction	TCS-6
101	31+070 to 31+220	Reconstruction	TCS-4
102	31+220 to 31+620	Reconstruction	TCS-6
103	31+620 to 31+780	Reconstruction	TCS-9
104	31+780 to 32+835	Reconstruction	TCS-1

6. RoadsideDrainage

Drainage system including surface and sub surfaced rains for the Project Highway has been provided in the table given below:

RCC Covered Drain

Chainage		Side	Net Length (m)
From (m)	To (m)		
24850	25610	Both	1520
31780	32835	Both	2094
Total Length =			3614

PCC Trapezoidal Drain

Chainage		Side	Net Length (m)
From (m)	To (m)		
13830	14120	One	275
14270	14420	One	150
14520	14720	One	400
14720	15120	One	390
15220	15370	One	147
15470	15570	One	100
15620	15820	One	400
15920	16030	One	110
16130	16230	One	195
16230	16780	One	542
16780	16870	One	87
17070	17270	One	400
17320	17520	One	392
17520	17610	One	90
17610	17820	One	415
17820	18020	One	186
18020	18170	One	300
18220	18420	One	395

Chainage		Side	Net Length (m)
From (m)	To (m)		
18420	18830	One	402
18920	19030	One	110
19030	19220	One	187
19220	19520	One	589
19820	19920	One	100
19920	20460	One	537
20620	21070	One	445
21370	21520	One	145
21520	21670	One	150
22120	22420	One	290
22420	22520	One	195
22570	22620	One	50
22620	22970	One	350
22970	23120	One	300
23120	23230	One	110
23230	23920	One	1370
23920	24070	One	150
24170	24220	One	50
24220	24320	One	100
24420	24520	One	200
24520	24620	One	100
25720	26070	One	692
26170	26220	One	50
26220	26320	One	100
26320	26570	One	500
26570	26620	One	50
26770	26870	One	200
26870	27020	One	147
27320	27670	One	700
27820	27870	One	50
27870	28070	One	400
28220	28420	One	400
28520	28670	One	147
28820	28870	One	50
28870	29320	One	884
29520	29770	One	500
29870	29970	One	100
30120	30720	One	600
30820	31070	One	495
31220	31620	One	795
31620	31780	One	160

Length of Side Drain **17924** **m**
Length of catch water Drain= **1792.436** **m**
Length of Outlet= **1792.436** **m**
Total Length of Drain= **21509** **m**

7. Design of Structures

(i)General

(a) All bridges culverts and structures shall be designed and constructed in accordance with provision of the relevant Manual and shall conform to the cross- sectional features and other details specified there in.

(b) Width of the carriage way of new bridges and structures shall be as follows:

[Refer to provision of the relevant Manual and specify the width of carriage way of new bridges and structures of more than 60 (sixty) metre length. If the carriage way width is different from 7.5 (seven point five) metres in the table below.]

Sl. No.	Bridge/Structure at km	Width of carriageway and cross-sectional features
1	14+223	Carriageway Width = 11.0 m Overall width = 16.0 m
2	17+017	
3	21+104	

(c) The following structures shall be provided with footpaths:

[Refer to provision of the relevant Manual and provide details of new Structures with footpath]

Sl. No.	Bridge/Structure at km	Width of carriageway and cross-sectional features*
Nil		

(d) All bridges shall be high-level bridges.

[Refer to provision of the relevant Manual and state if there is any exception]

(e) The following structures shall be designed to carry utility services specified in Table below:

[Refer to provision of the relevant Manualand provide details]

Sl.No.	Bridge at km	Utility service to be carried	Remarks
Nil			

(f) Cross-section of the new culverts and bridges at deck level for the Project Highways shall conform to the typical cross-sections given in provision of the relevant Manual.

(i) Culverts

(a) Overall width of all culverts shall be equal to the roadway width of the approaches.
(b) Reconstruction of existing culverts:

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

[Refer to provision of the relevant Manualand provide details]

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
1	13.861	2.0 X 2.0	Single Span
2	14.060	2.0 X 2.0	Single Span
3	14.087	2.0 X 2.0	Single Span
4	15.182	2.0 X 3.0	Single Span
5	15.242	2.0 X 2.0	Single Span
6	15.390	2.0 X 2.0	Single Span
7	15.420	5.0 X 5.0	Single Span
8	15.898	2.0 X 3.0	Single Span
9	16.090	4.0 X 3.0	Single Span
10	16.214	2.0 X 2.0	Single Span
11	16.367	2.0 X 3.0	Single Span
12	16.592	2.0 X 2.0	Single Span
13	16.680	2.0 X 2.0	Single Span
14	16.790	2.0 X 2.0	Single Span
15	17.065	2.0 X 2.0	Single Span
16	17.290	2.0 X 2.0	Single Span

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
17	17.515	3.0 X 4.0	Single Span
18	17.658	2.0 X 2.0	Single Span
19	17.845	2.0 X 3.0	Single Span
20	17.918	2.0 X 3.0	Single Span
21	18.402	2.0 X 2.0	Single Span
22	18.495	2.0 X 2.0	Single Span
23	18.650	4.0 X 3.0	Single Span
24	18.890	2.0 X 3.0	Single Span
25	19.264	2.0 X 2.0	Single Span
26	19.455	2.0 X 3.0	Single Span
27	19.715	4.0 X 3.0	Single Span
28	20.236	2.0 X 2.0	Single Span
29	20.488	2.0 X 2.0	Single Span
30	20.674	2.0 X 3.0	Single Span
31	20.802	2.0 X 3.0	Single Span
32	21.520	2.0 X 2.0	Single Span
33	21.712	2.0 X 2.0	Single Span
34	22.135	2.0 X 2.0	Single Span
35	22.450	2.0 X 2.0	Single Span
36	22.550	2.0 X 2.0	Single Span
37	23.245	2.0 X 2.0	Single Span
38	23.425	2.0 X 2.0	Single Span
39	24.110	5.0 X 5.0	Single Span
40	24.666	2.0 X 2.0	Single Span
41	24.805	2.0 X 2.0	Single Span
42	26.065	3.0 X 4.0	Single Span
43	26.902	2.0 X 3.0	Single Span
44	27.031	2.0 X 3.0	Single Span
45	27.305	2.0 X 3.0	Single Span
46	28.220	2.0 X 3.0	Single Span
47	28.486	2.0 X 2.0	Single Span
48	28.560	2.0 X 3.0	Single Span
49	28.760	2.0 X 2.0	Single Span
50	29.212	2.0 X 2.0	Single Span
51	29.280	2.0 X 2.0	Single Span
52	29.446	2.0 X 2.0	Single Span
53	29.855	2.0 X 3.0	Single Span
54	30.005	4.0 X 3.0	Single Span
55	30.746	2.0 X 2.0	Single Span
56	30.852	2.0 X 2.0	Single Span
57	31.137	2.0 X 3.0	Single Span
58	31.378	2.0 X 2.0	Single Span
59	31.906	2.0 X 2.0	Single Span
60	31.975	2.0 X 2.0	Single Span

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

(c) Widening of existing culverts:

All existing culverts which are not to be reconstructed shall be widened to the Roadway width of the Project Highway as per the typical cross section given in provision of the relevant Manual. Repairs and strengthening of existing structures where required shall be carried out.

Sl. No.	Culvert location	Type, span, height and width of existing culvert(m)	Repairs to be carried out [specify]
Nil			

(d) Additional new culverts shall be constructed as per particulars given in the table below:

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
1	14.489	2.0 X 3.0	Single Span
2	14.824	2.0 X 3.0	Single Span
3	15.600	2.0 X 2.0	Single Span
4	18.171	2.0 X 2.0	Single Span
5	19.130	2.0 X 2.0	Single Span
6	21.380	2.0 X 3.0	Single Span
7	24.368	2.0 X 3.0	Single Span
8	25.638	2.0 X 3.0	Single Span
9	29.081	2.0 X 2.0	Single Span
10	32.135	2.0 X 2.0	Single Span

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

[Refer provision of the relevant Manual and provide details]

Sl.No.	Location at km	Type of repair required
Nil		

(f) Floor protection works shall be as specified in the relevant IRC Codes and Specifications.

(iii) Bridges

(a) Existing bridges to be re-constructed/widened

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

Refer provision of the relevant Manual and provide details

Sl. No.	Bridge location	Salient details of existing bridge		Adequacy or otherwise of the existing waterway, vertical clearance etc.*	Remarks
	(km)	Type of Structures	Span Arrangement and Total Vent way (No. x Length) (m)		
1	14+223	INTEGRAL SLAB	1 X 12m	Insufficient width and not conform to IRC Loading	
2	17+017	RCC SLAB	1 X 10m	Insufficient width and not conform to IRC Loading	
3	21+104	RCC SLAB	1 X 8m	Insufficient width and not conform to IRC Loading	

(ii) The following narrow bridges shall be widened:

Sl. No.	Location (km)	Existing width(m)	Extent of widening(m)	Cross-sectionatdeck levelforwidening@
Nil				

(b) Additional new bridges

[Specify additional new bridges if required. And attach GAD]

New bridges at the following locations on the Project Highway shall be constructed. GADs for the new bridges are attached in the drawings folder.

Sl. No.	Location (km)	Total Length (m)	Remarks.If any
Nil			

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

[Refer provision of the relevant Manualand provide details:]

Sl.No.	Location atkm	Remarks
Nil		

(d) Repairs/replacements of railing/parapets of the existing bridges shall be undertaken as follows:

[Refer to provision of the relevant Manualand provide details]

Sl. No.	Location at km	Remarks
Nil		

(e) Drainage system for bridge decks

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

(f) Structures in marine environment

[Refer to provision of the relevant Manual and specify the necessary measures / treatments for protecting structures in marine environment. Where applicable]

(iv) Rail-road bridges

(a) Design construction and detailing of ROB/RUB shall be as specified in provision of the relevant Manual [Refer to provision of the relevant Manual and specify modification, if any]

(b) 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(Chainage km)	Length of bridge (m)
Nil		

(c)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 (Chainage km)	Number and length of span(m)
Nil		

(v) Grade separated structures

[Refer provision of the relevant Manual]

Thegradeseparatedstructuresshallbeprovidedatthelocationsandofthetypeand length specified in paragraphs 2(ix) and3 of this Annex-I.

(vi) Repairs and strengthening of bridges and structures

[Refer to provision of the relevant Manual and provide details]

Theexistingbridgesandstructurestoberepaired/strengthenedandthenatureand extents of repairs /strengthening required are given below:

(a) Bridges

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

(b)ROB / RUB

Sl. No.	Location of ROB/RUB (km)	Nature and extent of repairs/strengthening to be carried out
Nil		

(c) Overpasses/Underpasses and other structures

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

(vii) List of Major Bridges and Structures

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

Sl. No.	Location (Km)
Nil	

8. Traffic Control Devices and Road Safety Works

(i) Trafficcontroldevicesandroadsafetyworksshallbeprovidedinaccordancewith provisionsof relevant Manual.

Sl. No	Traffic Signages, Road Marking and other appurtenances	unit	Quantity
1	Total No of Street Light=	Nos	309
2	Kilometre stones=	Nos	16
3	5th Kilometre stones=	Nos	4
4	Boundary Stones=	Nos	193
5	Delineators (100 cm long and circular shaped) +Hazard marker =	Nos	1905
6	Road Stud=	Nos	9570

Sl. No	Traffic Signages, Road Marking and other appurtenances	unit	Quantity
7	900 mm Octagonal	Nos	8
8	600 mm circular	Nos	5
9	900 mm Triangular	Nos	339
10	800 mm x 600 mm rectangular	Nos	16
11	Direction Sign < 0.9 sqm	sqm	16.2
12	Direction Sign > 0.9 sqm	sqm	9
13	Convex Mirror for Blind Curve	Nos	30

(ii) Specifications of the reflective sheeting. [Refer to provision of relevant Manual and specify]

9. Road side Furniture

(i) Road side furniture shall be provided in accordance with article 8(i) of this schedule.

(ii) Overhead traffic signs: location and size

Sl. No.	Location (Km)	Size
Nil		

10. Compulsory Afforestation

[Refer to provision of relevant Manual and specify the number of trees which are required to be planted by the concerned department as compensatory afforestation.]

11. Hazardous Locations

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

a) Breast Wall

Chainage		Side	Net Length (m)
From (m)	To (m)		
15920	16030	One	110
16870	16970	One	100
18420	18830	One	402
18920	19030	One	110
19520	19820	One	295
21520	21670	One	150
21720	21770	One	50
21770	22070	One	300
22070	22120	One	50
22620	22970	One	350
24620	24850	One	225
26220	26320	One	100
28820	28870	One	50
30120	30720	One	600
31620	31780	One	160
Total Length =			**3052 m**

b) Retaining Wall

Chainage		Side	Net Length (m)
From (m)	To (m)		
15120	15220	One	97
15370	15470	One	91
15570	15620	One	47
15820	15870	One	50
16080	16130	One	45
16780	16870	One	87
17270	17320	One	47

17820	18020	One	186
18170	18220	One	47
20570	20620	One	50
21070	21120	One	50
21120	21270	One	150
21270	21370	One	200
21370	21520	One	145
21770	22070	One	300
22520	22570	One	95
22570	22620	One	50
23120	23230	One	110
23920	24070	One	150
24070	24170	One	94
24620	24850	One	225
25610	25720	One	107
26070	26170	One	100
26070	26170	One	100
26570	26620	One	50
29870	29970	One	100
Total Length =			**2774 m**

c) Toe wall

Chainage		**Side**	**Net Length (m)**
From (m)	**To (m)**		
14420	14520	One	97
15120	15220	One	97
15370	15470	One	91
17520	17610	One	90
19820	19920	One	100
21120	21270	One	150
24220	24320	One	100
24320	24420	One	97
27820	27870	One	50
29970	30020	One	45
Total Length =			**918 m**

d) Metal Beam Crash Barrier

Chainage		**Side**	**Net Length (m)**
From (m)	**To (m)**		
14420	14520	One	97
15120	15220	Both	195
15370	15470	Both	182
15570	15620	One	47
15820	15870	One	50
16080	16130	One	45
16780	16870	One	87
17270	17320	One	47
17520	17610	One	90
17820	18020	One	186
18170	18220	One	47
19820	19920	One	100
20570	20620	One	50
21070	21120	One	50
21120	21270	Both	300
21270	21370	Both	200
21370	21520	One	145
21770	22070	One	300

Chainage		Side	Net Length (m)
From (m)	To (m)		
22520	22570	Both	95
22570	22620	One	50
23120	23230	One	110
23920	24070	One	150
24070	24170	One	94
24220	24320	One	100
24320	24420	One	97
24620	24850	One	225
25610	25720	One	107
26070	26170	Both	200
26570	26620	One	50
27820	27870	One	50
29870	29970	One	100
29970	30020	One	45
Total Length =			**3692**

12. Special Requirement for Hill Roads

[Refer to the provision of relevant Manual and provide details where relevant and required.]

13. Change of Scope

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

(Schedule-B1)

1. The shifting o futilities and felling of trees shall be carried out by the concerned department. The cost of the same shall be borne by the concerned department.

Schedule - C

(See Clause 2.1)

Project Facilities

1. Project Facilities

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

(a) Toll plaza[s]

(b) Roadside furniture;

(c) Pedestrian facilities;

(d) Truck Lay byes;

(e) Bus-bays and passenger shelters;

(f) Rest areas; and

(g) Others to be specified

2. Description of Project Facilities

Each of the Project Facilities is described below

a) Toll Plaza: -

Sl. No.	Design Chainage(km)	Name of the Place
Nil		

b) Roadside furniture: -

Sl. No.	Description	Location	Design Standard
1	Traffic sign & pavement marking	Entire Length (As per Schedule B)	As per Manual
2	Km Stone, 5th kilometre stone	Entire Length	As per Manual
3	Boundary Stone	Entire Length	As per Manual
4	Roadside Delineator, marker & Road Stud	As per Schedule B	As per Manual
5	Metal beam crash barrier	As per Schedule B	As per Manual

C) Pedestrian Facility: -

Pedestrian facilities in the form of foot path shall be provided in the built-up area (refer typical cross – section drawing). Pedestrian facilities shall be provided at the locations of urban sections in order to ensure safety of pedestrians while crossing in consultation with NHIDCL.

d) Truck Lay bye: -

Sl. No.	Truck lay bye Chainage(Both Side)	Name of the Place
Nil		

e) Bus Bay &Passenger shelter: -

Sl. No.	Project Facility	Location (km)	Design Requirements	Other Essential Details
1	Bus Bay &Passenger shelter	15+650 (Both Side)	Bus Bays & Passenger shelter have been placed on both side of proposed roadway	Dimension of Bus Bay (L X B = 59.0 m X 3.0 m) Dimension of Passenger Shelter (L X B = 6.0 m X 2.0 m) (Refer Passenger Shelter Drawing)
2	Bus Bay & Passenger shelter	16+620 (Both Side)		
3	Bus Bay & Passenger shelter	19+170 (Both Side)		
4	Bus Bay & Passenger shelter	21+420 (Both Side)		
5	Bus Bay & Passenger shelter	23+630 (Both Side)		
6	Bus Bay &Passenger shelter	31+750 (Both Side)		
7	Bus Bay & Passenger shelter	32+500 (Both Side)		

f) Rest Areas

Sl. No.	Rest Area Chainage	Name of the Place
Nil		

g) Others to be specified

Street Lighting:
Total 309 Nos. Street lighting shall be provided in junction, passenger shelters &bridge locations.

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

Schedule - D

(See Clause 2.1)

Specifications and Standards

1. Construction

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

2. Design Standards

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

[Manual of Specifications and Standards for Two Lanning of Highways (IRC: SP: 73-2015), referred to herein as the Manual]

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

Annex – I

(Schedule-D)

Specifications and Standards for Construction

1. Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for [Two-Lanning of Highways (IRC:SP:73-2015)], referred to as the Manual, and MORTH Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2. Deviations from the Specifications and Standards

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

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

<table>
<tr><th>Item</th><th>Manual Clause Reference</th><th colspan="5">Provision as per Manual</th><th colspan="5">Modified Provision</th></tr>
<tr><td rowspan="11">Shoulder</td><td rowspan="11">2.6</td><td colspan="5"><u>Plain & Rolling Terrain</u></td><td colspan="5"><u>Plain & Rolling Terrain</u></td></tr>
<tr><td rowspan="2">Type of Section</td><td colspan="3">Width of Shoulder (m)</td><td rowspan="2">Type of Section</td><td colspan="3">Width of Shoulder (m)</td></tr>
<tr><td>Paved</td><td>Earthen</td><td>Total</td><td>Paved</td><td>Earthen</td><td>Total</td></tr>
<tr><td>Open Country with Isolated Built-up Area</td><td>1.5</td><td>2</td><td>3.5</td><td>Open Country with Isolated Built-up Area</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Built-up Area (2 Lane Section)</td><td>2.5</td><td>-</td><td>2.5</td><td>Built-up Area (2 Lane Section)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Built-up Area (4 Lane Section)</td><td>-</td><td>-</td><td>-</td><td>Built-up Area (4 Lane Section)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Approaches to grade separated structures</td><td>2</td><td>-</td><td>3</td><td>Approaches to grade separated structures</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Approaches to bridges</td><td>1.5</td><td>2</td><td>3.5</td><td>Approaches to bridges</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="5"><u>Mountainous Terrain</u></td><td colspan="5"><u>Mountainous Terrain</u></td></tr>
<tr><td rowspan="2">Type of Section</td><td rowspan="2"></td><td colspan="3">Width of Shoulder (m)</td><td rowspan="2">Type of Section</td><td rowspan="2"></td><td colspan="3">Width of Shoulder (m)</td></tr>
<tr><td>Paved</td><td>Earthen</td><td>Total</td><td>Paved</td><td>Earthen</td><td>Total</td></tr>
<tr><td rowspan="2">Open Country with Isolated Built-up Area</td><td>Hill Side</td><td>1.5</td><td>-</td><td>1.5</td><td rowspan="2">Open Country with Isolated Built-up Area</td><td>Hill Side</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Valley Side</td><td>1.5</td><td>1</td><td>2.5</td><td>Valley Side</td><td>-</td><td>Upto 1.0 m</td><td>1</td></tr>
<tr><td rowspan="2">Built-up Area and Approaches to grade separated structures/</td><td>Hill Side</td><td>0.25 m + 1.5 m (Raised)</td><td>-</td><td>1.75</td><td rowspan="2">Built-up Area and Approaches to grade separated structures/ bridges</td><td>Hill Side</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Valley Side</td><td>0.25 m + 1.5 m</td><td>-</td><td>1.75</td><td>Valley Side</td><td>-</td><td>-</td><td>-</td></tr>
</table>

<table>
<tr><th>Item</th><th>Manual Clause Reference</th><th>Provision as per Manual</th><th>Modified Provision</th></tr>
<tr><td></td><td></td><td>bridges (Raised)</td><td></td></tr>
<tr><td>Design Speed</td><td>2.2</td><td><u>Plain Terrain:</u>
Ruling : 100 Kmph
Minimum : 80 Kmph
<u>Mountainous Terrain:</u>
Ruling : 60 Kmph
Minimum : 40 Kmph</td><td><u>Plain Terrain:</u>
Design Speed followed 80 kmph in general. However design speed has been reduced to 40 kmph to accommodate the proposal within EROW.
<u>Mountainous Terrain:</u>
Design Speed followed 40-60 kmph in general. However design speed has been reduced to 20 kmph due to site constraints and to accommodate the proposal within EROW.
(Refer Horizontal Alignment Drawing and Table 1.1 below))</td></tr>
<tr><td>Extra Widening</td><td>2.7</td><td>Extra Widening has been proposed as per IRC: SP: 73-2015
<table><tr><th>Radius</th><th>Extra Widening</th></tr><tr><td>75-100 m</td><td>0.9 m</td></tr><tr><td>101-300 m</td><td>0.6 m</td></tr></table></td><td>Extra Widening has been proposed as per IRC: SP: 48-1998 (Table 6.9) of Hill Road Manual.
<table><tr><th>Radius</th><th>Extra Widening</th></tr><tr><td>21-40 m</td><td>1.5 m</td></tr><tr><td>41-60 m</td><td>1.2 m</td></tr><tr><td>61-100 m</td><td>0.9 m</td></tr><tr><td>75-100 m</td><td>0.9 m</td></tr><tr><td>101-300 m</td><td>0.6 m</td></tr><tr><td>Above 300 m</td><td>NIL</td></tr></table></td></tr>
<tr><td>Radii Of Horizontal Curve</td><td>2.9.4</td><td><u>Plain & Rolling Terrain:</u>
Desirable Minimum Radius: 400 m
Absolute Minimum Radius: 150 m
<u>Mountainous Terrain:</u>
Desirable Minimum Radius: 150 m
Absolute Minimum Radius: 75 m</td><td>Radius below 75 m has been provided in the location listed in table 1.</td></tr>
</table>

Table 1.1: Locations where Design Speed is less than40 kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
1	13+745 to 13+782	Sharp Bend	Design Speed = 30 Kmph
2	13+843 to 13+872	Sharp Bend	Design Speed = 30 Kmph
3	14+009 to 14+035	Sharp Bend	Design Speed = 30 Kmph
4	14+192 to 14+228	Sharp Bend	Design Speed = 20 Kmph
5	14+326 to 14+373	Sharp Bend	Design Speed = 30 Kmph
6	14+487 to 14+524	Sharp Bend	Design Speed = 30 Kmph
7	14+62 to 14+63	Sharp Bend	Design Speed = 30 Kmph
8	14+708 to 14+755	Sharp Bend	Design Speed = 30 Kmph
9	14+874 to 14+894	Sharp Bend	Design Speed = 30 Kmph
10	14+99 to 15+021	Sharp Bend	Design Speed = 30 Kmph
11	15+146 to 15+236	Sharp Bend	Design Speed = 20 Kmph
12	15+307 to 15+367	Sharp Bend	Design Speed = 20 Kmph
13	15+53 to 15+561	Sharp Bend	Design Speed = 20 Kmph
14	15+727 to 15+817	Sharp Bend	Design Speed = 30 Kmph
15	15+955 to 15+959	Sharp Bend	Design Speed = 20 Kmph
16	16+041 to 16+121	Sharp Bend	Design Speed = 30 Kmph
17	16+267 to 16+292	Sharp Bend	Design Speed = 30 Kmph
18	16+344 to 16+402	Sharp Bend	Design Speed = 20 Kmph
19	16+498 to 16+583	Sharp Bend	Design Speed = 20 Kmph
20	16+663 to 16+697	Sharp Bend	Design Speed = 20 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
21	16+749 to 16+78	Sharp Bend	Design Speed = 20 Kmph
22	16+869 to 16+892	Sharp Bend	Design Speed = 20 Kmph
23	16+979 to 17+049	Sharp Bend	Design Speed = 20 Kmph
24	17+19 to 17+247	Sharp Bend	Design Speed = 30 Kmph
25	17+391 to 17+422	Sharp Bend	Design Speed = 30 Kmph
26	17+502 to 17+545	Sharp Bend	Design Speed = 30 Kmph
27	17+59 to 17+619	Sharp Bend	Design Speed = 30 Kmph
28	17+796 to 17+831	Sharp Bend	Design Speed = 20 Kmph
29	17+994 to 18+051	Sharp Bend	Design Speed = 20 Kmph
30	18+102 to 18+122	Sharp Bend	Design Speed = 30 Kmph
31	18+194 to 18+231	Sharp Bend	Design Speed = 20 Kmph
32	18+346 to 18+407	Sharp Bend	Design Speed = 20 Kmph
33	18+590 to 18+599	Sharp Bend	Design Speed = 20 Kmph
34	18+668 to 18+690	Sharp Bend	Design Speed = 30 Kmph
35	18+813 to 18+847	Sharp Bend	Design Speed = 20 Kmph
36	18+950 to 18+996	Sharp Bend	Design Speed = 20 Kmph
37	19+073 to 19+095	Sharp Bend	Design Speed = 20 Kmph
38	19+234 to 19+327	Sharp Bend	Design Speed = 30 Kmph
39	19+404 to 19+435	Sharp Bend	Design Speed = 30 Kmph
40	19+496 to 19+513	Sharp Bend	Design Speed = 20 Kmph
41	19+694 to 19+731	Sharp Bend	Design Speed = 20 Kmph
42	19+791 to 19+837	Sharp Bend	Design Speed = 30 Kmph
43	19+924 to 20+143	Sharp Bend	Design Speed = 30 Kmph
44	20+223 to 20+258	Sharp Bend	Design Speed = 20 Kmph
45	20+373 to 20+422	Sharp Bend	Design Speed = 30 Kmph
46	20+491 to 20+500	Sharp Bend	Design Speed = 30 Kmph
47	20+572 to 20+626	Sharp Bend	Design Speed = 30 Kmph
48	20+715 to 20+768	Sharp Bend	Design Speed = 20 Kmph
49	20+844 to 20+862	Sharp Bend	Design Speed = 20 Kmph
50	20+939 to 20+978	Sharp Bend	Design Speed = 20 Kmph
51	21+118 to 21+184	Sharp Bend	Design Speed = 20 Kmph
52	21+232 to 21+265	Sharp Bend	Design Speed = 30 Kmph
53	21+339 to 21+357	Sharp Bend	Design Speed = 20 Kmph
54	21+570 to 21+606	Sharp Bend	Design Speed = 20 Kmph
55	21+668 to 21+725	Sharp Bend	Design Speed = 20 Kmph
56	21+762 to 21+805	Sharp Bend	Design Speed = 20 Kmph
57	21+847 to 21+922	Sharp Bend	Design Speed = 20 Kmph
58	22+129 to 22+170	Sharp Bend	Design Speed = 20 Kmph
59	22+207 to 22+223	Sharp Bend	Design Speed = 20 Kmph
60	22+289 to 22+364	Sharp Bend	Design Speed = 30 Kmph
61	22+426 to 22+444	Sharp Bend	Design Speed = 20 Kmph
62	22+547 to 22+574	Sharp Bend	Design Speed = 20 Kmph
63	22+610 to 22+643	Sharp Bend	Design Speed = 20 Kmph
64	22+684 to 22+701	Sharp Bend	Design Speed = 30 Kmph
65	22+769 to 22+785	Sharp Bend	Design Speed = 20 Kmph
66	22+828 to 22+851	Sharp Bend	Design Speed = 20 Kmph
67	23+017 to 23+048	Sharp Bend	Design Speed = 30 Kmph
68	23+102 to 23+111	Sharp Bend	Design Speed = 20 Kmph
69	23+228 to 23+244	Sharp Bend	Design Speed = 20 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
70	23+279 to 23+31	Sharp Bend	Design Speed = 30 Kmph
71	24+445 to 24+45	Sharp Bend	Design Speed = 20 Kmph
72	24+519 to 24+538	Sharp Bend	Design Speed = 30 Kmph
73	24+597 to 24+613	Sharp Bend	Design Speed = 30 Kmph
74	24+675 to 24+787	Sharp Bend	Design Speed = 20 Kmph
75	24+880 to 24+945	Sharp Bend	Design Speed = 30 Kmph
76	25+007 to 25+041	Sharp Bend	Design Speed = 30 Kmph
77	25+079 to 25+125	Sharp Bend	Design Speed = 30 Kmph
78	25+150 to 25+280	Sharp Bend	Design Speed = 20 Kmph
79	25+352 to 25+367	Sharp Bend	Design Speed = 20 Kmph
80	25+506 to 25+579	Sharp Bend	Design Speed = 20 Kmph
81	25+664 to 25+676	Sharp Bend	Design Speed = 30 Kmph
82	25+749 to 25+752	Sharp Bend	Design Speed = 20 Kmph
83	25+929 to 25+966	Sharp Bend	Design Speed = 20 Kmph
84	26+092 to 26+116	Sharp Bend	Design Speed = 30 Kmph
85	26+413 to 26+438	Sharp Bend	Design Speed = 30 Kmph
86	26+487 to 26+518	Sharp Bend	Design Speed = 20 Kmph
87	26+631 to 26+653	Sharp Bend	Design Speed = 20 Kmph
88	26+729 to 26+741	Sharp Bend	Design Speed = 20 Kmph
89	26+866 to 26+889	Sharp Bend	Design Speed = 20 Kmph
90	26+964 to 26+969	Sharp Bend	Design Speed = 20 Kmph
91	27+065 to 27+083	Sharp Bend	Design Speed = 20 Kmph
92	27+172 to 27+182	Sharp Bend	Design Speed = 20 Kmph
93	27+273 to 27+297	Sharp Bend	Design Speed = 20 Kmph
94	27+454 to 27+465	Sharp Bend	Design Speed = 20 Kmph
95	28+207 to 28+287	Sharp Bend	Design Speed = 20 Kmph
96	28+332 to 28+379	Sharp Bend	Design Speed = 30 Kmph
97	28+461 to 28+465	Sharp Bend	Design Speed = 30 Kmph
98	28+636 to 28+654	Sharp Bend	Design Speed = 30 Kmph
99	28+739 to 28+757	Sharp Bend	Design Speed = 30 Kmph
100	28+949 to 28+98	Sharp Bend	Design Speed = 20 Kmph
101	29+054 to 29+078	Sharp Bend	Design Speed = 30 Kmph
102	29+14 to 29+161	Sharp Bend	Design Speed = 20 Kmph
103	29+28 to 29+299	Sharp Bend	Design Speed = 30 Kmph
104	29+387 to 29+391	Sharp Bend	Design Speed = 20 Kmph
105	29+451 to 29+483	Sharp Bend	Design Speed = 30 Kmph
106	29+65 to 29+687	Sharp Bend	Design Speed = 30 Kmph
107	29+78 to 29+803	Sharp Bend	Design Speed = 30 Kmph
108	29+871 to 29+876	Sharp Bend	Design Speed = 20 Kmph
109	29+954 to 29+961	Sharp Bend	Design Speed = 30 Kmph
110	30+033 to 30+04	Sharp Bend	Design Speed = 20 Kmph
111	30+12 to 30+183	Sharp Bend	Design Speed = 20 Kmph
112	30+325 to 30+336	Sharp Bend	Design Speed = 30 Kmph
113	30+397 to 30+415	Sharp Bend	Design Speed = 30 Kmph
114	30+49 to 30+498	Sharp Bend	Design Speed = 20 Kmph
115	30+587 to 30+593	Sharp Bend	Design Speed = 20 Kmph
116	30+656 to 30+678	Sharp Bend	Design Speed = 20 Kmph
117	30+739 to 30+762	Sharp Bend	Design Speed = 30 Kmph
118	30+947 to 30+996	Sharp Bend	Design Speed = 20 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
119	31+05 to 31+072	Sharp Bend	Design Speed = 30 Kmph
120	31+126 to 31+164	Sharp Bend	Design Speed = 30 Kmph
121	31+24 to 31+263	Sharp Bend	Design Speed = 20 Kmph
122	31+361 to 31+397	Sharp Bend	Design Speed = 30 Kmph
123	31+463 to 31+514	Sharp Bend	Design Speed = 30 Kmph
124	31+6 to 31+61	Sharp Bend	Design Speed = 20 Kmph
125	31+662 to 31+693	Sharp Bend	Design Speed = 20 Kmph
126	31+788 to 31+803	Sharp Bend	Design Speed = 30 Kmph
127	31+85 to 31+89	Sharp Bend	Design Speed = 20 Kmph
128	31+951 to 31+964	Sharp Bend	Design Speed = 20 Kmph
129	32+071 to 32+081	Sharp Bend	Design Speed = 30 Kmph
130	32+146 to 32+157	Sharp Bend	Design Speed = 20 Kmph
131	32+21 to 32+22	Sharp Bend	Design Speed = 20 Kmph
132	32+267 to 32+286	Sharp Bend	Design Speed = 20 Kmph
133	32+334 to 32+342	Sharp Bend	Design Speed = 20 Kmph
134	32+419 to 32+443	Sharp Bend	Design Speed = 20 Kmph
135	32+532 to 32+554	Sharp Bend	Design Speed = 30 Kmph
136	32+683 to 32+733	Sharp Bend	Design Speed = 30 Kmph

Table 1.2: Locations where Radii of Horizontal Curve is less than 75 m

Sl. No.	HIP NO.	CHAINAGE (KM)		RADIUS
		From	To	
1	83	14192	14228	40
2	84	14326	14373	40
3	87	14708	14755	40
4	88	14874	14894	40
5	89	14990	15021	40
6	90	15146	15236	40
7	92	15530	15561	40
8	94	15955	15959	40
9	95	16041	16121	40
10	96	16267	16292	30
11	97	16344	16402	30
12	98	16498	16583	30
13	99	16663	16697	20
14	100	16749	16780	30
15	102	16979	17049	30
16	103	17190	17247	30
17	105	17502	17545	30
18	106	17590	17619	30
19	107	17796	17831	40
20	109	18102	18122	40
21	112	18590	18599	40
22	115	18950	18996	40
23	116	19073	19095	40
24	119	19496	19513	30
25	120	19694	19731	20
26	125	20491	20500	40
27	127	20715	20768	40
28	132	21339	21357	40

Sl. No.	HIP NO.	CHAINAGE (KM)		RADIUS
		From	To	
29	134	21668	21725	20
30	135	21762	21805	20
31	137	22129	22170	20
32	139	22289	22364	30
33	140	22426	22444	20
34	141	22547	22574	20
35	142	22610	22643	20
36	143	22684	22701	20
37	144	22769	22785	20
38	145	22828	22851	20
39	149	23279	23310	30
40	165	25664	25676	40
41	166	25749	25752	40
42	168	26092	26116	40
43	169	26413	26438	30
44	170	26487	26518	30
45	171	26631	26653	40
46	172	26729	26741	40
47	174	26964	26969	40
48	175	27065	27083	40
49	176	27172	27182	40
50	178	27454	27465	40
51	185	28461	28465	40
52	186	28636	28654	40
53	187	28739	28757	40
54	188	28949	28980	30
55	189	29054	29078	20
56	190	29140	29161	20
57	191	29280	29299	40
58	192	29387	29391	40
59	196	29871	29876	40
60	197	29954	29961	40
61	198	30033	30040	40
62	199	30120	30183	40
63	202	30490	30498	40
64	203	30587	30593	30
65	204	30656	30678	20
66	205	30739	30762	20
67	206	30947	30996	20
68	208	31126	31164	20
69	209	31240	31263	20
70	210	31361	31397	20
71	211	31463	31514	30
72	212	31600	31610	30
73	213	31662	31693	20
74	214	31788	31803	20
75	215	31850	31890	30
76	216	31951	31964	30
77	218	32146	32157	20
78	220	32267	32286	30
79	224	32683	32733	40

(iii) [Note1: Deviations fromtheaforesaidSpecificationsand Standards shallbe listedout here. Suchdeviations shall bespecified only ifthey are considered essential in viewof project-specific requirements.]

Schedule - E

(See Clauses 2.1 and 14.2)

Maintenance Requirements

1. Maintenance Requirements

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

(ii) 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-fulfilment 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.

(iii) 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.

[Specify all the relevant documents]

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: SP35. 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 wilful 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.

Table -1: Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					

Flexible Pavement **(Pavement of MCW, Service Road,** **approache**	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm in depth	Daily	Length Measuremen t Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA 2003 (http://www.tfhrc.com/pavement/lttp/reports/03031/)	24-48 hours	MORT&H Specificatio n 3004.2

		Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
	Performance Parameter	Desirable	Acceptable					
Asset Type sofGrade structure, approaches of connecting roads, slip roads,lay byes etc. as	Cracking	Nil	< 5 % subject to limit of 0.5 sqm for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3

applicable)	Rutting	Nil	< 5 mm	Daily	Straight Edge		15 -30 days	MORT&H Specification 3004.2
	Corrugations and Shoving	Nil	< 0.1 % of area	Daily	Length Measurement Unit like		2-7 days	IRC:82-2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
	Bleeding	Nil	< 1 % of area	Daily	Scale, Tape, odometer etc.		3-7 days	MORT&H Specification 3004.4
	Ravelling /		< 1 % of area				7-15 days	IRC:82-2015 read with IRC SP 81

	Stripping	Nil		Daily				
	Edge Deformation/ Breaking	Nil	< 1 m for any 100 m section and width < 0.1 m at any location, restricte	Daily			7- 15 days	IRC:82-2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	**Acceptable**					
			d to 30 cm from the edge					
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer	Class I Profilometer : ASTM E950 (98)	180 days	IRC:82-2015
	Skid			Bi-Annually	SCRIM (Sideway-	:2004 –Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference	180	

	Number	60SN	50SN		force Coefficient Routine Investigation Machine or equivalent)	ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	days	BS: 7941-1: 2006
	Pavement Condition Index	3	2.1	Bi-Annually			180 days	IRC:82-2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	**Acceptable**					
	Other Pavement Distresses			Bi-Annually			2-7 days	IRC:82-2015
	Deflection/ Remaining Life			Annually	Falling Weight Deflectometer	IRC 115: 2014	180 days	IRC:115-2014

Rigid Pavement (Pavement of MCW, Service Road, Grade structure,	Roughness BI	2200m m/km	2400mm /km	Bi-Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656 - 94: 2000	180 days	IRC:SP:83-2008
	Skid	Skid Resistance no. at different speed of vehicles		Bi-Annually	SCRIM (Sideway-force	IRC:SP:83-2008	180 days	IRC:SP:83-2008

		Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
	Performance Parameter	Desirable	Acceptable					
Asset Type approaches of connecting roads, slip roads, lay byes etc. as applicable)		Minimum SN	Traffic Speed (Km/h)		Coefficient Routine Investigation Machine or equivalent)			
		36	50					
		33	65					
		32	80					

		31	95					
		31	110					

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
	Edge drop at shoulders	Nil	40mm	Daily			7-15 days	MORT&H Specification 408.4

Embankment/ Slope	Slope of camber/cross fall	Nil	<2% variation in prescribed slope of camber /cross fall	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC	7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15 % variation in prescribe	Daily			7-15 days	MORT&H Specification 408.4

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	**Acceptable**					
			side slope					
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification

	Rain Cuts/ Gullies in slope	Nil	Nil	Daily Specially During Rainy Season	NA		7-15 days	MORT&H Specification

In addition to the above performance criterion, the contractor shall strictly maintain the rigid pavements as per requirements in the following table Table -2:

Maintenance Criteria for Rigid Pavements:

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
CRACKING						
			0	Nil, not discernible		
			1	w < 0.2 mm. hair cracks	No Action	Not applicable
	Single Discrete	w = width of crack L = length of crack d =	2	w = 0.2 - 0.5 mm, discernible from slow-moving car		Seal, and stitch if L >

1	**Cracks Not intersecting with any joint**	depth of crack D = depth of slab	3	w = 0.5 - 1.5 mm, discernible from fast-moving car	Seal without delay	lm. Within 7days

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			4	w = 1.5 - 3.0 mm	Seal, and stitch if L > l m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15days
			5	w > 3 mm.		
	Single Transverse (or	w = width of crack L	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Route and seal with epoxy. Within 7 days	Staple or Dowel Bar Retrofit. Within 15days
			2	w = 0.2 - 0.5 mm, discernible from slow vehicle		

2	**Diagonal) Crack intersecting with one or more joints**	= length of crack d = depth of crack D = depth of slab	3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1 m. Within 7 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			4	w = 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected.
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	Portion with norms and specifications - See Para 5.5 & 9.2 Within 15days
			0	Nil, not discernible	No Action	

3	**Single Longitudinal Crack intersecting with one or more joints**	w = width of crack L = length of crack d = depth of crack D = depth of slab	1	w < 0.5 mm, discernable from slow moving vehicle	Seal with epoxy, if L > 1 m. Within 7 days	Staple or dowel bar retrofit. Within 15days

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > 1 m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	
			4	w = 6.0 - 12.0 mm, usually associated with spalling		Partial Depth Repair with stapling. Within 15 days

			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	Full Depth Repair Dismantle and reconstruct affected portion as per norms and specifications -

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
						See Para 5.6.4 Within 15 days
			0	Nil, not discernible	No Action	-
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > l m. Within 15 days	
			2	w = 0.2 - 0.5 mm. discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle		

4	**Multiple Cracks intersecting with one or more joints**	**w = width of crack**	4	w = 3.0 - 6.0 mm panel broken into 2 or 3 pieces	Full depth repair within 15 days	Dismantle, Reinstate subbase, Reconstruct whole slab as per specifications within 30 days
			5	w > 6 mm and/or panel broken		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
				into more than 4 pieces		
			0	Nil, not discernible	No Action	-
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to secure broken parts Within 7 days	Seal with epoxy seal with epoxy Within 7days
			2	w < 1.5 mm; L < 0.6 m, only one corner broken		
			3	w < 1.5 mm; L < 0.6 m, two corners broken		

5	**Corner Break**	w = width of crack L = length of crack	4	w > 1.5 mm; L > 0.6 m or three corners broken	Partial Depth (Refer Figure 8.3 of	Full depth repair
			5	ree or four corners broken	IRC:SP: 83-2008) Within 15 days	Reinstate sub-base, and reconstruct the

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
						slab as per norms and specifications within 30days
			0	Nil, not discernible		No Action
			1	w < 0.5 mm; L < 3 m/m^2		Seal with low viscosity epoxy to secure broken parts.
			2	either w > 0.5 mm or L < 3 m/m^2		Within 15days
	Punchout (Applicable to Continuous Reinforced Concrete Pavement		3	w > 1.5 mm and L < 3 m/m^2		

6	**(CRCP) only)**	w = width of crack L = length (m/m2)	4	w > 3 mm, L < 3 m/m² and deformation	Not Applicable, as it may be full depth	Full depth repair - Cut out and replace damaged area taking care not to damage reinforcement.
			5	w > 3 mm, L > 3 m/m² and deformation		Within 30days

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
Surface Defects						
	Ravelling or	r = area damaged surface/total surface of slab (%) h =			Short Term	Long Term
			0	Nil, not discernible	No action.	
			1	r < 2 %	Local repair of areas damaged	
			2	r = 2 - 10 %	and liable to be damaged.	

7	Honeycomb type surface	maximum depth of damage			Within 15 days	Not Applicable
			3	r = 10-25%	Bonded Inlay, 2 or 3 slabs if affecting.	
			4	r = 25 - 50 %		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
					Within 30 days	
			5	r > 50% and h > 25 mm	Reconstruct slabs, 4 or more slabs ifaffecting. Within 30 days	
					Short Term	**Long Term**
			0	Nil, not discernible	No action.	
		r = damaged				

8	**Scaling**	surface/total surface of slab (%) h = maximum depth of damage	1	r < **2 %**	Local repair of areas damaged	Not Applicable
			2	r = 2 - 10 %	and liable to be damaged. Within 7days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			3	r = 10 - 20%	Bonded Inlay within 15 days	
			4	r = 20 - 30 %		
			5	r > 30 % and h > 25 mm	Reconstruct slab within 30 days	
			0		No action.	
			1	t > 1 mm		

9	**Polished Surface/Glazing**	t = texture depth, sand patch test	2 '	t = 1 - 0.6 mm	Monitor rate of deterioration	Not Applicable
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			5	t < 0.1 mm	Diamond Grinding if affecting 50% or more slabs in a continuous stretch of minimum 5 km. Within 30 days	

10	**Popout (Small Hole), Pothole Refer Para 8.4**	n = number/m² d = diameter h = maximum depth	0	d < 50 mm; h < 25 mm; n < 1 per 5 m²	No action.	Not Applicable
			1	d = 50 - 100 mm; h < 50 mm; n < 1 per 5 m²	Partial depth repair 65 mm deep. Within 15 days	
			2	d = 50 - 100 mm; h > 50 mm; n < 1 per 5 m²		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			3	d = 100 - 300 mm; h < 100 mm n < 1 per 5 m^2	Partial depth repair 110mm	
			4	d = 100 - 300 mm; h > 100 mm; n < 1 per 5 m^2	i.e.10 mm more than the depth of the hole. Within 30 days	
			5	d > 300 mm; h > 100 mm: n > 1 per 5 m^2	Full depth repair. Within 30 days	

Joint Defects						
					Short Term	**Long Term**
			0	Difficult to discern.	No action.	
			1	Discernible, L< 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	
		loss or damage L = Length as % total		Notable. L > 25% insufficient protection against ingress of water and trapping	Clean and reapply sealant in selected locations.	

1 1	**Joint Seal Defects**	joint length	3	incompressible material.	Within 7 days	Not Applicable
			5	Severe; w > 3 mm negligible protection against ingress of water	Clean, widen and reseal the joint. Within 7 days	

				and trapping incompressible material.		
12	**Spalling of Joints**	w = width on either side of the joint L = length of spalled portion (as % joint length)	0	Nil, not discernible	No action.	Not Applicable
			1	w < 10 mm	Apply low viscosity epoxy resin/ mortar in cracked portion.	
			2	w = 10 - 20 mm, L < 25%	Within 7 days	
			3	w = 20 - 40 mm, L > 25%	Partial Depth Repair. Within 15 days	
			4	w = 40 - 80 mm, L > 25%	30 - 50 mm deep, h = w + 20% of w, within 30 days	
					50 - 100 mm deep repair. H = w + 20% of w.	

			5	w > 80 mm, and L > 25%	Within 30 days	
13	**Faulting (or Stepping)**	f = difference of level	0	not discernible, < 1 mm	No action.	No action.

	in Cracks or Joints		1	f < 3 mm		
			2	f = 3 - 6 mm	Determine cause and observe, take action for diamond grinding	Replace the slab as appropriate.
			3	f = 6 - 12 mm	Diamond Grinding	Within 30days
			4	f= 12 - 18 mm	Raise sunken slab.	
			5	f> 18 mm	Strengthen subgrade and sub-base by grouting and raising sunken slab	Replace the slab as appropriate. Within 30days
					Short Term	**Long Term**
			0	Nil, not discernible		

14	**Blowup or Buckling**	h = vertical displacement from normal profile	1	h < 6 mm	No Action	
			2	h = 6 - 12 mm	Install Signs to Warn Traffic	

			3	h = 12 - 25 mm	within 7 days	
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shattered slabs, ie 4 or more pieces	Replace broken slabs. Within 30 days	
			0	Not discernible, h < 5 mm	No action.	
			1	h = 5 - 15 mm		
		h = negative vertical displacement from	2	h = 15-30 mm, Nos <20% joints	Install Signs to Warn Traffic	

15	**Depression**	normal profile L =length	3	h = 30 - 50 mm	within 7 days	Not Applicable
			4	h > 50 mm or > 20% joints	Strengthen subgrade. Reinstate pavement at normal level	

			5	h > 100 mm	if L < 20 m. Within 30 days	
16	**Heave**	h = positive vertical displacement from normal profile. L = length	0	Not discernible. h < 5 mm	**Short Term** No action.	**Long Term** scrabble
			1	h = 5 - 15 mm	Follow up.	
			2	h = 15 - 30 mm, Nos <20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Stabilise subgrade. Reinstate	

			5	h > 100 mm	pavement at normal level if length < 20 m. Within 30 days	
17	**Bump**	h = vertical	0	h < 4 mm	No action	

		displacement from normal profile	1	h = 4 - 7 mm	Grind, in case of new construction within 7 days	Construction Limit for New Construction.
			3	h = 7 - 15 mm	Grind, in case of ongoing Maintenance within 15 days	Replace in case of new construction. Within 30days
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
			0	Nil, not discernible < 3mm	**Short Term** No action.	**Long Term**
			1	f = 3 - 10 mm		

18	**Lane to Shoulder Dropoff**	f = difference of level	2	f = 10 - 25 mm	Spot repair of shoulder within 7 days	
			3	f = 25 - 50 mm	Fill up shoulder	

					within 7 dayss	
			4	f = 50 - 75 mm		For any 100 m stretch Reconstruct shoulder, if affecting 25% or more of stretch.
			5	f > 75 mm		Within 30days
Drainage						
		quantity of fines and water expelled through open joints and cracks Nos	0	not discernible	No Action	
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints Without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	appreciable/ Frequent 10 - 25%	Lift or jack slab within 30 days.	

19	**Pumping**	Nos/100 m stretch	5	abundant, crack development > 25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab. Within 30 days	

20	**Ponding**	Ponding on slabs due to blockage of drains	0-2	No discernible problem	No action.	
			3 to 4	Blockages observed in drains, but water flowing	Clean drains etc within 7 days, Follow up	Action required to stop water damaging foundation within 30 days.
			5	Ponding, accumulation of water observed	-do-	

Table -3: Maintenance Criteria for Safety Related Items and Other Furniture Items:

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th colspan="3">Level of Service (LOS)</th><th>Frequency of Measuremen t</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specification s and Standards</th></tr>
<tr><td rowspan="3">Highway</td><td rowspan="3">Availability of Safe Sight Distance</td><td colspan="3">As per IRC SP :84-2014, a minimum of safe stopping sight distance shall be available throughout.</td><td rowspan="3">Monthly</td><td rowspan="3">Manual Measurement s with

Odometer along with video/ image backup</td><td colspan="2" rowspan="3">Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments.

In case of permanent structure or design deficiency:

Removal of obstruction/improvement of deficiency at the earliest

Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.</td><td rowspan="3">IRC:SP 84-2014</td></tr>
<tr><td>Design Speed, kmph</td><td>Desirable Minimum Sight Distance (m)</td><td>Safe Stopping Sight Distance (m)</td></tr>
<tr><td>100</td><td>360</td><td>180</td></tr>
</table>

				0				
		80	26 0	1 3 0				
Pavemen t Marking	Wear	<70% of marking remaining			Bi-Annually	Visual Assessment as per Annexure-F of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect within 2 months -	IRC:35- 2015

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequency of Measuremen t</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specification s and Standards</th></tr>
<tr><td></td><td>Day time Visibility</td><td>During expected life Service Time
Cement Road -
130mcd/m²/lux
Bituminous Road - 100mcd/m²/lux</td><td>Monthly</td><td>As per
Annexure-D of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
<tr><td></td><td></td><td><u>Initial and Minimum Performance for Dry Retro reflectivity during</u>
<u>night time:</u>
<table><tr><td>Design Speed</td><td>(RL) Retro Reflectivity (mcd/m²/lux)</td></tr></table></td><td></td><td>As per
Annexure-E of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
</table>

	Night Time Visibility		Initial (7 days)	Minimum Threshold level (TL) & warranty period required up to 2 years	Bi-Annually					
		Upto65	200	80						
		65-1000	250	120						
		Above 10	350	150						

		0						
		Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):						

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		Initial 7 days Retro reflectivity: 100 mcd/m²/lux Minimum Threshold Level: 50 mcd/m²/lux					
	Skid Resistance	Initial and Minimum performance for Skid Resistance: Initial (7days): 55BPN Min. Threshold: 44BPN *Note: shall be considered under urban/city traffic condition encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc	Bi-Annually	As per Annexure-G of IRC:35-2015		Within 24 hours	IRC:35-2015

Road Signs	Shape and Position	Shape and Position as per IRC:67- 2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is damaged. Relocation as per requirement	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/Cantileve r Sign boards	IRC:67-2012
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of each	hange of ignboard	48 hours in case of Mandatory	RC:67-2012

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measuremen t	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specification s and Standards
				signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.		Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/Cantilev er Sign boards	
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance measuring tape	Raising Kerb Height	Within 1 Month	RC 86:1983
	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	RC 35:2015
	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2014 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:84-2014, IRC:35- 2015

Other Road Furnitur e	Pedestrian Guardrail	Functionality: Functioning of guardrail as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014
	Traffic Safety Barriers	Functionality: Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014, IRC:119-2015
	End Treatment of	Functionality: Functioning of End Treatment as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2014,

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measuremen t	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specification s and Standards
	Traffic Safety Barriers			backup			IRC:119-2015
	Attenuators	Functionality: Functioning of Attenuators as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP-2014, IRC:119-2015
	Guard Posts and Delineators	Functionality: Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/image backup	Rectificatio n	Within 15 days	IRC: 79 - 1981
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67-2012
	Traffic Blinkers	Functionality: Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014
		Illumination: Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014

Highway Lighting System	Highway Lights	No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84-2014
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84-2014
	Toll Plaza Canopy Lights	Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major/minor failure in the lighting system	Daily	-	Rectification of failure	8 hours	IRC:SP:84-2014

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measuremen t	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specification s and Standards
Trees and Plantatio n including median plantatio n	Obstruction in a minimum head-room of 5.5 m above carriageway or obstruction in visibility of road signs	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC:SP:84-2014
	Deterioration in health of trees and bushes	Health of plantation shall be as per requirement of specifications & instructions issued by Authority from time to time	Daily	Visual with video/image backup	Timely watering and treatment. Or Replacement of Trees and Bushes.	Within 90 days	IRC:SP:84-2014
	Vegetation affecting sight line and road structures	Sight line shall be free from obstruction by vegetation	Daily	Visual with video/image backup	Removal of Trees	Immediate	IRC:SP 84-2014
	Cleaning of toilets	-	Daily	-	-	Every 4 hours	

Rest Areas	Defects in electrical, water and sanitary installations	-	Daily	-	Rectification	24 hours	

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measuremen t	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specification s and Standards
Other Project Facilities and Approac h roads	Damage or deterioration in Approach Roads, pedestrian facilities, truck lay-bys, bus-bays, bus-shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works		Daily	-	Rectification	15 days	IRC:SP 84-2014

Asset Type	Performanc e Parameter	Level of Service (LOS)	Frequency of Measuremen t	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Free waterway/ unobstructe d flow section	85% of culvert normal flow area to available.	2 times in a year (before and after rainy season)	Inspection by Bridge Engineer as per IRC SP: 35-1990 and recording of depth of silting and area of vegetation.	Cleaning silt up soils and debris in culvert barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrel before rainy season.	15 days before onset of monsoon and within 30 days after end of rainy season.	IRC 5-2015, IRC SP:40-1993 and IRC SP:13-2004
	Leak-proof expansion joints if any	No leakage through expansion joints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35- 1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-1993 and IRC SP:69-2011
		Spalling of concrete not more than 0.25 sqm					

Pipe/box/slab culverts	Structurally sound	Delamination of concrete not more than 0.25 sq.m.	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording the defects	Repairs to spalling, cracking, delamination, rusting shall be followed as per IRC:SP:40-1993.	15 days	IRC SP 40-1993 and MORTH Specifications clause 2800
		Cracks wider than 0.3 mm not more than 1m aggregate length					

	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Bridges including ROBs Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811
	Bumps	No bump at expansion joint	Daily	Visual inspection as per IRC SP:35- 1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORT&H Specification 3004.2 & 2811.

Bridge -Super Structure	User safety (condition of crash barrier and guard rail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed condition survey as per IRC SP: 35-1990.	Repairs and replacement of safety barriers as the case may be	3days	IRC: 5-1998, IRC SP: 84-2014 and IRC SP: 40-1993.

	Rusted reinforcem ent	Not more than 0.25 sq.m	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied withanti-corrosive coating before carrying out the repairs to affected concrete portion with epoxy mortar / concrete.	15 days	IRC SP: 40-1993 and MORTH Specificatio n 1600.
	Spalling of concrete	Not more than 0.50 sq.m					
	Delaminatio n	Not more than 0.50 sq.m					
	Cracks wider than 0.30 mm	Not more than 1m total length	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting with epoxy mortar, investigating causes for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP: 40-1993 and MORTH Specification 2800.
	Rainwater seepage through deck slab	Leakage - nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting of deck slab at leakage areas, waterproofing, repairs to	1 months	MORTH specifications 2600 & 2700.

					drainage spouts		
	Deflection due to permanent loads and	Within design limits.	Once in every 10 years for spans more	Load test method	Carry out major rehabilitation works on bridge to retain original design loads capacity	6 months	IRC SP: 51-1999.

	live loads		than 40 m				
	Vibrations in bridge deck due to moving trucks	Frequency of vibrations shall not be more than 5 Hz	Once in every 5 years for spans more than 30m and every 10 years for spans between 15 to 30 m	Laser displacement sensors or laser vibro-meters	Strengthening of structure	4 months	AASHTO LRFD specifications
	Leakage in Expansion	No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rain water through expansion joint in case of buried and asphalt plug and		Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge	Replace of seal		MORTH specifications

	joints	copper strip joint.	Bi-Annually	Inspection Unit	expansion joint	15 days	2600 and IRC SP: 40-1993.
	Debris and dust in strip seal	No dust or debris in expansion joint	Monthly	Detailed condition survey as per IRC SP:35-1990 using	Cleaning of expansion joint gaps thoroughly	3 days	MORTH specification s 2600 and

	expansion joint	gap.		Mobile Bridge Inspection Unit			IRC SP: 40-1993.
	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No silt, debris, clogging of drainage spout collection chamber.	Monthly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainage spout if any leakages observed.	3 days	MORTH specification 2700.
Bridge-substructure	Cracks/spalling of concrete/ rusted steel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting/guniting and micro concreting depending on type of defect noticed	30 days	IRC SP: 40-1993 and MORTH specification 2800.

	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture of reinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment shall be replaced, in order to get uniform load transfer on to bearings.	3 months	MORTH specification 2810 and IRC SP: 40-199.
Bridge Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection as per IRC SP:35-1990 using Mobile Bridge Inspection Unit. In case of doubt, use Underwater camera for inspection of deep wells in major	Suitable protection works around pier/abutment	1 month	IRC SP: 40-1993, IRC 83-2014, MORTH specification 2500

				Rivers.			
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching.	30 days after defect observation or2	IRC: SP 40- 1993 and IRC:SP:13-2004.

		sq.m, damage to solid apron (concrete apron) not more than 1 sq.m				weeks before onset of rainy season whichever is earlier.	
Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of the contractor.							

Table 4: Maintenance Criteria for Structures and Culverts:

Table 5: Maintenance Criteria for Hill Roads

In addition to above, for hill roads the following provisions for maintenance is also to done.

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: For all tables 1 to 5 above, latest BIS & IRC standards (even those not indicated herewith) along with MoRTH specifications shall be binding for all maintenance activities.

A. Flexible Pavement

Nature of Defect 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
(ii)	Edge drop at shoulders exceeding 40 mm	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 (twenty four) hours
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)
(c)	**Road side furniture including road sign and pavement marking**	
(i)	Damage to shape or position, poor visibility or loss of retro- reflectivity	48 (forty eight) hours
(ii)	Painting of km stone, railing, parapets, crash barriers	As and when required/ Once every year
(iii)	Damaged/missing signs road 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 (twenty four) hours
(ii)	Faults and minor failures	8 (eight) hours

(e)	**Trees and plantation**	
Nature of Defect or deficiency		**Time limit for repair/ rectification**
(i)	Obstruction in a minimum head- room of 5 m above carriageway or obstruction in visibility of road signs	24 (twenty four)hours
(ii)	Removal of fallen trees from carriageway	4 (four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiring replacement	30 (thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
(f)	**Rest area**	
(i)	Cleaning of toilets	Every 4 (four) hours
(ii)	Defects in electrical, water and sanitary installations	24 (twenty four) hours
(g)	**[Toll Plaza]**	
(h)	**Other Project Facilities and Approach roads**	
(i)	Damage in approach roads, pedestrian facilities, truck lay- byes, bus-bays, bus-shelters, 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 of the mobile crane	4 (four) hours
Bridges		
(a)	**Superstructure**	

(i)	Any damage, cracks, spalling/ scaling Temporary measures Permanent measures	within 48 (forty eight) hours within 15 (fifteen) days or as specified by the Authority's Engineer
(b)	**Foundations**	
Nature of Defect or deficiency		**Time limit for repair/ rectification**
(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)	**Bearings (metallic) ofbridges**	
(i)	Deformation, damages, tilting or shifting of bearings	15 (fifteen) days Greasing of metallic bearings once in a year
(e)	**Joints**	
(i)	Malfunctioning of joints	15 (fifteen) days
(f)	**Other items**	
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3 (three) days
(iii)	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
(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
Nature of Defect or deficiency		**Time limit for repair/ rectification**
(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 beforeissuing the bidding document, with the approval of the competent authority.]

Schedule - F

(See Clause 4.1 (vii)(a))

Applicable Permits

1. Applicable Permits

(i) 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) Licence for use of explosives;

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

(e) Licence 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.

(ii) 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.

Schedule – G

(See Clauses 7.1 and 19.2)

Annex-I

(See Clause 7.1)

Form of Bank Guarantee

[Performance Security/Additional Performance Security]

To,
Managing Director, NHIDCL,
National Highways & Infrastructure Development Corporation Ltd.

(A) _____[name and address of contractor] (hereinafter called the "**Contractor**") and [name and address of the authority], (hereinafter called the **"Authority"**) have entered into an agreement (hereinafter called the "**Agreement**") for the **Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 13.747 to Km 32.835 (Package 1B) in the State of Manipur on Engineering, Procurement & Construction (EPC) mode** (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement

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

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

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of General Manager in the National Highways & Infrastructure Development Corporation Ltd. , 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.

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.

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

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 (Complete Address of bank branch is mandatory), 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. The guarantor/bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of NHIDCL, details of which is as under:

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

Signed and sealed this ……. day of …….., 20…… at …….. SIGNED, SEALED AND DELIVERED
For and on behalf of the Bank by:
(Signature)
(Name)
(Designation)
(Code Number)
(Address)

NOTES:

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

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

Annex – II

(Schedule - G)

(See Clause 19.2)

Form for Guarantee for Advance Payment

To,
Managing Director, NHIDCL,
National Highways & Infrastructure Development Corporation Ltd.
WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the authority], (hereinafter called the "**Authority**") for the **Widening to 2 (Two) Lane with Hard shoulder of Churachandpur to Tuivai section of NH 102B from Km 13.747 to Km 32.835 in the State of Manipur on Engineering, Procurement & Construction (EPC) mode** (the "**EPC**") basis, 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 + 3%* 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")**[$]**.**

(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 instalment 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.

A letter from the Authority, under the hand of an officer not below the rank of General Manager in the National Highways & Infrastructure Development Corporation Ltd., 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

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

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.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

8. 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.

9. 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

[$] 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).

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.

10. 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.

11. This guarantee shall also be operatable at our…….. Branch at New Delhi (Complete Address of bank branch is mandatory), 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.

12. The guarantor/bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of NHIDCL, details of which is as under:

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

Signed and sealed this ……. day of …….., 20…… at …….. SIGNED, SEALED AND DELIVERED
For and on behalf of the Bank by:
(Signature)
(Name)
(Designation)
(Code Number)
(Address)
NOTES:

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

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

Schedule - H

(See Clauses 10.1 (iv) and 19.3)

Contract Price Weightages

1.1 The Contract Price for this Agreement is Rs. ****

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

Item	Weightage in % of CP	Stage for Payment	Percentage
1	2	3	4
Road Works including Culverts, widening and repair ofculverts	64.52 %	**A- Widening and strengthening of existing road**	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) Non bituminous Base course	[Nil]
		(4) Bituminous Basecourse	11.88%
		(5) Wearing Coat	[Nil]
		(6) Widening andrepair of culverts	[Nil]
		B.1-Reconstruction/New 2-Lane Realignment /Bypass(Flexible Pavement)	
		(1) Earthwork up to top of the sub- grade	18.76%
		(2) Sub-base Course	27.6%
		(3) Non bituminous Base course	16.9%
		(4) Bituminous Basecourse	2.06%
		(5) Wearing Coat	8.1%
		B.2-Reconstruction/New 8-Lane Realignment/ Bypass(Rigid Pavement)	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) DryLean Concrete (DLC) Course	[Nil]
		(4) Pavement Quality Control (PQC) Course	[Nil]
		C.1-Reconstruction/ NewService Road(Flexible Pavement)	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) Non bituminous Base course	[Nil]
		(4) Bituminous Basecourse	[Nil]
		(5) Wearing Coat	[Nil]
		C.2- Reconstruction/New Service road(Rigid Pavement)	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) DryLean Concrete (DLC) Course	[Nil]
		(4) Pavement Quality Control (PQC) Course	[Nil]
		D- Reconstruction &New Culverts onexisting road, realignments, bypasses Culverts (length <6m)	14.69%
Minor bridge/ Underpasses/ Overpasses	2.14 %	**A.1-widening and repairing of Minor Bridges (length >6 m&<60m)**	
		Minor Bridges	[Nil]
		A.2- New Minor bridges (length >6 mand<60m)	
		(1)Foundation + Sub-Structure: On completion of the	75.45%

Item	Weightage in % of CP	Stage for Payment	Percentage
		foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	
		(2)Super-structure:On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road,signs & markings, tests on completion etc. complete in all respect.	22.37%
		(3)Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all and fit for use	[Nil]
		(4) Guide Bunds and River Training Works:On completion of Guide Bunds and river training works complete in all respects	2.18%
		B.1- Widening and repairs of underpasses/overpasses	
		Underpasses/ Overpasses	[Nil]
		B.2-NewUnderpasses/Overpasses	
		(1)Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	[Nil]
		(2)Super-structure:On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect. Wearing Coat (a) in case of Overpass-wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass- rigid pavement including drainage facility complete in all respects as specified.	[Nil]
		(3) Approaches: On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	[Nil]
Major bridge(length>60 m)worksand ROB/RUB/elevatedsections/flyovers including viaducts,ifany	0.000 %	**A.1- Wideningand repairs of Major Bridges**	
		(1)Foundation	[Nil]
		(2)Sub-structure	[Nil]
		(3)Super-structure(including bearings)	[Nil]
		(4)Wearing Coat including expansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7)Guidebunds,RiverTrainingworks etc.	[Nil]
		(8)Approaches(including Retaining walls, stone pitchingandprotection works)	[Nil]
		A.2-NewMajorBridges	
		(1)Foundation	[Nil]
		(2)Sub-structure	[Nil]
		(3)Super-structure(including bearings)	[Nil]

Item	Weightage in % of CP	Stage for Payment	Percentage
		(4)WearingCoatincludingexpansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7)Guidebunds,RiverTrainingworks etc.	[Nil]
		(8)Approaches(including Retaining walls, stone pitchingand protection works)	[Nil]
		B.1-Wideningandrepairsof (a) ROB (b) RUB	
		(1) Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3) Super-Structure (Including bearings)	[Nil]
		(4)Wearing Coat(a)in case of ROB- wearing coat including expansion joints complete in all respectsas specified and (b) incase of RUB-rigid pavement under RUB including drainagefacility completein all respects as specified	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/Return walls	[Nil]
		(7) Approaches (Including Retaining walls,Stone Pitching and protection works)	[Nil]
		B.2-NewROB/RUB	
		(1)Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3) Super-Structure (Including bearings)	[Nil]
		(4)Wearing Coat (a) in case of ROB- wearing coat including expansion joints complete in all respectsas specified and (b) incase of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/Return walls	[Nil]
		(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]
		C.1- Widening and repair of Elevated Section/Flyovers/Grade Separators	
		(1) Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3)Super-Structure(Including bearings)	[Nil]
		(4)WearingCoatincludingexpansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/Return walls	[Nil]
		(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]
		C.2- New Elevated Section/Flyovers/GradeSeparators	
		(1) Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3)Super-Structure(Including bearings)	[Nil]
		(4)WearingCoatincludingexpansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]

Item	Weightage in % of CP	Stage for Payment	Percentage
		(6) Wing walls/Return walls	[Nil]
		(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]
Other Works	33.34 %	(i) Toll Plaza	[Nil]
		(ii) Road side drains	33.36%
		(iii) Road signs,markings,km stones,safety devices etc	8.04%
		(iv) Project facilities	
		a) Bus Bays	5%
		b) Truck Lay-byes	[Nil]
		c) Passenger Shelter	0.67%
		d) Rest Area	[Nil]
		(v) Road side Plantation	[Nil]
		(viRepair of Protection Works other than approaches to the bridges, elevated sections/flyover/grade separators and ROBs/ RUBs	[Nil]
		(vii) Safety &Traffic Management during const.	[Nil]
		(viii) Breast Wall	23.04%
		(ix) Toe Wall	2.06%
		(x) Retaining Wall	24.29%
		(xi) Boundarywall	[Nil]
		(xii) Site Clearance & Dismanteling	1.54%
		(xiii) Protection Works	2%

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 & Strengthening of 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 5(Five) percent of the total length.
(1) Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Non bituminous Base course	[Nil]	
(4) Bituminous Base course	11.88%	
(5) Wearing Coat	[Nil]	
(6) Widening and repair of culverts	[Nil]	Cost of ten completed culverts shall be determined on pro rata basis with respect to the total number of culverts.
B.1- Reconstruction/New2-Lane Realignment/Bypass (Flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on prorata basis on completion of a stage in full length or 5 (five) km length, whichever is less.
(1)Earthwork up to top of the sub-grade	18.76%	
(3) Sub-base Course	27.6%	
(4) Non bituminous Base course	16.9%	
(5) Bituminous Base course	2.06%	
(6) Wearing Coat	8.1%	
(7) Widening and repair of culverts		
B.2- Reconstruction/New 8-Lane Realignment/Bypass (Rigid Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5 (five) km length, whichever is less.
(1)Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) DryLean Concrete (DLC) Course	[Nil]	
(4) Pavement Quality Control (PQC) Course	[Nil]	
C.1- Reconstruction/New Service Road/ Slip Road (Flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5 (five) km length, whichever is less.
(1)Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Non bituminous Base course	[Nil]	
(4) Bituminous Basecourse	[Nil]	
(5) Wearing Coat	[Nil]	
C.2- Reconstruction/New Service road (Rigid Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5 (five) km length, whichever is less.
(1)Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Dry Lean Concrete (DLC)Course	[Nil]	
(4) Pavement Quality Control (PQC) Course	[Nil]	
D- Reconstruction & New Culverts on existing road, realignments, bypasses		Cost of each culverts shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of at least five culverts
Culverts (length <6m)	14.69%	

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

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

Where,

P = Contract Price

L = Total length in km

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

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

1.3.2 Minor Bridges 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
1	2	3
A.1-Widening and repairs of Minor Bridges (length > 6 m & < 60 m)	[Nil]	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges.Payment shall be made on the completion of widening & repair works of a minor bridge
A.2- New Minor Bridges (length > 6 m & < 60 m)		
(1)Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	75.45%	Foundation:Cost of each minor bridge shall be determined on pro-rata basis with respect to the total linear length (m)of the minor bridges. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. Not lessthan 25% of the scope of foundation of each bridge. Incase where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2)Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road, signs & markings, tests on completion etc. complete in all respect.	22.37%	Super-structure:Payment shall be made on pro-rata basis on completion ofa stage i.e.completion of super structure of at leastone span in all respects as specified in the column of "Stageof Payment" in this sub-clause. Incase of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(3)Approaches:On completion of approaches including Retaining walls, stone pitching, protection works complete in all and fit for use	[Nil]	Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of "Stage of Payment" in this sub-clause.
(4) Guide Bund sand River Training Works:On completion of Guide Bunds and river training works complete in all respects	2.18%	Guide Bunds and River Training Works: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of Guide Bund sand River training Works in all respects as specified
B.1- Widening and repairs of under passes/overpasses	[Nil]	Cost of each underpass/overpass shall be determined on pro rata basis with respect to the total linear length of the underpasses/ overpasses. Payment shall be made on the completion of

Stage of Payment	Percentage weightage	Payment Procedure
		widening & repair works of a underpass/overpass.
B.2- NewUnderpasses/Overpasses		
(1)Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	[Nil]	Foundation:Cost of eachUnderpass/ Overpass shall be determined on pro- rata basis with respect to the total linear length (m) of the Underpasses/Overpasses. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. Not less than 25% of the scope of foundation of each Underpasses/ Overpasses. Incase where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2)Super-structure:On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails,crash barriers, road signs & markings, tests on completion etc. complete in all respect. Wearing Coat (a) in case of Overpass-wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass- rigid pavement including drainage facility complete in all respects as specified.	[Nil]	Super-structure:Payment shall be made on pro-rata basis on completion ofa 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. In case of structures where pre-cast girders have been proposed by the Contractor,50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(3) Approaches: On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	[Nil]	Payment shall be made on pro-rata basis on completion of a stage in all respects 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		
(1)Foundation	[Nil]	Foundation: Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the major Bridge. Incase where load testing is required for foundation,the trigger of first payment shall include load testing also where specified.

(2)Sub-structure	[Nil]	Sub-structure:Payment against sub- structure shall be made on pro-rata basis on completion of a stagei.e. not less than 25% of the scope of sub- structure of majorbridge.
(3)Super-structure(including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e.completion of super-structure including bearings of atleast one span inall respects asspecified.In case of structures where pre-cast girders have been proposed by the Contractor,50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)Wearing Coat including expansion joints	[Nil]	Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers,road markings etc. complete in all respects as specified.
(6) Wing walls/return walls	[Nil]	Wingwalls/return walls : Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7)Guide bunds, River Training works etc.	[Nil]	Guide Bunds, River Trainingworks: Payments shall be made on completion ofall guide bunds/river training works etc. complete in all respects as specified.
(8)Approaches(including Retaining walls, stone pitchingandprotection works)	[Nil]	Approaches: Payments shallbe made on pro rata basis on completion of 10% of the scope of each stage.
A.2-NewMajorBridges		
(1)Foundation	[Nil]	Foundation:Cost of each Major Bridge shall be determined on pro ratabasis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro-ratabasison completion of a stage i.e. not lessthan 25% of the scope of foundation of the major Bridge. Incase where load testing is required for foundation,the trigger of first payment shall include load testing also where specified.
(2)Sub-structure	[Nil]	Sub-structure:Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e.not less than 25% of the scope of sub- structure of major bridge.
(3)Super-structure(including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super- structure including bearings of atleast one span in all respects as specified.In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)WearingCoatincludingexpansion joints	[Nil]	WearingCoat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects asspecified.
(5) Miscellaneous Items like	[Nil]	Miscellaneous: Payments shall be made on

handrails, crash barrier, road markings etc.		completion of all miscellaneous works like handrails, crashbarriers,road markingsetc. completein all respects as specified.
(6) Wing walls/return walls	[Nil]	Wingwalls/return walls:Payments shall bemade on completion of all wing walls/returnwalls complete in all respects as specified.
(7)Guidebunds,RiverTrainingworks etc.	[Nil]	Guide Bunds, River Training works: Payments shall be made on completion ofall guide bunds/river training works etc. complete in all respects as specified.
(8)Approaches(including Retaining walls, stone pitchingand protection works)	[Nil]	Approaches: Payments shall be made on pro ratabasison completion of 10% of the scope of each stage.
B.1- Widening and repairs of (a)ROB (b)RUB		
(1) Foundations	[Nil]	Foundation: Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m)of theROB/RUB.Payment against foundation shall be made on pro-rata basis on completion of a stage i.e.not less than 25% of the scope of foundation of the ROB/RUB. In case where load testing is required for foundation,the trigger of first payment shall include load testing also where specified.
(2) Sub-Structure	[Nil]	Sub-structure:Payment against sub- structure shallbe made on pro-rata basis on completion of a stage i.e.not lessthan 25% of the scope of sub- structure of ROB/RUB.
(3) Super-Structure (Including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e.completion of super-structure including bearings of at least one span in all respects as specified. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above.
(4)Wearing Coat(a)in case of ROB-wearing coat including expansion joints complete in all respectsas specified and (b) incase of RUB-rigid pavement under RUB including drainagefacility completein all respects as specified	[Nil]	WearingCoat: Payment shall be made on completion (a) in case of ROB-wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement underRUB including drainage facility completein all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crashbarriers,road markingsetc. complete in all respects as specified.
(6) Wing walls/Return walls	[Nil]	Wingwalls/return walls:Payments shall be made on completion of all wing walls/returnwalls completeinall respects as specified.
(7) Approaches (Including	[Nil]	Payments shall be made on prorata basis on

Retaining walls, Stone Pitching and protection works)		completion of 20% of the total area.
B.2-NewROB/RUB	[Nil]	
(1) Foundation	[Nil]	Foundation: Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m)of the ROB/RUB. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the ROB/RUB.
(2) Sub-structure	[Nil]	Sub-structure: Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e. Not less than 25% of the scope of sub- structure of ROB/RUB.
(3)Super-structure (including bearing)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. Completion of super- structure including bearings of at least one span in all respects as specified. In case of structures where pre-cast girders have been proposed by the Contractor,50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)Wearing Coat (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) incase of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified		Wearing Coat: Payment shall be made on completion (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.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/Return walls	[Nil]	Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]	Payment shall be made on pro-rata basis on completion of a stage in all respects as specified
C.1-Wideningandrepairs of ElevatedSection/ Flyovers/Grade Separators	[Nil]	
(1) Foundations	[Nil]	Foundation: Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m)of the structure. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. Not less than 25% of the scope of foundation of the structure. Incase where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-Structure	[Nil]	Sub-structure: Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e.

		not less than 25% of the scope of sub- structure of structure.
(3)Super-Structure(Including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. Completion of super- structure including bearings of at least one span in all respects a specified case of structures where pre-cast girders have been proposed by the Contractor,50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)WearingCoatincludingexpansion joints	[Nil]	WearingCoat: Payment shall be made on completion of wearingcoat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.		Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crashbarriers,road markingsetc. Complete in all respects as specified.
(6) Wing walls/Return walls	[Nil]	Wingwalls/return walls:Payments shall be made on completion of all wing walls/returnwalls complete in all respects as specified.
(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]	Payment shall be made on pro-rata basis on completion of a stage in all respects as specified
C.2- New Elevated Section/ Flyovers/Grade Separators	[Nil]	
(1) Foundations	[Nil]	Foundation: Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m)of the structure. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-Structure	[Nil]	Sub-structure: Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub- structure of structure.
(3)Super-Structure(Including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super- structure including bearings of at least one span in all respects as specified. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders foreach span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)Wearing Coat including expansion joints	[Nil]	Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.		Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/Return walls	[Nil]	Wingwalls/return walls: Payments shall be made on

		completion of all wing walls/return walls complete in all respects as specified.
(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]	Payments shall be made on pro rata basis on completion of 20% of the total area.

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 Competent Authority.

(2) The Schedule for exclusive tunnel projects may be prepared as per site requirements before bidding with due approval of Competent Authority.

1.3.4 Other works.

Procedure for estimating the value of other works done shall be as stated in table 1.3.4.

Table 1.3.4

Stage of Payment	Percentage weightage	Payment Procedure
1	2	3
(1) Toll Plaza	[Nil]	Unit of measurement is each completed toll plaza. Payment of each toll plaza shall be made on pro rata basis with respect to the total of all toll plaza.
(2) Road side drains	33.36%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5 % (Five percent) of the total length.
(3) Road signs,markings,km stones,safety devices etc	8.04%	
(4) Project Facilities		Payment shall be made on pro rata basis for completed facilities.
a) Bus Bays	5%	
b) Truck Lay-byes	[Nil]	
c) Passenger Shelter	0.67%	
d) Rest Area	[Nil]	
(5) Road sidePlantation including Horticulturein Wayside Amenities	[Nil]	Unit of measurement is linear length
(6) Repair of Protection Works other than approaches to the bridges, elevated sections/flyover/grade separators and ROBs/ RUBs	[Nil]	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten percent) of the total length.
(7) Safety and traffic management during construction	[Nil]	Payment shall be made on pro rata basis every six months.
(8) Protection Works		Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5 % (Five percent) of the total length.
(a) Retaining Wall	24.29%	
(b) Breast Wall	23.04%	
(c) Toe Wall	2.06%	
(9) Site Clearance & Dismantling	1.54%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5 % (Five percent) of the total length.

Stage of Payment	Percentage weightage	Payment Procedure
(10) Other Works	2%	Unit of measurement is square metre.

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 instalments in accordance with the provisions of Clause 19.7.

Schedule - I

(See Clause 10.2 (iv))

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 Authority shall describe in this Annex-I, all the Drawings that the Contractor is required to furnish under Clause 10.2.]

Schedule - J

(See Clause 10.3 (ii))

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 ofeach Project Milestone, the Contractor shall notify the Authority of such compliance along with necessary particulars thereof.

2. Project Milestone-I

(i) Project Milestone-I shall occur on the date falling on the **[35% of the Scheduled Construction Period]** day from the Appointed Date (the "**Project Milestone- I**").

(ii) 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

(i) Project Milestone-II shall occur on the date falling on the **[60% of the Scheduled Construction Period]** day from the Appointed Date (the "**Project Milestone- II**").

(ii) 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 35% (thirty five per cent) of the Contract Price **and should have started construction of all bridges**

4. Project Milestone-III

(i) Project Milestone-III shall occur on the date falling on the **[85% of the Scheduled Construction Period]** day from the Appointed Date (the "**Project Milestone- III**").

(ii) 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 70% (seventy per cent) of the Contract Price and **should have** started construction of all project facilities.

5. Scheduled Completion Date

(i) The Scheduled Completion Date shall occur on the [Scheduled Construction Period] day from the Appointed Date.

(ii) 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 (ii))

Tests on Completion

1. Schedule for Tests

(i) 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.

(ii) 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

(i) 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 [***].

(ii) Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a Network Survey Vehicle (NSV) fitted with latest equipments and the maximum permissible roughness for purposes of this Test shall be [2,000 (two thousand)] mm for each kilometre.

(iii) 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 Nondestructive 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.

(iv) 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, except tests as specified in clause 5,but shall include measuring the reflectivity of road markings and road signs; and measuring the illumination level (lux) of lighting using requisite testing equipment.

(v) 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.

(vi) 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

All Tests set forth in this Schedule-K shall be conducted by the Authority's Engineer or such other agency or person 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.

5. The Authority Engineer will carry out tests with following equipment at his own cost in the presence of contractor's representative.

Sr. No.	Key metrics of Asset	Equipment to be used	Frequency of condition survey
1	Surface defects of pavement	Network Survey Vehicle (NSV)	At least twice a year (As per survey months defined for the state basis rainy season)
2	Roughness of pavement	Network Survey Vehicle (NSV)	At least twice a year (As per survey months defined for the state basis rainy season)
3	Strength of pavement	Falling Weight Deflectometer (FWD)	At least once a year
4	Bridges	Mobile Bridge Inspection Unit (MBU)	At least twice a year (As per survey months defined for the state basis rainy season)
5	Road signs	Retro-reflectometer	At least twice a year (As per survey months defined for the state basis rainy season)

The first testing with the help of NSV shall be conducted at the time of issue of Completion Certificate.

Schedule - L

(See Clause 12.2)

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 the ****section (km ** to km **) of National Highway No. ***] (the "**Project Highway**") 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….. , Scheduled Completed Date for which was 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

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

(ii) 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.

(iii) 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 on monthly basis

(i) The following percentages shall govern the payment reduction:

S. No.	Item/Defect/Deficiency	Percentage
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. vegetation growth, damaged pitching, 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%

S. No.	Item/Defect/Deficiency	Percentage
(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%

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

$$R = {}^{P}/_{100} \times (M1 \; or \; M2) \times {}^{L1}/_{L}$$

Where,

P= Percentage of particular item/Defect/deficiency for deduction
M1= Monthly lump-sum payment in accordance para 1.2 above of this Schedule
M2= Monthly lump-sum payment in accordance para 1.2 above of this Schedule
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 kilometer, the non-conforming length shall be taken as one kilometer.

Schedule - N

(See Clause 18.1 (i))

Selection of Authority's Engineer

1. Selection of Authority's Engineer

(i) 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.

(ii) 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

(i) 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 [name and address of the Authority] (the "**Authority**") and ..... (the "**Contractor**")# for [Two-Laning] of the **** section (km ** to km **) of National Highway No. ** in the State of *** 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.

- In case the bid of Authority's Engineer is invited simultaneously with the bid of EPC project, then the status of bidding of EPC project only to be indicated

(ii) The TOR shall apply to construction and maintenance of the Project Highway.

2. Definitions and interpretation

(i) 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.

(ii) 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.

(iii) The rules of interpretation stated in Article 1 of the Agreement shall apply, mutatis mutandis, to this TOR.

3. General

(i) 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.

(ii) 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) issuance of Completion Certificate or

(e) any other matter which is not specified in (a), (b), (c) or (d) above and which creates a financial liability on either Party.

(iii) 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.

(iv) 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.

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

(vi) 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

(i) During the Construction Period, the Authority's Engineer shall review and approve 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 (vi). The Authority's Engineer shall complete such review and approval 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.

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

(iii) The Authority's Engineer shall review and approve 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.

(iv) The Authority's Engineer shall complete the review and approve 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.

(v) 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.

(vi) 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.

(vii) 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.

(viii) 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.

(ix) 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 (ix), 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.

(x) The Authority's Engineer shall test check at least 50 (fifty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

(xi) The timing of tests referred to in Paragraph 4 (ix), 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.

(xii) 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.

(xiii) 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.

(xiv) 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.

(xv) 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 12.2.

(xvi) 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.

(xvii) 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.

(xviii) 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, as the case may be. For carrying out its functions under this Paragraph 4 (xviii) 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

(i) 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.

(ii) 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.

(iii) 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.

(iv) 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.

(v) 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

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

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

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

7. Payments

(i) 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 (iv) (d).

(ii) 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.

(iii) 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.

(iv) 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

(i) 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.

(ii) 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.

(iii) 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.

(iv) 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.

(v) 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 (i), 19.6 (i), and 19.8 (i))

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 (i) 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 (iii) (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 upto 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

(i) 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.

(ii) The insurance under sub para (a) and (b) of paragraph 1(i) 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 of not less than 15% of the Contract Price 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

(i) 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: Rs. [*****]

(ii) 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.

Schedule-Q

(See Clause 14.10)

Tests on Completion of Maintenance Period

1. Riding Quality test:

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 [2,200 (two thousand and two hundred only)] mm for each kilometre.

2. 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 measurement of cracking, rutting, stripping and potholes and shall be as per the requirement of maintenance mentioned in Schedule-E.

Schedule-R

(See Clause 14.10)

Taking Over Certificate

I, ……. (Name and designation of the Authority's Representative) under and in accordance with the Agreement dated…… (the "**Agreement**"), for [construction of the ****section (km ** to km **) of

****] (the "**Project Highway**") on Engineering, Procurement and Construction (EPC) basis through ……. (Name of Contractor), hereby certify that the Tests on completion of Maintenance Period in accordance with Article 14 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement and I hereby certify that the Authority has taken over the Project highway from the Contractor on this day.....

SIGNED, SEALED AND DELIVERED

(Signature)

(Name and designation of Authority's Representative)
(Address)