Schedule-A

(See Clauses 2.1 and 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 Clause 8.2 (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 on site/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-129A commencing from km 40+890 to km 57+995 i.e. Pumalong Village to Yangkhullen 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)		Existing Right of Way (m)	Proposed Right of Way (m)	Remarks
	From	To			
1	40.890	41.000	10.2	20	
2	41.000	41.100	8.5	20	
3	41.100	41.200	11.7	20	
4	41.200	41.300	8.7	18	
5	41.300	41.400	9.9	20	
6	41.400	41.500	9.9	20	
7	41.500	41.600	10.1	20	
8	41.600	41.700	10.2	20	
9	41.700	41.800	9.5	20	
10	41.800	41.900	9.8	20	
11	41.900	42.000	10.5	20	
12	42.000	42.100	8.6	20	
13	42.100	42.200	9.2	20	
14	42.200	42.300	10.7	24	
15	42.300	42.400	10	24	
16	42.400	42.500	10.2	24	
17	42.500	42.600	10.4	24	
18	42.600	42.700	8.7	24	
19	42.700	42.800	10	20	
20	42.800	42.900	9.4	24	
21	42.900	43.000	9.3	20	
22	43.000	43.100	10.6	20	
23	43.100	43.200	10.6	24	
24	43.200	43.300	8.3	24	
25	43.300	43.400	9	24	
26	43.400	43.500	8.2	24	
27	43.500	43.600	14.7	20	
28	43.600	43.700	13.9	24	

SL No.	Chainage (Km)		Existing Right of Way (m)	Proposed Right of Way (m)	Remarks
	From	To			
29	43.700	43.800	10.3	20	
30	43.800	43.900	10.4	24	
31	43.900	44.000	9	20	
32	44.000	44.100	9.9	24	
33	44.100	44.200	11.2	20	
34	44.200	44.300	13.1	20	
35	44.300	44.400	11	20	
36	44.400	44.500	10.6	20	
37	44.500	44.600	11	20	
38	44.600	44.700	11.4	20	
39	44.700	44.800	9.2	20	
40	44.800	44.900	12.3	20	
41	44.900	45.000	9.5	24	
42	45.000	45.100	9.5	24	
43	45.100	45.200	10.3	20	
44	45.200	45.300	9.5	24	
45	45.300	45.400	11.3	24	
46	45.400	45.500	9	24	
47	45.500	45.600	9.9	24	
48	45.600	45.700	8.5	24	
49	45.700	45.800	8.1	24	
50	45.800	45.900	7.4	20	
51	45.900	46.000	9	20	
52	46.000	46.100	8.9	24	
53	46.100	46.200	9.4	24	
54	46.200	46.300	9.7	24	
55	46.300	46.400	8.5	24	
56	46.400	46.500	8.2	24	
57	46.500	46.600	8.1	24	
58	46.600	46.700	9.9	20	
59	46.700	46.800	9.6	20	
60	46.800	46.900	9.4	20	
61	46.900	47.000	8.8	20	
62	47.000	47.100	9.9	24	
63	47.100	47.200	10.7	24	
64	47.200	47.300	9.6	24	
65	47.300	47.400	9.3	24	
66	47.400	47.500	9.1	24	
67	47.500	47.600	10	20	
68	47.600	47.700	10	24	
69	47.700	47.800	10	20	
70	47.800	47.900	10.1	24	
71	47.900	48.000	10.7	24	
72	48.000	48.100	10.1	24	
73	48.100	48.200	9.4	19	
74	48.200	48.300	10.6	19	
75	48.300	48.400	11.1	24	
76	48.400	48.500	10.8	24	
77	48.500	48.600	10.1	24	
78	48.600	48.700	8.9	24	
79	48.700	48.800	10.7	19	

SL No.	Chainage (Km)		Existing Right of Way (m)	Proposed Right of Way (m)	Remarks
	From	To			
80	48.800	48.900	9.5	19	
81	48.900	49.000	9.6	19	
82	49.000	49.100	8.4	19	
83	49.100	49.200	9.5	19	
84	49.200	49.300	8.9	24	
85	49.300	49.400	9.8	24	
86	49.400	49.600	8.4	24	
87	49.600	49.700	8	24	
88	49.700	49.800	8.4	24	
89	49.800	49.900	9.4	20	
90	49.900	50.000	10.8	20	
91	50.000	50.100	7.9	24	
92	50.100	50.200	11.2	24	
93	50.200	50.300	10.8	19	
94	50.300	50.600	8.4	19	
95	50.600	50.700	10.7	19	
96	50.700	50.800	10.4	19	
97	50.800	50.900	9.5	19	
98	50.900	51.000	12.6	19	
99	51.000	51.100	9.3	19	
100	51.100	51.200	9.9	19	
101	51.200	51.300	13.2	19	
102	51.300	51.400	8.2	19	
103	51.400	51.500	9.2	19	
104	51.500	51.600	10.3	19	
105	51.600	51.700	8.3	19	
106	51.700	51.800	11.5	19	
107	51.800	51.900	8.6	19	
108	51.900	52.000	8.1	19	
109	52.000	52.100	9.5	24	
110	52.100	52.200	8.0	24	
111	52.200	52.300	8.9	24	
112	52.300	52.400	9.7	24	
113	52.400	52.500	9.1	24	
114	52.500	52.600	9.8	24	
115	52.600	52.700	11.7	24	
116	52.700	52.800	10.2	24	
117	52.800	52.900	8.6	24	
118	52.900	53.000	10	24	
119	53.000	53.100	11.2	24	
120	53.100	53.200	9.0	24	
121	53.200	53.300	9.0	24	
122	53.300	53.400	10.4	24	
123	53.400	53.500	10.4	24	
124	53.500	53.600	9.3	24	
125	53.600	53.700	9.5	24	
126	53.700	53.800	10.4	18	
127	53.800	53.900	9.8	24	
128	53.900	54.000	8.1	24	
129	54.000	54.100	9.9	24	
130	54.100	54.200	8.5	24	

SL No.	Chainage (Km)		Existing Right of Way (m)	Proposed Right of Way (m)	Remarks
	From	To			
131	54.200	54.300	9.8	24	
132	54.300	54.400	9.5	24	
133	54.400	54.500	7.6	24	
134	54.500	54.600	9.3	24	
135	54.600	54.700	9.1	24	
136	54.700	54.800	7.7	24	
137	54.800	54.900	10.2	24	
138	54.900	55.000	12.9	24	
139	55.000	55.100	9.5	24	
140	55.100	55.200	9.4	24	
141	55.200	55.300	8.9	24	
142	55.300	55.400	9.3	19	
143	55.400	55.500	10	19	
144	55.500	55.600	10.5	19	
145	55.600	55.700	7.3	19	
146	55.700	55.800	9.3	24	
147	55.800	55.900	9.8	24	
148	55.900	56.000	11	19	
149	56.000	56.100	7.6	19	
150	56.100	56.200	9.3	24	
151	56.200	56.300	9.2	24	
152	56.300	56.400	7.7	19	
153	56.400	56.500	8.2	19	
154	56.500	56.600	10.4	19	
155	56.600	56.700	8.7	19	
156	56.700	56.800	8.9	19	
157	56.800	56.900	10	24	
158	56.900	57.000	8.9	24	
159	57.000	57.100	11.2	24	
160	57.100	57.200	9.9	24	
161	57.200	57.300	11.3	19	
162	57.300	57.400	9.3	19	
163	57.400	57.500	10.8	19	
164	57.500	57.600	10.1	24	
165	57.600	57.700	10.1	24	
166	57.700	57.800	9.0	24	
167	57.800	57.900	8.2	19	
168	57.900	57.995	8.3	19	

3. Carriageway

The present carriageway of the Project Highway is Two Lane from km 40+890 to km 57+995. 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:

Sl. 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	41.796	Open	Wall	RCC SLAB BRIDGE	1 X 5.80	12.70
2	43.590	Open	Wall	PSC BOX BRIDGE	1 X 29.00	12.00
3	49.218	Open	Wall	RCC SLAB BRIDGE	1 X 5.70	11.70
4	51.200	Open	Wall	RCC SLAB BRIDGE	1 X 5.50	11.20

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)

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length	Width of Culvert (m)
1	40.921	Pipe culvert	2×0.8	-
2	41.072	Pipe culvert	2×1.0	-
3	41.245	Slab culvert	1×2.0	-
4	41.355	Pipe culvert	2×0.9	-
5	41.675	Slab culvert	1×3.0	-
6	41.850	Slab culvert	1×3.0	-
7	42.037	Slab culvert	1×3.0	-
8	42.320	Pipe culvert	2×0.8	-
9	42.560	Pipe culvert	2X0.80	-
10	42.728	Pipe culvert	2×0.8	-
11	42.900	Pipe culvert	2×1.0	-
12	43.527	Slab culvert	1×3.0	-
13	43.820	Pipe culvert	2×1.0	-
14	43.975	Pipe culvert	2×1.0	-
15	44.178	Slab culvert	1×3.0	-
16	44.352	Pipe culvert	2×1.0	-
17	44.682	Pipe culvert	2×1.0	-
18	44.759	Pipe culvert	2×1.0	-
19	45.132	Pipe culvert	2×1.0	-
20	45.315	Pipe culvert	2×0.9	-
21	45.423	Pipe culvert	2×0.9	-
22	45.598	Pipe culvert	1×1.2	-
23	45.758	Pipe culvert	2×1	-
24	45.952	Pipe culvert	2×1	-
25	46.120	Pipe culvert	-	-
26	46.222	Pipe culvert	-	-
27	46.430	Pipe culvert	1×1.2	-
28	46.625	Pipe culvert	2×1	-
29	46.877	Pipe culvert	2×1	-
30	46.992	Pipe culvert	2×0.9	-
31	47.275	Pipe culvert	2×0.9	-
32	47.471	Pipe culvert	2×0.9	-
33	47.570	Pipe culvert	2×1	-
34	47.680	Pipe culvert	2X1.00	-
35	47.888	Pipe culvert	2×1	-
36	48.320	Pipe culvert	2×1	-
37	48.602	Pipe culvert	2×1	-
38	48.923	Pipe culvert	2×1	-
39	49.165	Pipe culvert	2×1	-
40	49.401	Pipe culvert	2×1	-
41	49.865	Pipe culvert	2×1	-
42	50.165	Pipe culvert	2×1	-
43	50.612	Pipe culvert	2×1	-
44	50.792	Pipe culvert	2×0.9	-
45	50.898	Pipe culvert	2×0.9	-
46	51.017	Pipe culvert	2×1	-
47	51.346	Pipe culvert	2×1	-
48	51.515	Pipe culvert	2×0.9	-
49	51.598	Pipe culvert	2×1	-
50	52.059	Pipe culvert	2×1	-
51	52.182	Pipe culvert	2×1	-

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length	Width of Culvert (m)
52	52.299	Pipe culvert	2×0.9	-
53	52.623	Pipe culvert	2×0.9	-
54	52.880	Pipe culvert	2×1	-
55	53.428	Pipe culvert	2×1	-
56	53.952	Slab culvert	1×3	-
57	54.220	Slab culvert	1×2	-
58	54.896	Pipe culvert	2×1	-
59	55.256	Pipe culvert	2×1	-
60	55.723	Pipe culvert	2×1.2	-
61	56.630	Pipe culvert	2×1.2	-
62	56.705	Pipe culvert	2×1.2	-
63	56.850	Pipe culvert	2×1.2	-
64	57.023	Pipe culvert	2×1.0	-
65	57.137	Pipe culvert	2×1.2	-
66	57.302	Pipe culvert	2X1.0	-
67	57.499	Pipe culvert	2×1.0	-
68	57.560	Pipe culvert	2×1.2	-

11. Bus bays

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

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

12. Truck Lay byes

The details of truck lay byes are as follows:

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

13. Roadside drains

The details of the roadside drains are as follows:

Sl. No.	Location		Type	
	From km	To km	Masonry/cc (Pucca)	Earthen (Kutcha)
1	42+850	43+290	Pucca (Both)	
2	40+890	46+560	Earthen (Hill Side)	

14. Major junctions

The details of major junctions are as follows:

Sl. No.	Location		At grade	Separated	Category of Cross Road			
	From km	to km			NH	SH	MDR	Others
Nil								

(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	41.050		Y	3-legged

16. Bypasses

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

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

17. Other structures

[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:

The Construction of Project Highway will be implemented as per Manual, details of which are already given in Article-2 of Annexure – I of Schedule – A.

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 on site/design requirement.

(ii) Traffic Signage plan of the Project Highway showing numbers & location of traffic 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

Environmental Clearances are not required for the project.

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 [Two-Lanning]

[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	Pumdumlong (Pumalong)	40+000	42+690	7	As per attached TCS drawing	7 m Carriageway
2	Yangkhullen	42+690	56+840	7		

(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. Geometric Design and General Features

(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	40+007 to 40+029	Sharp Bend	Design Speed = 30 Kmph
2	40+083 to 40+100	Sharp Bend	Design Speed = 30 Kmph
3	40+169 to 40+185	Sharp Bend	Design Speed = 30 Kmph
4	40+259 to 40+264	Sharp Bend	Design Speed = 30 Kmph
5	40+314 to 40+321	Sharp Bend	Design Speed = 30 Kmph
6	40+370 to 40+382	Sharp Bend	Design Speed = 30 Kmph
7	40+430 to 40+431	Sharp Bend	Design Speed = 30 Kmph
8	40+488 to 40+493	Sharp Bend	Design Speed = 30 Kmph
9	40+832 to 40+925	Sharp Bend	Design Speed = 30 Kmph
10	40+997 to 41+008	Sharp Bend	Design Speed = 30 Kmph
11	42+586 to 42+631	Sharp Bend	Design Speed = 30 Kmph
12	42+727 to 42+751	Sharp Bend	Design Speed = 25 Kmph
13	43+979 to 44+020	Sharp Bend	Design Speed = 30 Kmph
14	44+124 to 44+128	Sharp Bend	Design Speed = 30 Kmph
15	44+195 to 44+226	Sharp Bend	Design Speed = 25 Kmph
16	44+308 to 44+322	Sharp Bend	Design Speed = 20 Kmph
17	44+388 to 44+394	Sharp Bend	Design Speed = 30 Kmph
18	44+483 to 44+517	Sharp Bend	Design Speed = 20 Kmph
19	44+550 to 44+592	Sharp Bend	Design Speed = 20 Kmph
20	44+649 to 44+675	Sharp Bend	Design Speed = 20 Kmph
21	45+405 to 45+411	Sharp Bend	Design Speed = 25 Kmph
22	45+468 to 45+478	Sharp Bend	Design Speed = 20 Kmph
23	46+157 to 46+184	Sharp Bend	Design Speed = 20 Kmph
24	47+138 to 47+166	Sharp Bend	Design Speed = 20 Kmph
25	47+208 to 47+212	Sharp Bend	Design Speed = 30 Kmph
26	47+304 to 47+327	Sharp Bend	Design Speed = 20 Kmph
27	47+400 to 47+413	Sharp Bend	Design Speed = 30 Kmph
28	47+474 to 47+484	Sharp Bend	Design Speed = 25 Kmph
29	47+552 to 47+580	Sharp Bend	Design Speed = 30 Kmph
30	47+683 to 47+699	Sharp Bend	Design Speed = 30 Kmph
31	47+748 to 47+758	Sharp Bend	Design Speed = 30 Kmph
32	47+848 to 47+859	Sharp Bend	Design Speed = 30 Kmph
33	47+923 to 47+962	Sharp Bend	Design Speed = 30 Kmph
34	48+180 to 48+251	Sharp Bend	Design Speed = 25 Kmph
35	50+116 to 50+202	Sharp Bend	Design Speed = 30 Kmph
36	50+286 to 50+294	Sharp Bend	Design Speed = 30 Kmph
37	51+037 to 51+095	Sharp Bend	Design Speed = 30 Kmph
38	51+233 to 51+237	Sharp Bend	Design Speed = 20 Kmph
39	51+335 to 51+342	Sharp Bend	Design Speed = 20 Kmph
40	51+445 to 51+465	Sharp Bend	Design Speed = 20 Kmph
41	51+518 to 51+525	Sharp Bend	Design Speed = 20 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
42	51+576 to 51+596	Sharp Bend	Design Speed = 20 Kmph
43	51+930 to 51+939	Sharp Bend	Design Speed = 20 Kmph
44	51+993 to 51+999	Sharp Bend	Design Speed = 20 Kmph
45	52+038 to 52+041	Sharp Bend	Design Speed = 20 Kmph
46	52+097 to 52+099	Sharp Bend	Design Speed = 20 Kmph
47	52+152 to 52+190	Sharp Bend	Design Speed = 20 Kmph
48	52+242 to 52+270	Sharp Bend	Design Speed = 20 Kmph
49	52+288 to 52+321	Sharp Bend	Design Speed = 20 Kmph
50	52+353 to 52+362	Sharp Bend	Design Speed = 20 Kmph
51	52+390 to 52+421	Sharp Bend	Design Speed = 30 Kmph
52	52+527 to 52+537	Sharp Bend	Design Speed = 30 Kmph
53	52+581 to 52+623	Sharp Bend	Design Speed = 30 Kmph
54	52+809 to 52+821	Sharp Bend	Design Speed = 30 Kmph
55	52+872 to 52+887	Sharp Bend	Design Speed = 30 Kmph
56	52+931 to 52+935	Sharp Bend	Design Speed = 30 Kmph
57	52+993 to 53+028	Sharp Bend	Design Speed = 30 Kmph
58	53+077 to 53+106	Sharp Bend	Design Speed = 20 Kmph
59	53+199 to 53+205	Sharp Bend	Design Speed = 30 Kmph
60	53+246 to 53+276	Sharp Bend	Design Speed = 30 Kmph
61	53+327 to 53+332	Sharp Bend	Design Speed = 20 Kmph
62	53+372 to 53+382	Sharp Bend	Design Speed = 20 Kmph
63	53+428 to 53+432	Sharp Bend	Design Speed = 20 Kmph
64	53+475 to 53+480	Sharp Bend	Design Speed = 20 Kmph
65	53+542 to 53+548	Sharp Bend	Design Speed = 30 Kmph
66	53+596 to 53+617	Sharp Bend	Design Speed = 30 Kmph
67	53+682 to 53+710	Sharp Bend	Design Speed = 30 Kmph
68	53+781 to 53+818	Sharp Bend	Design Speed = 20 Kmph
69	54+588 to 54+602	Sharp Bend	Design Speed = 30 Kmph
70	54+672 to 54+707	Sharp Bend	Design Speed = 20 Kmph
71	55+032 to 55+053	Sharp Bend	Design Speed = 30 Kmph
72	55+901 to 55+923	Sharp Bend	Design Speed = 30 Kmph
73	56+705 to 56+708	Sharp Bend	Design Speed = 25 Kmph
74	56+766 to 56+773	Sharp Bend	Design Speed = 30 Kmph
75	56+830 to 56+835	Sharp Bend	Design Speed = 20 Kmph
76	56+893 to 56+906	Sharp Bend	Design Speed = 30 Kmph
77	57+025 to 57+071	Sharp Bend	Design Speed = 30 Kmph
78	58+444 to 58+463	Sharp Bend	Design Speed = 20 Kmph
79	59+211 to 59+222	Sharp Bend	Design Speed = 25 Kmph
80	59+322 to 59+331	Sharp Bend	Design Speed = 30 Kmph
81	59+391 to 59+406	Sharp Bend	Design Speed = 30 Kmph
82	59+456 to 59+463	Sharp Bend	Design Speed = 30 Kmph
83	59+534 to 59+543	Sharp Bend	Design Speed = 30 Kmph
84	59+651 to 59+666	Sharp Bend	Design Speed = 20 Kmph
85	59+749 to 59+777	Sharp Bend	Design Speed = 20 Kmph
86	59+825 to 59+828	Sharp Bend	Design Speed = 20 Kmph
87	60+248 to 60+257	Sharp Bend	Design Speed = 20 Kmph
88	60+377 to 60+386	Sharp Bend	Design Speed = 20 Kmph
89	60+439 to 60+454	Sharp Bend	Design Speed = 20 Kmph
90	60+548 to 60+566	Sharp Bend	Design Speed = 20 Kmph
91	60+626 to 60+643	Sharp Bend	Design Speed = 20 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
92	60+770 to 60+775	Sharp Bend	Design Speed = 30 Kmph
93	60+910 to 60+927	Sharp Bend	Design Speed = 30 Kmph
94	61+066 to 61+074	Sharp Bend	Design Speed = 30 Kmph
95	61+236 to 61+263	Sharp Bend	Design Speed = 20 Kmph
96	61+379 to 61+400	Sharp Bend	Design Speed = 20 Kmph
97	61+467 to 61+472	Sharp Bend	Design Speed = 30 Kmph
98	61+572 to 61+582	Sharp Bend	Design Speed = 30 Kmph
99	61+736 to 61+746	Sharp Bend	Design Speed = 20 Kmph
100	61+791 to 61+805	Sharp Bend	Design Speed = 30 Kmph
101	62+013 to 62+018	Sharp Bend	Design Speed = 30 Kmph
102	62+185 to 62+201	Sharp Bend	Design Speed = 30 Kmph
103	62+255 to 62+262	Sharp Bend	Design Speed = 30 Kmph
104	62+786 to 62+819	Sharp Bend	Design Speed = 20 Kmph
105	63+891 to 63+900	Sharp Bend	Design Speed = 30 Kmph
106	64+171 to 64+180	Sharp Bend	Design Speed = 30 Kmph
107	65+129 to 65+200	Sharp Bend	Design Speed = 30 Kmph
108	65+452 to 65+487	Sharp Bend	Design Speed = 30 Kmph
109	65+569 to 65+580	Sharp Bend	Design Speed = 30 Kmph
110	65+620 to 65+645	Sharp Bend	Design Speed = 30 Kmph
111	65+699 to 65+706	Sharp Bend	Design Speed = 20 Kmph
112	65+763 to 65+767	Sharp Bend	Design Speed = 20 Kmph
113	65+807 to 65+816	Sharp Bend	Design Speed = 20 Kmph
114	65+864 to 65+870	Sharp Bend	Design Speed = 20 Kmph
115	65+912 to 65+916	Sharp Bend	Design Speed = 20 Kmph
116	65+957 to 65+961	Sharp Bend	Design Speed = 20 Kmph
117	66+000 to 66+016	Sharp Bend	Design Speed = 20 Kmph
118	66+092 to 66+101	Sharp Bend	Design Speed = 20 Kmph
119	66+187 to 66+187	Sharp Bend	Design Speed = 20 Kmph
120	66+214 to 66+236	Sharp Bend	Design Speed = 20 Kmph
121	66+257 to 66+260	Sharp Bend	Design Speed = 20 Kmph
122	66+320 to 66+324	Sharp Bend	Design Speed = 20 Kmph
123	66+370 to 66+374	Sharp Bend	Design Speed = 20 Kmph
124	66+449 to 66+456	Sharp Bend	Design Speed = 20 Kmph
125	66+496 to 66+525	Sharp Bend	Design Speed = 20 Kmph
126	66+574 to 66+584	Sharp Bend	Design Speed = 20 Kmph
127	66+644 to 66+685	Sharp Bend	Design Speed = 30 Kmph
128	66+755 to 66+780	Sharp Bend	Design Speed = 30 Kmph
129	66+801 to 66+820	Sharp Bend	Design Speed = 30 Kmph
130	66+890 to 66+904	Sharp Bend	Design Speed = 20 Kmph
131	66+956 to 66+979	Sharp Bend	Design Speed = 20 Kmph
132	67+024 to 67+038	Sharp Bend	Design Speed = 20 Kmph
133	67+060 to 67+063	Sharp Bend	Design Speed = 20 Kmph
134	67+091 to 67+101	Sharp Bend	Design Speed = 20 Kmph
135	67+251 to 67+265	Sharp Bend	Design Speed = 20 Kmph
136	67+282 to 67+312	Sharp Bend	Design Speed = 20 Kmph
137	67+372 to 67+400	Sharp Bend	Design Speed = 20 Kmph
138	67+425 to 67+429	Sharp Bend	Design Speed = 20 Kmph
139	68+167 to 68+207	Sharp Bend	Design Speed = 20 Kmph
140	68+247 to 68+276	Sharp Bend	Design Speed = 20 Kmph
141	68+293 to 68+324	Sharp Bend	Design Speed = 20 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
142	68+715 to 68+754	Sharp Bend	Design Speed = 20 Kmph
143	69+088 to 69+103	Sharp Bend	Design Speed = 20 Kmph
144	69+172 to 69+210	Sharp Bend	Design Speed = 20 Kmph
145	69+298 to 69+330	Sharp Bend	Design Speed = 20 Kmph
146	69+392 to 69+420	Sharp Bend	Design Speed = 20 Kmph
147	69+512 to 69+549	Sharp Bend	Design Speed = 20 Kmph
148	69+614 to 69+651	Sharp Bend	Design Speed = 20 Kmph
149	69+716 to 69+743	Sharp Bend	Design Speed = 20 Kmph
150	69+810 to 69+842	Sharp Bend	Design Speed = 30 Kmph
151	69+904 to 69+915	Sharp Bend	Design Speed = 30 Kmph
152	69+999 to 70+010	Sharp Bend	Design Speed = 20 Kmph
153	70+057 to 70+095	Sharp Bend	Design Speed = 20 Kmph
154	70+149 to 70+166	Sharp Bend	Design Speed = 20 Kmph
155	70+232 to 70+237	Sharp Bend	Design Speed = 30 Kmph
156	70+289 to 70+296	Sharp Bend	Design Speed = 30 Kmph
157	70+381 to 70+392	Sharp Bend	Design Speed = 30 Kmph
158	70+427 to 70+453	Sharp Bend	Design Speed = 30 Kmph
159	70+539 to 70+576	Sharp Bend	Design Speed = 20 Kmph
160	70+629 to 70+655	Sharp Bend	Design Speed = 20 Kmph
161	70+738 to 70+748	Sharp Bend	Design Speed = 20 Kmph
162	70+813 to 70+850	Sharp Bend	Design Speed = 20 Kmph
163	70+911 to 70+923	Sharp Bend	Design Speed = 30 Kmph
164	70+989 to 70+992	Sharp Bend	Design Speed = 30 Kmph
165	71+114 to 71+150	Sharp Bend	Design Speed = 20 Kmph
166	71+209 to 71+218	Sharp Bend	Design Speed = 30 Kmph
167	71+289 to 71+292	Sharp Bend	Design Speed = 30 Kmph
168	71+388 to 71+398	Sharp Bend	Design Speed = 30 Kmph
169	71+505 to 71+516	Sharp Bend	Design Speed = 30 Kmph
170	71+578 to 71+616	Sharp Bend	Design Speed = 20 Kmph
171	71+669 to 71+679	Sharp Bend	Design Speed = 20 Kmph
172	71+758 to 71+807	Sharp Bend	Design Speed = 20 Kmph
173	71+916 to 71+940	Sharp Bend	Design Speed = 30 Kmph
174	72+003 to 72+016	Sharp Bend	Design Speed = 30 Kmph
175	72+073 to 72+083	Sharp Bend	Design Speed = 30 Kmph
176	72+164 to 72+197	Sharp Bend	Design Speed = 20 Kmph
177	72+254 to 72+263	Sharp Bend	Design Speed = 30 Kmph
178	72+342 to 72+353	Sharp Bend	Design Speed = 30 Kmph
179	72+447 to 72+483	Sharp Bend	Design Speed = 20 Kmph
180	72+541 to 72+577	Sharp Bend	Design Speed = 20 Kmph
181	72+655 to 72+689	Sharp Bend	Design Speed = 20 Kmph
182	72+744 to 72+769	Sharp Bend	Design Speed = 20 Kmph
183	72+853 to 72+883	Sharp Bend	Design Speed = 20 Kmph
184	73+003 to 73+099	Sharp Bend	Design Speed = 30 Kmph
185	73+257 to 73+311	Sharp Bend	Design Speed = 30 Kmph
186	73+536 to 73+563	Sharp Bend	Design Speed = 30 Kmph
187	73+635 to 73+639	Sharp Bend	Design Speed = 30 Kmph
188	73+698 to 73+716	Sharp Bend	Design Speed = 30 Kmph
189	73+776 to 73+854	Sharp Bend	Design Speed = 30 Kmph
190	73+892 to 73+902	Sharp Bend	Design Speed = 30 Kmph
191	73+955 to 73+975	Sharp Bend	Design Speed = 30 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
192	74+019 to 74+035	Sharp Bend	Design Speed = 30 Kmph
193	74+095 to 74+102	Sharp Bend	Design Speed = 30 Kmph
194	74+149 to 74+158	Sharp Bend	Design Speed = 30 Kmph
195	74+207 to 74+225	Sharp Bend	Design Speed = 30 Kmph
196	74+275 to 74+279	Sharp Bend	Design Speed = 30 Kmph
197	74+337 to 74+345	Sharp Bend	Design Speed = 30 Kmph
198	74+470 to 74+479	Sharp Bend	Design Speed = 30 Kmph
199	74+527 to 74+537	Sharp Bend	Design Speed = 20 Kmph
200	74+614 to 74+633	Sharp Bend	Design Speed = 30 Kmph
201	74+717 to 74+724	Sharp Bend	Design Speed = 30 Kmph
202	74+782 to 74+789	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
Nil			

(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 underpasses 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) Lateral and vertical clearances at overpasses shall be as per requirements specified in the 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 is 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 under pass/ overpass structure and whether the cross road is to be carried at the existing
Level. raised or lowered]

Sl. No.	Location	Type of structure Length (m)	Cross road at			Remarks. if any
			Existing Level	Raised Level	Lowered Level	
Nil						

(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	Typical Cross Section of Two-lane Carriageway in Built up area with both side footpath cum RCC Rectangular Drain (Reconstruction of Existing Pavement)	0
TCS-2	Typical Cross Section of Two-Lane Carriageway in Rural Area with RR Masonry Trapezoidal Drain on Hill Side and Earthen Shoulder on valley side (Reconstruction of Existing Pavement)	10340
TCS-3	Typical Cross Section of Two-lane Carriageway in Rural area with breast wall on hill side and	150

TCS TYPE	DESCRIPTION	Length (m)
	earthen shoulder on valley side (Reconstruction of Existing Pavement)	
TCS-4	Typical Cross Section of Two lane Carriageway at reconstruction stretch in rural area with one side retaining wall and other side RR masonry Trapezoidal drain (Reconstruction of Existing Pavement)	4500
TCS-5	Typical Cross Section of Two lane Carriageway in Rural area with one side retaining wall and other side breast wall (Reconstruction of Existing Pavement)	0
TCS-6	Typical Cross Section of Two lane Carriageway due to presence of hill in Rural area with both side RR Masonry Trapezoidal Drain(Reconstruction of Existing Pavement)	400
TCS-7	Typical Cross Section of Two lane Carriageway in Rural area with one side RR Masonry Trapezoidal Drain and earthen shoulder on valley side (New construction)	0
TCS-8	Typical Cross Section of Two lane Carriageway at realignment stretch due to presence of hill in Rural area with both side RR Masonry Trapezoidal Drain(New construction)	0
TCS-9	Typical Cross Section of Two lane Carriageway in rural area with one side retaining wall and other side RR Masonry Trapezoidal Drain(New construction)	0
TCS-10	Typical Cross Section of Two lane Carriageway in Built up area with both side footpath and open RR masonry trapezoidal drain(Reconstruction of Existing Pavement)	0
TCS-11	Typical Cross Section of Two lane Carriageway in rural area with one side breast wall and other side RR masonry trapezoidal drain(Reconstruction of Existing Pavement)	1450
	Total length =	**16840**

Chainage (Km)		Net Length (m)	TCS No.
From	To		
40000	40775	775	TCS-2
40775	40875	100	TCS-6
40875	41075	200	TCS-2
41075	41125	50	TCS-6
41125	41175	50	TCS-2
41175	41325	150	TCS-4
41325	41625	300	TCS-2
41625	41675	50	TCS-4
41675	41975	300	TCS-2
41975	42025	50	TCS-4
42025	42325	300	TCS-2
42325	42525	200	TCS-4
42525	42725	200	TCS-6
42725	42875	150	TCS-11
42875	43125	250	TCS-2
43125	43175	50	TCS-4
43175	44875	1700	TCS-2
44875	45025	150	TCS-4
45025	45075	50	TCS-2
45075	45125	50	TCS-4
45125	45325	200	TCS-2
45325	45375	50	TCS-4
45375	45425	50	TCS-2
45425	45475	50	TCS-4
45475	45575	100	TCS-2
45575	45625	50	TCS-4
45625	45775	150	TCS-2

Chainage (Km)		Net Length (m)	TCS No.
From	To		
45775	45825	50	TCS-4
45825	46475	650	TCS-2
46475	46525	50	TCS-4
46525	46725	200	TCS-2
46725	46775	50	TCS-4
46775	47325	550	TCS-2
47325	47475	150	TCS-4
47475	49275	1800	TCS-2
49275	49325	50	TCS-4
49325	49375	50	TCS-2
49375	49425	50	TCS-4
49425	49675	250	TCS-2
49675	49775	100	TCS-4
49775	49925	150	TCS-2
49925	50225	300	TCS-4
50225	50425	200	TCS-4
50425	51475	1050	TCS-4
51475	51575	100	TCS-2
51575	51775	200	TCS-4
51775	51975	200	TCS-2
51975	53275	1300	TCS-11
53275	53325	50	TCS-6
53325	53375	50	TCS-2
53375	53875	500	TCS-4
53875	53925	50	TCS-2
53925	54075	150	TCS-4
54075	54425	350	TCS-2
54425	54525	100	TCS-4
54525	54625	100	TCS-2
54625	54725	100	TCS-4
54725	54825	100	TCS-2
54825	55025	200	TCS-4
55025	55225	200	TCS-2
55225	55275	50	TCS-4
55275	55375	100	TCS-2
55375	55425	50	TCS-4
55425	55675	250	TCS-2
55675	55825	150	TCS-3
55825	55925	100	TCS-2
55925	56025	100	TCS-4
56025	56375	350	TCS-2
56375	56525	150	TCS-4
56525	56840	315	TCS-2
Total Length of PKG- IIA		**16840**	

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
Nil				

Minor Intersections

Sl. No.	Location of intersection (Km)	Type of intersection	Other features
1	41.050	Y-Type	3-legged

(ii) Grade separated intersection with/without ramps

Sl. No.	Location	Salient features	Minimum length of viaduct to be provided	Road to be carried over/under the 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	40+000 Km to 40+775 Km	Reconstruction	TCS-2
2	40+775 Km to 40+875 Km	Reconstruction	TCS-6
3	40+875 Km to 41+075 Km	Reconstruction	TCS-2
4	41+075 Km to 41+125 Km	Reconstruction	TCS-6
5	41+125 Km to 41+175 Km	Reconstruction	TCS-2
6	41+175 Km to 41+325 Km	Reconstruction	TCS-4
7	41+325 Km to 41+625 Km	Reconstruction	TCS-2
8	41+625 Km to 41+675 Km	Reconstruction	TCS-4
9	41+675 Km to 41+975 Km	Reconstruction	TCS-2
10	41+975 Km to 42+025 Km	Reconstruction	TCS-4
11	42+025 Km to 42+325 Km	Reconstruction	TCS-2
12	42+325 Km to 42+525 Km	Reconstruction	TCS-4
13	42+525 Km to 42+725 Km	Reconstruction	TCS-6
14	42+725 Km to 42+875 Km	Reconstruction	TCS-11
15	42+875 Km to 43+125 Km	Reconstruction	TCS-2
16	43+125 Km to 43+175 Km	Reconstruction	TCS-4
17	43+175 Km to 44+875 Km	Reconstruction	TCS-2
18	44+875 Km to 45+025 Km	Reconstruction	TCS-4
19	45+025 Km to 45+075 Km	Reconstruction	TCS-2
20	45+075 Km to 45+125 Km	Reconstruction	TCS-4
21	45+125 Km to 45+325 Km	Reconstruction	TCS-2
22	45+325 Km to 45+375 Km	Reconstruction	TCS-4
23	45+375 Km to 45+425 Km	Reconstruction	TCS-2
24	45+425 Km to 45+475 Km	Reconstruction	TCS-4
25	45+475 Km to 45+575 Km	Reconstruction	TCS-2
26	45+575 Km to 45+625 Km	Reconstruction	TCS-4
27	45+625 Km to 45+775 Km	Reconstruction	TCS-2
28	45+775 Km to 45+825 Km	Reconstruction	TCS-4
29	45+825 Km to 46+475 Km	Reconstruction	TCS-2
30	46+475 Km to 46+525 Km	Reconstruction	TCS-4
31	46+525 Km to 46+725 Km	Reconstruction	TCS-2
32	46+725 Km to 46+775 Km	Reconstruction	TCS-4

SL NO.	Stretch from Km to Km	Remarks	TCS Type
33	46+775 Km to 47+325 Km	Reconstruction	TCS-2
34	47+325 Km to 47+475 Km	Reconstruction	TCS-4
35	47+475 Km to 49+275 Km	Reconstruction	TCS-2
36	49+275 Km to 49+325 Km	Reconstruction	TCS-4
37	49+325 Km to 49+375 Km	Reconstruction	TCS-2
38	49+375 Km to 49+425 Km	Reconstruction	TCS-4
39	49+425 Km to 49+675 Km	Reconstruction	TCS-2
40	49+675 Km to 49+775 Km	Reconstruction	TCS-4
41	49+775 Km to 49+925 Km	Reconstruction	TCS-2
42	49+925 Km to 50+225 Km	Reconstruction	TCS-4
43	50+225 Km to 50+425 Km	Reconstruction	TCS-4
44	50+425 Km to 51+475 Km	Reconstruction	TCS-4
45	51+475 Km to 51+575 Km	Reconstruction	TCS-2
46	51+575 Km to 51+775 Km	Reconstruction	TCS-4
47	51+775 Km to 51+975 Km	Reconstruction	TCS-2
48	51+975 Km to 53+275 Km	Reconstruction	TCS-11
49	53+275 Km to 53+325 Km	Reconstruction	TCS-6
50	53+325 Km to 53+375 Km	Reconstruction	TCS-2
51	53+375 Km to 53+875 Km	Reconstruction	TCS-4
52	53+875 Km to 53+925 Km	Reconstruction	TCS-2
53	53+925 Km to 54+075 Km	Reconstruction	TCS-4
54	54+075 Km to 54+425 Km	Reconstruction	TCS-2
55	54+425 Km to 54+525 Km	Reconstruction	TCS-4
56	54+525 Km to 54+625 Km	Reconstruction	TCS-2
57	54+625 Km to 54+725 Km	Reconstruction	TCS-4
58	54+725 Km to 54+825 Km	Reconstruction	TCS-2
59	54+825 Km to 55+025 Km	Reconstruction	TCS-4
60	55+025 Km to 55+225 Km	Reconstruction	TCS-2
61	55+225 Km to 55+275 Km	Reconstruction	TCS-4
62	55+275 Km to 55+375 Km	Reconstruction	TCS-2
63	55+375 Km to 55+425 Km	Reconstruction	TCS-4
64	55+425 Km to 55+675 Km	Reconstruction	TCS-2
65	55+675 Km to 55+825 Km	Reconstruction	TCS-3
66	55+825 Km to 55+925 Km	Reconstruction	TCS-2
67	55+925 Km to 56+025 Km	Reconstruction	TCS-4
68	56+025 Km to 56+375 Km	Reconstruction	TCS-2
69	56+375 Km to 56+525 Km	Reconstruction	TCS-4
70	56+525 Km to 56+840 Km	Reconstruction	TCS-2

6. Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway has been provided in the table given below:

RR Masonry Trapezoidal Drain

Chainage (m)		Side	Net Length (m)
From	To		
40000	40775	Single	760.46
40775	40875	Both	200
40875	41075	Single	190.1

Chainage (m)		Side	Net Length (m)
From	To		
41075	41125	Both	92.32
41125	41175	Single	50
41175	41325	Single	150
41325	41625	Single	297.3
41625	41675	Single	50
41675	41975	Single	294.6
41975	42025	Single	50
42025	42325	Single	300
42325	42525	Single	200
42525	42725	Both	400
42725	42875	Single	150
42875	43125	Single	244.7
43125	43175	Single	50
43175	44875	Single	1678.9
44875	45025	Single	147.4
45025	45075	Single	50
45075	45125	Single	50
45125	45325	Single	194.7
45325	45375	Single	50
45375	45425	Single	50
45425	45475	Single	47.4
45475	45575	Single	100
45575	45625	Single	50
45625	45775	Single	147.3
45775	45825	Single	50
45825	46475	Single	644.7
46475	46525	Single	47.3
46525	46725	Single	194.6
46725	46775	Single	50
46775	47325	Single	547.4
47325	47475	Single	147.3
47475	49275	Single	1772.46
49275	49325	Single	50
49325	49375	Single	50
49375	49425	Single	50
49425	49675	Single	247.3
49675	49775	Single	97.3
49775	49925	Single	147.4
49925	50225	Single	289.9
50225	50425	Single	196.04
50425	51475	Single	1030.2
51475	51575	Single	97.3
51575	51775	Single	197.3
51775	51975	Single	200
51975	53275	Single	1300
53275	53325	Both	100
53325	53375	Single	50
53375	53875	Single	497.4

Chainage (m)		Side	Net Length (m)
From	To		
53875	53925	Single	50
53925	54075	Single	150
54075	54425	Single	347.4
54425	54525	Single	97.4
54525	54625	Single	97.3
54625	54725	Single	100
54725	54825	Single	97.4
54825	55025	Single	200
55025	55225	Single	197.4
55225	55275	Single	50
55275	55375	Single	100
55375	55425	Single	50
55425	55675	Single	244.7
55825	55925	Single	97.4
55925	56025	Single	97.3
56025	56375	Single	344.6
56375	56525	Single	147.3
56525	56840	Single	312.4
Total =			**16880 m**

PKG-IIA

Length of Side Drain	16880	m
Length of catch water Drain=	1688	m
Length of Outlet=	1688	m
Total Length of Drain=	**20256**	**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 therein.

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

[Refer to provision of the relevant Manual and specify the width of carriageway of new bridges and structures of more than 60 (sixty) metre length. if the carriageway 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 Nos. bridge is retained 4 Nos. bridges will be replaced by box culvert.		

(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

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 Manual and 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 Highway shall conform to the typical cross-sections given in provision of the relevant Manual.

(ii) 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 Manual and provide details]

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
1	40.032	2.0 X 3.0	Single Span
2	40.178	2.0 X 3.0	Single Span
3	40.342	2.0 X 2.0	Single Span
4	40.440	2.0 X 3.0	Single Span
5	40.765	3.0 X 3.0	Single Span
6	40.880	5.0 X 4.0	Single Span
7	40.935	3.0 X 3.0	Single Span
8	41.118	3.0 X 3.0	Single Span
9	41.392	2.0 X 3.0	Single Span
10	41.800	2.0 X 3.0	Single Span
11	41.972	2.0 X 3.0	Single Span
12	42.928	2.0 X 3.0	Single Span
13	43.082	2.0 X 2.0	Single Span
14	43.287	2.0 X 3.0	Single Span
15	43.455	2.0 X 2.0	Single Span
16	43.850	2.0 X 2.0	Single Span
17	44.210	2.0 X 2.0	Single Span
18	44.390	2.0 X 2.0	Single Span
19	44.495	2.0 X 3.0	Single Span
20	44.659	2.0 X 2.0	Single Span
21	44.818	2.0 X 3.0	Single Span
22	45.005	2.0 X 2.0	Single Span

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
23	45.168	2.0 X 3.0	Single Span
24	45.265	2.0 X 2.0	Single Span
25	45.470	2.0 X 2.0	Single Span
26	45.660	2.0 X 3.0	Single Span
27	45.911	2.0 X 3.0	Single Span
28	46.300	2.0 X 2.0	Single Span
29	46.495	2.0 X 3.0	Single Span
30	46.594	2.0 X 3.0	Single Span
31	46.720	2.0 X 3.0	Single Span
32	46.920	2.0 X 2.0	Single Span
33	47.330	2.0 X 3.0	Single Span
34	47.618	2.0 X 2.0	Single Span
35	47.930	2.0 X 3.0	Single Span
36	48.170	2.0 X 3.0	Single Span
37	48.225	5.0 X 3.0	Single Span
38	48.413	2.0 X 3.0	Single Span
39	48.862	2.0 X 3.0	Single Span
40	49.155	2.0 X 3.0	Single Span
41	49.582	2.0 X 3.0	Single Span
42	49.763	2.0 X 3.0	Single Span
43	49.861	2.0 X 2.0	Single Span
44	49.973	3.0 X 4.0	Single Span
45	50.155	5.0 X 3.0	Single Span
46	50.297	3.0 X 4.0	Single Span
47	50.454	3.0 X 4.0	Single Span
48	50.538	3.0 X 4.0	Single Span
49	50.950	3.0 X 4.0	Single Span
50	51.075	3.0 X 4.0	Single Span
51	51.185	3.0 X 4.0	Single Span
52	51.505	2.0 X 3.0	Single Span
53	51.765	2.0 X 3.0	Single Span
54	53.770	2.0 X 2.0	Single Span
55	54.135	2.0 X 2.0	Single Span
56	54.607	2.0 X 3.0	Single Span
57	55.494	2.0 X 3.0	Single Span
58	55.565	2.0 X 2.0	Single Span
59	55.705	2.0 X 3.0	Single Span
60	55.874	2.0 X 2.0	Single Span
61	55.990	2.0 X 3.0	Single Span
62	56.155	2.0 X 3.0	Single Span
63	56.346	2.0 X 3.0	Single Span
64	56.410	2.0 X 3.0	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	48.585	2.0 X 2.0	Single Span
2	48.776	2.0 X 3.0	Single Span
3	54.484	2.0 X 2.0	Single Span
4	54.806	2.0 X 2.0	Single Span
5	55.179	2.0 X 2.0	Single Span
6	56.593	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)		
Nil					

(ii) The following narrow bridges shall be widened:

Sl. No.	Location (km)	Existing width (m)	Extent of widening (m)	Cross-section at deck level for widening @
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 Manual and provide details:]

Sl. No.	Location at km	Remarks
Nil		

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

[Refer to provision of the relevant Manual and 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]

(v) 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]

The grade separated structures shall be provided at the locations and of the type and length specified in paragraphs 2(ix) and 3 of this Annex-I.

(vi) Repairs and strengthening of bridges and structures

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

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

(a) Bridges

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

(b) ROB / RUB

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

(c) Overpasses/Underpasses and other structures

Sl. No.	Location 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) Traffic control devices and road safety works shall be provided in accordance with provisions of relevant Manual.

Sl. No	Traffic Signages, Road Marking and other appurtenances	unit	Quantity
1	Total No of Street Light=	Nos	47
2	Kilometer stones=	Nos	14
3	5th Kilometer stones=	Nos	3

Sl. No	Traffic Signages, Road Marking and other appurtenances	unit	Quantity
4	Boundary Stones=	Nos	171
5	Delineators (100 cm long and circular shaped) +Hazard marker =	Nos	1537
6	Road Stud=	Nos	7569
7	900 mm Octagonal	Nos	1
8	600 mm circular	Nos	55
9	900 mm Triangular	Nos	182
10	800 mm x 600 mm rectangular	Nos	6
11	500x600 Rectangular (Chevron)	Nos	413
12	450 mm x 600 mm rectangular	Nos	74
13	Direction Sign < 0.9 sqm	sqm	1.8
14	Convex Mirror for Blind Curve	Nos	16

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

9. Roadside Furniture

(i) Roadside 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)		
42725	42875	Hill	150
51975	53275	Hill	1300
55675	55825	Hill	147
Total Net Length =			**1597 m**

b) Retaining Wall

Chainage		Side	Net Length (m)
From (m)	To (m)		
41175	41325	Valley	300
41625	41675	Valley	50
41975	42025	Valley	50
42325	42525	Valley	200
43125	43175	Valley	50
44875	45025	Valley	147
45075	45125	Valley	50
45325	45375	Valley	50
45425	45475	Valley	47
45575	45625	Valley	50

Chainage		Side	Net Length (m)
From (m)	To (m)		
45775	45825	Valley	50
46475	46525	Valley	47
46725	46775	Valley	50
47325	47475	Valley	147
49275	49325	Valley	50
49375	49425	Valley	50
49675	49775	Valley	97
49925	50425	Valley	486
50225	50425	Valley	196
50425	51475	Valley	1030
51575	51775	Valley	197
53375	53875	Valley	497
53925	54075	Valley	150
54425	54525	Valley	97
54625	54725	Valley	100
54825	55025	Valley	200
55225	55275	Valley	50
55375	55425	Valley	50
55925	56025	Valley	97
56375	56525	Valley	147
Total Net Length =			**4786**

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 here in above 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 of utilities 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	41+320 (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	47+800 (Both Side)		
3	Bus Bay & Passenger shelter	52+460 (Both Side)		

f) Rest Areas

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

g) Others to be specified

Street Lighting:
Total 47 Nos. Street lighting shall be provided in junction and passenger shelters 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="5">Shoulder</td><td rowspan="5">2.6</td><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>Open Country with Isolated Built-up Area</td><td>Hill Side</td><td>1.5</td><td>-</td><td>1.5</td><td>Open Country with Isolated Built-up Area</td><td>Hill Side</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Open Country with Isolated Built-up Area</td><td>Valley Side</td><td>1.5</td><td>1</td><td>2.5</td><td>Open Country with Isolated Built-up Area</td><td>Valley Side</td><td>-</td><td>Up to 1.0 m</td><td>1</td></tr>
<tr><td>Built-up Area and Approaches to grade separated structures/ bridges</td><td>Hill Side</td><td>0.25 m + 1.5 m (Raised)</td><td>-</td><td>1.75</td><td>Built-up Area and Approaches to grade separated structures/ bridges</td><td>Hill Side</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Built-up Area and Approaches to grade separated structures/ bridges</td><td>Valley Side</td><td>0.25 m + 1.5 m (Raised)</td><td>-</td><td>1.75</td><td>Built-up Area and Approaches to grade separated structures/ bridges</td><td>Valley Side</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Design Speed</td><td>2.2</td><td colspan="5"><u>Mountainous Terrain:</u>
Ruling : 60 Kmph</td><td colspan="5"><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.</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>Minimum : 40 Kmph</td><td>(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>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 than 40 kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
1	40+007 to 40+029	Sharp Bend	Design Speed = 30 Kmph
2	40+083 to 40+100	Sharp Bend	Design Speed = 30 Kmph
3	40+169 to 40+185	Sharp Bend	Design Speed = 30 Kmph
4	40+259 to 40+264	Sharp Bend	Design Speed = 30 Kmph
5	40+314 to 40+321	Sharp Bend	Design Speed = 30 Kmph
6	40+370 to 40+382	Sharp Bend	Design Speed = 30 Kmph
7	40+430 to 40+431	Sharp Bend	Design Speed = 30 Kmph
8	40+488 to 40+493	Sharp Bend	Design Speed = 30 Kmph
9	40+832 to 40+925	Sharp Bend	Design Speed = 30 Kmph
10	40+997 to 41+008	Sharp Bend	Design Speed = 30 Kmph
11	42+586 to 42+631	Sharp Bend	Design Speed = 30 Kmph
12	42+727 to 42+751	Sharp Bend	Design Speed = 25 Kmph
13	43+979 to 44+020	Sharp Bend	Design Speed = 30 Kmph
14	44+124 to 44+128	Sharp Bend	Design Speed = 30 Kmph
15	44+195 to 44+226	Sharp Bend	Design Speed = 25 Kmph
16	44+308 to 44+322	Sharp Bend	Design Speed = 20 Kmph
17	44+388 to 44+394	Sharp Bend	Design Speed = 30 Kmph
18	44+483 to 44+517	Sharp Bend	Design Speed = 20 Kmph
19	44+550 to 44+592	Sharp Bend	Design Speed = 20 Kmph
20	44+649 to 44+675	Sharp Bend	Design Speed = 20 Kmph
21	45+405 to 45+411	Sharp Bend	Design Speed = 25 Kmph
22	45+468 to 45+478	Sharp Bend	Design Speed = 20 Kmph
23	46+157 to 46+184	Sharp Bend	Design Speed = 20 Kmph
24	47+138 to 47+166	Sharp Bend	Design Speed = 20 Kmph
25	47+208 to 47+212	Sharp Bend	Design Speed = 30 Kmph
26	47+304 to 47+327	Sharp Bend	Design Speed = 20 Kmph
27	47+400 to 47+413	Sharp Bend	Design Speed = 30 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
28	47+474 to 47+484	Sharp Bend	Design Speed = 25 Kmph
29	47+552 to 47+580	Sharp Bend	Design Speed = 30 Kmph
30	47+683 to 47+699	Sharp Bend	Design Speed = 30 Kmph
31	47+748 to 47+758	Sharp Bend	Design Speed = 30 Kmph
32	47+848 to 47+859	Sharp Bend	Design Speed = 30 Kmph
33	47+923 to 47+962	Sharp Bend	Design Speed = 30 Kmph
34	48+180 to 48+251	Sharp Bend	Design Speed = 25 Kmph
35	50+116 to 50+202	Sharp Bend	Design Speed = 30 Kmph
36	50+286 to 50+294	Sharp Bend	Design Speed = 30 Kmph
37	51+037 to 51+095	Sharp Bend	Design Speed = 30 Kmph
38	51+233 to 51+237	Sharp Bend	Design Speed = 20 Kmph
39	51+335 to 51+342	Sharp Bend	Design Speed = 20 Kmph
40	51+445 to 51+465	Sharp Bend	Design Speed = 20 Kmph
41	51+518 to 51+525	Sharp Bend	Design Speed = 20 Kmph
42	51+576 to 51+596	Sharp Bend	Design Speed = 20 Kmph
43	51+930 to 51+939	Sharp Bend	Design Speed = 20 Kmph
44	51+993 to 51+999	Sharp Bend	Design Speed = 20 Kmph
45	52+038 to 52+041	Sharp Bend	Design Speed = 20 Kmph
46	52+097 to 52+099	Sharp Bend	Design Speed = 20 Kmph
47	52+152 to 52+190	Sharp Bend	Design Speed = 20 Kmph
48	52+242 to 52+270	Sharp Bend	Design Speed = 20 Kmph
49	52+288 to 52+321	Sharp Bend	Design Speed = 20 Kmph
50	52+353 to 52+362	Sharp Bend	Design Speed = 20 Kmph
51	52+390 to 52+421	Sharp Bend	Design Speed = 30 Kmph
52	52+527 to 52+537	Sharp Bend	Design Speed = 30 Kmph
53	52+581 to 52+623	Sharp Bend	Design Speed = 30 Kmph
54	52+809 to 52+821	Sharp Bend	Design Speed = 30 Kmph
55	52+872 to 52+887	Sharp Bend	Design Speed = 30 Kmph
56	52+931 to 52+935	Sharp Bend	Design Speed = 30 Kmph
57	52+993 to 53+028	Sharp Bend	Design Speed = 30 Kmph
58	53+077 to 53+106	Sharp Bend	Design Speed = 20 Kmph
59	53+199 to 53+205	Sharp Bend	Design Speed = 30 Kmph
60	53+246 to 53+276	Sharp Bend	Design Speed = 30 Kmph
61	53+327 to 53+332	Sharp Bend	Design Speed = 20 Kmph
62	53+372 to 53+382	Sharp Bend	Design Speed = 20 Kmph
63	53+428 to 53+432	Sharp Bend	Design Speed = 20 Kmph
64	53+475 to 53+480	Sharp Bend	Design Speed = 20 Kmph
65	53+542 to 53+548	Sharp Bend	Design Speed = 30 Kmph
66	53+596 to 53+617	Sharp Bend	Design Speed = 30 Kmph
67	53+682 to 53+710	Sharp Bend	Design Speed = 30 Kmph
68	53+781 to 53+818	Sharp Bend	Design Speed = 20 Kmph
69	54+588 to 54+602	Sharp Bend	Design Speed = 30 Kmph
70	54+672 to 54+707	Sharp Bend	Design Speed = 20 Kmph
71	55+032 to 55+053	Sharp Bend	Design Speed = 30 Kmph
72	55+901 to 55+923	Sharp Bend	Design Speed = 30 Kmph
73	56+705 to 56+708	Sharp Bend	Design Speed = 25 Kmph
74	56+766 to 56+773	Sharp Bend	Design Speed = 30 Kmph
75	56+830 to 56+835	Sharp Bend	Design Speed = 20 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
76	56+893 to 56+906	Sharp Bend	Design Speed = 30 Kmph
77	57+025 to 57+071	Sharp Bend	Design Speed = 30 Kmph
78	58+444 to 58+463	Sharp Bend	Design Speed = 20 Kmph
79	59+211 to 59+222	Sharp Bend	Design Speed = 25 Kmph
80	59+322 to 59+331	Sharp Bend	Design Speed = 30 Kmph
81	59+391 to 59+406	Sharp Bend	Design Speed = 30 Kmph
82	59+456 to 59+463	Sharp Bend	Design Speed = 30 Kmph
83	59+534 to 59+543	Sharp Bend	Design Speed = 30 Kmph
84	59+651 to 59+666	Sharp Bend	Design Speed = 20 Kmph
85	59+749 to 59+777	Sharp Bend	Design Speed = 20 Kmph
86	59+825 to 59+828	Sharp Bend	Design Speed = 20 Kmph
87	60+248 to 60+257	Sharp Bend	Design Speed = 20 Kmph
88	60+377 to 60+386	Sharp Bend	Design Speed = 20 Kmph
89	60+439 to 60+454	Sharp Bend	Design Speed = 20 Kmph
90	60+548 to 60+566	Sharp Bend	Design Speed = 20 Kmph
91	60+626 to 60+643	Sharp Bend	Design Speed = 20 Kmph
92	60+770 to 60+775	Sharp Bend	Design Speed = 30 Kmph
93	60+910 to 60+927	Sharp Bend	Design Speed = 30 Kmph
94	61+066 to 61+074	Sharp Bend	Design Speed = 30 Kmph
95	61+236 to 61+263	Sharp Bend	Design Speed = 20 Kmph
96	61+379 to 61+400	Sharp Bend	Design Speed = 20 Kmph
97	61+467 to 61+472	Sharp Bend	Design Speed = 30 Kmph
98	61+572 to 61+582	Sharp Bend	Design Speed = 30 Kmph
99	61+736 to 61+746	Sharp Bend	Design Speed = 20 Kmph
100	61+791 to 61+805	Sharp Bend	Design Speed = 30 Kmph
101	62+013 to 62+018	Sharp Bend	Design Speed = 30 Kmph
102	62+185 to 62+201	Sharp Bend	Design Speed = 30 Kmph
103	62+255 to 62+262	Sharp Bend	Design Speed = 30 Kmph
104	62+786 to 62+819	Sharp Bend	Design Speed = 20 Kmph
105	63+891 to 63+900	Sharp Bend	Design Speed = 30 Kmph
106	64+171 to 64+180	Sharp Bend	Design Speed = 30 Kmph
107	65+129 to 65+200	Sharp Bend	Design Speed = 30 Kmph
108	65+452 to 65+487	Sharp Bend	Design Speed = 30 Kmph
109	65+569 to 65+580	Sharp Bend	Design Speed = 30 Kmph
110	65+620 to 65+645	Sharp Bend	Design Speed = 30 Kmph
111	65+699 to 65+706	Sharp Bend	Design Speed = 20 Kmph
112	65+763 to 65+767	Sharp Bend	Design Speed = 20 Kmph
113	65+807 to 65+816	Sharp Bend	Design Speed = 20 Kmph
114	65+864 to 65+870	Sharp Bend	Design Speed = 20 Kmph
115	65+912 to 65+916	Sharp Bend	Design Speed = 20 Kmph
116	65+957 to 65+961	Sharp Bend	Design Speed = 20 Kmph
117	66+000 to 66+016	Sharp Bend	Design Speed = 20 Kmph
118	66+092 to 66+101	Sharp Bend	Design Speed = 20 Kmph
119	66+187 to 66+187	Sharp Bend	Design Speed = 20 Kmph
120	66+214 to 66+236	Sharp Bend	Design Speed = 20 Kmph
121	66+257 to 66+260	Sharp Bend	Design Speed = 20 Kmph
122	66+320 to 66+324	Sharp Bend	Design Speed = 20 Kmph
123	66+370 to 66+374	Sharp Bend	Design Speed = 20 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
124	66+449 to 66+456	Sharp Bend	Design Speed = 20 Kmph
125	66+496 to 66+525	Sharp Bend	Design Speed = 20 Kmph
126	66+574 to 66+584	Sharp Bend	Design Speed = 20 Kmph
127	66+644 to 66+685	Sharp Bend	Design Speed = 30 Kmph
128	66+755 to 66+780	Sharp Bend	Design Speed = 30 Kmph
129	66+801 to 66+820	Sharp Bend	Design Speed = 30 Kmph
130	66+890 to 66+904	Sharp Bend	Design Speed = 20 Kmph
131	66+956 to 66+979	Sharp Bend	Design Speed = 20 Kmph
132	67+024 to 67+038	Sharp Bend	Design Speed = 20 Kmph
133	67+060 to 67+063	Sharp Bend	Design Speed = 20 Kmph
134	67+091 to 67+101	Sharp Bend	Design Speed = 20 Kmph
135	67+251 to 67+265	Sharp Bend	Design Speed = 20 Kmph
136	67+282 to 67+312	Sharp Bend	Design Speed = 20 Kmph
137	67+372 to 67+400	Sharp Bend	Design Speed = 20 Kmph
138	67+425 to 67+429	Sharp Bend	Design Speed = 20 Kmph
139	68+167 to 68+207	Sharp Bend	Design Speed = 20 Kmph
140	68+247 to 68+276	Sharp Bend	Design Speed = 20 Kmph
141	68+293 to 68+324	Sharp Bend	Design Speed = 20 Kmph
142	68+715 to 68+754	Sharp Bend	Design Speed = 20 Kmph
143	69+088 to 69+103	Sharp Bend	Design Speed = 20 Kmph
144	69+172 to 69+210	Sharp Bend	Design Speed = 20 Kmph
145	69+298 to 69+330	Sharp Bend	Design Speed = 20 Kmph
146	69+392 to 69+420	Sharp Bend	Design Speed = 20 Kmph
147	69+512 to 69+549	Sharp Bend	Design Speed = 20 Kmph
148	69+614 to 69+651	Sharp Bend	Design Speed = 20 Kmph
149	69+716 to 69+743	Sharp Bend	Design Speed = 20 Kmph
150	69+810 to 69+842	Sharp Bend	Design Speed = 30 Kmph
151	69+904 to 69+915	Sharp Bend	Design Speed = 30 Kmph
152	69+999 to 70+010	Sharp Bend	Design Speed = 20 Kmph
153	70+057 to 70+095	Sharp Bend	Design Speed = 20 Kmph
154	70+149 to 70+166	Sharp Bend	Design Speed = 20 Kmph
155	70+232 to 70+237	Sharp Bend	Design Speed = 30 Kmph
156	70+289 to 70+296	Sharp Bend	Design Speed = 30 Kmph
157	70+381 to 70+392	Sharp Bend	Design Speed = 30 Kmph
158	70+427 to 70+453	Sharp Bend	Design Speed = 30 Kmph
159	70+539 to 70+576	Sharp Bend	Design Speed = 20 Kmph
160	70+629 to 70+655	Sharp Bend	Design Speed = 20 Kmph
161	70+738 to 70+748	Sharp Bend	Design Speed = 20 Kmph
162	70+813 to 70+850	Sharp Bend	Design Speed = 20 Kmph
163	70+911 to 70+923	Sharp Bend	Design Speed = 30 Kmph
164	70+989 to 70+992	Sharp Bend	Design Speed = 30 Kmph
165	71+114 to 71+150	Sharp Bend	Design Speed = 20 Kmph
166	71+209 to 71+218	Sharp Bend	Design Speed = 30 Kmph
167	71+289 to 71+292	Sharp Bend	Design Speed = 30 Kmph
168	71+388 to 71+398	Sharp Bend	Design Speed = 30 Kmph
169	71+505 to 71+516	Sharp Bend	Design Speed = 30 Kmph
170	71+578 to 71+616	Sharp Bend	Design Speed = 20 Kmph
171	71+669 to 71+679	Sharp Bend	Design Speed = 20 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
172	71+758 to 71+807	Sharp Bend	Design Speed = 20 Kmph
173	71+916 to 71+940	Sharp Bend	Design Speed = 30 Kmph
174	72+003 to 72+016	Sharp Bend	Design Speed = 30 Kmph
175	72+073 to 72+083	Sharp Bend	Design Speed = 30 Kmph
176	72+164 to 72+197	Sharp Bend	Design Speed = 20 Kmph
177	72+254 to 72+263	Sharp Bend	Design Speed = 30 Kmph
178	72+342 to 72+353	Sharp Bend	Design Speed = 30 Kmph
179	72+447 to 72+483	Sharp Bend	Design Speed = 20 Kmph
180	72+541 to 72+577	Sharp Bend	Design Speed = 20 Kmph
181	72+655 to 72+689	Sharp Bend	Design Speed = 20 Kmph
182	72+744 to 72+769	Sharp Bend	Design Speed = 20 Kmph
183	72+853 to 72+883	Sharp Bend	Design Speed = 20 Kmph
184	73+003 to 73+099	Sharp Bend	Design Speed = 30 Kmph
185	73+257 to 73+311	Sharp Bend	Design Speed = 30 Kmph
186	73+536 to 73+563	Sharp Bend	Design Speed = 30 Kmph
187	73+635 to 73+639	Sharp Bend	Design Speed = 30 Kmph
188	73+698 to 73+716	Sharp Bend	Design Speed = 30 Kmph
189	73+776 to 73+854	Sharp Bend	Design Speed = 30 Kmph
190	73+892 to 73+902	Sharp Bend	Design Speed = 30 Kmph
191	73+955 to 73+975	Sharp Bend	Design Speed = 30 Kmph
192	74+019 to 74+035	Sharp Bend	Design Speed = 30 Kmph
193	74+095 to 74+102	Sharp Bend	Design Speed = 30 Kmph
194	74+149 to 74+158	Sharp Bend	Design Speed = 30 Kmph
195	74+207 to 74+225	Sharp Bend	Design Speed = 30 Kmph
196	74+275 to 74+279	Sharp Bend	Design Speed = 30 Kmph
197	74+337 to 74+345	Sharp Bend	Design Speed = 30 Kmph
198	74+470 to 74+479	Sharp Bend	Design Speed = 30 Kmph
199	74+527 to 74+537	Sharp Bend	Design Speed = 20 Kmph
200	74+614 to 74+633	Sharp Bend	Design Speed = 30 Kmph
201	74+717 to 74+724	Sharp Bend	Design Speed = 30 Kmph
202	74+782 to 74+789	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	368	40.007	40.029	50
2	369	40.083	40.100	30
3	370	40.169	40.185	50
4	371	40.259	40.264	50
5	372	40.314	40.321	40
6	373	40.370	40.382	50
7	374	40.430	40.431	60
8	375	40.488	40.493	45
9	378	40.832	40.925	50
10	379	40.997	41.008	50
11	386	42.072	42.080	60
12	388	42.586	42.631	40
13	389	42.727	42.751	30

Sl. No.	HIP NO.	CHAINAGE (KM)		RADIUS
		From	To	
14	392	43.295	43.299	50
15	397	43.979	44.020	50
16	398	44.124	44.128	40
17	399	44.195	44.226	25
18	400	44.308	44.322	20
19	401	44.388	44.394	50
20	402	44.483	44.517	20
21	403	44.550	44.592	21
22	404	44.649	44.675	20
23	406	44.894	44.939	50
24	410	45.405	45.411	30
25	411	45.468	45.478	20
26	412	45.625	45.638	50
27	415	46.157	46.184	20
28	423	47.138	47.166	20
29	424	47.208	47.212	50
30	425	47.304	47.327	20
31	426	47.400	47.413	50
32	427	47.474	47.484	30
33	428	47.552	47.580	40
34	429	47.683	47.699	50
35	430	47.748	47.758	50
36	431	47.848	47.859	50
37	432	47.923	47.962	50
38	434	48.180	48.251	38
39	435	48.362	48.366	60
40	438	49.031	49.044	60
41	439	49.185	49.205	60
42	440	49.290	49.299	60
43	446	50.116	50.202	46
44	447	50.286	50.294	50
45	448	50.383	50.396	50
46	451	50.880	50.893	60
47	452	51.037	51.095	40
48	453	51.233	51.237	40
49	454	51.335	51.342	20
50	456	51.518	51.525	30
51	457	51.576	51.596	40
52	459	51.820	51.850	50
53	460	51.930	51.939	20
54	461	51.993	51.999	50
55	462	52.038	52.041	20
56	463	52.097	52.099	40
57	464	52.152	52.190	35
58	467	52.353	52.362	50
59	472	52.809	52.821	60
60	476	53.077	53.106	30
61	479	53.327	53.332	40

Sl. No.	HIP NO.	CHAINAGE (KM)		RADIUS
		From	To	
62	480	53.372	53.382	25
63	481	53.428	53.432	25
64	482	53.475	53.480	50
65	486	53.781	53.818	23
66	492	54.588	54.602	50
67	493	54.672	54.707	20
68	496	55.032	55.053	50
69	504	55.901	55.923	50
70	511	56.705	56.708	30
71	512	56.766	56.773	60
72	513	56.830	56.835	20
73	514	56.893	56.906	50
74	523	58.444	58.463	20
75	529	59.211	59.222	30
76	533	59.534	59.543	50
77	534	59.651	59.666	20
78	535	59.749	59.777	25
79	536	59.825	59.828	20
80	540	60.248	60.257	30
81	541	60.377	60.386	40
82	542	60.439	60.454	30
83	543	60.548	60.566	30
84	544	60.626	60.643	30
85	545	60.770	60.775	40
86	547	61.066	61.074	40
87	548	61.236	61.263	20
88	549	61.379	61.400	30
89	552	61.736	61.746	30
90	553	61.791	61.805	50
91	555	62.013	62.018	60
92	557	62.185	62.201	50
93	558	62.255	62.262	40
94	562	62.786	62.819	20
95	568	63.891	63.900	30
96	571	64.171	64.180	30
97	576	64.815	64.835	50
98	578	65.129	65.200	40
99	580	65.452	65.487	50
100	581	65.569	65.580	40
101	583	65.699	65.706	20
102	584	65.763	65.767	35
103	585	65.807	65.816	35
104	586	65.864	65.870	25
105	587	65.912	65.916	20
106	588	65.957	65.961	20
107	589	66.000	66.016	40
108	590	66.092	66.101	30
109	591	66.187	66.187	40

Sl. No.	HIP NO.	CHAINAGE (KM)		RADIUS
		From	To	
110	593	66.257	66.260	20
111	594	66.320	66.324	30
112	595	66.370	66.374	30
113	596	66.449	66.456	15
114	597	66.496	66.525	20
115	598	66.574	66.584	50
116	599	66.644	66.685	60
117	602	66.890	66.904	30
118	603	66.956	66.979	40
119	605	67.060	67.063	50
120	610	67.425	67.429	50
121	615	68.167	68.207	20
122	621	68.715	68.754	20
123	622	68.853	68.854	50
124	624	69.088	69.103	40
125	625	69.172	69.210	20
126	626	69.298	69.330	20
127	628	69.512	69.549	19
128	629	69.614	69.651	19
129	631	69.810	69.842	40
130	632	69.904	69.915	60
131	633	69.999	70.010	25
132	634	70.057	70.095	19
133	635	70.149	70.166	20
134	636	70.232	70.237	50
135	637	70.289	70.296	40
136	638	70.381	70.392	50
137	640	70.539	70.576	19
138	642	70.738	70.748	30
139	643	70.813	70.850	20
140	644	70.911	70.923	50
141	645	70.989	70.992	40
142	646	71.114	71.150	20
143	648	71.289	71.292	50
144	649	71.388	71.398	60
145	651	71.578	71.616	20
146	652	71.669	71.679	30
147	653	71.758	71.807	24
148	655	72.003	72.016	50
149	656	72.073	72.083	40
150	657	72.164	72.197	19
151	658	72.254	72.263	50
152	659	72.342	72.353	50
153	660	72.447	72.483	20
154	662	72.655	72.689	20
155	664	72.853	72.883	20
156	665	73.003	73.099	65
157	666	73.257	73.311	30

Sl. No.	HIP NO.	CHAINAGE (KM)		RADIUS
		From	To	
158	667	73.536	73.563	35
159	668	73.635	73.639	30
160	669	73.698	73.716	50
161	670	73.776	73.854	55
162	673	74.019	74.035	50
163	675	74.149	74.158	40
164	677	74.275	74.279	30
165	678	74.337	74.345	40
166	679	74.470	74.479	40
167	680	74.527	74.537	20
168	681	74.614	74.633	30
169	682	74.717	74.724	40
170	683	74.782	74.789	60

(iii) [Note 1: Deviations from the aforesaid Specifications and Standards shall be listed out here. Such deviations shall be specified only if they are considered essential in view of 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 s of Grade 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 SCRIM (Sideway-	Class I Profilometer : ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference	180 days	IRC:82-2015
	Skid			Bi-Annually			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						
	Single Discrete	w = width of crack L = length of crack d =	0	Nil, not discernible	No Action	Not applicable
			1	w < 0.2 mm. hair cracks		
			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. Portion with norms and specifications - See Para 5.5 & 9.2
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	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 > l 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. Within 30days
			5	w > 3 mm, L > 3 m/m² and deformation		

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 =	0	Nil, not discernible	**Short Term** No action.	**Long Term**
			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	
		r = damaged			**Short Term**	**Long Term**
			0	Nil, not discernible	No action.	

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/m^2 d = diameter h = maximum depth	0	d < 50 mm; h < 25 mm; n < 1 per 5 m^2	No action.	Not Applicable
			1	d = 50 - 100 mm; h < 50 mm; n < 1 per 5 m^2	Partial depth repair 65 mm deep.	
			2	d = 50 - 100 mm; h > 50 mm; n < 1 per 5 m^2	Within 15 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
			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.	

11	**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.	Replace the slab as appropriate.
			5	f> 18 mm	Strengthen subgrade and sub-base by grouting and raising sunken slab	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	
		h = negative vertical displacement from	0	Not discernible, h < 5 mm	No action.	
			1	h = 5 - 15 mm		
			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 Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications 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 Measurements 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	260	130				
Pavement 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

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

		Initial (7 days)	Minimum Threshold level (TL) & warranty period required up to 2 years	Bi-Annually				
Night Time Visibility								
	Upto65	200	80					
	65-100	250	120					
	Above	350	150					
	10							

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

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
		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/Cantilever 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	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Pipe/box/slab	Free waterway/ unobstructed 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					
		Delamination of concrete not more					

culverts	Structurally sound	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,	30 (thirty) days

	pitching, apron, toes, floor or guide bunds	
(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)

Annex-I : 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 **"Name of Work"** (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)

Annex-II : 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 "**Name of Work"** (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 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

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

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 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

[$] 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).

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 of culverts	78.17 %	**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	[Nil]
		(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	41.19%
		(2) Sub-base Course	16.1%
		(3) Non bituminous Base course	13.45%
		(4) Bituminous Basecourse	10.73%
		(5) Wearing Coat	6.17%
		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/ New Service 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) Dry Lean Concrete (DLC) Course	[Nil]
		(4) Pavement Quality Control (PQC) Course	[Nil]
		D- Reconstruction & New Culverts on existing road, realignments, bypasses Culverts (length <6m)	12.37%
Minor bridge/ Underpasses/ Overpasses	0.00 %	**A.1-widening and repairing of Minor Bridges (length >6 m&<60m)**	
		Minor Bridges	[Nil]
		A.2- New Minor bridges (length >6	

Item	Weightage in % of CP	Stage for Payment	Percentage
		mand<60m)	
		(1) Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap.	[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.	[Nil]
		(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	[Nil]
		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**	225
		(1)Foundation	[Nil]
		(2)Sub-structure	[Nil]

Item	Weightage in % of CP	Stage for Payment	Percentage
		(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)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]
		(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 respects as 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 respects as 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	

Item	Weightage in % of CP	Stage for Payment	Percentage
		(1) Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3)Super-Structure(Including bearings)	[Nil]
		(4)Wearing Coa tincluding expansion 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/Grade Separators	
		(1) Foundations	[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)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]
Other Works	21.83 %	(i) Toll Plaza	[Nil]
		(ii) Road side drains	33.11%
		(iii) Road signs, markings, km stones, safety devices etc.	3.87%
		(iv) Project facilities	
		a) Bus Bays	2.41%
		b) Truck Lay-byes	[Nil]
		c) Passenger Shelter	0.32%
		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	16.83%
		(ix) Toe Wall	[Nil]
		(x) Retaining Wall	37.19%
		(xi) Boundary wall	[Nil]
		(xii) Site Clearance & Dismantling	4.33%
		(xiii) Other Works (turfing & Hydro seeding etc.)	1.93%
		(xiv) Composite RE Wall	[Nil]

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 10(ten)percent of the total length.
(1)Earthwork up to top of the sub-grade	[Nil]	
(3) Sub-base Course	[Nil]	
(4) Non bituminous Base course	[Nil]	
(5) Bituminous Base course	[Nil]	
(6) Wearing Coat	[Nil]	
(7) 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	41.19%	
(3) Sub-base Course	16.1%	
(4) Non bituminous Base course	13.45%	
(5) Bituminous Base course	10.73%	
(6) Wearing Coat	6.17%	
(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) Dry Lean 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 existingroad, 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 One culverts
Culverts (length <6m)	12.37%	

@ 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	Weightage	Payment Procedure
1	2	3
A.1-Widening and repairs of Minor Bridges(length>6m&<60m)	[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 > 6m & < 60m)		
(1)Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap.	[Nil]	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 less than 25% of the scope of foundation of each bridge. In case 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.	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super structure of at least one span in all respects as specified in the column of "Stage of Payment" in this sub-clause. 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, 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 Bunds and River Training Works: On completion of Guide Bunds and river training works complete in all respects	[Nil]	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

Stage of Payment	Weightage	Payment Procedure
B.1- Widening and repairs of underpasses/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 widening & repair works of a underpass/overpass.
B.2- New Underpasses/Overpasses		
(1)Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap.	[Nil]	Foundation: Cost of each Underpass/ Overpass shall be determined on pro- rata basis with respect to the total linear length (m) of the Underpasses/Overpasses. Payment against foundation 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. In case 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 of a stage i.e. completion of super- structure of at least one span in all respects as specified in the column of "Stage of Payment" in this sub-clause. 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	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. 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 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 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 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 Training works: Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(8)Approaches(including Retaining walls, stone pitching and protection works)	[Nil]	Approaches: Payments shall be 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-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. 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

Stage of Payment	Weightage	Payment Procedure
		lessthan25% 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 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 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. 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 Training works: Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(8)Approaches(including Retaining walls, stone pitching and protection works)	[Nil]	Approaches: Payments shall be made on pro-rata basis on 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 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. 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 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%ofthe 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) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as	[Nil]	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

Stage of Payment	Weightage	Payment Procedure
specified		(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]	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, Stone Pitching and protection works)	[Nil]	Payments shall be made on pro-rata basis on completion of 20% of the total area.
B.2-NewROB/RUB		
(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) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	[Nil]	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]	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]	Payment shall be made on pro-rata basis on completion of a stage in all respects as specified
C.1-Widening and repairs of Elevated Section/ Flyovers/Grade Separators		
(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%

Stage of Payment	Weightage	Payment Procedure
		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 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) 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		
(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

Stage of Payment	Weightage	Payment Procedure
		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)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	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) Roadside drains	33.11%	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 05% (five percent) of the total length.
(3) Road signs, markings, km stones, safety devices etc.	3.87%	
(4) Project Facilities		Payment shall be made on pro-rata basis for completed facilities.
a) Bus Bays	2.41%	
b) Truck Lay-byes	[Nil]	
c) Passenger Shelter	0.32%	
d) Rest Area	[Nil]	
(5) Road side Plantation including Horticulture in 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 prorate 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 05% (five percent) of the total length.
(a) Retaining Wall	37.19%	
(b) Breast Wall	16.83%	
(c) Toe Wall	[Nil]	
(9) Site Clearance & Dismantling	4.33%	Unit of measurement is linear length. Payment shall be made

Stage of Payment	Weightage	Payment Procedure
		on pro-rata basis on completion of a stage in a length of not less than 05% (five percent) of the total length.
(10) Other Works (turfing & Hydro seeding etc.)	1.93%	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)

Annex-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 of each 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)

Annex-I : 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)