Schedules

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 Annexure-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 87+496 to km 109.494 i.e. Tamphung Village to Dzuku bridge near Peren Town 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 total 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	87500	87600	10.9	24	
2	87600	87700	9.3	24	
3	87700	87800	8.5	24	
4	87800	87900	10.8	24	
5	87900	88000	7.8	24	
6	88000	88100	9.2	24	
7	88100	88200	8.1	24	
8	88200	88300	8.5	24	
9	88300	88400	7.2	24	
10	88400	88500	8.3	24	
11	88500	88600	9.8	24	
12	88600	88700	7.9	24	
13	88700	88800	8.1	24	
14	88800	88900	7.8	24	
15	88900	89000	8.5	24	
16	89000	89100	8.6	24	
17	89100	89200	9.3	24	
18	89200	89300	8	24	
19	89300	89400	7.9	24	
20	89400	89500	9.3	24	
21	89500	89600	8.7	24	
22	89600	89700	9.4	24	
23	89700	89800	9.9	24	
24	89800	89900	10.3	20	
25	89900	90000	8.9	24	
26	90000	90100	8	24	
27	90100	90200	8.8	24	
28	90200	90300	9.2	24	

SL No.	Chainage (Km)		Existing Right of Way (m)	Proposed Right of Way (m)	Remarks
	From	To			
29	90300	90400	7.6	24	
30	90400	90500	9.2	24	
31	90500	90600	9.5	24	
32	90600	90700	8	24	
33	90700	90800	10	24	
34	90800	90900	10.5	24	
35	90900	91000	10.2	19	
36	91000	91100	11.3	19	
37	91100	91200	9.5	19	
38	91200	91300	10.3	19	
39	91300	91400	9.6	19	
40	91400	91500	9.9	19	
41	91500	91600	12	24	
42	91600	91700	10.5	24	
43	91700	91800	9.4	24	
44	91800	91900	13.5	24	
45	91900	92000	9.3	20	
46	92000	92100	9.6	20	
47	92100	92200	10	20	
48	92200	92300	10.1	20	
49	92300	92400	10.8	20	
50	92400	92500	9.8	20	
51	92500	92600	11.4	20	
52	92600	92700	10.5	20	
53	92700	92800	13.2	20	
54	92800	92900	11.5	20	
55	92900	93000	10.5	24	
56	93000	93100	12.7	24	
57	93100	93200	9.1	24	
58	93200	93300	9.1	24	
59	93300	93400	9.3	24	
60	93400	93500	10.9	24	
61	93500	93600	8.4	24	
62	93600	93700	7.5	24	
63	93700	93800	9.7	24	
64	93800	93900	9.4	24	
65	93900	94000	9.8	24	
66	94000	94100	9	20	
67	94100	94200	10.1	20	
68	94200	94300	10	20	
69	94300	94400	10	24	
70	94400	94500	9	24	
71	94500	94600	9.2	20	
72	94600	94700	9.3	20	
73	94700	94800	10.8	24	
74	94800	94900	9.5	24	
75	94900	95000	9.7	24	
76	95000	95100	10.6	24	
77	95100	95200	8.4	24	

SL No.	Chainage (Km)		Existing Right of Way (m)	Proposed Right of Way (m)	Remarks
	From	To			
78	95200	95300	10	20	
79	95300	95400	9.3	24	
80	95400	95600	11.1	24	
81	95600	95700	9.7	24	
82	95700	95800	9.7	20	
83	95800	95900	8.4	20	
84	95900	96000	8.9	20	
85	96000	96100	9.3	20	
86	96100	96200	9.9	20	
87	96200	96300	9.1	20	
88	96300	96400	8.4	20	
89	96400	96500	9.6	20	
90	96500	96600	9	20	
91	96600	96700	9.4	20	
92	96700	96800	8.6	20	
93	96800	96900	9	20	
94	96900	97000	9.6	24	
95	97000	97100	8.8	24	
96	97100	97200	8.8	24	
97	97200	97300	9.9	24	
98	97300	97400	9.7	24	
99	97400	97500	9.7	24	
100	97500	97600	10.4	24	
101	97600	97700	9.2	24	
102	97700	97800	9.2	24	
103	97800	97900	9.6	24	
104	97900	98000	10	24	
105	98000	98100	10	24	
106	98100	98200	9.7	24	
107	98200	98300	9.9	24	
108	98300	98400	9.1	24	
109	98400	98500	9.6	24	
110	98500	98600	10.6	24	
111	98600	98700	10.2	24	
112	98700	98800	9.8	24	
113	98800	98900	10.6	24	
114	98900	99000	9.5	24	
115	99000	99100	10	24	
116	99100	99200	9.6	24	
117	99200	99300	9.5	20	
118	99300	99400	9.8	20	
119	99400	99500	8.1	20	
120	99500	99600	9.8	20	
121	99600	99700	10.7	20	
122	99700	99800	9.2	20	
123	99800	99900	8.9	20	
124	99900	100000	9	20	
125	100000	100100	9.7	20	
126	100100	100200	8.4	20	

SL No.	Chainage (Km)		Existing Right of Way (m)	Proposed Right of Way (m)	Remarks
	From	To			
127	100200	100300	9.3	20	
128	100300	100400	9.5	20	
129	100400	100500	8.2	20	
130	100500	100600	10.3	24	
131	100600	100700	10.2	18	
132	100700	100800	10	18	
133	100800	100900	8.5	18	
134	100900	101000	10.6	18	
135	101000	101100	10.3	18	
136	101100	101200	9.8	18	
137	101200	101300	9.8	18	
138	101300	101400	9.8	18	
139	101400	101500	10.4	18	
140	101500	101600	9.3	18	
141	101600	101700	8.4	18	
142	101700	101800	8.9	18	
143	101800	101900	9.8	18	
144	101900	102000	9.2	18	
145	102000	102100	11.5	18	
146	102100	102200	10.6	18	
147	102200	102300	8.3	18	
148	102300	102400	10.3	18	
149	102400	102500	9	18	
150	102500	102600	8.3	18	
151	102600	102700	8.7	18	
152	102700	102800	10.1	18	
153	102800	102900	10.1	18	
154	102900	103000	9.9	18	
155	103000	103100	8.8	18	
156	103100	103200	7.1	18	
157	103200	103300	8.3	18	
158	103300	103400	8.8	18	
159	103400	103500	8.3	18	
160	103500	103600	8.3	18	
161	103600	103700	10.1	18	
162	103700	103800	9.2	18	
163	103800	103900	11.2	18	
164	103900	104100	8.7	20	
165	104100	104200	7.9	20	
166	104200	104300	8	20	
167	104300	104400	7.8	20	
168	104400	104500	8.5	20	
169	104500	104600	8.7	20	
170	104600	104700	8.9	20	
171	104700	104800	8.1	20	
172	104800	104900	Land Slide Zone	20	
173	104900	105000		24	
174	105000	105100		20	
175	105100	105200		24	

SL No.	Chainage (Km)		Existing Right of Way (m)	Proposed Right of Way (m)	Remarks
	From	To			
176	105200	105300		24	
177	105300	105400		24	
178	105400	105500		24	
179	105500	105600		20	
180	105600	105700		24	
181	105700	105800		24	
182	105800	105900		20	
183	105900	106000		24	
184	106000	106100		24	
185	106100	106200		24	
186	106200	106300		24	
187	106300	106400		24	
188	106400	106500		24	
189	106500	106600		24	
190	106600	106700		24	
191	106700	106800		24	
192	106800	106900		24	
193	106900	107000		24	
194	107000	107100		24	
195	107100	107200		24	
196	107200	107300		24	
197	107300	107400		24	
198	107400	107500		24	
199	107500	107600		24	
200	107600	107700		24	
201	107700	107800		24	
202	107800	107900		24	
203	107900	108000		24	
204	108000	108100		24	
205	108100	108200		24	
206	108200	108300		24	
207	108300	108400	10.9	24	
208	108400	108500	8.8	19	
209	108500	108600	11.7	19	
210	108600	108700	8.6	24	
211	108700	108800	8.7	19	
212	108800	108900	8	19	
213	108900	109000	7	24	
214	109000	109100	10.4	24	
215	109100	109200	8.1	24	
216	109200	109300	9.2	24	
217	109300	109400	11.9	24	
218	109400	109500	10	21	
219	109500	109600	10.6	21	
220	109600	109700	12.8	24	

3. Carriageway

The present carriageway of the Project Highway is Two Lane from km 87+496 to km 109.494. 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		
1	109.735	Open	Well	Steel Truss	1x66.48M	12.60

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

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

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

6 Grade separators

The Site includes the following grade separators:

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

7 Minor bridges

The Site includes the following minor bridges:

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

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	No. of Spans with	Width (m)

		Structure	span length (m)	
NIL				

10 Culverts

The Site has the following culverts:

Sl. No.	Chainage (km)	Type of Structures (Pipe/ Slab/ Box/ Arch)	Span Arrangement (No. x Length) (m)	Width of Culvert (m)
1	87.887	Pipe culvert	2X1.0	-
2	88.202	Pipe culvert	2X1.0	-
3	88.400	Pipe culvert	2X1.2	-
4	88.628	Pipe culvert	2X1.0	-
5	88.932	Pipe culvert	1X1.0	-
6	89.368	Pipe culvert	1X1.0	-
7	89.989	Pipe culvert	2X1.0	-
8	90.105	Pipe culvert	2X1.0	-
9	90.110	Pipe culvert	1X1.2	-
10	90.176	Slab culvert	1X1.0	-
11	90.238	Pipe culvert	1X1.2	-
12	90.440	Pipe culvert	2X1.0	-
13	90.750	ARCH CULVERT	1X1.0	-
14	91.014	Pipe culvert	2X1.0	-
15	91.263	Pipe culvert	2X1.0	-
16	91.442	Slab culvert	1X1.5	-
17	91.927	Slab culvert	1X1.5	-
18	91.775	Slab culvert	1X1.5	-
19	91.925	Slab culvert	1X1.5	-
20	92.052	Slab culvert	1X1.5	-
21	92.283	Slab culvert	1X1.5	-
22	92.644	Slab culvert	1X2.0	-
23	92.837	Slab culvert	1X1.5	-
24	93.060	Slab culvert	1X1.5	-
25	93.187	Slab culvert	1X2.0	-
26	93.610	Slab culvert	1X1.5	-
27	93.747	Slab culvert	1X1.5	-
28	93.910	Slab culvert	1X1.5	-
29	94.125	Slab culvert	1X1.5	-
30	94.270	Slab culvert	1×1.5	-
31	94.378	Slab culvert	1×1.5	-
32	94.628	Slab culvert	1×1.5	-
33	94.737	Slab culvert	1×1.5	-
34	94.960	Slab culvert	1×3.0	-
35	95.062	Slab culvert	1×3.0	-
36	95.148	Slab culvert	1X1.5	-
37	95.310	Slab culvert	1X1.5	-
38	95.436	Slab culvert	1x3.0	-
39	95.627	Slab culvert	1X4	-
40	95.763	Pipe culvert	2X1.0	-

Sl. No.	Chainage (km)	Type of Structures (Pipe/ Slab/ Box/ Arch)	Span Arrangement (No. x Length) (m)	Width of Culvert (m)
41	95.842	Pipe culvert	2X1.0	-
42	95.898	Pipe culvert	2X1.0	-
43	96.166	Pipe culvert	2X1.0	-
44	96.290	Slab culvert	1X2.5	-
45	96.433	Pipe culvert	2X1.0	-
46	96.560	Pipe culvert	2X1.0	-
47	96.835	Pipe culvert	2X1.0	-
48	97.098	Pipe culvert	2X1.0	-
49	97.602	Pipe culvert	2X1.0	-
50	97.707	Pipe culvert	2X1.0	-
51	97.850	Slab culvert	1X2.0	-
52	97.892	Pipe culvert	2X1.0	-
53	98.065	Pipe culvert	2X1.0	-
54	98.272	Pipe culvert	2X1.0	-
55	98.428	Pipe culvert	2X1.0	-
56	99.518	Pipe culvert	2X1.0	-
57	98.540	Slab culvert	1X5.8	-
58	98.654	Pipe culvert	2X1.0	-
59	98.910	Pipe culvert	2X1.0	-
60	98.966	Pipe culvert	2X1.0	-
61	99.066	Pipe culvert	2X1.0	-
62	99.288	Pipe culvert	2X1.0	-
63	99.518	Pipe culvert	2X1.0	-
64	99.625	Pipe culvert	2X1.0	-
65	99.730	Pipe culvert	2X1.0	-
66	99.855	Pipe culvert	2X1.0	-
67	100.014	Pipe culvert	2X1.0	-
68	100.109	Pipe culvert	2X1.0	-
69	100.328	Pipe culvert	2X1.0	-
70	100.400	Pipe culvert	2X1.0	-
71	100.571	Pipe culvert	2X1.0	-
72	100.740	Pipe culvert	2X1.0	-
73	100.793	Pipe culvert	2X1.0	-
74	100.952	Pipe culvert	2X1.0	-
75	101.334	Pipe culvert	2X1.0	-
76	101.548	Pipe culvert	2X1.0	-
77	101.705	Pipe culvert	2X1.0	-
78	101.896	Pipe culvert	2X1.0	-
79	102.080	Pipe culvert	2X1.0	-
80	102.352	Pipe culvert	2X1.0	-
81	102.428	Pipe culvert	2X1.0	-
82	102.570	Pipe culvert	2X1.0	-
83	102.823	Pipe culvert	2X1.0	-
84	102.900	Pipe culvert	2X1.0	-
85	103.350	Pipe culvert	2X1.0	-
86	103.462	Pipe culvert	2X1.0	-
87	103.790	Pipe culvert	2X1.0	-

Sl. No.	Chainage (km)	Type of Structures (Pipe/ Slab/ Box/ Arch)	Span Arrangement (No. x Length) (m)	Width of Culvert (m)
88	104.260	Pipe culvert	2X1.0	-
89	104.342	Pipe culvert	2X1.0	-
90	104.440	Pipe culvert	2X1.0	-
91	104.619	Pipe culvert	2X1.0	-
92	105.426	Pipe culvert	2X1.0	-

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 Road side drains

The details of the roadside drains are as follows:

Sl. No.	Location		Type	
	From km	To km	Masonry/cc (Pucca)	Earthen (Kutcha)
1	89+120	97.590	Earthen (Hill Side)	

14 Major junctions

The details of major junctions are as follows:

S. No.	Location		At grade	Separated	Category of Cross Road			
	From km	To km			NH	SH	MDR	Others
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	87.580		Y	3-legged

Sl. No.	Location		Type of intersection	
	From Km	To Km	T-Junction	Cross Road
2	91.900		Y	3-legged
3	96.150		Y	3-legged
4	109.300		Y	3-legged
5	109.700		X	4-legged

16 Bypasses

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

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

[17 Other structures] -NIL

[Provide details of other structures, if any.]

(Schedule-A)

Dates for providing Right of Way

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:

Sl. No	**From km to km**	**Length (km)**	**Width (m)**	**Date of providing ROW***
1	**2**	**3**	**4**	**5**
(i) Full Right of Way (full width) (a) Stretch (b) Stretch (c) Stretch				The Construction of Project Highway will be implemented within the existing ROW as much as possible and acquiring additional land wherever necessary, details of which are already given in Article-2 of Annexure – I of Schedule – A.
(ii) Part Right of Way (part width) (a) Stretch (b) Stretch (c) Stretch				
(iii) Balance Right of Way (width) a) Stretch b) Stretch c) Stretch				

* The dates specified herein shall in no case be beyond 150 (one hundred and fifty) days after the Appointed Date.

Annex - III

(Schedule-A)

Alignment Plans

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

(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 relevant specifications/IRC Codes/Manual.

Annex - IV

(Schedule-A)

Environment Clearances

The following environment clearances have been obtained:

- Environmental Clearance is not required as per new Notification of MoEF dated 22/08/2013.

SCHEDULE - B

(See Clause 2.1)

Development of the Project Highway

1 Development of the Project Highway

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

2 [Rehabilitation and augmentation]

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

3 Specifications and Standards

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

Annex - I
(Schedule-B)

Description of [Two-Laning]

[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 Laning of Highways (IRC: SP: 73-2015)], referred to as the Manual. If any standards, specifications or details are not given in the Manual, the minimum design/construction requirements 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	Tamphung	87+350	109.494	7	As per attached TCS drawing	7 m Carriageway

(b) Except as otherwise provided in this Agreement the width of the paved carriageway and cross-sectional features shall conform to paragraph 1.1above.

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 upto 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	89+176 to 89+190	Sharp Bend	Design Speed = 30 Kmph
2	89+251 to 89+280	Sharp Bend	Design Speed = 30 Kmph
3	89+597 to 89+689	Sharp Bend	Design Speed = 30 Kmph
4	90+070 to 90+084	Sharp Bend	Design Speed = 30 Kmph
5	90+143 to 90+158	Sharp Bend	Design Speed = 25 Kmph
6	90+228 to 90+234	Sharp Bend	Design Speed = 30 Kmph
7	90+333 to 90+349	Sharp Bend	Design Speed = 30 Kmph
8	92+872 to 92+902	Sharp Bend	Design Speed = 30 Kmph
9	92+938 to 93+015	Sharp Bend	Design Speed = 30 Kmph
10	93+067 to 93+100	Sharp Bend	Design Speed = 20 Kmph
11	93+399 to 93+496	Sharp Bend	Design Speed = 30 Kmph
12	93+547 to 93+556	Sharp Bend	Design Speed = 30 Kmph
13	93+600 to 93+631	Sharp Bend	Design Speed = 30 Kmph
14	93+703 to 93+720	Sharp Bend	Design Speed = 30 Kmph
15	93+832 to 93+837	Sharp Bend	Design Speed = 30 Kmph
16	93+904 to 93+913	Sharp Bend	Design Speed = 30 Kmph
17	93+972 to 93+974	Sharp Bend	Design Speed = 30 Kmph
18	94+024 to 94+091	Sharp Bend	Design Speed = 30 Kmph
19	95+823 to 95+836	Sharp Bend	Design Speed = 30 Kmph
20	95+889 to 95+904	Sharp Bend	Design Speed = 30 Kmph
21	95+970 to 95+981	Sharp Bend	Design Speed = 30 Kmph
22	96+035 to 96+040	Sharp Bend	Design Speed = 30 Kmph
23	96+082 to 96+094	Sharp Bend	Design Speed = 20 Kmph
24	96+146 to 96+173	Sharp Bend	Design Speed = 20 Kmph
25	96+249 to 96+265	Sharp Bend	Design Speed = 20 Kmph
26	98+042 to 98+044	Sharp Bend	Design Speed = 30 Kmph
27	98+122 to 98+129	Sharp Bend	Design Speed = 30 Kmph
28	100+939 to 100+964	Sharp Bend	Design Speed = 20 Kmph
29	101+045 to 101+063	Sharp Bend	Design Speed = 30 Kmph
30	101+137 to 101+150	Sharp Bend	Design Speed = 30 Kmph
31	101+303 to 101+343	Sharp Bend	Design Speed = 30 Kmph
32	101+399 to 101+422	Sharp Bend	Design Speed = 30 Kmph
33	101+498 to 101+532	Sharp Bend	Design Speed = 20 Kmph
34	101+617 to 101+631	Sharp Bend	Design Speed = 20 Kmph
35	101+681 to 101+692	Sharp Bend	Design Speed = 30 Kmph
36	101+772 to 101+792	Sharp Bend	Design Speed = 20 Kmph
37	101+878 to 101+917	Sharp Bend	Design Speed = 20 Kmph
38	101+975 to 101+987	Sharp Bend	Design Speed = 20 Kmph
39	102+030 to 102+044	Sharp Bend	Design Speed = 20 Kmph
40	102+096 to 102+104	Sharp Bend	Design Speed = 20 Kmph
41	102+137 to 102+138	Sharp Bend	Design Speed = 20 Kmph
42	102+181 to 102+196	Sharp Bend	Design Speed = 20 Kmph
43	102+221 to 102+228	Sharp Bend	Design Speed = 30 Kmph
44	102+290 to 102+296	Sharp Bend	Design Speed = 30 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
45	102+357 to 102+386	Sharp Bend	Design Speed = 30 Kmph
46	102+448 to 102+456	Sharp Bend	Design Speed = 30 Kmph
47	102+509 to 102+512	Sharp Bend	Design Speed = 20 Kmph
48	102+583 to 102+592	Sharp Bend	Design Speed = 20 Kmph
49	102+638 to 102+647	Sharp Bend	Design Speed = 20 Kmph
50	102+679 to 102+700	Sharp Bend	Design Speed = 20 Kmph
51	102+771 to 102+779	Sharp Bend	Design Speed = 20 Kmph
52	102+855 to 102+880	Sharp Bend	Design Speed = 20 Kmph
53	102+955 to 102+961	Sharp Bend	Design Speed = 20 Kmph
54	103+060 to 103+062	Sharp Bend	Design Speed = 20 Kmph
55	103+121 to 103+127	Sharp Bend	Design Speed = 30 Kmph
56	103+250 to 103+252	Sharp Bend	Design Speed = 30 Kmph
57	103+288 to 103+297	Sharp Bend	Design Speed = 30 Kmph
58	103+384 to 103+391	Sharp Bend	Design Speed = 30 Kmph
59	103+448 to 103+454	Sharp Bend	Design Speed = 30 Kmph
60	103+516 to 103+520	Sharp Bend	Design Speed = 20 Kmph
61	103+589 to 103+626	Sharp Bend	Design Speed = 20 Kmph
62	103+853 to 103+859	Sharp Bend	Design Speed = 30 Kmph
63	103+933 to 103+960	Sharp Bend	Design Speed = 20 Kmph
64	103+992 to 104+033	Sharp Bend	Design Speed = 20 Kmph
65	105+763 to 105+767	Sharp Bend	Design Speed = 30 Kmph
66	105+812 to 105+825	Sharp Bend	Design Speed = 30 Kmph
67	105+856 to 105+881	Sharp Bend	Design Speed = 30 Kmph
68	105+912 to 105+915	Sharp Bend	Design Speed = 20 Kmph
69	105+950 to 105+951	Sharp Bend	Design Speed = 20 Kmph
70	105+999 to 106+004	Sharp Bend	Design Speed = 30 Kmph
71	106+088 to 106+090	Sharp Bend	Design Speed = 20 Kmph
72	106+124 to 106+128	Sharp Bend	Design Speed = 20 Kmph
73	106+162 to 106+164	Sharp Bend	Design Speed = 20 Kmph
74	106+268 to 106+279	Sharp Bend	Design Speed = 30 Kmph
75	106+476 to 106+484	Sharp Bend	Design Speed = 30 Kmph
76	106+526 to 106+526	Sharp Bend	Design Speed = 25 Kmph
77	106+558 to 106+558	Sharp Bend	Design Speed = 20 Kmph
78	106+718 to 106+719	Sharp Bend	Design Speed = 30 Kmph
79	106+770 to 106+778	Sharp Bend	Design Speed = 30 Kmph
80	106+842 to 106+843	Sharp Bend	Design Speed = 25 Kmph
81	106+869 to 106+892	Sharp Bend	Design Speed = 30 Kmph
82	106+925 to 106+927	Sharp Bend	Design Speed = 20 Kmph
83	106+966 to 106+967	Sharp Bend	Design Speed = 20 Kmph
84	106+998 to 107+001	Sharp Bend	Design Speed = 20 Kmph
85	107+040 to 107+042	Sharp Bend	Design Speed = 20 Kmph
86	107+064 to 107+076	Sharp Bend	Design Speed = 30 Kmph
87	107+086 to 107+116	Sharp Bend	Design Speed = 30 Kmph
88	107+414 to 107+435	Sharp Bend	Design Speed = 30 Kmph
89	107+499 to 107+502	Sharp Bend	Design Speed = 25 Kmph
90	107+537 to 107+555	Sharp Bend	Design Speed = 30 Kmph
91	107+577 to 107+583	Sharp Bend	Design Speed = 30 Kmph
92	107+670 to 107+680	Sharp Bend	Design Speed = 30 Kmph
93	107+734 to 107+737	Sharp Bend	Design Speed = 25 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
94	107+757 to 107+774	Sharp Bend	Design Speed = 30 Kmph
95	107+832 to 107+843	Sharp Bend	Design Speed = 20 Kmph
96	107+877 to 107+886	Sharp Bend	Design Speed = 30 Kmph
97	107+903 to 107+931	Sharp Bend	Design Speed = 30 Kmph
98	107+980 to 107+981	Sharp Bend	Design Speed = 30 Kmph
99	108+058 to 108+063	Sharp Bend	Design Speed = 30 Kmph
100	108+145 to 108+150	Sharp Bend	Design Speed = 25 Kmph
101	108+184 to 108+190	Sharp Bend	Design Speed = 25 Kmph
102	108+234 to 108+250	Sharp Bend	Design Speed = 30 Kmph
103	108+383 to 108+390	Sharp Bend	Design Speed = 30 Kmph
104	108+437 to 108+444	Sharp Bend	Design Speed = 30 Kmph
105	108+499 to 108+509	Sharp Bend	Design Speed = 20 Kmph
106	108+552 to 108+558	Sharp Bend	Design Speed = 20 Kmph
107	108+592 to 108+607	Sharp Bend	Design Speed = 30 Kmph
108	108+638 to 108+646	Sharp Bend	Design Speed = 30 Kmph
109	108+704 to 108+712	Sharp Bend	Design Speed = 30 Kmph
110	108+798 to 108+805	Sharp Bend	Design Speed = 30 Kmph
111	109+010 to 109+040	Sharp Bend	Design Speed = 30 Kmph
112	109+131 to 109+142	Sharp Bend	Design Speed = 30 Kmph
113	109+228 to 109+234	Sharp Bend	Design Speed = 20 Kmph
114	109+271 to 109+303	Sharp Bend	Design Speed = 20 Kmph
115	109+382 to 109+409	Sharp Bend	Design Speed = 20 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) Inbuilt-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 requirement 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 provision of the Manual. The requisite particulars are given below:

[Refer to requirements specified in the relevant Manual]

Sl. No.	Location of structure	Length (m)	Number and length of spans (m)	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	Cross road at	Remarks,

		structure Length (m)	Existing Level	Raised Level	Lowered Level	if any
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)	5200
TCS-3	Typical Cross Section of Two-lane Carriageway in Rural area with breast wall on hill side and earthen shoulder on valley side (Reconstruction of Existing Pavement)	300
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)	4075
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)	150
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)	5450
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)	1750
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)	1050
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)	2469
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)	500
TCS-12	Typical Cross Section of Two lane Carriageway in rural area with bothside breast wall (Reconstruction of Existing Pavement)	0
TCS-13	Typical Cross Section of Two lane Carriageway in rural area with oneside retaining wall (New Construction)	150
TCS-14	Typical Cross Section of Two lane Carriageway in rural area with bothside retaining wall (New Construction)	0
TCS-15	Typical Cross Section of reconstruction of Two lane Carriageway in rural area with composite RE wall (New Construction)	0

TCS TYPE	DESCRIPTION	Length (m)
TCS-16	Typical Cross Section of reconstruction of Two lane Carriageway paved shoulder in rural area on both side composite RE wall	0
TCS-17	Typical Cross Section of Two lane Carriageway in rural area with breast wall on hill side and earthen shoulder on valley side (New Construction)	350
TCS-18	Typical Cross Section of Two lane Carriageway in rural area with one side retaining wall and other side breast wall (New Construction)	450
TCS-19	Typical Cross Section of Two lane Carriageway in rural area with one side breast wall and other side RR masonry trapezoidal drain (New Construction)	250
	Total length =	**22144**

Chainage (Km)		Net Length (m)	TCS No.
From	To		
87350	87825	475	TCS-4
87825	88025	200	TCS-2
88025	88075	50	TCS-4
88075	88125	50	TCS-2
88125	88175	50	TCS-4
88175	88225	50	TCS-6
88225	88275	50	TCS-2
88275	88475	200	TCS-4
88475	88525	50	TCS-2
88525	88625	100	TCS-4
88625	88875	250	TCS-2
88875	89025	150	TCS-6
89025	89125	100	TCS-4
89125	89225	100	TCS-2
89225	89475	250	TCS-6
89475	89525	50	TCS-2
89525	89575	50	TCS-4
89575	89825	250	TCS-2
89825	89875	50	TCS-4
89875	89975	100	TCS-2
89975	90025	50	TCS-6
90025	90075	50	TCS-4
90075	90225	150	TCS-2
90225	90325	100	TCS-6
90325	90375	50	TCS-2
90375	90575	200	TCS-4
90575	90675	100	TCS-6
90675	90725	50	TCS-4
90725	91175	450	TCS-2
91175	91225	50	TCS-4
91225	91325	100	TCS-6
91325	91425	100	TCS-4
91425	91475	50	TCS-6
91475	91525	50	TCS-11

Chainage (Km)		Net Length (m)	TCS No.
From	To		
91525	91675	150	TCS-6
91675	91825	150	TCS-2
91825	92125	300	TCS-6
92125	92175	50	TCS-2
92175	92725	550	TCS-6
92725	92775	50	TCS-4
92775	92875	100	TCS-3
92875	92975	100	TCS-2
92975	93075	100	TCS-6
93075	93175	100	TCS-2
93175	93225	50	TCS-4
93225	93325	100	TCS-6
93325	93375	50	TCS-2
93375	93575	200	TCS-6
93575	93775	200	TCS-2
93775	93825	50	TCS-4
93825	93875	50	TCS-6
93875	93975	100	TCS-4
93975	94125	150	TCS-2
94125	94225	100	TCS-11
94225	94325	100	TCS-4
94325	94375	50	TCS-6
94375	94525	150	TCS-4
94525	94575	50	TCS-2
94575	94625	50	TCS-4
94625	94975	350	TCS-2
94975	95225	250	TCS-6
95225	95275	50	TCS-4
95275	95325	50	TCS-6
95325	95475	150	TCS-2
95475	95525	50	TCS-4
95525	95675	150	TCS-2
95675	95925	250	TCS-4
95925	96025	100	TCS-6
96025	96075	50	TCS-4
96075	96275	200	TCS-6
96275	96375	100	TCS-2
96375	96575	200	TCS-4
96575	98125	1550	TCS-6
98125	98475	350	TCS-11
98475	98825	350	TCS-6
98825	98875	50	TCS-4
98875	98925	50	TCS-2
98925	99375	450	TCS-4
99375	99425	50	TCS-2

Chainage (Km)		Net Length (m)	TCS No.
From	To		
99425	99475	50	TCS-4
99475	99525	50	TCS-13
99525	99625	100	TCS-2
99625	99675	50	TCS-4
99675	99825	150	TCS-2
99825	99875	50	TCS-4
99875	100525	650	TCS-2
100525	100575	50	TCS-4
100575	100725	150	TCS-6
100725	100925	200	TCS-2
100925	101125	200	TCS-6
101125	101375	250	TCS-2
101375	101625	250	TCS-6
101625	101925	300	TCS-2
101925	102025	100	TCS-9
102025	102175	150	TCS-7
102175	102575	400	TCS-9
102575	102675	100	TCS-8
102675	102775	100	TCS-9
102775	102825	50	TCS-13
102825	102875	50	TCS-7
102875	102925	50	TCS-13
102925	102975	50	TCS-7
102975	103075	100	TCS-9
103075	103475	400	TCS-7
103475	103825	350	TCS-8
103825	103925	100	TCS-7
103925	104025	100	TCS-8
104025	104425	400	TCS-7
104425	104525	100	TCS-8
104525	104825	300	TCS-4
104825	104925	100	TCS-3
104925	105075	150	TCS-5
105075	105175	100	TCS-2
105175	105275	100	TCS-3
105275	105675	400	TCS-4
105675	105875	200	TCS-7
105875	106175	300	TCS-18
106175	106475	300	TCS-17
106475	106625	150	TCS-8
106625	106975	350	TCS-9
106975	107025	50	TCS-8
107025	107125	100	TCS-7
107125	107175	50	TCS-9
107175	107225	50	TCS-7

Chainage (Km)		Net Length (m)	TCS No.
From	To		
107225	107275	50	TCS-19
107275	107375	100	TCS-8
107375	107525	150	TCS-19
107525	107625	100	TCS-7
107625	107675	50	TCS-19
107675	107725	50	TCS-7
107725	107875	150	TCS-18
107875	107925	50	TCS-17
107925	107975	50	TCS-7
107975	109175	1200	TCS-9
109175	109275	100	TCS-8
109275	109325	50	TCS-7
109325	109494	169	TCS-9
Total Length of PKG- IIIB =		**22144**	

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

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

(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	87.580	Y-Type	3-legged
2	91.900	Y-Type	3-legged
3	96.150	Y-Type	3-legged
4	109.300	Y-Type	3-legged
5	109.700	X-Type	4-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**	**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	87+350 Km to 87+825 Km	Reconstruction	TCS-4

SL NO.	Stretch from Km to Km	Remarks	TCS Type
2	87+825 Km to 88+025 Km	Reconstruction	TCS-2
3	88+025 Km to 88+075 Km	Reconstruction	TCS-4
4	88+075 Km to 88+125 Km	Reconstruction	TCS-2
5	88+125 Km to 88+175 Km	Reconstruction	TCS-4
6	88+175 Km to 88+225 Km	Reconstruction	TCS-6
7	88+225 Km to 88+275 Km	Reconstruction	TCS-2
8	88+275 Km to 88+475 Km	Reconstruction	TCS-4
9	88+475 Km to 88+525 Km	Reconstruction	TCS-2
10	88+525 Km to 88+625 Km	Reconstruction	TCS-4
11	88+625 Km to 88+875 Km	Reconstruction	TCS-2
12	88+875 Km to 89+025 Km	Reconstruction	TCS-6
13	89+025 Km to 89+125 Km	Reconstruction	TCS-4
14	89+125 Km to 89+225 Km	Reconstruction	TCS-2
15	89+225 Km to 89+475 Km	Reconstruction	TCS-6
16	89+475 Km to 89+525 Km	Reconstruction	TCS-2
17	89+525 Km to 89+575 Km	Reconstruction	TCS-4
18	89+575 Km to 89+825 Km	Reconstruction	TCS-2
19	89+825 Km to 89+875 Km	Reconstruction	TCS-4
20	89+875 Km to 89+975 Km	Reconstruction	TCS-2
21	89+975 Km to 90+025 Km	Reconstruction	TCS-6
22	90+025 Km to 90+075 Km	Reconstruction	TCS-4
23	90+075 Km to 90+225 Km	Reconstruction	TCS-2
24	90+225 Km to 90+325 Km	Reconstruction	TCS-6
25	90+325 Km to 90+375 Km	Reconstruction	TCS-2
26	90+375 Km to 90+575 Km	Reconstruction	TCS-4
27	90+575 Km to 90+675 Km	Reconstruction	TCS-6
28	90+675 Km to 90+725 Km	Reconstruction	TCS-4
29	90+725 Km to 91+175 Km	Reconstruction	TCS-2
30	91+175 Km to 91+225 Km	Reconstruction	TCS-4
31	91+225 Km to 91+325 Km	Reconstruction	TCS-6
32	91+325 Km to 91+425 Km	Reconstruction	TCS-4
33	91+425 Km to 91+475 Km	Reconstruction	TCS-6
34	91+475 Km to 91+525 Km	Reconstruction	TCS-11
35	91+525 Km to 91+675 Km	Reconstruction	TCS-6
36	91+675 Km to 91+825 Km	Reconstruction	TCS-2
37	91+825 Km to 92+125 Km	Reconstruction	TCS-6
38	92+125 Km to 92+175 Km	Reconstruction	TCS-2
39	92+175 Km to 92+725 Km	Reconstruction	TCS-6
40	92+725 Km to 92+775 Km	Reconstruction	TCS-4
41	92+775 Km to 92+875 Km	Reconstruction	TCS-3
42	92+875 Km to 92+975 Km	Reconstruction	TCS-2
43	92+975 Km to 93+075 Km	Reconstruction	TCS-6
44	93+075 Km to 93+175 Km	Reconstruction	TCS-2
45	93+175 Km to 93+225 Km	Reconstruction	TCS-4
46	93+225 Km to 93+325 Km	Reconstruction	TCS-6
47	93+325 Km to 93+375 Km	Reconstruction	TCS-2
48	93+375 Km to 93+575 Km	Reconstruction	TCS-6
49	93+575 Km to 93+775 Km	Reconstruction	TCS-2
50	93+775 Km to 93+825 Km	Reconstruction	TCS-4
51	93+825 Km to 93+875 Km	Reconstruction	TCS-6

SL NO.	Stretch from Km to Km	Remarks	TCS Type
52	93+875 Km to 93+975 Km	Reconstruction	TCS-4
53	93+975 Km to 94+125 Km	Reconstruction	TCS-2
54	94+125 Km to 94+225 Km	Reconstruction	TCS-11
55	94+225 Km to 94+325 Km	Reconstruction	TCS-4
56	94+325 Km to 94+375 Km	Reconstruction	TCS-6
57	94+375 Km to 94+525 Km	Reconstruction	TCS-4
58	94+525 Km to 94+575 Km	Reconstruction	TCS-2
59	94+575 Km to 94+625 Km	Reconstruction	TCS-4
60	94+625 Km to 94+975 Km	Reconstruction	TCS-2
61	94+975 Km to 95+225 Km	Reconstruction	TCS-6
62	95+225 Km to 95+275 Km	Reconstruction	TCS-4
63	95+275 Km to 95+325 Km	Reconstruction	TCS-6
64	95+325 Km to 95+475 Km	Reconstruction	TCS-2
65	95+475 Km to 95+525 Km	Reconstruction	TCS-4
66	95+525 Km to 95+675 Km	Reconstruction	TCS-2
67	95+675 Km to 95+925 Km	Reconstruction	TCS-4
68	95+925 Km to 96+025 Km	Reconstruction	TCS-6
69	96+025 Km to 96+075 Km	Reconstruction	TCS-4
70	96+075 Km to 96+275 Km	Reconstruction	TCS-6
71	96+275 Km to 96+375 Km	Reconstruction	TCS-2
72	96+375 Km to 96+575 Km	Reconstruction	TCS-4
73	96+575 Km to 98+125 Km	Reconstruction	TCS-6
74	98+125 Km to 98+475 Km	Reconstruction	TCS-11
75	98+475 Km to 98+825 Km	Reconstruction	TCS-6
76	98+825 Km to 98+875 Km	Reconstruction	TCS-4
77	98+875 Km to 98+925 Km	Reconstruction	TCS-2
78	98+925 Km to 99+375 Km	Reconstruction	TCS-4
79	99+375 Km to 99+425 Km	Reconstruction	TCS-2
80	99+425 Km to 99+475 Km	Reconstruction	TCS-4
81	99+475 Km to 99+525 Km	Reconstruction	TCS-13
82	99+525 Km to 99+625 Km	Reconstruction	TCS-2
83	99+625 Km to 99+675 Km	Reconstruction	TCS-4
84	99+675 Km to 99+825 Km	Reconstruction	TCS-2
85	99+825 Km to 99+875 Km	Reconstruction	TCS-4
86	99+875 Km to 100+525 Km	Reconstruction	TCS-2
87	100+525 Km to 100+575 Km	Reconstruction	TCS-4
88	100+575 Km to 100+725 Km	Reconstruction	TCS-6
89	100+725 Km to 100+925 Km	Reconstruction	TCS-2
90	100+925 Km to 101+125 Km	Reconstruction	TCS-6
91	101+125 Km to 101+375 Km	Reconstruction	TCS-2
92	101+375 Km to 101+625 Km	Reconstruction	TCS-6
93	101+625 Km to 101+925 Km	Reconstruction	TCS-2
94	102+775 Km to 102+825 Km	Reconstruction	TCS-13
95	102+875 Km to 102+925 Km	Reconstruction	TCS-13
96	104+525 Km to 104+825 Km	Reconstruction	TCS-4
97	104+825 Km to 104+925 Km	Reconstruction	TCS-3
98	104+925 Km to 105+075 Km	Reconstruction	TCS-5
99	105+075 Km to 105+175 Km	Reconstruction	TCS-2
100	105+175 Km to 105+275 Km	Reconstruction	TCS-3
101	105+275 Km to 105+675 Km	Reconstruction	TCS-4

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		Side	Net Length (m)
From (m)	To (m)		
87350	87825	Single	472
87825	88025	Single	197
88025	88075	Single	47
88075	88125	Single	50
88125	88175	Single	50
88175	88225	Both	100
88225	88275	Single	47
88275	88475	Single	197
88475	88525	Single	50
88525	88625	Single	97
88625	88875	Single	246
88875	89025	Both	300
89025	89125	Single	100
89125	89225	Single	97
89225	89475	Both	500
89475	89525	Single	47
89525	89575	Single	50
89575	89825	Single	243
89825	89875	Single	50
89875	89975	Single	97
89975	90025	Both	95
90025	90075	Single	47
90075	90225	Single	150
90225	90325	Both	195
90325	90375	Single	50
90375	90575	Single	193
90575	90675	Both	200
90675	90725	Single	50
90725	91175	Single	445
91175	91225	Single	47
91225	91325	Both	200
91325	91425	Single	97
91425	91475	Both	100
91475	91525	Single	50
91525	91675	Both	295
91675	91825	Single	147
91825	92125	Both	592
92125	92175	Single	50
92175	92725	Both	1087
92725	92775	Single	47
92875	92975	Single	97
92975	93075	Both	200

Chainage		Side	Net Length (m)
From (m)	To (m)		
93075	93175	Single	100
93175	93225	Single	50
93225	93325	Both	195
93325	93375	Single	50
93375	93575	Both	395
93575	93775	Single	197
93775	93825	Single	47
93825	93875	Both	100
93875	93975	Single	97
93975	94125	Single	147
94125	94225	Single	100
94225	94325	Single	97
94325	94375	Both	95
94375	94525	Single	150
94525	94575	Single	50
94575	94625	Single	47
94625	94975	Single	342
94975	95225	Both	492
95225	95275	Single	44
95275	95325	Both	100
95325	95475	Single	145
95475	95525	Single	47
95525	95675	Single	150
95675	95925	Single	241
95925	96025	Both	200
96025	96075	Single	47
96075	96275	Both	395
96275	96375	Single	100
96375	96575	Single	196
96575	98125	Both	3100
98125	98475	Single	350
98475	98825	Both	700
98825	98875	Single	44
98875	98925	Single	50
98925	99375	Single	435
99375	99425	Single	47
99425	99475	Single	50
99525	99625	Single	97
99625	99675	Single	47
99675	99825	Single	150
99825	99875	Single	47
99875	100525	Single	637
100525	100575	Single	50
100575	100725	Both	300
100725	100925	Single	197
100925	101125	Both	395
101125	101375	Single	247
101375	101625	Both	500
101625	101925	Single	297

Chainage		Side	Net Length (m)
From (m)	To (m)		
101925	102025	Single	97
102025	102175	Single	147
102175	102575	Single	397
102575	102675	Both	200
102675	102775	Single	97
102825	102875	Single	50
102925	102975	Single	50
102975	103075	Single	100
103075	103475	Single	397
103475	103825	Both	700
103825	103925	Single	100
103925	104025	Both	200
104025	104425	Single	392
104425	104525	Both	200
104525	104825	Single	297
105075	105175	Single	100
105275	105675	Single	395
105675	105875	Single	197
106475	106625	Both	300
106625	106975	Single	347
106975	107025	Both	100
107025	107125	Single	100
107125	107175	Single	50
107175	107225	Single	50
107225	107275	Single	50
107275	107375	Both	200
107375	107525	Single	150
107525	107625	Single	100
107625	107675	Single	50
107675	107725	Single	50
107925	107975	Single	50
107975	109175	Single	1192
109175	109275	Both	200
109275	109325	Single	47
109325	109494	Single	169
Length of PKG-IIIB =			**18496**

Package - IIIB

Length of Side Drain	26958	m
Length of catch water Drain=	2696	m
Length of Outlet=	2696	m
Total Length of Drain=	**32350**	**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) meter length, if the carriageway width is different from 7.5 (seven point five) meters in the table below.]

Sl. No.	Bridge/Structure at km	Width of carriageway and cross-sectional features
1 Nos. bridge will be retained..		

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

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

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

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

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

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
1	87.740	2.0 X 3.0	Single Span

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
2	88.042	2.0 X 2.0	Single Span
3	88.240	2.0 X 3.0	Single Span
4	88.462	2.0 X 3.0	Single Span
5	88.763	3.0 X 4.0	Single Span
6	89.194	2.0 X 3.0	Single Span
7	89.800	3.0 X 4.0	Single Span
8	89.920	2.0 X 3.0	Single Span
9	89.980	2.0 X 2.0	Single Span
10	90.032	2.0 X 3.0	Single Span
11	90.227	2.0 X 2.0	Single Span
12	90.532	3.0 X 4.0	Single Span
13	90.793	2.0 X 2.0	Single Span
14	91.041	2.0 X 2.0	Single Span
15	91.220	2.0 X 3.0	Single Span
16	91.405	2.0 X 3.0	Single Span
17	91.670	2.0 X 3.0	Single Span
18	91.796	2.0 X 3.0	Single Span
19	92.015	3.0 X 4.0	Single Span
20	92.360	3.0 X 4.0	Single Span
21	92.540	2.0 X 3.0	Single Span
22	92.751	2.0 X 3.0	Single Span
23	92.875	2.0 X 2.0	Single Span
24	93.290	2.0 X 3.0	Single Span
25	93.425	2.0 X 2.0	Single Span
26	93.585	2.0 X 3.0	Single Span
27	93.795	2.0 X 3.0	Single Span
28	93.930	2.0 X 2.0	Single Span
29	94.032	2.0 X 3.0	Single Span
30	94.281	2.0 X 3.0	Single Span
31	94.375	2.0 X 2.0	Single Span
32	94.590	2.0 X 3.0	Single Span
33	94.688	2.0 X 2.0	Single Span
34	94.770	2.0 X 3.0	Single Span
35	94.930	2.0 X 3.0	Single Span
36	95.070	3.0 X 4.0	Single Span
37	95.235	5.0 X 3.0	Single Span
38	95.367	2.0 X 2.0	Single Span
39	95.445	2.0 X 3.0	Single Span
40	95.503	2.0 X 3.0	Single Span
41	95.770	2.0 X 2.0	Single Span
42	95.890	3.0 X 4.0	Single Span
43	96.030	2.0 X 2.0	Single Span
44	96.157	2.0 X 2.0	Single Span
45	96.431	3.0 X 4.0	Single Span
46	98.854	5.0 X 3.0	Single Span
47	99.080	4.0 X 5.0	Single Span
48	99.181	2.0 X 3.0	Single Span
49	99.285	2.0 X 3.0	Single Span
50	99.407	2.0 X 3.0	Single Span
51	99.565	2.0 X 2.0	Single Span

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
52	99.660	2.0 X 3.0	Single Span
53	99.870	2.0 X 3.0	Single Span
54	99.941	2.0 X 3.0	Single Span
55	100.104	2.0 X 3.0	Single Span
56	100.267	2.0 X 2.0	Single Span
57	100.318	2.0 X 3.0	Single Span
58	100.475	2.0 X 3.0	Single Span
59	100.855	2.0 X 2.0	Single Span
60	101.072	2.0 X 3.0	Single Span
61	101.230	2.0 X 2.0	Single Span
62	101.864	2.0 X 3.0	Single Span
63	101.935	2.0 X 2.0	Single Span
64	102.100	2.0 X 3.0	Single Span
65	102.502	2.0 X 3.0	Single Span
66	102.900	2.0 X 3.0	Single Span
67	103.450	2.0 X 3.0	Single Span
68	104.230	2.0 X 2.0	Single Span
69	104.310	2.0 X 3.0	Single Span
70	104.408	2.0 X 2.0	Single Span
71	104.570	2.0 X 3.0	Single Span
72	105.360	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	87.517	2.0 X 2.0	Single Span
2	87.927	2.0 X 2.0	Single Span
3	88.610	2.0 X 2.0	Single Span
4	89.524	2.0 X 2.0	Single Span
5	89.650	2.0 X 2.0	Single Span
6	90.450	2.0 X 2.0	Single Span
7	92.971	2.0 X 2.0	Single Span
8	95.689	2.0 X 2.0	Single Span
9	99.031	3.0 X 4.0	Single Span
10	102.713	2.0 X 3.0	Single Span
11	104.968	3.0 X 4.0	Single Span
12	105.590	2.0 X 3.0	Single Span
13	105.807	2.0 X 2.0	Single Span
14	105.978	2.0 X 2.0	Single Span

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
15	106.906	2.0 X 3.0	Single Span
16	107.842	2.0 X 2.0	Single Span
17	108.399	2.0 X 3.0	Single Span
18	108.697	2.0 X 2.0	Single Span
19	108.859	2.0 X 3.0	Single Span
20	109.325	2.0 X 3.0	Single Span

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

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

Sl. No.	Bridge location (km)	Salient details of existing bridge		Adequacy or otherwise of the existing waterway, vertical clearance etc.*	Remarks
		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 to 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:

Sl. No.	Location at km	Remarks
NIL		

(e) *Drainage system for bridge decks*

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

(f) *Structures in marine environment*

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

(iv) Rail-road bridges

(a) Design, construction and detailing of ROB/RUB shall be as specified in section 7 of the 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 to 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
NIL	

8 TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

(i) Traffic control devices and road safety works shall be provided in accordance with provision of the relevant Manual.

Sl. No	Traffic Signages, Road Marking and other appurtenances	unit	Quantity
1	Total No of Street Light=	Nos	13
2	Kilometer stones=	Nos	19
3	5th Kilometer stones=	Nos	4
4	Boundary Stones=	Nos	227
5	Delineators (100 cm long and circular shaped)+Hazard marker =	Nos	2127
6	Road Stud=	Nos	11556
7	900 mm Octagonal	Nos	5
8	600 mm circular	Nos	24
9	900 mm Triangular	Nos	297
10	800 mm x 600 mm rectangular	Nos	2
11	500x600 Rectangular (Chevron)	Nos	557
12	450 mm x 600 mm rectangular	Nos	120
13	Direction Sign < 0.9 sqm	sqm	16
14	Convex Mirror for Blind Curve	Nos	40

Sl. No	Traffic Signages, Road Marking and other appurtenances	unit	Quantity
15	Total No of Street Light=	Nos	13

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

9. Roadside Furniture

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

(ii) Overhead traffic signs: location and size

Sl. No.	Location (Km)	Size
Nil		

10 COMPULSORY AFFORESTATION

[Refer to provision of relevant Manual and specify the number of trees which are required to be planted by the Contractor as compensatory a forestation.]

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)		
91475	91525	Hill	50
92775	92875	Hill	97
94125	94225	Hill	100
98125	98475	Hill	350
104825	104925	Hill	100
104925	105075	Hill	146
105175	105275	Hill	100
105875	106175	Hill	297
106175	106475	Hill	300
107225	107275	Hill	50
107375	107525	Hill	150
107625	107675	Hill	50
107725	107875		147
107875	107925		50
Total Net Length =			**1988 m**

b) Retaining Wall

Chainage		Side	Net Length (m)
From (m)	To (m)		
86725	86875	Valley	145
86925	86975	Valley	50
87175	87225	Valley	50
87275	87325	Valley	50
87525	87825	Valley	297
88025	88075	Valley	47

Chainage		Side	Net Length (m)
From (m)	To (m)		
88125	88175	Valley	50
88275	88475	Valley	197
88525	88625	Valley	97
89025	89125	Valley	100
89525	89575	Valley	50
89825	89875	Valley	50
90025	90075	Valley	47
90375	90575	Valley	193
90675	90725	Valley	50
91175	91225	Valley	47
91325	91425	Valley	97
92725	92775	Valley	47
93175	93225	Valley	50
93775	93825	Valley	47
93875	93975	Valley	97
94225	94325	Valley	97
94375	94525	Valley	150
94575	94625	Valley	47
95225	95275	Valley	44
95475	95525	Valley	47
95675	95925	Valley	241
96025	96075	Valley	47
96375	96575	Valley	196
98825	98875	Valley	44
98925	98975	Valley	50
98975	99025	Valley	50
99025	99075	Valley	46
99075	99125	Valley	45
99125	99175	Valley	50
99175	99225	Valley	47
99225	99375	Valley	147
99425	99475	Valley	50
99475	99525	Valley	50
99625	99675	Valley	47
99825	99875	Valley	47
100525	100575	Valley	50
101925	102025	Valley	97
102175	102575	Valley	397
102675	102775	Valley	97
102775	102825	Valley	50
102875	102925	Valley	47
102975	103075	Valley	100
104525	104825	Valley	297
104925	105075	Valley	146
105275	105675	Valley	395
106625	106975	Valley	347
107125	107175	Valley	50
107975	109175	Valley	1192
109325	109494	Valley	169

Chainage		Side	Net Length (m)
From (m)	To (m)		
Total Net Length =			6841 m

a) **Area of Hydro seeding = 9200 sq m**

b) **Area of Turfing = 34196 sq m**

12 Special Requirement for Hill Roads

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

13 CHANGE OF SCOPE

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

(Schedule-B1)

1. The shifting 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) Road side 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) Road side 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	96+780 (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)

f) Rest Areas

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

g) Others to be specified

Street Lighting:
Total 13 Nos. Street lighting shall be provided in junction, passenger shelters & bridge locations.

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

Schedule - D

(See Clause 2.1)

Specifications and Standards

1. Construction

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

2. Design Standards

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

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

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

Annex – I
(Schedule-D)
Specifications and Standards for Construction

1. Specifications and Standards

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

2. Deviations from the Specifications and Standards

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

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

<table>
<tr><th>Item</th><th>Manual Clause Reference</th><th colspan="5">Provision as per Manual</th><th colspan="5">Modified Provision</th></tr>
<tr><td rowspan="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 rowspan="2">Open Country with Isolated Built-up Area</td><td>Hill Side</td><td>1.5</td><td>-</td><td>1.5</td><td rowspan="2">Open Country with Isolated Built-up Area</td><td>Hill Side</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Valley Side</td><td>1.5</td><td>1</td><td>2.5</td><td>Valley Side</td><td>-</td><td>Up to 1.0 m</td><td>1</td></tr>
<tr><td rowspan="2">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 rowspan="2">Built-up Area and Approaches to grade separated structures/ bridges</td><td>Hill Side</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Valley Side</td><td>0.25 m + 1.5 m (Raised)</td><td>-</td><td>1.75</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
Minimum : 40 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.
(Refer Horizontal Alignment Drawing and Table 1.1 below)</td></tr>
<tr><td>Extra Widening</td><td>2.7</td><td colspan="5">Extra Widening has been proposed as per IRC: SP: 73-2015
Radius | Extra Widening
75-100 m | 0.9 m
101-300 m | 0.6 m</td><td colspan="5">Extra Widening has been proposed as per IRC: SP: 48-1998 (Table 6.9) of Hill Road Manual.
Radius | Extra Widening
21-40 m | 1.5 m
41-60 m | 1.2 m</td></tr>
</table>

Item	Manual Clause Reference	Provision as per Manual	Modified Provision		
			61-100 m	0.9 m	
			75-100 m	0.9 m	
			101-300 m	0.6 m	
			Above 300 m	NIL	
Radii Of Horizontal Curve	2.9.4	**Mountainous Terrain:** Desirable Minimum Radius: 150 m Absolute Minimum Radius: 75 m	Radius below 75 m has been provided in the location listed in table 1.		

Table 1.1: Locations where Design Speed is less than40 kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
1	89+176 to 89+190	Sharp Bend	Design Speed = 30 Kmph
2	89+251 to 89+280	Sharp Bend	Design Speed = 30 Kmph
3	89+597 to 89+689	Sharp Bend	Design Speed = 30 Kmph
4	90+070 to 90+084	Sharp Bend	Design Speed = 30 Kmph
5	90+143 to 90+158	Sharp Bend	Design Speed = 25 Kmph
6	90+228 to 90+234	Sharp Bend	Design Speed = 30 Kmph
7	90+333 to 90+349	Sharp Bend	Design Speed = 30 Kmph
8	92+872 to 92+902	Sharp Bend	Design Speed = 30 Kmph
9	92+938 to 93+015	Sharp Bend	Design Speed = 30 Kmph
10	93+067 to 93+100	Sharp Bend	Design Speed = 20 Kmph
11	93+399 to 93+496	Sharp Bend	Design Speed = 30 Kmph
12	93+547 to 93+556	Sharp Bend	Design Speed = 30 Kmph
13	93+600 to 93+631	Sharp Bend	Design Speed = 30 Kmph
14	93+703 to 93+720	Sharp Bend	Design Speed = 30 Kmph
15	93+832 to 93+837	Sharp Bend	Design Speed = 30 Kmph
16	93+904 to 93+913	Sharp Bend	Design Speed = 30 Kmph
17	93+972 to 93+974	Sharp Bend	Design Speed = 30 Kmph
18	94+024 to 94+091	Sharp Bend	Design Speed = 30 Kmph
19	95+823 to 95+836	Sharp Bend	Design Speed = 30 Kmph
20	95+889 to 95+904	Sharp Bend	Design Speed = 30 Kmph
21	95+970 to 95+981	Sharp Bend	Design Speed = 30 Kmph
22	96+035 to 96+040	Sharp Bend	Design Speed = 30 Kmph
23	96+082 to 96+094	Sharp Bend	Design Speed = 20 Kmph
24	96+146 to 96+173	Sharp Bend	Design Speed = 20 Kmph
25	96+249 to 96+265	Sharp Bend	Design Speed = 20 Kmph
26	98+042 to 98+044	Sharp Bend	Design Speed = 30 Kmph
27	98+122 to 98+129	Sharp Bend	Design Speed = 30 Kmph
28	100+939 to 100+964	Sharp Bend	Design Speed = 20 Kmph
29	101+045 to 101+063	Sharp Bend	Design Speed = 30 Kmph
30	101+137 to 101+150	Sharp Bend	Design Speed = 30 Kmph
31	101+303 to 101+343	Sharp Bend	Design Speed = 30 Kmph
32	101+399 to 101+422	Sharp Bend	Design Speed = 30 Kmph
33	101+498 to 101+532	Sharp Bend	Design Speed = 20 Kmph
34	101+617 to 101+631	Sharp Bend	Design Speed = 20 Kmph
35	101+681 to 101+692	Sharp Bend	Design Speed = 30 Kmph
36	101+772 to 101+792	Sharp Bend	Design Speed = 20 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
37	101+878 to 101+917	Sharp Bend	Design Speed = 20 Kmph
38	101+975 to 101+987	Sharp Bend	Design Speed = 20 Kmph
39	102+030 to 102+044	Sharp Bend	Design Speed = 20 Kmph
40	102+096 to 102+104	Sharp Bend	Design Speed = 20 Kmph
41	102+137 to 102+138	Sharp Bend	Design Speed = 20 Kmph
42	102+181 to 102+196	Sharp Bend	Design Speed = 20 Kmph
43	102+221 to 102+228	Sharp Bend	Design Speed = 30 Kmph
44	102+290 to 102+296	Sharp Bend	Design Speed = 30 Kmph
45	102+357 to 102+386	Sharp Bend	Design Speed = 30 Kmph
46	102+448 to 102+456	Sharp Bend	Design Speed = 30 Kmph
47	102+509 to 102+512	Sharp Bend	Design Speed = 20 Kmph
48	102+583 to 102+592	Sharp Bend	Design Speed = 20 Kmph
49	102+638 to 102+647	Sharp Bend	Design Speed = 20 Kmph
50	102+679 to 102+700	Sharp Bend	Design Speed = 20 Kmph
51	102+771 to 102+779	Sharp Bend	Design Speed = 20 Kmph
52	102+855 to 102+880	Sharp Bend	Design Speed = 20 Kmph
53	102+955 to 102+961	Sharp Bend	Design Speed = 20 Kmph
54	103+060 to 103+062	Sharp Bend	Design Speed = 20 Kmph
55	103+121 to 103+127	Sharp Bend	Design Speed = 30 Kmph
56	103+250 to 103+252	Sharp Bend	Design Speed = 30 Kmph
57	103+288 to 103+297	Sharp Bend	Design Speed = 30 Kmph
58	103+384 to 103+391	Sharp Bend	Design Speed = 30 Kmph
59	103+448 to 103+454	Sharp Bend	Design Speed = 30 Kmph
60	103+516 to 103+520	Sharp Bend	Design Speed = 20 Kmph
61	103+589 to 103+626	Sharp Bend	Design Speed = 20 Kmph
62	103+853 to 103+859	Sharp Bend	Design Speed = 30 Kmph
63	103+933 to 103+960	Sharp Bend	Design Speed = 20 Kmph
64	103+992 to 104+033	Sharp Bend	Design Speed = 20 Kmph
65	105+763 to 105+767	Sharp Bend	Design Speed = 30 Kmph
66	105+812 to 105+825	Sharp Bend	Design Speed = 30 Kmph
67	105+856 to 105+881	Sharp Bend	Design Speed = 30 Kmph
68	105+912 to 105+915	Sharp Bend	Design Speed = 20 Kmph
69	105+950 to 105+951	Sharp Bend	Design Speed = 20 Kmph
70	105+999 to 106+004	Sharp Bend	Design Speed = 30 Kmph
71	106+088 to 106+090	Sharp Bend	Design Speed = 20 Kmph
72	106+124 to 106+128	Sharp Bend	Design Speed = 20 Kmph
73	106+162 to 106+164	Sharp Bend	Design Speed = 20 Kmph
74	106+268 to 106+279	Sharp Bend	Design Speed = 30 Kmph
75	106+476 to 106+484	Sharp Bend	Design Speed = 30 Kmph
76	106+526 to 106+526	Sharp Bend	Design Speed = 25 Kmph
77	106+558 to 106+558	Sharp Bend	Design Speed = 20 Kmph
78	106+718 to 106+719	Sharp Bend	Design Speed = 30 Kmph
79	106+770 to 106+778	Sharp Bend	Design Speed = 30 Kmph
80	106+842 to 106+843	Sharp Bend	Design Speed = 25 Kmph
81	106+869 to 106+892	Sharp Bend	Design Speed = 30 Kmph
82	106+925 to 106+927	Sharp Bend	Design Speed = 20 Kmph
83	106+966 to 106+967	Sharp Bend	Design Speed = 20 Kmph
84	106+998 to 107+001	Sharp Bend	Design Speed = 20 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
85	107+040 to 107+042	Sharp Bend	Design Speed = 20 Kmph
86	107+064 to 107+076	Sharp Bend	Design Speed = 30 Kmph
87	107+086 to 107+116	Sharp Bend	Design Speed = 30 Kmph
88	107+414 to 107+435	Sharp Bend	Design Speed = 30 Kmph
89	107+499 to 107+502	Sharp Bend	Design Speed = 25 Kmph
90	107+537 to 107+555	Sharp Bend	Design Speed = 30 Kmph
91	107+577 to 107+583	Sharp Bend	Design Speed = 30 Kmph
92	107+670 to 107+680	Sharp Bend	Design Speed = 30 Kmph
93	107+734 to 107+737	Sharp Bend	Design Speed = 25 Kmph
94	107+757 to 107+774	Sharp Bend	Design Speed = 30 Kmph
95	107+832 to 107+843	Sharp Bend	Design Speed = 20 Kmph
96	107+877 to 107+886	Sharp Bend	Design Speed = 30 Kmph
97	107+903 to 107+931	Sharp Bend	Design Speed = 30 Kmph
98	107+980 to 107+981	Sharp Bend	Design Speed = 30 Kmph
99	108+058 to 108+063	Sharp Bend	Design Speed = 30 Kmph
100	108+145 to 108+150	Sharp Bend	Design Speed = 25 Kmph
101	108+184 to 108+190	Sharp Bend	Design Speed = 25 Kmph
102	108+234 to 108+250	Sharp Bend	Design Speed = 30 Kmph
103	108+383 to 108+390	Sharp Bend	Design Speed = 30 Kmph
104	108+437 to 108+444	Sharp Bend	Design Speed = 30 Kmph
105	108+499 to 108+509	Sharp Bend	Design Speed = 20 Kmph
106	108+552 to 108+558	Sharp Bend	Design Speed = 20 Kmph
107	108+592 to 108+607	Sharp Bend	Design Speed = 30 Kmph
108	108+638 to 108+646	Sharp Bend	Design Speed = 30 Kmph
109	108+704 to 108+712	Sharp Bend	Design Speed = 30 Kmph
110	108+798 to 108+805	Sharp Bend	Design Speed = 30 Kmph
111	109+010 to 109+040	Sharp Bend	Design Speed = 30 Kmph
112	109+131 to 109+142	Sharp Bend	Design Speed = 30 Kmph
113	109+228 to 109+234	Sharp Bend	Design Speed = 20 Kmph
114	109+271 to 109+303	Sharp Bend	Design Speed = 20 Kmph
115	109+382 to 109+409	Sharp Bend	Design Speed = 20 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	781	87.466	87.479	60
2	783	87.855	87.873	60
3	788	88.648	88.665	50
4	790	89.024	89.037	60
5	792	89.176	89.190	60
6	793	89.251	89.280	40
7	794	89.384	89.388	60
8	798	90.070	90.084	40
9	799	90.143	90.158	30
10	800	90.228	90.234	30
11	801	90.333	90.349	30
12	806	91.419	91.431	50
13	807	91.522	91.543	60

Sl. No.	HIP NO.	CHAINAGE (KM)		RADIUS
		From	To	
14	815	92.710	92.733	50
15	817	92.872	92.902	35
16	819	93.067	93.100	20
17	822	93.399	93.496	60
18	823	93.547	93.556	50
19	825	93.703	93.720	50
20	826	93.832	93.837	40
21	827	93.904	93.913	40
22	828	93.972	93.974	30
23	829	94.024	94.091	55
24	831	94.282	94.303	60
25	838	95.360	95.380	50
26	839	95.482	95.490	50
27	841	95.823	95.836	60
28	842	95.889	95.904	40
29	845	96.082	96.094	20
30	846	96.146	96.173	20
31	847	96.249	96.265	20
32	848	96.361	96.435	60
33	851	96.707	96.721	50
34	857	97.279	97.300	50
35	859	97.459	97.494	50
36	864	98.042	98.044	30
37	865	98.122	98.129	40
38	867	98.342	98.376	50
39	868	98.504	98.507	50
40	877	99.717	99.754	50
41	885	100.939	100.964	15
42	886	101.045	101.063	50
43	889	101.303	101.343	50
44	890	101.399	101.422	50
45	891	101.498	101.532	20
46	892	101.617	101.631	20
47	894	101.772	101.792	40
48	895	101.878	101.917	40
49	896	101.975	101.987	30
50	897	102.030	102.044	30
51	898	102.096	102.104	15
52	899	102.137	102.138	25
53	901	102.221	102.228	50
54	903	102.357	102.386	40
55	905	102.509	102.512	30
56	906	102.583	102.592	30
57	907	102.638	102.647	30
58	908	102.679	102.700	15

(iii) [Note1: 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-fulfillment of the Maintenance obligations by the Contractor. Upon occurrence of any breach hereunder, the Authority shall be entitled to effect reduction in monthly lump sum payment as set forth in Clause 14.6 of this Agreement, without prejudice to the rights of the Authority under this Agreement, including Termination thereof.

(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 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.

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, approaches of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm indepth	Daily	Length Measurement 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 Specification 3004.2
	Cracking	Nil	< 5 % subject to limit of 0.5 sqm for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3
	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
	Bleeding	Nil	< 0.1 % of area	Daily	Scale, Tape, odometer etc.		3-7 days	MORT&H Specification 3004.4
	Raveling / Stripping	Nil	< 0.1 % of area	Daily			7-15 days	IRC:82- 2015 read with IRC SP 81
	Edge Deformation/ Breaking	Nil	< 1 m for any 100 m section and width < 0.1 m at any location, restricted to 30 cm from the edge	Daily	Scale, Tape, odometer etc.			IRC:82- 2015
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM	Class I Profilometer : ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of	180 days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-			180 days	BS: 7941-1: 2006

				Annually	(Sideway-force Coefficient Routine Investigation Machine or equivalent)	Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment		
	Pavement Condition Index	3	2.1	Bi-Annually			180 days	IRC:82- 2015
	Other Pavement Distresses			Bi-Annually			2-7 days	IRC:82- 2015
	Deflection/ Remaining Life			Annually	Falling Weight Deflect meter	IRC 115: 2014	180 days	IRC:115-2014
Rigid Pavement (Pavement of MCW, Service Road, Grade Structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	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 Coefficient Routine Investigation Machine or equivalent)	RC:SP:83-2008	180 days	IRC:SP:83-2008
		Minimum SN	**Traffic Speed (Km/h)**					
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					

Embankment/ Slope	Edge drop at shoulders	Nil	40 mm	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC	7-15 days	MORT&H Specification 408.4
	Slope of camber/cross fall	Nil	<2% variation in prescribed slope of camber /cross fall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15 % variation in prescribe side slope	Daily			7-15 days	MORT&H Specification 408.4
	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 Short Term	For the case d > D/2 Long Term
CRACKING						
1.	Single Discrete Cracks Not intersecting with any joint	w = width of crack L = length of crack d = depth of crack D = depth of slab	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 > lm.
			3	w = 0.5 - 1.5 mm, discernible from fast-moving car	Seal without delay	Within 7days
			4	w = 1.5 - 3.0 mm	Seal, and stitch if L > l m.	Staple or Dowel Bar Retrofit, FDR for affected portion.
			5	w > 3 mm.	Within 7 days	Within 15days
2.	**Single Transverse (or Diagonal) Crack intersecting with one or more joints**	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Route and seal with epoxy.	Staple or Dowel Bar Retrofit.
			2	w = 0.2 - 0.5 mm, discernible from slow vehicle	Within 7 days	Within 15 days
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1 m. Within 7 days	
			4	w = 3.0 - 6.0 mm	Dowel Bar Retrofit.	Full Depth Repair Dismantle and

			5	w > 6 mm, usually associated with spelling, and/or slab rocking under traffic	Within 15 days Not Applicable, as it may be full depth	reconstruct affected. Portion with norms and specifications - See Para 5.5 & 9.2 Within 15days
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	0	Nil, not discernible	No Action	
			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
			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	Partial Depth Repair with stapling. Within 15days
			4	w = 6.0 - 12.0 mm, usually associated with spalling		
			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 - See Para 5.6.4 Within 15days

4	Multiple Cracks intersecting with one or more joints	w = width of crack	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > l m.	
			2	w = 0.2 - 0.5 mm. discernible from slow vehicle	Within 15 days	
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, Reinstate Sub-base, Reconstruct whole slab as per specifications within 30 days
			4	w = 3.0 - 6.0 mm panel broken into 2 or 3 pieces		
			5	w > 6 mm and/or panel broken into more than 4 pieces		
5	**Corner Break**	w = width of crack L = length of crack	0	Nil, not discernible	No Action	
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to	Seal with epoxy seal with epoxy
			2	w < 1.5 mm; L < 0.6 m, only one corner broken	secure broken parts Within 7 days	Within 7 days
			3	w < 1.5 mm; L < 0.6 m, two corners broken		
			4	w > 1.5 mm; L > 0.6 m or three corners broken	Partial Depth (Refer Figure 8.3 of IRC:SP: 83-2008)	Full depth repair
			5	three or four corners broken	Within 15 days	Reinstate sub-base, and reconstruct the

						slab as per norms and specifications within 30days
6	Punchout (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)	w = width of crack L = length (m/m2)	0	Nil, not discernible	**Not Applicable, as it may be full depth**	No Action
			1	w < 0.5 mm; L < 3 m/m2		Seal with low viscosity epoxy to secure broken parts. Within 15 days
			2	either w > 0.5 mm or L < 3 m/m2		
			3	w > 1.5 mm and L < 3 m/m2		
			4	w > 3 mm, L < 3 m/m2 and deformation		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		
7	Raveling or Honeycomb type surface	r = area damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	No Action	
			1	r < 2 %	Local repair of areas Damaged	
			2	r = 2 - 10 %	and liable to be damaged. Within 15 days	
			3	r = 10-25%	Bonded Inlay, 2 or 3 slabs if	

			4	r = 25 - 50 %	Affecting Within 30 days	
			5	r > 50% and h > 25 mm	Reconstruct slabs, 4 or more slabs if affecting. Within 30 days	
8	Scaling	r = damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	Short Term No Action	Long Term
			1	r < 2 %	Local repair of areas Damaged and liable to be damaged. Within 7days Bonded Inlay within 15 Days	
			2	r = 2 - 10 %		
			3	r = 10 - 20%		
			4	r = 10 - 30%	Reconstruct slab within 30 days	
			5	r>30 % and h> 25mm		
9	Polished Surface/Glazing	t = texture depth, sand patch test	0		No action	
			1	t > 1 mm		

			2	t = 1 – 0.6 mm		Not Applicable
			3	t = 0.6 – 0.3 mm	Monitor rate of deterioration	
			4	t = 0.3 – 0.1 mm	Diamond Grinding if Affecting	
			5	t < 0.1 mm	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. Within 15 days	
			2	d = 50 - 100 mm; h > 50 mm; n < 1 per 5 m^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	i.e.10 mm more than the depth of the hole.	

				mm; n < 1 per 5 m^2	Within 30 days	
			5	d > 300 mm; h > 100 mm: n > 1 per 5 m^2	Full depth repair. Within 30 days	
11	Joint Seal Defects	loss or damage L = Length as % total joint length	0	Difficult to discern.	No action.	Not Applicable
			1	Discernible, L< 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	
			2	Notable. L > 25% insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in Selected locations. Within 7 days	
			4	Severe; w > 3 mm negligible protection against ingress of water and trapping incompressible material.	Clean, widen and reseal the joint. Within 7 days	
12	Spalling of Joints	w = width on either side of the joint L = length of spalled portion (as % joint	0	Nil, not discernible	No action.	
			1	w < 10 mm	Apply low viscosity epoxy resin/ mortar	

		length)	2 3 4 5	w = 10 - 20 mm, L < 25% w = 20 - 40 mm, L > 25% w = 40 - 80 mm, L > 25% w > 80 mm, and L > 25%	in cracked portion. Within 7 days Partial Depth Repair. Within 15 days 30 - 50 mm deep, h = w + 20% of w, within 30 days 50 - 100 mm deep repair. H = w + 20% of w. Within 30 days	Not Applicable
13	Faulting (or Stepping) in Cracks or Joints	f = difference of level	0 1	not discernible, < 1 mm f < 3 mm	No action.	No action.
			2 3	f = 3 - 6 mm f = 6 - 12 mm	Determine cause and observe, take action for diamond grinding Diamond Grinding	Replace the slab as appropriate. Within 30days

			4 5	f= 12 - 18 mm f> 18 mm	Raise sunken slab. Strengthen sub-grade and sub-base by grouting and raising sunken slab	Replace the slab as appropriate. Within 30days
14	Blowup or Buckling	h = vertical displacement from normal profile	0	Nil, not discernible	No Action	
			1	h < 6 mm		
			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	
15	Depression	h = negative vertical displacement from normal profile L =length	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 within 7 days	Not Applicable
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Strengthen subgrade. Reinstate pavement at normal level if L < 20 m.	
			5	h > 100 mm	Within 30 days	
16	Heave	h = positive vertical displacement from normal profile. L = length	0	Not discernible. h < 5 mm	No action.	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 pavement at normal level if length < 20 m.	
			5	h > 100 mm		

					Within 30 days	
17	Bump	h = vertical displacement from normal profile	0 1	h < 4 mm h = 4 - 7 mm	No action 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
			4	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	**Lane to Shoulder Dropoff**	f = difference of level	0	Nil, not discernible < 3mm	**Short Term** No Action	**Long Term**
			1 2	f = 3 - 10 mm f = 10 - 25 mm	Spot repair of shoulder within 7 days	

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

Asset Type	Performance Parameter	Level of Service (LOS)			Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Highway	Availability of Safe Sight Distance	As per IRC SP :84-2014, a minimum of safe stopping sight distance shall be available throughout.			Monthly	Manual Measurements with O dometer along with video/ image backup	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.		IRC:SP 84-2014
		Design Speed, kmph	**Desirable Minimum Sight Distance (m)**	**Safe Stopping Sight Distance (m)**					
		100	360	180					
		80	260	130					
Pavement Marking	Wear	<70% of marking remaining			Bi-Annually	**Visual Assessment as per Annexure-F**	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect -	IRC:35-2015

<table>
<tr><td></td><td></td><td></td><td></td><td>of IRC:35-2015</td><td></td><td>within 2 months</td><td></td></tr>
<tr><td></td><td>Day time Visibility</td><td>During expected life Service Time
Cement Road - 130mcd/m2/lux
Bituminous Road - 100mcd/m2/lux</td><td>Monthly</td><td>As per Annexure-D of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
<tr><td></td><td rowspan="6">Night Time Visibility</td><td><u>Initial and Minimum Performance for Dry Retro reflectivity during night time:</u></td><td rowspan="6">Bi-Annually</td><td rowspan="6">As per Annexure-E of IRC:35-2015</td><td rowspan="6">Re - painting</td><td rowspan="6">Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months</td><td rowspan="6">IRC:35-2015</td></tr>
<tr><td></td><td>Design Speed</td><td>(RL) Retro Reflectivity (mcd/m2/lux)</td></tr>
<tr><td></td><td>Up to 65</td><td>200</td><td>80</td></tr>
<tr><td></td><td>65-100</td><td>250</td><td>120</td></tr>
<tr><td></td><td>Above 100</td><td>350</td><td>150</td></tr>
<tr><td></td><td>Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):</td></tr>
<tr><td>Road Signs</td><td>Shape and Position</td><td>Shape and Position as per IRC:67-2012.
Signboard should be clearly visible for
the design speed of the section.</td><td>Daily</td><td>Visual with video/image backup</td><td>Improvement of shape, in case if shape is damaged.

Relocation as Per requirement</td><td>48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of</td><td>IRC:67-2012</td></tr>
</table>

						Gantry/Cantilever Sign boards	
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of Each signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.	Change of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/ Cantilever Sign boards	IRC:67-2012
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	IRC 86:1983
	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	IRC 35:2015
Other Road Furniture	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
	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	Rectification	Within 7 days	IRC:SP:84-2014,

				backup			IRC:119- 2015
	End Treatment of Traffic Safety Barriers	Functionality: Functioning of End Treatment as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014, 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	Rectification	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
Highway Lighting System	Highway Lights	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
		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

Trees and Plantation including median plantation	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
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every 4 hours	
	Defects in electrical, water and sanitary installations	-	Daily	-	Rectification	24 hours	
Other Project Facilities and Approach roads	Damage or deterioration in Approach Roads, pedestrian facilities, truck lay-bys, bus-bays, busshelters, 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 culverts	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
	Structurally sound	Spalling of concrete not more than 0.25 sqm	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
		Delamination of concrete not more than 0.25 sq.m.					
		Cracks wider than 0.3 mm not					

		more than 1m aggregatelength					
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concreteapron) 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
Bridge -Super Structure	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.
	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	**3** days	IRC: 5-1998, IRC SP: 84-2014 and IRC SP: 40-1993.

	Rusted reinforcement	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 with anti-corrosive coating before carrying out the repairs to affected concrete portion with epoxy mortar / concrete.	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
	Spalling of concrete	Not more than 0.50 sq.m					
	Delamination	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 drainage spouts	1 months	MORTH specifications 2600 & 2700
	Deflection due to permanent loads and live loads	Within design limits.	Once in every 10 years for spans more than 40 m	Load test method	Carry out major rehabilitation works on bridge to retain original design loads	6 months	IRC SP: 51-1999.

					capacity		
	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 super structure	4 months	AASHTO LRFD specifications
	Leakage in Expansion joints	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 copper strip joint	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Replace of seal in expansion joint	15 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Debris and dust in strip seal expansion joint	No dust or debris in expansion joint gap.	Monthly	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Cleaning of expansion joint gaps thoroughly	3 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes	3 days	MORTH specification 2700.

		silt, debris, clogging of drainage spout collection chamber.		Mobile Bridge Inspection Unit	with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainage spout if any leakages observed		
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	Delaminating of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per	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	3 months	MORTH specification 2810 and IRC SP: 40-199.

		side, no rupture of reinforcement or rubber			load transfer on to bearings.		
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 oubt, use Underwater camera for inspection of deep wells in major Rivers.	suitable protection works around pier/abutment	1 months	IRC SP: 40-1993, IRC 83-2014, MORTH specification 2500
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sq.m, damage to solid apron (concrete apron) not more than 1 sq.m	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.
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
(vi)	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		
(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
(vi)	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	24 (twenty four) hours

	installations	
(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		
(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) of bridges		
(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)
(vi)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g) Hill Roads		
(i)	Damage to retaining wall/breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours
(iii)	Snow requiring clearance	24 (twenty four) hours
[Note: Where necessary, the Authority may modify the time limit for repair/rectification, or add to the nature of Defect or deficiency before issuing the bidding document, with the approval of the competent authority.]		

SCHEDULE - F
(See Clause 3.1.7(a))

APPLICABLE PERMITS

1 Applicable Permits

(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) License for use of explosives;

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

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

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

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

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

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

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

Schedule – G

(See Clauses 7.1 and 19.2)

Annex-I

(See Clause 7.1)

Form of Bank Guarantee
[Performance Security/Additional Performance Security]

To,

Managing Director, NHIDCL,

National Highways & Infrastructure Development Corporation Ltd.

(A) _____[name and address of contractor] (hereinafter called the "**Contractor**") and [name and address of the authority], (hereinafter called the **"Authority"**) have entered into an agreement (hereinafter called the "**Agreement**") for the "**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

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

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.

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:

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & 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	Canara Bank (erstwhile Syndicate Bank) transport Bhawan, 1st Parliament Street, New Delhi-110001

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

For and on behalf of the Bank by:
(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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

Annex – II

(Schedule - G)

(See Clause 19.2)

Form for Guarantee for Advance Payment

To,

Managing Director, NHIDCL,

National Highways & Infrastructure Development Corporation Ltd.

WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the authority], (hereinafter called the "**Authority**") for the "**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:

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

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.

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

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

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

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

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

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

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

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

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

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

12. This guarantee shall also be operatable at our…….. Branch at New Delhi (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:

S.No.	Particulars	Details

[$] 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).

1	Name of Beneficiary	National Highways & 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	Canara Bank (erstwhile 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	76.97 %	**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 and repair of culverts	[Nil]
		B.1-Reconstruction/New 2-Lane Realignment /Bypass(Flexible Pavement)	
		(1) Earthwork up to top of the sub- grade	48.32%
		(2) Sub-base Course	14.46%
		(3) Non bituminous Base course	10.25%
		(4) Bituminous Basecourse	10%
		(5) Wearing Coat	5.75%
		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) Dry Lean 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 onexisting road, realignments, bypasses Culverts (length <6m)	11.22%
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 mand<60m)	

Item	Weightage in % of CP	Stage for Payment	Percentage
		(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.	[Nil]
		(3)Approaches:On completionof approaches includingRetainingwalls, stonepitching, protection works complete in all and fit for use	[Nil]
		(4) GuideBundsand River Training Works:On completion of GuideBunds andriver 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**	
		(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]

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

Item	Weightage in % of CP	Stage for Payment	Percentage
		walls/Reinforced Earth wall, stone pitching and protection works)	
		C.2- New Elevated Section/Flyovers/GradeSeparators	
		(1) Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3)Super-Structure(Including bearings)	[Nil]
		(4)WearingCoatincludingexpansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/Return walls	[Nil]
		(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]
Other Works	23.03 %	(i) Toll Plaza	[Nil]
		(ii) Road side drains	32.67%
		(iii) Road signs,markings,km stones,safety devices etc	3.5%
		(iv) Project facilities	
		a) Bus Bays	0.59%
		b) Truck Lay-byes	[Nil]
		c) Passenger Shelter	0.09%
		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	12.98%
		(ix) Toe Wall	[Nil]
		(x) Retaining Wall	47%
		(xi) Boundary wall	[Nil]
		(xii) Site Clearance & Dismantling	2.06%
		(xiii) Protection Works	1.1%
		(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 pro rata basis on completion of a stage in full length or 0.5 (one and half) km length, whichever is less.
(1)Earthwork up to top of the sub-grade	48.32%	
(3) Sub-base Course	14.46%	
(4) Non bituminous Base course	10.25%	
(5) Bituminous Base course	10%	
(6) Wearing Coat	5.75%	
(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)	11.22%	

@ 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	[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.

Stage of Payment	Weightage	Payment Procedure
and fit for use		
(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
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

Stage of Payment	Weightage	Payment Procedure
		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 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-	[Nil]	Wearing Coat: Payment shall be made on completion

Stage of Payment	Weightage	Payment Procedure
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		(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, 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	[Nil]	Payment shall be made on pro-rata basis on completion of a

Stage of Payment	Weightage	Payment Procedure
walls/Reinforced Earth wall, stone pitching and protection works)		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% 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

Stage of Payment	Weightage	Payment Procedure
		on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub- structure of structure.
(3)Super-Structure(Including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super- structure including bearings of at least one span in all respects as specified. In case of structures where pre-cast girders have been proposed by the Contractor,50% of the stage payment shall be due and payable on casting of girders foreach span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)Wearing Coat including expansion joints	[Nil]	Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[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	32.67%	Unit of measurement is linear length. Payment shall be made on pro-rata basis on completion of a stage in a length of not less than 5% (five percent) of the total length.
(3) Road signs, markings, km stones, safety devices etc.	3.5%	
(4) Project Facilities		Payment shall be made on pro-rata basis for completed facilities.
a) Bus Bays	0.59%	
b) Truck Lay-byes	[Nil]	
c) Passenger Shelter	0.09%	

Stage of Payment	Weightage	Payment Procedure
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 5% (five percent) of the total length.
(a) Retaining Wall	47%	
(b) Breast Wall	12.98%	
(c) Toe Wall	[Nil]	
(9) Site Clearance & Dismantling	2.06%	Unit of measurement is linear length. Payment shall be made on pro-rata basis on completion of a stage in a length of not less than 5% (five percent) of the total length.
(10) Other Works(Hydro seeding, Turfing)	1.1%	Unit of measurement is linear length. Payment shall be made on pro-rata basis on completion of a stage in a length of not less than 5% (five percent) of the total length.

2. Procedure for payment for Maintenance

2.1 The cost for maintenance shall be as stated in Clause 14.1.1.

2.2 Payment for Maintenance shall be made in quarterly instalments in accordance with the provisions of Clause 19.7.

SCHEDULE - I
(See Clause 10.2 (iv))

DRAWINGS

1 Drawings

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

2 Additional Drawings

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

Annex – I

(Schedule - I)

List of Drawings

1. A minimum list of the drawings of the various components/elements of the project highway and project facility required to be submitted by the Contractor is given below:

(a) Drawing of horizontal alignment, vertical profile and detailed cross sections
(b) Drawings of cross drainage works i.e. Bridges/Culverts/Flyovers and Other Structures.
(c) Drawings for River Training works
(d) Drawings of interchanges, major intersections and underpasses
(e) Drawing of control centre
(f) Drawings of road furniture items including traffic signage, marking, safety barriers, etc.
(g) Drawings of traffic diversions plans and traffic control measures
(h) Drawings of road drainage measures
(i) Drawings of typical details slope protection measures
(j) Drawings of landscaping and horticulture
(k) Drawings of pedestrian crossing
(k) Drawings of street lighting
(l) Any other drawings as per instruction of Authority Engineer
(m) General Arrangement showing Base Camp and Administrative Block

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 256th day from then 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 438th 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 621th 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 730th 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 kilometer.

(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.

S.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 **"Name of work"** (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…..

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

- 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 crossfall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%
S. No.	**Item/Defect/Deficiency**	**Percentage**
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
(d)	**Roadside Drains**	
(i)	Cleaning and repair of drains	5%
(e)	**Road Furniture**	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th km stones	5%
(f)	**Miscellaneous Items**	
(i)	Removal of dead animals, broken down/accidented vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	**Defects in Other Project Facilities**	5%

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

$$R=P/100 \times (M_1 \text{ or } M_2) \times L1/L$$

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

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

L1 = Non-complying length

L = Total length of the road,

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

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

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

SCHEDULE - N
(See Clause 18.1.1)

SELECTION OF AUTHORITY'S ENGINEER

1 Selection of Authority's Engineer

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

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

2 Terms of Reference

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

3 Appointment of Government entity as Authority's Engineer

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

Annex – I
(Schedule - N)

TERMS OF REFERENCE FOR AUTHORITY'S ENGINEER

1 Scope

(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 NHIDCL(the "Authority") and ..... (the "Contractor")# **"Name of Work** 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) any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding Rs. 5,000,000 (Rs. fifty lakh).

(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 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 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 4.9, the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any modification/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

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

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

(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'squality control records and documents before the Completion Certificate is issued pursuant to Clause 12.4.

(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 or Provisional Certificate, as the case may be. For carrying out its functions under this Paragraph 4.18 and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

5. Maintenance Period

(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 10.2.4 (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 19.4.1, 19.6.1, and 19.8.1)

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

(a) the estimated amount for the Works executed in accordance with Clause 19.3(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 **"Name of work"** (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)

***** End of the Document *****