Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

1 The Site

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

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

(iii) An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2 (i) of this Agreement.

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

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

Annex –I

(Schedule-A)

Site

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

1. Site

The Site of the Two-Lane Project Highway comprises the section of NH-102C commencing from km 0+000 to km 17+900 and Intermediate lane from km 17+900 to km 18+297 i.e. Pallel to Chandel 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)		Right of Way (m)	Remarks
	From	To		
1	0+100	0+200	9.3	
2	0+200	0+300	7.0	
3	0+300	0+400	7.9	
4	0+400	0+500	7.8	
5	0+500	0+600	8.5	
6	0+600	0+700	8.6	
7	0+700	0+800	8.8	
8	0+800	0+900	8.8	
9	0+900	1+000	8.5	
10	1+000	1+100	8.2	
11	1+100	1+200	8.9	
12	1+200	1+300	9.1	
13	1+300	1+400	8.8	
14	1+400	1+500	9.4	
15	1+500	1+600	8.4	
16	1+600	1+700	8.4	
17	1+700	1+800	7.8	
18	1+800	1+900	8.3	
19	1+900	2+000	9.3	
20	2+000	2+100	9.1	
21	2+100	2+200	9.1	
22	2+200	2+300	9.2	
23	2+300	2+400	9.5	
24	2+400	2+500	8.5	
25	2+500	2+600	9	
26	2+600	2+700	9.7	
27	2+700	2+800	10.3	
28	2+800	2+900	9.8	
29	2+900	3+000	9.5	

SL No.	Chainage (Km)		Right of Way (m)	Remarks
	From	To		
30	3+000	3+100	9.8	
31	3+100	3+200	8.9	
32	3+200	3+300	7.9	
33	3+300	3+400	8.4	
34	3+400	3+500	8.9	
35	3+500	3+600	8.8	
36	3+600	3+700	7.5	
37	3+700	3+800	7.7	
38	3+800	3+900	8.8	
39	3+900	4+000	9.7	
40	4+000	4+100	8.8	
41	4+100	4+200	9.4	
42	4+200	4+300	9.2	
43	4+300	4+400	8.3	
44	4+400	4+500	8.8	
45	4+500	4+600	9.4	
46	4+600	4+700	9.8	
47	4+700	4+800	8.3	
48	4+800	4+900	10.8	
49	4+900	5+000	10	
50	5+000	5+100	9.6	
51	5+100	5+200	10.2	
52	5+200	5+300	9.5	
53	5+300	5+400	10.2	
54	5+400	5+500	10.8	
55	5+500	5+600	9.7	
56	5+600	5+700	10.3	
57	5+700	5+800	8.6	
58	5+800	5+900	9	
59	5+900	6+000	9.4	
60	6+000	6+100	9.9	
61	6+100	6+200	9.1	
62	6+200	6+300	9.8	
63	6+300	6+400	8.9	
64	6+400	6+500	10.3	
65	6+500	6+600	10.5	
66	6+600	6+700	9.6	
67	6+700	6+800	9.1	
68	6+800	6+900	8.3	
69	6+900	7+000	9.7	
70	7+000	7+100	7.9	
71	7+100	7+200	8.8	
72	7+200	7+300	9	
73	7+300	7+400	7.6	
74	7+400	7+500	9	
75	7+500	7+600	8.9	
76	7+600	7+700	8.5	
77	7+700	7+800	9.4	
78	7+800	7+900	9.2	
79	7+900	8+000	8.2	
80	8+000	8+100	9.2	
81	8+100	8+200	8.7	

SL No.	Chainage (Km)		Right of Way (m)	Remarks
	From	To		
82	8+200	8+300	9.4	
83	8+300	8+400	8	
84	8+400	8+500	9.7	
85	8+500	8+600	9.5	
86	8+600	8+700	8.7	
87	8+700	8+800	8.8	
88	8+800	8+900	9.3	
89	8+900	9+000	8.6	
90	9+000	9+100	9.3	
91	9+100	9+200	7.6	
92	9+200	9+300	9.2	
93	9+300	9+400	8	
94	9+400	9+500	10.1	
95	9+500	9+600	8.3	
96	9+600	9+700	9	
97	9+700	9+800	8.3	
98	9+800	9+900	8.2	
99	9+900	10+000	7.4	
100	10+000	10+100	8.9	
101	10+100	10+200	8.2	
102	10+200	10+300	10.2	
103	10+300	10+400	10.7	
104	10+400	10+500	8.3	
105	10+500	10+600	9.8	
106	10+600	10+700	11.8	
107	10+700	10+800	8.5	
108	10+800	10+900	9.7	
109	10+900	11+000	8.8	
110	11+000	11+100	8.9	
111	11+100	11+200	9.2	
112	11+200	11+300	9.3	
113	11+300	11+400	9.6	
114	11+400	11+500	9.1	
115	11+500	11+600	8.8	
116	11+600	11+700	10.2	
117	11+700	11+800	7.4	
118	11+800	11+900	10.9	
119	11+900	12+000	10.1	
120	12+000	12+100	10.3	
121	12+100	12+200	10.9	
122	12+200	12+300	9.7	
123	12+300	12+400	11	
124	12+400	12+500	9.6	
125	12+500	12+600	10	
126	12+600	12+700	9.4	
127	12+700	12+800	9.2	
128	12+800	12+900	9.2	
129	12+900	13+000	9.1	
130	13+000	13+100	9.7	
131	13+100	13+200	9.3	
132	13+200	13+300	9.8	
133	13+300	13+400	8.8	

SL No.	Chainage (Km)		Right of Way (m)	Remarks
	From	To		
134	13+400	13+500	9.8	
135	13+500	13+600	7.9	
136	13+600	13+700	8	
137	13+700	13+800	9.6	
138	13+800	13+900	9.7	
139	13+900	14+000	8.8	
140	14+000	14+100	9.5	
141	14+100	14+200	9.6	
142	14+200	14+300	8.4	
143	14+300	14+400	8.5	
144	14+400	14+500	8.7	
145	14+500	14+600	9.3	
146	14+600	14+700	8.8	
147	14+700	14+800	10.7	
148	14+800	14+900	8.1	
149	14+900	15+000	9.1	
150	15+000	15+100	10	
151	15+100	15+200	11.3	
152	15+200	15+300	11.9	
153	15+300	15+400	13.4	
154	15+400	15+500	14.1	
155	15+500	15+600	16	
156	15+600	15+700	15.4	
157	15+700	15+800	14.9	
158	15+800	15+900	8.6	
159	15+900	16+000	9.9	
160	16+000	16+100	10.7	
161	16+100	16+200	9.3	
162	16+200	16+300	8.6	
163	16+300	16+400	8.1	
164	16+400	16+500	10.2	
165	16+500	16+600	9.6	
166	16+600	16+700	9.4	
167	16+700	16+800	7.9	
168	16+800	16+900	8.8	
169	16+900	17+000	9.4	
170	17+000	17+100	8.5	
171	17+100	17+200	10	
172	17+200	17+300	9.4	
173	17+300	17+400	9.8	
174	17+400	17+500	9.8	
175	17+500	17+600	10	
176	17+600	17+700	9.3	
177	17+700	17+800	8.6	
178	17+800	17+900	9.3	
179	17+900	18+000	6.5	
180	18+000	18+100	6.6	
181	18+100	18+200	6.6	
182	18+200	18+300	6.7	

3. Carriageway

The present carriageway of the Project Highway is Two Lane from km 0+000 to km 17+900 and Intermediate lane from km 17+900 to km 18+297. The type of the existing pavement is flexible.

4. Major Bridges

The Site includes the following Major Bridges:-

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

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

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

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

6. Grade separators

The Site includes the following grade separators:

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

7. Minor bridges

The Site includes the following minor bridges:

S. No.	Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub- structure	Super- structure		
1	3+654	Open	Wall	Composite Bridge	5 X 9.5	4.7
2	4+350	Open	Wall	RCC Slab Bridge	1 X 8.6	8.5
3	5+668	Open	Wall	RCC Slab Bridge	1X10.7	8.3
4	6+991	Open	Wall	RCC Slab Bridge	1X9.4	8.2
5	7+315	Open	Wall	RCC Slab Bridge	1X7.5	9.07
6	7+597	Open	Wall	RCC Slab Bridge	1X8.3	11
7	8+304	Open	Wall	RCC Slab Bridge	1X8.5	8.5
8	8+612	Open	Wall	RCC Slab Bridge	1X8.7	7.9
9	9+115	Open	Wall	RCC T-Girder	2 X 12.8	8.4

S. No.	Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub- structure	Super- structure		
				Bridge		
10	9+311	Open	Wall	RCC Slab Bridge	1X8.3	8.4
11	10+539	Open	Wall	Bailey Bridge	1X18.3	4.1
12	11+697	Open	Wall	RCC Slab Bridge	1 X 7.6	9.8
13	12+246	Open	Wall	RCC Slab Bridge	1 X 7.4	9.9
14	13+320	Open	Wall	RCC Slab Bridge	1X7.5	8.6
15	14+728	Open	Wall	RCC T-Girder Bridge	1X10.5	10.4
16	16+709	Open	Wall	RCC T-Girder Bridge	1X13.0	8.4
17	17+716	Open	Wall	RCC Slab Bridge	1X7.5	10.1

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location(km)	Remarks
Nil		

9. Underpasses (vehicular, non vehicular)

The Site includes the following underpasses:

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

10. Culverts

The Site has the following culverts:

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length	Width of Culvert (m)
1	0+131	SLAB	1X1.7X.5	10.4
2	0+592	SLAB	1X1.5X1.5	10
3	0+692	SLAB	1X1.5X1.0	10.05
4	0+885	SLAB	1X1.5X0.8	7.8
5	1+010	SLAB	1X1.5X1.0	7
6	1+162	SLAB	1X1.4X1.0	7.1
7	1+300	SLAB	1X1.5X1.0	8
8	1+532	SLAB	1X1.4X1.0	9.2
9	1+657	SLAB	1X1.0X1.0	9.2
10	1+928	SLAB	1X1.5X2.0	9.5
11	2+030	SLAB	1X1.5X1.2	9.9
12	2+080	SLAB	1X1.5X1.0	11
13	2+736	SLAB	1X1.5X1.2	10
14	3+098	SLAB	1X1.5X1.0	10
15	3+173	SLAB	1X1.5X1.0	10.5
16	3+215	SLAB	1X1.5X1.2	10
17	3+352	SLAB	1X1.5X1.6	10
18	3+486	SLAB	1X1.5X1.2	10.2

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length	Width of Culvert (m)
19	3+551	SLAB	1X1.5X1.2	10.2
20	3+852	SLAB	1X1.5X1.2	10
21	3+985	SLAB	1X1.5X1.2	10.3
22	4+169	SLAB	1X1.65X1.2	10
23	4+462	SLAB	1X1.4X1.2	10.6
24	4+655	SLAB	1X1.5X2.0	10.6
25	5+042	SLAB	1X1.5X1.2	10.6
26	5+115	SLAB	1X0.7X0.7	10
27	5+215	SLAB	1X1.5X2.0	10.5
28	5+278	SLAB	1X1.5X0.8	10.4
29	5+540	SLAB	1X1.2X0.8	10.2
30	5+782	SLAB	1X1.2X0.5	7.2
31	6+109	SLAB	1X1.0X1.0	8.6
32	6+189	SLAB	1X1.0X0.5	8.4
33	6+322	SLAB	1X1.5X0.8	7.1
34	6+365	SLAB	1X1.5X1.0	10
35	6+577	SLAB	1x3.0x2.0	8.4
36	7+170	SLAB	1X1.5X1.0	9.55
37	7+435	SLAB	1X1.5X0.6	9.5
38	7+907	SLAB	1X1.5X1.0	10
39	8+056	SLAB	1X1.34X1.2	10
40	8+399	SLAB	1X1.3X1.2	10
41	9+192	SLAB	1X1.2X0.8	11.4
42	9+260	SLAB	1X1.0X1.0	9.5
43	9+692	SLAB	1X1.0X1.0	9.4
44	10+067	SLAB	1X0.7X0.8	10.2
45	10+166	SLAB	1X1.5X2.0	9.25
46	10+433	SLAB	1X1.5X2.5	9
47	10+657	SLAB	1X1.0X1.0	9.5
48	10+921	SLAB	1X1.0X1.0	9
49	10+991	SLAB	1X1.0X0.8	11.5
50	11+288	SLAB	1X1.0X0.6	9
51	11+377	SLAB	1X1.0X0.6	10
52	12+159	SLAB	1X1.0X1.0	10
53	12+605	SLAB	1X1.5X2.0	10.5
54	12+945	SLAB	1X0.7X0.7	10
55	13+052	SLAB	1X1.2X2.8	10
56	13+429	SLAB	1X0.7X0.8	7.7
57	13+506	SLAB	1X1.2X2.5	7.5
58	13+534	SLAB	1X1.2X1.5	7.7
59	13+589	SLAB	1X1.5X2.0	9.7
60	13+905	SLAB	1X1.5X2.0	9.5
61	13+983	SLAB	1X1.5X1.5	9.7
62	14+156	SLAB	1X1.5X2.0	9.5
63	14+190	SLAB	1X1.2X0.8	9.7
64	14+247	SLAB	1X1.2X1.0	9.5
65	14+574	SLAB	1X1.0X0.8	9.5
66	14+877	SLAB	1X1.0X0.5	9.7
67	14+976	SLAB	1X1.0X0.5	15.6
68	15+000	SLAB	1X1.5X0.5	11
69	15+089	SLAB	1X1.0X0.5	15.7
70	15+762	SLAB	1X1.5X1.0	10.5

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length	Width of Culvert (m)
71	16+050	SLAB	1X1.5X0.8	9.5
72	16+307	SLAB	1X1.5X0.8	9
73	16+351	SLAB	1X4.0X2.5	7
74	16+666	SLAB	1X1.5X1.0	10.75
75	16+740	SLAB	1X1.0X1.0	9.5
76	16+843	SLAB	1X1.5X1.5	8.7
77	16+895	SLAB	1X1.5X1.0	9
78	17+036	SLAB	1X1.2X1.0	9
79	17+323	SLAB	1X1.2X1.0	9.5
80	17+518	SLAB	1X1.0X0.5	9.2
81	17+604	SLAB	1X1.2X0.5	9.2
82	17+658	SLAB	1X1.5X0.6	9.5
83	17+876	SLAB	1X1.5X0.5	9.5
84	17+893	SLAB	1X1.5X1.0	9.5

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	0+000	2+000		Earthen (Both Side)
2	2+160	2+220	Pucca (Right Side)	
3	2+320	2+430	Pucca (Right Side)	
4	2+430	2+500	Pucca (Both Side)	
5	2+530	2+600	Pucca (Left Side)	
6	2+820	2+870	Pucca (Left Side)	
7	2+950	3+150	Pucca (Both Side)	
8	7+900	8+200	Pucca (Left Side)	
9	8+550	9+150		Earthen (Right Side)
10	13+000	13+200	Pucca (Right Side)	
11	13+500	13+700		Earthen (Right Side)
12	15+500	15+700	Pucca (Left Side)	
13	15+800	15+900	Pucca (Both Side)	
14	16+400	16+500	Pucca (Right Side)	

14. Major junctions

The details of major junctions are as follows:

S. No.	Location		At grade	Separated	Category of Cross Road			
	From km	to km			NH	SH	MDR	Others
1	0+000		✓		Moreh (via NH-102)			
2	15+685		✓					Village road

(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	0+100		Y-Type	To Pallel Bosti Village
2	0+320		Y-Type	To Pallel Bosti Village
3	0+450		Y-Type	To Pallel Bosti Village
4	0+680		X-Type	To Pallel Village And To Thamlakhuren Village
5	0+900		Y-Type	To Thamlakhuren Village
6	0+970		Y-Type	To Thamlakhuren Village
7	1+250		X-Type	To Kumbirei Baptist Church And To Aibuldham Village
8	1+570		Y-Type	To Damjol Village
9	1+900		Y-Type	To Khuninglung St. Thomas Church
10	2+320		Y-Type	To Liwacaangning Village
11	2+430		X-Type	To Liwacaangning Village And To Pemaching Village
12	2+590		Y-Type	To Panaching
13	2+725		Y-Type	To Model School

Sl. No.	Location		Type of intersection	
	From Km	To Km	T-Junction	Cross Road
14	2+870		X-Type	To Tunglam Veen (Kapaam Gate 1) And To Deenphae Veen
15	3+050		Y-Type	To Tunglam Veen (Kapaam Gate 1)
16	3+100		Y-Type	To Penaching Village
17	3+810		Y-Type	To I.T.I.
18	3+930		X-Type	To Kenbung Veen And Kapaam
19	4+980		Y-Type	To Chandponpoki Village
20	6+210		Y-Type	To Heibunglok Village
21	6+420		Y-Type	To Heibunglok Baptist Church
22	7+205		Y-Type	To Ringkhu Village
23	7+530		Y-Type	To Salemthar Village
24	7+675		Y-Type	To Mg.Nregs-201617Work Ivr Singling Village
25	8+350		Y-Type	To Lirungtabi Village
26	9+170		Y-Type	Jawahar Navodaya Vidyalaya
27	9+250		Y-Type	To Khunthak Village
28	9+660		Y-Type	To Lunglhe Village
29	10+365		Y-Type	To Liwa Sarei Village
30	12+150		Y-Type	8Th Battalion Manipur Rifles Area
31	12+590		X-Type	To Angkh Village And To P/Ralringkhu Village
32	12+935		Y-Type	To P/Ralringkhu Village
33	13+965		Y-Type	To Fishery Department(Dc/Cdl)
34	14+155		X-Type	To Sericulture Department And To Thotchanham Village
35	14+715		Y-Type	To D C Complex
36	14+915		Y-Type	To Pwd Quarter
37	14+955		Y-Type	To Pwd Quarter
38	15+015		Y-Type	To Office Of The Sinadham Village Authority
39	15+395		Y-Type	To Japhou Village
40	15+515		Y-Type	To Limbung River Line
41	15+925		Y-Type	To Panchai-Khu Village
42	16+165		Y-Type	To Lankang Colony
43	16+265		Y-Type	To Panchai Village
44	16+715		Y-Type	To Chandel-Khullel Village
45	17+635		Y-Type	To Chandel-Khubul Village
46	17+845		X-Type	To Chandel-Christian Village And Chandel-Christian Baptist Church
47	17+875		Y-Type	To Spot Complex
48	18+225		Y-Type	Hospital More

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

[Provide details of other structures, if any.]

Annex – II

(As per Clause 8.3 (i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

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

The Construction of Project Highway will be implemented within the exiting ROW, details of which are already given in Article-2 of Annexure – I of Schedule –A. Hence, no land acquisition is required for the project.

Annex - III

(Schedule-A)

Alignment Plans

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

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

(ii) Traffic Signage plan of the Project Highway showing numbers & location of traffic signs is enclosed. The contractor shall, however, improve/upgrade upon the traffic signage plan as indicated in Annex-III based on site/design requirement as per the relevant specifications/IRC Codes/Manual.

Annex – IV

(Schedule-A)

Environment Clearances

Environmental Clearances are not required for the project.

Schedule - B

(See Clause 2.1)

Development of the Project Highway

1. Development of the Project Highway

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

2. Rehabilitation and augmentation

Rehabilitation and augmentation shall include Two-Lanning with hard shoulders and Strengthening of the Project Highway as described in Annex-I of this Schedule-B and in Schedule-C.

3. Specifications and Standards

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

Annex – I

(Schedule-B)

Description of **Widening/Strengthening to Two laning with hard shoulder of Pallel-Chandel section From Km 0.000 to Km 18.292 of NH-102C in the state of Manipur on Engineering, Procurement & Construction (EPC) Mode**

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

1. Widening of the Existing Highway

(i) The Project Highway shall follow the existing alignment unless otherwise specified by the Authority and shown in the alignment plans specified in Annex-III of Schedule-A. Geometric deficiencies, if any, in the existing horizontal and vertical profiles shall be corrected as per the prescribed standards for hilly terrain to the extent land is available.

(ii) Width of Carriageway

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

Sl. No.	Built-up stretch (Township)	Location		Width (m)	Typical Cross Section (Refer to Manual)	Remarks
1	THAMLAKHUREN	0+500	1+000	7.0	As per attached TCS drawing	7 m Carriageway
2	DAMJOL VILLAGE	1+750	2+000	7/7.25		7 m Carriageway / (7 m Carriageway+1X0.25 kerb signage)
3	LEISHOKCHING	2+000	2+500	7/7.25/7.5		7 m Carriageway / (7 m Carriageway+1X0.25 kerb signage)/ (7 m Carriageway+2X0.25 kerb signage)
4	KAPAAM	2+500	3+250	7.5		7 m Carriageway+2X0.25 kerb signage
5	HOYSHING	3+750	4+500	7/7.5		7 m Carriageway / (7 m Carriageway+2X0.25 kerb signage)
6	CHANDANPOKPI	4+500	4+750	7/7.25		7 m Carriageway / (7 m Carriageway+1X0.25 kerb

Sl. No.	Built-up stretch (Township)	Location		Width (m)	Typical Cross Section (Refer to Manual)	Remarks
						signage)
7	CHANDANPOKPI	5+000	5+250	7.25		(7 m Carriageway+1X0.25 kerb signage)
8	KHUKTHAR	5+250	5+750	7.25		(7 m Carriageway+1X0.25 kerb signage)
9	KHUKTHAR	6+250	6+500	7/7.25/7.5		7 m Carriageway / (7m Carriageway+1X0.25m kerb signage)/ (7m Carriageway+1X0.25m kerb signage)
10	HEBUNGLOK	6+500	7+000	7.25/7.5		(7m Carriageway+1X0.25m kerb signage)/ (7m Carriageway+2X0.25m kerb signage)
11	RINGKHU	7+000	7+500	7/7.25/7.5		7m Carriageway / (7m Carriageway+1X0.25m kerb signage)/ (7 m Carriageway+2X0.25 kerb signage)
12	LIRUNGTABI	8+250	8+750	7/7.25/7.5		7 m Carriageway / (7m Carriageway+1X0.25m kerb signage)/ (7m Carriageway+2X0.25m kerb signage)
13	P.RALRINGKHU	12+750	13+000	7/7.5		7m Carriageway / (7m Carriageway+2X0.25m kerb signage)
14	P.RALRINGKHU	14+000	14+250	7.25		(7m Carriageway+1X0.25m kerb signage)
15	DIYASHI	15+000	15+250	7.5		(7m Carriageway+2X0.25m kerb signage)
16	JAPHON BAZAR	15+250	15+500	10/12		(7m Carriageway+2X1.5m Paved Shoulder)/ (7m Carriageway+2X2.5m Paved Shoulder)
17	ABUNGNIKHU	15+500	15+750	12		(7m Carriageway+2X2.5m Paved Shoulder)
18	DEERINGKHU	15+750	16+000	7.5/12		(7m Carriageway+2X0.25m kerb signage)/ (7m Carriageway+2X2.5m Paved Shoulder)
19	PANCHAI	16+000	16+250	7.5		(7m Carriageway+2X0.25m kerb signage)
20	HNATHAM	16+250	16+500	7.5		(7m Carriageway+2X0.25 kerb signage)
21	CHANDEL KHULLEN	16+750	17+250	7.25/7.5		(7m Carriageway+1X0.25 kerb signage)/ (7m Carriageway+2X0.25m kerb signage)
22	CHANDEL KHUBUL	17+250	17+750	7/7.25/7.5		7 m Carriageway / (7m Carriageway+1X0.25m kerb signage)/

Sl. No.	Built-up stretch (Township)	Location		Width (m)	Typical Cross Section (Refer to Manual)	Remarks
						(7m Carriageway+2X0.25m kerb signage)
23	CHANDEL CHRISTIAN	17+750	17+870	7.5		(7m Carriageway+2X0.25m kerb signage)
24	CHANDEL CHRISTIAN	17+870	17+900	6.0/5.5		(5.5m Carriageway+2X0.25m kerb signage/ 5.5m Carriageway)

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

2. 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 plain terrain design speed shall be 60-80 kmph in general. However design speed has been restricted to 40kmph to accommodate the proposal within existing right of way.

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

(iii) Improvement of the existing road geometrics

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

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
1	0+104 to 0+124	Sharp Bend	Design Speed = 20 Kmph
2	2+873 to 2+881	Sharp Bend	Design Speed = 20 Kmph
3	3+840 to 3+853	Sharp Bend	Design Speed = 30 Kmph
4	4+635 to 4+651	Sharp Bend	Design Speed = 20 Kmph
5	4+693 to 4+736	Sharp Bend	Design Speed = 30 Kmph
6	5+036 to 5+053	Sharp Bend	Design Speed = 30 Kmph
7	5+716 to 5+750	Sharp Bend	Design Speed = 30 Kmph
8	5+772 to 5+794	Sharp Bend	Design Speed = 20 Kmph
9	6+020 to 6+090	Sharp Bend	Design Speed = 30 Kmph
10	6+097 to 6+123	Sharp Bend	Design Speed = 30 Kmph
11	6+138 to 6+156	Sharp Bend	Design Speed = 30 Kmph
12	6+194 to 6+261	Sharp Bend	Design Speed = 30 Kmph
13	6+401 to 6+426	Sharp Bend	Design Speed = 30 Kmph
14	6+443 to 6+465	Sharp Bend	Design Speed = 30 Kmph
15	6+486 to 6+541	Sharp Bend	Design Speed = 30 Kmph
16	6+726 to 6+744	Sharp Bend	Design Speed = 30 Kmph
17	6+786 to 6+838	Sharp Bend	Design Speed = 30 Kmph

Sl. No.	Stretch (from km to km)	Type of Deficiency	Remarks
18	6+861 to 6+874	Sharp Bend	Design Speed = 30 Kmph
19	6+892 to 6+935	Sharp Bend	Design Speed = 30 Kmph
20	6+984 to 6+996	Sharp Bend	Design Speed = 30 Kmph
21	7+288 to 7+303	Sharp Bend	Design Speed = 30 Kmph
22	7+351 to 7+392	Sharp Bend	Design Speed = 30 Kmph
23	7+415 to 7+440	Sharp Bend	Design Speed = 30 Kmph
24	7+514 to 7+551	Sharp Bend	Design Speed = 30 Kmph
25	7+580 to 7+593	Sharp Bend	Design Speed = 30 Kmph
26	7+609 to 7+637	Sharp Bend	Design Speed = 30 Kmph
27	7+734 to 7+808	Sharp Bend	Design Speed = 30 Kmph
28	7+897 to 7+908	Sharp Bend	Design Speed = 20 Kmph
29	7+966 to 7+979	Sharp Bend	Design Speed = 30 Kmph
30	8+923 to 8+955	Sharp Bend	Design Speed = 30 Kmph
31	10+352 to 10+376	Sharp Bend	Design Speed = 20 Kmph
32	10+568 to 10+581	Sharp Bend	Design Speed = 30 Kmph
33	11+036 to 11+096	Sharp Bend	Design Speed = 30 Kmph
34	11+117 to 11+14	Sharp Bend	Design Speed = 30 Kmph
35	11+168 to 11+209	Sharp Bend	Design Speed = 30 Kmph
36	11+242 to 11+258	Sharp Bend	Design Speed = 30 Kmph
37	11+714 to 11+734	Sharp Bend	Design Speed = 30 Kmph
38	11+857 to 11+867	Sharp Bend	Design Speed = 30 Kmph
39	12+357 to 12+377	Sharp Bend	Design Speed = 20 Kmph
40	12+527 to 12+550	Sharp Bend	Design Speed = 30 Kmph
41	12+572 to 12+614	Hair Pin Bend	Design Speed = 20 Kmph
42	12+675 to 12+691	Sharp Bend	Design Speed = 30 Kmph
43	12+752 to 12+791	Sharp Bend	Design Speed = 20 Kmph
44	12+808 to 12+849	Sharp Bend	Design Speed = 30 Kmph
45	12+935 to 12+967	Hair Pin Bend	Design Speed = 20 Kmph
46	13+013 to 13+027	Sharp Bend	Design Speed = 20 Kmph
47	13+218 to 13+258	Sharp Bend	Design Speed = 30 Kmph
48	13+563 to 13+594	Sharp Bend	Design Speed = 30 Kmph
49	14+510 to 14+536	Sharp Bend	Design Speed = 30 Kmph
50	14+560 to 14+589	Sharp Bend	Design Speed = 30 Kmph
51	14+624 to 14+646	Sharp Bend	Design Speed = 30 Kmph
52	14+691 to 14+708	Sharp Bend	Design Speed = 30 Kmph
53	14+802 to 14+838	Sharp Bend	Design Speed = 30 Kmph
54	14+918 to 14+933	Sharp Bend	Design Speed = 30 Kmph
55	16+684 to 16+710	Sharp Bend	Design Speed = 30 Kmph
56	16+728 to 16+733	Sharp Bend	Design Speed = 30 Kmph
57	16+770 to 16+810	Sharp Bend	Design Speed = 30 Kmph
58	17+386 to 17+439	Sharp Bend	Design Speed = 30 Kmph
59	17+460 to 17+518	Sharp Bend	Design Speed = 30 Kmph
60	17+633 to 17+678	Sharp Bend	Design Speed = 30 Kmph

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

(iv) Right of Way

[Refer to paragraph 2.3 of the Manual]. Details of the Right of Way are given in Annex-II of Schedule-A.

(v) Type of shoulders
[Refer to paragraph 2.5.2 of the Manual and specify]

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

Sl. No.	Stretch (from Km to Km)	Fully Paved shoulders/footpaths	Reference to cross section
1	15+250 to 15+350	2 X 1.5 m Paved Shoulder/ 2 X 0.75m width Footpath	TCS-14A
2	15+350 to 15+450	2 X 1.5 m Paved Shoulder/ 2 X 0.75m width Footpath	TCS-14B
3	15+450 to 16+025	2 X 2.5 m Paved Shoulder/ 2 X 0.75m width Footpath	TCS-15A

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

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

(vi) Lateral and vertical clearances at underpasses

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

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

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

(vii) Lateral and vertical clearances at overpasses

(a) Lateral and vertical clearances at overpasses shall be as per requirements specified in the relevant Manual.

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

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

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

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

(ix) Grade separated structures

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

[Refer to requirements specified in the relevant Manual]

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

(b) In the case of grade separated structures the type of structure and the level of the Project Highway and the cross roads shall be as follows: [Refer to provision of the Manual and specify the type of vehicular under pass/ overpass structure and whether the cross road is to be carried at the existing
Level. raised or lowered]

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

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

Sl. No.	Location	Type of crossing
Nil		

(xi) Typical cross-sections of the Project Highway
[Give typical cross-sections of the Project Highway by reference to the Manual]

As per attached Drawings

Sl. No.	Description	Length (m)
TCS-1A	Typical cross section of Two Lane Carriageway with Both side hard shoulder in Rural Area (Overlay with BC, DBM & WMM Single Layer)	850
TCS-1B	Typical cross section of Two Lane Carriageway with Both side hard shoulder in Rural Area (Reconstruction from GSB Layer)	1875
TCS-1C	Typical cross section of Two Lane Carriageway with Both side hard shoulder in Rural Area (Reconstruction from Sub-grade Layer)	250
TCS-2A	Typical cross section of Two Lane Carriageway with Breast wall in hill side in Rural Area (Overlay with BC, DBM & WMM Single Layer)	125
TCS-3A	Typical cross section of Two Lane Carriageway in Rural Area with One Side Toe wall (Overlay with BC, DBM & WMM Single Layer)	75
TCS-3B	Typical cross section of Two Lane Carriageway in Rural Area with One Side Toe wall (Reconstruction from GSB Layer)	250
TCS-4A	Typical cross section of Two Lane Carriageway with One side RCC Covered Drain in Built-Up Area (Overlay with BC, DBM & WMM Single Layer)	425
TCS-4C	Typical cross section of Two Lane Carriageway with One side RCC Covered Drain in Built-Up Area (Reconstruction from Sub-grade Layer)	100
TCS-5A	Typical cross section of Two Lane Carriageway with One side PCC trapezoidal open drain in Built-Up Area (Overlay with BC, DBM & WMM Single Layer)	1575
TCS-5B	Typical cross section of Two Lane Carriageway with One side PCC trapezoidal open drain in Built-Up Area (Reconstruction from GSB Layer)	3800
TCS-5C	Typical cross section of Two Lane Carriageway with One side PCC trapezoidal open drain in Built-Up Area (Reconstruction from Sub-grade Layer)	350
TCS-6B	Typical cross section of Two Lane Carriageway with RCC Covered Drain & Retaining wall on valley side in Built-Up Area (Reconstruction from GSB Layer)	50
TCS-7A	Typical cross section of Two Lane Carriageway with both side RCC Covered Drain in Built-Up Area (Overlay with BC, DBM, WMM Single Layer)	325
TCS-7B	Typical cross section of Two Lane Carriageway with both side RCC Covered Drain in Built-	1620

Sl. No.	Description	Length (m)
	Up Area (Reconstruction from GSB Layer)	
TCS-7C	Typical cross section of Two Lane Carriageway with both side RCC Covered Drain in Built-Up Area (Reconstruction from Sub-grade Layer)	150
TCS-8A	Typical cross section of Two Lane Carriageway with both side Perforated Drain in Built-Up Area (Overlay with BC, DBM & WMM Single Layer)	475
TCS-9B	Typical cross section of Two Lane Carriageway with existing breast wall on hill side in Rural Area (Reconstruction from GSB Layer)	100
TCS-9C	Typical cross section of Two Lane Carriageway with existing breast wall on hill side in Rural Area (Reconstruction from Sub-grade Layer)	250
TCS-10A	Typical cross section of Two Lane Carriageway with both side PCC trapezoidal open drain in Built-Up Area (Overlay with BC, DBM, WMM Single Layer)	150
TCS-10B	Typical cross section of Two Lane Carriageway with both side PCC trapezoidal open drain in Built-Up Area (Reconstruction from GSB Layer)	1450
TCS-10C	Typical cross section of Two Lane Carriageway with both side PCC trapezoidal open drain in in Built-Up Area (Reconstruction from Sub-grade Layer)	50
TCS-11A	Typical cross section of Two Lane Carriageway in Rural Area with both side retaining wall (Overlay with BC, DBM & WMM Single Layer)	75
TCS-11C	Typical cross section of Two Lane Carriageway in Rural Area with both side retaining wall (Reconstruction from Sub-grade Layer)	325
TCS-12B	Typical cross section of Two Lane Carriageway in Rural Area with retaining wall on valley side and breast wall on hill side (Reconstruction from GSB Layer)	100
TCS-13B	Typical cross section of Two Lane Carriageway in Rural Area with both side toe wall (Reconstruction from GSB Layer)	450
TCS-13C	Typical cross section of Two Lane Carriageway in Rural Area with both side toe wall (Reconstruction from Sub-grade Layer)	1650
TCS-14A	Typical Cross Section of Two lane Carriageway with 1.5m Wide Paved Shoulder on Both Side in Chandel Bazaar Area (Overlay with BC, DBM & WMM Single Layer)	100
TCS-14B	Typical Cross Section of Two lane Carriageway with 1.5m Wide Paved Shoulder and on Both Side in Chandel Bazaar Area (Reconstruction from GSB Layer)	100
TCS-15A	Typical Cross Section of Two lane Carriageway with 2.5m Wide Paved Shoulder on Both Side in Chandel Bazaar Area (Overlay with BC, DBM & WMM Single Layer)	575
TCS-16A	Typical cross section of Intermediate Lane Carriageway with both side Kerb Channel Drain in Built-Up Area (Overlay with BC, DBM & WMM Single Layer)	342
TCS-17B	Typical cross section of Intermediate Lane Carriageway with both side Kerb in Built-Up Area (Reconstruction from GSB Layer)	80
TCS-18C	Typical cross section of two lane carriageway in rural area with one side toe wall (Reconstruction from Subgrade Layer)	200
Total Length =		**18292 m**

Chainage (m)		Net Length (m)	TCS Type
From	To		
0	475	475	TCS-8A
475	550	75	TCS-1A
550	1025	475	TCS-1B
1025	1625	600	TCS-13C
1625	1775	150	TCS-1B
1775	1875	100	TCS-1A
1875	2125	250	TCS-4A
2125	2225	100	TCS-1B
2225	2375	150	TCS-3B
2375	2800	425	TCS-7B
2800	3125	325	TCS-7A
3125	3475	350	TCS-13B
3475	3875	400	TCS-13C
3875	4350	475	TCS-1B
4350	4550	200	TCS-1A

Chainage (m)		Net Length (m)	TCS Type
From	To		
4550	4625	75	TCS-1B
4625	4700	75	TCS-1A
4700	4775	75	TCS-3A
4775	4875	100	TCS-1A
4875	4975	100	TCS-13C
4975	5100	125	TCS-5B
5100	5250	150	TCS-5A
5250	5600	350	TCS-5B
5600	5850	250	TCS-5A
5850	6025	175	TCS-5B
6025	6125	100	TCS-13C
6125	6275	150	TCS-10A
6275	6325	50	TCS-5A
6325	6425	100	TCS-1A
6425	6575	150	TCS-5B
6575	6625	50	TCS-11C
6625	6875	250	TCS-9C
6875	7375	500	TCS-5B
7375	7475	100	TCS-13C
7475	7525	50	TCS-1C
7525	7825	300	TCS-10B
7825	7925	100	TCS-1C
7925	8025	100	TCS-12B
8025	8125	100	TCS-1C
8125	8225	100	TCS-13B
8225	8575	350	TCS-10B
8575	8625	50	TCS-1B
8625	8800	175	TCS-4A
8800	8925	125	TCS-1A
8925	9025	100	TCS-13C
9025	9125	100	TCS-11C
9125	9350	225	TCS-5A
9350	9675	325	TCS-5B
9675	9775	100	TCS-4C
9775	9975	200	TCS-5C
9975	10225	250	TCS-13C
10225	10425	200	TCS-1B
10425	10625	200	TCS-18C
10625	10725	100	TCS-5B
10725	10825	100	TCS-3B
10825	11025	200	TCS-5B
11025	11175	150	TCS-10B
11175	11475	300	TCS-5A
11475	11700	225	TCS-5B
11700	11800	100	TCS-10B
11800	12575	775	TCS-5B
12575	12875	300	TCS-7B
12875	12925	50	TCS-6B
12925	13075	150	TCS-1B
13075	13375	300	TCS-5B
13375	13775	400	TCS-10B
13775	13975	200	TCS-1B
13975	14275	300	TCS-5B
14275	14375	100	TCS-10B
14375	14575	200	TCS-5A
14575	14725	150	TCS-5C

Chainage (m)		Net Length (m)	TCS Type
From	To		
14725	14825	100	TCS-9B
14825	14875	50	TCS-10B
14875	15250	375	TCS-7B
15250	15350	100	TCS-14A
15350	15450	100	TCS-14B
15450	16025	575	TCS-15A
16025	16375	350	TCS-7B
16375	16525	150	TCS-7C
16525	16575	50	TCS-10C
16575	16750	175	TCS-11C
16750	16825	75	TCS-11A
16825	17125	300	TCS-5A
17125	17250	125	TCS-2A
17250	17525	275	TCS-5B
17525	17625	100	TCS-5A
17625	17700	75	TCS-1A
17700	17870	170	TCS-7B
17870	17950	80	TCS-17B
17950	18292	342	TCS-16A
Total Length=		**18292 m**	

3. Intersections and Grade Separators

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

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

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

(i) At-grade intersections

Major Intersections

Sl. No.	Location of intersection (Km)	Type of intersection	Other features	Remarks
1	0+000	4 Legged	RHS- Towards Imphal LHS- Towards Burma Border	No Improvement Proposed
2	15+680	3 Legged	LHS - Towards Japhou Village	At-grade improvement proposed within Exiting ROW

Minor Intersections

Sl. No.	Location of intersection (Km)	Type of intersection	Other features
1	0+100	Y-Type	To Pallel Bosti Village
2	0+320	Y-Type	To Pallel Bosti Village
3	0+450	Y-Type	To Pallel Bosti Village
4	0+680	X-Type	To Pallel Village and To Thamlakhuren Village
5	0+900	Y-Type	To Thamlakhuren Village
6	0+970	Y-Type	To Thamlakhuren Village

Sl. No.	Location of intersection (Km)	Type of intersection	Other features
7	1+250	X-Type	To Kumbirei Baptist Church and To Aibuldham Village
8	1+570	Y-Type	To Damjol Village
9	1+900	Y-Type	To Khuninglung St. Thomas Church
10	2+320	Y-Type	To Liwacaangning Village
11	2+430	X-Type	To Liwacaangning Village and To Pemaching Village
12	2+590	Y-Type	To Panaching
13	2+725	Y-Type	To Model School
14	2+870	X-Type	To Tunglam Veen (Kapaam Gate 1) And To Deenphae Veen
15	3+050	Y-Type	To Tunglam Veen (Kapaam Gate 1)
16	3+100	Y-Type	To Penaching Village
17	3+810	Y-Type	To I.T.I.
18	3+930	X-Type	To Kenbung Veen And Kapaam
19	4+980	Y-Type	To Chandponpoki Village
20	6+210	Y-Type	To Heibunglok Village
21	6+420	Y-Type	To Heibunglok Baptist Church
22	7+205	Y-Type	To Ringkhu Village
23	7+530	Y-Type	To Salemthar Village
24	7+675	Y-Type	To Mg.Nregs-201617Work Ivr Singling Village
25	8+350	Y-Type	To Lirungtabi Village
26	9+170	Y-Type	Jawahar Navodaya Vidyalaya
27	9+250	Y-Type	To Khunthak Village
28	9+660	Y-Type	To Lunglhe Village
29	10+365	Y-Type	To Liwa Sarei Village
30	12+150	Y-Type	8Th Battalion Manipur Rifles Area
31	12+590	X-Type	To Angkh Village And To P/Ralringkhu Village
32	12+935	Y-Type	To P/Ralringkhu Village
33	13+965	Y-Type	To Fishery Department(Dc/Cdl)
34	14+155	X-Type	To Sericulture Department And To Thotchanham Village
35	14+715	Y-Type	To D C Complex
36	14+915	Y-Type	To Pwd Quarter
37	14+955	Y-Type	To Pwd Quarter
38	15+015	Y-Type	To Office of the Sinadham Village Authority
39	15+395	Y-Type	To Japhou Village
40	15+515	Y-Type	To Limbung River Line
41	15+925	Y-Type	To Panchai-Khu Village
42	16+165	Y-Type	To Lankang Colony
43	16+265	Y-Type	To Panchai Village
44	16+715	Y-Type	To Chandel-Khullel Village
45	17+635	Y-Type	To Chandel-Khubul Village
46	17+845	X-Type	To Chandel-Christian Village And Chandel-Christian Baptist Church
47	17+875	Y-Type	To Spot Complex
48	18+225	Y-Type	Hospital More

(ii) Grade separated intersection with/without ramps

Sl. No.	Location	Salient features	Minimum length of viaduct to be provided	Road to be carried over/under the structures
Nil				

4. Road Embankment and Cut Section

(i) Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/ cuttings shall conform to the Specifications and Standards given in Section 4 of the Manual and the specified cross sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

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

The existing road shall be raised in the following sections:

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

5. Pavement Design

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

(ii) Type of pavement

Flexible Pavement

(iii) Design requirements

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

(a) Design Period and strategy

Flexible pavement for new pavement or for widening and strengthening of the existing pavement shall be designed for a minimum design period of 20 years. Stage construction shall not be permitted.

(b) Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual. The Contractor shall design the pavement base and sub-base course for design traffic of 20 msa and bituminous surface, binder courses for design traffic of 5 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	0.550 to 1.025	Reconstruction from Sub-Base	TCS-1B
2	1.025 to 1.625	Reconstruction from Sub-grade	TCS-13C
3	1.625 to 1.775	Reconstruction from Sub-Base	TCS-1B
4	2.125 to 2.225	Reconstruction from Sub-Base	TCS-1B
5	2.225 to 2.375	Reconstruction from Sub-Base	TCS-3B
6	2.375 to 2.800	Reconstruction from Sub-Base	TCS-7B
7	3.125 to 3.475	Reconstruction from Sub-Base	TCS-13B
8	3.475 to 3.875	Reconstruction from Sub-grade	TCS-13C
9	3.875 to 4.350	Reconstruction from Sub-Base	TCS-1B
10	4.550 to 4.625	Reconstruction from Sub-Base	TCS-1B
11	4.875 to 4.975	Reconstruction from Sub-grade	TCS-13C
12	4.975 to 5.100	Reconstruction from Sub-Base	TCS-5B
13	5.250 to 5.600	Reconstruction from Sub-Base	TCS-5B
14	5.850 to 6.025	Reconstruction from Sub-Base	TCS-5B
15	6.025 to 6.125	Reconstruction from Sub-grade	TCS-13C
16	6.425 to 6.575	Reconstruction from Sub-Base	TCS-5B
17	6.575 to 6.625	Reconstruction from Sub-grade	TCS-11C
18	6.625 to 6.875	Reconstruction from Sub-grade	TCS-9C
19	6.875 to 7.375	Reconstruction from Sub-Base	TCS-5B
20	7.375 to 7.475	Reconstruction from Sub-grade	TCS-13C
21	7.475 to 7.525	Reconstruction from Sub-grade	TCS-1C
22	7.525 to 7.825	Reconstruction from Sub-Base	TCS-10B
23	7.825 to 7.925	Reconstruction from Sub-grade	TCS-1C
24	7.925 to 8.025	Reconstruction from Sub-Base	TCS-12B
25	8.025 to 8.125	Reconstruction from Sub-grade	TCS-1C
26	8.125 to 8.225	Reconstruction from Sub-Base	TCS-13B
27	8.225 to 8.575	Reconstruction from Sub-Base	TCS-10B
28	8.575 to 8.625	Reconstruction from Sub-Base	TCS-1B
29	8.925 to 9.025	Reconstruction from Sub-grade	TCS-13C
30	9.025 to 9.125	Reconstruction from Sub-grade	TCS-11C
31	9.350 to 9.675	Reconstruction from Sub-Base	TCS-5B
32	9.675 to 9.775	Reconstruction from Sub-grade	TCS-4C
33	9.775 to 9.975	Reconstruction from Sub-grade	TCS-5C
34	9.975 to 10.225	Reconstruction from Sub-grade	TCS-13C
35	10.225 to 10.425	Reconstruction from Sub-Base	TCS-1B
36	10.425 to 10.625	Reconstruction from Sub-grade	TCS-18C
37	10.625 to 10.725	Reconstruction from Sub-Base	TCS-5B
38	10.725 to 10.825	Reconstruction from Sub-Base	TCS-3B
39	10.825 to 11.025	Reconstruction from Sub-Base	TCS-5B
40	11.025 to 11.175	Reconstruction from Sub-Base	TCS-10B
41	11.475 to 11.700	Reconstruction from Sub-Base	TCS-5B
42	11.700 to 11.800	Reconstruction from Sub-Base	TCS-10B
43	11.800 to 12.575	Reconstruction from Sub-Base	TCS-5B
44	12.575 to 12.875	Reconstruction from Sub-Base	TCS-7B
45	12.875 to 12.925	Reconstruction from Sub-Base	TCS-6B
46	12.925 to 13.075	Reconstruction from Sub-Base	TCS-1B
47	13.075 to 13.375	Reconstruction from Sub-Base	TCS-5B
48	13.375 to 13.775	Reconstruction from Sub-Base	TCS-10B
49	13.775 to 13.975	Reconstruction from Sub-Base	TCS-1B
50	13.975 to 14.275	Reconstruction from Sub-Base	TCS-5B
51	14.275 to 14.375	Reconstruction from Sub-Base	TCS-10B
52	14.575 to 14.725	Reconstruction from Sub-grade	TCS-5C

SL NO.	Stretch From Km to Km	Remarks	TCS Type
53	14.725 to 14.825	Reconstruction from Sub-Base	TCS-9B
54	14.825 to 14.875	Reconstruction from Sub-Base	TCS-10B
55	14.875 to 15.250	Reconstruction from Sub-Base	TCS-7B
56	15.350 to 15.450	Reconstruction from Sub-Base	TCS-14B
57	16.025 to 16.375	Reconstruction from Sub-Base	TCS-7B
58	16.375 to 16.525	Reconstruction from Sub-grade	TCS-7C
59	16.525 to 16.575	Reconstruction from Sub-grade	TCS-10C
60	16.575 to 16.750	Reconstruction from Sub-grade	TCS-11C
61	17.250 to 17.525	Reconstruction from Sub-Base	TCS-5B
62	17.700 to 17.870	Reconstruction from Sub-Base	TCS-7B
63	17.870 to 17.950	Reconstruction from Sub-Base	TCS-17B

6. Roadside Drainage

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

RCC Covered Drain

Chainage		Side	Net Length (m)
From(m)	To(m)		
1875	2125	One	246
2375	2800	Both	850
2800	3125	Both	650
8625	8800	One	175
9675	9775	One	97
12575	12875	Both	600
12875	12925	One	50
14875	14975	Both	195
14975	15250	Both	545
15250	15350	Both	200
15350	15450	Both	200
15450	16025	Both	1150
16025	16175	Both	295
16175	16375	Both	391
16375	16525	Both	300
17700	17870	Both	323
Total Net length=			**6267 m**

RCC Perforated Drain

Chainage		Side	Net Length (m)
From(m)	To(m)		
0	475	Both	945
Total Net length=			**945 m**

PCC Trapezoidal Drain

Chainage		Side	Net Length (m)
From(m)	To(m)		
4975	5100	One	122
5100	5250	One	147
5250	5600	One	350
5600	5850	One	238
5850	6025	One	175
6125	6275	Both	295
6275	6325	One	47
6425	6475	One	50

Chainage		Side	Net Length (m)
From(m)	To(m)		
6475	6575	One	100
6625	6875	One	250
6875	7375	One	488
7525	7825	Both	588
8225	8400	Both	329
8400	8575	Both	350
9125	9350	One	215
9350	9675	One	325
9775	9975	One	197
10425	10625	One	179
10625	10725	One	97
10825	11025	One	197
11025	11175	Both	300
11175	11475	One	297
11475	11700	One	219
11700	11800	Both	200
11800	12575	One	769
13075	13375	One	294
13375	13775	Both	779
13975	14275	One	289
14275	14375	Both	195
14375	14575	One	200
14575	14725	One	142
14725	14825	One	100
14825	14875	Both	100
16525	16575	Both	100
16825	17125	One	297
17250	17350	One	100
17350	17425	One	75
17425	17525	One	97
17525	17625	One	100
Total Net length=			**9394 m**

7. Design of Structures

(i) General

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

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

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

Sl. No.	Bridge/Structure at km	Width of carriageway and cross-sectional features
1	3+658	Carriageway Width = 7.500 m Kerb width for railing = 0.950 m (2 X 0.475 m) Overall width = 8.450 m
2	10+553	

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

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

Sl. No.	Location at km	Remarks

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

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

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

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

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

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

(ii) Culverts

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

(b) Reconstruction of existing culverts:

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

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

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
1	0+132	2.0 X 2.0	Single Cell
2	0+692	2.0 X 2.0	Single Cell
3	0+883	2.0 X 2.0	Single Cell
4	1+01	2.0 X 2.0	Single Cell
5	1+162	2.0 X 2.0	Single Cell
6	1+302	2.0 X 2.0	Single Cell
7	1+532	2.0 X 2.0	Single Cell
8	2+029	3.0 X 4.0	Single Cell
9	3+551	2.0 X 2.0	Single Cell
10	3+852	2.0 X 2.0	Single Cell
11	3+985	2.0 X 2.0	Single Cell
12	4+167	2.0 X 2.0	Single Cell
13	4+459	2.0 X 2.0	Single Cell

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
14	5+041	2.0 X 2.0	Single Cell
15	5+112	2.0 X 2.0	Single Cell
16	5+781	2.0 X 2.0	Single Cell
17	6+186	2.0 X 2.0	Single Cell
18	6+319	2.0 X 2.0	Single Cell
19	7+430	2.0 X 2.0	Single Cell
20	7+905	2.0 X 3.0	Single Cell
21	8+052	2.0 X 2.0	Single Cell
22	8+395	2.0 X 2.0	Single Cell
23	9+255	2.0 X 2.0	Single Cell
24	9+690	2.0 X 2.0	Single Cell
25	10+063	2.0 X 2.0	Single Cell
26	10+427	2.0 X 3.0	Single Cell
27	10+653	2.0 X 2.0	Single Cell
28	10+985	2.0 X 2.0	Single Cell
29	11+282	2.0 X 2.0	Single Cell
30	12+941	2.0 X 2.0	Single Cell
31	13+426	2.0 X 2.0	Single Cell
32	13+502	2.0 X 3.0	Single Cell
33	13+530	2.0 X 2.0	Single Cell
34	13+902	2.0 X 3.0	Single Cell
35	13+980	2.0 X 3.0	Single Cell
36	14+152	2.0 X 3.0	Single Cell
37	14+187	2.0 X 2.0	Single Cell
38	14+245	2.0 X 3.0	Single Cell
39	14+972	2.0 X 2.0	Single Cell
40	14+997	2.0 X 2.0	Single Cell
41	16+046	2.0 X 2.0	Single Cell
42	16+347	4.0 X 3.0	Single Cell
43	16+736	2.0 X 2.0	Single Cell
44	16+890	2.0 X 2.0	Single Cell
45	17+513	2.0 X 2.0	Single Cell
46	17+870	2.0 X 2.0	Single Cell

*[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	9+904	2.0 X 2.0	Single Cell
2	13+753	2.0 X 2.0	Single Cell
3	14+336	2.0 X 2.0	Single Cell

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

[Refer provision of the relevant Manual and provide details]

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

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

(iii) Bridges

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

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

Refer provision of the relevant Manual and provide details

Sl. No.	Bridge location	Salient details of existing bridge		Adequacy or otherwise of the existing waterway, vertical clearance etc.*	Remarks
	(km)	Type of Structures	Span Arrangement and Total Vent way (No. x Length) (m)		
1	3+658	Composite Bridge	5X9.5	Insufficient width and not conform to IRC Loading	
2	10+553	Bailey Bridge	1x18.3	Insufficient width and not conform to IRC Loading	

(ii) The following narrow bridges shall be widened:

Sl. No.	Location (km)	Existing width (m)	Extent of widening (m)	Cross-section at deck level for widening @
Nil				

(b) Additional new bridges

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

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

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

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

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

Sl. No.	Location at km	Remarks
Nil		

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

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

Sl. No.	Location at km	Remarks
Nil		

(e) Drainage system for bridge decks

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

(f) Structures in marine environment

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

(iv) Rail-road bridges

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

(b) Road over-bridges

Road over-bridges (road over rail) shall be provided at the following level crossings. As per GAD drawings attached:

Sl. No.	Location of Level crossing (Chainage km)	Length of bridge (m)
Nil		

(c) Road under-bridges

Road under-bridges (road under railway line) shall be provided at the following level crossings as per GAD drawings attached:

Sl. No.	Location of Level crossing (Chainage km)	Number and length of span (m)
Nil		

(v) Grade separated structures

[Refer provision of the relevant Manual]

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
1	4+350	Grouting, Wearing Course, Repairing of Kerb below Parapet, Repair of parapet, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
2	5+666	Grouting, Wearing Course, Repairing of Kerb below Parapet, Repair of parapet, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
3	6+988	Grouting, Wearing Course, Repairing of Kerb below Parapet, Repair of parapet, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
4	7+311	Grouting, Wearing Course, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
5	7+597	Grouting, Wearing Course, Repairing of Kerb below Parapet, Repair of parapet, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
6	8+301	Grouting, Wearing Course, Repairing of Kerb below Parapet, Repair of parapet, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
7	8+609	Grouting, Wearing Course, Repairing of Kerb below Parapet, Repair of parapet, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
8	9+111	Grouting, Wearing Course, Repairing of Kerb below Parapet, Repair of parapet, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
9	9+306	Grouting, Wearing Course, Repairing of Kerb below Parapet, Repair of parapet, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
10	11+695	Grouting, Wearing Course, Repairing of Kerb below Parapet, Repair of parapet, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
11	12+24	Grouting, Wearing Course, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
12	13+317	Grouting, Wearing Course, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
13	14+724	Grouting, Wearing Course, construction of parapet, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
14	16+705	Grouting, Wearing Course, Painting, Stone pitching, Toe wall, Filter Blanket below pitching
15	17+711	Grouting, Wearing Course, Painting, Stone pitching, Toe wall, Filter Blanket below pitching

(b) ROB / RUB

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

(c) Overpasses/Underpasses and other structures

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

(vii) List of Major Bridges and Structures

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

Sl. No.	Location (Km)
Nil	

8. Traffic Control Devices and Road Safety Works

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

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

Sl No	Traffic Signages, Road Marking and other appurtenances	unit	Quantity
1	Stop Sign (900 mm Octagonal)	Nos.	61
2	Speed Limit (600 mm circular)	Nos.	38
3	Restriction Ends (600 mm circular)	Nos.	4
4	Left Hand Side curve (900 mm Triangular)	Nos.	24
5	Right & Left Hair Pin bend (900 mm Triangular)	Nos.	6
6	Series of bends (900 mm Triangular)	Nos.	12
7	Side Road (900 mm Triangular)	Nos.	120
8	Cross Road (900 mm Triangular)	Nos.	40
9	Pedestrian Crossing (900 mm Triangular)	Nos.	84
10	School ahead (900 mm Triangular)	Nos.	10
11	Built -up area (900 mm Triangular)	Nos.	20
12	Rumble Strip (Rumble Strip)	Nos.	20
13	Object Hazard (900x300 Rectangular)	Nos.	256
14	Place/ City identification (Direction Sign > 0.9 sqm)	Sqm.	27
15	Convex Mirror for Blind Curve	Nos.	6
16	Pavement Marking	Sqm.	5992.4
17	Road Delineators	Nos.	1356
18	Road Studs	Nos.	11560
19	W-Beam Crash Barrier	m	1700

9. Roadside Furniture

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

(ii) Overhead traffic signs: location and size

Sl. No.	Location (Km)	Size
1	At Pallel Town (Ch. 0+000 km)	11 m X 1.2 m (Double Pole)

10. Compulsory Afforestation

Not involved

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)		
6625	6875	One	250
7925	8025	One	100
14725	14825	One	100
17125	17250	One	125
Total Length			**575 m**

b) Retaining Wall

Chainage		Side	Net Length (m)
From(m)	To(m)		
6575	6625	Both	100

Chainage		Side	Net Length (m)
From(m)	To(m)		
7925	8025	One	100
9025	9125	Both	154
12875	12925	One	50
16575	16750	Both	321
16750	16825	Both	150
Total Net length			**875 m**

c) Toe wall

Chainage		Side	Net Length (m)
From(m)	To(m)		
1025	1625	Both	1184
2225	2375	One	150
3125	3475	Both	700
3475	3875	Both	677
4700	4775	One	75
4875	4975	Both	200
6025	6125	Both	200
7375	7475	Both	195
8125	8225	Both	200
8925	9025	Both	200
9975	10225	Both	495
10425	10625	One	179
10725	10825	One	100
Total Net length			**4555 m**

d) Metal Beam Crash Barrier

Sl. No.	Bridge Location (Km)	Remarks
1	3+658	25 m Metal Beam Crash Barrier is provided on both side of bridge approaches (both sides) 17 X 25 X 4 = **1700 m**
2	4+35	
3	5+666	
4	6+988	
5	7+311	
6	7+597	
7	8+301	
8	8+609	
9	9+111	
10	9+306	
11	10+553	
12	11+695	
13	12+24	
14	13+317	
15	14+724	
16	16+705	
17	17+711	

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.

Sr. No	Type of Utility	Unit	Quantity	Location/stretch (LHS/RHS)
A	Electrical Utilities			
A1	Electrical Poles	Nos.		
A2	Electrical cables	meters		
A3	Transformers	Nos.		
-	------	--		
-	-------	--		
B	Water/Sewage pipeline			
B1	Sewage	meters		
B2	Water supply	meters		
-	-------	--		
-	-------	--		
C	Felling of Tress	Nos.		

Schedule - C

(See Clause 2.1)

Project Facilities

1. Project Facilities

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

(a) Toll plaza[s]

(b) Roadside furniture;

(c) Pedestrian facilities;

(d) Truck Lay byes;

(e) Bus-bays and passenger shelters;

(f) Rest areas; and

(g) Others to be specified

2. Description of Project Facilities

Each of the Project Facilities is described below:

a) Toll Plaza :-

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

b) 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	Road side 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) Passenger shelter:-

Sl. No.	Project Facility	Location (km)	Design Requirements	Other Essential Details
1	Passenger shelter	0+100 (Both Side)	Passenger shelter has been placed on both side of proposed roadway within available ROW	Dimension of Passenger Shelter (L X B = 6.0 m X 2.0 m) (Refer Passenger Shelter Drawing)
2	Passenger shelter	1+800 (Both Side)		
3	Passenger shelter	2+710 (Both Side)		
4	Passenger shelter	7+800 (Both Side)		
5	Passenger shelter	10+250 (Both Side)		
6	Passenger shelter	12+870 (Both Side)		
7	Passenger shelter	15+400 (Both Side)		
8	Passenger shelter	16+550 (Both Side)		
9	Passenger shelter	17+650 (Both Side)		

f) Rest Areas

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

g) Others to be specified

Street Lighting:
Total 39 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>Provision as per Manual</th><th>Modified Provision</th></tr>
<tr><td rowspan="7">Shoulder</td><td rowspan="7">2.6</td><td><u>Plain & Rolling Terrain</u>
<table>
<tr><th rowspan="2">Type of Section</th><th colspan="3">Width of Shoulder (m)</th></tr>
<tr><th>Paved</th><th>Earthen</th><th>Total</th></tr>
<tr><td>Open Country with Isolated Built-up Area</td><td>1.5</td><td>2</td><td>3.5</td></tr>
<tr><td>Built-up Area (2 Lane Section)</td><td>2.5</td><td>-</td><td>2.5</td></tr>
<tr><td>Built-up Area (4 Lane Section)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Approaches to grade separated structures</td><td>2</td><td>-</td><td>3</td></tr>
<tr><td>Approaches</td><td>1.5</td><td>2</td><td>3.5</td></tr>
</table></td><td><u>Plain & Rolling Terrain</u>
<table>
<tr><th rowspan="2">Type of Section</th><th colspan="3">Width of Shoulder (m)</th></tr>
<tr><th>Paved</th><th>Earthen</th><th>Total</th></tr>
<tr><td>Open Country with Isolated Built-up Area</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Built-up Area (2 Lane Section)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Built-up Area (4 Lane Section)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Approaches to grade separated structures</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Approaches</td><td>-</td><td>-</td><td>-</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Item</th><th>Manual Clause Reference</th><th>Provision as per Manual</th><th>Modified Provision</th></tr>
<tr><td></td><td></td><td>to bridges
<table>
<tr><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></tr>
<tr><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></tr>
<tr><td>Valley Side</td><td>1.5</td><td>1</td><td>2.5</td></tr>
<tr><td rowspan="2">Built-up Area and Approaches to grade seperated structures/ bridges</td><td>Hill Side</td><td>0.25 m + 1.5 m (Raised)</td><td>-</td><td>1.75</td></tr>
<tr><td>Valley Side</td><td>0.25 m + 1.5 m (Raised)</td><td>-</td><td>1.75</td></tr>
</table></td><td>to bridges
<table>
<tr><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></tr>
<tr><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>-</td><td>-</td><td>-</td></tr>
<tr><td>Valley Side</td><td>-</td><td>Upto 1.0 m</td><td>1</td></tr>
<tr><td rowspan="2">Built-up Area and Approaches to grade separated structures/ bridges</td><td>Hill Side</td><td>2.5 m/ 1.5 m</td><td>-</td><td>2.5 m/ 1.5 m</td></tr>
<tr><td>Valley Side</td><td>2.5 m/ 1.5 m</td><td>-</td><td>2.5 m/ 1.5 m</td></tr>
</table></td></tr>
<tr><td>Design Speed</td><td>2.2</td><td><u>Plain Terrain:</u>
Ruling : 100 Kmph
Minimum : 80 Kmph
<u>Mountainous Terrain:</u>
Ruling : 60 Kmph
Minimum : 40 Kmph</td><td><u>Plain Terrain:</u>
Design Speed followed 80 kmph in general. However design speed has been reduced to 40 kmph to accommodate the proposal within EROW.
<u>Mountainous Terrain:</u>
Design Speed followed 40-60 kmph in general. However design speed has been reduced to 20 kmph due to site constraints and to accommodate the proposal within EROW.
(Refer Horizontal Alignment Drawing and Table 1.1 below))</td></tr>
<tr><td>Extra Widening</td><td>2.7</td><td>Extra Widening has been proposed as per IRC: SP: 73-2015
<table>
<tr><th>Radius</th><th>Extra Widening</th></tr>
<tr><td>75-100 m</td><td>0.9 m</td></tr>
<tr><td>101-300 m</td><td>0.6 m</td></tr>
</table></td><td>Extra Widening has been proposed as per IRC: SP: 48-1998 (Table 6.9) of Hill Road Manual.
<table>
<tr><th>Radius</th><th>Extra Widening</th></tr>
<tr><td>21-40 m</td><td>1.5 m</td></tr>
<tr><td>41-60 m</td><td>1.2 m</td></tr>
<tr><td>61-100 m</td><td>0.9 m</td></tr>
<tr><td>75-100 m</td><td>0.9 m</td></tr>
<tr><td>101-300 m</td><td>0.6 m</td></tr>
<tr><td>Above 300 m</td><td>NIL</td></tr>
</table></td></tr>
<tr><td>Radii</td><td>2.9.4</td><td><u>Plain & Rolling Terrain:</u></td><td>Radius below 75 m has been provided</td></tr>
</table>

Item	Manual Clause Reference	Provision as per Manual	Modified Provision
Of Horizontal Curve		Desirable Minimum Radius: 400 m Absolute Minimum Radius: 150 m **Mountainous Terrain:** Desirable Minimum Radius: 150 m Absolute Minimum Radius: 75 m	in the location listed in table 1.2 to accommodate the improvement proposal within EROW.
Overlay Thickness	5.9.9 (iv)	The Thickness of Bituminous Pavement strengthening shall not be less than 40 mm bituminous concrete, after attending to the requirements of profile corrective course	The Thickness of Bituminous Pavement strengthening provided is 30 mm bituminous concrete, after attending to the requirements of profile corrective course
Structure Width	7.3	Bridge - 16.0 m Culvert - 12.0 m	Bridge - 8.450 m Culvert - 7.5m/8.5 m
Design Traffic	5.4.1 (ii)	Flexible Pavement shall be designed for a minimum design period of 15 years subject to the condition that design traffic shall not be less than 20 msa.	Flexible Pavement has been designed for a design period of 20 years. Pavement base & sub base courses have been designed for 20 msa traffic and bituminous surface, binder courses have been designed for design traffic of 5 msa.
Major and Minor Junction	3.2.4	Fig 3.1	Major and Minor Junction has been developed within available ROW.
Bus Bay	12.6	Bus Bay to be provided with passenger shelter	Only Passenger Shelter is provided.

Table 1.1: Locations where Design Speed is less than 40 kmph

Sl. No.	HIP NO.	CHAINAGE (KM)		DESIGN SPEED
		From	To	
1	1	0+104	0+124	20
2	27	2+873	2+881	20
3	36	3+840	3+853	30
4	46	4+635	4+651	20
5	47	4+693	4+736	30
6	51	5+036	5+053	30
7	57	5+716	5+750	30
8	58	5+772	5+794	20
9	62	6+020	6+090	30
10	63	6+097	6+123	30
11	64	6+138	6+156	30
12	65	6+194	6+261	30
13	67	6+401	6+426	30
14	68	6+443	6+465	30
15	69	6+486	6+541	30
16	71	6+726	6+744	30
17	72	6+786	6+838	30
18	73	6+861	6+874	30
19	74	6+892	6+935	30

Sl. No.	HIP NO.	CHAINAGE (KM)		DESIGN SPEED
		From	To	
20	75	6+984	6+996	30
21	79	7+288	7+303	30
22	80	7+351	7+392	30
23	81	7+415	7+440	30
24	82	7+514	7+551	30
25	83	7+580	7+593	30
26	84	7+609	7+637	30
27	85	7+734	7+808	30
28	86	7+897	7+908	20
29	87	7+966	7+979	30
30	99	8+923	8+955	30
31	119	10+352	10+376	20
32	122	10+568	10+581	30
33	128	11+036	11+096	30
34	129	11+117	11+140	30
35	130	11+168	11+209	30
36	131	11+242	11+258	30
37	136	11+714	11+734	30
38	138	11+857	11+867	30
39	143	12+357	12+377	20
40	145	12+527	12+550	30
41	146	12+572	12+614	20
42	147	12+675	12+691	30
43	148	12+752	12+791	20
44	149	12+808	12+849	30
45	150	12+935	12+967	20
46	151	13+013	13+027	20
47	154	13+218	13+258	30
48	158	13+563	13+594	30
49	170	14+510	14+536	30
50	171	14+560	14+589	30
51	172	14+624	14+646	30
52	173	14+691	14+708	30
53	176	14+802	14+838	30
54	178	14+918	14+933	30
55	191	16+684	16+710	30
56	192	16+728	16+733	30
57	193	16+770	16+810	30
58	199	17+386	17+439	30
59	200	17+460	17+518	30
60	201	17+633	17+678	30

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

Sl. No.	HIP NO.	CHAINAGE (KM)		RADIUS
		From	To	
1	1	0+104	0+124	25
2	27	2+873	2+881	30
3	36	3+840	3+853	60
4	46	4+635	4+651	25
5	51	5+036	5+053	50
6	58	5+772	5+794	40

Sl. No.	HIP NO.	CHAINAGE (KM)		RADIUS
		From	To	
7	62	6+020	6+090	62
8	71	6+726	6+744	50
9	72	6+786	6+838	58
10	74	6+892	6+935	55
11	75	6+984	6+996	55
12	82	7+514	7+551	60
13	86	7+897	7+908	20
14	99	8+923	8+955	60
15	112	9+825	9+853	70
16	119	10+352	10+376	25
17	131	11+242	11+258	50
18	136	11+714	11+734	65
19	138	11+857	11+867	60
20	143	12+357	12+377	40
21	145	12+527	12+550	50
22	146	12+572	12+614	22
23	147	12+675	12+691	60
24	148	12+752	12+791	33
25	150	12+935	12+967	20
26	151	13+013	13+027	45
27	171	14+560	14+589	54
28	173	14+691	14+708	45
29	176	14+802	14+838	70
30	178	14+918	14+933	45
31	192	16+728	16+733	60
32	193	16+770	16+810	45
33	201	17+633	17+678	65

(iii) Note 1: Deviations from the aforesaid Specifications and Standards shall be listed out here. Such deviations shall be specified only if they are considered essential in view of project-specific requirements - **NIL**

Schedule - E

(See Clauses 2.1 and 14.2)

Maintenance Requirements

1. Maintenance Requirements

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

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

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

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

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

4. Extension of time limit

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

5. Emergency repairs/restoration

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

6. Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

The Contractor shall carry out a detailed pre-monsoon inspection of all bridges, culverts and drainage system before [1st June] every year in accordance with the guidelines contained in IRC: SP35. Report of this inspection together with details of proposed maintenance works as required on the basis of this inspection shall be sent to the Authority's Engineer before the [10th June] every year. The Contractor shall complete the required repairs before the onset of the monsoon and send to the Authority's Engineer a compliance report. Post monsoon inspection shall be done by the [30th September] and the inspection report together with details of any damages observed and proposed action to remedy the same shall be sent to the Authority's Engineer.

8. Repairs on account of natural calamities

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

Annex – I

(Schedule-E)

Repair/rectification of Defects and deficiencies

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

Table -1: Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, approaches of Grade structure, approaches of connecting roads, slip roads, lay	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm in depth	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

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**					
byes etc. as applicable)								3004.2
	Corrugations and Shoving	Nil	< 0.1 % of area	Daily	Length Measurement Unit like Scale, Tape, odometer etc.		2-7 days	IRC:82-2015
	Bleeding	Nil	< 1 % of area	Daily			3-7 days	MORT&H Specification 3004.4
	Ravelling/ Stripping	Nil	< 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	Daily			7- 15 days	IRC:82-2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	**Acceptable**					
			from the edge					
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)	Class I Profilometer : ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	180 days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-Annually			180 days	BS: 7941-1: 2006
	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 Deflectometer	IRC 115: 2014	180 days	IRC:115-2014

<table>
<tr><th rowspan="2">Asset Type</th><th rowspan="2">Performance Parameter</th><th colspan="2">Level of Service (LOS)</th><th>Frequency of Inspection</th><th>Tools/Equipment</th><th>Standards and References for Inspection and Data Analysis</th><th>Time limit for Rectification/Repair</th><th>Maintenance Specifications</th></tr>
<tr><th>Desirable</th><th>Acceptable</th><th></th><th></th><th></th><th></th><th></th></tr>
<tr><td rowspan="2">Rigid Pavement

(Pavement of MCW, Service Road, Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)</td><td>Roughness BI</td><td>2200mm/km</td><td>2400mm/km</td><td>Bi-Annually</td><td>Class I Profilometer</td><td>ASTM E950 (98) :2004 and ASTM E1656 - 94: 2000</td><td>180 days</td><td>IRC:SP:83-2008</td></tr>
<tr><td>Skid</td><td colspan="2">Skid Resistance no. at different speed of vehicles
<table><tr><th>Minimum SN</th><th>Traffic Speed (Km/h)</th></tr><tr><td>36</td><td>50</td></tr><tr><td>33</td><td>65</td></tr><tr><td>32</td><td>80</td></tr><tr><td>31</td><td>95</td></tr><tr><td>31</td><td>110</td></tr></table></td><td>Bi-Annually</td><td>SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)</td><td>IRC:SP:83-2008</td><td>180 days</td><td>IRC:SP:83-2008</td></tr>
</table>

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**					
Embankment/ Slope	Edge drop at shoulders	Nil	40mm	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	Nil	Nil	Daily Specially	NA		7-15 days	MORT&H Specification

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**					
	slope			During Rainy Season				

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

Table -2: **Maintenance Criteria for Rigid Pavements:**

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
CRACKING						
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 without delay	Seal, and stitch if L > lm. Within 7days
			3	w = 0.5 - 1.5 mm, discernible from fast-moving car		
			4	w = 1.5 - 3.0 mm	Seal, and stitch if L > l m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15days
			5	w > 3 mm.		
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		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
				slow vehicle	Within 7 days	Within 15days
			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. Within 15 days	Full Depth Repair Dismantle and reconstruct affected. Portion with norms and specifications - See Para 5.5 & 9.2 Within 15days
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	
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

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > 1 m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair with stapling. Within 15 days
			4	w = 6.0 - 12.0 mm, usually associated with spalling	Not Applicable, as it may be full depth	
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic		Full Depth Repair Dismantle and reconstruct affected portion as per norms and specifications - See Para 5.6.4 Within 15 days
4	**Multiple Cracks intersecting with one**	**w = width of crack**	0	Nil, not discernible	No Action	-
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > 1 m.	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
	or more joints		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 subbase, 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 secure broken parts Within 7 days	Seal with epoxy seal with epoxy Within 7days
			2	w < 1.5 mm; L < 0.6 m, only one corner broken		
			3	w < 1.5 mm; L < 0.6 m, two corners broken	Partial Depth (Refer Figure 8.3 of IRC:SP: 83-2008)	Full depth repair
			4	w > 1.5 mm; L > 0.6 m or three corners broken		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
			5	hree 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		No Action
			1	w < 0.5 mm; L < 3 m/m^2	Not Applicable, as it may be full depth	Seal with low viscosity epoxy to secure broken parts. Within 15days
			2	either w > 0.5 mm or L < 3 m/m^2		
			3	w > 1.5 mm and L < 3 m/m^2		
			4	w > 3 mm, L < 3 m/m^2 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/m^2 and deformation		
Surface Defects						
7	Ravelling or	r = area damaged	0	Nil, not discernible	**Short Term**	**Long Term**

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
	Honeycomb type surface	surface/total surface of slab (%) h = maximum depth of damage			No action.	Not Applicable
			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	0	Nil, not discernible	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	r < **2 %**	Local repair of areas	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
		of damage	2	r = 2 - 10 %	damaged and liable to be damaged. Within 7days	
			3	r = 10 - 20%	Bonded Inlay within 15 days	
			4	r = 20 - 30 %		
			5	r > 30 % and h > 25 mm	Reconstruct slab within 30 days	
9	**Polished Surface/Glazing**	t = texture depth, sand patch test	0		No action.	Not Applicable
			1	t > 1 mm		
			2 '	t = 1 - 0.6 mm	Monitor rate of deterioration	
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		
			5	t < 0.1 mm	Diamond Grinding if affecting 50% or more slabs in a	

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

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
				m^2	Within 30 days	

Joint Defects						
11	**Joint Seal Defects**	loss or damage L = Length as % total joint length	0	Difficult to discern.	**Short Term** No action.	**Long Term** 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.	
			3	Notable. L > 25% insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days	
			5	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 length)	0	Nil, not discernible	No action.	Not Applicable
			1	w < 10 mm	Apply low viscosity epoxy resin/ mortar in cracked portion.	
			2	w = 10 - 20 mm, L < 25%	Within 7 days	

			3	w = 20 - 40 mm, L > 25%	Partial Depth Repair. Within 15 days	
			4	w = 40 - 80 mm, L > 25%	30 - 50 mm deep, h = w + 20% of w, within 30 days	
			5	w > 80 mm, and L > 25%	50 - 100 mm deep repair. H = w + 20% of w. Within 30 days	
13	**Faulting (or Stepping) in Cracks or Joints**	f = difference of level	0	not discernible, < 1 mm	No action.	No action.
			1	f < 3 mm		
			2	f = 3 - 6 mm	Determine cause and observe, take action for diamond grinding	Replace the slab as appropriate.
			3	f = 6 - 12 mm	Diamond Grinding	Within 30days
			4	f= 12 - 18 mm	Raise sunken slab.	Replace the slab as appropriate. Within 30days
			5	f> 18 mm	Strengthen subgrade and sub-base by grouting and raising sunken slab	
14	**Blowup or Buckling**	h = vertical	0	Nil, not discernible	**Short Term**	**Long Term**

		displacement from normal profile			No Action	
			1	h < 6 mm		
			2	h = 6 - 12 mm	Install Signs to Warn Traffic within 7 days	
			3	h = 12 - 25 mm		
			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.	Not Applicable
			1	h = 5 - 15 mm		
			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	Strengthen subgrade. Reinstate pavement at normal level if L < 20 m. Within 30 days	
			5	h > 100 mm		

16	**Heave**	h = positive vertical displacement from normal profile. L = length	0	Not discernible. h < 5 mm	**Short Term** No action.	**Long Term** scrabble
			1	h = 5 - 15 mm	Follow up.	
			2	h = 15 - 30 mm, Nos <20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Stabilise subgrade. Reinstate pavement at normal level if length < 20 m. Within 30 days	
			5	h > 100 mm		
17	**Bump**	h = vertical displacement from normal profile	0	h < 4 mm	No action	
			1	h = 4 - 7 mm	Grind, in case of new construction within 7 days	Construction Limit for New Construction.
			3	h = 7 - 15 mm	Grind, in case of ongoing Maintenance within 15 days	Replace in case of new construction. Within 30days
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	**Lane to Shoulder**	f = difference of	0	Nil, not discernible	**Short Term**	**Long Term**

	Dropoff	level		< 3mm	No action.	
			1	f = 3 - 10 mm	Spot repair of shoulder within 7 days	
			2	f = 10 - 25 mm		
			3	f = 25 - 50 mm	Fill up shoulder within 7 dayss	
			4	f = 50 - 75 mm		For any 100 m stretch Reconstruct shoulder, if affecting 25% or more of stretch. 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	slight/ occasional Nos < 10%	Repair cracks and joints Without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	appreciable/ Frequent 10 - 25%	Lift or jack slab within 30 days.	
		Nos/100 m stretch	5	abundant, crack development > 25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab. Within 30 days	

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

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

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td>Highway</td><td>Availability of Safe Sight Distance</td><td>As per IRC SP :84-2014, a minimum of safe stopping sight distance shall be available throughout.
<table><tr><th>Design Speed, kmph</th><th>Desirable Minimum Sight Distance (m)</th><th>Safe Stopping Sight Distance (m)</th></tr><tr><td>100</td><td>360</td><td>180</td></tr><tr><td>80</td><td>260</td><td>130</td></tr></table></td><td>Monthly</td><td>Manual Measurements with Odometer along with video/ image backup</td><td colspan="2">Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments.
In case of permanent structure or design deficiency:
Removal of obstruction/improvement of deficiency at the earliest
Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.</td><td>IRC:SP 84-2014</td></tr>
<tr><td rowspan="2">Pavement Marking</td><td>Wear</td><td><70% of marking remaining</td><td>Bi-Annually</td><td>Visual Assessment as per Annexure-F 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>Day time Visibility</td><td>During expected life Service Time
Cement Road - 130mcd/m^2/lux
Bituminous Road - 100mcd/m^2/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>
</table>

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td rowspan="2"></td><td>Night Time Visibility</td><td>
<u>Initial and Minimum Performance for Dry Retro reflectivity during night time:</u>
<table>
<tr><td>Design Speed</td><td colspan="2">(RL) Retro Reflectivity (mcd/m^2/lux)</td></tr>
<tr><td></td><td>Initial (7 days)</td><td>Minimum Threshold level (TL) & warranty period required up to 2 years</td></tr>
<tr><td>Up to 65</td><td>200</td><td>80</td></tr>
<tr><td>65 - 100</td><td>250</td><td>120</td></tr>
<tr><td>Above 100</td><td>350</td><td>150</td></tr>
</table>
<u>Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):</u>
Initial 7 days Retro reflectivity: 100 mcd/m^2/lux
Minimum Threshold Level: 50 mcd/m^2/lux
</td><td>Bi-Annually</td><td>As per Annexure-E of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
<tr><td>Skid Resistance</td><td>Initial and Minimum performance for Skid Resistance:
Initial (7days): 55BPN</td><td>Bi-Annually</td><td>As per Annexure-G of IRC:35-2015</td><td></td><td>Within 24 hours</td><td>IRC:35-2015</td></tr>
</table>

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		Min. Threshold: 44BPN *Note: shall be considered under urban/city traffic condition encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc					
Road Signs	Shape and Position	Shape and Position as per IRC:67-2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is damaged. Relocation as per requirement	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/Cantilever Sign boards	IRC:67-2012
	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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance measuring tape	Raising Kerb Height	Within 1 Month	RC 86:1983
	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	RC 35:2015
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 backup	Rectification	Within 7 days	IRC:SP:84-2014, 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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	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, bus-shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works		Daily	-	Rectification	15 days	IRC:SP 84-2014

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
				National Highways Infrastructure Development and Corporation Limited			
Pipe/box/slab culverts	Free waterway/un obstructed 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 Delamination of concrete not more than 0.25 sq.m. Cracks wider than 0.3 mm not more than 1m aggregate length	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
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid	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	IRC: SP 40-1993 and IRC:SP:13-2004.

		apron (concrete apron) not more than 1 sqm				of rainy season whichever is earlier.	
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	3days	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 capacity	6 months	IRC SP: 51-1999.
	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 silt, debris, clogging of drainage spout collection chamber.	Monthly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainage spout if any leakages observed.	3 days	MORTH specification 2700.

Bridge-substructure	Cracks/spalling of concrete/rusted steel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting/guniting and micro concreting depending on type of defect noticed	30 days	IRC SP: 40-1993 and MORTH specification 2800.
	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture of reinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment shall be replaced, in order to get uniform load transfer on to bearings.	3 months	MORTH specification 2810 and IRC SP: 40-199.

Bridge Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection as per IRC SP:35-1990 using Mobile Bridge Inspection Unit. In case of doubt, use Underwater camera for inspection of deep wells in major Rivers.	Suitable protection works around pier/abutment	1 month	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
(iv)	Damage to road mark ups	7 (seven) days
(d)	**Road lighting**	
(i)	Any major failure of the system	24 (twenty four) hours
(ii)	Faults and minor failures	8 (eight) hours
(e)	**Trees and plantation**	
(i)	Obstruction in a minimum head- room of 5 m above carriageway or obstruction in visibility of road signs	24 (twenty four)hours
(ii)	Removal of fallen trees from carriageway	4 (four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiring replacement	30 (thirty) days

Nature of Defect or deficiency		Time limit for repair/ rectification
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
(f)	**Rest area**	
(i)	Cleaning of toilets	Every 4 (four) hours
(ii)	Defects in electrical, water and sanitary installations	24 (twenty four) hours
(g)	**[Toll Plaza]**	
(h)	**Other Project Facilities and Approach roads**	
(i)	Damage in approach roads, pedestrian facilities, truck lay- byes, bus-bays, bus-shelters, cattle crossings, [Traffic Aid Posts, Medical Aid Posts] and service roads	15 (fifteen) days
(ii)	Damaged vehicles or debris on the road	4 (four) hours
(iii)	Malfunctioning of the mobile crane	4 (four) hours
Bridges		
(a)	**Superstructure**	
(i)	Any damage, cracks, spalling/ scaling Temporary measures Permanent measures	within 48 (forty eight) hours within 15 (fifteen) days or as specified by the Authority's Engineer
(b)	**Foundations**	
(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**	

Nature of Defect or deficiency		Time limit for repair/ rectification
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3 (three) days
(iii)	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g)	**Hill Roads**	
(i)	Damage to retaining wall/breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours
(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 4.1 (vii)(a))

Applicable Permits

1. Applicable Permits

(iv) The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:

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

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

(c) Licence for use of explosives;

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

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

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

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

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

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

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

Schedule – G

(See Clauses 7.1 and 19.2)

Annex-I

(See Clause 7.1)

Form of Bank Guarantee

[Performance Security/Additional Performance Security]

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

(A) _____[name and address of contractor] (hereinafter called the "**Contractor**") and [name and address of the authority], (hereinafter called the **"Authority"**) have entered into an agreement (hereinafter called the "**Agreement**") for the **Widening/Strengthening to Two laning with hard shoulder of Pallel- Chandel section of NH-102C (Km 0.000 to Km 18.292) in the state of Manipur on Engineering, Procurement & Construction** (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 Authority of India], that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending

before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

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

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

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

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

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

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

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

10. Any notice by way of request, demand or otherwise hereunder may be sent by post

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

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:

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

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

NOTES:

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

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

Annex – II

(Schedule - G)

(See Clause 19.2)

Form for Guarantee for Advance Payment

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

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the authority], (hereinafter called the "**Authority**") for the **Widening/Strengthening to Two laning with hard shoulder of Pallel- Chandel section From Km 0.000 to Km 18.292 of NH-102C in the state of Manipur on Engineering, Procurement & Construction** (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement

(B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing *@Bank Rate + 3%* advance payment (herein after called "**Advance Payment**") equal to 10% (ten per cent) of the Contract Price; and that the Advance Payment shall be made in two installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} installment of the Advance Payment is Rs. ------ cr. (Rupees ------ crore) and the amount of this Guarantee is Rs. ------ cr. (Rupees ------ crore) (the **"Guarantee Amount")[$].**

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

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid instalment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways Authority of India], that the Contractor has committed default in the due and faithful performance of all or any of its

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

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.

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

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

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

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

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

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

[$] 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).

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

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

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

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

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

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

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

NOTES:

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

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

Schedule - H

(See Clauses10.1 (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 percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
Road Works including Culverts, widening and repair of culverts.	59.24%	**A- Widening and strengthening of existing road**	
		(1) Earthwork up to top of the sub- grade	0.03%
		(2) Sub-Base Course	1.59%
		(3) Non Bituminous Base course	6.49%
		(4) Bituminous Base course	6.23%
		(5) Wearing Coat	3.69%
		(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	1.73%
		(2) Sub Base Course	14.41%
		(3) Non Bituminous Base course	20.49%
		(4) Bituminous Base course	14.36%
		(5) Wearing Coat	8.35%
		B.2-Reconstruction/New 2-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]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		(2) Sub Base Course	[Nil]
		(3) Non Bituminous Base course	[Nil]
		(4) Bituminous Base course	[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 and New culverts on existing road, realignments, bypasses: Culverts (length <6m)	22.63%
Minor Bridges/ Underpasses/ Overpasses	16.81%	**A.1-Widening and Repair of Minor bridges (length >6 m and<60m).**	
		Minor Bridges	54.71%
		A.2- New Minor bridges (length >6 m and<60m)	
		(1) Foundation + Sub Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	32.08%
		(2) Super-structure: On completion of the super-structure in all respects including wearing coat, bearing, expansion joint, hand rails, crash barrier, road signs & markings, tests on completion etc. complete in all respect.	9.83%
		(3) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use	1.94%

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		(4) Guide Bunds & River Training Works: On completion of Guide Bunds and river Training Works complete in all respects	1.44%
		B.1- Widening and Repair of underpasses/overpasses	
		Underpasses/ Overpasses	[Nil]
		B.2-New underpasses/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) works and ROB/RUB/ elevated sections/ flyovers	Nil	**A.1- Widening and repairs of Major Bridges**	
		(1) Foundation	[Nil]
		(2) Sub-structure	[Nil]
		(3) Super-structure (including bearings)	[Nil]
		(4) Wearing Coat including expansion joints	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
including viaducts ,if any		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7) Guide Bunds, River Training works etc.	[Nil]
		(8) Approaches(including Retaining walls, stone pitching and protection works)	[Nil]
		A.2-New Major Bridges	
		(1) Foundation	[Nil]
		(2) Sub-structure	[Nil]
		(3) Super-structure (including bearings)	[Nil]
		(4) Wearing Coat including expansion joints	[Nil]
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7) Guide Bunds, River Training works etc.	[Nil]
		(8) Approaches (including Retaining walls, stone pitching and protection works)	[Nil]
		B.1-Widening and repair of **(a) ROB** **(b) RUB**	
		(1) Foundation	[Nil]
		(2) Sub-Structure	[Nil]
		(3) Super-structure (including bearings)	[Nil]
		(4) Wearing Coat: (a)in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	[Nil]
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7) Approaches (including Retaining walls, stone pitching and protection works)	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		B.2-New ROB/RUB (a) ROB (b) RUB	
		(1) Foundation	[Nil]
		(2) Sub-Structure	[Nil]
		(3) Super-structure (including bearings)	[Nil]
		(4) Wearing Coat (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	[Nil]
		(5) Miscellaneous Items like hand rails, crash barriers, 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) Foundation	[Nil]
		(2) Sub-structure	[Nil]
		(3) Super-structure (including bearings)	[Nil]
		(4)Wearing Coat including expansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barriers, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7) Approaches (including Retaining walls/ Reinforced Earth wall, stone pitching and protection works)	[Nil]
		C.2- New Elevated Section/Flyovers/Grade Separators	
		(1) Foundation	[Nil]
		(2) Sub-structure	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		(3) Super-structure (including bearings)	[Nil]
		(4)Wearing Coat including expansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barriers, 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	23.95%	(i) Toll Plaza	[Nil]
		(ii) Road side drains	43.46%
		(iii) Road signs, marking, km stones, safety devices, ...	15.31%
		(iv) Project facilities	
		(a) Bus Bays	[Nil]
		(b) Truck lay-byes	[Nil]
		(b) Passenger Shelter	2.22%
		(c) Rest areas	[Nil]
		(d) Others	[Nil]
		(v) Road side plantation	[Nil]
		(vi) Repair of protection works other than approaches to the bridges, elevated sections/ flyovers/ grade separators and ROBs/ RUBs	[Nil]
		(vii) Safety and traffic management during construction	[Nil]
		(viii) Protection Works	
		(a) Retaining wall	9.93%
		(b) Breast wall	7.57%
		(c) Toe wall	15.60%
		(ix)Site clearance & Dismantling	5.91%

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 existing road		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length.
(1) Earthwork up to top of the sub- grade	0.03%	
(2) Sub-Base Course	1.59%	
(3) Non Bituminous Base Course	6.49%	
(4) Bituminous Base Course	6.23%	
(5) Wearing Coat	3.69%	
(6) Widening and repair of culverts	[Nil]	Cost of completed culverts shall be determined pro rata basis with respect to the total no. of culverts. The payment shall be made on the completion of atleast five culverts.
B.1- Reconstruction/New 2-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 5 (five) km. length, whichever is less.
(1) Earthwork up to top of the sub-grade	1.73%	
(2) Sub Base Course	14.41%	
(3) Non-Bituminous Base Course	20.49%	
(4) Bituminous Base Course	14.36%	
(5) Wearing Coat	8.35%	
B.2- Reconstruction/New 2-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]	

Stage of Payment	Percentage weightage	Payment Procedure
(4) Pavement Quality Control (PQC) Course	[Nil]	
C.1- Reconstruction/ New service 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 Base Course	[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- Re-Construction and New culverts on existing road, realignments, bypasses		Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of at least five culverts.
(1) Culverts (length <6m)	22.63%	

@ 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:

Stage of Payment	Weightage	Payment Procedure
1	2	3
A.1-Widening and repair of minor bridges **(length > 6m and < 60m)**	54.71%	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 **(i) Foundation +Sub- Structure:** On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	32.08%	(i) Foundation +Sub- Structure: 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 + sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation +sub-structure of each bridge subject to completion of atleast two foundations along with sub-structure upto abutment/pier cap level of each bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing

1	2	3
(ii) 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.	9.83%	**(ii) Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure of atleast one span in all respects as specified in the column of "Stage of Payment" in this sub-clause.
(iii) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	1.94%	**(iii) 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.
(iv) Guide Bunds and River Training Works: On completion of Guide Bunds and river Training Works complete in all respects	1.44%	**(iv) Guide Bunds and River Training Works:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of Guide Bunds and River training Works in all respects as specified.
B.1-Widening and repair of underpasses/overpasses	[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.

1	2	3
B.2- New Underpasses/ Overpasses: **(i) Foundation +Sub-Structure:** On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	[Nil]	**(i) Foundation +Sub-Structure:** Cost of each Underpass/Overpass shall be determined on pro rata basis with respect to the total linear length (m) of the Underpasses/Overpasse s. Payment against foundation + sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation +sub- structure of each Underpasses/Overpasse s subject to completion of atleast two foundations along with sub-structure upto abutment/pier cap level each underpass/overpass. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified. **(ii) Super-structure:** Payment shall be made on pro-rata basis on
(ii) 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.	[Nil]	

1	2	3
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 as specified. **(iii) Approaches:** On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use	[Nil]	completion of a stage i.e. completion of super-structure of atleast one span in all respects as specified in the column of "Stage of Payment" in this sub-clause. **(iii) Approaches:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified.

1.3.3 Major Bridge works, ROB/RUB and Structures.

Procedure for estimating the value of Major Bridge works, ROB/RUB and Structures shall be as stated in table 1.3.3:

Table 1.3.3

Stage of Payment	Weightage	Payment Procedure
1	**2**	**3**
A.1- Widening and repairs of Major Bridges		
(i) Foundation	[Nil]	**(i) 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 subject to completion of atleast two foundations 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.

Stage of Payment	Weightage	Payment Procedure
1	2	3
(ii) Sub-structure	[Nil]	**(ii) 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 the major bridge subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge.
(iii)Super-structure (including bearings)	[Nil]	**(iii)Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	[Nil]	**(iv) Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc	[Nil]	**(v) Miscellaneous**: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	[Nil]	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Guide Bunds, River Training works etc.	[Nil]	**(vii) Guide Bunds, River Training works:** Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(viii) Approaches (including Retaining walls, stone pitching and protection works)	[Nil]	**(viii) Approaches:** Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
A.2- New Major Bridges		

Stage of Payment	Weightage	Payment Procedure
1	2	3
(i) Foundation	[Nil]	**(i) 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 subject to completion of atleast two foundations of the major Bridge . In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	[Nil]	**(ii) 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 the major bridge subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge.
(iii)Super-structure (including bearings)	[Nil]	**(iii)Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	[Nil]	**(iv) Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc	[Nil]	**(v) Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	[Nil]	**(vi)Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Guide Bunds, River Training works etc.	[Nil]	**(vii) Guide Bunds, River Training works**: Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.

Stage of Payment	Weightage	Payment Procedure
1	2	3
(viii) Approaches (including Retaining walls, stone pitching and protection works)	[Nil]	**(viii) Approaches:** Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
B.1 -Widening and repairs of **(a)ROB** **(b) RUB**		
(i) Foundation	[Nil]	**i) Foundation:** Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROBs/RUBs. 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 subject to completion of atleast two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	[Nil]	**(ii) 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 the ROB/RUB subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the ROB/RUB.
(iii)Super-structure (including bearings)	[Nil]	**(iii)Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints in case of ROB. In case of RUB, rigid pavement under RUB including drainage facility as specified.	[Nil]	**(iv) Wearing Coat:** Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified as specified.

Stage of Payment	Weightage	Payment Procedure
1	2	3
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	[Nil]	**(v) Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	[Nil]	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (including Retaining walls, stone pitching and protection works)	[Nil]	**(vii) Approaches:** Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
B.2 -New **(a) ROB** **(b) RUB**		
(i) Foundation	[Nil]	**i) Foundation**: Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROBs/RUBs. 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 subject to completion of atleast two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	[Nil]	**(ii) 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 the ROB/RUB subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the ROB/RUB.
(iii)Super-structure (including bearings)	[Nil]	**(iii)Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.

Stage of Payment	Weightage	Payment Procedure
1	2	3
(iv) Wearing Coat including expansion joints in case of ROB. In case of RUB, rigid pavement under RUB including drainage facility as specified.	[Nil]	**(iv) Wearing Coat:** Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	[Nil]	**(v) Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	[Nil]	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (including Retaining walls, stone pitching and protection works)	[Nil]	**(vii) Approaches:** Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
C.1- Widening and repairs of Elevated Section/Flyovers/ Grade Separators		
(i) Foundation	[Nil]	**(i) Foundation:** Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures. 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 subject to completion of atleast two foundations of the structure . In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	[Nil]	**(ii) 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

Stage of Payment	Weightage	Payment Procedure
1	2	3
		the scope of sub- structure of the structure subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the structure.
(iii)Super-structure (including bearings)	[Nil]	**(iii)Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	[Nil]	**(iv) Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	[Nil]	**(v) Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	[Nil]	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (including Retaining walls, stone pitching and protection works)	[Nil]	**(vii) Approaches**: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
C.2- New Elevated Section/Flyovers/ Grade Separators		
(i) Foundation	[Nil]	**(i) Foundation:** Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures. 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 subject to completion of atleast two foundations of the structure . In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.

Stage of Payment	Weightage	Payment Procedure
1	2	3
(ii) Sub-structure	[Nil]	**(ii) 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 the structure subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the structure.
(iii)Super-structure (including bearings)	[Nil]	**(iii)Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	[Nil]	**(iv) Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	[Nil]	**(v) Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	[Nil]	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (including Retaining walls, stone pitching and protection works)	[Nil]	**(vii) Approaches:** Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.

Note: (1) In case of innovate Major Bridge projects like cable suspension/cable stayed/ Extra Dozed and exceptionally long span bridges, the schedule may be modified as per site requirements before bidding with due approval of 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
(i) Toll plaza	[Nil]	Unit of measurement is each completed toll plaza. Payment of each toll plaza

Stage of Payment	Weightage	Payment Procedure
		shall be made on pro rata basis with respect to the total of all toll plazas.
(ii) Road side drains	43.46%	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10 % (ten per cent) of the total length.
(iii) Road signs, markings, km stones, safety devices, …	15.61%	
(iv) Project Facilities a) Bus bays b) Truck lay-byes c) Rest areas d) Passenger Shelter e) others	[Nil] [Nil] [Nil] 1.92% [Nil]	Payment shall be made on pro rata basis for completed facilities.
(v) Roadside plantation	[Nil]	Unit of measurement is linear length.
(vi) Repair of protection works other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs/RUBs.	[Nil]	Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(vii) Safety and traffic management during construction	[Nil]	Payment shall be made on pro rata basis every six months.
(viii) Protection Works a) Retaining wall b) Breast wall c) Toe wall	9.93% 7.57% 15.60%	Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(ix)Site clearance & Dismantling	5.91%	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.

2. Procedure for payment for Maintenance

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

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

Schedule - I

(See Clause 10.2 (iv))

Drawings

1. Drawings

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

2. Additional Drawings

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

Annex – I

(Schedule - I)

List of Drawings

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

Standard Drawings as per IRC to be used

Schedule - J

(See Clause 10.3 (ii))

Project Completion Schedule

1. Project Completion Schedule

During Construction period, the Contractor shall comply with the requirements set forth in this Schedule-J for each of the Project Milestones and the **Scheduled Completion Date**. Within 15 (fifteen) days of the date ofeach Project Milestone, the Contractor shall notify the Authority of such compliance along with necessary particulars thereof.

2. Project Milestone-I

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

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

3. Project Milestone-II

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

(ii) Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 35% (thirty five per cent) of the Contract Price **and should have started construction of all bridges.**

4. Project Milestone-III

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

(ii) Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 70% (seventy per cent) of the Contract Price and **should have started construction of all project facilities**.

5. Scheduled Completion Date

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

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

6. Extension of time

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

Schedule - K

(See Clause 12.1 (ii))

Tests on Completion

1. Schedule for Tests

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

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

2. Tests

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

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

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

(iv) Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and Standards, except tests as specified in clause 5,but shall include measuring the reflectivity of road markings and road signs; and measuring the illumination level (lux) of lighting using requisite testing equipment.

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

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

3. Agency for conducting Tests

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

4. Completion Certificate

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

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

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

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

Schedule - L

(See Clause 12.2)

Completion Certificate

1 I, …….. (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated …… (the "**Agreement**"), for "**Widening /Strengthening to Two laning with hard shoulder of Pallel-Chandel section of NH-102C (Km 0.000 to Km 18.292) in the state of Manipur**" on Engineering, Procurement and Construction (EPC) basis through ……. (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

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

SIGNED, SEALED AND DELIVERED
For and on behalf of the Authority's Engineer by:

(Signature)
(Name)
(Designation) (Address)

Schedule - M

(See Clauses 14.6, 15.2 and 19.7)

Payment Reduction for Non-Compliance

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

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

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

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

2. Percentage reductions in lump sum payments on monthly basis

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

S. No.	Item/Defect/Deficiency	Percentage
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
(d)	**Roadside Drains**	
(i)	Cleaning and repair of drains	5%
(e)	**Road Furniture**	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th km stones	5%

S. No.	Item/Defect/Deficiency	Percentage
(f)	**Miscellaneous Items**	
(i)	Removal of dead animals, broken down/accidented vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	**Defects in Other Project Facilities**	5%

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

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

Where,

P= Percentage of particular item/Defect/deficiency for deduction
M1= Monthly lump-sum payment in accordance para 1.2 above of this Schedule
M2= Monthly lump-sum payment in accordance para 1.2 above of this Schedule
L1= Non-complying length L = Total length of the road,
R= Reduction (the amount to be deducted for non-compliance for a particular item/Defect/deficiency

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

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

Schedule - N

(See Clause 18.1 (i))

Selection of Authority's Engineer

1. Selection of Authority's Engineer

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

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

2. Terms of Reference

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

3. Appointment of Government entity as Authority's Engineer

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

Annex – I
(Schedule - N)

Terms of Reference for Authority's Engineer

1. Scope

(i) These Terms of Reference (the "**TOR**") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "**Agreement**), which has been entered into between the National Highways and Infrastructure Development Corporation Ltd. (the "**Authority**") and ..... (the "**Contractor**")# for the **Widening /Strengthening to Two laning with hard shoulder of Pallel- Chandel section of NH-102C (Km 0.000 to Km 18.292) in the state of Manipur on Engineering, Procurement & Construction (EPC) basis** and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

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

2. Definitions and interpretation

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

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

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

3. General

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

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

(a) any Time Extension;

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

(c) the Termination Payment; or

(d) issuance of Completion Certificate or

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

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

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

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

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

4. Construction Period

(i) During the Construction Period, the Authority's Engineer shall review and approve the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1 (vi). The Authority's Engineer shall complete such review and approval and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

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

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

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

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

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

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

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

(ix) For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4 (ix), the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any modification/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

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

(xi) The timing of tests referred to in Paragraph 4 (ix), and the criteria for acceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.

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

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

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

(xv) The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.2.

(xvi) Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measure, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.

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

(xviii) The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate, as the case may be. For carrying out its functions under this Paragraph 4 (xviii) and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

5. Maintenance Period

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

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

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

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

(v) The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of the Project Highway for undertaking maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure, the Authority's Engineer shall monitor the reopening of such lane(s), and in case of delay, determine the Damages payable by the Contractor to the Authority under Clause 14.5.

6. Determination of costs and time

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

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

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

7. Payments

(i) The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2 (iv) (d).

(ii) Authority's Engineer shall -

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

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

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

(iv) The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provisions of Clause 19.16.

8. Other duties and functions

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

9. Miscellaneous

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

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

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

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

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

Schedule - O

(See Clauses 19.4 (i), 19.6 (i), and 19.8 (i))

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

(a) the estimated amount for the Works executed in accordance with Clause 19.3 (i) subsequent to the last claim;

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

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

(d) amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2 (iii) (a);

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

(f) Deductions:

i. Any amount to be deducted in accordance with the provisions of the Agreement except taxes;

ii. Any amount towards deduction of taxes; and

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

(g) Net claim: (e) – (f) (iii);

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

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

ii. For Change of Scope Orders, and

iii. Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

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

(j) the deductions for maintenance work not done;

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

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

(m) 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 **Widening /Strengthening to Two laning with hard shoulder of Pallel- Chandel section of NH-102C (Km 0.000 to Km 18.292) in the state of Manipur** 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)