Schedules

Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

1. The Site

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

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

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

(iv) The alignment plans of the Project Highway are specified in Annex-III. In the case of sections where no modification in the existing alignment of the Project Highway is contemplated, the alignment plan has not been provided. Alignment plans have only been given for sections where the existing alignment is proposed to be upgraded. The proposed profile of the Project Highways shall be followed by the contractor with minimum FRL as indicated in the alignment plan. The Contractor, however, improve/upgrade the Road Profile as indicated in 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 [National Highway-208] commencing from km 29.970 to km 51.440 i.e. the Fultali-Jurichhara section in the state of Tripura. 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:

S. No.	Chainage (km)		Existing Right of Way (m)	Remarks
	From	To		
1	29.970	30.100	23	Existing Alignment Followed
2	30.100	30.600	18	Mostly Existing Alignment Followed
3	30.600	31.100	14	Existing Alignment Followed
4	31.100	31.600	20	Existing Alignment Followed
5	31.600	32.100	20	Mostly Existing Alignment Followed
6	32.100	32.600	20	Mostly Existing Alignment Followed
7	32.600	33.100	15	Mostly Existing Alignment Followed
8	33.100	33.600	18	Existing Alignment Followed
9	33.600	34.100	15	Realignment Proposed
10	34.100	34.600	17	Realignment Proposed
11	34.600	35.100	22	Mostly Existing Alignment Followed
12	35.100	35.600	20	Mostly Existing Alignment Followed
13	35.600	36.100	23	Mostly Existing Alignment Followed
14	36.100	36.600	18	Realignment Proposed
15	36.600	37.100	18	Realignment Proposed
16	37.100	37.600	18	Mostly Existing Alignment Followed
17	37.600	38.100	15	Realignment Proposed
18	38.100	38.600	14	Existing Alignment Followed
19	38.600	39.100	15	Realignment Proposed
20	39.100	39.600	16	Existing Alignment Followed

S. No.	Chainage (km)		Existing Right of Way (m)	Remarks
	From	To		
21	39.600	40.100	16	Existing Alignment Followed
22	40.100	40.600	20	Existing Alignment Followed
23	40.600	41.100	19	Mostly Existing Alignment Followed
24	41.100	41.600	18	Realignment Proposed
25	41.600	42.100	14	Mostly Existing Alignment Followed
26	42.100	42.600	10	Existing Alignment Followed
27	42.600	43.100	10	Existing Alignment Followed
28	43.100	44.100	11	Mostly Existing Alignment Followed
29	44.100	44.600	10	Mostly Existing Alignment Followed
30	44.600	45.100	9	Existing Alignment Followed
31	45.100	45.600	9	Realignment Proposed
32	45.600	46.100	11	Realignment Proposed
33	46.100	46.650	12	Realignment Proposed
34	46.650	47.100	12	Existing Alignment Followed
35	47.100	47.600	11	Existing Alignment Followed
36	47.600	48.000	10	Mostly Existing Alignment Followed
37	48.000	48.600	14	Mostly Existing Alignment Followed
38	48.600	49.100	12	Mostly Existing Alignment Followed
39	49.100	49.600	11	Mostly Existing Alignment Followed
40	49.600	50.100	12	Mostly Existing Alignment Followed
41	50.100	50.600	11	Realignment Proposed
42	50.600	51.100	11	Realignment Proposed
43	51.100	51.440	11	Realignment Proposed

3. Carriageway

The present carriageway of the Project Highway is [Single/Intermediate Lane]. The type of the existing pavement is [flexible].

4. Major Bridges

The Site includes the following Major Bridges:

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

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

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

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

6. Grade separators

The Site includes the following grade separators:

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

7. Minor bridges

The Site includes the following minor bridges:

S. No.	Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub- structure	Super- structure		
1	30.562	Open	RCC	RCC Box	2 x 8.0	12.0
2	32.787	Open	RCC	RCC Box	1 x 6.0	12.0
3	33.375	Open	RCC	RCC Box	2 x 6.0	12.0
4	34.873	Open	RCC	RCC Slab	1 X 8.6	7.9
5	35.460	Open	RCC	RCC T-Girder	1 X 11.8	8.3
6	37.989	Open	RCC	RCC T-Girder	1 X 11.5	8.3
7	38.670	Open	RCC	RCC Slab	1 X 10.7	8.3
8	44.237	Open	PCC	Bailey Bridge	1 X 24.4	4.9
9	46.295	-	-	Wooden Bridge	1 X 33.5	3.6
10	48.305	Open	PCC	Bailey Bridge	1 X 42.7	5.4
11	50.735	Open	PCC	Bailey Bridge	1 X 21.3	4.2

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:

S. No.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)
1	30.514	HP	1 X 1.000	9.2
2	30.794	HP	2 X 0.900	13.0
3	31.810	HP	2 X 0.900	13.0
4	31.973	HP	1 X 0.900	12.7
5	32.128	HP	1 X 0.600	-
6	32.415	HP	1 X 0.900	10.2
7	32.700	HP	1 x 1.200	-
8	33.013	HP	1 X 0.600	10.3
9	33.458	Slab	1 X 2.600	12.0
10	33.976	HP	1 X 1.000	12.12
11	34.032	HP	1 X 0.600	-
12	34.396	Box	1 X 1.000	6.9
13	34.496	HP	2 X 0.900	12.0
14	34.682	HP	1 X 1.000	11.2
15	35.058	HP	2 X 0.900	9.0
16	35.195	HP	1 X 0.900	7.3
17	35.620	Slab	1X 0.900	9.5
18	36.000	HP	1 X 1.000	7.9
19	36.482	Box	1 X 1.000	9.0
20	36.608	HP	2 X 0.900	10.2
21	37.346	HP	1 X 1.200	-
22	37.692	HP	1 X 1.200	9.0

S. No.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)
23	37.826	HP	2 X 0.900	8.5
24	38.235	HP	Not visible	-
25	38.987	HP	1 X 0.900	12.0
26	39.097	HP	1 X 1.000	10.0
27	39.254	HP	1 X 0.900	8.8
28	39.532	HP	1 X 1.200	-
29	39.604	HP	1 X 1.200	9.1
30	39.950	HP	2 X 0.900	9.1
31	40.075	HP	1 X 1.000	8.1
32	40.379	HP	2 X 0.900	8.0
33	40.435	HP	1 X 1.000	8.2
34	40.495	HP	2 X 0.900	9.4
35	40.578	HP	1 X 1.000	9.1
36	40.642	HP	2 X 1.000	9.2
37	40.703	HP	1 X 1.000	9.5
38	40.788	HP	3 x 0.900	15.0
39	41.068	HP	2 X 1.000	11.2
40	41.401	HP	1 X 0.900	-
41	41.575	HP	2 X 0.900	8.1
42	41.704	Slab	1 X 1.200	8.6
43	41.807	HP	1 X 0.900	8.9
44	42.360	HP	1 X 0.900	-
45	42.711	HP	1 X 1.2	10.0
46	42.855	HP	1 X 0.9	10.0
47	43.372	Slab	1 X 3.0	6.0
48	43.380	HP	3 X 1.5	10.0
49	45.510	HP	1 X 1.5	12.5
50	45.575	HP	2 X 0.9	12.5
51	45.675	HP	3 X 1.2	12.5
52	45.752	HP	2 X 0.9	12.5
53	46.635	HP	1 X 1.2	10.0
54	48.104	HP	1 x 0.6 + 1 x 0.9	10.0
55	48.985	HP	1 x 1.200	15.0
56	49.498	HP	1 x 0.900	5.0
57	50.198	HP	2 X 1.2	7.5
58	50.375	HP	Not visible	10.0

11. Bus bays

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

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

12. Truck Lay byes

The details of truck lay byes are as follows:

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

13. Road side drains

The details of the roadside drains are as follows:

S. No.	Location		Type	
	From km	to km	Masonry/cc (Pucca)	Earthen (Kutcha)
1	29.970	30.190	Lined	
2	30.215	30.543	Lined	
3	31.100	31.500	Lined	
4	31.850	31.950	Lined	
5	32.050	32.350	Lined	
6	32.450	32.620	Lined	
7	33.487	33.750	Lined	
8	40.250	40.300	Lined	
9	40.325	40.500	Lined	
10	41.900	42.000	Lined	
11	42.500	42.600		Unlined
12	42.700	42.800		Unlined
13	43.170	43.250		Unlined
14	43.315	43.400		Unlined
15	43.450	43.500		Unlined
16	44.130	44.230		Unlined
17	44.230	44.260	Lined	
18	44.360	44.410		Unlined
19	44.360	44.400	Lined	
20	44.400	44.450	Lined	
21	44.500	44.550		Unlined
22	44.680	44.800		Unlined

S. No.	Location		Type	
	From km	to km	Masonry/cc (Pucca)	Earthen (Kutcha)
23	44.750	44.800		Unlined
24	44.800	44.900		Unlined
25	44.800	44.850		Unlined
26	44.900	45.000		Unlined
27	44.900	44.950		Unlined
28	45.000	45.100		Unlined
29	45.050	45.100		Unlined
30	45.100	45.700		Unlined
31	45.740	45.800	Lined	
32	45.800	46.000	Lined	
33	46.000	46.100		Unlined
34	46.600	46.700		Unlined
35	46.650	46.700	Lined	
36	46.700	46.800		Unlined
37	46.700	46.790	Lined	
38	47.250	47.380		Unlined
39	47.475	47.680		Unlined
40	48.148	48.270		Unlined
41	48.550	48.680		Unlined
42	48.610	48.800		Unlined
43	48.710	48.800		Unlined
44	48.850	49.000		Unlined
45	49.000	49.200		Unlined
46	49.110	49.201		Unlined
47	49.300	50.400		Unlined
48	50.500	50.700		Unlined
49	50.850	50.900		Unlined
50	50.900	51.000		Unlined
51	51.000	51.440		Unlined

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	42.340		√					√

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

15. Minor junctions

The details of the minor junctions are as follows:

S. No.	Location		Type	
	From km	To km	T -junction	Cross road
1	30.000		√	
2	30.745		√	
3	30.770		√	
4	31.725		√	
5	33.250		√	
6	35.350		√	
7	38.050		√	
8	38.675		√	
9	40.425		√	
10	40.480		√	
11	43.150		√	
12	43.550		√	
13	43.820		√	
14	44.925		√	
15	47.935		√	
16	49.950		√	

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.]

18. Proposed Right of Way (ROW)

The Proposed Right of Way and co-relation between existing and design chainage is given below:

Existing Chainage (km)	Design Chainage (km)	From Existing Road Center Line		Total Proposed ROW (m)	From Proposed Road Center Line		Remarks
		Proposed ROW_Left (m)	Proposed ROW_Right (m)		PROW_ Left (m)	PROW_ Right (m)	
29.970	29.200	-4.6	34.6	**30.0**	15.0	15.0	
30.082	29.300	21.0	9.0	**30.0**	15.0	15.0	
30.182	29.400	15.6	14.4	**30.0**	15.0	15.0	
30.283	29.500	27.8	4.2	**32.0**	17.0	15.0	
-	29.600	52.1	-20.1	**32.0**	17.0	15.0	Minor Realignment
30.498	29.700	15.2	14.8	**30.0**	15.0	15.0	
30.598	29.800	15.2	14.8	**30.0**	15.0	15.0	
30.697	29.900	12.4	17.6	**30.0**	15.0	15.0	
30.797	30.000	11.6	18.4	**30.0**	15.0	15.0	
30.898	30.100	23.4	6.7	**30.0**	15.0	15.0	
31.002	30.200	10.8	19.2	**30.0**	15.0	15.0	
31.103	30.300	11.3	18.7	**30.0**	15.0	15.0	
31.204	30.400	15.2	14.8	**30.0**	15.0	15.0	
31.304	30.500	14.0	16.0	**30.0**	15.0	15.0	
31.405	30.600	10.6	19.4	**30.0**	15.0	15.0	
31.505	30.700	13.0	17.0	**30.0**	15.0	15.0	
31.610	30.800	21.3	8.7	**30.0**	15.0	15.0	
31.712	30.900	-5.8	35.8	**30.0**	15.0	15.0	
31.830	31.000	33.1	-3.1	**30.0**	15.0	15.0	
31.940	31.100	10.3	19.7	**30.0**	15.0	15.0	
32.046	31.200	4.8	25.2	**30.0**	15.0	15.0	
-	31.300	15.8	14.2	**30.0**	15.0	15.0	Minor Realignment
32.292	31.400	12.4	17.6	**30.0**	15.0	15.0	
32.394	31.500	15.0	15.0	**30.0**	15.0	15.0	
32.498	31.600	30.6	-0.6	**30.0**	15.0	15.0	
32.602	31.700	10.3	19.7	**30.0**	15.0	15.0	
32.702	31.800	10.7	19.3	**30.0**	15.0	15.0	
32.807	31.900	24.1	5.9	**30.0**	15.0	15.0	
32.930	32.000	8.8	21.2	**30.0**	15.0	15.0	
33.036	32.100	13.2	16.8	**30.0**	15.0	15.0	
33.137	32.200	13.5	16.5	**30.0**	15.0	15.0	
33.238	32.300	19.4	10.6	**30.0**	15.0	15.0	
33.350	32.400	14.2	15.8	**30.0**	15.0	15.0	
33.450	32.500	17.1	12.9	**30.0**	15.0	15.0	
33.552	32.600	2.3	27.7	**30.0**	15.0	15.0	
33.664	32.700	59.8	-29.8	**30.0**	15.0	15.0	
-	32.800	53.5	-23.5	**30.0**	15.0	15.0	Minor Realignment
-	32.900	49.6	-19.6	**30.0**	15.0	15.0	Minor Realignment

Existing Chainage (km)	Design Chainage (km)	From Existing Road Center Line		Total Proposed ROW (m)	From Proposed Road Center Line		Remarks
		Proposed ROW_Left (m)	Proposed ROW_Right (m)		PROW_ Left (m)	PROW_ Right (m)	
-	33.000	-8.3	38.3	**30.0**	15.0	15.0	Minor Realignment
-	33.100	-34.5	64.5	**30.0**	15.0	15.0	Minor Realignment
34.257	33.200	9.2	20.8	**30.0**	15.0	15.0	
-	33.300	-46.3	76.3	**30.0**	15.0	15.0	Minor Realignment
34.503	33.400	16.8	13.2	**30.0**	15.0	15.0	
34.605	33.500	1.1	28.9	**30.0**	15.0	15.0	
-	33.600	-32.6	62.6	**30.0**	15.0	15.0	Minor Realignment
34.807	33.700	14.4	15.6	**30.0**	15.0	15.0	
34.910	33.800	29.5	0.6	**30.0**	15.0	15.0	
35.012	33.900	18.7	11.3	**30.0**	15.0	15.0	
35.137	34.000	22.5	7.5	**30.0**	15.0	15.0	
35.242	34.100	30.0	0.0	**30.0**	15.0	15.0	
35.350	34.200	34.1	-4.1	**30.0**	15.0	15.0	
35.460	34.300	31.2	-1.2	**30.0**	15.0	15.0	
35.590	34.400	51.4	-21.4	**30.0**	15.0	15.0	
35.694	34.500	35.1	-5.1	**30.0**	15.0	15.0	
35.795	34.600	31.5	-1.5	**30.0**	15.0	15.0	
35.898	34.700	8.5	21.5	**30.0**	15.0	15.0	
36.000	34.800	25.8	4.2	**30.0**	15.0	15.0	
-	34.900	116.8	-86.8	**30.0**	15.0	15.0	Minor Realignment
36.292	35.000	28.6	1.4	**30.0**	15.0	15.0	
36.404	35.100	40.9	-10.9	**30.0**	15.0	15.0	
-	35.200	66.2	-36.2	**30.0**	15.0	15.0	Minor Realignment
-	35.300	116.6	-86.6	**30.0**	15.0	15.0	Minor Realignment
-	35.400	124.9	-94.9	**30.0**	15.0	15.0	Minor Realignment
-	35.500	139.1	-99.1	**40.0**	20.0	20.0	Minor Realignment
-	35.600	141.7	-111.7	**30.0**	15.0	15.0	Minor Realignment
-	35.700	91.3	-59.3	**32.0**	16.0	16.0	Minor Realignment
37.195	35.800	30.7	1.3	**32.0**	16.0	16.0	
37.297	35.900	13.3	16.7	**30.0**	15.0	15.0	
37.398	36.000	12.8	17.2	**30.0**	15.0	15.0	
37.498	36.100	19.6	10.5	**30.0**	15.0	15.0	
-	36.200	-30.0	60.0	**30.0**	15.0	15.0	Minor Realignment
-	36.300	-151.1	181.1	**30.0**	15.0	15.0	Minor Realignment
-	36.400	-139.6	169.6	**30.0**	15.0	15.0	Minor Realignment
-	36.500	-132.0	162.0	**30.0**	15.0	15.0	Minor Realignment
38.075	36.600	0.7	29.3	**30.0**	15.0	15.0	
38.159	36.700	2.8	27.2	**30.0**	15.0	15.0	
38.260	36.800	6.7	23.3	**30.0**	15.0	15.0	
38.361	36.900	13.0	17.0	**30.0**	15.0	15.0	
38.461	37.000	12.4	17.6	**30.0**	15.0	15.0	
38.562	37.100	22.8	7.3	**30.0**	15.0	15.0	
38.662	37.200	28.8	1.2	**30.0**	15.0	15.0	

Existing Chainage (km)	Design Chainage (km)	From Existing Road Center Line		Total Proposed ROW (m)	From Proposed Road Center Line		Remarks
		Proposed ROW_Left (m)	Proposed ROW_Right (m)		PROW_ Left (m)	PROW_ Right (m)	
-	37.300	258.7	-228.7	**30.0**	15.0	15.0	Minor Realignment
-	37.400	193.0	-163.0	**30.0**	15.0	15.0	Minor Realignment
-	37.500	195.0	-155.0	**40.0**	20.0	20.0	Minor Realignment
-	37.600	194.1	-154.1	**40.0**	20.0	20.0	Minor Realignment
39.075	37.700	30.0	0.1	**30.0**	15.0	15.0	
39.178	37.800	25.1	4.9	**30.0**	15.0	15.0	
39.286	37.900	17.5	12.5	**30.0**	15.0	15.0	
39.387	38.000	8.8	21.2	**30.0**	15.0	15.0	
39.493	38.100	8.1	21.9	**30.0**	15.0	15.0	
39.594	38.200	16.0	14.0	**30.0**	15.0	15.0	
39.695	38.300	13.4	16.6	**30.0**	15.0	15.0	
39.795	38.400	13.9	16.1	**30.0**	15.0	15.0	
39.896	38.500	24.1	5.9	**30.0**	15.0	15.0	
40.000	38.600	9.9	20.1	**30.0**	15.0	15.0	
40.100	38.700	15.6	14.4	**30.0**	15.0	15.0	
40.203	38.800	9.6	22.4	**32.0**	15.0	17.0	
40.304	38.900	12.2	17.9	**30.0**	15.0	15.0	
40.405	39.000	16.1	13.9	**30.0**	15.0	15.0	
40.510	39.100	20.0	10.0	**30.0**	15.0	15.0	
40.612	39.200	20.8	9.2	**30.0**	15.0	15.0	
40.714	39.300	7.8	22.2	**30.0**	15.0	15.0	
40.814	39.400	3.6	26.4	**30.0**	15.0	15.0	
40.948	39.500	43.2	-13.2	**30.0**	15.0	15.0	
41.500	39.600	0.5	29.5	**30.0**	15.0	15.0	
41.161	39.700	-5.3	35.3	**30.0**	15.0	15.0	
41.282	39.800	6.4	23.6	**30.0**	15.0	15.0	
41.387	39.900	2.5	27.5	**30.0**	15.0	15.0	
41.494	40.000	39.7	-9.7	**30.0**	15.0	15.0	
41.616	40.100	13.9	16.1	**30.0**	15.0	15.0	
41.725	40.200	33.0	-3.0	**30.0**	15.0	15.0	
41.827	40.300	41.0	-11.0	**30.0**	15.0	15.0	
41.943	40.400	4.2	25.8	**30.0**	15.0	15.0	
42.045	40.500	24.3	5.7	**30.0**	15.0	15.0	
42.151	40.600	11.4	18.6	**30.0**	15.0	15.0	
42.252	40.700	14.4	8.5	**22.9**	11.5	11.5	
42.352	40.800		-	**-**	-	-	Junction road leads to Kumarghat
42.452	40.900	11.1	11.1	**22.2**	11.0	11.2	
42.553	41.000	15.5	14.5	**30.0**	15.0	15.0	
42.653	41.100	10.3	19.8	**30.0**	15.0	15.0	
42.753	41.200	24.1	5.9	**30.0**	15.0	15.0	
42.857	41.300	-0.4	30.4	**30.0**	15.0	15.0	
42.960	41.400	9.4	20.6	**30.0**	15.0	15.0	

Existing Chainage (km)	Design Chainage (km)	From Existing Road Center Line		Total Proposed ROW (m)	From Proposed Road Center Line		Remarks
		Proposed ROW_Left (m)	Proposed ROW_Right (m)		PROW_ Left (m)	PROW_ Right (m)	
43.062	41.500	20.2	9.8	**30.0**	15.0	15.0	
43.161	41.600	8.3	21.7	**30.0**	15.0	15.0	
-	41.700	-80.7	110.7	**30.0**	15.0	15.0	Minor Realignment
-	41.800	-16.6	46.6	**30.0**	15.0	15.0	Minor Realignment
43.600	41.900	34.7	-4.7	**30.0**	15.0	15.0	
43.700	42.000	26.0	4.0	**30.0**	15.0	15.0	
43.803	42.100	8.8	11.2	**20.0**	10.0	10.0	
43.904	42.200	10.2	9.8	**20.0**	10.0	10.0	
44.002	42.300	7.1	12.9	**20.0**	10.0	10.0	
44.102	42.400	13.6	6.4	**20.0**	10.0	10.0	
44.202	42.500	22.5	7.5	**30.0**	15.0	15.0	
44.300	42.600	43.2	-13.2	**30.0**	15.0	15.0	
44.412	42.700	39.1	-9.1	**30.0**	15.0	15.0	
44.512	42.800	11.5	18.5	**30.0**	15.0	15.0	
44.612	42.900	15.4	14.6	**30.0**	15.0	15.0	
44.711	43.000	21.6	8.4	**30.0**	15.0	15.0	
44.811	43.100	12.3	17.7	**30.0**	15.0	15.0	
44.912	43.200	15.7	14.3	**30.0**	15.0	15.0	
45.013	43.300	18.4	11.6	**30.0**	15.0	15.0	
-	43.400	-20.8	50.8	**30.0**	15.0	15.0	Major Realignment
-	43.500	-50.0	98.0	**48.0**	15.0	33.0	Major Realignment
-	43.600	13.7	34.3	**48.0**	15.0	33.0	Major Realignment
-	43.700	8.9	21.1	**30.0**	15.0	15.0	Major Realignment
-	43.800	-63.7	93.7	**30.0**	15.0	15.0	Major Realignment
-	43.900	-161.3	191.3	**30.0**	15.0	15.0	Major Realignment
-	44.000	-212.4	270.4	**58.0**	25.0	33.0	Major Realignment
-	44.100	-204.0	262.0	**58.0**	25.0	33.0	Major Realignment
-	44.200	-166.3	224.3	**58.0**	25.0	33.0	Major Realignment
-	44.300	-153.1	183.1	**30.0**	15.0	15.0	Major Realignment
-	44.400	-140.4	170.4	**30.0**	15.0	15.0	Major Realignment
-	44.500	-121.9	151.9	**30.0**	15.0	15.0	Major Realignment
-	44.600	-149.1	189.1	**40.0**	21.0	19.0	Major Realignment
-	44.700	-166.4	196.4	**30.0**	15.0	15.0	Major Realignment
-	44.800	-58.9	88.9	**30.0**	15.0	15.0	Major Realignment
46.736	44.900	10.9	19.1	**30.0**	15.0	15.0	
46.839	45.000	9.5	20.5	**30.0**	15.0	15.0	
46.940	45.100	15.1	14.9	**30.0**	15.0	15.0	
47.040	45.200	14.5	15.5	**30.0**	15.0	15.0	
47.142	45.300	20.5	9.5	**30.0**	15.0	15.0	
47.242	45.400	18.0	12.0	**30.0**	15.0	15.0	
47.345	45.500	6.4	23.6	**30.0**	15.0	15.0	
47.449	45.600	18.1	11.9	**30.0**	15.0	15.0	
47.550	45.700	6.9	23.1	**30.0**	15.0	15.0	

Existing Chainage (km)	Design Chainage (km)	From Existing Road Center Line		Total Proposed ROW (m)	From Proposed Road Center Line		Remarks
		Proposed ROW_Left (m)	Proposed ROW_Right (m)		PROW_ Left (m)	PROW_ Right (m)	
47.650	45.800	11.0	19.0	**30.0**	15.0	15.0	
47.752	45.900	18.6	1.5	**20.0**	10.0	10.0	
47.853	46.000	9.9	10.1	**20.0**	10.0	10.0	
47.956	46.100	28.0	2.0	**30.0**	15.0	15.0	
48.100	46.200	44.5	-14.5	**30.0**	15.0	15.0	
48.212	46.300	-8.9	38.9	**30.0**	15.0	15.0	
48.310	46.400	-22.9	52.9	**30.0**	15.0	15.0	
48.416	46.500	-8.5	38.5	**30.0**	15.0	15.0	
48.513	46.600	11.4	18.6	**30.0**	15.0	15.0	
48.613	46.700	17.9	16.1	**34.0**	17.0	17.0	
48.719	46.800	21.4	10.6	**32.0**	17.0	15.0	
48.820	46.900	16.8	15.2	**32.0**	15.0	17.0	
48.928	47.000	7.2	24.8	**32.0**	15.0	17.0	
49.035	47.100	-7.0	37.0	**30.0**	15.0	15.0	
49.150	47.200	52.2	-14.2	**38.0**	21.0	17.0	
49.287	47.300	26.5	5.5	**32.0**	17.0	15.0	
49.389	47.400	35.9	-3.9	**32.0**	17.0	15.0	
49.505	47.500	12.2	17.8	**30.0**	15.0	15.0	
49.605	47.600	17.9	12.1	**30.0**	15.0	15.0	
49.707	47.700	16.2	15.8	**32.0**	17.0	15.0	
49.832	47.800	15.2	25.8	**41.0**	21.0	20.0	
49.933	47.900	17.3	23.7	**41.0**	21.0	20.0	
50.050	48.000	63.6	-22.6	**41.0**	21.0	20.0	
50.150	48.100	41.8	-9.8	**32.0**	17.0	15.0	
50.258	48.200	9.4	43.6	**53.0**	20.0	33.0	
50.375	48.300	-38.2	91.2	**53.0**	20.0	33.0	
50.480	48.400	-11.9	64.9	**53.0**	20.0	33.0	
50.590	48.500	38.9	-3.9	**35.0**	20.0	15.0	
50.694	48.600	34.0	-4.0	**30.0**	15.0	15.0	
-	48.700	116.1	-79.1	**37.0**	20.0	17.0	Minor Realignment
-	48.800	221.7	-184.7	**37.0**	20.0	17.0	Minor Realignment
-	48.900	225.6	-188.6	**37.0**	20.0	17.0	Minor Realignment
-	49.000	163.6	-126.6	**37.0**	20.0	17.0	Minor Realignment
-	49.100	87.7	-50.7	**37.0**	20.0	17.0	Minor Realignment
51.440	49.200	-0.9	30.9	**30.0**	15.0	15.0	Minor Realignment

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:

Sl. No	From km	to km	Length (km)	Width (m)	Date of providing Right of Way*
(1)	(2)		(3)	(4)	(5)
(i) Full Right of Way (full width)					
1	29.200	29.450	0.250	30	On Appointed date
2	29.450	29.650	0.200	32	
3	29.650	35.440	5.790	30	
4	35.440	35.550	0.110	40	
5	35.550	35.700	0.150	30	
6	35.700	35.850	0.150	32	
7	35.850	37.500	1.650	30	
8	37.500	37.600	0.100	40	
9	37.600	38.730	1.130	30	
10	38.730	38.800	0.070	32	
11	38.800	40.650	1.850	30	
12	40.650	40.950	0.300	varying	
13	40.950	42.050	1.100	30	
14	42.050	42.420	0.370	20	
15	42.420	42.500	0.080	22	
16	42.500	43.450	0.950	30	
17	43.450	43.620	0.170	48	
18	43.620	44.000	0.380	30	
19	44.000	44.270	0.270	58	
20	44.270	44.540	0.270	30	
21	44.540	44.630	0.090	40	
22	44.630	45.800	1.170	30	
23	45.800	46.100	0.300	20	
24	46.100	46.670	0.570	30	
25	46.670	46.700	0.030	32	
26	46.700	46.800	0.100	32	
27	46.800	46.880	0.080	30	
28	46.880	47.030	0.150	32	
29	47.030	47.180	0.150	30	
30	47.180	47.250	0.070	38	
31	47.250	47.450	0.200	32	

Sl. No	From km	to km	Length (km)	Width (m)	Date of providing Right of Way*
(1)	(2)		(3)	(4)	(5)
32	47.450	47.610	0.160	30	On Appointed date
33	47.610	47.700	0.090	32	
34	47.700	47.800	0.100	30	
35	47.800	48.000	0.200	41	
36	48.000	48.040	0.040	30	
37	48.040	48.100	0.060	32	
38	48.100	48.190	0.090	30	
39	48.190	48.450	0.260	53	
40	48.450	48.550	0.100	35	
41	48.550	48.700	0.150	30	
42	48.700	49.100	0.400	37	
43	49.100	49.200	0.100	30	
(ii) Part Right of Way (full width) (a) Stretch (b) Stretch (c) Stretch					
(iii) Balance Right of Way (full width) (a) Stretch (b) Stretch (c) Stretch					

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

Annex - III

(Schedule-A)

Alignment Plans

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

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

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

Annex – IV

(Schedule-A)

Environment Clearances

No Environment Clearance is 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-Laning and Strengthening] of the Project Highway as described in Annex-I of this Schedule-B and in Schedule-C.

3. Specifications and Standards

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

Annex – I

(Schedule-B)

Description of [Two-Laning][$]

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

1. Widening of the Existing Highway

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

(ii) Width of Carriageway

(a) Two-Laning [with] paved shoulders shall be undertaken. The paved carriageway shall be [7(seven) m] wide in accordance with the typical cross sections drawings in the Manual.

Provided that in the built-up areas [refer to paragraphs 2.1 (ii) (a) of the Manual and provide necessary details]: the width of the carriageway shall be as specified in the following table:

Sl. No.	Built-up stretch (Township)	Location (km to km)		Width (m)	Typical cross section (Ref. to Manual)
1	Rajnagar	42.175	42.425	12 m	TCS-4

(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.

[$] The contents of this Annex-I may be modified in accordance with the structure of the Project.

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

The design speed shall be the minimum design speed of [80 km per hr for plain/rolling terrain].

(iii) Improvement of the existing road geometrics

[Refer to paragraph 2.1 (v) of the Manual and provide details]

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

Sl. No.	Stretch (from km to km)		Type of Deficiency	Remarks
1	30+162.719	30+214.992	R=230 m	Plain & Rolling Terrain
2	31+162.557	31+376.005	R=230 m	
3	32+319.767	32+355.741	R=60 m	
4	32+531.894	32+576.179	R=155 m	
5	32+968.495	33+152.060	R=155 m	
6	33+631.254	33+636.717	R=155 m	
7	34+233.318	34+241.411	R=150 m	
8	34+400.924	34+443.712	R=100 m	
9	36+464.492	36+598.144	R=155 m	
10	37+300.906	37+577.275	R=170 m	
11	37+832.575	37+916.610	R=155 m	
12	38+201.626	38+243.180	R=155 m	
13	38+388.545	38+398.079	R=200 m	
14	38+573.356	38+583.676	R=155 m	
15	39+004.968	39+104.968	R=155 m	
16	39+375.975	39+461.675	R=160 m	
17	39+659.519	39+800.901	R=160 m	
18	40+023.340	40+088.443	R=160 m	
19	40+333.880	40+391.797	R=155 m	
20	40+548.410	40+563.942	R=200 m	
21	42+266.037	42+309.006	R=155 m	
22	43+243.004	43+280.113	R=200 m	
23	44+976.878	45+010.054	R=155 m	
24	45+240.912	45+256.854	R=200 m	

25	45+498.028	45+559.083	R=155 m	
26	46+761.670	46+777.573	R=50 m	
27	46+927.315	47+023.199	R=125 m	Plain & Rolling Terrain
28	47+216.344	47+320.921	R=155 m	
29	47+727.989	47+764.650	R=90 m	
30	48+455.234	48+486.884	R=100 m	

(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	42.175	42.425	Yes	TCS-4

(b) In open country, [paved shoulders of 1.5 m width shall be provided and balance 1.0m width shall be covered with 150 mm thick compacted layer of granular material].

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

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 relevant Manual. The requisite particulars are given below:

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

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

(b) In the case of grade separated structures, the type of structure and the level of the Project Highway and the cross roads shall be as follows: [Refer to the provision of relevant 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 relevant Manual and specify the requirements of cattle and pedestrian

underpass/overpass]

Sl. No.	Location	Type of crossing
Nil		

(xi) Typical cross-sections of the Project Highway

[Give typical cross-sections of the Project Highway by reference to the Manual]

As per attached Drawings

TCS TYPE	DESCRIPTION
TCS-1	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder In Rural Area (Reconstruction) Applicable For Plain/Rolling Terrain
TCS-2	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder In Bypass And Realignment Stretch (Newconstruction) Applicable For Plain/Rolling Terrain
TCS-3	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder In Bypass And Realignment Stretch Applicable For Plain/Rolling Terrain In Cutting Section (Newconstruction)
TCS-4	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder And Both Side RCC Cover Drain In Builtup Area Applicable For Plain/Rolling Terrain (Reconstruction)
TCS-5	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder And Both Side Rectangular Brick Masonary Drain Applicable For Mountainous Terrain (Reconstruction)
TCS-6	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder And Left Side Rectangular Brick Masonary Drain Applicable For Mountainous Terrain (Reconstruction)
TCS-7	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder And Right Side Rectangular Brick Masonary Drain Applicable For Mountainous Terrain (Reconstruction)
TCS-8	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder Left Side Breast Wall And Right Side Rectangular Brick Masonary Drain Applicable For Mountainous Terrain (Reconstruction)
TCS-9	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder Right Side Breast Wall And Left Side Rectangular Brick Masonary Drain Applicable For Mountainous Terrain (Reconstruction)
TCS-10	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder Right Side Retaining Wall And Left Side Rectangular Brick Masonary Drain Applicable For Mountainous Terrain (Reconstruction)

TCS TYPE	DESCRIPTION
TCS-12	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder Left Side Breast Wall And Right Side Retaining Wall Applicable For Mountainous Terrain (Reconstruction)
TCS-14	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder And Both Side Retaining Wall Applicable For Mountainous Terrain (Reconstruction)
TCS-15	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder And Both Side Breast Wall Applicable For Mountainous Terrain (Newconstruction)
TCS-16	Typical Cross Section Of 2-Lane Carriageway With Paved Shoulder And Both Side Rectangular Brick Masonary Drain Applicable For Mountainous Terrain (Newconstruction)

Design Chainage (m)		Length (m)	TCS Type
From	To		
29200	29350	150	TCS-2
29350	29410	60	TCS-1
29410	29700	290	TCS-3
29700	30570	870	TCS-1
30570	31240	670	TCS-2
31240	31460	220	TCS-3
31460	31490	30	TCS-1
31490	31535	45	TCS-2
31535	31620	85	TCS-3
31620	32100	480	TCS-2
32100	32300	200	TCS-1
32300	32425	125	TCS-2
32425	32575	150	TCS-1
32575	32950	375	TCS-3
32950	33050	100	TCS-2
33050	33350	300	TCS-3
33350	33425	75	TCS-2
33425	33550	125	TCS-3
33550	33600	50	TCS-2
33600	33700	100	TCS-3
33700	33850	150	TCS-2
33850	33900	50	TCS-1
33900	34450	550	TCS-2
34450	34650	200	TCS-16
34650	34750	100	TCS-1
34750	34850	100	TCS-7

Design Chainage (m)		Length (m)	TCS Type
From	To		
34850	34950	100	TCS-15
34950	35000	50	TCS-16
35000	35075	75	TCS-7
35075	35325	250	TCS-16
35325	35425	100	TCS-2
35425	35900	475	TCS-15
35900	35975	75	TCS-6
35975	36200	225	TCS-5
36200	36600	400	TCS-2
36600	37200	600	TCS-1
37200	37475	275	TCS-2
37475	37575	100	TCS-15
37575	37750	175	TCS-2
37750	38000	250	TCS-7
38000	38250	250	TCS-1
38250	38400	150	TCS-5
38400	38725	325	TCS-1
38725	38825	100	TCS-9
38825	38925	100	TCS-7
38925	39350	425	TCS-1
39350	39525	175	TCS-15
39525	39675	150	TCS-2
39675	39950	275	TCS-7
39950	40325	375	TCS-2
40325	40425	100	TCS-7
40425	40625	200	TCS-2
40625	40800	175	TCS-1
40800	40975	175	TCS-3
40975	41175	200	TCS-1
41175	41225	50	TCS-6
41225	42175	950	TCS-1
42175	42425	250	TCS-4
42425	42475	50	TCS-7
42475	42675	200	TCS-1
42675	42825	150	TCS-5
42825	43025	200	TCS-1
43025	43150	125	TCS-5
43150	43325	175	TCS-1
43325	43450	125	TCS-5
43450	43575	125	TCS-9

Design Chainage (m)		Length (m)	TCS Type
From	To		
43575	43625	50	TCS-3
43625	43875	250	TCS-9
43875	43975	100	TCS-1
43975	44000	25	TCS-5
44000	44275	275	TCS-15
44275	44425	150	TCS-2
44425	44475	50	TCS-7
44475	44850	375	TCS-2
44850	45325	475	TCS-1
45325	45500	175	TCS-5
45500	45575	75	TCS-1
45575	45800	225	TCS-5
45800	46075	275	TCS-1
46075	46600	525	TCS-2
46600	46875	275	TCS-5
46875	47000	125	TCS-9
47000	47200	200	TCS-16
47200	47250	50	TCS-14
47250	47450	200	TCS-8
47450	47550	100	TCS-5
47550	47650	100	TCS-8
47650	47700	50	TCS-10
47700	47750	50	TCS-14
47750	47800	50	TCS-10
47800	47900	100	TCS-12
47900	47950	50	TCS-8
47950	48100	150	TCS-16
48100	48150	50	TCS-15
48150	48350	200	TCS-9
48350	48400	50	TCS-15
48400	48450	50	TCS-5
48450	48550	100	TCS-8
48550	48650	100	TCS-14
48650	48700	50	TCS-5
48700	49050	350	TCS-15
49050	49200	150	TCS-16
Total length =		**20,000 m**	

3. Intersections and Grade Separators

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

[Refer to the provision of 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.	Intersection at km	Type of intersection	Other features
1	40.788	3-legged	

Minor Intersections

Sl. No.	Intersection at km	Type of intersection	Other features
1	29.220	3- legged	
2	29.945	3- legged	
3	29.970	3- legged	
4	30.880	3- legged	
5	32.300	3- legged	
6	34.190	3- legged	
7	36.580	3- legged	
8	37.240	3- legged	
9	39.020	3- legged	
10	39.065	3- legged	
11	41.590	3- legged	
12	41.850	3- legged	
13	42.110	3- legged	
14	43.215	3- legged	
15	46.080	3- legged	
16	47.900	3- legged	

(ii) Grade separated intersection with/without ramps

Sl. No.	Location (km)	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 the provision of relevant Manual and specify sections to be raised]

The existing road shall be raised in the following sections:

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

5. Pavement Design

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

(ii) Type of pavement

[Refer to the provision of relevant Manual and state specific requirement, if any, of providing cement concrete pavement.]

(iii) Design requirements

[Refer to the provision of 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 15 years. Stage construction shall not be permitted.

b) Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for design traffic of 20 million standard axles.

(iv) Reconstruction of stretches

[Refer to the provision of 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
1	29.350	29.410	TCS-1
2	29.700	30.570	TCS-1
3	31.460	31.490	TCS-1
4	32.100	32.300	TCS-1
5	32.425	32.575	TCS-1
6	33.850	33.900	TCS-1
7	34.650	34.750	TCS-1
8	34.750	34.850	TCS-7
9	35.000	35.075	TCS-7
10	35.900	35.975	TCS-6
11	35.975	36.200	TCS-5
12	36.600	37.200	TCS-1
13	37.750	38.000	TCS-7
14	38.000	38.250	TCS-1
15	38.250	38.400	TCS-5
16	38.400	38.725	TCS-1
17	38.725	38.825	TCS-9
18	38.825	38.925	TCS-7
19	38.925	39.350	TCS-1
20	39.675	39.950	TCS-7
21	40.325	40.425	TCS-7
22	40.625	40.800	TCS-1
23	40.975	41.175	TCS-1
24	41.175	41.225	TCS-6
25	41.225	42.175	TCS-1
26	42.175	42.425	TCS-4
27	42.425	42.475	TCS-7
28	42.475	42.675	TCS-1
29	42.675	42.825	TCS-5
30	42.825	43.025	TCS-1
31	43.025	43.150	TCS-5
32	43.150	43.325	TCS-1
33	43.325	43.450	TCS-5
34	43.450	43.575	TCS-9
35	43.625	43.875	TCS-9
36	43.875	43.975	TCS-1
37	43.975	44.000	TCS-5
38	44.425	44.475	TCS-7
39	44.850	45.325	TCS-1
40	45.325	45.500	TCS-5

Sl. No.	Stretch From km to km		Remarks
41	45.500	45.575	TCS-1
42	45.575	45.800	TCS-5
43	45.800	46.075	TCS-1
44	46.600	46.875	TCS-5
45	46.875	47.000	TCS-9
46	47.200	47.250	TCS-14
47	47.250	47.450	TCS-8
48	47.450	47.550	TCS-5
49	47.550	47.650	TCS-8
50	47.650	47.700	TCS-10
51	47.700	47.750	TCS-14
52	47.750	47.800	TCS-10
53	47.800	47.900	TCS-12
54	47.900	47.950	TCS-8
55	48.150	48.350	TCS-9
56	48.400	48.450	TCS-5
57	48.450	48.550	TCS-8
58	48.550	48.650	TCS-14
59	48.650	48.700	TCS-5

6. Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per the provision of relevant Manual.

List of RCC Cover Drain

Chainage (m)		Side	Net Length (m)
From	To		
42175	42425	Both	500.00
Total=			**500 m**

List of Brick Masonry Drain

Chainage (m)		Side	Net Length (m)
Form	To		
34450	34650	Both	400.00
34750	34850	Right	100.00
34950	35000	Both	100.00
35000	35075	Right	75.00
35075	35325	Both	494.6
35900	35975	Left	72.40
35975	36200	Both	450.00
37750	38000	Right	247.40

Chainage (m)		Side	Net Length (m)
Form	To		
38250	38400	Both	300.00
38725	38825	Left	100.00
38825	38925	Right	100.00
39675	39950	Right	272.30
40325	40425	Right	100.00
41175	41225	Left	50.00
42425	42475	Right	50.00
42675	42825	Both	300.00
43025	43150	Both	250.00
43325	43450	Both	250.00
43450	43575	Left	125.00
43625	43875	Left	250.00
43975	44000	Both	50.00
44425	44475	Right	50.00
45325	45500	Both	350.00
45575	45800	Both	450.00
46600	46875	Both	550.00
46875	47000	Left	122.40
47000	47200	Both	394.80
47250	47450	Right	200.00
47450	47550	Both	194.80
47550	47650	Right	100.00
47650	47700	Left	50.00
47750	47800	Left	47.40
47900	47950	Right	50.00
47950	48100	Both	300.00
48150	48350	Left	200.00
48400	48450	Both	100.00
48450	48550	Right	100.00
48650	48700	Both	100.00
49050	49200	Both	300.00
Total=			**7,796 m**

List of Catch Water Drain

Chainage(m)		No. of Steps	Side	Net Length (m)
Form	To			
34850	34950	1	Both	200.00
35425	35550	1	Both	250.00
35750	35900	1	Both	300.00

Chainage(m)		No. of Steps	Side	Net Length (m)
Form	To			
37500	37575	1	Both	150.00
38725	38825	1	Left	100.00
43450	43575	1	Left	125.00
43800	43875	1	Left	75.00
44000	44275	2	Both	1100.00
46925	47000	1	Left	75.00
47900	47950	1	Right	50.00
48150	48350	1	Left	194.60
48350	48400	1	Both	100.00
48450	48550	1	Right	100.00
48700	49050	1	Both	700.00
Total=				**3,520 m**

7. Design of Structures

(i) General

(a) All bridges, culverts and structures shall be designed and constructed in accordance with the provision of 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 the provision of 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 at km	Width of carriageway and cross-sectional features*
1	31.878	**Carriageway Width = 11.0 m** Footpath width= 3.0m (2x1.5m) Width of Crash Barrier = 1.0m (2x0.5m) Width of Railings = 1.0m (2x0.50m) **Overall width = 16 m**
2	33.760	
3	34.295	
4	37.210	
5	42.529	
6	44.554	
7	46.384	
8	48.637	

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

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

Structures with footpath.]

Sl. No.	Location at km	Remarks
1	31.878	1.5 m wide Footpath on Both Side
2	33.760	
3	34.295	
4	37.210	
5	42.529	
6	44.554	
7	46.384	
8	48.637	

(d) All bridges shall be high-level bridges.
[Refer to the provision of relevant Manual and state if there is any exception]

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

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

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

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

(ii) Culverts

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

(b) Reconstruction of existing culverts:

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

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

Sl. No.	Culvert location (km)	Span/Opening (m)	Remarks, if any*

Sl. No.	Culvert location (km)	Span/Opening (m)	Remarks, if any*
1	29.716	2.0 X 3.0 X (Single Cell)	
2	29.997	3.0 X 4.0 X (Single Cell)	
3	31.010	2.0 X 2.0 X (Single Cell)	
4	31.126	2.0 X 2.0 X (Single Cell)	
5	31.520	2.0 X 3.0 X (Single Cell)	
6	31.809	2.0 X 3.0 X (Single Cell)	
7	32.074	2.0 X 3.0 X (Single Cell)	
8	32.505	2.0 X 3.0 X (Single Cell)	
9	33.045	3.0 X 4.0 X (Single Cell)	
10	33.391	3.0 X 4.0 X (Single Cell)	
11	34.053	2.0 X 2.0 X (Single Cell)	
12	34.430	2.0 X 3.0 X (Single Cell)	
13	35.948	2.0 X 2.0 X (Single Cell)	
14	36.775	2.0 X 2.0 X (Single Cell)	
15	37.721	3.0 X 4.0 X (Single Cell)	
16	37.870	2.0 X 2.0 X (Single Cell)	
17	38.139	2.0 X 3.0 X (Single Cell)	
18	38.553	2.0 X 3.0 X (Single Cell)	
19	38.675	2.0 X 3.0 X (Single Cell)	
20	38.975	2.0 X 2.0 X (Single Cell)	
21	39.030	2.0 X 2.0 X (Single Cell)	
22	39.086	2.0 X 3.0 X (Single Cell)	
23	39.228	2.0 X 2.0 X (Single Cell)	
24	39.297	2.0 X 2.0 X (Single Cell)	
25	39.381	2.0 X 3.0 X (Single Cell)	
26	39.610	2.0 X 3.0 X (Single Cell)	
27	39.895	2.0 X 3.0 X (Single Cell)	
28	40.075	3.0 X 4.0 X (Single Cell)	
29	40.203	2.0 X 3.0 X (Single Cell)	
30	41.158	2.0 X 2.0 X (Single Cell)	

Sl. No.	Culvert location (km)	Span/Opening (m)	Remarks, if any*
31	41.284	3.0 X 4.0 X (Single Cell)	
32	46.200	2.0 X 2.0 X (Single Cell)(3m E.C)	
33	47.055	2.0 X 2.0 X (Single Cell)	
34	47.494	2.0 X 2.0 X (Single Cell)	
35	48.150	2.0 X 2.0 X (Single Cell) (3m E.C)	

*[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 the provision of 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 (km)	Span/Opening (m)
1	30.617	2.0 X 2.0 X (Single Cell)
2	34.694	2.0 X 2.0 X (Single Cell)
3	35.080	2.0 X 3.0 X (Single Cell)
4	35.590	2.0 X 3.0 X (Single Cell)
5	36.235	2.0 X 3.0 X (Single Cell)
6	36.440	2.0 X 2.0 X (Single Cell)
7	40.516	2.0 X 3.0 X (Single Cell)
8	41.758	3.0 X 3.0 X (Single Cell)
9	43.950	2.0 X 2.0 X (Single Cell)(3m E.C)
10	45.515	3.0 X 4.0 X (Single Cell)
11	46.900	2.0 X 2.0 X (Single Cell)

Sl No.	Culvert location (km)	Span/Opening (m)
12	47.767	2.0 X 2.0 X (Single Cell)(3m E.C)

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

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

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

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

(iii) Bridges

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

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

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

Sl. No.	Bridge location (km)	Salient details of existing bridge		Adequacy or otherwise of the existing waterway, vertical clearance, etc*	Remarks
		Type of Structures	Span Arrangement and Total Vent way (No. x Length) (m)		
1	31.878	RCC Box	1 x 6.0	–	
2	33.760	RCC Slab Bridge	1 X 8.6	Insufficient width and not conform to IRC Loadings.	
3	34.295	RCC T-Girder	1 X 11.8	Insufficient width and not conform to IRC Loadings.	
4	37.210	RCC T-Girder	1 X 10.7	Insufficient width and not conform to IRC Loadings.	
5	42.529	Bailey Bridge	1 X 24.4	Insufficient width and not conform to IRC Loadings.	

6	44.554	Wooden Bridge	1 X 33.5	–	
7	46.384	Bailey Bridge	1 X 42.7	Insufficient width and not conform to IRC Loadings.	
8	48.637	Bailey Bridge	1 X 21.3	Insufficient width and not conform to IRC Loadings.	

*Attach GAD

(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				

@ Attach cross-section

(b) Additional new bridges

[Specify additional new bridges if required, and attach GAD]

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

Sl. No.	Location (km)	Total length (m)	Remarks, if any
Nil			

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

[Refer to the provision of 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 the provision of 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 the provision of relevant Manual.

(f) Structures in marine environment

[Refer to the provision of 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 the provision of relevant Manual. [Refer to the provision of relevant Manual and specify modification, if any]

(b) Road over-bridges

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

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

(c) Road under-bridges

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

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

(v) Grade separated structures

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

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

(a) Bridges

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

(b) ROB / RUB

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

(c) Overpasses/Underpasses and other structures

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

(vii) List of Major Bridges and Structures

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

Sl. No.	Location (km)
Nil	

8. Traffic Control Devices and Road Safety Works

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

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

9. Roadside Furniture

(i) Roadside furniture shall be provided in accordance with the provisions of the relevant Manual.

(ii) Overhead traffic signs: location and size

Sl. No.	Location (km)	Size	Remarks
Nil			

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

10. Compulsory Afforestation

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

11. Hazardous Locations

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

a) Retaining Wall

Sl. No.	Location stretch from (km) to (km)		LHS/RHS
	From	To	
1	47.200	47.250	Both Side
2	47.650	47.700	RHS
3	47.700	47.750	Both Side
4	47.750	47.800	RHS
5	47.800	47.900	RHS
6	48.550	48.650	Both Side

b) Breast Wall

Sl. No.	Location stretch from (km) to (km)		LHS/RHS
	From	To	
1	34.850	34.950	Both Side
2	35.425	35.900	Both Side
3	37.475	37.575	Both Side
4	38.725	38.825	RHS
5	39.350	39.525	Both Side
6	43.450	43.575	RHS
7	43.625	43.875	RHS
8	44.000	44.275	Both Side
9	46.875	47.000	RHS
10	47.250	47.450	LHS
11	47.550	47.650	LHS
12	47.800	47.900	LHS
13	47.900	47.950	LHS
14	48.100	48.150	Both Side
15	48.150	48.350	RHS
16	48.350	48.400	Both Side
17	48.450	48.550	LHS

Sl. No.	Location stretch from (km) to (km)		LHS/RHS
	From	To	
18	48.700	49.050	Both Side

c) Built-up Area

Sl. No.	Location stretch from (km) to (km)	LHS/RHS
1	42.175 to 42.425	Both Side

12. Special Requirement for Hill Roads

[Refer to 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 – B-1)

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 Authority.

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) tree plantation;

(e) truck lay-byes;

(f) bus-bays and bus shelters;

(g) rest areas; and

(h) others to be specified

2. Description of Project Facilities

Each of the Project Facilities is described below:

(a) Toll Plaza: Nil

(b) Roadside Furniture:

Sl. No.	Project Facility	Location	Design Requirements	Other essential details
1	Traffic Sign & Pavement marking	Entire Length	As per Schedule D	
2	Km stone, Hectometer Stone, 5th kilometre stone	Entire Length	As per Schedule D	
3	Boundary Stone	Entire Length	As per Schedule D	
4	Roadside Delineator, marker & Road Stud	As per manual	As per Schedule D	
5	Metal beam crash barrier	Both approaches of bridge location	As per Schedule D	

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.

(c) Pedestrian Facilities:

Pedestrian facilities in the form of footpath cum drain 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 Authority.

(d) Tree Plantation: To be carried out by Unakoti District Forest Department.

(e) Truck Lay Byes: Nil

(f) Busbays and Bus shelters:

Sl. No.	Project Facility	Location (km)	Design Requirements	Other Essential Details
1	Bus Bay	43.535	(Both side) Separation from main carriageway	Start Taper-100 m, Straight-30 m, End Taper-100 m
2	Bus Bay	45.750	(One side) Separation from main carriageway	Start Taper-100 m, Straight-30 m, End Taper-100 m
3	Bus Bay	46.565	(One Side) Separation from main carriageway	Start Taper-100 m, Straight-30 m, End Taper-100 m

(g) Rest areas: Nil

(h) Others:

Street Lighting

Street lighting shall be provides in the built up area, bus bay and junction location.

Environment

The Project Highway during design, construction and maintenance during implementation period shall conform to the environmental rules and regulations in force. The Construction Contractor shall be responsible for the same.

Schedule - D

(See Clause 2.1)

Specifications and Standards

1. Construction

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

2. Design Standards

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

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

[Hill Road Manual (IRC: SP: 48-1998)]

[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-Laning 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:]

(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.]

Locations where Radii of horizontal curve is less than Absolute minimum radius of 250m.

HIP/CURVE NO.	HIP		RADIUS (m)
	EASTING	NORTHING	
18	396865.239	2681422.948	230
20	397181.589	2680429.963	230
23	396751.906	2679480.865	60
24	396908.356	2679334.468	155
25	396971.127	2678824.269	155
26	396391.243	2678763.807	155
28	395967.188	2678351.844	150
29	395934.004	2678171.461	100
32	396172.254	2676214.969	155
34	397077.498	2675950.553	170
35	396879.507	2675518.071	155
36	397041.515	2675212.500	155
37	397199.971	2675149.921	200
38	397346.234	2675037.672	155
40	397445.067	2674577.686	155
41	397768.937	2674413.997	160

42	398057.003	2674543.438	160
43	398310.521	2674333.108	160
44	398616.656	2674326.917	155
45	398761.257	2674199.321	200
50	397999.558	2673593.736	155
53	397050.009	2673504.532	200
55	395517.040	2672882.019	155
56	395265.364	2672843.305	200
57	395008.917	2672733.561	155
61	393957.781	2672520.965	50
62	394008.723	2672320.555	125
63	393806.313	2672103.544	155
64	393863.711	2671629.908	90
65	393252.187	2671247.757	100

SCHEDULE - E

(See Clauses 2.1 and 14.2)

MAINTENANCE REQUIREMENTS

1 Maintenance Requirements

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

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

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

[Specify all the relevant documents]

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

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

4. Extension of time limit

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

5. Emergency repairs/restoration

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

6. Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

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

8. Repairs on account of natural calamities

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

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 byes etc. as applicable)	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm indepth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA 2003 (http://www.tfhrc.com/pavement/lttp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2
	Cracking	Nil	< 5 % subject to limit of 0.5 sqm for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15 -30 days	MORT&H Specification 3004.2
	Corrugations and Shoving	Nil	< 0.1 % of area	Daily	Length Measurement Unit like		2-7 days	IRC:82- 2015
	Bleeding	Nil	< 0.1 % of area	Daily	Scale, Tape, odometer etc.		3-7 days	MORT&H Specification 3004.4
	Raveling / Stripping	Nil	< 0.1 % of area	Daily			7-15 days	IRC:82- 2015 read with IRC SP 81
	Edge Deformation/ Breaking	Nil	< 1 m for any 100 m section and width < 0.1 m at any location, restricted to 30 cm from the edge	Daily	Scale, Tape, odometer etc.			IRC:82- 2015
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM	Class I Profilometer : ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of	180 days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-			180 days	BS: 7941-1: 2006

				Annually	(Sideway-force Coefficient Routine Investigation Machine or equivalent)	Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment		
	Pavement Condition Index	3	2.1	Bi-Annually			180 days	IRC:82- 2015
	Other Pavement Distresses			Bi-Annually			2-7 days	IRC:82- 2015
	Deflection/ Remaining Life			Annually	Falling Weight Deflect meter	IRC 115: 2014	180 days	IRC:115-2014
Rigid Pavement (Pavement of MCW, Service Road, Grade Structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Roughness BI	2200m m/km	2400mm /km	Bi-Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656 - 94: 2000	180 days	IRC:SP:83-2008
	Skid	Skid Resistance no. at different speed of vehicles		Bi-Annually	SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)	RC:SP:83-2008	180 days	IRC:SP:83-2008
		Minimum SN	**Traffic Speed (Km/h)**					
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					

Embankment/ Slope	Edge drop at shoulders	Nil	40 mm	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC	7-15 days	MORT&H Specification 408.4
	Slope of camber/cross fall	Nil	<2% variation in prescribed slope of camber /cross fall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15 % variation in prescribe side slope	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification
	Rain Cuts/ Gullies in slope	Nil	Nil	Daily Specially During Rainy Season	NA		7-15 days	MORT&H Specification

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

Table -2: Maintenance Criteria for Rigid Pavements:

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2 Short Term	For the case d > D/2 Long Term
CRACKING						
1.	Single Discrete Cracks Not intersecting with any joint	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	Not applicable
			1	w < 0.2 mm. hair cracks		
			2	w = 0.2 - 0.5 mm, discernible from slow-moving car		Seal, and stitch if L > lm.
			3	w = 0.5 - 1.5 mm, discernible from fast-moving car	Seal without delay	Within 7days
			4	w = 1.5 - 3.0 mm	Seal, and stitch if L > l m.	Staple or Dowel Bar Retrofit, FDR for affected portion.
			5	w > 3 mm.	Within 7 days	Within 15days
2.	**Single Transverse (or Diagonal) Crack intersecting with one or more joints**	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Route and seal with epoxy.	Staple or Dowel Bar Retrofit.
			2	w = 0.2 - 0.5 mm, discernible from slow vehicle	Within 7 days	Within 15 days
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1 m. Within 7 days	
			4	w = 3.0 - 6.0 mm	Dowel Bar Retrofit.	Full Depth Repair

			5	w > 6 mm, usually associated with spelling, and/or slab rocking under traffic	Within 15 days Not Applicable, as it may be full depth	Dismantle and reconstruct affected. Portion with norms and specifications - See Para 5.5 & 9.2 Within 15days
3	Single Longitudinal Crack intersecting with one or more joints	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	w < 0.5 mm, discernable from slow moving vehicle	Seal with epoxy, if L > 1 m. Within 7 days	Staple or dowel bar retrofit. Within 15days
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > l m. Within 15 days	
			3	w = 3.0 – 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair with stapling. Within 15days
			4	w = 6.0 - 12.0 mm, usually associated with spalling		
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	Full Depth Repair Dismantle and reconstruct affected portion as per norms and specifications - See Para 5.6.4

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

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

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

			1	t > 1 mm		Not Applicable
			2	t = 1 – 0.6 mm		
			3	t = 0.6 – 0.3 mm	Monitor rate of deterioration	
			4	t = 0.3 – 0.1 mm	Diamond Grinding if Affecting 50% or more slabs in a	
			5	t < 0.1 mm	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	Partial depth repair 110mm	
			3	d = 100 - 300 mm; h < 100 mm n < 1 per 5 m^2	i.e.10 mm more than	

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

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

			4 5	f= 12 - 18 mm f> 18 mm	Raise sunken slab. Strengthen sub-grade and sub-base by grouting and raising sunken slab	Replace the slab as appropriate. Within 30days
14	Blowup or Buckling	h = vertical displacement from normal profile	0	Nil, not discernible	No Action	
			1	h < 6 mm		
			2	h = 6 - 12 mm	Install Signs to Warn Traffic	
			3	h = 12 - 25 mm	within 7 days	
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shattered slabs, ie 4 or more pieces	Replace broken slabs. Within 30 days	
15	Depression	h = negative vertical displacement from normal profile L =length	0	Not discernible, h < 5 mm	No action.	

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

			5	h > 100 mm	length < 20 m. Within 30 days	
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
			4	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	**Lane to Shoulder Dropoff**	f = difference of level			**Short Term**	**Long Term**
			0	Nil, not discernible < 3mm	No Action	
			1	f = 3 - 10 mm	Spot repair of shoulder within 7 days	
			2	f = 10 - 25 mm		

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

		blockage of drains				
			3 to 4	Blockages observed in drains, but water flowing	Clean drains etc within 7 days, Follow up	Action required to stop water damaging foundation within 30 days.
			5	Ponding, accumulation of water observed	-do	

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

Asset Type	Performance Parameter	Level of Service (LOS)			Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Highway	Availability of Safe Sight Distance	As per IRC SP :84-2014, a minimum of safe stopping sight distance shall be available throughout.			Monthly	Manual Measurements with O dometer along with video/ image backup	Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments. In case of permanent structure or design deficiency: Removal of obstruction/improvement of deficiency at the earliest Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.		IRC:SP 84-2014
		Design Speed, kmph	**Desirable Minimum Sight Distance (m)**	**Safe Stopping Sight Distance (m)**					
		100	360	180					
		80	260	130					
Pavement Marking	Wear	<70% of marking remaining			Bi-Annually	**Visual Assessment as per Annexure-F**	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect -	IRC:35-2015

<table>
<tr><td></td><td></td><td></td><td></td><td>of IRC:35-2015</td><td></td><td>within 2 months</td><td></td></tr>
<tr><td></td><td>Day time Visibility</td><td>During expected life Service Time
Cement Road - 130mcd/m2/lux
Bituminous Road - 100mcd/m2/lux</td><td>Monthly</td><td>As per Annexure-D of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
<tr><td></td><td rowspan="6">Night Time Visibility</td><td colspan="3"><u>Initial and Minimum Performance for Dry Retro reflectivity during night time:</u></td><td rowspan="6">Bi-Annually</td><td rowspan="6">As per Annexure-E of IRC:35-2015</td><td rowspan="6">Re - painting</td><td rowspan="6">Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months</td><td rowspan="6">IRC:35-2015</td></tr>
<tr><td></td><td>Design Speed</td><td colspan="2">(RL) Retro Reflectivity (mcd/m2/lux)</td></tr>
<tr><td></td><td>Up to 65</td><td>200</td><td>80</td></tr>
<tr><td></td><td>65-100</td><td>250</td><td>120</td></tr>
<tr><td></td><td>Above 100</td><td>350</td><td>150</td></tr>
<tr><td></td><td colspan="3">Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):</td></tr>
<tr><td>Road Signs</td><td>Shape and Position</td><td>Shape and Position as per IRC:67-2012.
Signboard should be clearly visible for
the design speed of the section.</td><td>Daily</td><td>Visual with video/image backup</td><td>Improvement of shape, in case if shape is damaged.

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

						Gantry/Cantilever Sign boards	
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of Each signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.	Change of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/ Cantilever Sign boards	IRC:67-2012
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance measuring tape	Raising Kerb Height	Within 1 Month	IRC 86:1983
	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	IRC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2014 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:84-2014, IRC:35-2015
	Pedestrian Guardrail	Functionality: Functioning of guardrail as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014
	Traffic Safety Barriers	Functionality: Functioning of Safety Barriers as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2014,

				backup			IRC:119- 2015
	End Treatment of Traffic Safety Barriers	Functionality: Functioning of End Treatment as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014, IRC:119- 2015
	Attenuators	Functionality: Functioning of Attenuators as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP-2014, IRC:119- 2015
	Guard Posts and Delineators	Functionality: Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: 79 - 1981
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67-2012
	Traffic Blinkers	Functionality: Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014
Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84-2014
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84-2014
	Toll Plaza Canopy Lights	Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major/minor failure in the lighting system	Daily	-	Rectification of failure	8 hours	IRC:SP:84-2014

Trees and Plantation including median plantation	Obstruction in a minimum head-room of 5.5 m above carriageway or obstruction in visibility of road signs	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC:SP:84-2014
	Deterioration in health of trees and bushes	Health of plantation shall be as per requirement of specifications & instructions issued by Authority from time to time	Daily	Visual with video/image backup	Timely watering and treatment. Or Replacement of Trees and Bushes.	Within 90 days	IRC:SP:84-2014
	Vegetation affecting sight line and road structures	Sight line shall be free from obstruction by vegetation	Daily	Visual with video/image backup	Removal of trees	Immediate	IRC:SP 84-2014
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every 4 hours	
	Defects in electrical, water and sanitary installations	-	Daily	-	Rectification	24 hours	
Other Project Facilities and Approach roads	Damage or deterioration in Approach Roads, pedestrian facilities, truck lay-bys, bus-bays, busshelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works		Daily	-	Rectification	15 days	IRC:SP 84-2014

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Pipe/box/ slab culverts	Free waterway / unobstructed flow section	85% of culvert normal flow area to available.	2 times in a year (before and after rainy season)	Inspection by Bridge Engineer as per IRC SP: 35-1990 and recording of depth of silting and area of vegetation.	Cleaning silt up soils and debris in culvert barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrel before rainy season.	15 days before onset of monsoon and within 30 days after end of rainy season.	IRC 5-2015, IRC SP:40-1993 and IRC SP:13-2004
	Leak-proof expansion joints if any	No leakage through expansion joints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35-1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-1993 and IRC SP:69-2011
	Structurall	Spalling of	Bi-	Detailed	Repairs to	15 days	IRC SP 40-

	y sound	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 aggregatelength	Annually	inspection of all components of culvert as per IRC SP:35-1990 and recording the defects	spalling, cracking, delamination, rusting shall be followed as per IRC:SP:40-1993.		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 apron (concreteapron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Bridges including	Riding quality or	No pothole in	Daily	Visual inspectio	Repairs to BC or wearing	15 days	MORT&H Specificati

ROBs Flyover etc. as applicable	user comfort	wearing coat on bridge deck		n as per IRC SP:35-1990	coat		on 2811
Bridge - Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORT&H Specification 3004.2 & 2811.
	User safety (condition of crash barrier and guard rail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed condition survey as per IRC SP: 35-1990.	Repairs and replacement of safety barriers as the case may be	**3** days	IRC: 5-1998, IRC SP: 84-2014 and IRC SP: 40-1993.
	Rusted reinforcement	Not more than 0.25 sq.m	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990	All the corroded reinforcement shall need to be thoroughly	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		using Mobile Bridge Inspection Unit	cleaned from rusting and applied with anti-corrosive coating before carrying out the repairs to affected concrete portion with epoxy mortar / concrete.		
	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	Grouting of deck slab at leakage areas, waterproofing, repairs to drainage spouts	1 months	MORTH specifications 2600 & 2700

				Bridge Inspection Unit			
	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	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.

		through expansion joint in case of buried and asphalt plug and copper strip joint					
	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 specification s 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.	Bi-Annually	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.	3 days	MORTH specification 2700.

					Providing sealant around the drainage spout if any leakages observed		
Bridge-substructure	Cracks/ spalling of concrete/ Rusted steel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting/guniting and micro concreting depending on type of defect noticed	30 days	IRC SP: 40-1993 and MORTH specification 2800.
	Bearings	Delaminatin	Bi-	Detailed	In case of	3 months	MORTH

		g 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	Annually	condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	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.		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 oubt, use	suitable protection works around pier/abutment	1 months	IRC SP: 40-1993, IRC 83-2014, MORTH specification 2500

				Underwater camera for inspection of deep wells in major Rivers.			
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sq.m, damage to solid apron (concrete apron) not more than 1 sq.m	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching.	30 days After defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of the contractor.							

Table 4: Maintenance Criteria for Structures and Culverts:

Table 5: Maintenance Criteria for Hill Roads

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

Hill Roads		
(i)	Damage to Retaining wall/ Breast wall	7 (Seven) days
(ii)	Landslides requiring clearance	12 (Twelve) hours
(iii)	Snow requiring clearance	24 (Twenty Four) hours

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

A. Flexible Pavement

Nature of Defect or deficiency		**Time limit for repair/ rectification**
(b) Granular earth shoulders, side slopes, drains and culverts		
(i)	Variation by more than 1 % in the prescribed slope of camber/cross fall (shall not be less than the camber on the main carriageway)	7 (seven) days
(ii)	Edge drop at shoulders exceeding 40 mm	7 (seven) days
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	30 (thirty) days
(iv)	Rain cuts/gullies in slope	7 (seven) days
(v)	Damage to or silting of culverts and side drains	7 (seven) days
(vi)	Desilting of drains in urban/semi- urban areas	24 (twenty four) hours
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)
(c) Road side furniture including road sign and pavement marking		
(i)	Damage to shape or position, poor visibility or loss of retro- reflectivity	48 (forty eight) hours
(ii)	Painting of km stone, railing, parapets, crash barriers	As and when required/ Once every year
(iii)	Damaged/missing signs road requiring replacement	7 (seven) days

(vi)	Damage to road mark ups	7 (seven) days
(d) Road lighting		
(i)	Any major failure of the system	24 (twenty four) hours
(ii)	Faults and minor failures	8 (eight) hours
(e) Trees and plantation		
(i)	Obstruction in a minimum head- room of 5 m above carriageway or obstruction in visibility of road signs	24 (twenty four)hours
(ii)	Removal of fallen trees from carriageway	4 (four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(vi)	Trees and bushes requiring replacement	30 (thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
(f) Rest area		
(i)	Cleaning of toilets	Every 4 (four) hours
(ii)	Defects in electrical, water and sanitary 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		
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3 (three) days
(iii)	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
(vi)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g) Hill Roads		
(i)	Damage to retaining wall/breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours
(iii)	Snow requiring clearance	24 (twenty four) hours
[Note: Where necessary, the Authority may modify the time limit for repair/rectification, or add to the nature of Defect or deficiency before issuing the bidding document, with the approval of the competent authority.]		

SCHEDULE - F
(See Clause 3.1.7(a))

APPLICABLE PERMITS

1 Applicable Permits

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

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

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

(c) License for use of explosives;

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

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

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

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

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

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

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

SCHEDULE – G

(See Clauses 7.1 and 19.2)

FORM OF BANK GUARANTEE

Annex-I

(See Clause 7.1)

[Performance Security/Additional Performance Security]

[DG(RD)&SS,

Ministry of Road Transport & Highways Transport Bhawan, New Delhi]

WHEREAS:

(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 construction of the **"Improvement and widening to two lane with paved shoulder of road from Km 29.200 to Km 49.200 (Total length: 20.000 km) i.e. Fultali - Jurichhara section of NH-208 (Package-II) in the state of Tripura on 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 addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized 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 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 opera table at our …….. Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension/ renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation

13. Intimation regarding issuance of this Bank Guarantee shall be sent to Authority's Bank through SFMS gateway as per the details below:

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	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) (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 Withdrawal of Retention Money

[DG(RD)&SS,

Ministry of Road Transport & Highways Transport Bhawan, New Delhi]

WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "Agreement") with the NHIDCL, (hereinafter called the "**Authority**") for the construction of the **"Improvement and widening to two lane with paved shoulder of road from Km 29.200 to Km 49.200 (Total length: 20.000 km) i.e. Fultali - Jurichhara section of NH-208 (Package-II) in the state of Tripura on EPC basis in the state of Tripura on 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 obligations for under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due

and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

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 Retention Money.

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

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

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

9. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at

the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be 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, from whom, confirmation regarding the issue of this guarantee or extension/ renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation

12. Intimation regarding issuance of this Bank Guarantee shall be sent to Authority's Bank through SFMS gateway as per the details below:

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	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.	63.2	**A- Widening and strengthening of existing road**	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-Base Course	[Nil]
		(3) Non Bituminous Base course	[Nil]
		(4) Bituminous Base course	[Nil]
		(5) Wearing Coat	[Nil]
		(6) Widening and repair of culverts	[Nil]
		B.1-Reconstruction/New 2-Lane Realignment /Bypass (Flexible Pavement)	
		(1) Earthwork up to top of the sub- grade	18.91
		(2) Sub Base Course	18.74
		(3) Non Bituminous Base course	[Nil]
		(4) Bituminous Base course	28.02
		(5) Wearing Coat	12.83
		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)	21.49
Minor Bridges/ Underpasses/ Overpasses	14.60	**A.1-Widening and Repair of Minor bridges (length >6 m and<60m).**	
		Minor Bridges	[Nil]
		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.	63.94
		(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.	26.66
		(3) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use	9.40
		(4) Guide Bunds & River Training Works: On completion of Guide Bunds and river Training Works complete in all respects	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		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 including viaducts ,if any	0.00	**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]
		(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,	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		stone pitching and protection works)	
		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]
		B.2-New ROB/RUB (a) ROB (b) RUB	
		(1) Foundation	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		(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]
		(3) Super-structure (including bearings)	[Nil]
		(4)Wearing Coat including expansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barriers, road markings etc.	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		(6) Wing walls/return walls	[Nil]
		(7) Approaches (including Retaining walls/ Reinforced Earth wall, stone pitching and protection works)	[Nil]
Other Works	22.20	(i) Toll Plaza	[Nil]
		(ii) Road side drains	19.23
		(iii) Road signs, marking, km stones, safety devices, ...	4.74
		(iv) Project facilities	
		(a) Bus Bays	3.75
		(b) Truck lay-byes	[Nil]
		(c) Rest areas	[Nil]
		(d) Others	0.45
		(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	15.32
		(b) Breast wall	49.49
		(c) Turfing, hydro seeding, grassing	3.99
		(ix)Site clearance & Dismantling	3.02

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 5 (five) percent of the total length.
(1) Earthwork up to top of the sub- grade	[Nil]	
(2) Sub-Base Course	[Nil]	
(3) Non Bituminous Base Course	[Nil]	
(4) Bituminous Base Course	[Nil]	
(5) Wearing Coat	[Nil]	
(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 one 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 0.5 (Zero point five) km. length, whichever is less.
(1) Earthwork up to top of the sub-grade	18.91	
(2) Sub Base Course	18.74	
(3) Non-Bituminous Base Course	[Nil]	
(4) Bituminous Base Course	28.02	
(5) Wearing Coat	12.83	
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 0.5 (Zero point 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]	

Stage of Payment	Percentage weightage	Payment Procedure
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 0.5 (Zero point 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 0.5 (Zero point 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 one culverts.
(1) Culverts (length <6m)	21.49	

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

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

Where,

P = Contract Price

L = Total length in km

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

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

1.3.2 Minor Bridges and Underpasses/Overpasses.

Procedure for estimating the value of Minor bridge and Underpasses/Overpasses shall be as stated in table 1.3.2:

Table 1.3.2

Stage of Payment	**Weightage**	**Payment Procedure**
1	**2**	**3**
A.1-Widening and repair of minor bridges **(length > 6m and < 60m)**	[Nil]	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of widening & repair works of a minor bridge.
A.2- New minor bridges **(i) Foundation +Sub-Structure:** On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	63.94	(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 also where specified

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.	26.66	**(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.	9.40	**(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	[Nil]	**(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. **(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] [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

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.		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/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use	[Nil]	**(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.
(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.

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) 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		
(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.

Stage of Payment	Weightage	Payment Procedure
1	**2**	**3**
(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.
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.

Stage of Payment	Weightage	Payment Procedure
1	2	3
		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.
(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.

Stage of Payment	Weightage	Payment Procedure
1	**2**	**3**
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.
(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.
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 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.

Stage of Payment	Weightage	Payment Procedure
1	**2**	**3**
(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 shall be made on pro rata basis with respect to the total of all toll plazas.
(ii) Road side drains	19.23	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 5 % (five per cent) of the total length.
(iii) Road signs, markings, km stones, safety devices, …	4.74	
(iv) Project Facilities		Payment shall be made on pro rata basis for completed facilities.
a) Bus bays	3.75	
b) Truck lay-byes	[Nil]	
c) Rest areas	[Nil]	
d) others	0.45	
(v) Roadside plantation	[Nil]	Unit of measurement is linear length.

Stage of Payment	Weightage	Payment Procedure
(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 5% (five 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) Turfing,hydro seeding, grassing	15.32 49.49 53.99	Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five per cent) of the total length.
(ix)Site clearance & Dismantling	3.02	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 5 (five) percent of the total length.

2. Procedure for payment for Maintenance

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

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

SCHEDULE - I
(See Clause 10.2 (iv))

DRAWINGS

1 Drawings

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

2 Additional Drawings

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

Annex – I

(Schedule - I)

List of Drawings

1.	A minimum list of the drawings of the various components/elements of the project highway and project facility required to be submitted by the Contractor is given below:
(a)	Drawing of horizontal alignment, vertical profile and detailed cross sections
(b)	Drawings of cross drainage works i.e. Bridges/Culverts/Flyovers and Other Structures.
(c)	Drawings for River Training works
(d)	Drawings of interchanges, major intersections and underpasses
(e)	Drawing of control centre
(f)	Drawings of road furniture items including traffic signage, marking, safety barriers, etc.
(g)	Drawings of traffic diversions plans and traffic control measures
(h)	Drawings of road drainage measures
(i)	Drawings of typical details slope protection measures
(j)	Drawings of landscaping and horticulture
(k)	Drawings of pedestrian crossing
(k)	Drawings of street lighting
(l)	Any other drawings as per instruction of Authority Engineer
(m)	General Arrangement showing Base Camp and Administrative Block

Schedule - J

(See Clause 10.3 (ii))

Project Completion Schedule

1. Project Completion Schedule

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

2. Project Milestone-I

(i) Project Milestone-I shall occur on the date falling on the 55th day from then Appointed Date (the "Project Milestone- I").

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

3. Project Milestone-II

(i) Project Milestone-II shall occur on the date falling on the 192nd 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 384th 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 548th day from the Appointed Date.

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

6. Extension of time

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

SCHEDULE - K
(See Clause 12.1 (ii))

Tests on Completion

1 Schedule for Tests

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

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

2 Tests

(i) Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include [***].

(ii) Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a Network Survey Vehicle (NSV) fitted with latest equipments and

the maximum permissible roughness for purposes of this Test shall be [2,000 (two thousand)] mm for each kilometer.

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

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

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

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

3 Agency for conducting Tests

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

3.1 Completion Certificate

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

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

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

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

Schedule – L

(See Clause 12.2)

Completion Certificate

1 I, ……. (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated …… (the "**Agreement**"), for **"Improvement and widening to two lane with paved shoulder of road from Km 29.200 to Km 49.200 (Total length: 20.000 km) i.e. Fultali - Jurichhara section of NH-208 (Package-II) in the state of Tripura on EPC basis"** (the "**Project Highway**") on Engineering, Procurement and Construction (EPC) basis through ……. (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

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

SIGNED, SEALED AND DELIVERED

For and on behalf of

the Authority's Engineer by:

(Signature)

(Name)

(Designation)

(Address)

SCHEDULE - M

(See Clauses 14.6, 15.2 and 19.7)

PAYMENT REDUCTION FOR NON-COMPLIANCE

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

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

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

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

2. Percentage reductions in lump sum payments

- The following percentages shall govern the payment reduction:

S. No.	**Item/Defect/Deficiency**	**Percentage**
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate crossfall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to	20%

	foundations	
(ii)	Any Defects in superstructures, bearings and sub-structures	10%
S. No.	**Item/Defect/Deficiency**	**Percentage**
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
(d)	**Roadside Drains**	
(i)	Cleaning and repair of drains	5%
(e)	**Road Furniture**	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th km stones	5%
(f)	**Miscellaneous Items**	
(i)	Removal of dead animals, broken down/accidented vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	**Defects in Other Project Facilities**	5%

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

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

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

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

L1 = Non-complying length

L = Total length of the road,

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

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

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

SCHEDULE - N
(See Clause 18.1.1)

SELECTION OF AUTHORITY'S ENGINEER

1 Selection of Authority's Engineer

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

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

2 Terms of Reference

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

3 Appointment of Government entity as Authority's Engineer

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

Annex – I
(Schedule - N)

TERMS OF REFERENCE FOR AUTHORITY'S ENGINEER

1 Scope

(i) These Terms of Reference (the "TOR") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "Agreement), which has been entered into between the NHIDCL(the "Authority") and ..... (the "Contractor")# **"Improvement and widening to two lane with paved shoulder of road from Km 29.200 to Km 49.200 (Total length: 20.000 km) i.e. Fultali - Jurichhara section of NH-208 (Package-II) in the state of Tripura on 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) any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding Rs. 5,000,000 (Rs. fifty lakh).

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

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

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

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

4 **Construction Period**

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

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

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

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

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

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

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

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

(ix) For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4.9, the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any modification/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

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

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

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

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

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

(xv) The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor'squality control records and documents before the Completion Certificate is issued pursuant to Clause 12.4.

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

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

(xviii) The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate or Provisional Certificate, as the case may be. For carrying out its functions under this Paragraph 4.18 and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

5. Maintenance Period

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

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

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

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

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

lane(s), and in case of delay, determine the Damages payable by the Contractor to the Authority under Clause 14.5.

6 Determination of costs and time

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

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

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

7. Payments

(i) The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2.4 (d).

(ii) Authority's Engineer shall –

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

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

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

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

8. Other duties and functions

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

9 Miscellaneous

(i) A copy of all communications, comments, instructions, Drawings or Documents sent by the Authority's Engineer to the Contractor pursuant to this TOR, and a copy of all

the test results with comments of the Authority's Engineer thereon, shall be furnished by the Authority's Engineer to the Authority forthwith.

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

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

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

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

SCHEDULE – O

(See Clauses 19.4.1, 19.6.1, and 19.8.1)

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

(a) the estimated amount for the Works executed in accordance with Clause 19.3(i) subsequent to the last claim;
(b) amounts reflecting adjustments in price for the aforesaid claim;
(c) the estimated amount of each Change of Scope Order executed subsequent to the last claim;
(d) amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2(iii) (a);
(e) total of (a), (b), (c) and (d) above;
(f) Deductions:
  (i) Any amount to be deducted in accordance with the provisions of the Agreement except taxes;
  (ii) Any amount towards deduction of taxes; and
  (iii) Total of (i) and (ii) above.
(g) Net claim: (e) – (f) (iii);
(h) The amounts received by the Contractor upto the last claim:
(i) For the Works executed (excluding Change of Scope orders);

(ii) For Change of Scope Orders, and

(iii) Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

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

(b) the deductions for maintenance work not done;

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

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

(e) amount towards deduction of taxes.

3. Contractor's claim for Damages

Note: The Contractor shall submit its claims in a form acceptable to the Authority.

SCHEDULE - P
(See Clause 20.1)

INSURANCE

1. Insurance during Construction Period

(i) The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the Completion Certificate, the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:

(a) insurance of Works, Plant and Materials and an additional sum of [15 (fifteen)] per cent of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and

(b) insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.

(ii) The insurance under sub para (a) and (b) of paragraph 1(i) above shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

2. Insurance for Contractor's Defects Liability

The Contractor shall effect and maintain insurance cover of not less than 15% of the Contract Price for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and which arises from a cause occurring prior to the issue of the Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage to property

(i) The Contractor shall insure against its liability for any loss, damage, death or bodily injury, or damage to any property (except things insured under Paragraphs 1 and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences.
The insurance cover shall be not less than: Rs. [*****]

(ii) The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor's performance of this Agreement excluding:

(a) the Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and

(b) damage which is an unavoidable result of the Contractor's obligations to execute the Works.

4. **Insurance to be in joint names**

The insurance under paragraphs 1 to 3 above shall be in the joint names of the Contractor and the Authority.

Schedule-Q

(See Clause 14.10)

Tests on Completion of Maintenance Period

1. Riding Quality test:

Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator and the maximum permissible roughness for purposes of this Test shall be [2,200 (two thousand and two hundred only)] mm for each kilometre.

2. Visual and physical test:

The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include measurement of cracking, rutting, stripping and potholes and shall be as per the requirement of maintenance mentioned in Schedule-E.

Schedule-R

(See Clause 14.10)

Taking Over Certificate

I, …….. (Name and designation of the Authority's Representative) under and in accordance with the Agreement dated …….. (the "Agreement"), for **"Improvement and widening to two lane with paved shoulder of road from Km 29.200 to Km 49.200 (Total length: 20.000 km) i.e. Fultali - Jurichhara section of NH-208 (Package-II) in the state of Tripura on EPC basis"** (the "Project Highway") on Engineering, Procurement and Construction (EPC) basis through …….. (Name of Contractor), hereby certify that the Tests on completion of Maintenance Period in accordance with Article 14 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement and I hereby certify that the Authority has taken over the Project highway from the Contractor on this day.....

SIGNED, SEALED AND DELIVERED

(Signature)

(Name and designation of Authority's Representative)

(Address)

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