Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

1. The Site

(i) Site of the **"Akhegwo - Avangkhu road, NH-202K from Design Chainage Km 34.795 to Design Chainage Km 69.875 (Package-II) in the State of Nagaland"** 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 **"Akhegwo - Avangkhu road, NH-202K from Design Chainage Km 34.795 to Design Chainage Km 69.875(Package-II) in the State of Nagaland"** Project Highway comprises the section of NH-202K commencing from km 35+870 to km 72+316 in the state of Nagaland. 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)	Proposed Right of Way (m)
	From	To		
1	35.870	36.050	5.0 -6.0	24
2	36.050	36.205		18
3	36.205	36.850		24
4	36.850	37.120		18
5	37.120	37.880		24-38
6	37.880	40.930		24
7	40.930	41.220		24-30
8	41.220	47.530		24
9	47.530	48.250		18
10	48.250	48.720		24
11	48.720	48.794		26
12	48.794	57.550		24
13	57.550	57.850		18
14	57.850	57.930		26
15	57.930	58.200		24-30
16	58.200	58.680		24
17	58.680	59.070		24-36
18	59.070	62.850		24
19	62.850	64.280		24-45
20	64.280	65.940		24
21	65.940	66.180		24-28
22	66.180	67.450		24
23	67.450	65.400		31-35

S. No.	Chainage (km)		Existing Right of Way (m)	Proposed Right of Way (m)
	From	To		
24	65.400	71.580		24
25	71.580	72.160		18
26	72.160	72.265		26
27	72.265	72.316		24

3. Carriageway

The present carriageway of the Project Highway is Single Lane of width 3m to 4m from km 35+870 to km 72+316. 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	70.717	Causeway			L=23.5 m	4.1

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location (km)	Remarks
Nil		

9. Underpasses (vehicular, non vehicular)

The Site includes the following underpasses:

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

10. Culverts

The Site has the following culverts:

S. No.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)
1	36.298	HUME PIPE	Covered by soil	7.50
2	36.925	HUME PIPE	Covered by soil	7.30
3	37.095	HUME PIPE	Covered by soil	7.30
4	37.978	HUME PIPE	Covered by soil	7.30
5	38.213	HUME PIPE	Covered by soil	7.30
6	38.515	HUME PIPE	Covered by soil	7.40
7	38.730	HUME PIPE	Covered by soil	7.40
8	39.140	HUME PIPE	Covered by soil	7.50
9	39.958	HUME PIPE	Covered by soil	7.50
10	39.672	HUME PIPE	Covered by soil	7.50
11	39.900	HUME PIPE	Covered by soil	7.50
12	40.282	HUME PIPE	Covered by soil	7.50
13	40.408	HUME PIPE	Covered by soil	7.50
14	40.669	HUME PIPE	Covered by soil	7.50
15	40.740	SLAB	1 x 4.0m	7.50
16	40.865	HUME PIPE	Covered by soil	6.30
17	41.638	HUME PIPE	Covered by soil	7.60

S. No.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)
18	41.885	HUME PIPE	Covered by soil	7.00
19	42.285	HUME PIPE	Covered by soil	7.50
20	42.405	HUME PIPE	Covered by soil	6.00
21	42.660	HUME PIPE	Covered by soil	7.50
22	42.830	HUME PIPE	Covered by soil	7.70
23	43.212	HUME PIPE	Covered by soil	7.50
24	43.418	HUME PIPE	Covered by soil	8.00
25	44.245	HUME PIPE	Covered by soil	7.50
26	45.110	HUME PIPE	Covered by soil	6.50
27	45.568	HUME PIPE	Covered by soil	7.50
28	45.738	HUME PIPE	Covered by soil	6.00
29	46.708	HUME PIPE	Covered by soil	7.50
30	46.910	HUME PIPE	Covered by soil	7.50
31	47.318	HUME PIPE	Covered by soil	6.50
32	47.495	HUME PIPE	Covered by soil	7.50
33	47.810	HUME PIPE	Covered by soil	7.00
34	47.945	HUME PIPE	Covered by soil	6.50
35	48.148	HUME PIPE	Covered by soil	7.00
36	48.388	HUME PIPE	Covered by soil	7.00
37	48.595	HUME PIPE	Covered by soil	7.50
38	48.860	HUME PIPE	Covered by soil	7.70
39	49.940	HUME PIPE	Covered by soil	8.00
40	50.462	HUME PIPE	Covered by soil	7.70
41	50.578	HUME PIPE	Covered by soil	7.50
42	50.690	HUME PIPE	Covered by soil	6.50
43	51.000	HUME PIPE	Covered by soil	7.50
44	51.128	HUME PIPE	Covered by soil	8.50
45	51.280	HUME PIPE	Covered by soil	7.50
46	51.455	HUME PIPE	Covered by soil	7.50
47	51.620	HUME PIPE	Covered by soil	6.50
48	51.678	HUME PIPE	Covered by soil	7.80
49	52.278	HUME PIPE	Covered by soil	7.60
50	52.480	HUME PIPE	Covered by soil	6.70
51	52.888	HUME PIPE	Covered by soil	6.20
52	53.930	HUME PIPE	Covered by soil	7.00
53	54.230	HUME PIPE	Covered by soil	6.70
54	54.542	HUME PIPE	Covered by soil	7.00
55	54.805	HUME PIPE	Covered by soil	7.50
56	55.560	HUME PIPE	Covered by soil	7.00
57	55.925	HUME PIPE	Covered by soil	7.50
58	56.050	HUME PIPE	Covered by soil	8.00
59	56.333	HUME PIPE	Covered by soil	7.50
60	56.498	HUME PIPE	Covered by soil	7.50
61	56.508	HUME PIPE	Covered by soil	7.00
62	56.660	HUME PIPE	Covered by soil	7.20
63	56.975	HUME PIPE	Covered by soil	7.20
64	57.178	HUME PIPE	Covered by soil	7.50
65	57.360	HUME PIPE	Covered by soil	7.50

S. No.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)
66	57.550	HUME PIPE	Covered by soil	7.50
67	57.648	HUME PIPE	Covered by soil	7.30
68	58.295	HUME PIPE	Covered by soil	7.50
69	58.512	HUME PIPE	Covered by soil	7.50
70	58.958	HUME PIPE	Covered by soil	7.50
71	59.405	HUME PIPE	Covered by soil	7.00
72	59.508	HUME PIPE	Covered by soil	7.30
73	59.720	HUME PIPE	Covered by soil	7.00
74	59.825	SLAB	1 x 3.0m	7.00
75	59.948	HUME PIPE	Covered by soil	7.00
76	60.150	HUME PIPE	Covered by soil	7.50
77	60.298	HUME PIPE	Covered by soil	7.00
78	60.860	HUME PIPE	Covered by soil	7.20
79	61.300	HUME PIPE	Covered by soil	7.00
80	62.960	HUME PIPE	Covered by soil	7.00
81	63.258	HUME PIPE	Covered by soil	6.70
82	64.808	HUME PIPE	Covered by soil	6.70
83	65.005	HUME PIPE	Covered by soil	7.00
84	65.092	HUME PIPE	Covered by soil	7.00
85	65.225	HUME PIPE	Covered by soil	7.50
86	66.170	HUME PIPE	Covered by soil	6.70
87	66.388	HUME PIPE	Covered by soil	7.00
88	66.810	HUME PIPE	Covered by soil	7.50
89	67.157	HUME PIPE	Covered by soil	6.50
90	67.920	HUME PIPE	Covered by soil	7.00
91	68.281	HUME PIPE	Covered by soil	7.00
92	68.880	SLAB	1 x 3.5m	7.00
93	69.058	SLAB	1 x 5.0m	7.00
94	69.785	SLAB	1 x 3.6m	7.00
95	69.988	SLAB	1 x 5.3m	7.50
96	70.320	HUME PIPE	Covered by soil	7.00
97	70.890	HUME PIPE	Covered by soil	7.00
98	71.228	HUME PIPE	Covered by soil	7.50
99	71.668	HUME PIPE	Covered by soil	7.50
100	71.910	HUME PIPE	Covered by soil	4.50
101	72.018	HUME PIPE	Covered by soil	6.00

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)
Nil				

14. Major junctions

The details of major junctions are as follows:

S. No.	Location	At grade	Separated	Category of Cross Road			
				NH	SH	MDR	Others
Nil							

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

15. Minor junctions

The details of the minor junctions are as follows:

S. No.	Location	Type	
		T -junction	Cross road
1	37.325	Y	
2	38.225	Y	
3	41.075	Y	
4	47.640	Y	
5	47.900	Y	
6	71.250	Y	

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. Existing utilities

(i) Electrical utilities

The site includes the following electrical utilities:-

a) Extra High-Tension Lines (EHT Lines)*

b) High Tension/Low Tension Lines (HT/LT Lines)*

List of 11KV Line to be Shifted								
Sl. No.	Design Chainage (km)	Existing Chainage (km)	Description	Offset Distance From Existing Road Centre (m)	Side		Coordinates	
					Left	Right	Easting (m)	Northing (m)
1	35.048	36.128	11 KV	16.1		RHS	672683.260	2838930.879
2	41.685	42.935	11 KV	10.8		RHS	673739.634	2837913.141
3	44.165	45.610	11 KV	3.8	LHS		673955.633	2836137.911
4	44.575	46.750	11 KV	8.9	LHS		674149.207	2835851.403
5	44.925	46.560	11 KV	10.1		RHS	674472.000	2835864.503
6	45.970	47.550	11 KV	26.4		RHS	675056.670	2835398.235
7	46.226	47.829	11 KV	10.7		RHS	675164.611	2835189.703
8	46.495	48.102	11 KV	10.9		RHS	675163.697	2834972.41
9	46.498	48.110	11 KV	29.7	LHS		675139.996	2834959.296
10	46.880	48.510	11 KV	31.4	RHS		675308.637	2834662.975
11	47.280	48.970	11 KV	7		RHS	675419.115	2834362.577
12	49.518	51.295	11 KV	37		RHS	676289.642	2833521.461
13	53.498	55.428	11 KV	13.3		RHS	677458.166	2831490.797
14	60.772	62.942	11 KV	23.2		RHS	677151.092	2829037.065
15	62.360	64.590	11 KV	22.1	LHS		677113.969	2828707.784

List of LT Line to be Shifted								
Sl. No.	Design Chainage (km)	Existing Chainage (km)	Description	Offset Distance From Existing Road Centre (m)	Side		Coordinates	
					Left	Right	Easting (m)	Northing (m)
1	34.897	35.970	LT	3.4	LHS		672728.318	2839075.583
2	34.960	36.040	LT	3.2		RHS	672724.382	2839003.438
3	35.017	36.095	LT	5	LHS		672686.781	2838963.754
4	35.053	36.132	LT	9.4	LHS		672675.319	2838930.569
5	35.083	36.168	LT	8.2	LHS		672677.624	2838901.005
6	35.085	36.170	LT	9.9	LHS		672679.403	2838901.169

7	35.135	36.218	LT	7.1	LHS		72679.385	2838851.567
8	35.205	36.290	LT	25.6		RHS	672701.018	2838770.879
9	36.975	38.125	LT	13.4		RHS	672687.675	2838413.727
10	46.043	47.628	LT	5.5	LHS		675051.005	2835341.327
11	46.067	47.658	LT	4.2	LHS		675067.402	2835315.035
12	46.076	47.670	LT	28.7		RHS	675046.432	2835288.063
13	46.225	47.800	LT	34.2	LHS		675130.825	2835187.083
14	46.240	47.825	LT	18.9		RHS	675193.425	2835200.24
15	46.255	47.855	LT	35.7		RHS	675219.361	2835173.026
16	46.565	48.175	LT	12.2		RHS	675182.043	2834912.392
17	46.570	48.170	LT	9.3	LHS		675164.35	2834906.394
18	55.567	57.645	LT	5.6		RHS	676830.583	2830462.825
19	55.660	57.745	LT	32.8		RHS	676917.864	2830376.369
20	55.735	57.815	LT	10.1		RHS	676862.474	2830321.314
21	69.287	71.695	LT	19.2		RHS	677608.317	2827623.529
22	68.305	71.712	LT	2.9		LHS	677582.959	677582.959
23	69.343	71.755	LT	2.9	LHS		677596.448	2827681.973
24	69.380	71.815	LT	6.4	LHS		677630.464	2827724.697
25	69.390	71.825	LT	6.2		RHS	677645.403	2827710.653
26	69.436	71.871	LT	2.5	LHS		677686.175	2827703.839
27	69.510	71.940	LT	7.8	LHS		677750.283	2827723.785
28	69.610	72.048	LT	2.1	LHS		677853.566	2827744.57
29	69.670	72.105	LT	3.5	LHS		677904.703	2827769.254

(ii) Public Health utilities (Water/Sewage Pipe Lines)*

The site includes the following Public Health utilities:-

S. No	**Existing Chainage**		**Design Chainage**		**Length(in Km)**
	From (Km)	**To (Km)**	**From (Km)**	**To (Km)**	**Water Supply line**
1	35.870	72.316	34.795	69.875	4.12

(iii) Any Other line

(* This illustrative and may change as per features of existing utilities.)

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	Existing Chainage(km)		Length in km	Existing ROW	Proposed ROW Width (m)	Date of Providing proposed ROW
	From	To				
(i) 90% Right of Way (full width)	35.870	72.316	36.446	5m-6m	18.0 m to 45.0 m	on Appointed Date
(ii) Balance Right of Way (width)	35.870	72.316	36.446	5m-6m	18.0 m to 45.0 m	Within 150 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 with Paved/Hard Shoulder

[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:73-2018)], referred to as the Manual. If any standards, specifications or details are not given in the Manual, the minimum design/construction requirements shall be specified in this Schedule. In addition to these particulars, all other essential project specific details, as required, should be provided in order to define the Scope of the Project clearly and precisely.]

1. Widening of the Existing Highway

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

(ii) Width of Carriageway

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

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)	Remarks
1	Weziho Village	34.795	34.900	10m	Fig- 2.10 & Table 2.3 of manual (TCS drawing attached)	7m Carriageway+2x1.5m Paved shoulder+2x1.0m Footpath on covered RCC drain+(2+4)m utility corridor
2	Weziho Village	34.950	35.185	10m	Fig- 2.10 & Table 2.3 of manual (TCS drawing attached)	7m Carriageway+2x1.5m Paved shoulder+2x1.0m Footpath on covered RCC drain+(2+4)m utility corridor
3	Washelo Village	55.475	55.545	10m	Fig- 2.10 & Table 2.3 of manual (TCS drawing attached)	7m Carriageway+2x1.5m Paved shoulder+2x1.0m Footpath on covered RCC drain+(2+4)m utility corridor

4	Washelo Village	55.545	55.595	10m	Fig- 2.10 & Table 2.3 of manual (TCS drawing attached)	7m Carriageway+2x1.5m Paved shoulder+2x1.0m Footpath on covered RCC drain+(2+4)m utility corridor
5	Washelo Village	55.595	55.665	10m	Fig- 2.10 & Table 2.3 of manual (TCS drawing attached)	7m Carriageway+2x1.5m Paved shoulder+2x1.0m Footpath on covered RCC drain+(2+4)m utility corridor
6	Washelo Village	55.665	55.725	10m	Fig- 2.10 & Table 2.3 of manual (TCS drawing attached)	7m Carriageway+2x1.5m Paved shoulder+2x1.0m Footpath on covered RCC drain+(2+4)m utility corridor
7	New Thewati Village	69.285	69.675	10m	Fig- 2.10 & Table 2.3 of manual (TCS drawing attached)	7m Carriageway+2x1.5m Paved shoulder+2x1.0m Footpath on covered RCC drain+(2+4)m utility corridor

(b) Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1(i) above

2. Geometric Design and General Features

(i) General

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

(ii) Design speed

The design speed shall be as per section 2.2 of IRC 73: 2018 for Mountainous and Steep terrain. However, in exceptional cases the minimum design speed of 30 km per hour may be adopted and 20 km per hour for hair pin bend locations shall be adopted in accordance with IRC 52:2019.

(iii) Improvement of the existing road geometrics

In the 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

(iv) Right of Way

Details of the Right of Way are given in Annex II of Schedule-A.

(v) Type of shoulders

(a)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	34.795	34.900	2x1.5m Paved shoulder +2x 1.0m width Footpath cum Drain	TCS-7A
2	34.950	35.185	2x1.5m Paved shoulder +2x 1.0m width Footpath cum Drain	TCS-7A
3	55.475	55.545	2x1.5m Paved shoulder +2x 1.0m width Footpath cum Drain	TCS-7
4	55.545	55.595	2x1.5m Paved shoulder +2x 1.0m width Footpath cum Drain	TCS-7A
5	55.595	55.665	2x1.5m Paved shoulder +2x 1.0m width Footpath cum Drain	TCS-7
6	55.665	55.725	2x1.5m Paved shoulder +2x 1.0m width Footpath cum Drain	TCS-7A
7	69.285	69.675	2x1.5m Paved shoulder +2x 1.0m width Footpath cum Drain	TCS-7A

(a)b Width of Shoulder in open country shall be mentioned in the following Table:

Type of Section		Width of Shoulder (m)		
		Hard	Earthen	Total
Open Country with isolated built-up area	Hill Side	1.5	-	1.5
	Valley Side	1.5	1.0	2.5

[Hard shoulders of 1.5m width with compacted layer of granular material shall be provided].

(c) Design and specifications of earthen 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.

Nil

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

Nil

(vii) Lateral and vertical clearances at overpasses

Nil

(viii) Service roads

Service roads shall be constructed at the locations and for the lengths indicated below:

Nil

(ix) Grade separated structures

Nil

(x) Cattle and pedestrian underpass /overpass

Nil

(xi) Typical cross-sections of the Project Highway is as per attached Drawings

TCS TYPE	DESCRIPTION	Length(m)
TCS-1	Typical cross section of Two Lane carriageway with hard shoulder in rural area with open Triangular drain on hill side (New Construction)	12495
TCS-1A	Typical cross section of Two Lane carriageway with hard shoulder in rural area with open Triangular drain on hill side (Reonstruction)	3790
TCS-2	Typical cross section of Two Lane carriageway with hard shoulder in rural area and open Triangular drain with breast wall on hill side (New Construction)	6660
TCS-2A	Typical cross section of Two Lane carriageway with hard shoulder in rural area and open Triangular drain with breast wall on hill side (Reonstruction)	2095
TCS-3	Typical cross section of Two Lane carriageway with hard shoulder in rural area with both side open Triangular drain (New Construction)	1500
TCS-3A	Typical cross section of Two Lane carriageway with hard shoulder in rural area with both side open Triangular drain (Re Construction)	320
TCS-4	Typical cross section of Two Lane carriageway with hard shoulder in rural area with retaining wall on valley side and open Triangular drain on hill side (New Construction)	1800
TCS-4A	Typical cross section of Two Lane carriageway with hard shoulder in rural area with retaining wall on valley side and open Triangular drain on hill side (Reonstruction)	2075
TCS-5	Typical cross section of Two Lane carriageway with hard shoulder in rural area with open Triangular drain in bothside and breast wall on hill side (New Construction)	2690
TCS-5A	Typical cross section of Two Lane carriageway with hard shoulder in rural area with open Triangular drain in bothside and breast wall on hill side (Re Construction)	565
TCS-6A	Typical cross section of Two Lane carriageway with hard shoulder in rural area with retaining wall on valley side and open Triangular drain with Breast wall on hill side (Reonstruction)	110
TCS-7	Typical cross section of Two Lane carriageway in built-up area with Bothside side footpath cum covered drain (New Construction)	140
TCS-7A	Typical cross section of Two Lane carriageway in built-up area with Both side footpath cum covered drain (Reconstruction)	840

Chainage (m)		Length (m)	TCS No.
From	To		
34795	34900	105.0	TCS-7A
34900	34950	50.0	TCS-4A
34950	35185	235.0	TCS-7A
35185	35255	70.0	TCS-4A
35255	35450	195.0	TCS-1A
35450	35550	100.0	TCS-4A
35550	35655	105.0	TCS-1A
35655	35835	180.0	TCS-2A

Chainage (m)		Length (m)	TCS No.
From	To		
35835	36000	165.0	TCS-2A
36000	36100	100.0	TCS-4A
36100	36150	50.0	TCS-1
36150	36250	100.0	TCS-5
36250	36375	125.0	TCS-2
36375	36450	75.0	TCS-4
36450	36500	50.0	TCS-5
36500	36650	150.0	TCS-2
36650	36700	50.0	TCS-5
36700	37085	385.0	TCS-1A
37085	37150	65.0	TCS-1A
37150	37250	100.0	TCS-4A
37250	37400	150.0	TCS-1A
37400	37550	150.0	TCS-4A
37550	37600	50.0	TCS-1
37600	37650	50.0	TCS-4
37650	37800	150.0	TCS-1
37800	37950	150.0	TCS-4
37950	38050	100.0	TCS-1
38050	38100	50.0	TCS-4
38100	38175	75.0	TCS-1
38175	38350	175.0	TCS-1A
38350	38450	100.0	TCS-4A
38450	38600	150.0	TCS-1A
38600	38750	150.0	TCS-4A
38750	38800	50.0	TCS-1A
38800	38900	100.0	TCS-5A
38900	39100	200.0	TCS-2A
39100	39200	100.0	TCS-1A
39200	39435	235.0	TCS-1A
39435	39665	230.0	TCS-1
39665	39850	185.0	TCS-5A
39850	39900	50.0	TCS-3A
39900	39950	50.0	TCS-5A
39950	40025	75.0	TCS-1A
40025	40075	50.0	TCS-4
40075	40185	110.0	TCS-1
40185	40215	30.0	TCS-2
40215	40445	230.0	TCS-2
40445	40805	360.0	TCS-1
40805	40965	160.0	TCS-2A
40965	41065	100.0	TCS-2
41065	41265	200.0	TCS-1
41265	41315	50.0	TCS-4A

Chainage (m)		Length (m)	TCS No.
From	To		
41315	41365	50.0	TCS-4
41365	41415	50.0	TCS-1
41415	41465	50.0	TCS-1
41465	41515	50.0	TCS-1
41515	41575	60.0	TCS-4
41575	41665	90.0	TCS-4A
41665	41710	45.0	TCS-4
41710	41875	165.0	TCS-1A
41875	42305	430.0	TCS-2
42305	42345	40.0	TCS-4A
42345	42415	70.0	TCS-2
42415	42455	40.0	TCS-2A
42455	42545	90.0	TCS-5
42545	42595	50.0	TCS-2
42595	42665	70.0	TCS-2A
42665	42755	90.0	TCS-4
42755	42985	230.0	TCS-5
42985	43025	40.0	TCS-5A
43025	43425	400.0	TCS-5
43425	43995	570.0	TCS-1
43995	44045	50.0	TCS-2A
44045	44325	280.0	TCS-5
44325	44385	60.0	TCS-5A
44385	44485	100.0	TCS-5
44485	44540	55.0	TCS-2A
44540	44640	100.0	TCS-5
44640	44685	45.0	TCS-2A
44685	44775	90.0	TCS-5
44775	44825	50.0	TCS-3
44825	44895	70.0	TCS-2
44895	44965	70.0	TCS-3
44965	45025	60.0	TCS-2A
45025	45195	170.0	TCS-1A
45195	45295	100.0	TCS-1
45295	45405	110.0	TCS-2
45405	45525	120.0	TCS-1
45525	45605	80.0	TCS-4
45605	45685	80.0	TCS-1
45685	45845	160.0	TCS-3
45845	45915	70.0	TCS-1A
45915	45955	40.0	TCS-1
45955	46100	145.0	TCS-4A
46100	46175	75.0	TCS-2
46175	46275	100.0	TCS-2A

Chainage (m)		Length (m)	TCS No.
From	To		
46275	46375	100.0	TCS-2
46375	46485	110.0	TCS-6A
46485	46625	140.0	TCS-2
46625	46705	80.0	TCS-1
46705	46745	40.0	TCS-1A
46745	47035	290.0	TCS-1
47035	47115	80.0	TCS-4
47115	47165	50.0	TCS-1
47165	47295	130.0	TCS-1
47295	47345	50.0	TCS-4
47345	47555	210.0	TCS-1
47555	47605	50.0	TCS-3
47605	47935	330.0	TCS-1
47935	48235	300.0	TCS-3
48235	48325	90.0	TCS-5
48325	48475	150.0	TCS-1
48475	48555	80.0	TCS-1A
48555	48595	40.0	TCS-3
48595	48645	50.0	TCS-4A
48645	48735	90.0	TCS-1
48735	48930	195.0	TCS-1
48930	48980	50.0	TCS-1A
48980	49065	85.0	TCS-3
49065	49185	120.0	TCS-1
49185	49275	90.0	TCS-1A
49275	49385	110.0	TCS-1
49385	49445	60.0	TCS-3
49445	49495	50.0	TCS-1
49495	49555	60.0	TCS-3
49555	49605	50.0	TCS-4
49605	49655	50.0	TCS-1
49655	49695	40.0	TCS-1A
49695	49755	60.0	TCS-3
49755	49895	140.0	TCS-1
49895	49945	50.0	TCS-4A
49945	49995	50.0	TCS-1
49995	50035	40.0	TCS-4A
50035	50115	80.0	TCS-1
50115	50185	70.0	TCS-4A
50185	50235	50.0	TCS-1
50235	50310	75.0	TCS-1A
50310	50365	55.0	TCS-3
50365	50455	90.0	TCS-1
50455	50515	60.0	TCS-1A

Chainage (m)		Length (m)	TCS No.
From	To		
50515	50685	170.0	TCS-1
50685	50765	80.0	TCS-4
50765	50895	130.0	TCS-1
50895	50975	80.0	TCS-4A
50975	51155	180.0	TCS-2A
51155	51255	100.0	TCS-2
51255	51305	50.0	TCS-4A
51305	51575	270.0	TCS-2
51575	51635	60.0	TCS-4
51635	51755	120.0	TCS-2
51755	51855	100.0	TCS-1
51855	51905	50.0	TCS-1A
51905	52065	160.0	TCS-2
52065	52105	40.0	TCS-2A
52105	52195	90.0	TCS-2
52195	52245	50.0	TCS-2A
52245	52315	70.0	TCS-5
52315	52415	100.0	TCS-2
52415	52545	130.0	TCS-4A
52545	52605	60.0	TCS-2
52605	52695	90.0	TCS-4
52695	52845	150.0	TCS-2
52845	52905	60.0	TCS-4
52905	52955	50.0	TCS-2
52955	53035	80.0	TCS-2A
53035	53135	100.0	TCS-2
53135	53195	60.0	TCS-2A
53195	53245	50.0	TCS-1
53245	53295	50.0	TCS-1A
53295	53365	70.0	TCS-4A
53365	53465	100.0	TCS-2
53465	53525	60.0	TCS-2A
53525	53595	70.0	TCS-1
53595	53665	70.0	TCS-4
53665	53735	70.0	TCS-2
53735	54025	290.0	TCS-1
54025	54085	60.0	TCS-2
54085	54195	110.0	TCS-1A
54195	54285	90.0	TCS-1
54285	54365	80.0	TCS-4
54365	54415	50.0	TCS-3
54415	54555	140.0	TCS-2
54555	54745	190.0	TCS-1
54745	54795	50.0	TCS-1A

Chainage (m)		Length (m)	TCS No.
From	To		
54795	54895	100.0	TCS-1
54895	54975	80.0	TCS-1A
54975	55025	50.0	TCS-3
55025	55085	60.0	TCS-1A
55085	55215	130.0	TCS-1
55215	55280	65.0	TCS-1A
55280	55385	105.0	TCS-1
55385	55475	90.0	TCS-3
55475	55545	70.0	TCS-7
55545	55595	50.0	TCS-7A
55595	55665	70.0	TCS-7
55665	55725	60.0	TCS-7A
55725	55775	50.0	TCS-2
55775	55895	120.0	TCS-2
55895	55995	100.0	TCS-5
55995	56105	110.0	TCS-1
56105	56435	330.0	TCS-2
56435	56485	50.0	TCS-2A
56485	56725	240.0	TCS-2
56725	56795	70.0	TCS-3
56795	56895	100.0	TCS-1
56895	56945	50.0	TCS-4A
56945	57085	140.0	TCS-2
57085	57175	90.0	TCS-4
57175	57235	60.0	TCS-2
57235	57305	70.0	TCS-1
57305	57365	60.0	TCS-5
57365	57425	60.0	TCS-1
57425	57505	80.0	TCS-4
57505	57565	60.0	TCS-1
57565	57635	70.0	TCS-1A
57635	57705	70.0	TCS-4
57705	57765	60.0	TCS-1
57765	57815	50.0	TCS-1A
57815	57865	50.0	TCS-1
57865	57925	60.0	TCS-4
57925	58275	350.0	TCS-1
58275	58325	50.0	TCS-2
58325	58405	80.0	TCS-5
58405	58485	80.0	TCS-4
58485	58635	150.0	TCS-2
58635	58685	50.0	TCS-2A
58685	58755	70.0	TCS-2
58755	58845	90.0	TCS-1

Chainage (m)		Length (m)	TCS No.
From	To		
58845	59025	180.0	TCS-2
59025	59075	50.0	TCS-1A
59075	59195	120.0	TCS-1
59195	59310	115.0	TCS-1A
59310	59360	50.0	TCS-1
59360	59475	115.0	TCS-1A
59475	59565	90.0	TCS-2
59565	59645	80.0	TCS-4A
59645	59835	190.0	TCS-2
59835	59885	50.0	TCS-2A
59885	59965	80.0	TCS-2
59965	60055	90.0	TCS-5
60055	60305	250.0	TCS-1
60305	60465	160.0	TCS-5
60465	60595	130.0	TCS-1
60595	60975	380.0	TCS-2
60975	61095	120.0	TCS-1A
61095	61225	130.0	TCS-5A
61225	61345	120.0	TCS-1
61345	61795	450.0	TCS-1
61795	61885	90.0	TCS-2
61885	62015	130.0	TCS-5
62015	62235	220.0	TCS-2
62235	62365	130.0	TCS-1
62365	62435	70.0	TCS-2A
62435	62885	450.0	TCS-1
62885	62995	110.0	TCS-2
62995	63415	420.0	TCS-1
63415	63535	120.0	TCS-2A
63535	63615	80.0	TCS-1
63615	63785	170.0	TCS-2
63785	63845	60.0	TCS-1
63845	63945	100.0	TCS-1A
63945	64045	100.0	TCS-4
64045	64155	110.0	TCS-1
64155	64275	120.0	TCS-1
64275	64405	130.0	TCS-4A
64405	64485	80.0	TCS-1
64485	64565	80.0	TCS-3
64565	64725	160.0	TCS-1
64725	64865	140.0	TCS-5
64865	65035	170.0	TCS-3
65035	65115	80.0	TCS-3A
65115	65255	140.0	TCS-2

Chainage (m)		Length (m)	TCS No.
From	To		
65255	65325	70.0	TCS-3A
65325	65455	130.0	TCS-5
65455	65585	130.0	TCS-1
65585	65765	180.0	TCS-1
65765	66055	290.0	TCS-1
66055	66125	70.0	TCS-1A
66125	66305	180.0	TCS-1
66305	66375	70.0	TCS-4A
66375	66545	170.0	TCS-2
66545	66645	100.0	TCS-1
66645	66785	140.0	TCS-2
66785	67425	640.0	TCS-1
67425	67535	110.0	TCS-1A
67535	67595	60.0	TCS-4A
67595	67725	130.0	TCS-1
67725	67845	120.0	TCS-3A
67845	68185	340.0	TCS-1
68185	68425	240.0	TCS-2
68425	68675	250.0	TCS-1
68675	69035	360.0	TCS-1
69035	69175	140.0	TCS-1
69175	69285	110.0	TCS-2A
69285	69675	390.0	TCS-7A
69675	69725	50.0	TCS-2A
69725	69875	150.0	TCS-5

3. Intersections and Grade Separators

All intersections and grade separators shall be as per Section 3 of the Manual. Existing intersections which are deficient shall be improved to the prescribed standards.
Properly designed intersections shall be provided at the locations and of the types and features given in the tables below:

(i) At-grade intersections

Major Intersections

Sl. No.	Location of Intersection (km)	Type of intersection	Other features	Remarks
Nil				

Minor Intersections

Sl. No.	Location of Intersection (km)	Type of intersection	Other features

Sl. No.	Location of Intersection (km)	Type of intersection	Other features
1	36.150	Y-Type	3-Legged
2	37.075	Y-Type	3-Legged
3	39.875	Y-Type	3-Legged
4	46.050	Y-Type	3-Legged
5	46.305	Y-Type	3-Legged
6	68.865	Y-Type	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 IRC: S: 73-2018 and the specified typical cross section. 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 section 5 of the IRC:SP:73-2018 and IRC 37-2018.

(ii) Type of pavement

Flexible Pavement as per IRC 37-2018 (or latest) shall be adopted.

(iii) Design requirements

Notwithstanding anything to the contrary contained in this agreement or the manual, the contractor shall design the pavement of main carriageway for design traffic of 20 MSA with a minimum design period of 20 years. Effective CBR value as obtained at site shall be taken for design, if CBR is less than 10%. Maximum value of effective CBR to be taken for design shall not exceed 10%. Bituminous Grade VG 40 shall be used for BC.

(iv) Reconstruction of stretches

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

Sl. No.	Stretch From km to km		Remarks	TCS Type
1	34.795	34.900	Reconstruction	TCS-7A
2	34.900	34.950	Reconstruction	TCS-4A
3	34.950	35.185	Reconstruction	TCS-7A
4	35.185	35.255	Reconstruction	TCS-4A
5	35.255	35.450	Reconstruction	TCS-1A
6	35.450	35.550	Reconstruction	TCS-4A
7	35.550	35.655	Reconstruction	TCS-1A
8	35.655	35.835	Reconstruction	TCS-2A
9	35.835	36.000	Reconstruction	TCS-2A
10	36.000	36.100	Reconstruction	TCS-4A
11	36.700	37.085	Reconstruction	TCS-1A
12	37.085	37.150	Reconstruction	TCS-1A
13	37.150	37.250	Reconstruction	TCS-4A
14	37.250	37.400	Reconstruction	TCS-1A
15	37.400	37.550	Reconstruction	TCS-4A
16	38.175	38.350	Reconstruction	TCS-1A
17	38.350	38.450	Reconstruction	TCS-4A
18	38.450	38.600	Reconstruction	TCS-1A
19	38.600	38.750	Reconstruction	TCS-4A
20	38.750	38.800	Reconstruction	TCS-1A
21	38.800	38.900	Reconstruction	TCS-5A
22	38.900	39.100	Reconstruction	TCS-2A
23	39.100	39.200	Reconstruction	TCS-1A
24	39.200	39.435	Reconstruction	TCS-1A
25	39.665	39.850	Reconstruction	TCS-5A
26	39.850	39.900	Reconstruction	TCS-3A
27	39.900	39.950	Reconstruction	TCS-5A
28	39.950	40.025	Reconstruction	TCS-1A
29	40.805	40.965	Reconstruction	TCS-2A
30	41.265	41.315	Reconstruction	TCS-4A
31	41.575	41.665	Reconstruction	TCS-4A
32	41.710	41.875	Reconstruction	TCS-1A
33	42.305	42.345	Reconstruction	TCS-4A
34	42.415	42.455	Reconstruction	TCS-2A
35	42.595	42.665	Reconstruction	TCS-2A
36	42.985	43.025	Reconstruction	TCS-5A
37	43.995	44.045	Reconstruction	TCS-2A
38	44.325	44.385	Reconstruction	TCS-5A

Sl. No.	Stretch From km to km		Remarks	TCS Type
39	44.485	44.540	Reconstruction	TCS-2A
40	44.640	44.685	Reconstruction	TCS-2A
41	44.965	45.025	Reconstruction	TCS-2A
42	45.025	45.195	Reconstruction	TCS-1A
43	45.845	45.915	Reconstruction	TCS-1A
44	45.955	46.100	Reconstruction	TCS-4A
45	46.175	46.275	Reconstruction	TCS-2A
46	46.375	46.485	Reconstruction	TCS-6A
47	46.705	46.745	Reconstruction	TCS-1A
48	48.475	48.555	Reconstruction	TCS-1A
49	48.595	48.645	Reconstruction	TCS-4A
50	48.930	48.980	Reconstruction	TCS-1A
51	49.185	49.275	Reconstruction	TCS-1A
52	49.655	49.695	Reconstruction	TCS-1A
53	49.895	49.945	Reconstruction	TCS-4A
54	49.995	50.035	Reconstruction	TCS-4A
55	50.115	50.185	Reconstruction	TCS-4A
56	50.235	50.310	Reconstruction	TCS-1A
57	50.455	50.515	Reconstruction	TCS-1A
58	50.895	50.975	Reconstruction	TCS-4A
59	50.975	51.155	Reconstruction	TCS-2A
60	51.255	51.305	Reconstruction	TCS-4A
61	51.855	51.905	Reconstruction	TCS-1A
62	52.065	52.105	Reconstruction	TCS-2A
63	52.195	52.245	Reconstruction	TCS-2A
64	52.415	52.545	Reconstruction	TCS-4A
65	52.955	53.035	Reconstruction	TCS-2A
66	53.135	53.195	Reconstruction	TCS-2A
67	53.245	53.295	Reconstruction	TCS-1A
68	53.295	53.365	Reconstruction	TCS-4A
69	53.465	53.525	Reconstruction	TCS-2A
70	54.085	54.195	Reconstruction	TCS-1A
71	54.745	54.795	Reconstruction	TCS-1A
72	54.895	54.975	Reconstruction	TCS-1A
73	55.025	55.085	Reconstruction	TCS-1A
74	55.215	55.280	Reconstruction	TCS-1A
75	55.545	55.595	Reconstruction	TCS-7A
76	55.665	55.725	Reconstruction	TCS-7A
77	56.435	56.485	Reconstruction	TCS-2A
78	56.895	56.945	Reconstruction	TCS-4A
79	57.565	57.635	Reconstruction	TCS-1A
80	57.765	57.815	Reconstruction	TCS-1A
81	58.635	58.685	Reconstruction	TCS-2A
82	59.025	59.075	Reconstruction	TCS-1A
83	59.195	59.310	Reconstruction	TCS-1A
84	59.360	59.475	Reconstruction	TCS-1A
85	59.565	59.645	Reconstruction	TCS-4A
86	59.835	59.885	Reconstruction	TCS-2A
87	60.975	61.095	Reconstruction	TCS-1A

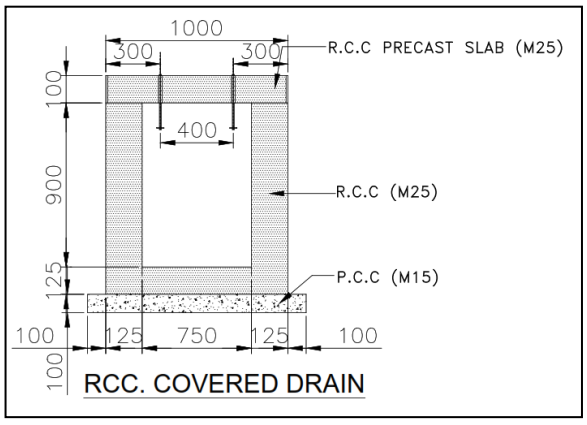
Sl. No.	Stretch From km to km		Remarks	TCS Type
88	61.095	61.225	Reconstruction	TCS-5A
89	62.365	62.435	Reconstruction	TCS-2A
90	63.415	63.535	Reconstruction	TCS-2A
91	63.845	63.945	Reconstruction	TCS-1A
92	64.275	64.405	Reconstruction	TCS-4A
93	65.035	65.115	Reconstruction	TCS-3A
94	65.255	65.325	Reconstruction	TCS-3A
95	66.055	66.125	Reconstruction	TCS-1A
96	66.305	66.375	Reconstruction	TCS-4A
97	67.425	67.535	Reconstruction	TCS-1A
98	67.535	67.595	Reconstruction	TCS-4A
99	67.725	67.845	Reconstruction	TCS-3A
100	69.175	69.285	Reconstruction	TCS-2A
101	69.285	69.675	Reconstruction	TCS-7A
102	69.675	69.725	Reconstruction	TCS-2A

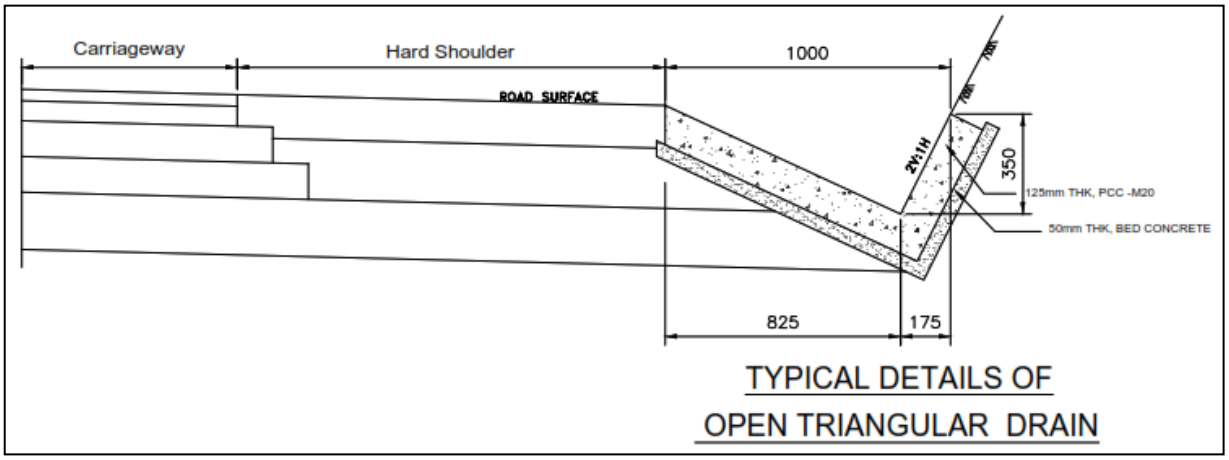
*- Annexure-II of Schedule-B

6. Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per Section 6 of the Manual (IRC: SP: 73-2018).

Drain Type	Side	Net Length (m)
RCC Covered Drain	Both side	1950
PCC Open Triangular Drain	Both/One side	38781
Total=		**40731 m**





Note 1: The length of side drains given above are minimum and it may vary as per site condition. In case of increase of length, no positive change of scope will be payable.

Note 2: Box cut sections will have drains on both sides.

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:

Sl. No.	Bridge at km	Width of carriageway and cross-sectional features*
1	68.305	**Carriageway Width = 11.0 m** Width of Crash Barrier = 1.0m (2x0.5m) Overall width = 12m

(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.	Bridge at km	Width of carriageway and cross-sectional features
Nil		

(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) Distance between any two culverts shall not be more than 200 m.

(c) Minimum of five culverts per Km shall be provided.

(d) Reconstruction of existing culverts:

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

Sl. No.	Design Chainage (km)	Size (m)
1	35.215	1X 2.0 X 3.0
2	35.835	1X 2.0 X 3.0
3	36.830	1X 2.0 X 3.0
4	37.562	1X 2.0 X 2.0
5	37.962	1X 2.0 X 3.0
6	38.288	1X 2.0 X 3.0
7	38.490	1X 2.0 X 2.0
8	38.712	1X 2.0 X 3.0
9	39.092	1X 2.0 X 2.0
10	39.210	1X 2.0 X 3.0
11	39.469	1X 2.0 X 2.0
12	39.535	1X 4.0 X 3.0
13	39.670	1X 2.0 X 2.0
14	40.450	1X 2.0 X 2.0
15	40.769	1X 4.0 X 5.0
16	41.088	1X 2.0 X 3.0
17	41.205	1X 2.0 X 3.0
18	41.432	1X 2.0 X 3.0
19	41.595	1X 2.0 X 3.0
20	41.910	1X 2.0 X 3.0
21	42.112	1X 2.0 X 3.0
22	45.168	1X 2.0 X 2.0
23	45.374	1X 2.0 X 2.0
24	45.765	1X 2.0 X 2.0

Sl. No.	Design Chainage (km)	Size (m)
25	45.910	1X 2.0 X 2.0
26	46.210	1X 3.0 X 4.0
27	46.340	1X 2.0 X 2.0
28	46.545	1X 2.0 X 3.0
29	46.780	1X 2.0 X 2.0
30	46.972	1X 2.0 X 3.0
31	47.218	1X 2.0 X 2.0
32	48.232	1X 2.0 X 3.0
33	48.732	1X 2.0 X 2.0
34	49.250	1X 2.0 X 2.0
35	49.370	1X 2.0 X 3.0
36	49.662	1X 2.0 X 2.0
37	49.815	1X 2.0 X 3.0
38	49.870	1X 2.0 X 3.0
39	50.448	1X 2.0 X 3.0
40	50.638	1X 2.0 X 3.0
41	51.030	1X 2.0 X 2.0
42	52.010	1X 2.0 X 2.0
43	52.318	1X 2.0 X 3.0
44	52.624	1X 2.0 X 2.0
45	52.880	1X 2.0 X 3.0
46	53.608	1X 2.0 X 3.0
47	54.068	1X 2.0 X 2.0
48	54.342	1X 2.0 X 3.0
49	54.500	1X 2.0 X 3.0
50	54.512	1X 2.0 X 2.0
51	54.660	1X 2.0 X 3.0
52	54.973	1X 2.0 X 2.0
53	55.173	1X 2.0 X 2.0
54	55.355	1X 2.0 X 3.0
55	55.475	1X 2.0 X 3.0
56	55.575	1X 2.0 X 2.0
57	56.460	1X 2.0 X 2.0
58	56.935	1X 2.0 X 2.0
59	57.370	1X 2.0 X 3.0
60	57.470	1X 2.0 X 2.0
61	57.680	1X 2.0 X 2.0
62	57.788	1X 3.0 X 3.0
63	57.918	1X 3.0 X 4.0
64	58.110	1X 2.0 X 2.0
65	58.258	1X 2.0 X 2.0
66	58.753	1X 2.0 X 2.0
67	59.158	1X 2.0 X 2.0
68	62.590	1X 2.0 X 2.0
69	62.780	1X 2.0 X 2.0
70	62.865	1X 2.0 X 2.0
71	62.995	1X 2.0 X 3.0
72	63.922	1X 2.0 X 2.0
73	64.130	1X 2.0 X 3.0

Sl. No.	Design Chainage (km)	Size (m)
74	64.870	1X 2.0 X 2.0
75	65.610	1X 4.0 X 5.0
76	66.570	1X 4.0 X 4.0
77	66.752	1X 5.0 X 4.0
78	67.468	1X 3.0 X 4.0
79	67.660	1X 5.0 X 3.0
80	68.502	1X 2.0 X 2.0
81	68.838	1X 2.0 X 2.0
82	69.258	1X 2.0 X 2.0
83	69.475	1X 2.0 X 2.0
84	69.580	1X2.0 X 3.0

Note : The above Design Chainages are indicative and may vary as per site requirement to be approved by Authority's Engineer.

(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.	Design	Size
1	35.570	1X 2.0 X 2.0
2	36.395	1X 2.0 X 2.0
3	37.242	1X 2.0 X 3.0
4	39.805	1X 2.0 X 2.0
5	40.075	1X 2.0 X 2.0
6	42.400	1X 2.0 X 2.0
7	46.650	1X 2.0 X 2.0
8	47.700	1X 2.0 X 2.0
9	49.078	1X 2.0 X 2.0
10	50.159	1X 2.0 X 2.0
11	50.827	1X 2.0 X 2.0
12	51.273	1X 2.0 X 2.0
13	51.600	1X 2.0 X 2.0
14	52.500	1X 2.0 X 2.0
15	53.123	1X 2.0 X 2.0
16	53.310	1X 2.0 X 2.0
17	53.784	1X 2.0 X 2.0

18	54.800	1X 2.0 X 2.0
19	55.800	1X 2.0 X 2.0
20	57.132	1X 2.0 X 2.0
21	58.450	1X 2.0 X 2.0
22	58.978	1X 2.0 X 2.0
23	59.557	1X 2.0 X 3.0
24	60.061	1X 2.0 X 2.0
25	60.477	1X 2.0 X 2.0
26	60.984	1X 2.0 X 2.0
27	61.390	1X 2.0 X 2.0
28	61.660	1X 2.0 X 2.0
29	62.069	1X 2.0 X 2.0
30	62.414	1X 2.0 X 2.0
31	63.219	1X 2.0 X 2.0
32	63.500	1X 2.0 X 2.0
33	64.300	1X 2.0 X 2.0
34	66.221	1X 2.0 X 2.0
35	66.955	1X 4.0 X 5.0
36	67.150	1X 2.0 X 2.0
37	67.275	1X 2.0 X 2.0
38	68.251	1X 5.0 X 5.0

Note : The above Design Chainages are indicative and may vary as per site requirement to be approved by Authority's Engineer.

(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.

Sl.	Bridge	Salient details of existing bridge	Adequacy or	Remarks

No.	location (km)	Type of Structures	Span Arrangement and Total Vent way (No. x Length) (m)	otherwise of the existing waterway, vertical clearance, etc*	
Nil					

(ii) The following narrow bridges shall be widened:

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

(b) Additional new bridges

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
1	68.305	1 x 40	PSC I-Girder

(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

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.

Sl. No.	Traffic Signage, Road Marking and other appurtenances	Quantity	Unit
1	90 cm equilateral triangle	**684**	nos
2	Stop Sign (90 cm high octagon)	**6**	nos
3	60 cm circular	**16**	nos
4	Direction Sign <.0.9 sqm	**12**	nos
5	Direction Sign >0.9 sqm	**8**	nos
6	Delineator/Object /Hazard Marker	**3464**	nos
7	Rumble Strip	**8**	nos
8	Road stud	**19059**	nos
9	Painting	**11693**	sqm

(ii) Specifications of the reflective sheeting.

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)	Remarks
1	69.875	Full Width

10. Compulsory Afforestation

Compensatory afforestation shall be in accordance with section 11 of the relevant Manual.

11. Hazardous Locations

11.1 "W" Metal Beam crash barrier of minimum length of 8161m, Wire rope Crash Barrier of minimum length of 6184m and Parapet wall of minimum length of 5121m shall be provided at the locations of bridge approaches, high embankment (3.0m and more) ,at sharp curves and valley sides of the road. Typical details of crash barrier are given in manual. Increase in length if any as per site requirement will not constitute change of scope.

11.2 Rest of the complete length of the project highway shall have parapet wall as per IRC SP 48:1998.

12. Special Requirement for Hill Roads

Refer to section 13 of IRC: SP: 73-2018. The minimum quantity of protection work may be taken as below:

Type of Protection Work		
Protection Work	Unit	Quantity
PCC Breast wall, 1.5m height	Running Meter	3100
RCC Breast wall, 3.0m height	Running Meter	8897
RCC Retaining wall, 2m height	Running Meter	3096
RCC Retaining wall, 3m height	Running Meter	667
RCC Retaining wall, 4m height	Running Meter	90
RCC Retaining wall, 5m height	Running Meter	73
Seeding & Mulching with Jute Net	Sqm	116980
Chute for Culvert	No.	At Every Culvert location

Note:

(i) The Contractor shall be responsible for accurate assessment of the actual requirement as per site situation & prepare designs for slope protection & stabilization as per the specifications & standards stipulated in schedule 'D' and submit the same to the AE for review through the proof consultant and implement it accordingly thereafter.

(ii) Any increase in quantity over and above the minimum qty. as mentioned in above table or through change in specifications will not be considered as change of scope. Therefore contractor shall make thorough investigation at site and assess the requirement of slope protection and slide prone zone and other safety features at his own before submission of bid.

(iii) The length of Retaining Wall shown above is minimum, to be constructed at site for proper geometrics and will not be converted to Breast Wall. Any reduction in the total length of Retaining Wall constructed at site shall constitute of negative change of scope.

(iv) Entire slope/formation which has been cut, apart from the above tabulated lengths/area shall have to be stabilized by the Contractor using techniques approved by AE.

Special Treatment for Hill Cutting above 15m Height

Surficial Protection and Erosion Control Measures

The Hill side surficial protection and erosion control measures is proposed at locations where the cut height is more than 15m or required as per site condition. The minimum details of locations with length are as below.

Chainage (Km)		Length (m)
From	To	
39.900	39.950	50
42.850	43.350	500
48.100	48.300	200
51.400	51.500	100
55.850	56.000	150
60.850	60.950	100
61.150	61.200	50
61.900	62.000	100
63.750	63.800	50
68.200	68.450	250
Total Length=		**1550**

Hill side Typical Surficial Protection and Erosion Control Measures for cut height of side slope more than 15m or required as per site condition are presented in described below:

(a) RCC Breast wall with minimum height 3.0 m shall be constructed after cutting at the toe of hill side slope. Breast wall shall be constructed along with granular filter media behind the Wall for filtration & separation and road edge drain.

(b) Surficial Protection for hill cutting above 15m height -Continuously threaded anchors shall be installed on the side slope. Surficial protection with secured drapery system shall be done for minimum 8 m length and height of cut slope surface developed by cutting with slope angle of 60 degree with horizontal after excavation. in Surface protection shall be done by high resistance double twisted hexagonal Shaped Wire Mesh Netting o f Mesh Type 10 x12 with D=100 mm tolerance of ± 2% , Zn + PVC coated with top, bottom and surface continuously threaded anchors. Top, bottom and surface anchors shall have minimum length and minimum diameter as 8.0 m and 32 mm respectively. Top and bottom anchors shall be provided at a minimum spacing of 3.0 m c/c in longitudinal and vertical directions for total area. All anchors shall be fully grouted. Minimum yield strength of anchorages shall be 500 MPa.

(c) Providing and spreading Non Woven Geotextile (150 GSM) for total area from the bottom of the cut slope.

(d) Drainage Measures for Cut Slopes - Drainage measures for internal seepage in the cut slope shall be adopted by installing PVC pipes inside the slope. PVC pipes for internal seepage shall be half perforated and lined with geotextile. PVC pipes shall be installed for minimum 4 m length at spacing of 3 m c/c in longitudinal and vertical directions for total area from the bottom of the cut slope. Top drain shall also be constructed at the toe. In addition to the above mentioned drainage measures, suitable surface drainage measures shall be adopted as per the site condition.

Emergency Escape Ramp in Hillside

Chainage (m)		Length (m)	Width (m)
From	To		
42050	42150	100	3.5
44150	44250	100	3.5
48050	48150	100	3.5
Total Length		**300**	

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.

14. Utility Shifting

Shifting of obstructing existing utilities indicated in Schedule A to an appropriate location in accordance with the standards and specification of concerned Utility Owning Department is part of the scope of work of the Contractor/Concessionaire*. The bidders may visit the site and assess the quantum of shifting of utilities for the projects before submission of their bid. Copy of utility relocation plan is enclosed. The specification of concerned Utility Owning Department shall be applicable and followed.

Note-I:

a) The type/spacing/size/specifications of poles/towers/lines/cables to be used in shifting work shall be as per the guidelines of utility owning department and it is to be agreed solely between the contractor/Concessionaire* and the utility owning department. No change of scope shall be admissible and no cost shall be paid for using different type/spacing/size/specifications in shifted work in comparison to those in the existing work or for making any overhead crossing to underground as per requirement of utility owning department and/or construction of project highway. The contractor/concessionaire* shall carry out joint inspection with utility owning department and get the estimates from the utility owning department. The assistance of the Authority is limited to giving forwarding letter on the proposal of contractor/concessionaire* to utility owning department whenever asked by the contractor/concessionaire*. The decision/ approval of utility owning department shall be on the contractor/concessionaire*.

b) The supervision charges at the rates/charges applicable of the utility owning department shall be paid directly by the Authority to the utility Owning department as and when contractor/concessionaire*furnishes demand of utility Owning Department along with a copy of estimated cost given by later.

c) The dismantled material/scrap of existing Utility to be shifted/Dismantled shall belong to the contractor/concessionaire* who would be free to dispose-off the dismantled material as deemed fit by them unless the contractor/concessionaire* is required to deposit the dismantled material may be availed by the contractor/concessionaire* as per estimate agreed between them.

d) The utilities shall be handed over after shifting work is completed to utility Owning Department to their entire satisfaction. The maintenance liability shall rest with the Utility Owning Department after Handing over Process is complete as far as utility shifting works are concerned.

Note-II:

Utility Shifting/Relocation Plan and drawings incorporating the details, such as the length and category of lines, types of circuits, type and number of poles, size and type of conductor/cable, the number and type of crossings and the capacity and the number of transformer, the length and category of pipes etc., shall be prepared by the Contractor in consultation with Utility Owning Department and the Authority's Engineer as per the site requirement.

(Schedule-B1)

1.The shifting of utilities

(iv) Electrical utilities

The site includes the following electrical utilities:-

c) Extra High-Tension Lines (EHT Lines)*

d) High Tension/Low Tension Lines (HT/LT Lines)*

List of 11KV Line to be Shifted								
Sl. No.	**Design Chainage (km)**	**Existing Chainage (km)**	**Description**	**Offset Distance From Existing Road Centre (m)**	**Side**		**Coordinates**	
					Left	**Right**	**Easting (m)**	**Northing (m)**
1	35.048	36.128	11 KV	16.1		RHS	672683.260	2838930.879
2	41.685	42.935	11 KV	10.8		RHS	673739.634	2837913.141
3	44.165	45.610	11 KV	3.8	LHS		673955.633	2836137.911
4	44.575	46.750	11 KV	8.9	LHS		674149.207	2835851.403
5	44.925	46.560	11 KV	10.1		RHS	674472.000	2835864.503
6	45.970	47.550	11 KV	26.4		RHS	675056.670	2835398.235
7	46.226	47.829	11 KV	10.7		RHS	675164.611	2835189.703
8	46.495	48.102	11 KV	10.9		RHS	675163.697	2834972.41
9	46.498	48.110	11 KV	29.7	LHS		675139.996	2834959.296
10	46.880	48.510	11 KV	31.4	RHS		675308.637	2834662.975
11	47.280	48.970	11 KV	7		RHS	675419.115	2834362.577
12	49.518	51.295	11 KV	37		RHS	676289.642	2833521.461
13	53.498	55.428	11 KV	13.3		RHS	677458.166	2831490.797
14	60.772	62.942	11 KV	23.2		RHS	677151.092	2829037.065
15	62.360	64.590	11 KV	22.1	LHS		677113.969	2828707.784

List of LT Line to be Shifted						
Sl.	**Design**	**Existing**	**Description**	**Offset Distance**	**Side**	**Coordinates**

No.	Chainage (km)	Chainage (km)		From Existing Road Centre (m)	Left	Right	Easting (m)	Northing (m)
1	34.897	35.970	LT	3.4	LHS		672728.318	2839075.583
2	34.960	36.040	LT	3.2		RHS	672724.382	2839003.438
3	35.017	36.095	LT	5	LHS		672686.781	2838963.754
4	35.053	36.132	LT	9.4	LHS		672675.319	2838930.569
5	35.083	36.168	LT	8.2	LHS		672677.624	2838901.005
6	35.085	36.170	LT	9.9	LHS		672679.403	2838901.169
7	35.135	36.218	LT	7.1	LHS		72679.385	2838851.567
8	35.205	36.290	LT	25.6		RHS	672701.018	2838770.879
9	36.975	38.125	LT	13.4		RHS	672687.675	2838413.727
10	46.043	47.628	LT	5.5	LHS		675051.005	2835341.327
11	46.067	47.658	LT	4.2	LHS		675067.402	2835315.035
12	46.076	47.670	LT	28.7		RHS	675046.432	2835288.063
13	46.225	47.800	LT	34.2	LHS		675130.825	2835187.083
14	46.240	47.825	LT	18.9		RHS	675193.425	2835200.24
15	46.255	47.855	LT	35.7		RHS	675219.361	2835173.026
16	46.565	48.175	LT	12.2		RHS	675182.043	2834912.392
17	46.570	48.170	LT	9.3	LHS		675164.35	2834906.394
18	55.567	57.645	LT	5.6		RHS	676830.583	2830462.825
19	55.660	57.745	LT	32.8		RHS	676917.864	2830376.369
20	55.735	57.815	LT	10.1		RHS	676862.474	2830321.314
21	69.287	71.695	LT	19.2		RHS	677608.317	2827623.529
22	68.305	71.712	LT	2.9		LHS	677582.959	677582.959
23	69.343	71.755	LT	2.9	LHS		677596.448	2827681.973
24	69.380	71.815	LT	6.4	LHS		677630.464	2827724.697
25	69.390	71.825	LT	6.2		RHS	677645.403	2827710.653
26	69.436	71.871	LT	2.5	LHS		677686.175	2827703.839
27	69.510	71.940	LT	7.8	LHS		677750.283	2827723.785
28	69.610	72.048	LT	2.1	LHS		677853.566	2827744.57
29	69.670	72.105	LT	3.5	LHS		677904.703	2827769.254

(v) Public Health utilities (Water/Sewage Pipe Lines)*

The site includes the following Public Health utilities:-

S. No	Existing Chainage		Design Chainage		Length(in Km)
	From (Km)	To (Km)	From (Km)	To (Km)	Water Supply line
1	35.870	72.316	34.795	69.875	4.12

(vi) Any Other line

Note: Variation upto 10% in quantities of Utilities to be shifted will not constitute Change of Scope.

Appendix B-I of Annexure -I

(Schedule-B)

The plan & profile and GAD of structures of the project highway are given in soft copy.

Schedule - C

(See Clause 2.1)

Project Facilities

1. Project Facilities

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

(a) toll plaza[s];

(b) roadside furniture;

(c) pedestrian facilities;

(d) truck lay-byes;

(e) bus-bays and bus shelters; (f)

rest areas; and

(g) others to be specified

2. Description of Project Facilities

Each of the Project Facilities is described below:

(a) Toll Plaza: Nil

(b) Roadside Furniture:

The roadside furniture shall be provided in accordance with section 9.0 of the Manual of the standards and Specifications.

Sl. No.	Project Facility	Location	Design Standard	Other essential details
1	Traffic Sign & Pavement marking	Entire Length(As per Schedule B)	As per manual	
2	Km stone, Hectometer Stone, 5th kilometre stone	Entire Length	As per manual	
3	Roadside Delineator, marker & Road Stud	As per Schedule B	As per manual	
4	Metal beam crash barrier	As per Schedule B	As per 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) Truck Lay Byes:

Sl. No.	Proposed Chainage (km)
Nil	

(e) Bus bays and Bus shelters:

Sl. No.	Proposed Chainage (km)	Remarks
1	35.365 (Both side)	Fig. 12.3 of Manual
2	47.105 (Both side)	Fig. 12.3 of Manual
3	55.810 (Both side)	Fig. 12.3 of Manual
4	69.800 (Both side)	Fig. 12.3 of Manual

(f) Rest areas: Nil

(g) Others:

Street Lighting

Street lighting shall be provides in the built up area.

Landscaping

Landscape treatment of the Project Highway shall be undertaken through planting of trees and ground cover of appropriate varieties and landscaping on surplus land in the ROW. The construction Contractor should plant at least 11220 nos. of tress of minimum 6ft. height with tree guard made up MS sections.

Plantation scheme shall be prepared in consultation with the Forest Department of the Government of Nagaland, and the Independent Consultant/NHIDCL.

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.

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

Schedule - D

(See Clause 2.1)

Specifications and Standards

1. Construction

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

2. Design Standards

The Project Highway including Project Facilities shall conform to design requirements set out in the Manual of Specifications and Standards for Two-Laning of Highways (IRC: SP: 73-2018) referred to as the Manual, and MORTH Specifications for Road and Bridge Works 5th Revision 2013 or latest version. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer. The Hill Road Manual IRC SP 48 -1998 and IRC:52-2019 should also be referred.

THE NATIONAL GREEN TRIBUNAL PRINCIPAL BENCH, NEW DELHI on 01th Nov, 2018

Following recommendations and suggestions have been made for dumping muck & dumping yard:-

a. Before dumping muck at the dumping yard first of all retaining/ gabion walls of specified capacity and suitable design should be constructed.

b. All the dumping sites should be properly designed with retaining wall/gabion structures and should be maintained regularly in order to check the spillage of the muck down the slope and into the rivers and other places.

c. Wherever boulders are rolling down along with much, gabion structures/retaining wall should have sufficient foundation and bottom width should be 4-5 m. Length of one gabion structure should not be more than 6-8 m. Wherever more length of gabion structure is required one gabion structure should be bound with another.

d. If any new dumping sites are identified in future, then the retaining / gabion structures should be constructed at suitable vertical interval of 5-6 m so that entire disposed muck may not exert pressure only at one wall/ toe wall rather the load of muck should be distributed on different walls.

e. Angle of repose of muck should be maintained between 30 to 450. Long slopes should be intercepted to several short ones with the help of 1.5 to 2.0 m wide berms / terraces/ benches in between in order to maintain less than critical velocity for runoff water and simultaneously mass erosion with be controlled.

f. The capacity/ volume of muck disposal site should be more than volume of muck to be disposed.

g. Proper sign boards indicating the name, number, location, dumping capacity, etc. should be installed at all the dumping sites.

h. Dumping sites which are full of their capacity they should be rehabilitated with local grass or shrubs. Jute geo textile (JGT) may also be used for establishment of vegetation at vulnerable sites.

i. Gabion walls should be constructed above HFL of River. If slope is very high to construct a

gabion wall then a RCC/stone masonry retaining wall should be given at bank of River after proper design including foundation. Height of this wall should be well above the HFL of River.

j. All construction sites should follow and comply with the provisions of the Construction and Demolition Waste Management Rules, 2016".

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 Manual of Specifications and Standards for Two-Laning of Highways (IRC: SP: 73-2018) referred to as the Manual, and MORTH Specifications for Road and Bridge Works 5th Revision 2013 or latest version. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer. The Hill Road Manual IRC SP 48 -1998 and IRC:52-2019 should also be referred.

THE NATIONAL GREEN TRIBUNAL PRINCIPAL BENCH, NEW DELHI on 01th Nov, 2018

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c. Wherever boulders are rolling down along with much, gabion structures/retaining wall should have sufficient foundation and bottom width should be 4-5 m. Length of one gabion structure should not be more than 6-8 m. Wherever more length of gabion structure is required one gabion structure should be bound with another.

d. If any new dumping sites are identified in future, then the retaining / gabion structures should be constructed at suitable vertical interval of 5-6 m so that entire disposed muck may not exert pressure only at one wall/ toe wall rather the load of muck should be distributed on different walls.

e. Angle of repose of muck should be maintained between 30 to 450. Long slopes should be intercepted to several short ones with the help of 1.5 to 2.0 m wide berms / terraces/ benches in between in order to maintain less than critical velocity for runoff water and simultaneously mass erosion with be controlled.

f. The capacity/ volume of muck disposal site should be more than volume of muck to be disposed.

g. Proper sign boards indicating the name, number, location, dumping capacity, etc. should be installed at all the dumping sites.

h. Dumping sites which are full of their capacity they should be rehabilitated with local grass or shrubs. Jute geo textile (JGT) may also be used for establishment of vegetation at vulnerable sites.

i. Gabion walls should be constructed above HFL of River. If slope is very high to construct a

gabion wall then a RCC/stone masonry retaining wall should be given at bank of River after proper design including foundation. Height of this wall should be well above the HFL of River.

j. All construction sites should follow and comply with the provisions of the Construction and Demolition Waste Management Rules, 2016".

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:73-2018)], 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.]

Item	Manual Clause Reference	Provision as per Manual	Modified Provision
Design Speed	2.2	**Mountainous or Steep Terrain:** As per IRC SP 73: 2018 Ruling: 60 km/ hr Minimum: 40 km/ hr As per IRC SP 48: 1998/IRC 52: 2019 Ruling: 40 km/ hr Minimum: 30 km/ hr	**Mountainous or Steep Terrain:** Minimum design speed of 30 km/hr has been taken as per IRC SP 48: 1998/IRC 52: 2019 in steep terrain and at some locations, design speed has been reduced to 20 km/ hr at hair pin bend. (Refer Horizontal Alignment Drawing and Table 2.1 below)

<table>
<tr><td rowspan="7">Extra Widening</td><td rowspan="7">2.7</td><td colspan="2">Extra Widening has been proposed as per IRC: SP: 73-2018</td><td colspan="2">Extra Widening has been proposed as per IRC:52: 2019 (Table 6.10) of Hill Road Manual.</td></tr>
<tr><td>Radius (in m)</td><td>Extra Widening (in m)</td><td>Radius (in m)</td><td>Extra Widening (in m)</td></tr>
<tr><td>75-100</td><td>0.9</td><td>21-40</td><td>1.5</td></tr>
<tr><td>101-300</td><td>0.6</td><td>41-60</td><td>1.2</td></tr>
<tr><td></td><td></td><td>61-100</td><td>0.9</td></tr>
<tr><td></td><td></td><td>75-100</td><td>0.9</td></tr>
<tr><td></td><td></td><td>101-300</td><td>0.6</td></tr>
<tr><td></td><td></td><td>Above 300</td><td>NIL</td></tr>
<tr><td>Radii of Horizontal Curve</td><td>2.9.4</td><td colspan="2">Mountainous Terrain: Desirable Minimum Radius: 150 m
Absolute Minimum Radius: 75 m</td><td colspan="2">Radius below 75 m has been provided in the location listed in table 2.2.</td></tr>
<tr><td>Shoulder</td><td>2.6</td><td colspan="2">In open country (Table-2.3)
Hill side –Paved shoulder-1.5m
Valley side - Paved shoulder-1.5m & Earthen shoulder- 1.0m</td><td colspan="2">In open country
Hill side –Hard shoulder-1.5m
Valley side - Hard shoulder-1.5m & Earthen shoulder- 1.0m</td></tr>
</table>

Table 2.1: Locations where Design Speed is less than 40 kmph due to Sharp Bend

SL. No	Stretch		Design speed in km/hr.
	From	To	
1	35869.508m	35888.975m	20
2	35928.980m	35932.077m	20
3	36023.722m	36037.251m	20
4	36138.488m	36162.488m	20
5	36162.787m	36186.888m	20
6	36261.354m	36275.519m	30
7	36354.285m	36391.011m	20
8	36411.153m	36439.559m	20
9	36439.683m	36467.501m	20
10	36516.949m	36533.345m	20
11	36578.976m	36602.431m	20
12	36602.594m	36626.596m	20
13	36958.704m	36989.229m	20
14	37048.705m	37094.558m	30
15	37182.792m	37218.115m	20
16	37762.933m	37797.111m	30
17	37842.379m	37903.866m	30

SL. No	Stretch		Design speed in km/hr.
	From	To	
18	37968.318m	38013.180m	30
19	38149.735m	38160.932m	30
20	38244.171m	38275.546m	30
21	38581.213m	38595.663m	30
22	38653.899m	38661.920m	30
23	38889.840m	38909.724m	30
24	39030.244m	39036.826m	30
25	39084.137m	39091.642m	30
26	39138.134m	39163.043m	20
27	39211.037m	39221.756m	30
28	39562.256m	39594.595m	30
29	39859.947m	39884.630m	20
30	39884.727m	39909.531m	20
31	40392.235m	40517.218m	30
32	40588.907m	40638.451m	30
33	40693.223m	40704.754m	30
34	40745.301m	40759.593m	30
35	40800.559m	40822.721m	30
36	40876.512m	40930.129m	30
37	41330.111m	41369.746m	30
38	41425.020m	41451.207m	30
39	41506.256m	41518.505m	30
40	41592.910m	41613.704m	30
41	41678.611m	41707.736m	20
42	42595.114m	42632.637m	30
43	42678.367m	42716.200m	30
44	43249.883m	43263.134m	30
45	43308.180m	43321.503m	30
46	43368.333m	43392.864m	30
47	43480.797m	43559.051m	30
48	43667.467m	43742.135m	30
49	44156.176m	44176.519m	30
50	44246.491m	44262.768m	30
51	44323.566m	44338.734m	30
52	44391.739m	44448.366m	30
53	44600.251m	44627.550m	30
54	44866.052m	44879.487m	30
55	44932.997m	44993.831m	30
56	45101.675m	45114.623m	30
57	45175.270m	45215.788m	30
58	46250.278m	46262.582m	30
59	46319.719m	46348.154m	30
60	46429.257m	46443.598m	30
61	46529.082m	46551.517m	30
62	46607.990m	46639.808m	30
63	46706.013m	46736.384m	30
64	46814.685m	46848.130m	30
65	46928.980m	46963.834m	30

SL. No	Stretch		Design speed in km/hr.
	From	To	
66	47023.894m	47032.030m	30
67	47178.606m	47185.382m	30
68	47245.733m	47286.899m	30
69	47846.575m	47888.947m	30
70	47983.065m	48019.037m	30
71	48219.249m	48269.562m	30
72	48555.772m	48588.977m	20
73	49554.022m	49581.921m	30
74	49648.783m	49694.266m	30
75	49734.399m	49745.062m	30
76	49797.514m	49902.165m	30
77	49949.367m	49969.731m	30
78	50233.137m	50252.765m	30
79	50322.856m	50351.985m	30
80	50408.178m	50470.547m	30
81	50545.167m	50568.604m	30
82	50866.394m	50873.985m	30
83	50950.011m	50956.448m	30
84	51011.761m	51031.328m	30
85	51096.014m	51106.883m	30
86	51307.824m	51336.783m	30
87	51383.758m	51410.709m	30
88	51555.195m	51596.655m	30
89	51833.274m	51944.898m	30
90	52004.189m	52030.492m	30
91	53541.608m	53554.598m	30
92	53605.199m	53611.815m	30
93	53663.665m	53672.757m	30
94	54078.835m	54140.035m	30
95	54198.390m	54230.745m	20
96	54318.205m	54342.505m	30
97	55074.260m	55100.273m	30
98	55161.769m	55180.457m	30
99	55270.239m	55306.249m	30
100	55356.323m	55363.068m	30
101	55409.965m	55432.353m	30
102	55467.703m	55479.915m	30
103	55994.733m	56035.850m	20
104	56238.897m	56253.235m	30
105	56576.193m	56617.341m	30
106	56667.172m	56688.068m	30
107	56749.625m	56804.969m	20
108	56842.167m	56882.533m	20
109	56933.713m	56942.105m	20
110	56992.828m	57030.142m	30
111	57069.164m	57117.997m	30
112	57168.085m	57188.837m	30
113	57584.266m	57631.036m	30

SL. No	Stretch		Design speed in km/hr.
	From	To	
114	57764.690m	57796.340m	30
115	57882.132m	57899.687m	30
116	58553.588m	58592.790m	30
117	58652.482m	58676.701m	30
118	58732.847m	58745.779m	30
119	58795.781m	58815.689m	30
120	58860.785m	58879.357m	30
121	58924.415m	58995.319m	30
122	59087.237m	59092.365m	30
123	59155.282m	59171.601m	30
124	59316.190m	59351.062m	30
125	60009.038m	60034.955m	20
126	60035.156m	60054.522m	20
127	60405.945m	60443.841m	20
128	60916.148m	60955.294m	20
129	60990.387m	61047.922m	30
130	61103.415m	61121.253m	30
131	61213.895m	61253.614m	20
132	61335.643m	61350.597m	30
133	61404.709m	61408.126m	30
134	61477.075m	61485.193m	30
135	61554.568m	61572.984m	30
136	61612.724m	61652.779m	20
137	61722.631m	61730.032m	30
138	61789.242m	61832.063m	30
139	61910.832m	61922.292m	30
140	61974.665m	62015.789m	20
141	62078.627m	62086.136m	20
142	62141.619m	62175.908m	20
143	62200.417m	62210.113m	20
144	62251.906m	62272.953m	20
145	62331.950m	62371.459m	30
146	62464.209m	62477.259m	30
147	62547.839m	62585.220m	30
148	62629.736m	62697.930m	30
149	62764.485m	62772.040m	30
150	62818.889m	62831.211m	30
151	62893.713m	62902.879m	30
152	62963.700m	62993.149m	30
153	63796.086m	63817.804m	20
154	63818.802m	63847.360m	20
155	63913.857m	63930.159m	30
156	63976.450m	63991.239m	30
157	64029.255m	64034.056m	30
158	64110.799m	64125.446m	30
159	64219.125m	64238.224m	30
160	64666.173m	64687.232m	30
161	64820.198m	64924.512m	30

SL. No	Stretch		Design speed in km/hr.
	From	To	
162	64978.950m	65046.636m	30
163	65089.374m	65156.173m	20
164	65186.926m	65192.345m	20
165	65227.851m	65268.947m	20
166	65311.925m	65314.211m	30
167	65344.357m	65380.890m	30
168	65425.634m	65467.608m	20
169	65531.170m	65561.721m	30
170	65596.700m	65650.051m	30
171	65817.950m	65856.530m	30
172	66176.050m	66237.984m	30
173	66554.214m	66589.091m	20
174	66659.095m	66676.469m	30
175	66736.323m	66748.073m	30
176	66802.723m	66846.579m	30
177	66900.689m	66906.162m	30
178	66957.162m	66996.752m	30
179	67053.631m	67088.353m	30
180	67444.446m	67482.703m	20
181	67596.987m	67613.475m	30
182	67654.633m	67667.311m	20
183	67710.548m	67726.493m	20
184	68248.685m	68266.536m	20
185	68345.416m	68352.703m	20
186	69245.320m	69261.967m	30

Table 2.2: Locations where Radii of Horizontal Curve is less than 75 m

Sl. NO.	Stretch		Radius (m)
	From	To	
1	35026.330m	35044.825m	70
2	35869.508m	35888.975m	20
3	35928.980m	35932.077m	20
4	36023.722m	36037.251m	30
5	36138.488m	36162.488m	20
6	36162.787m	36186.888m	20
7	36261.354m	36275.519m	30
8	36411.153m	36439.559m	20
9	36439.683m	36467.501m	20
10	36578.976m	36602.431m	20
11	36602.594m	36626.596m	20
12	36958.704m	36989.229m	20
13	37048.705m	37094.558m	30
14	37182.792m	37218.115m	20
15	37762.933m	37797.111m	60
16	37842.379m	37903.866m	30
17	37968.318m	38013.180m	30
18	38149.735m	38160.932m	30

Sl. NO.	Stretch		Radius (m)
	From	To	
19	38244.171m	38275.546m	30
20	38516.733m	38535.681m	70
21	38581.213m	38595.663m	60
22	38653.899m	38661.920m	30
23	38889.840m	38909.724m	30
24	39030.244m	39036.826m	50
25	39084.137m	39091.642m	40
26	39138.134m	39163.043m	20
27	39211.037m	39221.756m	50
28	39428.648m	39433.554m	60
29	39562.256m	39594.595m	30
30	39859.947m	39884.630m	20
31	39884.727m	39909.531m	20
32	40184.586m	40194.801m	60
33	40392.235m	40517.218m	50
34	40693.223m	40704.754m	50
35	40745.301m	40759.593m	50
36	40800.559m	40822.721m	50
37	40876.512m	40930.129m	40
38	41208.076m	41229.290m	70
39	41330.111m	41369.746m	30
40	41425.020m	41451.207m	40
41	41506.256m	41518.505m	30
42	41592.910m	41613.704m	30
43	41678.611m	41707.736m	20
44	42595.114m	42632.637m	60
45	42678.367m	42716.200m	30
46	43249.883m	43263.134m	30
47	43308.180m	43321.503m	60
48	43368.333m	43392.864m	30
49	43480.797m	43559.051m	40
50	43667.467m	43742.135m	40
51	43803.150m	43911.951m	60
52	44156.176m	44176.519m	30
53	44246.491m	44262.768m	50
54	44323.566m	44338.734m	30
55	44391.739m	44448.366m	50
56	44600.251m	44627.550m	30
57	44704.029m	44735.950m	50
58	44866.052m	44879.487m	40
59	44932.997m	44993.831m	40
60	45101.675m	45114.623m	40
61	45175.270m	45215.788m	50
62	45812.471m	45830.932m	60
63	46250.278m	46262.582m	30
64	46319.719m	46348.154m	40
65	46429.257m	46443.598m	30
66	46529.082m	46551.517m	30

Sl. NO.	Stretch		Radius (m)
	From	To	
67	46607.990m	46639.808m	40
68	46706.013m	46736.384m	30
69	46814.685m	46848.130m	30
70	46928.980m	46963.834m	40
71	47023.894m	47032.030m	40
72	47178.606m	47185.382m	30
73	47245.733m	47286.899m	30
74	47479.793m	47556.664m	50
75	47650.887m	47697.858m	50
76	47846.575m	47888.947m	30
77	47983.065m	48019.037m	30
78	48219.249m	48269.562m	30
79	48555.772m	48588.977m	20
80	49101.078m	49137.380m	70
81	49554.022m	49581.921m	30
82	49648.783m	49694.266m	60
83	49734.399m	49745.062m	40
84	49797.514m	49902.165m	50
85	49949.367m	49969.731m	40
86	50233.137m	50252.765m	30
87	50322.856m	50351.985m	30
88	50408.178m	50470.547m	40
89	50545.167m	50568.604m	30
90	50634.990m	50667.271m	60
91	50866.394m	50873.985m	40
92	50950.011m	50956.448m	40
93	51011.761m	51031.328m	40
94	51096.014m	51106.883m	40
95	51307.824m	51336.783m	50
96	51383.758m	51410.709m	40
97	51555.195m	51596.655m	30
98	51833.274m	51944.898m	50
99	52004.189m	52030.492m	30
100	52228.077m	52248.557m	60
101	52394.621m	52400.743m	70
102	52705.007m	52729.907m	70
103	52958.929m	52981.757m	70
104	53541.608m	53554.598m	30
105	53605.199m	53611.815m	50
106	53663.665m	53672.757m	30
107	53843.125m	53855.056m	60
108	53923.692m	53948.638m	70
109	54078.835m	54140.035m	40
110	54198.390m	54230.745m	20
111	54318.205m	54342.505m	30
112	54850.304m	54860.251m	50
113	54932.537m	54958.637m	70
114	55074.260m	55100.273m	40

Sl. NO.	Stretch		Radius (m)
	From	To	
115	55161.769m	55180.457m	30
116	55270.239m	55306.249m	50
117	55356.323m	55363.068m	30
118	55409.965m	55432.353m	60
119	55467.703m	55479.915m	50
120	55994.733m	56035.850m	20
121	56238.897m	56253.235m	30
122	56342.943m	56356.216m	50
123	56455.748m	56460.765m	50
124	56576.193m	56617.341m	30
125	56749.625m	56804.969m	50
126	56842.167m	56882.533m	20
127	56933.713m	56942.105m	20
128	57069.164m	57117.997m	50
129	57168.085m	57188.837m	50
130	57495.080m	57502.137m	50
131	57584.266m	57631.036m	40
132	57764.690m	57796.340m	30
133	57882.132m	57899.687m	50
134	58234.769m	58258.264m	60
135	58553.588m	58592.790m	40
136	58652.482m	58676.701m	60
137	58732.847m	58745.779m	50
138	58795.781m	58815.689m	30
139	58860.785m	58879.357m	60
140	58924.415m	58995.319m	50
141	59087.237m	59092.365m	30
142	59155.282m	59171.601m	30
143	59316.190m	59351.062m	30
144	59500.311m	59529.468m	50
145	60009.038m	60034.955m	20
146	60035.156m	60054.522m	20
147	60405.945m	60443.841m	20
148	60714.827m	60770.427m	70
149	60916.148m	60955.294m	20
150	61103.415m	61121.253m	60
151	61213.895m	61253.614m	20
152	61335.643m	61350.597m	50
153	61404.709m	61408.126m	40
154	61477.075m	61485.193m	30
155	61554.568m	61572.984m	70
156	61612.724m	61652.779m	20
157	61722.631m	61730.032m	50
158	61789.242m	61832.063m	40
159	61910.832m	61922.292m	40
160	61974.665m	62015.789m	20
161	62078.627m	62086.136m	30
162	62200.417m	62210.113m	20

Sl. NO.	Stretch		Radius (m)
	From	To	
163	62251.906m	62272.953m	20
164	62331.950m	62371.459m	30
165	62464.209m	62477.259m	70
166	62547.839m	62585.220m	60
167	62629.736m	62697.930m	60
168	62764.485m	62772.040m	30
169	62818.889m	62831.211m	60
170	62893.713m	62902.879m	40
171	62963.700m	62993.149m	30
172	63378.420m	63404.095m	50
173	63796.086m	63817.804m	20
174	63818.802m	63847.360m	20
175	63913.857m	63930.159m	40
176	63976.450m	63991.239m	50
177	64029.255m	64034.056m	60
178	64110.799m	64125.446m	40
179	64219.125m	64238.224m	30
180	64299.052m	64308.123m	70
181	64408.020m	64420.846m	60
182	64499.594m	64544.984m	50
183	64666.173m	64687.232m	40
184	64820.198m	64924.512m	43
185	64978.950m	65046.636m	50
186	65089.374m	65156.173m	30
187	65186.926m	65192.345m	30
188	65227.851m	65268.947m	20
189	65311.925m	65314.211m	60
190	65344.357m	65380.890m	60
191	65425.634m	65467.608m	20
192	65531.170m	65561.721m	70
193	65596.700m	65650.051m	60
194	65817.950m	65856.530m	50
195	65974.114m	65984.052m	70
196	66176.050m	66237.984m	30
197	66554.214m	66589.091m	20
198	66659.095m	66676.469m	60
199	66736.323m	66748.073m	40
200	66802.723m	66846.579m	60
201	66900.689m	66906.162m	40
202	66957.162m	66996.752m	40
203	67053.631m	67088.353m	50
204	67141.279m	67164.542m	70
205	67345.343m	67359.853m	60
206	67444.446m	67482.703m	20
207	67596.987m	67613.475m	50
208	67654.633m	67667.311m	30
209	67710.548m	67726.493m	20
210	67862.693m	67904.340m	70

Sl. NO.	Stretch		Radius (m)
	From	To	
211	67978.044m	67997.343m	70
212	68135.534m	68163.061m	70
213	68248.685m	68266.536m	20
214	68345.416m	68352.703m	20
215	69245.320m	69261.967m	30
216	69335.114m	69380.419m	50

Schedule - E

(See Clauses 2.1 and 14.2)

Maintenance Requirements

1. Maintenance Requirements

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

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

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

[Specify all the relevant documents]

2. Repair/rectification of Defects and Deficiencies

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

3. Other Defects and Deficiencies

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

4. Extension of time limit

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

5. Emergency repairs/restoration

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

6. Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

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

8. Repairs on account of natural calamities

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

Annex -I

(Schedule-E)

Repair/rectification of Defects and deficiencies

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

Table -1: Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, Approaches of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Potholes	Nil	< 0.1 %of area and subject to limit of 10 mm in depth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA2003(http://www.tfhrc.com/pavement/lttp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2
	Cracking	Nil	< 5 %subject to limitof0.5 sq.m 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% ofarea	Daily	Length Measurement Unit like		2-7 days	IRC:82- 2015
	Bleeding	Nil	< 1 % of area	Daily	Scale, Tape, odometer etc.		3-7 days	MORT&H Specification 3004.4
	Ravelling/Stripping	Nil	< 1 % of area	Daily			7-15 days	IRC:82-2015 read with IRC SP 81
	Edge Deformation/ Breaking	Nil	< 1 m for any 100 m section and width <0.1 matanylocation ,restricted to 30 cm from the edge	Daily			7- 15 days	IRC:82- 2015
	Roughness BI	2000mm/km	2400mm/km	Bi- Annually	Class I Profilo meter SCRIM(Sideway-force Co efficient Routine Investigation Machine or equivalent)	Class I Profilo meter: ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000- Standard	180 days	IRC:82- 2015
	Skid Number	60SN	50SN	Bi- Annually			180 days	BS: 7941-1: 2006
	Pavement	3	2.1	Bi- Annually			180 days	IRC:82- 2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
	Condition Index					Guide for Classification of Automatic Pavement Condition Survey Equipment		
	Other Pavement Distresses			Bi- Annually			2-7 days	IRC:82- 2015
	Deflection/ Remaining Life			Annually	Falling Weight Deflectometer	IRC 115: 2014	180 days	IRC:115- 2014
Rigid Pavement (Pavement of MCW, Service Road, Grade structure, approaches of connecting road, slip roads, lay byes etc. as applicable)	Roughness BI	2200mm m/km	2400mm /km	Bi- Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656 - 94: 2000	180 days	IRC:SP:83-2008
	Skid	Skid Resistance no. at different speed of vehicles		Bi- Annually	SCRIM (Sideway- force	IRC:SP:83-2008	180 days	IRC:SP:83-2008
		Minimum SN 36 33 32 31 31		**traffic Speed (Km/h)** 50 65 80 95 110	Coefficient Routine Investigation Machine or equivalent)			
Embankment/ Slope	Edge drop at shoulders	Nil	40m m	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 inprescribedslope of camber/cross fall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15 %variation inprescribe 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	DailySpecially 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:

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
CRACKING						
1	**SingleDiscreteCracksNotintersecting with any joint**	w = width of crack L = length of crack d = depth of crack D = depth ofslab	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-movingcar	Seal without delay	Seal, and stitch if L > lm. Within 7days
			3	w = 0.5 - 1.5 mm, discernible from fast-movingcar		
			4	w = 1.5 - 3.0 mm	Seal, and stitch if L > l m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15days
			5	w > 3 mm.		
2	**Single Transverse (or Diagonal) Crack intersecting with one or morejoints**	w = width of crack L = length of crack d = depth of crack D = depth ofslab	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Route and seal with epoxy. Within 7 days	Staple or Dowel Bar Retrofit. Within 15days
			2	w = 0.2 - 0.5 mm, discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1m. Within 7 days	
			4	w = 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstructaffected. Portion with norms and specifications - See Para 5.5 & 9.2Within 15days
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may befull depth	
3	**Single Longitudinal Crack intersecting with one or more joints**	w = width of crack L = length of crack d = depth of crack D = depth ofslab	0	Nil, not discernible	No Action	
			1	w < 0.5 mm, discernable from slow movingvehicle	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, ifL> l m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair withstapling.Within 15 days
			4	w = 6.0 - 12.0 mm, usually associated withspalling	Not Applicable, as it may befull depth	
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic		Full Depth Repair Dismantle and reconstruct affected portion as pernorms

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
						And specifications - See Para 5.6.4 Within 15 days
4	**MultipleCracks intersecting with one or morejoints**	**w = width of crack**	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > l m. Within 15 days	
			2	w = 0.2 - 0.5 mm. discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, Reinstate subbase, Reconstruct whole slab as per specifications within 30 days
			4	w = 3.0 - 6.0 mm panel broken into 2 or 3pieces		
			5	w > 6 mm and/or panelbroken into more than 4 pieces		
5	**Corner Break**	w = width of crack L = length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to secure broken parts Within 7 days	Seal with epoxy seal withepoxy Within 7days
			2	w < 1.5 mm; L < 0.6 m, only one cornerbroken		
			3	w < 1.5 mm; L < 0.6 m, two corners broken	Partial Depth (Refer Figure 8.3 of IRC: SP: 83-2008) Within 15 days	Full depth repair Reinstate sub-base, and reconstructthe slab as per norms and specifications within 30days
			4	w > 1.5 mm; L > 0.6 m or three corners broken		
			5	three or four corners broken		
6	**Punch out (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)**	w = width of crack L = length(m/m2)	0	Nil, not discernible		No Action
			1	w < 0.5 mm; L < 3 m/m^2	Applicable, as it may be fulldepth	Seal with low viscosity epoxy to secure broken parts. Within 15days
			2	either w > 0.5 mm or L < 3 m/m^2		
			3	w > 1.5 mm and L < 3 m/m^2		
			4	w > 3 mm, L < 3 m/m^2 and deformation		Full depth repair - Cut out and replace damaged area taking care not to damage reinforcement. Within30days
			5	w > 3 mm, L > 3 m/m^2 and deformation		
7	RavellingorHoneycombtype surface	r = area 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 liableto be damaged. Within 15 days	Not Applicable
			2	r = 2 - 10 %		
			3	r = 10-25%	Bonded Inlay, 2 or 3 slabs if affecting. Within 30 days	
			4	r = 25 - 50 %		

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			5	r > 50% and h > 25 mm	Reconstruct slabs, 4 or more slabs ifaffecting. Within 30 days	
8	**Scaling**	r = damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	r <**2 %**	Local repair ofareas damagedandliable to be damaged. Within 7days	
			2	r = 2 - 10 %		
			3	r = 10 - 20%	Bonded Inlay within 15 days	
			4	r = 20 - 30 %		
			5	r > 30 % and h > 25 mm	Reconstruct slab within 30 days	
9	**Polished Surface/Glazing**	t = texture depth, sand patchtest	0		No action.	Not Applicable
			1	t > 1 mm		
			2	t = 1 - 0.6 mm	Monitor rate of deterioration	
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		
			5	t < 0.1 mm	DiamondGrindingif affecting50% or more slabs ina continuousstretch of minimum 5 km. Within 30 days	
10	**Pop out (Small Hole), Pothole Refer Para 8.4**	n = number/m^2 d = diameter h = maximumdepth	0	d < 50 mm; h < 25 mm; n < 1 per 5 m^2	No action.	Not Applicable
			1	d=50-100mm;h<50mm;n<1 per 5 m^2	Partial depth repair 65 mm deep. Within 15 days	
			2	d=50-100mm;h>50mm;n<1 per 5 m^2		
			3	d = 100 - 300 mm; h < 100 mm n < 1 per 5m^2		
			4	d = 100 - 300 mm; h > 100 mm; n < 1 per 5m^2		
			5	d > 300 mm; h > 100 mm: n > 1 per 5 m^2		
Joint Defects						
11	**Joint Seal Defects**	loss or damage L = Length as % total jointlength	0	Difficult to discern.	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	Discernible, L< 25% but of little immediate consequence with regard to	Clean joint, inspect later.	

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
				ingress of water or trapping incompressible material.		
			3	Notable. L > 25% insufficient protection against ingress of water andtrappingincompressible material.	Clean and reapply sealant in selected locations. Within 7 days	
			5	Severe; w > 3 mm negligibleprotection against ingress ofwater and trapping incompressible material.	Clean, widen and reseal the joint. Within 7 days	
12	**Spalling of Joints**	w = width on either side of the joint L = length of spalled portion (as % joint length)	0	Nil, not discernible	No action.	
			1	w < 10 mm	Apply low viscosity epoxy resin/ mortar in crackedportion. Within 7 days	
			2	w = 10 - 20 mm, L < 25%		
			3	w = 20 - 40 mm, L > 25%	Partial Depth Repair. Within 15 days	
			4	w = 40 - 80 mm, L > 25%	30 - 50 mm deep, h = w + 20% of w, within 30 days	
			5	w > 80 mm, and L > 25%	50 - 100 mm deep repair. H = w + 20% of w. Within 30 days	Not Applicable
13	**Faulting (orStepping) in Cracks or Joints**	f = difference of level	0	not discernible, < 1 mm	No action.	No action.
			1	f < 3 mm		
			2	f = 3 - 6 mm	Determine cause and observe, take action for diamondgrinding	Replace the slab as appropriate.
			3	f = 6 - 12 mm	Diamond Grinding	Within 30days
			4	f= 12 - 18 mm	Raise sunken slab.	Replace the slab as appropriate.
			5	f> 18 mm	Strengthen subgrade and sub-base by groutingand raising sunken slab	Within 30days
14	**Blow-up or Buckling**	H =vertical displacement from normalprofile	0	Nil, not discernible	**Short Term**	**Long Term**
					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, i.e. 4 or morepieces	Replace broken slabs. Within 30 days	
15	**Depression**	H =negative vertical displacement from	0	Not discernible, h < 5 mm	No action.	Not Applicable
			1	h = 5 - 15 mm		

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
		normal profile L=length	2	h = 15-30 mm, Nos<20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Strengthen subgrade. Reinstate pavement at normal level	
			5	h > 100 mm	If L < 20 m. Within 30 days	
16	**Heave**	h = positive vertical displacement from normal profile. L = length	0	Not discernible. h < 5 mm	**Short Term**	**Long Term**
					No action.	
			1	h = 5 - 15 mm	Follow up.	
			2	h = 15 - 30 mm, Nos <20% joints	Install Signs to Warn Trafficwithin 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Stabilise subgrade. Reinstate pavement at normal level if length < 20 m. Within 30 days	
			5	h > 100 mm		scrabble
17	**Bump**	H =vertical displacement from normalprofile	0	h < 4 mm	No action	
			1	h = 4 - 7 mm	Grind, in case of new construction within 7 days	Construction Limit for New Construction.
			3	h = 7 - 15 mm	Grind, in case of ongoing Maintenance within 15 days	Replace in case of new construction. Within 30days
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	**Lane toShoulder Drop-off**	f = difference of level	0	Nil, not discernible < 3mm	**Short Term**	**Long Term**
					No action.	
			1	f = 3 - 10 mm	Spot repair of shoulder within 7 days	
			2	f = 10 - 25 mm		
			3	f = 25 - 50 mm	Fill up shoulder within 7 days	For any 100 m stretch Reconstruct shoulder, if affecting 25% or more ofstretch. Within 30days
			4	f = 50 - 75 mm		
			5	f > 75 mm		
Drainage						
19	**Pumping**	quantity of fines and water expelled through open joints and cracks Nos Nos/100 m stretch	0	not discernible	No Action	
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints Without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	appreciable/ Frequent 10 -25%	Lift or jack slab within 30 days.	

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			5	abundant,crack development >25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab. Within 30 days	
20	**Ponding**	Ponding on slabs due to blockage of drains	0-2	Nodiscernible problem	No action.	
			3 to 4	Blockages observed in drains, but water flowing	Clean drains etc. within 7 days, Follow up	Action required to stop water damaging foundation within 30 days.
			5	Ponding, accumulation of water observed	-do-	

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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Highway	Availability of Safe Sight Distance	As per IRC SP: 84-2014, a minimum of safe stopping sight distance shall be available throughout.	Monthly	Manual Measurements with Odometer 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 of IRC:35-2015	Re - painting	Cat-1 Defect –within 24 hours Cat-2 Defect within 2months-	IRC:35-2015
	Day time Visibility	During expected life Service Time Cement Road - 130mcd/m^2/lux Bituminous Road- 100mcd/m^2/lux	Monthly	As per Annexure-D of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months	IRC:35- 2015
	Night	Initial and Minimum	Bi-Annually	As	Re - painting	Cat-1 Defect – within	IRC:35-2015

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td></td><td>Time Visibility</td><td><u>Performancefor Dry Retro reflectivity during nighttime:</u>
<table>
<tr><td>Design Speed</td><td colspan="2">(RL)RetroReflectivity (mcd/m^2/lux)</td></tr>
<tr><td></td><td>Initial (7 days)</td><td>Minimum Threshold level (TL) &warranty period required up to 2 years</td></tr>
<tr><td>Up to 65</td><td>200</td><td>80</td></tr>
<tr><td>65 - 100</td><td>250</td><td>120</td></tr>
<tr><td>Above 100</td><td>350</td><td>150</td></tr>
</table>
<u>Initial and Minimum Performance for Night Visibility under wet condition(Retro reflectivity):</u></td><td></td><td>per Annexure-E</td><td></td><td>24 hours Cat-2 Defect – within 2 months</td><td></td></tr>
<tr><td></td><td></td><td>Initial 7 days Retro reflectivity: 100 mcd/m^2/lux
Minimum Threshold Level: 50 mcd/m^2/lux</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Skid Resistance</td><td>Initial and Minimum performance for Skid Resistance:
Initial (7days): 55BPN Min.
Threshold: 44BPN
*Note: shall be considered under urban/city traffic condition encompassing the locations like pedestrian</td><td>Bi-Annually</td><td>As per Annexure-G of IRC:35-2015</td><td></td><td>Within 24 hours</td><td>IRC:35-2015</td></tr>
</table>

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc.					
Road Signs	Shape Position and	Shape and Position as per IRC: 67- 2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shapeis Damaged. Relocation as per requirement change of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/Cantilever Sign boards	IRC:67-2012
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of each Signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.		48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual postsigns) 1 Month in case of Gantry/Cantilever Sign boards	RC: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	RC 86:1983
	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	RC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2014 and IRC: 35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:84-2014,IRC:35-2015
	Pedestrian Guardrail	Functionality: Functionin g of guardrail asintended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014
		Functionality: Functioning of		Visual with		Within 7 days	IRC:SP:84-

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Traffic Safety Barriers	Safety Barriers as intended	Daily	video/image backup	Rectification		2014, IRC:119-2015
	End Treatment	Functionality: Functioning ofEnd Treatment as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2014,
	Traffic Safety Barriers			backup			IRC:119-2015
	Attenuators	Functionality: Functioning of Attenuators asintended	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	Daily	-	Rectification of failure	8 hours	IRC:SP:84-

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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Pipe/box/slab culverts	Free waterway/ unobstructed flowsection	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 barrelbefore rainy season.	15 days before onset of monsoon and within 30 days after end ofrainy season.	IRC 5-2015, IRC SP:40 - 1993 and IRC SP:13 - 2004
	Leak-proof expansion joints if any	No leakage through expansionjoints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35- 1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-1993 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25 sqm Delamination of concrete not more than 0.25 sq.m. Cracks wider than 0.3 mm not more than 1m aggregatelength	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording	Repairs to spalling, cracking, delamination, rusting shall be followed as perIRC:SP:40-1993.	15 days	IRC SP 40-1993 and MORTH Specifications clause 2800
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons andpitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993and IRC:SP:13-2004.
Bridges including ROBs	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Flyover etc. as applicable				1990			
Bridge - Super Structure	Bumps	No bump at expansionjoint	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 & 2811.
	User safety (condition of crash barrier andguardrail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection anddetailed condition survey as per IRC SP: 35-1990.	Repairs and replacement of safety barriers as the case may be	3days	IRC: 5-1998, IRC SP: 84-2014and IRC SP: 40-1993.
	Rusted reinforcement Spalling of concrete Delamination	Not more than 0.25 sq.m Not more than 0.50 sq.m Not more than 0.50 sq.m	Bi- Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out the repairs to affected concrete portionwith epoxy mortar / concrete.	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
	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 InspectionUnit	Grouting with epoxy mortar, investigatingcauses for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP: 40-1993 and MORTH Specification 2800.
	Rainwater seepage through deck slab	Leakage - nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	Grouting of deck slab at leakageareas,waterproofing, repairs to drainage spouts	1 months	MORTH specifications 2600 & 2700.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	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 outmajor rehabilitation works on bridge to retain original design loadscapacity	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 structure of super	4 months	AASHTO LRFD specifications
	Leakage in Expansion joints	No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rain water through expansion joint in case of buried and asphalt plug and copper stripjoint.	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge InspectionUnit	Replace of expansionjoint seal in	15 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Debris and dust in strip seal expansion joint	No dust debris expansion or in joint gap.	Monthly	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge InspectionUnit	Cleaning of expansion joint gapsthoroughly	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.	Monthly	Detailed condition survey as per IRC SP: 35-1990 using Mobile	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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
				Bridge InspectionUnit	Providing sealant around the drainagespout if any leakages observed.		2700.
Bridge-substructure	Cracks/spalling of concrete/ rusted steel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs tosubstructureby grouting/guniting and micro concretingexpending on type of defect noticed	30 days	IRC SP: 40-1993 and MORTH specification 2800.
	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture ofreinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment shall be replaced, in order to get uniform load transfer on tobearings.	3 months	MORTH specification 2810andIRC 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 visualinspection as per IRC SP:35-1990 UsingMobile Bridge Inspection Unit. In case of doubt, use Underwater camera Rivers.	Suitable protection works around pier/abutment	1 month	IRC SP: 40-1993,IRC 83-2014, MORTH specification 2500
	Protection works in good	Damaged of rough stone apron or bank revetment not more than 3	2 times in a year (before and	Condition survey as per	Repairs todamaged aprons andpitching.	30 days after defect observation or 2	IRC: SP 40-1993 and IRC: SP: 13-

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	condition		after rainy season)	IRC SP:35-1990			2004.
		sq.m, damage to solidapron (concrete apron) not morethan1 sq.m				weeks before onset of rainy season whicheveris earlier.	
Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of thecontractor.							

Table 4: 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 MoRT&H 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)	**Roadside furniture including road sign and pavement marking**	
(i)	Damage to shape or position, poor visibility or loss of retro-reflectivity	48 (forty-eight) hours
(ii)	Painting of km stone, railing, parapets, crash barriers	As and when required/ Once every year
(iii)	Damaged/missing signs Road requiring replacement	7 (seven) days
(iv)	Damage to road mark ups	7 (seven) days
(d)	**Road lighting**	
(i)	Any major failure of the system	24 (twenty-four) hours
(ii)	Faults and minor failures	8 (eight) hours
(e)	**Trees and plantation**	
(i)	Obstruction in a minimum head- room of 5 m above carriageway or obstruction in visibility of road signs	24 (twenty-four)hours
(ii)	Removal of fallen trees from carriageway	4 (four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiring replacement	30 (thirty) days
(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)
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g)	**Hill Roads**	
(i)	Damage to retaining wall/breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours
(iii)	Snow requiring clearance	24 (twenty-four) hours

[Note: Where necessary, the Authority may modify the time limit for repair/rectification, or add to the nature of Defect or deficiency before issuing the bidding document, with the approval of the competent authority.]

Schedule - F

(See Clause 4.1 (vii) (a))

Applicable Permits

1. Applicable Permits

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

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

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

(c) Licence for use of explosives;

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

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

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

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

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

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

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

Schedule – G

(See Clauses 7.1 and 19.2)

Annex-I

(See Clause 7.1)

Form of Bank Guarantee

[Performance Security/Additional Performance Security]

[To

_____ [name of Authority]

_____ [address of Authority]

WHEREAS_____[name and address of Contractor] (hereafter called the "Contractor") has undertaken, in pursuance of Letter of Acceptance (LOA) No. _Dated__ for construction of [name of the Project] (hereinafter called the "Contract")

AND WHEREAS the Contract requires the Contractor to furnish an {Performance Security/ Additional Performance Security} for due and faithful performance of its obligations, under and in accordance with the Contract, during the {Construction Period/ Defects Liability Period and Maintenance Period} in a sum of Rs….. cr. (Rupees …….. crore) (the "**Guarantee Amount**"[1]).

AND WHEREAS 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 Contract, 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 of National Highways & Infrastructure Development Corporation Limited], 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 Contract 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 Contract 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,

[1] Guarantee Amount for Performance Security and Additional Performance Security shall be calculated as per Contract.

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 Contract 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 Contract 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 Contract 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 Contract or for the fulfillment, compliance and/or performance of all or any of the obligations of the Contractor under the Contract.

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 before expiry of the Guarantee, 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.

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 so posted shall be conclusive.

[$]Insert date atleast 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 2.21 of the RFP). The Contractors can submit the BG for periods of two years at one time and keep on renewing the same till the DLP is over if they have problems in getting the BG in one go for the entire DLP.

9. 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 Contract.

10. This Guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

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

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	CNRB0019062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank (erstwhile Syndicate Bank) transport Bhawan, 1st Parliament Street, New Delhi-110001

Signed and sealed this ……. day of ……., 20…… at …….

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

Annex – II

(Schedule - G)

(See Clause 19.2)

Form for Guarantee for Advance Payment

[National Highways & Infrastructure Development Corporation Limited, New Delhi] WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the authority], (hereinafter called the "**Authority**") for ……..(the "**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 percent)of the Contract Price; and that the Advance Payment shall be made in two instalments 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 instalment to remain effective till the complete and full repayment of the instalment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} instalment of the Advance Payment is Rs. ------ cr. (Rupees crore) and the amount of this Guarantee is Rs. ------- cr. (Rupees ------ crore) (the **"Guarantee Amount")**[$]**.**

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

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

The 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.

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

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

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

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

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

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

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

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

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

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

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) Thebankguaranteeshouldcontainthename,designationandcodenumberofthe officer(s) signing theguarantee.

$ Insert a date being 90 (ninety) days after the end of one year from the date of payment of the Advance payment to the Contractor (in accordance with Clause 19.2 of the Agreement).

(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.	55.36	**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	24.30
		(2) Sub Base Course	22.76
		(3) Non Bituminous Base course	15.13
		(4) Bituminous Base course	[Nil]
		(5) Wearing Coat	12.07
		(6) Hard Shoulder	6.46
		(7) Earthen Shoulder	1.40
		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)	

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		(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)	
		(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)	17.88
Minor Bridges/ Underpasses/ Overpasses	1.82	**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.	64.74
		(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.	31.86
		(3) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use	3.40

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		(4) Guide Bunds & River Training Works: On completion of Guide Bunds and river Training Works complete in all respects	[Nil]
		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	Nil	**A.1- Widening and repairs of Major Bridges**	
		(1) Foundation	[Nil]
		(2) Sub-structure	[Nil]
		(3) Super-structure (including bearings)	[Nil]
		(4) Wearing Coat including expansion joints	[Nil]
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	[Nil]

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

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

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		(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]
Other Works	42.82	(i) Toll Plaza	[Nil]
		(ii) Road side covered drains	1.91
		(iii) Road side open drains	8.50
		(iv) Road signs, markings, km stones, safety Devices,... etc.	
		a) Pavement marking	0.72
		b) Crash Barrier - "W" : Metal Beam Crash Barrier & Wire Rope Safety Barrier	4.74
		c) Road signs,	0.40
		d) Road boundary stones, km stones, 5th km stones and hectometer stones, other items	0.03
		e) Road Delineators, studs, lighting	1.38
		f) Road furniture (overhead gantry sign)	0.06
		g)Steel Railing	[Nil]
		(iv) Project facilities	
		a) Bus Bays	0.53
		b)Truck Lay-Byes	[Nil]
		c) Junctions (Minor)	0.26
		d) Rest areas	[Nil]
		e) Diversion work	[Nil]
		f) Others (Parapet wall,)	1.68
		(v) Road side plantation	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		(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 with parapet	16.22
		(b) PCC Breast wall (1.5m ht.)	9.30
		(c) RCC Breast wall (3m ht.)	46.89
		(d) Seeding Mulching with jute net	0.80
		(e) Special Hill Slope Protection(Soil Nailing)	4.91
		(ix)Site clearance & Dismantling	0.92
		(x) Utility shifting	
		a) EHT line	[Nil]
		b) EHT Crossing	[Nil]
		c) HT / LT line	0.49
		d) HT / LT line crossings	
		(e) Water pipeline	0.26
		(x) Utility shifting	

1.3 Procedure of estimating the value of work done

1.3.1 Road works

Procedure for estimating the value of road work done shall be as follows:

Table 1.3.1

Stage of Payment	Percentage weightage	Payment Procedure
A- Widening & strengthening of existing road		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length.
(1) Earthwork up to top of the sub- grade	[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 five culverts.
B.1- Reconstruction/New 2-lane realignment/ bypass (Flexible pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 3 (three) km. length, whichever is less.
(1) Earthwork up to top of the sub- grade	24.30	
(2) Sub Base Course	22.76	
(3) Non Bituminous Base course	15.13	
(4) Bituminous Base course	[Nil]	
(5) Wearing Coat	12.07	
(6) Hard Shoulder	6.46	
(7) Earthen Shoulder	1.40	
B.2- Reconstruction/New 2-Lane realignment / bypass (Rigid pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km. length, whichever is less.
(1) Earthwork up to top of the sub- grade	[Nil]	
(2) Sub Base Course	[Nil]	
(3) Dry Lean Concrete (DLC) Course	[Nil]	

Stage of Payment	Percentage weightage	Payment Procedure
(4) Pavement Quality Control (PQC) Course	[Nil]	
C.1- Reconstruction/ New service road (Flexible pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km. length, whichever is less.
(1) Earthwork up to top of the sub- grade	[Nil]	
(2) Sub Base Course	[Nil]	
(3) Non-Bituminous Base Course	[Nil]	
(4) Bituminous Base Course	[Nil]	
(5) Wearing Coat	[Nil]	
C.2- Reconstruction/ New service road (Rigid pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km. length, whichever is less.
(1) Earthwork up to top of the sub- grade	[Nil]	
(2) Sub Base Course	[Nil]	
(3) Dry Lean Concrete (DLC) Course	[Nil]	
(4) Pavement Quality Control (PQC) Course	[Nil]	
D- Re-Construction and New culverts on existing road, realignments, bypasses		Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of at least five culverts.
(1) Culverts (length <6m)	17.88	

@ 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.	64.74	(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.	31.85	**(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.	3.41	**(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. **(iii) Approaches:** On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use	[Nil]	completion of a stage i.e. completion of super-structure of atleast one span in all respects as specified in the column of "Stage of Payment" in this sub-clause. **(iii) Approaches:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified.

1.3.3 Major Bridge works, ROB/RUB and Structures.

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

Table 1.3.3

Stage of Payment	Weightage	Payment Procedure
1	**2**	**3**
A.1- Widening and repairs of Major Bridges		
(i) Foundation	[Nil]	**(i) Foundation:** Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro- rata basis on completion of a stage i.e. not less than 25 of the scope of foundation of the major Bridge subject to completion of atleast two foundations of the major Bridge . In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(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. In case where load testing is required for foundation, the trigger of first payment shall

Stage of Payment	Weightage	Payment Procedure
1	2	3
		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.
B.2 -New **(a) ROB** **(b) RUB**		

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

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

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

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.

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 Covered drains	1.91	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten per cent) of the total length.
(iii) Road side open drains	8.50	

Stage of Payment	Weightage	Payment Procedure
(iii) Road signs, markings, km stones, safety devices, …		
a) Pavement marking	0.72	
b) Crash Barrier - "W" : Metal Beam Crash Barrier & Wire Rope Safety Barrier	4.74	
c) Road signs,	0.40	
d) Road boundary stones, km stones, 5th km stones and hectometer stones, other items etc	0.03	
e) Road Delineators, studs, lighting	1.38	
f) Road furniture (overhead gantry sign)	0.06	
g)Steel Railing	[Nil]	
(iv) Project Facilities		
a) Bus bays	0.53	Payment shall be made on pro rata basis for completed facilities.
b) Truck lay-byes	[Nil]	
c) Junctions (Minor)	0.26	
d) Rest areas	[Nil]	
e) Diversion work	[Nil]	
f) others (Parapet wall,)	1.68	
(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 10 (ten per cent) of the total length.
(vii) Safety and traffic management during construction	[Nil]	Payment shall be made on pro rata basis every six months.
(viii) Protection Works a) Retaining wall with parapet b) PCC Breast wall(1.5m ht) c) RCC Breast wall(3m ht) d) Seeding Mulching with jute net e) Special hill slope protection (Soil Nailing)	16.22 9.30 46.89 0.80 4.91	Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten per cent) of the total length.
(ix)Site clearance & Dismantling	0.92	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length.

Stage of Payment	Weightage	Payment Procedure
(x) Utility Shifting i) EHT line	[Nil]	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rate basis as per its weightage with reference to total cost of EHT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is (i) Erection of Poles-20, (ii) Conductor stringing including laying of cable- 30, (iii) DTR erection (if involved)-15 and (iv) Charging of line including dismantling and site clearance-35 (with DTR) and 50 (without DTR)
ii) EHT Crossing	[Nil]	Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25 of the crossings subject to a minimum of 4 crossings.
iii) HT I LT line (including transformers if any)	0.49	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of LT I HT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is (i) Erection of Poles-20 (ii) Conductor stringing including laying of cable- 30, (iii) DTR erection (if involved)-10 and (iv) Charging of line including dismantling and site clearance-40 (with DTR) and 50 without DTR)

Stage of Payment	Weightage	Payment Procedure
iv) HT I LT line crossings		Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25 of the crossings subject to a minimum of 10 crossings.
(v) Water pipeline	0.26	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipe line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50, Charging of line including all miscellaneous works and dismantling and site clearance-50)
(vi) Water pipeline crossings		Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25 of the crossings subject to a minimum of 8 crossings.

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. The Project drawings, as defined in Clause 1.1, Definitions, Article 1, Definitions and Interpretation, Part-I: Preliminary, of the Contract Agreement shall consist:

   (a) Working Drawings of all the components/elements of the Project as determined by Authority Engineer/Authority, and

   (b) As-built drawings for the Project components/elements as determined by AE/Authority. As-built drawings shall be duly certified by Authority Engineer.

2. A minimum list of the drawings of the various components/elements of the Project and project facilities required to be submitted by the Contractor is given below:

A. BRIDGE

General Arrangement Drawing

Detailed Drawings of Structures/Bridges

B. ROAD (PLAN & PROFILE)

Plan & Profile

Cross Sections

Drawings of horizontal alignment, vertical profile and cross sections

Drawings of cross drainage works

Drawings of traffic diversion plans and traffic control measures

Drawings of road drainage measures

Drawings of typical details slope protection measures

Drawings of landscaping and horticulture

Drawings of street lighting

C. STANDARD DRAWINGS

Detail of Mandatory Regulatory Signs

Detail of Mandatory Regulatory Signs & Compulsory Direction Control and Other Signs

Detail of Informatroy Signs

Detail of Cautionary Signs-TS

Detail of cautionary warning signs

Detail of cautionary warning signs

Details of route marking (chevron marking)

Details of road marking

Details of directional signs

Details Toe drain

Details of pitching, filter material, chute drain and energy dissipation basin-std

Details of double head metal beam crash barrier

Details for 200 meter 1 km & km post

Detail for boundary stone & guard post

Drain retaining wall & kerb

Gabion wall

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 [35% of the Scheduled Construction Period]** day from the Appointed Date (the "**Project Milestone-I**").

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

3. Project Milestone-II

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

(ii) Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 30% (thirty-five per cent) of the Contract Price and should have started construction of all bridges.

4. Project Milestone-III

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

(ii) Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 60% (seventy per cent) of the Contract Price and should have started construction of all project facilities.

5. Scheduled Completion Date

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

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

6. Extension of time

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

Schedule - K

(See Clause 12.1 (ii))

Tests on Completion

1. Schedule for Tests

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

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

2. Tests

A. Road and Bridge

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

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

(iii) Tests for bridges: All major and minor bridges shall be subjected to the rebound hammer and ultrasonic pulse velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on Non destructive 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.

B. Other Tests

(i) 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.

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

3. Agency for Conducting Tests

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

4. Completion Certificate

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

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

Sr. No.	Key metrics of Asset	Equipment to be used	Frequency of condition survey
1	Surface of defects 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-reflecto meter	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**"), **"Name of work"** . (the "**Project Highway**") on Engineering, Procurement and Construction (EPC) basis through .....(Name of Contractor),hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Authority's Engineer by:

(Signature)

(Name) (Designation)(Address)

Schedule - M

(See Clauses 14.6, 15.2 and 19.7)

Payment Reduction for Non-Compliance

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

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

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

(iii) The Authority's Engineer shall calculate the amount of payment reduction on the basis of weightage in percentage assigned to non-conforming items as given in Paragraph2.

2. Percentage reductions in lump sum payments on monthly basis

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

S. No.	Item/Defect/Deficiency	Percentage
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, rain cuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%
(iii)	Painting, repairs/replacement kerb, 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/accidental 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 asunder:

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

Where,

P= Percentage of particular item/Defect/deficiency fordeduction

M1= Monthly lump-sum payment in accordance para 1.2 above of this Schedule M2= Monthly lump-sum payment in accordance para 1.2 above of this Schedule L1= Non-complying length L = Total length of the road,

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

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

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

Schedule - N

(See Clause 18.1 (i))

Selection of Authority's Engineer

1. Selection of Authority's Engineer

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

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

2. Terms of Reference

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

3. Appointment of Government entity as Authority's Engineer

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

Annex – I

(Schedule - N)

Terms of Reference for Authority's Engineer

1. Scope

(i) These Terms of Reference(the "**TOR**") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "**Agreement**), which has been entered into between the [name and address of the Authority](the "**Authority**")and..... (the "**Contractor**")# for **"Name of Work ".** (EPC) basis, and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

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

2. Definitions and interpretation

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

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

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

3. General

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

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

(a) any Time Extension;

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

(c) the Termination Payment; or

(d) issuance of Completion Certificate or

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

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

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

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

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

4. Construction Period

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

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

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

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

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

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

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

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

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

(x) The Authority's Engineer shall test check at least 50 (fifty) percent of the quantity or number

of tests prescribed for each category or type of test for quality control by the Contractor.

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

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

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

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

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

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

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

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

5. Maintenance Period

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

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

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

tests and the remedial measures, if any, taken by the Contractor in this behalf.

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

(v) The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of the Project Highway for undertaking maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure, the Authority's Engineer shall monitor the reopening of such lane(s), and in case of delay, determine the Damages payable by the Contractor to the Authority under Clause14.5.

6. Determination of costs and time

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

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

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

7. Payments

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

(ii) Authority's Engineer shall-

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

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

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

(iv) The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provisions of Clause19.16.

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-builtsurveyillustratingthelayoutoftheProjectHighwayandsetbacklines,ifany,ofthe buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.

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

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

Schedule - O

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

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

(a) the estimated amount for the Works executed in accordance with Clause19.3

(i) subsequent to the last claim;

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

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

(d) amountsreflectingadjustmentinprice,ifany,for(c)aboveinaccordancewith 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 up to 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. 2,00,00,000/- (Two Crore only)

(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 kilometer.

2. Visual and physical test

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

Schedule-R

(See Clause 14.10)

Taking Over Certificate

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

SIGNED, SEALED ANDDELIVERED

(Signature)

(Name and designation of Authority's Representative)

(Address)

SCHEDULE [S]

(See Clause 26.1(iii))

Procedure for Dispute Resolution Board

The parties to the Contract Agreement mutually agree as follows:

(1) The Board shall comprise of three Members having experience in the field of construction or have been involved in the Works related to construction and with the interpretation of contractual documents. One Member shall be selected by each of the Employer and the Contractor from the list maintained by NHAI hosted on its website (www.nhai.gov.in). In the event the parties fail to select the member within 28 days of the date of the signing of Contract Agreement, in that eventuality, upon the request of either or both parties such Member shall be selected by SAROD within 14 days. The third Member shall be selected by the other two members from the same list. If the two Members selected by or on behalf of the parties fail to select the third Member within 14 days after the later of their selections, then upon the request of either or both parties such third Member shall be selected by SAROD within 14 days. The third Member shall serve as Chairman of the Board.

(2) The Board shall be constituted when each of the three Board Members has signed a Board Member's declaration of Acceptance as required by the DRB's rules and procedures (which, along with the declaration of acceptance form, are attached as Annexure herewith).

(3) In the event of death, disability, or resignation of any Member, such Member shall be replaced in the same manner as the Member being replaced was selected. If for any other reason, a Member fails or is unable to serve, the Chairman (or failing the action of the Chairman then either of the other Members) shall inform the Parties and such non-serving Member shall be replaced in the same manner as the Member being replaced was selected. Any replacement made by the parties shall be completed within 28 days after the event giving rise to the vacancy on the Board, failing which the replacement shall be made by SAROD in the same manner as described above. Replacement shall be considered complete when the new Member signs the Board Member's Declaration of Acceptance. Throughout any replacement process, the Members not being replaced shall continue to serve and the Board shall continue to function and its activities shall have the same force and effect as if the vacancy had not occurred, provided, however, that the Board shall not conduct a hearing nor issue a decision until the replacement is completed.

(4) If either the Employer or the Contractor is dissatisfied witn any decision of the Board, and/or if the Board fails to issue its decision within 56 days after receipt of all the pleadings (along with the supporting documents) of the parties by the Chairman of the Board or any extension mutually agreed upon by the Employer and the Contractor, in such a case, either the Employer or the Contractor may, within 28 days after his receipt of the decision, or within 28 days after the expiry of the said period, as the case may be, give notice to the other party, with a copy for information to the Authority engineer, of his intention to refer the matter to the Conciliation Committee of Independent Experts (CCIE) of the Authority for Conciliation/amicable settlement.

(5) It is mandatory to refer all the disputes to DRB before issuance of completion certificate and satisfactory completion of punch list items. No dispute shall be entertained after completion of aforementioned date.

(6) If the Board has issued a decision to the employer and the Contractor within the said 56 days or any extension mutually agreed upon by the Employer and the Contractor and no notice of intention to commence Conciliation by the Conciliation Committee of Independent Experts (CCIE) of the Authority for Conciliation/amicable settlement as to such dispute has been given by either the Employer or the Contractor within 28 days after the parties received such decision from the Board, the decision shall become final and binding upon the employer and Contractor.

(7) Whether or not it has become final and binding upon the Employer and the Contractor, a decision shall be admissible as evidence in any subsequent dispute resolution procedure, including any arbitration or litigation having any relation to the dispute to which the decision relates.

(8) All decision of DRB which have become final and binding or till they have been reversed in subsequent conciliation/Arbitration process shall be implemented by the parties forthwith. Such implementation shall also include any relevant action of the Authority engineer.

(9) If during the Contract Period, the Employer and the Contractor are of the opinion that the Disputes Resolution Board is not performing its functions properly, the Employer and the Contractor may together disband the Disputes Resolution Board and reconstitute it. In that case, a new board shall be selected in accordance with the provisions applying to the selection of the original Board as specified above, except that words "within 28 days after the signing of this Contract Agreement" shall be replaced by the words "within 28 days after the date on which the notice disbanding the original Board became effective".

(10) The Employer and the Contractor shall jointly sign a notice specifying that the Board shall stand disbanded with effect from the date specified in the notice. The notice shall be posted by email to each Member of the Board. A Member shall be deemed to have received the e mail even if he refuses to have received the same.

(11) All other terms and conditions of the original Contract Agreement shall remain unaltered/unaffected and the parties shall remain bound by terms and conditions as contained therein.

Annexure to Schedule [S]

Disputes Resolution Board's Rules and Procedures

1. Except for providing the services required hereunder, the Board Members shall not give any advice to either party or to the Authority engineer concerning conduct of the Works. The Board Members:

   (a) Shall have no financial interest in any party to the 'Contract, or the Authority engineer, or a financial interest in the contract, except for payment for services on the Board.

   (b) Shall have had no previous employment by, or financial ties to, any party to the Contract Agreement, or the Authority engineer, except for fee based consulting services/advisers on other projects, and/or be Retired Government Officers (not connected in whole or part with the project), all of which must be disclosed in writing to both parties prior to appointment to the Board.

   (c) Shall have disclosed in writing to both parties prior to appointment to the Board any and all recent or close professional or personal relationships with any director, officer, or employee of any party to the Contract, or the Authority engineer, and any and all prior involvement in the project to which the Contract relates;

   (d) Shall not, while Board member, be employed whether as a consultant or adviser or otherwise by either party to the Contract, or the Authority engineer, except as a Board Member, without the prior consent of the parties and the other Board Members;

   (e) Shall not, while a Board Member, engage in discussion or make any agreement with any party to the Contract, or with the Authority engineer, regarding employment whether as a consultant or otherwise whether after the Contract is completed or after service as a Board Member is completed.

   (f) Shall remain and be impartial and independent of the parties and shall disclose in writing to the Employer, the Contractor and one another any fact or circumstance which might be such as to cause either the Employer or the Contractor to question the continued existence of the impartiality and independence required of Board Members; and

   (g) Shall be fluent in the language of the Contract.

2. Except for its participation in the Board's activities as provided in the Contract Agreement and in this Agreement none of the Employer, the Contractor, and or the Authority engineer shall solicit advice or consultation from the Board or the Board Members on matters dealing with the conduct of the Works.

3. The Contractor shall :

   (a) Furnish to each Board member one copy of all documents which the Board may request including Contract Agreement, progress reports and other documents pertinent to the performance of the Contract Agreement.

   (b) In cooperation with the Employer, coordinate the site visits of the Board, including conference facilities, and secretarial and copying service.

4. The Board shall begin its activities following the signing of a Board Member's Declaration of Acceptance by all three Board Members, and it shall terminate these activities as set forth below

   (a) The Board shall terminate its regular activities when either (i) issuance of completion certificate and completion of punch list items or (ii) the parties have terminated the contract and when, in either case, the Board has communicated to the parties and the Authority engineer its decision on all disputes previously referred to it.

   (b) Once the Board has terminated its regular activities as provided by the previous paragraph, the Board shall remain available to process any dispute referred to it by either party. In case of such a referral, Board Members shall receive payments as provided in paragraphs 7(a)(ii), (iii) and (iv).

Board Members shall not assign or subcontract any of their work under these Rules and Procedures.

The Board Members are Independent and not employees or agents of either the Employer or the Contractor.

Payments to the Board Members for their services shall be governed by the following provisions

(a) Each Board Member will receive payments as follows :

i. A retainer fee per calendar month as specified in the schedule of fee made part of his Schedule and its revision from time to time. This retainer fee shall be considered as payment in full for :

(A) Being available, on 7 days' notice, for all hearings, Site Visits, and other meetings of the Board.

(B) Being conversant with all project developments and maintaining relevant files.

(C) All offices and overhead expenses such as secretarial services, photocopying and office supplies (but not include telephone calls, faxes and telexes) incurred in connection with the duties as a Board Member.

ii A daily fee as specified in the schedule of fee in respect of fee for site visit & meeting, fee for meeting/ hearing not at site and extra charges for days (max. of 02 days for travel on each occasion) other than hearing / meeting days.

iii Expenses, in addition to the above, all reasonable and necessary travel expenses (including economy class air fare, subsistence, and other direct travel expenses). Receipts for all expenses in excess of Rs. 2000/- (Rupees Two Thousand only) shall be provided.

iv Reimbursement of any taxes that may be levied on payments made to the Board Member pursuant to this paragraph 7.

(b) The retainer fee and other fees shall remain fixed for the period of each Board Member's term until revised by NHAI.

(c) Phasing out of monthly retainer fee. Beginning with the next month after the completion certificate (or, if there are more than one, the one issued last) has been issued, the Board members shall receive only one-third of the monthly retainer fee till next one year. Beginning with the next month after the Board has terminated its regular activities pursuant to paragraph 4(a) above, the Board members shall no longer receive any monthly retainer fee.

(d) Payments to the Board Members shall be shared equally by the Employer and the Contractor. The concerned Project Implementation Unit (PIU) of Employer shall pay members' invoices within 30 calendar days after receipt of such invoices and shall invoice the Contractor for one-half of the amounts of such invoices. The Contractor shall pay such invoices within 30 days" time period after receipt of such invoices.

8. Board Site Visits:

(a) The Board shall visit the Site and meet the representatives of tne Employer, the Contractor and the Authority engineer at regular intervals, at times of critical construction events, at the written request of either party, and in any case not less than 6 times in any period of 12 months. The timing of Site visits shall be as agreed among the Employer, the Contractor and the Board, but failing agreement shall be fixed by the Board.

(b) Site visits shall include an informal discussion of the status of the construction of the Works. Site visits shall be attended by personnel from the Employer, the Contractor and the Authority engineer.

(e) At the conclusion of each Site visit, the Board shall prepare a report covering its activities during the visit and shall send copies to the parties and to the Authority engineer.

9. Procedure for Dispute Referral to the Board :

(a) If either party objects to any action or inaction of the other party or the Authority engineer, the objecting party may file a written Notice of Dispute to the other party with a copy to the Authority engineer stating that it is given pursuant to the Agreement and state clearly and in details the basis of the dispute.

(b) The party receiving the Notice of Dispute will consider it and respond to it in writing within 14 days after receipt.

(c) This response shall be final and conclusive on the subject, unless a written appeal to the response is filed with the responding party within 10 days after receiving the response and call upon Authority engineer to mediate and assist the parties in arriving an amicable settlement thereof. Both parties are encouraged to pursue the matter further to attempt to settle the dispute.

(d) If the Authority engineer receiving the Notice of Dispute fails to provide a written response within 14 days after receipt of such Notice or failing mediation by Authority engineer, either party may require such dispute to be referred to the Board, either party may refer the dispute to the Board by written Request to the Board. The Request for decision shall state clearly and in full detail the specific issues of the dispute (s) to be considered by Board and shall be addressed to the Chairman of the Board, with copies to the other Board Members, the other party, and the Authority engineer, and it shall state that it is made pursuant to this Agreement.

(e) When a dispute is referred to the Board, and the Board is satisfied that the dispute requires the Board's assistance, the Board decide when to conduct a hearing on the dispute. The Board may request that written documentation and arguments from both parties be submitted to each Board Member before the hearing begins. The parties shall submit insofar as possible agreed statements of the relevant facts.

(f) During the hearing, the Contractor, the Employer, and the Authority engineer shall each have ample opportunity to be heard and to offer evidence. The Board's decision for resolution of the dispute will be given in writing to the Employer, the Contractor and the Authority engineer as soon as possible, and in any event not more than 56 days or any mutually extended period between the Employer and the Contractor. The time period of 56 days of issuance of DRB decision will reckon/start from the day of first hearing that begins after submission of complete pleadings (including supporting documents, if any) by the parties.

10. Conduct of Hearings :

(a) Normally hearings will be conducted at the Site, but any location that would be more convenient and still provide all required facilities and access to necessary documentation may be utilized by the Board. Private session of the Board may be held at any cost effective location convenient to the Board. Video recordings of all hearings shall invariably be made The Employer, the Authority engineer and the Contractor shall be given opportunity to have representatives at all hearings. Parties should restrain to bring any Advocate/Law Firm during DRB hearings.

(b) During the hearings, no Board Member shall express any opinion concerning the merit of the respective arguments of the parties.

(c) After the hearings are concluded, the Board shall meet privately to formulate its decision. The private meeting (s) of the Board shall not exceed 3 sittings. All Board deliberations shall be conducted in private, with all Members' individual views kept strictly confidential. The Board's decisions, together with an explanation of its reasoning shall be submitted in writing to both parties and to the Authority engineer. The decision shall be based on the pertinent contract provisions, applicable laws and regulations and the facts and circumstances involved in the dispute.

(d) The Board shall make every effort to reach a unanimous decision. If this proves impossible the majority shall decide and the dissenting Member may prepare a written minority report together with an explanation of its reasoning for submission to both parties and to the Authority engineer.

11. In all procedural matters, including the furnishing of written documents and arguments relating to disputes, site visits and conduct of hearings, the Board shall have full and the final authority. If a unanimous decision on any such matter proves impossible, the majority shall prevail.

12. After having been selected and where necessary approved each Board Member shall sign two copies of the following declaration and make one copy available each to the Employer and to the Contractor.

"BOARD MEMBER'S DECLARATION OF ACCEPTANCE'

WHEREAS

(a) A Contract agreement (the Contract) for the _____ project [fill in the name of project] has been signed on _____ [fill in date] between _____ [name of Employer] and _____ [name of Contractor] (the Contractor).;

(b) The provisions of Agreement and Dispute Resolution Board's rules and procedure provided for establishment and operation of Dispute Resolution Board (DRB).

(c) The undersigned has been selected to serve as a Board Member on said Board; NOW

THEREFORE, the undersigned Board Member hereby declares as follows :

1. I accept the selection as a Board Member and agree to serve on the Board and to be bound by the provisions of Contract agreement and rules and procedure provided for establishment and operation of Dispute Resolution Board (DRB),

2. With respect to paragraph 1 of Dispute Resolution Board's Rules and Procedure. said Annex A, I declare

   (a) that I have no financial interest of the kind referred to in subparagraph (a):

   (b) that I have had no previous employment nor financial ties of the kind referred to in subparagraph (b); and

   (c) that I have made to both parties any disclosures that may be required by sub-paragraphs (b) and (c).

3. I declare that I have_____ no. of Arbitrations (list enclosed) and_____no. of DRBs (list enclosed) in progress and that I will give sufficient time for the current assignment.

BOARD MEMBER

____ _____

_____*[insert name of Board Member)*

Date _____

Schedule of expenses and fees payable to the
Member (s) of Dispute Resolution Board (DRB)

The fee and other expenses payable to the members of DRB shall be as under :-

S.No.	PARTICULAR	AMOUNT PAYBLE
1.	Retainer-ship fee, secretarial assistance and incidental charges (telephone, fax, postage etc.)	Rs. 50,000/- per month for one package and maximum of Rs. 75,000/- per month for 2 or more packages
2(i)	Fee for site visit or meetings at site	Rs. 25,000/- per day
(ii)	Fee for meetings/hearings not at site	Rs. 10,000/- per day
3	Travelling expenses	Economy class by air, AC first class by train and AC taxi by road
4	Lodging & Boarding	Rs. 15,000/- per day (Metro Cities); or Rs. 10,000/- per day (in other cities); or Rs. 5,000/- per day (own arrangement)
5	Extra charges for days other than hearing/meeting days (travel days maximum of 2 days on each occasion)	Rs. 5,000/-
6	Local conveyance	Rs. 2,000/-

i. Lodging, boarding and travelling expenses will be allowed only for those members who are residing 100 kms away from the place of meeting.
ii. Delhi, Mumbai, Chennai, Kolkata, Bangalore and Hyderabad shall be considered as Metro Cites.
iii. The above schedule of fee and expenses shall be applicable on or after the date of issue of this circular.
iv. The expenses are to be shared equally by the parties i.e. Employer and Contractor

Appendix-III: Arbitration Rules or the Society for Affordable Redressal of Disputes

(SAROD) SAROD'ARBITRATION RULES)

Under Clause 44.3.1

Rule INDEX ARBITRATION RULES OF SAROD

PREAMBLE

In order to seek speedy, affordable, just and reasonable Redressal or Dispute/ Differenccs between NHAI and Concessionairc/Contractor arising out of and during the course of execution of various contracts, a Society for Affordable Redressal of Disputes (SAROD) has been formed as a Society under Societies Registration Act. 1860 with registration No.S/RS/SW/10441/2013. It has been formed by National Highways Authority of India (N1IA1) and National Highways Builders Federation (NHBF) with founding members as mentioned in the Memorandum of Association of SAROD.

SAROD ARBITRATION RULES

Rule I -Scope of Application

Where any agreement, submission or reference provides for arbitration at the Society for Affordable Redressal of Disputes ("SAROD"), or under the Arbitration Rules of the SAROD and where the case is a domestic arbitration shall be conducted in accordance with the following Rules, or such Rules as amended by the SAROD where the amendments take effect before the commencement of the Arbitration. Parties may adopt following clause for inclusion in the contract:- "Any dispute or difference whatsoever arising between the parties and of or relating to the construction, interpretation, application, meaning, scope, operation or effect of this contract or the validity or the breach thereof, shall be settled by arbitration in accordance with the rules of arbitration of the "SAR.OD" and the award made in pursuance thereof shall be final and binding on the parties subject to Provisions of The Arbitration and Conciliation Act, 1996".

1.2 These rules shall come into effect from the day of approval by Governing Body of SAROD.

Rule **2 - Definitions**

2.1 These Rules shall be referred to as "the SAROD Arbitration Rules".

2.2 In these Rules:

"Act" means the 'Arbitration and Conciliation Act 1996' **of India and** any statutory modifications or re-enactments thereof.

"**SAROD**" means the Society for Affordable Redressal of Disputes.

"**SAROD Arbitrator Panel**" **means** the list of persons admitted to serve as arbitrators under these Rules.

"NHAl" means National Highways Authority of India.

"**NHBF**" means the National Highways Builders Federation.

"**GOVERNING BODY**" means Governing Body of SAROD as defined in Article 9 of Memorandum of Association.

"**PRESIDENT**" **means** President of Governing Body of SAROD as defined in Rules & Regulation of SAROD,

"SECRETARY" means. Secretary of SAROD as defined in Rules & Regulation of SAROD.

'TRIBUNAL" means either a Sole Arbitrator or all arbitrators when more than one is appointed.

PARTY" means a parly to an arbitral ion am-cement.

"E-Arbitration" means submission of pleadings. defence statement etc by E-mail and holding of preccedings via video conferencing.

Rule 3 - Notice, Calculation of periods of Time

3l For the purposes of these Rules, any notice, including a notification, communication or proposal. is deemed to have been received lilt is physically delivered to the addressee or if ii is delivered at his habitual residence, place of business or mailing address, or, if none of these can be found after making reasonable inquiry, then at the addressee's last-known residence or place of business. Notice shall be deemed to have been received on the day it is so delivered.

32 For the purposes of calculating a period of time under these Rules, such period shall begin to run on the day following the day when a notice, notification, communication or proposal is received. If the last day of such period is an official holiday or a non-business day at the residence or place or business of the addressee, the period is extended until the first business day which follows. Gazetted public holidays or non-business days occurring during the running of the period of time are included in calculating the period.

3.3 Without prejudice to the effectiveness of any other form of written communication, written communication may be made by fax. email or any other means of electronic transmission effected to a number, address or site of a party,

3.4 The transmission is deemed to have been received on the day or transmission. Rule 4 - Commencement of Arbitration

Rule 4 – Commencement of Arbitration

4.1 Any party wishing to commence an arbitration under these Rules ("the Claimant") shall file with the Secretary and serve on the other parry {"the Respondent"), a written Notice of Arbitration ("the Notice of Arbitration") which shall include the following:

a) a request that the dispute be referred to arbitration;

b) the names, addresses, telephone numbers, fax numbers and email addresses of the parties to the dispute;

c) a reference to the arbitration clause or any separate arbitration agreement that is invoked and provide a copy of the arbitration clause or arbitration agreement

d) a reference to the contract out or which the dispute arises and provide a copy of the contract where possible;

e) a brief statement describing the nature and circumstances of the dispute;

f) the relief or remedy sought, including the amount of claim unquantifiable at the time the Notice or Arbitration is filed;

g) a proposal as to the number of arbitrators (i.e. one or three), if the parties have not previously agreed on the number: and

h) the name of the claimant’s nominated arbitrator.

4.2 A riling fez of Rs. 10,0011- (T.:.n thousand) or any amount decided by Governing .fiody from time to.
time is payabie at the time of filing the Notice of arbitration.

4.3 The date of filing of the Notice of Arbitration with the Secretary is the date of commencement of the arbitTatiort for the purpose of these Rules.

Rule 5 - Response by Respondent

5.1 Within 11 days of receipt of the Notice of Arhitiation, the Respondent shall Ilk with the Secretary and serve upon on the Claimant. a Response including

a. A confirmation or denial of all or part of the claims;
b. Brief statement of the nature and circumstances of any envisaged counterclaims;
c. A comment in response to..any proposals contained in the Notice of Arbitration; and

d. The name of the respondent's nominated arbitrator.

5. 2 A filing fee of Rs. 10,0001- or any amount decided by Governing Body from time to time is payable at the time of filing the Response.

5.3 In case parties have objection to the jurisdiction of Arbitral Tribunal, such objection shall be raised not later than 15 days of the commencement of Arbitration proceedings failing which it will be deemed that parties have waived their right to objection.

Rule 6 Filing of Case Statements

6.1 Within 30 days after the filing of the Notice of Arbitration, the claimant must file with the Secretary and serve on the Respondent, a Statement or Claimant's Case alongwith all documents to be relied upon by the Claimant.

6.2 Within 30 days after the service of the statement of Claimant's Case, the Respondent must file with the Secretary and serve on the Claimant, a statement of respondent's defence and counterclaim (if any) alongwith all documents to be relied upon by the Respondent.

6.3 Within 30 days after the service of the statement of Respondent's defence, if the Claimant intends to challenge anything in the statement of Respondent's defence and/or counterclaim, the Claimant must then ale with the Secretary and serve on the Respondent, a statement of claimant's reply and it' necessary, defence to counterclaim.

6.4 No further ease statements may be filed without the leave of the Tribunal or if a Tribunal has not been appointed, the Secretary.

6.5 The Tribunal or if a Tribunal has not been appointed, the Secretary, may upon the written application of a party, extend the time limits provided under this Rule,

6.6 Thy party required to file a ease statement must at the same time deposit with the Secretary for eventual transmission to the Tribunal an additional copy or additional copies of the case statement, according to the number of arbitrators constituting or who will constitute the Tribunal.

Role 7 - Contents of Case Statements

7.1 The case statements must contain the detailed particulars of the party's claim, defence or cowiterelaim and must thus contain a comprehensive statement of the facts and contentions of law supporting the party's position.

7.2 It must:

a) Set out all items of relief Of other remedies sought together with the amount of all quantifiable claims and detailed calculations.

b) State fully its reasons for denying any anegatIon or statement of the other party.

c) State fully its own version of events if a party intends to put forward a version of' events different from that given by the other party.

7.3 A case statement must be sigied by or on behalf of the party making it.

Rule 8 - Default in Filing and Serving Cast Statements

8.1 If the Claimant fails within the time specified under these Rules or as may be fixed by the Tribunal or by the Secretary, to submit its Statement of Case, the Tribunal or if a Tribunal has not been appointed, the Governing Body may issue an order for the termination of the arbitral proceedings or make such other directions as may be appropriate in the circumstances.

8.2 It the Respondent fails to submit a Statement of Respondent's Defence, the Tribunal may nevertheless proceed with the arbitration and make the award.

Rule 9 - Further Written Statements

9.1 The Tribunal will decide which further written statements, in addition to the case statement(s)

already filed, arc required from the parties and shall fix the periods of time for giving, filing and serving such statements.

9.2 All such further statements must be given to the Tribunal, filed with the Secretary and served on the Claimant or Respondent, whichever is applicable.

Rule 10 - SAROD to Provide Assistance

10.1 At the request of the Tribunal or either party, the Secretary will render such assistance as is required for the conduct of the arbitration, including arranging for facilities, suitable accommodation for sittings of the Tribunal, secretarial assistance or interpretation of these rules.

10.2 Any additional expenses incurred or to be incurred for any such arrangements shall be borne by the parties.

Rule 11 - Appointment of Tribunal

1 1.1 The disputes shall be decided by a Sole Arbitrator when the total claim of dispute is Rs. 3 Crores Or less.

11.2 In all cases of disputes claimed for more than Rs. 3 Crores, the tribunal shall consist of odd number of Arbitrators to be nominated by the parties. The Presiding Arbitrator shall be appointed by the Arbitrators nominated by the parties from amongst the panel maintained by SAROD. For deciding the Presiding Arbitrator, a draw of lots can he carried out from amongst the names suggested by the Arbitrators nominated by the Parties. The eligibility criteria the empane!rnent of Arbitrators will he decided by the Governino Body.

11.3 lf a Sole Arbitrator is to be appointed. the Governing Body will appoint the Arbitrator within 21 days from the date the Respondent's Statement of Defence and Counterclaim (i fany) is filed or falls due, whichever is earlier. The Governing Body will appoint the Arbitrator irom the panel of Arbitrators by draw of lots,

11.4 An ArhitratorfPrcsidin;.,,, Arbitrator to be appointed under these Rules shall be a person on the SARCID Arbitration Panel as at the dale of the appointment..

11.5 In the event of any party failing to appoint Arbitrator within 30 days of receipt of the notice of Arbitratiart,
the Governing Body shall appoint the Arbitrator or Presiding Arbitrator as the case may be by a draw of lots.

Rule 12 - Multiparty appointment of the Tribunal

12.1 If there are more than 2 parties in the arbitration, the parties shall agree on the procedure for appointing the Tribunal Within 21 days of the receipt of the Notice of Arbitration.

12.2 lithe parties are unable to do so, upon the lapse of the 21 day time period mentioned herein,
the Tribunal shall be appointed by the Governing Body as soon as practicable.

Rule 13- Appointment of substitute Arbitrator

In the event of the death or resignation of any of the arbitrators, a substitute arbitrator must be appointed by the Same procedure as in Rule I I by which the arbitrator concerned was appointed, failing which, the Governing Body will make the appointment.

Rule 14 - Independence and Impartiality of the Tribunal

14.1 The Tribunal conducting arbitration under these Rules shall be and remain at all times independent and impartial, and shall not act asadvocatc for any party.

14.2 A prospective arbitrator shall disclose to those who approach him in connection with his possible appointment, any circumstances likely to give rise to justifiable doubts as to his impartiality or independence.

14.3 An arbitrator, once nominated or appointed, shall disclose any such circumstance referred to in Rule 14.2 to the Secretary and or to all parties.

Rule 15 - Code of Ethics for Arbitrators

An Arbitrator is a fountain of justice and emblem of equity, fairness and good conscience. Therefore he/she is expected to exhibit a noble conduct. The code of conduct prescribed by the Governing Body has to be adopted.

Appointment

15.1 A prospeotive arbitrator shall accept an appointment only if he is fully satisfied that he is able to
discharge his duties without bias, he his an adequate knowledge of the language of the arbitration, and he is able to give to the arbitration the time and attention which the parties are reasonably entitled to expect,

15.2 In this code, the masculine includes the feminine.

Disclosure

15.3 A prospective arbitrator shall disiose all facts or circumstances that may give rise to justifiable doubts as to Ms impartiality or independence. such duty to continue thorough out
the arbitral proceedings with regard to new facts and circumstauces,

15.4 A prospective arbitrator shall disclose to the Secretary and any party who approach.es him for a possible appointment:

(a) Any past or present close personal relationship or business relationship, whether direct or indirect, with any party to the dispute, or any representative of a party, or any person known to be a potentially important witness in the arbitration;

(b) The extent of any prior knowledge he may have of the dispute.

Bias

15.5 The criteria for assessing questions relating to bias are impartiality and independence. Partiality arises when an arbitrator favours one of the parties or where he is prejudiced in relation to the subject matter of the dispute. Dependence arises from relationships between an arbitrator and one or the parties, or with someone closely connected with one of the parties.

15.6 Any close personal relationship or current direct or indirect business relationship between an arbitrator and a party, or any representative of a party, or with a person who is known to be a potentially important witness, will normally give rise to justifiable doubts as to a prospective arbitrator's impartiality or independence. Past business relationships will only give rise to justifiable doubts if they are of such magnitude or nature as to be likely to affect a prospective arbitrator's judgment. He should decline to accept an appointment in such circumstances unless the parties agree in writing that he may proceed.

Communications

15.7 Before accepting an appointment. an arbitrator may only enquire as to the general nature of the dispute, the names of the parties and the expected time period required for the arbitration.

15.8 No arbitrator shall confer with any of the parties or their Counsel until after the Secretary gives notice of the formation of the Tribunal to the parties.

15.9 Throughout the arbitral proceedings, an arbitrator shall avoid any unilateral communications regarding the case with any party, or its representatives.

Fees

15.10 In accepting an appointment, an arbitrator agrees to the remuneration as prescribed in the rules of SAROD, and he shall make no unilateral arrangements with any of the parties or their

Counsel for any additional fees or expenses without the agreement of all the parties and the consent of the Secretary of SAROD.

Conduct

15.11 Once the arbitration proceedings commence, the arbitrator shall acquaint himself with all the facts and arguments presented and all discussions relative to the proceedings so that he may properly understand the dispute

Confidentiality

15.12 The arbitration proceedings shall remain confidential. An arborator is in a relationship of trust to the parties and should not, at any time, use confidential information acquired during the course of the proceedings to gain personal advantage or advantage for others, or to affect adversely the interest of another.

15.13 This Code is not intended to provide grounds for the setting aside

of an award.

Rule 16 - Challenge of Arbitrators

16.1 An arbitrator May be challenged if there are circumstances that give rise to justifiable doubts as to his impartially or independence and also if he or she has committed any misconduct,

16.2 An arbitrator may also be challenged if he does not possess the qualifications required by the agreement of the parties,

16.3 A party may challenge an arbitrator appointed on its nomination or with its agreement only for reasons of which it becomes aware after the appointment has been made.

16.4 A party who intends to challenge an arbitrator shall file with the Secretary and serve on the other party or all other parties, whichever is applicable, a Notice of Challenge.

16. 5- The Notice of challenge must be filed and served within 14 days from the appointment of the arbitrator or within 14 days after the circumstances mentioned in Rule 15.1 became known to that party.

16.6 The Notice of Challenge must state the reasons for the challenge.

16.7 The arbitration shall be suspended until the challenge is resolved or decided upon.

16.8 When an arbitrator has been challenged by one party, the other party may agree to the challenge. The arbitrator may also, after the challenge, withdraw from his office. However, it is not implied in either case that there has been an acceptance of the validity of the grounds for the challenge. In both cases, the procedure provided in Rule 11 read with Rule. 13, shall be used for the appointment or a substitute arbitrator.

Rule 17 - Decision on Challenge

17,1 If the other party does not agree to the challenge and the arbitrator does not withdraw, the decision on the challenge will be made by the Governing Body.

17.2 If the Governing Body sustains the challenge, a substitute arbitrator shall be appointed or chosen pursuant to the procedure applicable to the appointment of an arbitrator as provided in Rule 11 read with Rule 13.If the Governing Body dismisses the challenge, the arbitrator shall continue with the arbitration.

Rule 18. Removal of' the Tribunal

18.1 The. Governing Body may on the application of a party remove an arbitrator

a. Who is physically or mentally. incapable Of conducting the proceedings or where there arc justifiable doubts as to his ability to do so; or

b. Who has refused or failed to use ail reasonable dispatch in conducting the arbitration or making an

award.

e. Who has continuously absented from attending the proceedings for more than 3 silting without prior permission of Presiding Arbitrator/Governing Body or SAROD.

18.2 The arbitrator(s) concerned is entitled to appear and be heard at the hearing of the application to remove him.

18.3 Upon the removal of the arbitrator, a substitute arbitrator shall be appointed in accordance with Rule IL read with Rule 13.

18.4 The Governing Body's decision on the application is final and is not subject to appeal or review.

Rule 19 - Re-hearing in the Event of Replacement of the Tribunal

If the sole or presiding Arbitrator is replaced, there shall be a re-hearing. If any other arbitrator is replaced, such re-hearing may take place at the discretion of the Tribunal.

Rule 20 -Jurisdiction or the Tribunal

20.1 The Tribunal shall have the power to rule on its own jurisdiction, including any objection with respect to the existence, termination or validity of the arbitration agreement. For that purpose, an arbitration agreement which forms part of a contract shall be treated as an agreement independent of the other terms of the contract. A decision by the Tribunal that the contract is null and void shall not entail ipso jure the invalidity of the arbitration agreement.

20.1 The plea that the Tribunal does not have jurisdiction shall be raised not later than in the Statement of Defense. A plea that the Tribunal is exceeding the scope of its authority shall be raised promptly after the Tribunal has indicated its intention to decide on the matter alleged to be beyond the scope of its authority. In either case the Tribunal may nevertheless admit a late plea under this Rule if it considers the delay justified. A party is not precluded from raising such a plea by the fact that he has nominated, or participated in the appointment of an arbitrator.

20.3 The Tribunal must rule on an objection that it lacks jurisdiction as a preliminary question upon the objection being raised. It may rule on an objection that it exceeds the scope of its authority either as a preliminary question or in an award on the merits, as it deems just and convenient.

20.4 In addition to the jurisdiction to exercise the powers defined elsewhere in these Rules. the Tribunal shall have jurisdiction to determine any question of law arising in the arbitration; proceed with the arbitration not with sanding the failure or refusal of any party to comply with these Rules or with the Tribunal's orders or directions, or to attend any meeting or hearing, but only after giving that party written notice that it intends to do so; and to receive and take into account such written or oral evidence as it shall determine to be relevant, whether or not strictly admissible in law.

Rule 21 - Fees of SAROD and Arbitral Tribunal Fee Schedule

Registration Fee (Non - Refundable): Rs, l0000/- or any amount fixed by Governing Body from tillie to time. The Schedule of Fees and allied expenditure shall be decided by Governing Body.

Rule 22- Transmission ol*File to the Tribunal

22.1 The Secretary shall, as soon as practicable transmit to the Tribunal, a file containing the Notice of Arbitration, the Response and all case statements.

22.2 The Tribunal shall as soon as practicable, after consultation with the parties, issue such orders
and/or directions as are necessary for the conduct of the arbitration to conclusion, including a timetable for steps to be taken in the arbitration and for the hearing of the arbitration.

Rule 23 - Judicial Seat of Arbitration

23.1 Unless otherwise agreed by the parties, the judicial seat of arbitration shall be New Delhi.

23.2 Notwithstanding Rule 22.1 and 22.2, the Tribunal may, unless otherwise agreed by the parties, hold hearings and meetings anywhere convenient, subject to the provisions of Rule 28.2.

Rule 24 - Language of Arbitration

The language of arbitrators shall be English. In case of material existing are in any other language, other than English the same has to be translated to English language.

Rule 25- Conduct of the proceedings

The Tribunal shall have the widest discretion allowed by the Act to ensure the just, expeditious, economical and final determination of the dispute. The proceedings shall be conducted from 10.AM to 5PM with a recess of one hour.

Rule 26 - Communication between Parties and the Tribunal

26.1 Where the Tribunal sends any written communication to one party, it shall send a copy to the other party or parties as the case may be.

26. 2 Where a party sends any written communication (including Statements, expert reports or evidentiary documents) to the Tribunal, the same shall be copied to the other party or ail other parties, whichever is applicable, and show to the Tribunal that the same has been so copied.

26.3 The address of the parties for the purpose of all communications during the proceedings shall be those set out in the Notice of Arbitration, or as either party may at any time notify the Tribunal and the other party or parties, whichever is applicable.

26.4 A copy of correspondence between the parties and the Tribunal shall be sent to the Secretary.

Rule 27 - Party Representatives

Any party may be represented by lega: practitioners or any other representatives, subject to such yrr:x)f of authority as the Tribunal may require. The names and addresses of such representatives must be nazi ftd to the other par:y or parties. In case one party is represented by non-legal person, another party will also be represented by non-legal person so as to maintain natural juAice.

Rule 28- Hearings

28.1 Unless the parties have agreed on documents-only arbitration, the tribunal shall hold a hearing for the presentation olevidence by witnesses, including expert wit.nesses. or for oral submissions.

28.2 The Trthunal shall Fix the date, time and place of any meetings and hearings in the arbitrations on the first hearing, and complete time table pertaining to all the activities of the Arbitration e. g. submission of statement of claim, reply, counter claim, reply therein, admission and denial of documents, visit/inspection of site if any. The tribunal shall stick to the time table with without any deviations unless there arc unavoidable circumstances warranting such deviation which will be with the prior permission of the tribunal.

28.3 Prior to the hearing, the Tribunal may provide the Parties with matters or questions to which it wishes them to give special consideration.

28.4 In the event that a party to the proceedings without sufficient cause, fails to appear at a hearing of which the notice has been given, the Tribunal may proceed with the arbitration and may make the Award after the party present has submitted evidence to prove its case.

28.5 All meetings and hearing shall be in private unless the parties .agree otherwise.

Rule 29 - Documents Only Arbitration

29.1 The Disputes may he decided without an oral hearing if it is so agreed by the parties.

29.2.1 Where the parties agree to dispense with oral hearing, the Tribunal must be promptly informed by either of the parties, as soon as is practicable. The Tribunal must also be promptly informed it, at a later stage, the parties or either of them intends to apply for an oral hearing.

29.21 Parties may seek discovery of documents if they are not satisfied with existence of documents annexed with statement or claim, reply and counter claim by giving self contained request to the Tribunal justifying the necessity for such documents. Decision of tribunal shall be final and binding upon the parties.

Rule 39 – Witnesses

30.1 The Tribunal may require each party to give notice of the names and designations of the witnesses it intends to call and reasons for legal necessity of such witness.

30.2 No party shall call any expert witness without the leave of the Tribunal.

30.3 Any witness who gives evidence may be questioned by each party or its representative subject to any rulings made by the Tribunal,

30.4 A Witness may be required by the Tribunal to testify under oath or affirmation.

30.5 Subject to such order or direction which the Tribunal may make, the testimony oi witness may be presented in written form, either as signed statements or by duly sworn or affirmed affidavits,

30.6 Any party may require a witness to attend an oral examination at a hearing. If the witness fails to attend, the Tribunal may place such weight on the written testimony as it thinks lit, or may exclude it altogether,

30.7 The Tribunal shall determine the admissibility, relevance, materiality and weight of the evidence given by any witness.

Rule 31 - Experts Appointed by the Tribunal

31.1 Unless otherwise agreed by the parties, the Tribunal may:
a. appoint one or more experts to report the Tribunal on specific issues;
b. require a party to give any such expert any relevant information or to produce, or to provide access to, any relevant documents, goods or property for inspection by the expert.

31.2 Unless otherwise agreed by the parties, if a party so requests or if the Tribunal deem it fit, the expert shall, after delivery of his written or oral report, participate in an oral hearing, at which the parties may question him and present expert witnesses in order to testify on the points at issue.

31.3 Rule 30.2 shall not apply to an assessor appointed by agreement of the parties ; or to an expert appointed by the Tribunal to advise solely in relation to procedural matters.

Rule 32 - Rules applicable to substance of dispute- (1) Where the place of arbitration is situated

in India,

32.1 In an arbitration, the arbitral tribunal shall decide the dispute submitted to arbitration in accordance with the substantive law for the time being in force in India;

Rule 33- Closure of Hearing

33.1. The Tribunal may inquire of the parties if they have any further proof to offer or witnesses to be heard or submission to make and, if there are none, declare the hearing closed.

33.2 The Tribunal may also, in view of exceptional circumstance, reopen the hearings at any time before the award is made.

Rule 34 - Additional Powers of the Tribunal

34.1 In additien to the powers confeffed by the Act, the Tribunal shall also have the power to:-

a. Allow any party, upon such termsfas to costs and otherwise) as it shall determine, to amend claims or counterclaims;

b. Extend or abbreviate any time limits provided by these Rules;

c. Conduct such enquires as may appear to the Tribunal to be necessary or expedient;

d. Order the parties to make any propeny or thing available for inspection

e. Order any parties to produce to the Tribunal, and to the other parties for inspection, and to supply copies of any documents or classes of documents in their possession, custody or power which the Tribunal determines to be relevant.

g. Make orders ar give directions to any party for interrogatories;

h. Make such order or give directions to any party for an inrirn injunction or any other intinimeasure;

i. Makesuch orders or give such directions as it deems fit in so far as they are not inconsistent with the Act or any statutory re-enactment thereof or such law which is applicable or these Rules.

34.2 lithe parties so agree. iiic Tribunal shall also hava the power to add other parties •(with their consent) to be joined in the arbitration and make a single Final Award determining all disputes between them.

Rule 35 - Deposits to Costs and Expenses

35.1 Thc Tribunal's fees and SAROD administration fees shall be ascertained in accordance with the Schedule of Fees in Farce at the time of commencement of the arbitration.

35.2 The Claimant shall deposit with the SAROD half of the fees payable at the time of filing of the Statement of Case. The Respondent shall deposit with the SAROD one-half of the fees payable at the time of filing the Statement of Respondent's Defence and Counterclaim (if any). The balance of fees payable shall be paid 60 days before the date of the final hearing or on such other date that the Secretary may direct.

35.3 Where the amount of the claim or the counterclaim is not quantifiable at the time payment is due, the Secretary will make a provisional estimate. The fees will be adjusted in the light of such information as may subsequently become available. If the arbitration is settled or disposed of without a hearing, the amount of the Tribunal's fees and SAROD administration fees shall be finally determined by the Secretary who will have regard to all the circumstances of the ease, including the stage of proceedings at which the arbitration is settled or otherwise disposed of.

35.4 The Secretary may from time to time direct parties to make one or more deposit(s) towards any farther expenses incurred or to be incurred on behalf of or for the benefit of the parties.

35.5 All deposit(s) shall be made to and held by the SAROD. Any interest which may accrue on such

deposit(s) shall be retained by the SAROD.

35.6 If a party fails to make the payments or deposits required or directed, the Tribunal may refuse to hear the claims or counterclaims, whichever is applicable, by the noncomplying party, although it may proceed to determine claims or counterclaims by any party who has complied with orders.

35.7 The parties shall remain jointly and severally liable to the SAROD for payment of all such fees and expenses until they have been paid in full even if the arbitration is abandoned, suspended or concluded, by agreement or otherwise, before the final Award is made.

Rule 36 - Decision Making by the Tribunal

36.1 Where a Tribunal has been appointed, any direction, order, decision or award of the Tribunal must be made by the whole Tribunal or a majority. If an arbitrator refuses or falls to sign the Award, the signatures of the majority shall be sufficient, provided that the reason for the omitted signature is stated.

36.2 if there is no unanimity, the same shall be made by the majority arbitrators as well as by the dissenting Arbitrator alone as if acting as a sole arbitrator.
36.3 However in the case of a three member Tribunal the presiding arbitrator may after consulting the other arbitrators make procedural rulings alone.

Rule 37 - The Award

37.1 It will be mandatory Cot the parties to submit written synopsis of their arguments respectively which will form part of thc arbitral proceedings.

37.2 The Tribunal shall assemble at the assigned place in SAROD and shall exercise utmost secrecy and confidentiality in writing the award,

37.3 Unless the Secretary extends thetime or the parties agree otherwise, the Tribunal shall make its Award in writing within 30 days from the date on which the bearings are closed and shall state the reasons upon which its award is based. The award shall contain the date and shall be signed by the arbitrator or arbitrators.

374 The Tribunal may make interim awards or separate awards on different issues at different times. 37.5 All Awards must be submitted by the Tribunal to the Secretary and they shall be issued through the Secretary.

37.6 The Tribunal must deliver to the Secretary number of originals of the award sufficient for the parties and for filing with the Secretary.

37.7 The Secretary shall release the award to the parties only upon receipt of sufficient deposits to cover the fees and expenses due to the Tribunal and to the SAROD.

37.8 By agreeing to have arbitration under these Rules, the parties undertake to carry out the award without delay.

37.9 Stamp duty on award shall be payable by the party in whose favor the award has been pronounced.

Rule 38 _- Additional Award

38.1 Within 30 days after the receipt °laic award, either party, with. notice to the Secretary and the other party may request the Tribunal to make an additional award as to claims presented in the arbitral proceedings but omitted from the award.

38.2 If the Tribunal considers the request for an additional award to be justified and considers that

the omission can be rectified without any further hearings or evidence, it shall notify all the parties within 7 days of the receipt of the request, that it will make and additional award, and complete the additional award within 30 days after the receipt of the request.

Rule 39 _ Correction of Awards

39.1 Within 30 days of receiving an Award, unless another period of time has been agreed upon by the panics, a party may by notice to the Secretary and the other party request the Tribunal to correct in the Award, any errors in computation, any clerical or typographical errors or any errors of similar nature.

39.2 lithe Tribunal considers the request to be justified, it shall make the corrections) within 30 days of receiving the request. Any correction shall be notified in writing to the parties and shall become part of the Award,

39,3 The Tribunal may correct any error orate type referred to in Rule 37.1 on its own imitative within 30 days of the date of the Award,

Rule 40 - Settlement

40.1 If, the parties arrived at amicable settlement of the dispute during the currency proceedings, the parties shall file memo of settlement before the tribunal who shall either issue an order for the termination of the arbitral proceedings or, if requested by both parties and accepted by the Tribunal, record the settlement in the form elan arbitral award on agreed terms. The Tribunal is not obliged to give reasons for such an award,

40.2 The Parties shall:

a) Notify the Tribunal and the Secretary immediately if the arbitration is settled or otherwise terminated!

b) Make provision in any settlement for payment of all the costs of the arbitration and fees and expenses due to the SAROD and the Tribunal.

40.3 If the continuation of the arbitral proceedings becomes unnecessary or impossible for any reason not mentioned in Rule 38.1, before the award is made, the Tribunal shall inform the parties of its intention to issue an order for the termination of the proceedings. The Tribunal shall have the power to issue such an order unless party raises justifiable grounds for objection.

40.4 Copies of the order for termination of the arbitral proceedings or of the arbitral award on. agreed terms, signed by the Tribunal, shall be communicated by the Tribunal to the parties through the Secretary.

Rule 41 - Interest

The Tribunal may award interest on any sum awarded at such rate as applicable in fixed deposits of Sate Bank of India in respect of such periods ending not later than the date of the award as the Tribunal considers just.

Rule 42 - Costs

42.1 The Tribunal shall specify in the final award, the costs of the arbitrations and decide which party shall bear them and in what proportion they shall be borne.

42.2 In this Rule, "costs of the arbitration" shall include:

a) The fees and expenses of the Tribunal and the administration fees of the SAROD as determined by the Secretary in accordance with the Schedule of Fees;

b) The costs of tribunal appointed experts or of other assistance rendered: and

c) All expenses which are reasonably incurred by the SAROD in connection with the arbitration.

42.3 The Tribunal has power to order in its Award, that all or part of the legal or other costs (such as legal fees and expenses, costs incurred in respect of party appointed experts etc) of one party shall be paid by the other party.

Rule 43 - Waiver

A party which is aware of non-compliance with these Rules and yet proceeds with the arbitration without promptly stating its objection in writing to such non-compliance shall be deemed to have waived its right to object

Rut::44 - Exclusion of Lability

44.1 The Tribunal, the President, the SAROD and any or its officers, employees or agents shall not be Eable to any party for any act or omission in connection with any arbitration conducted under these Rules,

44.2 After the Award as been made and the possibilities of corrections and additional Awards have lapsed or been exhausted, neither the Tribunal nor the President shall be :under any obligation to make any statement to any person about any matter concerning the arbitration, and no party shall seek to make any arbitrator or the President or the SAROD and any of its officers a witness in any legal proceedings arising out of the arbitration.

Rule 45 - General Provisions

45.1 In all matters not expressly provided for in these Rules, the President, the Secretary and the

Tribunal shall act in the spirit of these Rules and shall make every reasonable effort to ensure the just, expeditious and economical conclusion of the arbitration.

45.2 The Secretary may iron, time to time issue Practice Notes on the implementation of these Rules.

Rule 46 - Amendment to Rules

These Rules may from time to time be amended by the Governing Body of SAROD

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