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 0.000 (5-legged junction at Old Akhegwo i.e. junction with 283.000 km of NH-202 and new NH-202K) to Design Chainage Km 34.795 (Package-I) 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 0.000 (5-legged junction at Old Akhegwo i.e. junction with 283.000 km of NH-202 and new NH-202K) to Design Chainage Km 34.795 (Package-I) in the State of Nagaland"** Project Highway comprises the section of NH-202K commencing from km 0+000 to km 35+870 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	0.000	0.187	5.0 -6.0	18-27
2	0.187	0.572		24
3	0.572	1.146		18
4	1.146	6.440		24
5	6.440	6.930		28-40
6	6.930	17.230		24
7	17.230	17.710		24-40
8	17.710	30.010		24
9	30.010	30.570		20-31
10	30.570	31.845		24
11	31.845	32.390		26-37
12	32.390	32.597		24
13	32.597	32.840		18
14	32.840	33.370		24
15	33.370	33.810		24-35
16	33.810	34.250		18
17	34.250	34.500		24
18	34.500	35.250		24-35
19	35.250	35.870		24

3. Carriageway

The present carriageway of the Project Highway is Single Lane of width 3.0 m to 4.0 m from km 0+000 to km 35+870. The type of the existing pavement is [flexible].

4. Major Bridges

The Site includes the following Major Bridges:

S. No.	Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-structure	Super-structure		
1	15.850	Open	Stone	Steel Truss	1 X 62.8	4.9

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

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

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

6. Grade separators

The Site includes the following grade separators:

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

7. Minor bridges

The Site includes the following minor bridges:

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

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location (km)	Remarks
Nil		

9. Underpasses (vehicular, non vehicular)

The Site includes the following underpasses:

S. No.	Chainage (km)	Type of 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	0.243	HUME PIPE	Covered by soil	7.5
2	0.610	HUME PIPE	Covered by soil	7.5
3	1.085	HUME PIPE	Covered by soil	7.5
4	1.414	HUME PIPE	Covered by soil	7.5
5	2.075	HUME PIPE	Covered by soil	7.5
6	2.220	HUME PIPE	Covered by soil	7.5
7	2.426	HUME PIPE	Covered by soil	7.5
8	2.773	HUME PIPE	Covered by soil	7.5
9	2.850	HUME PIPE	Covered by soil	7.5
10	3.320	HUME PIPE	Covered by soil	7.5
11	3.497	HUME PIPE	Covered by soil	7.5
12	3.740	HUME PIPE	Covered by soil	7.5
13	3.980	HUME PIPE	Covered by soil	7.5
14	4.148	HUME PIPE	Covered by soil	7.5
15	4.412	HUME PIPE	Covered by soil	7.5
16	4.630	HUME PIPE	Covered by soil	7.5
17	4.838	HUME PIPE	Covered by soil	7.5
18	5.062	HUME PIPE	Covered by soil	7.5
19	5.255	HUME PIPE	Covered by soil	7.5
20	5.482	HUME PIPE	Covered by soil	7.5
21	5.660	HUME PIPE	Covered by soil	7.5
22	5.750	HUME PIPE	Covered by soil	7.5
23	5.830	HUME PIPE	Covered by soil	7.8
24	6.278	HUME PIPE	Covered by soil	7
25	6.508	HUME PIPE	Covered by soil	7.5
26	6.862	HUME PIPE	Covered by soil	7.5
27	7.250	HUME PIPE	Covered by soil	7.5
28	8.801	HUME PIPE	Covered by soil	7.2
29	9.210	HUME PIPE	Covered by soil	7.5

S. No.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)
30	9.321	HUME PIPE	Covered by soil	7.5
31	9.608	HUME PIPE	Covered by soil	7.5
32	9.888	HUME PIPE	Covered by soil	7.5
33	10.040	HUME PIPE	Covered by soil	7.5
34	10.248	HUME PIPE	Covered by soil	8
35	10.532	HUME PIPE	Covered by soil	7.5
36	10.718	HUME PIPE	Covered by soil	7.5
37	10.870	HUME PIPE	Covered by soil	7.5
38	11.050	HUME PIPE	Covered by soil	7.5
39	11.350	HUME PIPE	Covered by soil	8
40	11.500	HUME PIPE	Covered by soil	8
41	11.975	HUME PIPE	Covered by soil	7.5
42	12.315	HUME PIPE	Covered by soil	7.5
43	12.485	HUME PIPE	Covered by soil	7.5
44	12.628	HUME PIPE	Covered by soil	7.5
45	12.858	HUME PIPE	Covered by soil	7.5
46	13.092	HUME PIPE	Covered by soil	7.5
47	13.268	HUME PIPE	Covered by soil	7.5
48	13.485	HUME PIPE	Covered by soil	7.5
49	13.760	HUME PIPE	Covered by soil	7
50	14.100	HUME PIPE	Covered by soil	7.5
51	14.458	HUME PIPE	Covered by soil	7.5
52	14.840	HUME PIPE	Covered by soil	7.5
53	15.150	HUME PIPE	Covered by soil	7
54	15.230	HUME PIPE	Covered by soil	8.1
55	15.653	HUME PIPE	Covered by soil	7
56	16.055	HUME PIPE	Covered by soil	7
57	16.482	HUME PIPE	Covered by soil	7.5
58	16.628	HUME PIPE	Covered by soil	7.5
59	17.312	HUME PIPE	Covered by soil	7.5
60	17.745	HUME PIPE	Covered by soil	7.5
61	18.202	HUME PIPE	Covered by soil	7.5
62	18.318	HUME PIPE	Covered by soil	7.5
63	18.908	HUME PIPE	Covered by soil	7.5
64	19.135	HUME PIPE	Covered by soil	7.5
65	19.358	HUME PIPE	Covered by soil	7.5
66	19.548	HUME PIPE	Covered by soil	7.5
67	20.228	HUME PIPE	Covered by soil	7.5
68	20.485	HUME PIPE	Covered by soil	8
69	20.758	HUME PIPE	Covered by soil	7.5
70	21.108	HUME PIPE	Covered by soil	7.5
71	21.282	HUME PIPE	Covered by soil	7.5
72	21.510	HUME PIPE	Covered by soil	7.5
73	21.697	HUME PIPE	Covered by soil	7.5
74	22.240	HUME PIPE	Covered by soil	7.5
75	22.460	HUME PIPE	Covered by soil	7.5
76	22.581	HUME PIPE	Covered by soil	7.5
77	22.802	HUME PIPE	Covered by soil	7.5

S. No.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)
78	22.971	HUME PIPE	Covered by soil	7.5
79	23.415	HUME PIPE	Covered by soil	7.5
80	23.825	HUME PIPE	Covered by soil	7.5
81	24.031	HUME PIPE	Covered by soil	7.5
82	24.200	HUME PIPE	Covered by soil	7.5
83	24.408	HUME PIPE	Covered by soil	7.5
84	24.628	HUME PIPE	Covered by soil	7.5
85	24.730	HUME PIPE	Covered by soil	7.5
86	25.078	HUME PIPE	Covered by soil	7.5
87	25.195	HUME PIPE	Covered by soil	7.5
88	25.470	HUME PIPE	Covered by soil	7.5
89	25.653	HUME PIPE	Covered by soil	7.5
90	25.980	HUME PIPE	Covered by soil	7.5
91	26.241	HUME PIPE	Covered by soil	7.5
92	27.010	HUME PIPE	Covered by soil	7.5
93	27.285	HUME PIPE	Covered by soil	7.5
94	27.552	HUME PIPE	Covered by soil	6.6
95	27.760	HUME PIPE	Covered by soil	7.5
96	28.140	HUME PIPE	Covered by soil	8.4
97	28.328	HUME PIPE	Covered by soil	7.5
98	28.410	HUME PIPE	Covered by soil	7.5
99	29.170	HUME PIPE	Covered by soil	10.2
100	29.205	HUME PIPE	Covered by soil	7.6
101	29.336	HUME PIPE	Covered by soil	7.1
102	29.505	HUME PIPE	Covered by soil	8
103	29.712	HUME PIPE	Covered by soil	7.5
104	29.903	HUME PIPE	Covered by soil	7.5
105	30.056	HUME PIPE	Covered by soil	7.5
106	30.242	HUME PIPE	Covered by soil	7.5
107	30.495	HUME PIPE	Covered by soil	7.5
108	30.670	HUME PIPE	Covered by soil	7.8
109	30.840	HUME PIPE	Covered by soil	7.5
110	31.258	HUME PIPE	Covered by soil	7.5
111	31.330	HUME PIPE	Covered by soil	7.5
112	31.500	HUME PIPE	Covered by soil	7.5
113	31.550	HUME PIPE	Covered by soil	7.2
114	31.678	HUME PIPE	Covered by soil	8
115	33.362	HUME PIPE	Covered by soil	7.5
116	33.576	HUME PIPE	Covered by soil	7.5
117	34.225	HUME PIPE	Covered by soil	7.1
118	35.115	HUME PIPE	Covered by soil	7.2
119	35.462	HUME PIPE	Covered by soil	7.5
120	35.572	HUME PIPE	Covered by soil	7.3

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	1.030	Y	
2	15.59	Y	
3	34.025	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 33KV 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	0.061	0.070	33 Kv	50.2	LHS		668973.548	2845515.697
2	0.982	1.005	33 Kv	23.8	LHS		669275.308	2844687.771
3	1.078	1.121	33 Kv	5		RHS	669321.619	2844658.186
4	1.100	1.148	33 Kv	10.9	LHS		669322.921	2844687.177
5	22.503	23.170	33 Kv	14.0		RHS	673103.126	2843549.845

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	25.651	26.391	11 kv	39	LHS		672494.545	2843232.317
2	25.850	26.590	11 kv	51.8	LHS		672292.466	2843197.473
3	26.098	26.848	11 kv	5.9		RHS	672095.364	2843097.723
4	26.115	26.868	11 kv	36.4	LHS		672144.526	2843081.761
5	26.220	26.978	11 kv	9.2		RHS	672106.430	2842970.484
6	27.844	28.624	11 kv	7.60		RHS	672235.886	2841660.892
7	31.893	32.858	11 kv	10.8		RHS	672344.286	2840320.688
8	32.845	33.815	11 kv	11.7	LHS		672490.050	2839886.699
9	32.846	33.816	11 kv	13	LHS		672488.650	2839886.291
10	32.850	33.820	11 kv	12.5	LHS		672484.599	2839884.925

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	0.010	0.022	LT	10.7	LHS		668936.100	2845551.855
2	0.020	0.028	LT	3.2		RHS	668922.282	2845542.886
3	0.051	0.062	LT	3.9		RHS	668920.153	2845507.473
4	0.701	0.728	LT	23.8		RHS	669223.227	2844958.826
5	0.710	0.738	LT	26.3	LHS		669273.507	2844962.634
6	0.808	0.832	LT	17	LHS		669286.940	2844867.847
7	0.925	0.950	LT	10.7		RHS	669257.378	2844750.377
8	0.867	0.892	LT	4.5		RHS	669271.651	2844805.659
9	0.980	1.010	LT	5.1		RHS	669246.096	669246.096
10	28.003	28.782	LT	5.5	LHS		672250.019	2841502.457
11	28.050	28.828	LT	11.9		RHS	672241.104	2841455.971
12	31.633	32.580	LT	13.8		RHS	672130.397	2840372.326
13	31.728	32.680	LT	18.9		RHS	672193.814	2840387.350
14	31.790	32.751	LT	5.6	LHS		672269.373	2840395.431
15	32.795	33.762	LT	10.6		RHS	672544.804	2839886.606
16	32.815	33.785	LT	8.5	LHS		672516.144	2839888.205
17	33.040	34.016	LT	9.7		RHS	672298.237	2839927.788
18	33.045	34.022	LT	19.7	LHS		672317.419	2839903.449
19	33.067	34.045	LT	4		RHS	672296.414	2839891.596
20	33.110	34.086	LT	3.7		RHS	672307.597	2839848.869
21	33.235	34.210	LT	3.4		RHS	672403.537	2839773.587
22	33.290	34.265	LT	3		RHS	672448.796	2839748.096
23	33.303	34.278	LT	16.5	LHS		672472.448	2839746.867
24	33.373	34.348	LT	10.1	LHS		672470.459	2839672.062

List of Transformer 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	31.893	32.860	TRANSFORMER	10.3		RHS	672344.73	2840319.702

(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	0.000	35.870	0.000	34.795	5.3

(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)	0.000	35.870	35.870	5m-6m	18.0 m to 40.0 m	on Appointed Date
(ii) Balance Right of Way (width)	0.000	35.870	35.870	5m-6m	18.0 m to 40.0 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	Kukhegwo Village	0.700	1.100	10m	Fig- 2.10 & Table 2.3 of manual (TCS drawing attached)	7 m 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	0.700	1.100	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)	7930
TCS-1A	Typical cross section of Two Lane carriageway with hard shoulder in rural area with open Triangular drain on hill side (Reonstruction)	14180
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)	2620.0
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)	1105.0
TCS-3	Typical cross section of Two Lane carriageway with hard shoulder in rural area with both side open Triangular drain (New Construction)	860.0
TCS-3A	Typical cross section of Two Lane carriageway with hard shoulder in rural area with both side open Triangular drain (Re Construction)	495.0
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)	1285.0
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)	3225.0
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)	1900.0
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)	150.0
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)	645.0
TCS-7A	Typical cross section of Two Lane carriageway in built-up area with Bothside side footpath cum covered drain (Reconstruction)	400.0

Chainage (m)		Length (m)	TCS No.
From	To		
0	175	175.0	TCS-2A
175	250	75.0	TCS-1A
250	400	150.0	TCS-1
400	475	75.0	TCS-2
475	575	100.0	TCS-3
575	700	125.0	TCS-2A
700	1100	400.0	TCS-7A
1100	1200	100.0	TCS-1
1200	1300	100.0	TCS-2
1300	1450	150.0	TCS-3A
1450	1560	110.0	TCS-1A
1560	1590	30.0	TCS-2
1590	1625	35.0	TCS-1A
1625	1750	125.0	TCS-2
1750	1930	180.0	TCS-1A
1930	2225	295.0	TCS-1
2225	2375	150.0	TCS-2
2375	2550	175.0	TCS-2A
2550	2800	250.0	TCS-5
2800	3000	200.0	TCS-5
3000	3525	525.0	TCS-5
3525	3850	325.0	TCS-5
3850	4000	150.0	TCS-5A
4000	4270	270.0	TCS-3A
4270	4425	155.0	TCS-2
4425	4500	75.0	TCS-1
4500	4750	250.0	TCS-1A
4750	4825	75.0	TCS-4A
4825	5420	595.0	TCS-1A
5420	5450	30.0	TCS-4A
5450	5510	60.0	TCS-1A
5510	5650	140.0	TCS-2
5650	6000	350.0	TCS-1A
6000	6175	175.0	TCS-2
6175	6350	175.0	TCS-1A
6350	6450	100.0	TCS-1
6450	7000	550.0	TCS-1A
7000	7125	125.0	TCS-1
7125	7200	75.0	TCS-2
7200	7375	175.0	TCS-5
7375	7690	315.0	TCS-1
7690	7900	210.0	TCS-1A
7900	7940	40.0	TCS-4A

Chainage (m)		Length (m)	TCS No.
From	To		
7940	8030	90.0	TCS-1A
8030	8060	30.0	TCS-4A
8060	8150	90.0	TCS-1A
8150	8225	75.0	TCS-3A
8225	8300	75.0	TCS-2
8300	8450	150.0	TCS-1A
8450	8600	150.0	TCS-1
8600	8925	325.0	TCS-2
8925	9050	125.0	TCS-5
9050	9275	225.0	TCS-1
9275	9475	200.0	TCS-2
9475	9560	85.0	TCS-1
9560	9850	290.0	TCS-1A
9850	9900	50.0	TCS-1
9900	10075	175.0	TCS-2
10075	10125	50.0	TCS-1
10125	10210	85.0	TCS-5
10210	10255	45.0	TCS-4
10255	10430	175.0	TCS-1
10430	11050	620.0	TCS-1A
11050	11175	125.0	TCS-2
11175	11625	450.0	TCS-1
11625	11675	50.0	TCS-2
11675	11800	125.0	TCS-1
11800	11925	125.0	TCS-2
11925	12125	200.0	TCS-3
12125	12200	75.0	TCS-1
12200	12330	130.0	TCS-1A
12330	12370	40.0	TCS-4A
12370	12660	290.0	TCS-1A
12660	12870	210.0	TCS-1
12870	13000	130.0	TCS-1A
13000	13200	200.0	TCS-1
13200	13430	230.0	TCS-1A
13430	13500	70.0	TCS-1
13500	13620	120.0	TCS-1A
13620	13750	130.0	TCS-1
13750	13900	150.0	TCS-1A
13900	13950	50.0	TCS-2A
13950	14100	150.0	TCS-1
14100	14175	75.0	TCS-2
14175	14650	475.0	TCS-1
14650	14775	125.0	TCS-3
14775	14960	185.0	TCS-1

Chainage (m)		Length (m)	TCS No.
From	To		
14960	15125	165.0	TCS-2A
15125	15575	450.0	TCS-1
15575	16275	700.0	TCS-1A
16275	16425	150.0	TCS-4
16425	16495	70.0	TCS-5
16495	16695	200.0	TCS-1
16695	16750	55.0	TCS-1A
16750	16950	200.0	TCS-4A
16950	17095	145.0	TCS-5
17095	17175	80.0	TCS-1
17175	17425	250.0	TCS-1A
17425	17925	500.0	TCS-1
17925	18155	230.0	TCS-1A
18155	18225	70.0	TCS-1
18225	18300	75.0	TCS-2
18300	18525	225.0	TCS-1
18525	18575	50.0	TCS-2
18575	18925	350.0	TCS-1
18925	19000	75.0	TCS-1A
19000	19075	75.0	TCS-4A
19075	19285	210.0	TCS-1A
19285	19325	40.0	TCS-2A
19325	19675	350.0	TCS-1A
19675	19725	50.0	TCS-4A
19725	19945	220.0	TCS-1A
19945	19995	50.0	TCS-4A
19995	20090	95.0	TCS-6A
20090	20225	135.0	TCS-1A
20225	20395	170.0	TCS-1
20395	20550	155.0	TCS-1A
20550	20700	150.0	TCS-4A
20700	20750	50.0	TCS-1A
20750	20800	50.0	TCS-4A
20800	20900	100.0	TCS-1A
20900	20950	50.0	TCS-4A
20950	21050	100.0	TCS-1A
21050	21100	50.0	TCS-4A
21100	21335	235.0	TCS-1A
21335	21565	230.0	TCS-1
21565	22150	585.0	TCS-1A
22150	22200	50.0	TCS-4A
22200	22315	115.0	TCS-1A
22315	22350	35.0	TCS-1
22350	22400	50.0	TCS-4

Chainage (m)		Length (m)	TCS No.
From	To		
22400	22465	65.0	TCS-1
22465	22500	35.0	TCS-4A
22500	23100	600.0	TCS-1A
23100	23300	200.0	TCS-4A
23300	23415	115.0	TCS-1A
23415	23455	40.0	TCS-1
23455	23580	125.0	TCS-3
23580	23635	55.0	TCS-4
23635	23850	215.0	TCS-4A
23850	24100	250.0	TCS-1A
24100	24200	100.0	TCS-4A
24200	24550	350.0	TCS-1A
24550	24700	150.0	TCS-4A
24700	25125	425.0	TCS-1A
25125	25300	175.0	TCS-1
25300	25350	50.0	TCS-4
25350	25650	300.0	TCS-1
25650	25700	50.0	TCS-4
25700	25745	45.0	TCS-1
25745	25800	55.0	TCS-4
25800	25875	75.0	TCS-1
25875	25950	75.0	TCS-4A
25950	26100	150.0	TCS-1A
26100	26150	50.0	TCS-4A
26150	26550	400.0	TCS-1A
26550	26600	50.0	TCS-4A
26600	26800	200.0	TCS-1A
26800	26900	100.0	TCS-4A
26900	27200	300.0	TCS-1A
27200	27250	50.0	TCS-4A
27250	27300	50.0	TCS-1A
27300	27400	100.0	TCS-4A
27400	27750	350.0	TCS-1A
27750	28000	250.0	TCS-4A
28000	28235	235.0	TCS-1A
28235	28350	115.0	TCS-3
28350	28400	50.0	TCS-4
28400	28450	50.0	TCS-1
28450	28500	50.0	TCS-4
28500	28900	400.0	TCS-1
28900	29000	100.0	TCS-4
29000	29050	50.0	TCS-1
29050	29250	200.0	TCS-2
29250	29300	50.0	TCS-4

Chainage (m)		Length (m)	TCS No.
From	To		
29300	29350	50.0	TCS-1
29350	29600	250.0	TCS-4
29600	29655	55.0	TCS-1
29655	29700	45.0	TCS-1A
29700	29750	50.0	TCS-4A
29750	29975	225.0	TCS-1A
29975	30125	150.0	TCS-4A
30125	30175	50.0	TCS-4
30175	30295	120.0	TCS-1A
30295	30355	60.0	TCS-1
30355	30435	80.0	TCS-4
30435	30535	100.0	TCS-1
30535	30775	240.0	TCS-4A
30775	30975	200.0	TCS-1A
30975	31205	230.0	TCS-4A
31205	31325	120.0	TCS-2
31325	31525	200.0	TCS-4
31525	32075	550.0	TCS-1A
32075	32125	50.0	TCS-4A
32125	32625	500.0	TCS-1A
32625	32725	100.0	TCS-1
32725	33275	550.0	TCS-6A
33275	33525	250.0	TCS-1A
33525	33725	200.0	TCS-2A
33725	33900	175.0	TCS-2A
33900	34095	195.0	TCS-3
34095	34235	140.0	TCS-4A
34235	34300	65.0	TCS-1A
34300	34350	50.0	TCS-4A
34350	34435	85.0	TCS-1A
34435	34525	90.0	TCS-1
34525	34795	270.0	TCS-1A

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
1	1.000	Y-Type	3-Legged
2	15.175	Y-Type	3-Legged
3	33.050	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	0.000	0.175	Reconstruction	TCS-2A
2	0.175	0.250	Reconstruction	TCS-1A
3	0.575	0.700	Reconstruction	TCS-2A
4	0.700	1.100	Reconstruction	TCS-7A
5	1.300	1.450	Reconstruction	TCS-3A
6	1.450	1.560	Reconstruction	TCS-1A
7	1.590	1.625	Reconstruction	TCS-1A
8	1.750	1.930	Reconstruction	TCS-1A
9	2.375	2.550	Reconstruction	TCS-2A
10	3.850	4.000	Reconstruction	TCS-5A
11	4.000	4.270	Reconstruction	TCS-3A
12	4.500	4.750	Reconstruction	TCS-1A
13	4.750	4.825	Reconstruction	TCS-4A
14	4.825	5.420	Reconstruction	TCS-1A
15	5.420	5.450	Reconstruction	TCS-4A
16	5.450	5.510	Reconstruction	TCS-1A
17	5.650	6.000	Reconstruction	TCS-1A
18	6.175	6.350	Reconstruction	TCS-1A
19	6.450	7.000	Reconstruction	TCS-1A
20	7.690	7.900	Reconstruction	TCS-1A
21	7.900	7.940	Reconstruction	TCS-4A
22	7.940	8.030	Reconstruction	TCS-1A
23	8.030	8.060	Reconstruction	TCS-4A
24	8.060	8.150	Reconstruction	TCS-1A
25	8.150	8.225	Reconstruction	TCS-3A
26	8.300	8.450	Reconstruction	TCS-1A
27	9.560	9.850	Reconstruction	TCS-1A
28	10.430	11.050	Reconstruction	TCS-1A
29	12.200	12.330	Reconstruction	TCS-1A
30	12.330	12.370	Reconstruction	TCS-4A
31	12.370	12.660	Reconstruction	TCS-1A
32	12.870	13.000	Reconstruction	TCS-1A
33	13.200	13.430	Reconstruction	TCS-1A
34	13.500	13.620	Reconstruction	TCS-1A
35	13.750	13.900	Reconstruction	TCS-1A

Sl. No.	Stretch From km to km		Remarks	TCS Type
36	13.900	13.950	Reconstruction	TCS-2A
37	14.960	15.125	Reconstruction	TCS-2A
38	15.575	16.275	Reconstruction	TCS-1A
39	16.695	16.750	Reconstruction	TCS-1A
40	16.750	16.950	Reconstruction	TCS-4A
41	17.175	17.425	Reconstruction	TCS-1A
42	17.925	18.155	Reconstruction	TCS-1A
43	18.925	19.000	Reconstruction	TCS-1A
44	19.000	19.075	Reconstruction	TCS-4A
45	19.075	19.285	Reconstruction	TCS-1A
46	19.285	19.325	Reconstruction	TCS-2A
47	19.325	19.675	Reconstruction	TCS-1A
48	19.675	19.725	Reconstruction	TCS-4A
49	19.725	19.945	Reconstruction	TCS-1A
50	19.945	19.995	Reconstruction	TCS-4A
51	19.995	20.090	Reconstruction	TCS-6A
52	20.090	20.225	Reconstruction	TCS-1A
53	20.395	20.550	Reconstruction	TCS-1A
54	20.550	20.700	Reconstruction	TCS-4A
55	20.700	20.750	Reconstruction	TCS-1A
56	20.750	20.800	Reconstruction	TCS-4A
57	20.800	20.900	Reconstruction	TCS-1A
58	20.900	20.950	Reconstruction	TCS-4A
59	20.950	21.050	Reconstruction	TCS-1A
60	21.050	21.100	Reconstruction	TCS-4A
61	21.100	21.335	Reconstruction	TCS-1A
62	21.565	22.150	Reconstruction	TCS-1A
63	22.150	22.200	Reconstruction	TCS-4A
64	22.200	22.315	Reconstruction	TCS-1A
65	22.465	22.500	Reconstruction	TCS-4A
66	22.500	23.100	Reconstruction	TCS-1A
67	23.100	23.300	Reconstruction	TCS-4A
68	23.300	23.415	Reconstruction	TCS-1A
69	23.635	23.850	Reconstruction	TCS-4A
70	23.850	24.100	Reconstruction	TCS-1A
71	24.100	24.200	Reconstruction	TCS-4A
72	24.200	24.550	Reconstruction	TCS-1A
73	24.550	24.700	Reconstruction	TCS-4A
74	24.700	25.125	Reconstruction	TCS-1A
75	25.875	25.950	Reconstruction	TCS-4A
76	25.950	26.100	Reconstruction	TCS-1A
77	26.100	26.150	Reconstruction	TCS-4A
78	26.150	26.550	Reconstruction	TCS-1A
79	26.550	26.600	Reconstruction	TCS-4A
80	26.600	26.800	Reconstruction	TCS-1A
81	26.800	26.900	Reconstruction	TCS-4A
82	26.900	27.200	Reconstruction	TCS-1A
83	27.200	27.250	Reconstruction	TCS-4A
84	27.250	27.300	Reconstruction	TCS-1A

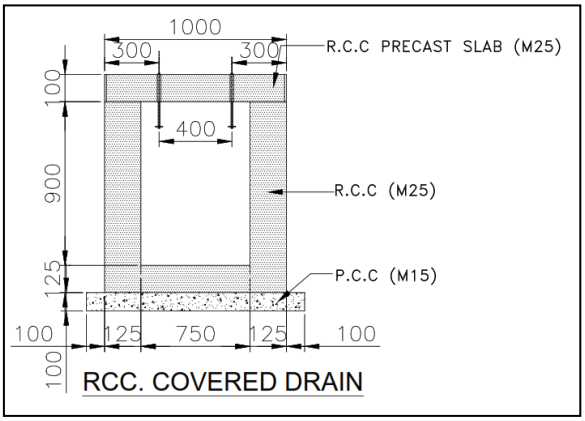
Sl. No.	Stretch From km to km		Remarks	TCS Type
85	27.300	27.400	Reconstruction	TCS-4A
86	27.400	27.750	Reconstruction	TCS-1A
87	27.750	28.000	Reconstruction	TCS-4A
88	28.000	28.235	Reconstruction	TCS-1A
89	29.655	29.700	Reconstruction	TCS-1A
90	29.700	29.750	Reconstruction	TCS-4A
91	29.750	29.975	Reconstruction	TCS-1A
92	29.975	30.125	Reconstruction	TCS-4A
93	30.175	30.295	Reconstruction	TCS-1A
94	30.535	30.775	Reconstruction	TCS-4A
95	30.775	30.975	Reconstruction	TCS-1A
96	30.975	31.205	Reconstruction	TCS-4A
97	31.525	32.075	Reconstruction	TCS-1A
98	32.075	32.125	Reconstruction	TCS-4A
99	32.125	32.625	Reconstruction	TCS-1A
100	32.725	33.275	Reconstruction	TCS-6A
101	33.275	33.525	Reconstruction	TCS-1A
102	33.525	33.725	Reconstruction	TCS-2A
103	33.725	33.900	Reconstruction	TCS-2A
104	34.095	34.235	Reconstruction	TCS-4A
105	34.235	34.300	Reconstruction	TCS-1A
106	34.300	34.350	Reconstruction	TCS-4A
107	34.350	34.435	Reconstruction	TCS-1A
108	34.525	34.795	Reconstruction	TCS-1A

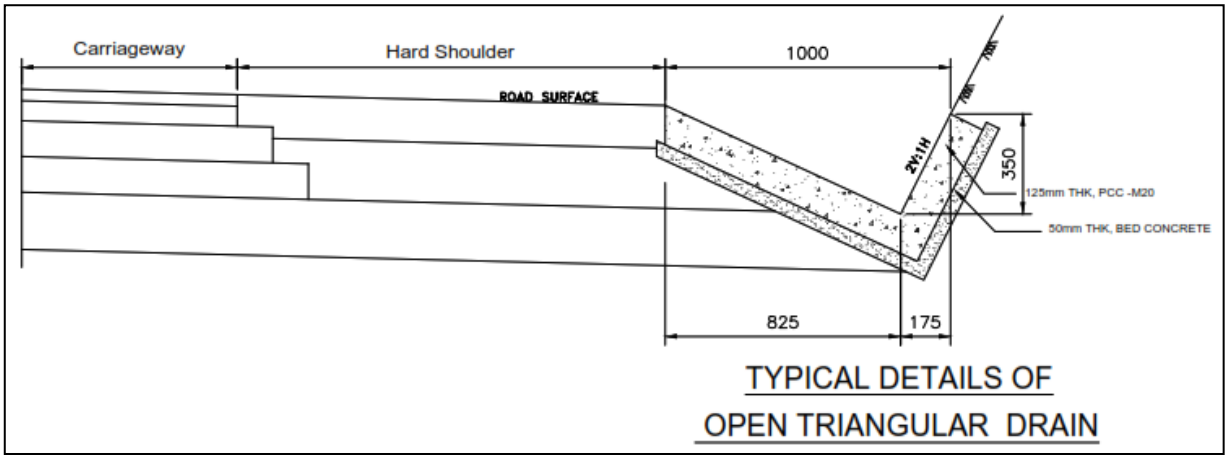
*- Annexure-II of Schedule-B

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	795
PCC Open Triangular Drain	Both/One side	37333
Total=		**38128 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	15.470	**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	0.223	1X 2.0 X 3.0
2	0.585	1X 2.0 X 2.0
3	1.032	1X 2.0 X 2.0
4	1.360	1X 2.0 X 2.0
5	1.995	1X 2.0 X 3.0
6	2.132	1X 2.0 X 2.0
7	2.333	1X 2.0 X 2.0
8	4.278	1X 2.0 X 2.0
9	4.495	1X 2.0 X 3.0
10	4.700	1X 3.0 X 4.0
11	4.918	1X 3.0 X 4.0
12	5.105	1X 2.0 X 3.0
13	5.323	1X 2.0 X 2.0
14	5.493	1X 2.0 X 2.0
15	5.591	1X 2.0 X 3.0
16	5.658	1X 2.0 X 3.0
17	6.103	1X 2.0 X 3.0
18	6.330	1X 2.0 X 2.0
19	6.661	1X 2.0 X 2.0
20	7.049	1X 2.0 X 2.0
21	8.549	1X 2.0 X 2.0
22	8.955	1X 3.0 X 4.0
23	9.613	1X 2.0 X 2.0
24	9.763	1X 2.0 X 2.0
25	10.258	1X 2.0 X 3.0

Sl. No.	Design Chainage (km)	Size (m)
26	10.438	1X 2.0 X 2.0
27	10.568	1X 2.0 X 3.0
28	10.750	1X 2.0 X 3.0
29	11.050	1X 2.0 X 3.0
30	11.208	1X 2.0 X 2.0
31	11.638	1X 2.0 X 3.0
32	11.988	1X 2.0 X 2.0
33	12.145	1X 2.0 X 3.0
34	12.280	1X 2.0 X 3.0
35	12.498	1X 2.0 X 2.0
36	12.725	1X 2.0 X 3.0
37	12.897	1X 2.0 X 3.0
38	13.110	1X 2.0 X 2.0
39	13.392	1X 2.0 X 2.0
40	14.050	1X 2.0 X 3.0
41	14.440	1X 2.0 X 3.0
42	14.750	1X 2.0 X 2.0
43	14.820	1X 2.0 X 3.0
44	15.235	1X 2.0 X 2.0
45	15.672	1X 2.0 X 2.0
46	16.100	1X 2.0 X 2.0
47	16.250	1X2.0 X 3.0
48	16.815	1X 2.0 X 3.0
49	17.240	1X 2.0 X 2.0
50	17.665	1X 2.0 X 3.0
51	17.768	1X 2.0 X 3.0
52	18.360	1X 2.0 X 3.0
53	18.580	1X 2.0 X 3.0
54	18.809	1X 2.0 X 3.0
55	18.990	1X 2.0 X 2.0
56	19.640	1X 2.0 X 3.0
57	19.885	1X 2.0 X 3.0
58	20.162	1X 2.0 X 3.0
59	20.498	1X 2.0 X 3.0
60	20.670	1X 2.0 X 3.0
61	20.900	1X 2.0 X 3.0
62	21.090	1X 2.0 X 3.0
63	21.581	1X 2.0 X 2.0
64	21.808	1X 2.0 X 3.0
65	21.925	1X 2.0 X 3.0
66	22.142	1X 2.0 X 3.0
67	22.318	1X 2.0 X 2.0
68	22.748	1X 2.0 X 3.0
69	23.156	1X 2.0 X 3.0
70	23.352	1X 2.0 X 3.0
71	23.730	1X 2.0 X 2.0
72	23.948	1X 2.0 X 2.0
73	24.058	1X 2.0 X 3.0
74	24.408	1X 2.0 X 2.0

Sl. No.	Design Chainage (km)	Size (m)
75	24.500	1X 2.0 X 3.0
76	24.758	1X 2.0 X 2.0
77	24.938	1X 2.0 X 3.0
78	25.260	1X 2.0 X 3.0
79	25.510	1X 2.0 X 2.0
80	26.248	1X 2.0 X 2.0
81	26.526	1X 2.0 X 3.0
82	26.780	1X 2.0 X 3.0
83	26.988	1X 2.0 X 3.0
84	27.370	1X 2.0 X 2.0
85	27.548	1X 2.0 X 3.0
86	27.631	1X 2.0 X 2.0
87	28.348	1X 2.0 X 2.0
88	28.380	1X 2.0 X 2.0
89	28.510	1X 2.0 X 2.0
90	28.682	1X 2.0 X 3.0
91	28.880	1X 2.0 X 2.0
92	29.048	1X 2.0 X 3.0
93	29.198	1X 2.0 X 2.0
94	29.378	1X 2.0 X 3.0
95	29.651	1X 2.0 X 3.0
96	29.812	1X 4.0 X 5.0
97	29.980	1X 2.0 X 2.0
98	30.370	1X 2.0 X 3.0
99	30.445	1X 4.0 X 5.0
100	30.590	1X 2.0 X 3.0
101	30.640	1X 2.0 X 2.0
102	30.760	1X 2.0 X 3.0
103	32.385	1X 2.0 X 3.0
104	32.585	1X 3.0 X 4.0
105	33.248	1X 2.0 X 3.0
106	34.098	1X 2.0 X 2.0
107	34.478	1X 2.0 X 3.0
108	34.510	1X 2.0 X 2.0

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	1.591	1X 2.0 X 2.0
2	1.805	1X 2.0 X 2.0
3	7.750	1X 2.0 X 2.0
4	7.950	1X 2.0 X 2.0
5	11.383	1X 2.0 X 2.0
6	13.581	1X 2.0 X 2.0
7	15.142	1X 2.0 X 2.0
8	15.301	1X 2.0 X 2.0
9	18.013	1X 2.0 X 2.0
10	19.455	1X 2.0 X 2.0
11	21.275	1X 2.0 X 2.0
12	21.475	1X 2.0 X 2.0
13	25.758	1X 2.0 X 2.0
14	26.650	1X 2.0 X 2.0
15	26.805	1X 2.0 X 2.0
16	27.225	1X 2.0 X 2.0
17	27.868	1X 2.0 X 3.0
18	28.150	1X 2.0 X 2.0
19	29.503	1X 2.0 X 2.0
20	30.054	1X 2.0 X 2.0
21	30.114	1X 2.0 X 2.0
22	30.185	1X 2.0 X 2.0
23	30.250	1X 2.0 X 2.0
24	30.972	1X 2.0 X 2.0
25	31.150	1X 2.0 X 2.0
26	31.440	1X 2.0 X 2.0
27	32.140	1X 2.0 X 2.0
28	32.950	1X 2.0 X 2.0
29	33.133	1X 2.0 X 2.0
30	33.498	1X 2.0 X 2.0
31	33.714	1X 2.0 X 2.0
32	33.881	1X 2.0 X 2.0
33	34.313	1X 2.0 X 2.0

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. No.	Bridge location (km)	Salient details of existing bridge		Adequacy or otherwise of the existing waterway, vertical clearance, etc*	Remarks
		Type of Structures	Span Arrangement and Total Vent way (No. x Length) (m)		
1	15.470	Steel Truss bridge	1 x 62.8	Insufficient width and not conform to IRC Loadings.	1 x 72 (Steel Truss)

(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
Nil			

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

locations:

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

Sl. No.	Location at km	Remarks
Nil		

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

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

Sl. No.	Location at km	Remarks
Nil		

(e) Drainage system for bridge decks

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

(f) Structures in marine environment

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

(iv) Rail-road bridges

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

(b) Road over-bridges

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

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

(c) Road under-bridges

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

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

(v) Grade separated structures

[Refer to the provision of relevant Manual]

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

(vi) Repairs and strengthening of bridges and structures

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)
1	15.470

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	**636**	nos

2	Stop Sign (90 cm high octagon)	**8**	nos
3	60 cm circular	**16**	nos
4	Direction Sign <.0.9 sqm	**6**	nos
5	Direction Sign >0.9 sqm	**11**	nos
6	Delineator/Object /Hazard Marker	**3347**	nos
7	Rumble Strip	**7**	nos
8	Road stud	**18561**	nos
9	Painting	**11599**	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	0.000	Full Width
2	34.795	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 7164m, Wire rope Crash Barrier of minimum length of 4920m and Parapet wall of minimum length of 4077m 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	1884
RCC Breast wall, 3.0m height	Running Meter	4495
RCC Retaining wall, 2m height	Running Meter	4322
RCC Retaining wall, 3m height	Running Meter	277
RCC Retaining wall, 4m height	Running Meter	85
RCC Retaining wall, 5m height	Running Meter	400

Type of Protection Work		
Protection Work	Unit	Quantity
Seeding & Mulching with Jute Net	Sqm	63473
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**	
2.275	2.325	50
2.575	3.025	450
7.175	7.225	50
8.675	8.775	100
8.975	9.075	100
9.275	9.325	50
11.075	11.125	50
16.450	16.550	100
Total Length		**950**

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		
2500	2600	100	3.5
Total Length		**100**	

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 33KV 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	0.061	0.070	33 Kv	50.2	LHS		668973.548	2845515.697
2	0.982	1.005	33 Kv	23.8	LHS		669275.308	2844687.771
3	1.078	1.121	33 Kv	5		RHS	669321.619	2844658.186
4	1.100	1.148	33 Kv	10.9	LHS		669322.921	2844687.177
5	22.503	23.170	33 Kv	14.0		RHS	673103.126	2843549.845

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	25.651	26.391	11 kv	39	LHS		672494.545	2843232.317
2	25.850	26.590	11 kv	51.8	LHS		672292.466	2843197.473
3	26.098	26.848	11 kv	5.9		RHS	672095.364	2843097.723
4	26.115	26.868	11 kv	36.4	LHS		672144.526	2843081.761
5	26.220	26.978	11 kv	9.2		RHS	672106.430	2842970.484
6	27.844	28.624	11 kv	7.60		RHS	672235.886	2841660.892
7	31.893	32.858	11 kv	10.8		RHS	672344.286	2840320.688
8	32.845	33.815	11 kv	11.7	LHS		672490.050	2839886.699
9	32.846	33.816	11 kv	13	LHS		672488.650	2839886.291
10	32.850	33.820	11 kv	12.5	LHS		672484.599	2839884.925

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)

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	0.010	0.022	LT	10.7	LHS		668936.100	2845551.855
2	0.020	0.028	LT	3.2		RHS	668922.282	2845542.886
3	0.051	0.062	LT	3.9		RHS	668920.153	2845507.473
4	0.701	0.728	LT	23.8		RHS	669223.227	2844958.826
5	0.710	0.738	LT	26.3	LHS		669273.507	2844962.634
6	0.808	0.832	LT	17	LHS		669286.940	2844867.847
7	0.925	0.950	LT	10.7		RHS	669257.378	2844750.377
8	0.867	0.892	LT	4.5		RHS	669271.651	2844805.659
9	0.980	1.010	LT	5.1		RHS	669246.096	669246.096
10	28.003	28.782	LT	5.5	LHS		672250.019	2841502.457
11	28.050	28.828	LT	11.9		RHS	672241.104	2841455.971
12	31.633	32.580	LT	13.8		RHS	672130.397	2840372.326
13	31.728	32.680	LT	18.9		RHS	672193.814	2840387.350
14	31.790	32.751	LT	5.6	LHS		672269.373	2840395.431
15	32.795	33.762	LT	10.6		RHS	672544.804	2839886.606
16	32.815	33.785	LT	8.5	LHS		672516.144	2839888.205
17	33.040	34.016	LT	9.7		RHS	672298.237	2839927.788
18	33.045	34.022	LT	19.7	LHS		672317.419	2839903.449
19	33.067	34.045	LT	4		RHS	672296.414	2839891.596
20	33.110	34.086	LT	3.7		RHS	672307.597	2839848.869
21	33.235	34.210	LT	3.4		RHS	672403.537	2839773.587
22	33.290	34.265	LT	3		RHS	672448.796	2839748.096
23	33.303	34.278	LT	16.5	LHS		672472.448	2839746.867
24	33.373	34.348	LT	10.1	LHS		672470.459	2839672.062

List of Transformer 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	31.893	32.860	TRANSFORMER	10.3		RHS	672344.73	2840319.702

(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	0.000	35.870	0.000	34.795	5.3

(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	0.285 (BothSide)	Fig. 12.3 of Manual
2	1.585 (BothSide)	Fig. 12.3 of Manual
3	30.770 (BothSide)	Fig. 12.3 of Manual
4	32.200 (BothSide)	Fig. 12.3 of Manual
5	33.460 (BothSide)	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 10120 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".

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	1008.142m	1068.365m	30
2	4683.624m	4695.062m	30
3	4742.644m	4762.515m	30
4	4803.937m	4831.158m	30
5	4886.237m	4931.027m	30
6	4993.270m	5000.327m	30
7	5041.314m	5057.765m	30
8	5190.999m	5208.510m	30
9	6282.426m	6362.958m	30
10	6394.307m	6439.986m	20
11	6461.823m	6498.416m	20
12	6613.343m	6654.615m	30
13	7683.270m	7695.549m	30
14	7745.486m	7776.385m	30
15	8925.145m	8984.843m	30
16	9484.226m	9497.472m	30
17	9560.796m	9561.917m	30

SL. No	Stretch		Design speed in km/hr.
	From	To	
18	9613.466m	9636.780m	30
19	9952.588m	10005.433m	30
20	10493.362m	10566.948m	30
21	11541.786m	11599.879m	30
22	11822.749m	11866.851m	30
23	12669.449m	12677.218m	30
24	12731.201m	12745.799m	30
25	12801.207m	12815.537m	30
26	12862.428m	12874.292m	30
27	13111.126m	13142.694m	30
28	13243.180m	13253.316m	30
29	13343.335m	13394.352m	30
30	13439.256m	13446.405m	30
31	13670.714m	13673.890m	30
32	13722.643m	13738.992m	30
33	15346.416m	15408.465m	30
34	15537.069m	15583.227m	30
35	16215.141m	16251.119m	30
36	16287.098m	16317.991m	20
37	16358.958m	16384.296m	20
38	16427.150m	16431.856m	20
39	16478.529m	16484.265m	30
40	16530.290m	16599.626m	30
41	16878.964m	16919.606m	30
42	16970.434m	17010.646m	20
43	17383.658m	17395.466m	30
44	17441.390m	17462.219m	30
45	17914.707m	17933.458m	30
46	18566.411m	18599.635m	20
47	18740.806m	18753.965m	20
48	18795.930m	18814.061m	20
49	18850.152m	18904.228m	20
50	18968.706m	18989.856m	20
51	19033.985m	19073.351m	20
52	19110.492m	19122.960m	30
53	19171.277m	19184.909m	30
54	19653.368m	19688.029m	30
55	19733.854m	19741.444m	30
56	19782.334m	19783.853m	30
57	19828.915m	19831.812m	30
58	19890.996m	19917.710m	30
59	20149.925m	20172.269m	30
60	20251.921m	20264.582m	30
61	20299.448m	20386.065m	30
62	21774.273m	21819.352m	30
63	21867.914m	21881.971m	30
64	21933.083m	21945.136m	30
65	22293.871m	22383.240m	30

SL. No	Stretch		Design speed in km/hr.
	From	To	
66	22437.504m	22484.362m	30
67	22825.753m	22879.751m	30
68	22947.203m	22984.272m	30
69	23292.394m	23300.786m	30
70	23343.794m	23360.778m	20
71	23412.865m	23452.968m	20
72	23476.613m	23553.398m	20
73	23612.554m	23626.142m	30
74	24048.312m	24076.249m	20
75	24378.122m	24412.882m	30
76	24463.755m	24472.138m	30
77	24555.616m	24567.888m	30
78	24694.063m	24710.939m	30
79	24766.683m	24775.527m	30
80	24835.471m	24851.953m	30
81	25052.860m	25076.068m	20
82	25106.448m	25145.500m	20
83	25525.719m	25617.890m	30
84	25645.140m	25686.456m	20
85	25706.592m	25733.181m	20
86	26720.237m	26746.420m	30
87	26855.620m	26871.736m	30
88	26958.370m	26994.441m	30
89	28211.938m	28252.051m	20
90	28331.223m	28364.426m	30
91	28664.909m	28677.754m	30
92	28735.476m	28770.939m	30
93	29041.208m	29065.991m	30
94	29114.455m	29127.248m	30
95	29183.552m	29195.627m	30
96	29247.643m	29263.270m	30
97	29353.459m	29362.660m	20
98	29399.227m	29440.647m	20
99	29477.870m	29510.881m	20
100	29565.682m	29599.599m	30
101	29650.378m	29671.040m	30
102	29724.884m	29759.000m	30
103	29810.258m	29823.316m	30
104	29864.843m	29910.738m	20
105	29965.572m	29994.910m	20
106	30093.594m	30174.162m	30
107	30233.558m	30283.213m	30
108	30387.060m	30443.702m	30
109	30504.079m	30526.017m	30
110	31130.730m	31136.092m	30
111	31170.643m	31187.369m	20
112	31221.740m	31263.236m	20
113	31285.996m	31325.289m	20

SL. No	Stretch		Design speed in km/hr.
	From	To	
114	31345.731m	31374.582m	30
115	31472.124m	31483.376m	30
116	31534.073m	31554.084m	20
117	31586.816m	31612.534m	20
118	31685.057m	31707.013m	20
119	31740.818m	31753.330m	20
120	31784.571m	31793.989m	20
121	32005.467m	32006.327m	30
122	32052.401m	32063.945m	30
123	32115.097m	32135.067m	30
124	32184.480m	32185.997m	30
125	32246.601m	32263.823m	30
126	32316.082m	32332.270m	30
127	32367.688m	32414.758m	30
128	32470.942m	32509.218m	30
129	32564.288m	32578.460m	30
130	32631.384m	32657.604m	20
131	32658.002m	32686.158m	20
132	32724.364m	32731.361m	30
133	32801.449m	32817.534m	30
134	32909.702m	32929.435m	30
135	32970.902m	32971.133m	30
136	33024.307m	33059.139m	30
137	33506.872m	33514.102m	30
138	33819.379m	33841.690m	20
139	33883.850m	33922.776m	20
140	33970.714m	33994.012m	30
141	34451.057m	34461.181m	30
142	34517.890m	34528.489m	30

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

Sl. NO.	Stretch		Radius (m)
	From	To	
1	1008.142m	1068.365m	30
2	1687.950m	1722.516m	50
3	1803.963m	1837.422m	50
4	1940.863m	1963.478m	50
5	2102.028m	2150.972m	60
6	2292.147m	2326.044m	60
7	2696.228m	2771.809m	50
8	2852.082m	2860.038m	50
9	2949.872m	2964.794m	50
10	3087.663m	3128.117m	50
11	3373.832m	3426.523m	50
12	4578.878m	4593.194m	60
13	4683.624m	4695.062m	50
14	4742.644m	4762.515m	60

Sl. NO.	Stretch		Radius (m)
	From	To	
15	4803.937m	4831.158m	40
16	4886.237m	4931.027m	60
17	4993.270m	5000.327m	50
18	5041.314m	5057.765m	50
19	5190.999m	5208.510m	30
20	5420.698m	5426.189m	60
21	5532.685m	5555.561m	60
22	6282.426m	6362.958m	50
23	6461.823m	6498.416m	20
24	6613.343m	6654.615m	50
25	7683.270m	7695.549m	60
26	7745.486m	7776.385m	50
27	7872.252m	7885.635m	50
28	7978.057m	7987.450m	60
29	8060.504m	8160.773m	70
30	8248.463m	8274.655m	50
31	8925.145m	8984.843m	30
32	9222.593m	9235.057m	50
33	9560.796m	9561.917m	30
34	9613.466m	9636.780m	60
35	9706.982m	9717.751m	50
36	9876.160m	9879.478m	60
37	9952.588m	10005.433m	30
38	10493.362m	10566.948m	40
39	11541.786m	11599.879m	40
40	11822.749m	11866.851m	30
41	12185.247m	12187.765m	60
42	12374.342m	12399.791m	50
43	12500.126m	12503.886m	60
44	12669.449m	12677.218m	50
45	12731.201m	12745.799m	30
46	12801.207m	12815.537m	40
47	12862.428m	12874.292m	50
48	13111.126m	13142.694m	30
49	13243.180m	13253.316m	30
50	13343.335m	13394.352m	60
51	13439.256m	13446.405m	50
52	13511.929m	13526.342m	50
53	13608.288m	13620.259m	60
54	13670.714m	13673.890m	70
55	13722.643m	13738.992m	30
56	13962.428m	13978.107m	50
57	14259.442m	14270.688m	50
58	14897.938m	14909.859m	50
59	15346.416m	15408.465m	50
60	15537.069m	15583.227m	40
61	16215.141m	16251.119m	40
62	16358.958m	16384.296m	20

Sl. NO.	Stretch		Radius (m)
	From	To	
63	16427.150m	16431.856m	20
64	16478.529m	16484.265m	40
65	16530.290m	16599.626m	60
66	16878.964m	16919.606m	60
67	16970.434m	17010.646m	20
68	17087.282m	17094.151m	50
69	17441.390m	17462.219m	30
70	17692.806m	17698.938m	50
71	17780.223m	17789.370m	50
72	17914.707m	17933.458m	30
73	18041.452m	18069.496m	50
74	18181.853m	18197.032m	50
75	18411.947m	18458.729m	50
76	18566.411m	18599.635m	20
77	18740.806m	18753.965m	20
78	18795.930m	18814.061m	20
79	18850.152m	18904.228m	30
80	18968.706m	18989.856m	20
81	19033.985m	19073.351m	30
82	19110.492m	19122.960m	50
83	19171.277m	19184.909m	40
84	19653.368m	19688.029m	60
85	19733.854m	19741.444m	40
86	19782.334m	19783.853m	60
87	19828.915m	19831.812m	40
88	19890.996m	19917.710m	40
89	20149.925m	20172.269m	30
90	20251.921m	20264.582m	30
91	20587.842m	20598.101m	50
92	21162.305m	21179.218m	60
93	21372.023m	21517.711m	60
94	21774.273m	21819.352m	50
95	21867.914m	21881.971m	40
96	21933.083m	21945.136m	40
97	22013.074m	22046.631m	50
98	22124.830m	22138.867m	60
99	22293.871m	22383.240m	60
100	22437.504m	22484.362m	30
101	22825.753m	22879.751m	40
102	22947.203m	22984.272m	30
103	23292.394m	23300.786m	40
104	23343.794m	23360.778m	30
105	23412.865m	23452.968m	20
106	23612.554m	23626.142m	50
107	23939.223m	23951.554m	70
108	24048.312m	24076.249m	20
109	24224.298m	24284.150m	50
110	24378.122m	24412.882m	40

Sl. NO.	Stretch		Radius (m)
	From	To	
111	24463.755m	24472.138m	40
112	24555.616m	24567.888m	40
113	24694.063m	24710.939m	40
114	24766.683m	24775.527m	30
115	24835.471m	24851.953m	40
116	25106.448m	25145.500m	20
117	25458.591m	25479.750m	50
118	25645.140m	25686.456m	20
119	26506.407m	26533.110m	70
120	26720.237m	26746.420m	30
121	26855.620m	26871.736m	60
122	26958.370m	26994.441m	30
123	27381.226m	27419.930m	50
124	28211.938m	28252.051m	20
125	28331.223m	28364.426m	30
126	28664.909m	28677.754m	30
127	28735.476m	28770.939m	40
128	28874.721m	28882.417m	60
129	28958.310m	28973.847m	50
130	29041.208m	29065.991m	50
131	29114.455m	29127.248m	50
132	29183.552m	29195.627m	40
133	29247.643m	29263.270m	40
134	29353.459m	29362.660m	30
135	29399.227m	29440.647m	20
136	29477.870m	29510.881m	40
137	29565.682m	29599.599m	40
138	29650.378m	29671.040m	40
139	29724.884m	29759.000m	40
140	29810.258m	29823.316m	40
141	29864.843m	29910.738m	30
142	29965.572m	29994.910m	20
143	30093.594m	30174.162m	45
144	30233.558m	30283.213m	50
145	30387.060m	30443.702m	30
146	30504.079m	30526.017m	30
147	30811.071m	30832.315m	70
148	31130.730m	31136.092m	40
149	31221.740m	31263.236m	20
150	31345.731m	31374.582m	50
151	31472.124m	31483.376m	50
152	31534.073m	31554.084m	30
153	31586.816m	31612.534m	30
154	31685.057m	31707.013m	30
155	31740.818m	31753.330m	30
156	31784.571m	31793.989m	30
157	32005.467m	32006.327m	50
158	32052.401m	32063.945m	40

Sl. NO.	Stretch		Radius (m)
	From	To	
159	32115.097m	32135.067m	40
160	32246.601m	32263.823m	40
161	32470.942m	32509.218m	30
162	32564.288m	32578.460m	40
163	32631.384m	32657.604m	20
164	32658.002m	32686.158m	20
165	32724.364m	32731.361m	60
166	32801.449m	32817.534m	30
167	32909.702m	32929.435m	50
168	32970.902m	32971.133m	50
169	33024.307m	33059.139m	30
170	33283.480m	33304.903m	50
171	33387.652m	33400.046m	50
172	33506.872m	33514.102m	30
173	33819.379m	33841.690m	30
174	33883.850m	33922.776m	20
175	33970.714m	33994.012m	40
176	34218.907m	34298.840m	50
177	34451.057m	34461.181m	30
178	34517.890m	34528.489m	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	Long Term
					No action.	Not Applicable
			1	r < 2 %	Local repair of areas damaged and liableto be damaged. Within 15 days	
			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
	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
Pipe/box/slab culverts	Structurally sound	Spalling of concrete not more than 0.25 sqm	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording	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
		Delamination of concrete not more than 0.25 sq.m.					
		Cracks wider than 0.3 mm not more than 1m aggregatelength					
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (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.	59.14	**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	20.57
		(2) Sub Base Course	22.74
		(3) Non Bituminous Base course	15.44
		(4) Bituminous Base course	[Nil]
		(5) Wearing Coat	12.31
		(6) Hard Shoulder	6.75
		(7) Earthen Shoulder	1.54
		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)	20.65
Minor Bridges/ Underpasses/ Overpasses	Nil	**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.	[Nil]
		(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.	[Nil]
		(3) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use	[Nil]
		(4) Guide Bunds & River Training Works: On completion of Guide Bunds and river Training Works complete in all respects	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		B.1- Widening and Repair of underpasses/overpasses	
		Underpasses/ Overpasses	[Nil]
		B.2-New underpasses/overpasses	
		(1) Foundation + Sub Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	[Nil]
		(2) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect. Wearing Coat (a) in case of Overpass- wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass-rigid pavement including drainage facility complete in all respects as specified.	[Nil]
		(3) Approaches: On completion of approaches including Retaining walls/Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	[Nil]
Major bridge (length>60 m) works and ROB/RUB/ elevated sections/ flyovers including viaducts ,if any	4.88	**A.1- Widening and repairs of Major Bridges**	
		(1) Foundation	[Nil]
		(2) Sub-structure	[Nil]
		(3) Super-structure (including bearings)	[Nil]
		(4) Wearing Coat including expansion joints	[Nil]
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7) Guide Bunds, River Training works etc.	[Nil]
		(8) Approaches(including Retaining walls, stone pitching and protection works)	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		A.2-New Major Bridges	
		(1) Foundation	5.21
		(2) Sub-structure	10.13
		(3) Super-structure (including bearings)	80.70
		(4) Wearing Coat including expansion joints	2.43
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.96
		(6) Wing walls/return walls	[Nil]
		(7) Guide Bunds, River Training works etc.	[Nil]
		(8) Approaches (including Retaining walls, stone pitching and protection works)	0.57
		B.1-Widening and repair of **(a) ROB** **(b) RUB**	
		(1) Foundation	[Nil]
		(2) Sub-Structure	[Nil]
		(3) Super-structure (including bearings)	[Nil]
		(4) Wearing Coat: (a)in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	[Nil]
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7) Approaches (including Retaining walls, stone pitching and protection works)	[Nil]
		B.2-New ROB/RUB (a) ROB (b) RUB	

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

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		(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	35.98	(i) Toll Plaza	[Nil]
		(ii) Road side covered drains	1.03
		(iii) Road side open drains	10.79
		(iv) Road signs, markings, km stones, safety Devices,... etc.	
		a) Pavement marking	0.95
		b) Crash Barrier - "W" : Metal Beam Crash Barrier & Wire Rope Safety Barrier	5.30
		c) Road signs,	0.50
		d) Road boundary stones, km stones, 5th km stones and hectometer stones, other items etc	0.03
		e) Road Delineators, studs, lighting	1.39
		f) Road furniture (overhead gantry sign)	0.17
		g)Steel Railing	[Nil]
		(iv) Project facilities	
		a) Bus Bays	0.88
		b)Truck Lay-Byes	[Nil]
		c) Junctions (Minor)	0.17
		d) Rest areas	[Nil]
		e) Diversion work	[Nil]
		f) Others (Parapet Wall,)	1.76
		(v) Road side plantation	[Nil]
		(vi) Repair of protection works other than approaches to the bridges, elevated sections/ flyovers/ grade separators and ROBs/ RUBs	[Nil]
		(vii) Safety and traffic management during construction	[Nil]
		(viii) Protection Works	
		(a) RCC Retaining wall with parapet	30.56
		(b) PCC Breast wall (1.5m ht.)	7.46

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
		(c) RCC Breast wall (3m ht.)	31.26
		(d) Seeding Mulching with jute net	0.57
		(e) Special Hill Slope Protection(Soil Nailing)	4.00
		(ix)Site clearance & Dismantling	2.01
		(x) Utility shifting	
		a) EHT line	[Nil]
		b) EHT Crossing	[Nil]
		c) HT / LT line	0.74
		d) HT / LT line crossings	
		(e) Water pipeline	0.43
		(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	20.57	
(2) Sub Base Course	22.74	
(3) Non Bituminous Base course	15.44	
(4) Bituminous Base course	[Nil]	
(5) Wearing Coat	12.31	
(6) Hard Shoulder	6.75	
(7) Earthen Shoulder	1.54	
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)	20.65	

@ 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.	[Nil]	(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.	[Nil]	**(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.	[Nil]	**(iii) Approaches:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified 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		

Stage of Payment	Weightage	Payment Procedure
1	2	3
(i) Foundation	[Nil]	**(i) Foundation:** Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro- rata basis on completion of a stage i.e. not less than 25 of the scope of foundation of the major Bridge subject to completion of atleast two foundations of the major Bridge . In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	[Nil]	**(ii) Sub-Structure:** Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25 of the scope of sub- structure of the major bridge subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge.
(iii)Super-structure (including bearings)	[Nil]	**(iii)Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	[Nil]	**(iv) Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc	[Nil]	**(v) Miscellaneous**: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	[Nil]	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.

Stage of Payment	Weightage	Payment Procedure
1	2	3
(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	5.21	**(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	10.13	**(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)	80.70	**(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	2.43	**(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	0.96	**(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)	0.57	**(viii) Approaches:** Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
B.1 -Widening and repairs of **(a)ROB** **(b) RUB**		
(i) Foundation	[Nil]	**i) Foundation:** Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROBs/RUBs. Payment against foundation shall be made on pro- rata basis on completion of a stage i.e. not less than 25 of the scope of foundation of the ROB/RUB subject to completion of atleast two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	[Nil]	**(ii) Sub-Structure:** Payment against Sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25 of the scope of sub-structure of the ROB/RUB subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the ROB/RUB.

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 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**		
(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.

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

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	1.03	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	10.79	

Stage of Payment	Weightage	Payment Procedure
(iii) Road signs, markings, km stones, safety devices, …		
a) Pavement marking	0.95	
b) Crash Barrier - "W" : Metal Beam Crash Barrier & Wire Rope Safety Barrier	5.30	
c) Road signs,	0.50	
d) Road boundary stones, km stones, 5th km stones and hectometer stones, other items etc	0.03	
e) Road Delineators, studs, lighting	1.39	
f) Road furniture (overhead gantry sign)	0.17	
g)Steel Railing	[Nil]	
(iv) Project Facilities		
a) Bus bays	0.88	Payment shall be made on pro rata basis for completed facilities.
b) Truck lay-byes	[Nil]	
c) Junctions (Minor)	0.17	
d) Rest areas	[Nil]	
e) Diversion work	[Nil]	
f) others (Parapet Wall)	1.76	
(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) RCC 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)	30.56 7.46 31.26 0.57 4.00	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	2.01	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)	0.74	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	0.43	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

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