Schedule :A

SCHEDULE -A

(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

1. The Site

1.1 Site of the Four Laning divided Project Highway of Existing Dimapur- Kohima Road on EPC basis starts from design km. 152.490 to km 166.700 (Design Length 14.21 Kms) (Existing km. 156.000 to km. 172.900, Length 16.900 Kms) of NH 39 (New No. is NH-29) in the state of Nagaland. Project Highway shall include the land, buildings, structures and road works as described in Annex-1 of this Schedule-A.

1.2 The dates of handing over the Right of Way to the Contractor are specified inAnnex-II of this Schedule-A.

1.3 An inventory of the Site including the land, structures, road works 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 8.2.1 of this Agreement.

1.4 The proposed alignment plans of the Project Highway are specified in Annex-III which has to be followed by the Contractor as a minimum. The Contractor may, however, improve upon the alignment plans and profile and raise the finished roadway level (FRL) with approval from the Authority's Engineer within the available Right of Way.

1.5 The status of the environment clearances obtained or awaited is given in Annex IV.

Annex-1
(Schedule-A)

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-1. All the chainages/location referred to in Annex- I to Schedule-A shall be Design chainages.

1. Site

The site of the four lane Project Highway comprises the section of Dimapur- Kohimaroad commencing from Km 156.000 to Km 172.900 (Existing, Length= 16.90 Kms) and from Design Km 152.490 to Km 166.700 (Design, Length = 14.21 Kms) i.e. Dimapur – Kohima Section in the State of Nagaland. The land, carriageway and structures comprising the Site are described below.

2. Current Status of Project Chainages: The following work has been completed.

Sl. No.	Activity	Chainage		Side	Length (M)	Remarks
		From	To			
1	Earthworkupto Subgrade Top	152+490	155+650	LHS	3160	
		155+710	155+840	LHS	130	
		156+100	157+250	LHS	1150	
		157+480	158+030	LHS	550	
		158+100	162+920	LHS	4820	
		162+960	166+600	LHS	3640	
		166+640	166+670	LHS	30	
		152+490	153+180	RHS	690	
		153+250	154+960	RHS	1710	
		155+000	155+650	RHS	650	
		155+710	155+840	RHS	130	
		156+100	156+390	RHS	290	
		156+390	157+250	RHS	860	
		157+450	162+929	RHS	5479	
		162+960	166+600	RHS	3640	
		Total			**26929**	
Sl. No.	**Activity**	**Chainage**		**Side**	**Length (M)**	**Remarks**
		From	**To**			
2	Subgrade Preparation	152+490	154+890	LHS	2400	
		156+100	156+220	LHS	120	
		156+350	157+130	LHS	780	
		158+240	158+400	LHS	160	
		158+610	161+180	LHS	2570	
		161+270	162+600	LHS	1330	
		162+620	162+850	LHS	230	
		162+960	164+000	LHS	1040	
		164+080	165+120	LHS	1040	
		165+250	165+400	LHS	150	
		165+425	166+600	LHS	1175	
		152+490	153+180	RHS	690	
		153+250	153+880	RHS	630	
		153+940	154+880	RHS	940	

		156+418	157+000	RHS	582	
		158+240	158+390	RHS	150	
		158+610	158+780	RHS	170	
		158+820	159+140	RHS	320	
		159+370	161+200	RHS	1830	
		161+400	162+600	RHS	1200	
		162+710	162+850	RHS	140	
		162+960	165+100	RHS	2140	
		165+250	165+450	RHS	200	
		165+630	166+090	RHS	460	
		166+290	166+400	RHS	110	
		Total			**20557**	
Sl. No.	**Activity**	**Chainage**		**Side**	**Length (M)**	**Remarks**
		From	**To**			
3	GSB	152+490	153+250	LHS	760	
		153+425	154+890	LHS	1465	
		156+420	157+130	LHS	710	
		158+240	158+400	LHS	160	
		158+610	161+180	LHS	2570	
		161+300	162+600	LHS	1300	
		162+620	162+850	LHS	230	
		162+960	164+000	LHS	1040	
		164+120	165+120	LHS	1000	
		165+250	165+400	LHS	150	
		165+400	165+450	LHS	50	
		165+630	166+600	LHS	970	
		152+490	153+180	RHS	690	
		153+250	153+880	RHS	630	
		153+880	154+810	RHS	930	
		156+418	156+850	RHS	432	
		158+240	158+390	RHS	150	
		158+610	158+780	RHS	170	
		158+900	159+140	RHS	240	
		159+370	161+200	RHS	1830	
		161+460	162+600	RHS	1140	
		162+710	162+850	RHS	140	
		162+960	165+100	RHS	2140	
		165+250	165+450	RHS	200	
		165+630	166+090	RHS	460	
		166+290	166+400	RHS	110	
		Total			**19667**	
Sl. No.	**Activity**	**Chainage**		**Side**	**Length (M)**	**Remarks**
		From	**To**			
4	WMM	152+490	153+070	LHS	580	
		153+500	154+800	LHS	1300	
		156+420	157+130	LHS	710	
		158+300	158+390	LHS	90	

		158+660	160+600	LHS	1940	
		160+600	161+180	LHS	580	
		161+530	162+540	LHS	1010	
		162+960	164+000	LHS	1040	
		164+120	164+315	LHS	195	
		164+315	165+120	LHS	805	
		165+250	166+560	LHS	1310	
		152+490	153+115	RHS	625	
		153+450	154+780	RHS	1330	
		156+500	156+850	RHS	350	
		158+220	158+390	RHS	170	
		158+900	159+100	RHS	200	
		159+400	160+690	RHS	1290	
		160+815	161+200	RHS	385	
		161+550	162+530	RHS	980	
		163+100	164+000	RHS	900	
		164+100	164+270	RHS	170	
		164+310	165+090	RHS	780	
		165+650	166+090	RHS	440	
		Total			**17180**	

Sl. No.	**Activity**	**Chainage**		**Side**	**Length (M)**	**Remarks**
		From	**To**			
5	DBM	152+490	152+830	LHS	340	
		152+860	152+975	LHS	115	
		152+990	153+050	LHS	60	
		153+550	154+775	LHS	1225	
		156+420	157+130	LHS	710	
		158+660	159+440	LHS	780	
		159+490	159+590	LHS	100	
		159+660	160+600	LHS	940	
		160+650	161+160	LHS	510	
		161+560	162+540	LHS	980	
		162+960	164+000	LHS	1040	
		164+315	165+100	LHS	785	
		165+650	166+240	LHS	590	
		166+265	166+550	LHS	285	
		152+490	153+115	RHS	625	
		153+470	153+800	RHS	330	
		154+000	154+760	RHS	760	
		156+610	156+830	RHS	220	
		159+430	160+690	RHS	1260	
		160+820	161+195	RHS	375	
		161+560	162+070	RHS	510	
		162+070	162+530	RHS	460	
		163+113	164+000	RHS	887	
		164+620	164+860	RHS	240	
		165+650	166+090	RHS	440	

		Total	**14567**	

3. Reconstruction of damaged stretches:

The new Contractor shall be fully responsible for reconstruction of all defects of work executed by earlier EPC Contractors for such works for which NCR was already issued for such defects.

3.1 Reconstruction of Damaged DBM stretch :

SL. NO.	CHAINAGE		Side	Length
	From	To		
1	156+450	157+130	LHS	680
2	158+660	159+100	LHS	440
3	159+660	160+040	LHS	380
4	160+650	160+810	LHS	160
5	162+175	162+500	LHS	325
6	163+000	163+220	LHS	220
7	163+750	164+000	LHS	250
8	164+315	165+100	LHS	785
9	165+650	166+240	LHS	590
10	166+265	166+550	LHS	285
11	153+470	153+570	RHS	100
12	159+430	160+665	RHS	1235
13	160+830	161+000	RHS	170
14	164+780	164+800	RHS	20
15	165+650	166+090	RHS	440
	Total Length (2 Lane)			**6080**
	Total Length (4 Lane)			**3040**

3.2 Reconstruction of WMM stretch:

Sl. No.	Chainage		Side	Length
	From	To		
1	152+550	152+600	LHS	50
2	152+900	153+070	LHS	170
3	153+500	153+550	LHS	50
4	160+800	160+810	LHS	10
5	161+160	161+180	LHS	20
6	161+530	161+560	LHS	30
7	164+300	164+315	LHS	15
8	165+100	165+120	LHS	20
9	166+235	166+265	LHS	30
10	166+430	166+450	LHS	20
11	152+905	153+110	RHS	195
12	153+800	153+880	RHS	80
13	153+880	153+940	RHS	60

14	153+940	153+985	RHS	45
15	156+500	156+610	RHS	110
16	156+830	156+850	RHS	20
17	158+900	159+100	RHS	200
18	159+380	159+400	RHS	20
19	160+037	160+055	RHS	18
20	160+200	160+210	RHS	10
21	160+280	160+300	RHS	20
22	160+465	160+520	RHS	55
23	160+655	160+690	RHS	35
24	163+324	163+915	RHS	591
25	163+915	164+000	RHS	85
26	166+020	166+060	RHS	40
	Total Length(2 Lane)			**1999**
	Total Length(4 Lane)			**999.5**

3.3 Reconstruction of GSB stretch:

	Chainage			
Sl. No.	**From**	**To**	**Side**	**Length**
1	153+070	153+150	LHS	80
2	164+300	164+315	LHS	15
3	166+430	166+450	LHS	20
4	153+800	153+880	RHS	80
5	154+780	154+810	RHS	30
6	156+418	156+500	RHS	82
7	159+370	159+400	RHS	30
8	160+655	160+810	RHS	155
9	161+460	161+490	RHS	30
	Total Length(2 Lane)			522
	Total Length(4 Lane)			**261**

3.4 Bidders are requested to visit the site/stretch to understand the requirement of reconstruction of damaged/ defective works as per their own assessment. The locations and length given above are tentative. The distressed locations should be identified with their exact chainages. The distresses should then be marked up in a grid pattern covering the distressed portion and also beyond the distressed portion. Then the entire DBM layer within the identified grid must be scrapped off thoroughly. After scrapping of DBM layer, the top WMM surface must be thoroughly checked with respect to degree of compaction and plasticity (within the grid) randomly by doing the test pits at few locations. Further it should be extended for GSB and subgrade layer with extraction of layer material to observe CBR value. If result does not comply in any of the layers then in that grid all the material including subgrade should be excavated and reconstructed freshly.If subgrade soil is complying with the physical properties while GSB does not, then excavation should be made upto GSB layer and reconstruction should be done from GSB layer. The same should be done for WMM also.

4. Land

The Site of the Project Highway as described below:

Sl. No.	Existing Chainage		Design Chainage		Length (m)	Available ROW (m)	Remarks
	From	To	From	To			
1	156.000	172.900	152.490	166.700	14210	45	

5. Carriageway

The Proposed Project section is completed partly 4-lane and partly 2-Lane bituminous carriageway with variable width of Earthen Shoulders as per proposed cross section. The Project stretch runs through hilly terrain.

6. Major Bridge-The Site includes the following Major Bridges:

Sl. No.	Design (Km)	Type of Structure			Span Length (m)	HFL (m)	Width (m)	Remarks (River/Nala Name)
		Foundation	Sub-Structure	Super Structure				
1	155.245	Steel Girder			1 x 81.0	-	7.80 m Carriage plus 1.5 footpath on either side	Dzozaru constructed in year 2013 (LHS)
2	155.245	Steel Girder			1 x 81.0	-	7.80 m Carriage plus 1.5 footpath on either side	Upto Sub-Structure completed. (RHS)

Balance Bridge work also shall be fully undertaken for completion in all respects by the new Contractor.

7. Road over-bridges (ROB)

The Site includes the following ROB (road over railway line)

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

8. Grade separators

The Site includes the following grade separators:

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

NIL

9. Minor bridges

The Site includes the following minor bridges:

Sl. No	Design (Km)	Type of Structure			Span Length (m)	HFL (m)	Width (m)	Remarks (River/Nala Name)
		Foundation	Sub-Structure	Super Structure				
1	158.817	RCCSlab			1 x 9.80	967.980	7.9	Diaru, Completed (BHS)
2	161.255	RCC T-Beam			1 x 14.50	961.440	8.4	Kharu, Existing (LHS)
2A	161.255	RCC T-Beam			1 x 14.50	961.440	8.4	Kharu,Slab Completed (RHS).
3	165.130	RCC T-Beam			1 x 24.5	981.146	8.6	Dzuza, Existing (LHS)
3A	165.130	RCC T-Beam			1 x 24.5	981.146	8.6	Dzuza, To be constructed (RHS)
4	165.530	RCC Box			1 x 9.80	967.980	7.9	Dzuza, Deck Slabcompleted (BHS)

Balance Bridge work also shall be fully undertaken for completion in all respects by the new Contractor.

10. Railway level crossings/Railway Track

The Site includes the following railway level crossings/Track:

Sl. No.	Location (km)	Remarks
NIL		

11. Underpasses (Vehicular, Non Vehicular)

The Site includes the following underpasses:

Sl. No.	Chainage (km)	Type of Structure	No. Of Spans with span length (m)	Width (m)
NIL				

12. Culverts: The Site has the following culvert:

SL.No.	Design Ch.	Span Arrangement	Type of Culvert	Completed	Remarks

1	152+515	(1X1.5X1.5)	Box culvert	1.00	Completed
2	152+577	(1X1.5X1.5)	Box culvert	1.00	Completed
3	152+826	(1X1.5X1.5)	Box culvert	1.00	Completed
4	152+858	(1X1.5X1.5)	Box culvert	1.00	Completed
5	152+900	(1X1.5X1.5)	Box culvert	1.00	Completed
6	152+965	(1X1.5X1.5)	Box culvert	1.00	Completed
7	153+104	(1X1.5X1.5)	Box culvert	1.00	Completed
8	153+422	(1X1.5X1.5)	Box culvert	1.00	Completed
9	153+450	(1X1.5X1.5)	Box culvert	1.00	Completed
10	153+610	(1X1.5X1.5)	Box culvert	1.00	Completed
11	153+652	(1X1.5X1.5)	Box culvert	1.00	Completed
12	153+820	(1X1.5X1.5)	Box culvert	1.00	Completed
13	153+881	(1X1.5X1.5)	Box culvert	1.00	Completed
14	153+980	(1X1.5X1.5)	Box culvert	1.00	Completed
15	154+022	(1X1.5X1.5)	Box culvert	1.00	Completed
16	154+133	(1X1.5X1.5)	Box culvert	1.00	Completed
17	154+243	(1X1.5X1.5)	Box culvert	1.00	Completed
18	154+340	(1X1.5X1.5)	Box culvert	1.00	Completed
19	154+388	(1X1.5X1.5)	Box culvert	1.00	Completed
20	154+450	(1X1.5X1.5)	Box culvert	1.00	Completed
21	154+495	(1X1.5X1.5)	Box culvert	1.00	Completed
22	154+612	(1X1.5X1.5)	Box culvert	1.00	Completed
23	154+808	(1X1.5X1.5)	Box culvert	1.00	Completed
24	154+834	(1X1.5X1.5)	Box culvert	1.00	Completed
25	154+908	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
26	154+989	(1X1.5X1.5)	Box culvert	0.00	To be constructed
27	155+039	(1X1.5X1.5)	Box culvert	0.00	To be constructed
28	155+130	(1X1.5X1.5)	Box culvert	0.00	To be constructed
29	155+445	(1X1.5X1.5)	Box culvert	0.00	To be constructed
30	155+555	(1X1.5X1.5)	Box culvert	0.00	To be constructed
31	155+680	(1X1.5X1.5)	Box culvert	0.00	To be constructed
32	155+707	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
33	155+820	(1X1.5X1.5)	Box culvert	1.00	Completed
34	155+867	(1X1.5X1.5)	Box culvert	0.00	To be constructed
35	156+087	(1X1.5X1.5)	Box culvert	0.00	To be constructed
36	156+230	(1X1.5X1.5)	Box culvert	1.00	Completed
37	156+418	(1X1.5X1.5)	Box culvert	1.00	Completed
38	156+485	(1X1.5X1.5)	Box culvert	1.00	Completed
39	156+543	**(1x4.0X3.0)**	Box culvert	1.00	Completed
40	156+595	(1X1.5X1.5)	Box culvert	1.00	Completed
41	156+786	(1X1.5X1.5)	Box culvert	1.00	Completed
42	156+847	(1X1.5X1.5)	Box culvert	1.00	Completed
43	157+003	(1X1.5X1.5)	Box culvert	1.00	Completed
44	157+074	**(1x3.0x3.0)**	Box culvert	1.00	Completed
45	157+750	(1X1.5X1.5)	Box culvert	1.00	Completed
46	157+800	(1X1.5X1.5)	Box culvert	1.00	Completed

47	157+475	**(1X4.0X3.0)**	Box culvert	0.00	To be constructed
48	158+045	**(1x3.0x3.0)**	Box culvert	0.00	To be constructed
49	158+140	(1X1.5X1.5)	Box culvert	1.00	Completed
50	158+254	(1X1.5X1.5)	Box culvert	1.00	Completed
51	158+296	(1X1.5X1.5)	Box culvert	1.00	Completed
52	158+754	(1X1.5X1.5)	Box culvert	1.00	Completed
53	158+896	(1X1.5X1.5)	Box culvert	1.00	Completed
54	159+445	(1X1.5X1.5)	Box culvert	1.00	Completed
55	159+567	(1X1.5X1.5)	Box culvert	1.00	Completed
56	159+656	(1X1.5X1.5)	Box culvert	1.00	Completed
57	159+701	(1X1.5X1.5)	Box culvert	1.00	Completed
58	159+860	(1X1.5X1.5)	Box culvert	1.00	Completed
59	159+891	(1X1.5X1.5)	Box culvert	1.00	Completed
60	159+978	(1X1.5X1.5)	Box culvert	1.00	Completed
61	160+037	(1X1.5X1.5)	Box culvert	1.00	Completed
62	160+279	(1X1.5X1.5)	Box culvert	1.00	Completed
63	160+385	(1X1.5X1.5)	Box culvert	1.00	Completed
64	160+541	(1X1.5X1.5)	Box culvert	1.00	Completed
65	160+640	**(1x3.0x3.0)**	Box culvert	1.00	Completed
66	160+822	(1X1.5X1.5)	Box culvert	1.00	Completed
67	160+876	(1X1.5X1.5)	Box culvert	1.00	Completed
68	160+990	(1X1.5X1.5)	Box culvert	1.00	Completed
69	161+057	(1X1.5X1.5)	Box culvert	1.00	Completed
70	161+205	(1X1.5X1.5)	Box culvert	1.00	Completed
71	161+300	(1X1.5X1.5)	Box culvert	1.00	Completed
72	161+556	(1X1.5X1.5)	Box culvert	1.00	Completed
73	161+640	(1X1.5X1.5)	Box culvert	1.00	Completed
74	161+715	(1X1.5X1.5)	Box culvert	1.00	Completed
75	161+758	(1X1.5X1.5)	Box culvert	1.00	Completed
76	161+820	**(1x6.0x3.0)**	Box culvert	1.00	Completed
77	161+918	(1X1.5X1.5)	Box culvert	1.00	Completed
78	162+030	(1X1.5X1.5)	Box culvert	1.00	Completed
79	162+085	(1X1.5X1.5)	Box culvert	1.00	Completed
80	162+175	(1X1.5X1.5)	Box culvert	1.00	Completed
81	162+222	(1X1.5X1.5)	Box culvert	1.00	Completed
82	162+299	(1X1.5X1.5)	Box culvert	1.00	Completed
83	162+326	(1X1.5X1.5)	Box culvert	1.00	Completed
84	162+364	(1X1.5X1.5)	Box culvert	1.00	Completed
85	162+392	(1X1.5X1.5)	Box culvert	1.00	Completed
86	162+428	(1X1.5X1.5)	Box culvert	1.00	Completed
87	162+457	(1X1.5X1.5)	Box culvert	1.00	Completed
88	162+497	(1X1.5X1.5)	Box culvert	1.00	Completed
89	162+551	(1X1.5X1.5)	Box culvert	1.00	Completed
90	162+730	(1X1.5X1.5)	Box culvert	1.00	Completed
91	162+820	(1X1.5X1.5)	Box culvert	1.00	Completed but damaged
92	162+980	(1X1.5X1.5)	Box culvert	1.00	Completed

93	163+065	(1X1.5X1.5)	Box culvert	1.00	Completed
94	163+138	(1X1.5X1.5)	Box culvert	1.00	Completed
95	163+177	(1X1.5X1.5)	Box culvert	1.00	Completed
96	163+280	(1X1.5X1.5)	Box culvert	1.00	Completed
97	163+309	(1x2.0X2.0)	Box culvert	1.00	Completed
98	163+380	(1X1.5X1.5)	Box culvert	1.00	Completed
99	163+514	(1X1.5X1.5)	Box culvert	1.00	Completed
100	163+579	(1X1.5X1.5)	Box culvert	1.00	Completed
101	163+694	(1X1.5X1.5)	Box culvert	1.00	Completed
102	163+892	(1X1.5X1.5)	Box culvert	1.00	Completed
103	164+018	(1x2.0X2.0)	Box culvert	1.00	Completed
104	164+123	(1X1.5X1.5)	Box culvert	1.00	Completed
105	164+314	(1X1.5X1.5)	Box culvert	1.00	Completed
106	164+431	(1X1.5X1.5)	Box culvert	1.00	Completed
107	164+507	(1X1.5X1.5)	Box culvert	1.00	Completed
108	164+596	(1X1.5X1.5)	Box culvert	1.00	Completed
109	164+667	(1X1.5X1.5)	Box culvert	1.00	Completed
110	164+782	(1x2.0X2.0)	Box culvert	1.00	Completed
111	164+907	(1X1.5X1.5)	Box culvert	1.00	Completed
112	165+014	(1X1.5X1.5)	Box culvert	1.00	Completed
113	165+290	(1X1.5X1.5)	Box culvert	1.00	Completed
114	165+390	(1X1.5X1.5)	Box culvert	1.00	Completed
115	165+418	(1X1.5X1.5)	Box culvert	1.00	Completed
116	165+691	(1X1.5X1.5)	Box culvert	1.00	Completed
117	166+247	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
118	165+762	(1X1.5X1.5)	Box culvert	1.00	Completed
119	165+837	(1X1.5X1.5)	Box culvert	1.00	Completed
120	165+974	(1X1.5X1.5)	Box culvert	1.00	Completed
121	166+092	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
122	166+191	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
123	166+210	(1X1.5X1.5)	Box culvert	0.50	Partially Completed
124	166+340	(1X1.5X1.5)	Box culvert	1.00	Completed
125	166+450	(1X1.5X1.5)	Box culvert	1.00	Completed

Protection work to be constructed for balanceculverts and other pending culverts already constructed earlier by M/s OASIS Projects Ltd. As per site conditionthe new Contractor shall be fully responsible for the rectification of defects and maintenance for such works including the portion or part of the work done earlier by M/s OASIS Projects Ltd.

13. Bus Bays

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

SI. No.	Design Chainage	LHS	RHS	Village Name	Remarks
				Nil	

14. Truck Lay Byes

The details of truck lay byes are as follows:

Sl. No.	Chainage (km)	Length (m)	Left Hand Side	Right Hand Side
NIL				

15. Road Side Drains

The details of completed PCC roadside drains are as follows:

SL. NO.	Design Chainage		LENGTH in Mtrs	SIDE
	From	To		
1	152+520	152+570	50	RHS
2	152+580	152+820	240	RHS
3	152+830	152+853	23	RHS
4	152+863	152+895	33	RHS
5	152+904	152+962	58	RHS
6	152+968	153+100	13	RHS
7	153+465	153+606	141	RHS
8	153+613	153+648	35	RHS
9	153+738	153+790	52	RHS
10	153+840	153+860	20	RHS
11	153+870	153+920	50	RHS
12	153+895	153+975	80	RHS
13	153+985	154+015	30	RHS
14	154+027	154+129	102	RHS
15	154+136	154+240	104	RHS
16	154+255	154+325	70	RHS
17	154+328	154+384	56	RHS
18	154+390	154+449	59	RHS
19	154+451	154+494	43	RHS
20	154+496	154+550	54	RHS
21	154+613	154+680	67	RHS
22	156+600	156+625	25	RHS
23	156+647	156+780	133	RHS
24	156+790	156+840	50	RHS
25	159+456	159+570	114	RHS

26	159+578	159+650	72	RHS
27	159+660	159+698	38	RHS
28	159+705	159+720	15	RHS
29	159+725	159+858	133	RHS
30	159+865	159+885	20	RHS
31	159+965	159+975	10	RHS
32	159+981	160+035	54	RHS
33	160+038	160+075	37	RHS
34	160+080	160+185	105	RHS
35	160+185	160+250	65	RHS
36	160+302	160+360	58	RHS
37	160+390	160+425	35	RHS
38	160+435	160+455	20	RHS
39	160+470	160+535	65	RHS
40	160+540	160+620	80	RHS
41	160+645	160+790	145	RHS
42	160+842	160+872	30	RHS
43	160+880	160+910	30	RHS
44	160+910	160+920	10	RHS
45	160+967	160+988	21	RHS
46	160+990	161+050	60	RHS
47	161+054	161+200	146	RHS
48	161+520	161+550	30	RHS
49	161+570	161+600	30	RHS
50	161+620	161+660	40	RHS
51	161+687	161+694	7	RHS
52	161+720	161+770	50	RHS
53	161+790	161+795	5	RHS
54	161+830	161+915	85	RHS
55	161+930	162+020	90	RHS
56	162+020	161+100	80	RHS
57	162+100	162+220	120	RHS
58	162+223	162+293	70	RHS
59	162+305	162+320	15	RHS
60	162+330	162+335	5	RHS

61	162+335	162+360	25	RHS
62	162+393	162+424	31	RHS
63	162+430	162+473	43	RHS
64	163+100	163+134	34	RHS
65	163+143	163+172	29	RHS
66	163+180	163+270	88	RHS
67	163+290	163+310	20	RHS
68	163+650	163+700	50	RHS
69	164+900	164+915	15	RHS
		Total	**3913**	

The new Contractor shall be fully responsible for the rectification of defects and maintenance for such works including the portion or part of the work done earlier by M/s OASIS Projects Ltd.

16. Major Junctions

Sl. No.	Location		At Grade	Separated	Category of Cross Road			
	Existing Ch.	Design Ch.			NH	SH	MDR	Others
NIL								

The details of major junctions are as follows,(NH: National Highway, SH: State Highway, MDR: Major District Road)

17. Minor Junctions

The details of the minor junctions are as follows:

Sl. No.	Design Ch. (m)	Side	Type of Junction	Remarks
1	156556	RHS	Minor	To Village
2	166600	RHS	Minor	To Jotsoma

18. Bypass

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

Sl. No.	Name of Bypass to Town	Chainage (km) from km to km
NIL		

19. Other Structure/Details

The locations of other structure/Land Slide are as follows:

Sl. No.	Existing Chainage (m)		Design Chainage (m)		Length in m (Design)	Remarks
	From	To	From	To		
NIL						

The Following location Breast wall, Gabion wall and Retaining wall already constructed.

Sl. No.	Design Chainage		Length (m)	Structure	Remarks
	From	To			
1	152+490	152+510	20	Breast wall	
2	152+520	152+570	50	Breast wall	
3	152+770	152+820	50	Breast wall	
4	152+833	152+850	17	Breast wall	
5	152+860	152+895	35	Breast wall	
6	152+910	152+960	50	Breast wall	
7	152+965	153+050	85	Breast wall	10m Reconstruction required
8	153+060	153+096	36	Breast wall	
9	153+110	153+164	54	Breast wall	
10	153+165	153+187	22	Breast wall	
11	153+140	153+230	90	Breast wall	
12	153+388	153+418	30	Breast wall	
13	153+420	153+447	27	Breast wall	
14	153+460	153+580	120	Breast wall	
15	153+613	153+730	117	Breast wall	
16	153+730	153+818	88	Breast wall	
17	153+820	153+875	55	Breast wall	40m Reconstructionrequired
18	153+887	153+923	36	Breast wall	
19	153+940	153+977	37	Breast wall	
20	153+980	154+019	39	Breast wall	
21	154+027	154+130	103	Breast wall	
22	154+137	154+230	93	Breast wall	
23	154+250	154+300	50	Breast wall	
24	154+470	154+490	20	Breast wall	
25	154+500	154+560	60	Breast wall	
26	154+630	154+680	50	Retaining wall	
27	154+840	154+870	30	Breast wall	
28	155+165	155+175	10	Gabion wall	Reconstruction required
29	155+175	155+195	20	Gabion wall	
30	155+740	155+760	20	Breast wall	Reconstruction required
31	155+740	155+750	10	Gabion wall	
32	155+750	155+840	90	Gabion wall	Reconstruction required
33	156+350	156+390	40	Breast wall	
34	156+388	156+410	22	Breast wall	
35	156+410	156+480	70	Breast wall	
36	156+600	156+625	25	Breast wall	
37	156+690	156+730	40	Breast wall	
38	156+730	156+780	50	Breast wall	
39	156+790	156+843	53	Breast wall	

40	156+850	156+995	145	Gabion wall	110m Reconstruction required
41	156+905	156+997	92	Breast wall	
42	157+005	157+065	60	Breast wall	
43	157+470	157+480	10	Gabion wall	
44	157+770	157+830	60	Breast wall	
45	157+955	157+980	25	Breast wall	
46	157+980	158+000	20	Breast wall	
47	158+065	158+095	30	Breast wall	Reconstruction required
48	158+100	158+137	37	Breast wall	Reconstruction required
49	158+144	158+173	29	Breast wall	Reconstruction required
50	158+174	158+246	72	Breast wall	
51	157+990	158+080	90	Retaining wall	
52	158+214	158+254	40	Retaining wall	
53	158+256	158+290	34	Retaining wall	
54	158+530	158+540	10	Breast wall	
55	158+640	158+740	100	Breast wall	
56	158+760	158+780	20	Breast wall	
57	158+780	158+810	30	Breast wall	
58	158+820	158+840	20	Breast wall	
59	158+840	158+890	50	Breast wall	
60	158+900	159+070	170	Breast wall	20mReconstruction required
61	158+265	158+280	15	Gabion wall	
62	159+070	159+130	60	Breast wall	20m Reconstruction required
63	159+165	159+285	120	Breast wall	40m Reconstruction required
64	159+350	159+440	90	Breast wall	20m Reconstruction required
65	159+458	159+550	92	Breast wall	
66	159+460	159+470	10	Retaining wall	
67	159+550	159+560	10	Retaining wall	
68	159+570	159+650	80	Breast wall	
69	159+660	159+695	35	Breast wall	
70	159+695	159+725	30	Breast wall	
71	159+830	159+875	45	Breast wall	
72	159+875	159+895	20	Breast wall	
73	159+925	159+970	45	Breast wall	
74	160+004	160+052	48	Breast wall	
75	160+280	160+360	80	Retaining wall	
76	160+360	160+420	60	Breast wall	
77	160+490	160+535	45	Breast wall	
78	160+550	160+635	85	Breast wall	
79	160+645	160+690	45	Breast wall	
80	160+740	160+760	20	Breast wall	

81	160+760	160+793	33	Breast wall	
82	160+830	160+840	10	Breast wall	
83	161+060	161+150	90	Breast wall	
84	161+180	161+200	20	Breast wall	
85	161+300	161+370	70	Retaining wall	10m Reconstruction required
86	161+325	161+507	182	Breast wall	
87	161+830	161+910	80	Breast wall	
88	161+930	161+960	30	Breast wall	
89	161+970	162+010	40	Breast wall	
90	162+020	162+030	10	Breast wall	
91	162+040	162+080	40	Breast wall	
92	162+090	162+160	70	Breast wall	
93	162+160	162+170	10	Breast wall	
94	162+180	162+190	10	Breast wall	
95	162+190	162+295	105	Breast wall	
96	162+305	162+322	17	Breast wall	
97	162+330	162+360	30	Breast wall	
98	162+370	162+419	49	Breast wall	
99	162+430	162+450	20	Breast wall	
100	162+462	162+469	7	Breast wall	
101	162+470	162+500	30	Breast wall	
102	162+500	162+510	10	Breast wall	
103	162+510	162+545	35	Breast wall	
104	162+550	162+577	27	Breast wall	
105	162+578	162+591	13	Breast wall	
106	162+625	162+705	80	Breast wall	
107	162+715	162+725	10	Breast wall	Reconstruction required
108	162+730	162+770	40	Breast wall	
109	162+770	162+795	25	Breast wall	
110	162+810	162+850	40	Breast wall	
111	162+780	162+805	25	Retaining wall	Reconstruction required
112	162+990	163+060	70	Breast wall	
113	163+063	163+110	47	Breast wall	
114	163+110	163+170	60	Breast wall	
115	163+182	163+250	68	Breast wall	
116	163+360	163+490	130	Breast wall	6m Reconstruction required
117	163+490	163+500	10	Breast wall	
118	163+520	163+530	10	Breast wall	
119	163+530	163+575	45	Breast wall	
120	163+585	163+694	109	Breast wall	
121	163+696	163+840	144	Breast wall	
122	163+849	163+884	35	Breast wall	
123	163+930	163+940	10	Breast wall	

124	163+970	164+010	40	Breast wall	10m Reconstruction required
125	164+010	164+180	40	Breast wall	Reconstruction required
126	164+180	164+200	20	Retaining wall	Reconstruction required
127	164+270	164+305	35	Retaining wall	Reconstruction required
128	163+895	164+010	115	Breast wall	
129	164+168	164+185	17	Breast wall	
130	164+320	164+429	109	Breast wall	10mReconstruction required
131	164+415	164+479	64	Retaining wall	
132	164+435	164+500	65	Breast wall	
133	164+510	164+530	20	Breast wall	
134	164+530	164+555	25	Breast wall	
135	164+640	164+680	40	Breast wall	10m Reconstruction required
136	164+687	164+755	68	Breast wall	
137	164+755	164+910	155	Breast wall	
138	164+910	164+940	30	Breast wall	
139	165+045	165+110	65	Retaining wall	
140	165+115	165+155	40	Retaining wall	
141	165+000	165+015	15	Breast wall	
142	165+020	165+100	80	Breast wall	
143	165+280	165+310	30	Breast wall	
144	165+355	165+418	63	Breast wall	
145	165+420	165+550	130	Breast wall	115m Reconstruction required
146	165+595	165+610	15	Retaining wall	
147	165+990	166+060	70	Breast wall	
148	166+060	166+087	27	Breast wall	
149	166+308	166+445	137	Breast wall	10m Reconstruction required
150	166+455	166+600	145	Breast wall	50m Reconstruction required
151	166+460	166+470	10	Retaining wall	
Total Length in Meters			**7759**		

The new Contractor shall be fully responsible for the reconstruction/rectification of defects and maintenance for such works including the portion or part of the work done earlier by M/s OASIS Projects Ltd.

20. There are certain sinking, sliding areas and slope prone to slides in the project stretch which are mentioned in Schedule-B. The Geotechnical investigation, engineering solution to stabilize / protect such areas / locations within ROW shall be under the obligation of the Contractor, neither Change of Scope (COS) nor additional ROW shall be provided on this account by the Authority. Hence, Bidder is required to arrive at Geotechnical, Engineering solution at these unstable / sinking / sliding areas.

Annex-Ill
(Schedule-A)

Alignment Plans

The existing alignment of the Project Highway may be modified in some sections as per the site condition.

Annex-IV
(Schedule-A)

Environment Clearances

Environment Clearance for the Project Road Section has been obtained on 22.10.2007.

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. Upgradation to 4 lane highway

Upgradation shall include Four-Lanning 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 Four-Lanning

1. SPECIAL REQUIREMENT FOR HILL ROADS

All special features shall be provided as per Manual. The side slope shall be protected by using suitable slope protection measures all along the highway on Hill side and valley side as per site requirements.

1.1 Landslide Mitigation:

Landslide Mitigation has to be provided at the specified chainages mentioned below. The following are the Landslide Mitigation measures to be adopted with the technical specification mentioned below:

1.1.1 System for reinforcing the earth

It includes reinforcing and strengthening of the unstable slopes while doing the excavation in a top down manner by in-situ soil reinforcement of the excavated slope surface based on the detail soil investigation and slope stability analysis.

System for reinforcing the earth shall consist of reinforced earth wall structure as per the specification below and soil nailing/ ground anchors. The backfilled reinforced earth wall is to be mechanically connected with the soil nailed/ ground anchored stabilized slope.

(i) **Fascia :** The fascia element shall be of prefabricated and hot deep galvanized mild steel bar steel mesh having minimum bar diameter of 8mm and minimum galvanization thickness in accordance with BS 729: 1971 (1994).

(ii) **Soil Reinforcing Element:** High Adherence Geosynthetic Straps with grooves on both sides to generate high friction and having coating for better durability as soil reinforcing element. Any other similar material for Soil Reinforcement can be used after the approval from AE.

(iii) **Connection between fascia and soil reinforcing element:** mechanical connection system shall be used, using rust/corrosion resistant steel meeting the long term strength criteria.

(iv) **Fill material:** Backfill material shall be reasonably free from organic or other deleterious material confirming to MoRTH "Specification of Road and Bridges Works", Fifth Revision or IRC: SP: 102-2014.

(v) **Drainage:** Drainage gallery minimum 600mm wide having 20mm down aggregates as per MoRTH specification.

(vi) **Soil Nailing:** To be done as per AS 4678:2002 or any other relevant code as per site condition with approval of AE.

(vii) **Ground Anchors:** Depending on the soil strata, height of the structure and slope

stability design, the excavated slope surface to be strengthened by Permanent Ground Anchors.

(viii) **Connection System:** The connection between the reinforced soil slope and soil nail and/ or ground anchors shall be mechanical in nature for full load transfer mechanism. All steel components of the connection shall be hot-dip galvanized to BS 729:1971 requirements or IS 4759:1996.

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. Further the Proof and Safety Consultancy for the above work will only be done through IIT/CBRI/CSIR.

1.1.2 A brief chainage-wise summary of the slope stabilization solutions is given below which is to be implemented in consultation with Authority's Engineer.

Sl. No.	**Chainage**		**Length (m)**	**Avg. Height(m)**	**Area (sqm.)**	**Suggested Slope Stability Solution**
	From	**To**				
1	153.150	153.350	200	15	3000	Hydroseeding with Coir Mat
2	155.050	155.150	100	15	1500	Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Rhomboidal wire mesh, Hydroseeding etc.
3	155.150	155.200	50	15	750	Rock netting with Primary and secondary DT mesh with Self drilling Anchors of 32mm dia.
4	155.800	155.870	70	15	1050	Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Hydroseeding etc.
5	155.870	156.370	500	15	7500	Hydroseeding with Coir Mat
6	157.200	157.800	600	25	15000	Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Rhomboidal wire mesh, Hydroseeding etc.
7	158.850 162.500	159.900 162.700	250	15	3750	Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Hydroseeding etc.
8	158.140	158.240	100	20	2000	Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Hydroseeding, concrete drain/Anchor trench at top etc.
9	159.000	159.400	400	15	6000	Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Hydroseeding etc.
10	161.250	161.350	200	20	4000	Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Rhomboidal wire mesh, Hydroseeding, concrete drain/Anchor trench at top etc.
11	162.800	163.000	200	25	5000	Self drilling Anchors of 25mm/32mm dia, DT

						mesh, Coir mat, Hydroseeding, concrete drain/Anchor trench at top etc.
12	164.000	164.100	100	20	2000	Self drilling Anchors of 25mm/32mm dia, DT mesh, Coir mat, Hydroseeding, concrete drain/Anchor trench at top etc.
13	164.650	165.050	400	15	6000	Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Hydroseeding etc.
14	165.230	165.550	320	20	6400	Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Hydroseeding etc.
15	165.650	165.850	200	25	5000	Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Rhomboidal wire mesh, Hydroseeding, concrete drain/Anchor trench at top etc.
22	166.200	166.250	50	20	1000	Hydroseeding with Coir Mat
23	166.600	166.700	100	15	1500	Hydroseeding With Coir Mat

1.2 Slope Protection/Stabilization work includes Jute netting with Hydroseeding, nailing,wire Mess/Cable Net and Geogrid etc. The land for muck dumping to be leased/procured by the contractor and generated muck to be deposited in the leased/purchased ground. The muck dumping ground to be stabilized as per NGT orders and shall be covered with bio-engineering.

Any increase in quantity over and above the minimum qty. as mentioned in both the tables above 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.

Note : The contractor shall be responsible for accurate assessment and design of the actual requirement as per site situation and prepare design for slope protection and stabilization as per specification and standards stipulated in Schedule-D and submit the same to the Authority's Engineer/Authority for review through the Proof/Safety Consultant only through IIT/CBRI/CSIR and implement it accordingly thereafter. 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. However, mechanical bio-engineering is essentially to be done for uniform vegetation all over the treated area.

1.3 Change of Scope

The length of Slope protection measures (either on hill side or on valley side) specified here in above shall be treated as per present site assessment within available ROW. 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 under taken in accordance with the provisions of Article 13.

(Schedule-B1)

1. The shifting of utilities and felling of trees shall be carried out by the concerned department. The cost of the same shall be borne by the concerned department.

SCHEDULE - C

(See Clause 2.1)

PROJECT FACILITIES

1 Project Facilities

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

a) Roadside furniture;

b) Pedestrian facilities;

c) Tree plantation;

d) Bus-bays and bus shelters;

e) Others to be specified

2 Description of Project Facilities

a) **Road Side Furniture**

Roadside furniture shall be provided in accordance with the provisions of Section 12 of the manual.

b) **Pedestrian Facilities**

Pedestrian Facilities in the form of guard rails, footpath, at grade pedestrian crossing, road lighting etc. shall be provided wherever required in accordance with the provisions of Section 12 of the manual.

.

c) **Tree plantation**

Tree plantation shall be done as per section 11 of Manual.

d) **Bus-bays and bus shelters**

11nos of Bus bays shall be provided, the location of proposed Bus bays are as under:

Sl. No.	Design Chainage	LHS	RHS	Village Name	Remarks
1	154+330		√		
2	155+400	√	√		
3	156+650	√	√	KIRUPHEMA	

4	158+400	√	√	ZUBZA	
5	160+820	√	√	SECHU ZUBZA	
6	161+600	√	√		
Total Numbers….		**11**			

e) Others to be specified:

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="8">Extra Widening</td><td rowspan="8">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. Within 30days
			3	f = 6 - 12 mm	Diamond Grinding	
			4	f= 12 - 18 mm	Raise sunken slab.	Replace the slab as appropriate. Within 30days
			5	f> 18 mm	Strengthen subgrade and sub-base by groutingand raising sunken slab	
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 c</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: Functioning of guardrail asintended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014
		Functionality: Functioning of		Visual with		Within 7 days	IRC:SP:84-

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Traffic Safety Barriers	Safety Barriers as intended	Daily	video/image backup	Rectification		2014, IRC:119-2015
	End Treatment	Functionality: Functioning ofEnd Treatment as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2014,
	Traffic Safety Barriers			backup			IRC:119-2015
	Attenuators	Functionality: Functioning of Attenuators asintended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP-2014, IRC:119-2015
	Guard Posts and Delineators	Functionality: Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: 79 - 1981
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67-2012
	Traffic Blinkers	Functionality: Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014
Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84-2014
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84-2014
	Toll Plaza Canopy Lights	Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major/minor failure in the	Daily	-	Rectification of failure	8 hours	IRC:SP:84-

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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Pipe/box/slab culverts	Free waterway/ unobstructed flowsection	85% of culvert normal flow area to available.	2 times in a year (before and after rainy season)	Inspection by Bridge Engineer as per IRC SP: 35-1990 and recording of depth of silting and area of vegetation.	Cleaning silt up soils and debris in culvert barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrelbefore rainy season.	15 days before onset of monsoon and within 30 days after end ofrainy season.	IRC 5-2015, IRC SP:40 - 1993 and IRC SP:13 - 2004
	Leak-proof expansion joints if any	No leakage through expansionjoints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35- 1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-1993 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25 sqm	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 B ridge 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 Clauses 10.1.4 and 19.3)			
Contract Price Weightages			
1.1 The Contract Price for Slope Protection works in this Agreement excluding GST is **Rs. ……..**			
1.2 Proportions of the Contract Price for different stges 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, minor bridges, underpasses, overpasses, approaches to ROB/RUB/ Major Bridges/ Structures		**A-Widening and Strengthening**	
		(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock and removal of sliding materials	
		(2) Subgrade preparation with cement stabilization with 2% cement	
		(3) Granular work (sub-base)	
		(4) Granular work (Cementatious base, CRL , shoulders)	
		(5) Bituminous work	
		a) DBM with Prime coat & Tack Coat	
		b) BC with Tack Coat	
		(6) DLC	
		(7) PQC	
		(8) Existing road maintenance work	
		(9) Widening and repair of minor bridges	
		(10) Reconstruction of Damaged Stretch (for widening & realignment stretch)	
		B- New 4-lane alignment	
		(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock.	

		(2) Subgrade preparation with cement stabilization with 2% cement	
		(3) Granular work (sub- base)	
		(4) Granular work (Cementatious base, CRL , shoulders)	
		(5) Bituminous work	
		a) DBM with Prime coat & Tack Coat	
		b) BC with Tack Coat	
		(6) DLC	
		(7) PQC	
		C- New culverts, minor bridges, underpasses, overpasses on existing road, realignments, bypasses, Viaduct:	
		(1) Culverts	
		(2) Protection work of Culverts	
		(3) Minor bridges balance work	
		(a) Foundation	
		(b) Sub-structure	
		(c) Super-structure (including wearing course, approach slab, crash barriers, expansion joint, drainage spout, stone pitching, filter media etc. complete)	
		(3) Viaduct	
		(a) Foundation	
		(b) Sub-structure	
		(c) Super-structure (including wearing course, kerb, footpath etc. complete)	
Major Bridge works and ROB/RUB		**D- New Major Bridges**	
		(1) Balance work of Sub-structure	
		(2) Super-structure (including crash barriers etc. complete)	

ITEM	**WEIGHTAGE IN PERCENTAGE TO THE CONTRACT PRICE**	**STAGE FOR PAYMENT**	**PERCENTAGE WEIGHTAGE**
1	**2**	**3**	**4**
Other Works	**100.00%**		
		(i) Foot Over Bridge	
		(ii) Toll Plaza	

		(iii) Road side drains	
		a) RCC / PCC Drain	
		b) Sub surface drain	
		(iv) Road signs, markings, km stones, safety devices, ….	
		(v) Project facilities	
		(a) Bus bays	
		(b) Truck lay-byes	
		(c) Junction Improvement	
		(vi) Protection works	
		a) Slope Protection Works (Including Retaining wall, Gabion wall & Breast wall, Parapet etc)	
		Parapet wall on Valley Side.	
		Gabion Wall	
		RCC Retaining Wall with micro piling	
		RCC Breast Wall with micro piling	
		Slope protection measures in hill side of the following details as under:	
		a) Hydroseeding with coir netting	1.30%
		b) Rock netting	0.82%
		c) Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Rhomboidal wire mesh, Hydroseeding etc.	50.40%
		d) Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Hydroseeding etc.	39.02%
		e)Self drilling Anchors of 25mm/32mm dia, DT mesh, Coir mat, Hydroseeding concrete drain/Anchor trench at top etc.	8.46%
		f) Sinking zone protection works	
		(vii) Road furniture, Road Light, plantation & Miscellaneous works on issue of completion certificate	
			100.00%

TABLE 1.3.1

1.3 Procedure of estimating the value of work done		
STAGE OF PAYMENT	**PERCENTAGE - WEIGHTAGE**	**PAYMENT PROCEDURE**
A-Widening and Strengthening		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 5 (Five) percent of the balance length.
(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock.	0.00%	
(2) Subgrade preparation with cement stabilization with 2% cement	0.00%	
(3) Granular work (sub- base)	0.00%	
(4) Granular work (Cementatious base, CRL , shoulders)	0.00%	
(5) Bituminous work		
a) DBM with Prime coat & Tack Coat	0.00%	
b) BC with Tack Coat	0.00%	
(6) DLC	0.00%	
(7) PQC	0.00%	
(8) Existing road maintenance work	0.00%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in 0.25 km length.
(9) Widening and repair of minor bridges	0.00%	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 a minor bridge.
(10) Reconstruction of Damaged Stretch (for widening & realignment stretch)	0.00%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in 0.25 km length.
B- New 4-lane alignment		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 5 (five) percent of the balance length.
(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock.	0.00%	
(2) Subgrade preparation with cement stabilization with 2% cement	0.00%	
(3) Granular work (sub- base)	0.00%	
(4) Granular work (Cementatious base, CRL , shoulders)	0.00%	
(5) Bituminous work		
a) DBM with Prime coat & Tack Coat	0.00%	
b) BC with Tack Coat	0.00%	
(6) DLC	0.00%	
(7) PQC	0.00%	
C- New culverts, minor bridges, underpasses, overpasses on existing road, realignments, bypasses:		
(1) Culverts	0.00%	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 five culverts.
(2) Protection work of Culverts	0.00%	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 five culverts.
(3) Minor bridges balance work		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 a minor bridge.
(a) Foundation	0.00%	
(b) Sub-structure	0.00%	
(c) Super-structure (including wearing course, approach slab, crash barriers, expansion joint, drainage spout, stone pitching, filter media etc. complete)	0.00%	
(3) Viaduct		
(a) Foundation	0.00%	Cost of foundation shall be determined on pro rata basis with respect to the total linear length of viaduct.

		Payemnt shall be made on the Completion of min 50m length
(b) Sub-structure	0.00%	Cost of sub-structure shall be determined on pro rata basis with respect to the total linear length of viaduct. Payemnt shall be made on the Completion of min 50m length
(c) Super-structure (including wearing course, kerb, footpath etc. complete)	0.00%	Cost of super-structure shall be determined on pro rata basis with respect to the total linear length of viaduct. Payemnt shall be made on the Completion of min 50m length

1.3.2 Major Bridge works.		
Procedure for estimating the value of Major Bridge works shall be as stated in table 1.3.2		
TABLE 1.3.2		
STAGE OF PAYMENT	**PERCENTAGE -WEIGHTAGE**	**PAYMENT PROCEDURE**
D- New Major Bridges		Payment shall be made on pro rata basis on completion of each stage of a Major

(1) Balance work of Sub-structure	0.00%	Bridge as per the weightage given in this table.
(2) Super-structure (including crash barriers etc. complete)	0.00%	

1.3.4 Other works.		
Procedure for estimating the value of the other works done shall be as stated in table 1.3.4:		
TABLE 1.3.4		
STAGE OF PAYMENT	**WEIGHTAGE**	**PAYMENT PROCEDURE**
(i) Foot Over Bridge	0.00%	Unit of measurement is completed FOB. Payment of FOB shall be made on pro rata basis with respect to the total of all items completed.
(ii) Road side drains		Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5 (five) percent of the total length.
a) RCC / PCC Drain	0.00%	
b) Sub surface drain Drain	0.00%	
(iii) Road signs, markings, km stones, safety devices, ….	0.00%	Payment shall be made on pro rata basis for completed facilities.
(iv) Project facilities		
(a) Bus bays	0.00%	
(b) Truck lay-byes	0.00%	
(c) Junction Improvement	0.04%	
(v) Protection works		Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5 (five) percent of the total length.
a) Slope Protection Works (Including Retaining wall, Gabion wall & Breast wall, Parapet etc)		
Parapet wall on Valley Side.	0.00%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5 (five) percent of the total length.
Gabion Wall	0.00%	
RCC Retaining Wall with micro piling	0.00%	
RCC Breast Wall with micro piling	0.00%	
Slope protection measures in hill side of the following details as under:		Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage in a area of not less than 5 (five) percent of the total quantity.
a) Hydroseeding with coir netting	1.30%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage in a area of not less than 5 (five) percent of the total quantity.
b) Rock netting	0.82%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage in a area of not less than 5 (five)

		percent of the total quantity.
c) Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Rhomboidal wire mesh, Hydroseeding etc.	50.40%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage in a area of not less than 5 (five) percent of the total quantity.
d) Self drilling Anchors of 25mm/32mm dia, 3D steel reinforced monofilament erosion control mat, Hydroseeding etc.	39.02%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage in a area of not less than 5 (five) percent of the total quantity.
e)Self drilling Anchors of 25mm/32mm dia, DT mesh, Coir mat, Hydroseeding concrete drain/Anchor trench at top etc.	8.46%	Unit of measurement is Sqm. Payment shall be made on pro rata basis on completion of a stage in a area of not less than 5 (five) percent of the total quantity.
f) Sinking zone protection works	0.00%	
(vi) Road furniture, Road Light, plantation & Miscellaneous works on issue of completion certificate	0.00%	Payment shall be made for completed items.

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 [128th]** 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 **[219th]** 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 **[310th]** 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 **[365th 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:

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

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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