National Highways & Infrastructure Development Corporation Limited

BUILDING INFRASTRUCTURE - BUILDING THE NATION

Ministry of Road Transport & Highways,
(Govt. of India)

SCHEDULES

For

"Restoration & Rehabilitation of Imphal-Jiribam Road from Km 133.00 to Km 163.00 (Length: 30 Km) on NH-37 in the state of Manipur in the year 2021-2022 on EPC."

September, 2021

National Highways & Infrastructure Development Corporation Ltd

Regional Office,Imphal, Manipur

Schedule-A

SCHEDULE- A

(SeeClauses 2.1 and 8.1)

SITE OFTHE PROJECT

1. The Site

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

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

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

(iv) The alignment plans of the Project Highway are specified in Annex-III.

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

Annex-I

(Schedule-A)

Site for the Project

1. Site

The Site of the two-lane Project Highway comprises the section of NH-37 commencing from existing Chainage km 133+000 to km 163+000 i.e., near KambironVillage to near Keimai Village in the state of Manipur.The land, carriageway and structures comprising the Site are described below.

2. Land

The Site of the Project Highway comprises the land (total of land already in possession) as described below:

SL No.	Chainage (Km)		Existing Right of Way (m)	Remarks
	From	To		
1	133	163	10.00	

3. Carriageway

The present carriageway of the Project Highway is Two Lane from km 133+000 to km 163+00. The type of the existing pavement is [flexible].

4. Major Bridges

The Site includes the following Major Bridges:

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

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

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

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

6. Grade separators

The Site includes the following grade separators:

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

7. Minor bridges

The Site includes the following Minor bridges:

Sl. No.	Survey Chainage (Km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-structure	Super-structure		
1	134+035	Open	Wall	RCC SLAB BRIDGE	1X14.5M	12
2						
3	138+128	Open	Wall	RCC Slab	1 x 10 m	9.98
4	141+269	Open	Wall	RCC Box Girder	1 x 24.7 m	11.97
5	142+315	Open	Wall	RCC Slab	1 x 6 m	7.45
6	142+578	Open	Wall	RCC Slab	1 x 10 m	11.8
7	143+221	Open	Wall	RCC Slab	1 x 6 m	8.89
8	145+527	Open	Wall	RCC Box Girder	1 x 24.7 m	5.36
9	147+28	Open	Wall	RCC Box Girder	1 x 29.7 m	12.02
10	147+796	Open	Wall	RCC Slab	1 x 6 m	9.53
11	149+978	Open	Wall	RCC Box Girder	1 x 29.7 m	12.07
12	150+204	Open	Wall	RCC Box Girder	1 x 29.7 m	11.93

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Existing Chainage (km)	Name of the crossing	Leads to		Remarks
			On LHS	On RHS	
Nil					

9. Underpasses (vehicular, non-vehicular)

The Site includes the following underpasses:

S.No.	Existing Chainage (km)	TypeofStructure	No. of Spans withspanlength(m)	Width(m)
NIL				

10. Culverts

The Site has the following culverts:

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length
1	133.217	HP	1 X 0.90 Dia
2	133.410	HP	1 X 0.90 Dia
3	133.535	HP	1 X 1.00 Dia

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length
4	133.686	HP	1 X 1.20 Dia
5	133.936	HP	1 X 1.00 Dia
1	134.134	R.C.C SLAB	1 X 2.70m
2	134.309	R.C.C SLAB	1 X 1.60m
3 4	134.664	HP	1 X 1.50 Dia
5	134.832	HP Culvert	2 X 0.90 Dia
6	135.029	HP Culvert	1 X 1.00 Dia
7	135.453	R.C.C SLAB	1 X 4.40m
8	135.701	HP Culvert	1 X 1.00 Dia
9	135.858	HP Culvert	2 X 0.60 Dia
10	135.938	HP Culvert	1 X 1.00 Dia
11	136.050	HP Culvert	1 X 1.00 Dia
12	136.233	R.C.C SLAB	1 X 2.80m
13	136.537	HP Culvert	1 X 1.50 Dia
14	136.846	R.C.C SLAB	1 X 1.00 Dia
15	136.997	HP Culvert	2 X 0.90 Dia
16	137.230	HP Culvert	1 X 0.90 Dia
17	137.971	R.C.C SLAB	1 X 2.70m
18	138.312	HP Culvert	1 X 1.20 Dia
19	138.560	HP Culvert	1 X 0.90 Dia
20	138.744	HP Culvert	1 X 0.60 Dia
21	138.834	HP Culvert	1 X 0.90 Dia
22	138.944	HP Culvert	1 X 0.90 Dia
23	139.026	HP Culvert	1 X 1.00 Dia
24	139.174	HP Culvert	1 X 1.00 Dia
25	139.728	R.C.C SLAB	1 X 2.00m
26	139.128	HP Culvert	1 X 0.90 Dia
27	140.256	R.C.C SLAB	1 X 1.40m
28	140.515	R.C.C SLAB	1 X 6.00m
29	141.083	R.C.C SLAB	1 X 3.00m
30	141.211	R.C.C SLAB	1 X 2.70m
31	141.299	R.C.C SLAB	1 X 1.50m
32	141.504	R.C.C SLAB	1 X 1.30m
33	141.664	R.C.C SLAB	1 X 2.70m
34	141.932	R.C.C SLAB	1 X 1.50m
35	142.004	R.C.C SLAB	1 X 1.50m
36	142.156	R.C.C SLAB	1 X 2.00m
37	143.353	R.C.C SLAB	1 X 1.00m
38	143.438	R.C.C SLAB	1 X 1.50m
39	143.734	R.C.C SLAB	1 X 1.60m
40	143.803	R.C.C SLAB	1 X 0.90m
41	143.964	R.C.C SLAB	1 X 1.10m
42	144.035	R.C.C SLAB	1 X 1.00m
43	144.429	R.C.C SLAB	1 X 1.50m

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length
44	144.760	R.C.C SLAB	1 X 1.30m
45	144.854	R.C.C SLAB	1 X 1.80m
46	145.145	R.C.C SLAB	1 X 1.45m
47	145.379	R.C.C SLAB	1 X 3.00m
48	145.600	R.C.C SLAB	1 X 2.90m
49	145.749	R.C.C SLAB	1 X 1.50m
50	145.812	R.C.C SLAB	1 X 1.60m
51	145.867	R.C.C SLAB	1 X 1.60m
52	146.111	R.C.C SLAB	1 X 1.00m
53	146.544	R.C.C SLAB	1 X 1.00m
54	146.814	R.C.C SLAB	1 X 0.80m
55	147.157	R.C.C SLAB	1 X 1.00m
56	147.553	R.C.C SLAB	1 X 0.86m
57	147.702	R.C.C SLAB	1 X 2.50m
58	148.026	R.C.C SLAB	1 X 3.00m
59	148.168	R.C.C SLAB	1 X 1.50m
60	148.436	R.C.C SLAB	1 X 2.70m
61	148.475	R.C.C SLAB	1 X 1.00m
62	148.793	R.C.C SLAB	1 X 1.10m
63	148.963	R.C.C SLAB	1 X 1.50m
64	149.073	R.C.C SLAB	1 X 1.60m
65	149.372	R.C.C SLAB	1 X 1.50m
66	149.513	R.C.C SLAB	1 X 3.90m
67	149.567	R.C.C SLAB	1 X 1.50m
68	149.640	R.C.C SLAB	1 X 3.00m
69	149.911	R.C.C SLAB	1 X 1.00m
70	150.045	R.C.C SLAB	1 X 1.45m
71	150.191	R.C.C SLAB	1 X 5.90m
72	150.787	R.C.C SLAB	1 X 1.20m
73	151.125	R.C.C SLAB	1 X 0.95m
74	151.347	R.C.C SLAB	1 X 1.45m
75	151.461	R.C.C SLAB	1 X 1.50m
76	151.614	R.C.C SLAB	1 X 1.50m
77	151.785	R.C.C SLAB	1 X 3.20m
78	151.863	R.C.C SLAB	1 X 1.50m
79	152.333	R.C.C SLAB	1 X 2.79m
80	152.542	R.C.C SLAB	1 X 1.09m
81	153.148	R.C.C SLAB	1 X 1.31m
82	153.856	R.C.C SLAB	1 X 0.97m
83	154.042	R.C.C SLAB	1 X 1.40m
84	154.399	R.C.C SLAB	1 X 2.88m
85	154.614	R.C.C SLAB	1 X 2.95m
86	154.957	R.C.C SLAB	1 X 0.96m
87	155.116	R.C.C SLAB	1 X 1.55m
88	155.165	R.C.C SLAB	1 X 1.06m

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length
89	155.318	R.C.C SLAB	1 X 1.30m
90	155.410	R.C.C SLAB	1 X 1.67m
91	156.134	R.C.C SLAB	1 X 2.88m
92	156.320	R.C.C SLAB	1 X 1.19m
93	156.725	R.C.C SLAB	1 X 1.74m
94	157.118	R.C.C SLAB	1 X 0.90m
95	157.275	R.C.C SLAB	1 X 3.21m
96	157.328	R.C.C SLAB	1 X 4.58m
97	157.959	R.C.C SLAB	1 X 0.89m
98	158.173	R.C.C SLAB	1 X 0.92m
99	158.788	R.C.C SLAB	1 X 1.81m
100	158.951	R.C.C SLAB	1 X 1.75m
101	159.124	R.C.C SLAB	1 X 1.37m
102	159.181	R.C.C SLAB	1 X 1.26m
103	159.246	R.C.C SLAB	1 X 1.07m
104	159.382	R.C.C SLAB	1 X 2.14m
105	159.759	R.C.C SLAB	1 X 0.89m
106	160.684	R.C.C SLAB	1 X 2.23m
107	160.751	R.C.C SLAB	1 X 1.54m
108	160.812	R.C.C SLAB	1 X 1.54m
109	160.885	R.C.C SLAB	1 X 2.82m
110	161.099	R.C.C SLAB	1 X 1.53m
111	161.227	R.C.C SLAB	1 X 1.97m
112	161.248	R.C.C SLAB	1 X 1.82m
113	161.363	R.C.C SLAB	1 X 1.15m
114	161.440	R.C.C SLAB	1 X 1.53m
115	161.533	R.C.C SLAB	1 X 0.84m
116	161.592	R.C.C SLAB	1 X 0.83m
117	161.881	R.C.C SLAB	1 X 3.14m
118	162.130	R.C.C SLAB	1 X 1.39m
119	162.374	R.C.C SLAB	1 X 0.80m
120	162.715	R.C.C SLAB	1 X 0.74m
121	162.919	R.C.C SLAB	1 X 1.02m

11. Bus bay:

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

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

12. Truck Lay byes

The details of truck lay byes are as follows:

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

13. Roadside drains

The details of the roadside drains are as follows:

Sl No	Chainage (km)		Length (m)	Side	Type
	From	To			
1	134.821	136.535	1.714	Left	Kacha
2	136.541	136.992	0.451	Left	Kacha
3	137.000	137.225	0.225	Left	Kacha
4	137.236	138.310	1.074	Left	Kacha
5	138.319	138.516	0.197	Left	Kacha
6	138.560	138.829	0.269	Left	Kacha
7	138.851	139.171	0.320	Left	Kacha
8	139.235	139.655	0.420	Left	Kacha
9	139.800	139.825	0.025	Left	Kacha
10	140.108	140.222	0.114	Right	Kacha
11	140.263	140.500	0.237	Right	Kacha
12	140.523	141.483	0.960	Right	Kacha
13	141.506	141.525	0.019	Right	Kacha
14	141.633	141.668	0.035	Right	Kacha
15	141.767	142.400	0.633	Right	Kacha
16	142.532	142.570	0.038	Right	Kacha
17	143.225	143.623	0.398	Right	Kacha
18	143.735	143.860	0.125	Right	Kacha
19	143.937	144.057	0.120	Right	Kacha
20	144.137	145.212	1.075	Right	Kacha
21	145.353	145.375	0.022	Right	Kacha
22	145.575	145.633	0.058	Right	Kacha
23	145.727	146.052	0.325	Right	Kacha
24	146.114	146.135	0.021	Right	Kacha
25	146.516	146.578	0.062	Right	Kacha
26	146.815	147.237	0.422	Right	Kacha
27	147.392	147.723	0.331	Right	Kacha
28	147.750	147.975	0.225	Right	Kacha
29	147.975	148.427	0.452	Right	Pucca
30	148.443	148.955	0.512	Right	Pucca
31	148.955	149.033	0.078	Right	Kacha
32	149.033	149.743	0.710	Right	Pucca
33	149.775	149.905	0.130	Right	Pucca
34	149.931	149.985	0.054	Right	Pucca

Sl No	Chainage (km)		Length (m)	Side	Type
	From	To			
35	150.050	150.170	0.120	Right	Pucca
36	150.277	150.350	0.073	Right	Pucca
37	150.475	150.773	0.298	Right	Pucca
38	150.786	152.702	1.916	Right	Pucca
39	152.702	154.012	1.310	Right	Kacha
40	154.023	154.395	0.372	Right	Kacha
41	154.423	154.770	0.347	Right	Kacha
42	154.845	155.058	0.213	Right	Kacha
43	155.118	155.279	0.161	Right	Kacha
44	155.333	155.391	0.058	Right	Kacha
45	155.416	155.593	0.177	Right	Kacha
46	155.658	155.720	0.062	Right	Kacha
47	155.756	155.833	0.077	Right	Kacha
48	156.000	156.062	0.062	Right	Kacha
49	156.078	156.174	0.096	Right	Kacha
50	156.321	156.800	0.479	Right	Kacha
51	157.330	157.743	0.413	Right	Kacha
52	158.209	158.287	0.078	Right	Kacha
53	158.370	158.400	0.030	Right	Kacha
54	159.106	159.428	0.322	Right	Kacha
55	159.550	159.670	0.120	Right	Kacha
56	159.750	159.780	0.030	Right	Kacha
57	160.132	160.482	0.350	Right	Kacha
58	160.730	160.750	0.020	Right	Kacha
59	161.160	161.262	0.102	Right	Kacha
60	161.440	161.693	0.253	Right	Kacha
61	162.675	162.735	0.060	Right	Kacha
62	162.972	163.090	0.118	Right	Kacha

14. Major Junctions

Details of major junctions are as follow.

Sl. No.	Location		At Grade	Category of crossroad	Remarks
	Ex. Chainage	Name of junction			
NIL					

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

15. Minor Junctions

The details of the minor junctions are as follows:

Sl. No.	Type of intersection		
	From Km	T-Junction	Cross Road
1	133.832	Y	3-legged
2	134.381	Y	3-legged
3	134.593	Y	3-legged
4	134.625	Y	3-legged
5	135.400	T	3-legged
6	136.775	Y	3-legged
7	139.175	Y	3-legged
8	142.500	Y	3-legged
9	148.500	T	3-legged
10	153.475	T	3-legged
11	158.475	Y	3-legged
12	161.700	Y	3-legged
13	162.400	T	3-legged
14	162.700	T	3-legged

16. Bypasses

The details of the bypasses are as follows:

S. No.	Name of bypass (town)	Existing Chainage (km)	Design Length (km)	Carriageway	
				Width (m)	Type
NIL					

17. Other Structures: NIL

Annex-II

(As per Clause 8.3 (i))

(Schedule-A)

Datesfor providing Rightof Way.

ThedatesonwhichtheAuthorityshallprovideRightofWaytotheContractoron differentstretchesof theSite arestated below:

Sr. No.	From Km to Km	Specifications (km)	Description	Date Details of ROW
1	Km 133 to km 163	30 km	Two Lane	100% of ROW shall be handed over on Appointed Date

Annex - III

(Schedule-A)

Alignment Plans

The existing road is proposed only for restoration and rehabilitation work. Hence, the existing alignment of this road does not required for any modification.

Annex - IV

(Schedule-A)

Environment Clearances

The existing road is proposed only for restoration and rehabilitation work on the existing road. Hence, the environmental clearance is not required.

Schedule-B

SCHEDULE - B

(See Clause 2.1)

Development of the Project Highway

1 Development of the Project Highway

Development oft heProjectHighwayshallincludedesignandconstruction of theProject Highwayasdescribed in this Schedule-Band in Schedule-C.

2 Rehabilitation and augmentation

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

3 Specifications and Standards

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

Annex-I

(Schedule-B)

Description of Project Road (Two-Laning)

1. WIDENING OFTHE EXISTINGHIGHWAY

(i) There is no requirement of widening of carriageway as the scope of work pertains to restoration and rehabilitation of the existing highway only and the Project shall follow existing alignment. The road stretch is to be rehabilitated and strengthened to sustain traffic at least for 5 years.

(ii) WIDTH OF CARRIAGEWAY

The width of the carriageway is 7.0mand shall be rehabilitated to 7m width.

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

Sl. No.	Built-up stretch (Township)	Location (km to km)	Width(m)	Typical cross section (Ref.to Manual)
NIL				

2. GEOMETRIC DESIGN AND GENERAL FEATURES

(i) General

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the IRC SP-84-2019.

(ii) Design Speed

The design speed given in table 2.1 of IRC: SP: 84-2019 shall be adopted.

(iii) Improvements of the existing road geometrics

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

Also, if any, in the existing horizontal and vertical profiles shall be corrected as per the prescribed standards for Mountainous / Hill terrain to the extent land is available.

(iv) **Right of Way** - Details of the Right of Way are given in Annex II of Schedule A.

(v) **Deleted.**

(vi) **Lateral and Vertical Clearances at Underpasses/Flyovers**

Lateral and vertical clearances at Underpasses/Flyovers and provision of guardrails/crash barriers shall be as per the paragraph 2.10 of IRC SP 84-2019.

a) Lateral clearance: The size of the opening at the Underpasses shall be as follows:

S. No.	Location (Km)	Span arrangement and Vertical clearance	Remarks
NIL			

b) Vertical clearance: Vertical Clearance at Underpasses shall not be less than 4.0 m (urban area).

(vii) **Laterals and Vertical Clearance at Overpasses**

a) Lateral and Vertical clearances at over passes shall be as per paragraph 2.11 of theIRC SP 84-2019.

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

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

c) Vertical clearance: The vertical clearance at the underpass shall be as follows.

S. No.	Location (Km)	Span arrangement and Vertical clearance	Remarks
NIL			

(viii) **Service roads /Slip Road**

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

Details of Service Road/Slip Road

Sl. No.	Location of service road(fromkmtokm)	Righthandside(RHS)/Lefthand side(LHS)/orBothsides	Length (km) of service road
NIL			

Note:

(i) The above length of slip/service road is excluding the tapering length/merging length of acceleration/deceleration lane. The entry and exit of slip road should be constructed as per Fig 2.1 C and service road

as per Fig 2.1 A of IRC: SP: 84: 2019.

(ii) Length of service road and slip road given in above table excludes length across the Project Highway for proper connectivity of crossroad on either side of Project Highway as given in the alignment plan enclosed at **Annex-III, Schedule-A** which shall be deemed to be included in the scope of work.

(iii) The length of slip/service road shown in above table is minimum and may increase as per actual site conditions and No Change of Scope shall be admissible on this account.

(iv) Width and locations of service road/slip road shown above are minimum and may vary as per site condition/as per design. Change in locations of slip/service road, if required, shall be deemed to be part of project.

(ix) Grade Separated Structures

a) Grade separated structures shall be provided as per paragraph 2.13 of the IRC SP 84-2019. The requisite particulars are given below:

Sl. No	Location of Structure	Length (m)	Number and length of clear Spans (m)	Approach gradient	Remarks if Any
Nil					

b) In the case of grade separated structures, the type of structure and the level of the Project Highway and the crossroads shall be as follows:

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

X. Cattle and pedestrian underpass /overpass

Cattle and pedestrian underpass/ overpass shall be constructed as follows:

Sl. No.	Location	Type of crossing
Nil		

XI. Deleted

XII. Work Description. The under mentioned work is to be executed as per MoRTH guidelines and standard Engineering practice.

Details of WBM				
Sl. No.	Location (km)		Dimension	
	From	To	Length (metre)	Layer Thickness (metre)
1	133+300	133+350	50.0	0.075
2	133+350	133+400	50.0	0.100
3	133+400	133+450	50.0	0.100
4	133+600	133+650	50.0	0.100
33	134+400	134+450	50.0	0.100
34	135+100	135+150	50.0	0.100
35	135+400	135+450	50.0	0.100
36	135+500	135+550	50.0	0.100
37	135+600	135+650	50.0	0.100
38	135+800	135+850	50.0	0.100
39	137+200	137+388	188.0	0.100
40	145+600	146+300	700.0	0.150
41	146+900	147+000	100.0	0.075
42	147+800	147+820	20.0	0.075
43	148+300	148+310	10.0	0.075
44	148+500	148+530	30.0	0.075
45	149+500	149+508	8.0	0.075
46	150+300	150+310	10.0	0.075
47	150+400	150+420	20.0	0.075
48	151+200	151+280	80.0	0.150
49	151+600	151+700	100.0	0.075
50	151+800	151+900	100.0	0.075
51	152+350	152+360	10.0	0.150
52	152+500	152+520	20.0	0.075
53	153+000	153+020	20.0	0.075
54	153+700	153+740	40.0	0.075
55	154+100	154+110	10.0	0.075

56	154+500	154+510	10.0	0.075
57	154+900	154+920	20.0	0.075
58	155+700	155+720	20.0	0.075
59	155+800	155+830	30.0	0.150
60	155+900	155+910	10.0	0.150
61	156+200	156+300	100.0	0.075
62	156+600	156+630	30.0	0.150
63	156+800	156+830	30.0	0.075
64	156+900	156+940	40.0	0.150
65	157+100	157+300	200.0	0.150
66	157+350	157+360	10.0	0.150
67	157+500	157+800	300.0	0.075
68	157+800	158+000	200.0	0.150
69	158+500	158+550	50.0	0.150
70	158+600	158+640	40.0	0.150
71	158+700	158+710	10.0	0.075
72	158+800	158+815	15.0	0.075
73	158+900	158+920	20.0	0.075
74	159+500	159+530	30.0	0.075
75	159+700	159+710	10.0	0.150
76	159+800	159+810	10.0	0.075
77	159+900	159+910	10.0	0.075
78	160+600	160+605	5.0	0.075
79	160+700	160+710	10.0	0.075
80	160+850	160+855	5.0	0.075
81	161+800	161+830	30.0	0.075
82	161+900	161+920	20.0	0.075
83	162+600	162+900	300.0	0.075
84	162+970	162+990	20.0	0.075

Details of GSB				
Sl. No.	Location (km)		Dimension	
	From	To	Length (metre)	Layer Thickness (metre)
28	133+300	133+350	50.0	0.150
29	133+400	133+450	50.0	0.200
30	133+600	133+650	50.0	0.200

31	135+600	135+650	50.0	0.200
32	137+200	137+388	188.0	0.200
33	145+600	146+300	700.00	0.150
34	147+800	147+820	20.00	0.100
35	148+500	148+530	30.00	0.100
36	149+500	149+508	8.00	0.100
37	151+200	151+280	80.00	0.150
38	151+800	151+900	100.00	0.200
39	153+700	153+740	40.00	0.150
40	155+700	155+720	20.00	0.100
41	157+100	157+300	200.00	0.200
42	157+350	157+360	10.00	0.200
43	157+500	157+800	300.00	0.200
44	157+800	158+000	200.00	0.200
45	158+500	158+550	50.00	0.200
46	158+600	158+640	40.00	0.200
47	158+700	158+710	10.00	0.200
48	158+800	158+815	15.00	0.200
49	158+900	158+920	20.00	0.200
50	159+500	159+530	30.00	0.150

Details of Prime Coat And Tack Coat as per MORTH Guidelines			
Sl. No.	Location (km)		Dimension
	From	To	Length (metre)
1	133+000	163+000	30000.0

Scarifying of Existing Bituminous Layer			
Sl.No.	From	To	Length (metre)
1	133+050	133+150	100.0
2	133+150	133+250	100.0
3	133+250	133+300	50.0
4	133+450	133+550	100.0
5	133+550	133+600	50.0
6	133+650	133+750	100.0
7	133+750	133+850	100.0

8	133+850	133+990	140.0
9	134+400	134+500	100.0
10	134+500	134+600	100.0
11	134+600	134+700	100.0
12	134+700	134+800	100.0
13	134+800	134+900	100.0
14	134+900	135+000	100.0
15	135+000	135+100	100.0
16	135+100	135+200	100.0
17	135+200	135+300	100.0
18	135+300	135+400	100.0
19	135+400	135+500	100.0
20	135+500	135+600	100.0
21	135+650	135+750	100.0
22	135+750	135+800	50.0
23	135+850	135+950	100.0
24	135+950	136+050	100.0
25	136+050	136+150	100.0
26	136+150	136+250	100.0
27	136+250	136+350	100.0
28	136+350	136+450	100.0
29	136+450	136+550	100.0
30	136+550	136+650	100.0
31	136+650	136+750	100.0
32	136+750	136+850	100.0
33	136+850	136+950	100.0
34	136+950	137+050	100.0
35	137+050	137+150	100.0
36	137+150	137+200	50.0
37	137+388	137+488	100.0
38	137+488	137+588	100.0
39	137+588	137+688	100.0
40	137+688	137+788	100.0
41	137+788	137+888	100.0
42	137+888	137+988	100.0
43	137+988	138+088	100.0
44	138+088	138+188	100.0
45	138+188	138+288	100.0
46	138+288	138+388	100.0
47	138+388	138+488	100.0

48	138+488	138+588	100.0
49	138+588	138+688	100.0
50	138+688	138+788	100.0
51	138+788	138+888	100.0
52	138+888	138+988	100.0
53	138+988	139+088	100.0
54	139+088	139+188	100.0
55	139+188	139+288	100.0
56	139+288	139+388	100.0
57	139+388	139+488	100.0
58	139+488	139+588	100.0
59	139+588	139+688	100.0
60	139+688	139+788	100.0
61	139+788	139+888	100.0
62	139+888	139+988	100.0
63	139+988	140+088	100.0
64	140+088	140+188	100.0
65	140+188	140+288	100.0
66	140+288	140+388	100.0
67	140+388	140+488	100.0
68	140+488	140+588	100.0
69	140+588	140+688	100.0
70	140+688	140+788	100.0
71	140+788	140+888	100.0
72	140+888	140+988	100.0
73	140+988	141+088	100.0
74	141+088	141+188	100.0
75	141+188	141+288	100.0
76	141+288	141+388	100.0
77	141+388	141+488	100.0
78	141+488	141+588	100.0
79	141+588	141+688	100.0
80	141+688	141+788	100.0
81	141+788	141+888	100.0
82	141+888	141+988	100.0
83	141+988	142+088	100.0
84	142+088	142+188	100.0
85	142+188	142+288	100.0
86	142+288	142+388	100.0
87	142+388	142+488	100.0

88	142+488	142+588	100.0
89	142+588	142+688	100.0
90	142+688	142+788	100.0
91	142+788	142+888	100.0
92	142+888	142+988	100.0
93	142+988	143+088	100.0
94	143+088	143+188	100.0
95	143+188	143+288	100.0
96	143+288	143+388	100.0
97	143+388	143+488	100.0
98	143+488	143+588	100.0
99	143+588	143+688	100.0
100	143+688	143+788	100.0
101	143+788	143+888	100.0
102	143+888	143+988	100.0
103	143+988	144+088	100.0
104	144+088	144+188	100.0
105	144+188	144+288	100.0
106	144+288	144+388	100.0
107	144+388	144+488	100.0
108	144+488	144+588	100.0
109	144+588	144+688	100.0
110	144+688	144+788	100.0
111	144+788	144+888	100.0
112	144+888	144+988	100.0
113	144+988	145+088	100.0
114	145+088	145+188	100.0
115	145+188	145+288	100.0
116	145+288	145+388	100.0
117	145+388	145+488	100.0
118	145+488	145+588	100.0
119	145+588	145+600	12.0
120	146+300	146+400	100.0
121	146+400	146+500	100.0
122	146+500	146+600	100.0
123	146+600	146+700	100.0
124	146+700	146+800	100.0
125	146+800	146+900	100.0
126	147+000	147+100	100.0
127	147+100	147+200	100.0

128	147+200	147+300	100.0
129	147+300	147+400	100.0
130	147+400	147+500	100.0
131	147+500	147+600	100.0
132	147+600	147+700	100.0
133	147+700	147+800	100.0
134	147+820	147+920	100.0
135	147+920	148+020	100.0
136	148+020	148+120	100.0
137	148+120	148+220	100.0
138	148+220	148+300	80.0
139	148+310	148+410	100.0
140	148+410	148+500	90.0
141	148+530	148+630	100.0
142	148+630	148+730	100.0
143	148+730	148+830	100.0
144	148+830	148+930	100.0
145	148+930	149+030	100.0
146	149+030	149+130	100.0
147	149+130	149+230	100.0
148	149+230	149+330	100.0
149	149+330	149+430	100.0
150	149+430	149+500	70.0
151	149+508	149+605	97.0
152	149+605	149+705	100.0
153	149+705	149+805	100.0
154	149+805	149+905	100.0
155	149+905	150+005	100.0
156	150+005	150+105	100.0
157	150+105	150+205	100.0
158	150+205	150+300	95.0
159	150+310	150+400	90.0
160	150+420	150+520	100.0
161	150+520	150+620	100.0
162	150+620	150+720	100.0
163	150+720	150+820	100.0
164	150+820	150+920	100.0
165	150+920	151+020	100.0
166	151+020	151+120	100.0
167	151+120	151+200	80.0

168	151+280	151+420	140.0
169	151+420	151+520	100.0
170	151+520	151+600	80.0
171	151+700	151+800	100.0
172	151+900	152+000	100.0
173	152+000	152+100	100.0
174	152+100	152+200	100.0
175	152+200	152+300	100.0
176	152+300	152+350	50.0
177	152+360	152+460	100.0
178	152+460	152+500	40.0
179	152+520	152+620	100.0
180	152+620	152+720	100.0
181	152+720	152+820	100.0
182	152+820	152+920	100.0
183	152+920	153+000	80.0
184	153+020	153+120	100.0
185	153+120	153+220	100.0
186	153+220	153+320	100.0
187	153+320	153+420	100.0
188	153+420	153+520	100.0
189	153+520	153+620	100.0
190	153+620	153+700	80.0
191	153+740	153+840	100.0
192	153+840	153+940	100.0
193	153+940	154+040	100.0
194	154+040	154+100	60.0
195	154+110	154+210	100.0
196	154+210	154+310	100.0
197	154+310	154+410	100.0
198	154+410	154+500	90.0
199	154+510	154+610	100.0
200	154+610	154+710	100.0
201	154+710	154+810	100.0
202	154+810	154+900	90.0
203	154+920	155+020	100.0
204	155+020	155+120	100.0
205	155+120	155+220	100.0
206	155+220	155+320	100.0
207	155+320	155+420	100.0

208	155+420	155+520	100.0
209	155+520	155+620	100.0
210	155+620	155+700	80.0
211	155+720	155+800	80.0
212	155+830	155+900	70.0
213	155+910	156+010	100.0
214	156+010	156+110	100.0
215	156+110	156+200	90.0
216	156+300	156+400	100.0
217	156+400	156+500	100.0
218	156+500	156+600	100.0
219	156+630	156+730	100.0
220	156+730	156+800	70.0
221	156+830	156+900	70.0
222	156+940	157+040	100.0
223	157+040	157+100	60.0
224	157+300	157+350	50.0
225	157+360	157+460	100.0
226	157+460	157+500	40.0
227	158+000	158+100	100.0
228	158+100	158+200	100.0
229	158+200	158+300	100.0
230	158+300	158+400	100.0
231	158+400	158+500	100.0
232	158+550	158+600	50.0
233	158+640	158+700	60.0
234	158+710	158+800	90.0
235	158+815	158+900	85.0
236	158+920	159+020	100.0
237	159+020	159+120	100.0
238	159+120	159+220	100.0
239	159+220	159+320	100.0
240	159+320	159+420	100.0
241	159+420	159+500	80.0
242	159+530	159+630	100.0
243	159+630	159+700	70.0
244	159+710	159+800	90.0
245	159+810	159+900	90.0
246	159+910	160+010	100.0
247	160+010	160+110	100.0

248	160+110	160+210	100.0
249	160+210	160+310	100.0
250	160+310	160+410	100.0
251	160+410	160+510	100.0
252	160+510	160+600	90.0
253	160+605	160+700	95.0
254	160+710	160+810	100.0
255	160+810	160+850	40.0
256	160+855	160+955	100.0
257	160+955	161+055	100.0
258	161+055	161+155	100.0
259	161+155	161+255	100.0
260	161+255	161+355	100.0
261	161+355	161+455	100.0
262	161+455	161+555	100.0
263	161+555	161+655	100.0
264	161+655	161+755	100.0
265	161+755	161+800	45.0
266	161+830	161+900	70.0
267	161+920	162+020	100.0
268	162+020	162+120	100.0
269	162+120	162+220	100.0
270	162+220	162+320	100.0
271	162+320	162+420	100.0
272	162+420	162+520	100.0
273	162+520	162+600	80.0
274	162+900	162+970	70.0
275	162+990	163+090	100.0

Details of DBM and BC					
Sl. No.	Location (km)		Dimension		
	From	To	Length (metre)	Layer Thickness (DBM) in metre	Thickness (BC) in metre
1	133+000	163+000	30000.0	0.070	0.040

3. INTERSECTIONS AND GRADE SEPARATORS

All intersections and grade separators shall be as per Section 3of the IRC SP 84-2019.Existing intersections which are deficient shall be improved to the prescribed standards.

All intersections as per the site requirement shall be designed and constructed in accordance with the manual. List of intersections is given in below table. Draft layout of major junctions is given in indicative Plan & Profile drawings.

(i) At-gradeintersections

(a) Major Junction

Sl. No.	Location		Type ofintersection	Type of Road (SH/ MDR/ ODR/ VR)	Remarks
	Design Chainage	Existing Chainage			
NIL					

(b) Minor Junction:

Sl. No.	Location		Type ofintersection	Type of Road (SH/ MDR/ ODR/ VR)	Remarks
	Design Chainage	Existing Chainage			
NIL					

Note: *It is clarified that if any other junction is identified during development of the project highway in addition to those mentioned above shall also be improved with proper drainage facilities as per standards. It shall be covered within the scope of work. The Number, location & type of junction shown in above table are minimum and it may increase as per actual site condition and increase in number will not attract change of Scope on this account.*

(ii) Grade separated intersection with/without ramps.

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

4. ROAD EMBANKMENT AND CUT SECTION

(i) Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/ cuttings shall conform to the Specifications and Standards given in section 4 of the IRC SP 84-2019 and MoRTH manual. Deficiencies in the plan and profile of the existing road shall be corrected.

(ii) Raising of the existing road

[Refer to provision of the relevant Manual and specify sections to be raised]

The existing road shall be raised in the following sections:

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

5. PAVEMENT DESIGN

(i) Pavement design shall be carried out in accordance with Section 5 of the IRC SP 84-2019 and IRC SP: 59-2019.

(ii) Type of pavement

Type of pavement to be provided is Flexible pavement from km 133.00 to km 163.00.

(iii) Design requirements

NIL

(iv) Reconstruction of stretches

The following stretches of the existing road shall be restored and rehabilitated.

Sl. No.	From (Km)	TO (Km)	Length (Km)
1.	133+000	163+000	30

6. ROADSIDE DRAINAGE

Unlined Drain: The drained shall be cleared of all debris and rehabilitated to proper shape and slope.

Sl. No.	From (Km)	TO (Km)	Length (Km)
1.	133+000	163+000	30

Note: The above locations are minimum. Additional locations if any required as per site condition shall be provided as per manual. It shall not be treated as change in scope of work.

7. DESIGN OF STRUCTURES

(i) General

Deleted.

(ii) Culverts

Deleted.

(iii) Bridges

Deleted.

(iv) Rail-road bridges

Deleted.

(v) Grade separated structures.

Deleted.

(vi) Repairs and strengthening of bridges and structures.

Deleted.

(vii) List of Major Bridges and Structures

The following is the list of the Major Bridges andStructures:

Sl. No.	Location
NIL	

8. TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

Road safety works shall be ensured in accordance with provisions of relevant Manual.

9. ROADSIDE FURNITURE

Deleted.

10. COMPULSORY AFFORESTATION

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

11. HAZARDOUS LOCATIONS

Roadside safety barriers shall be provided at all locations of hazards such as high embankment, roadside obstacles, sharp curves, Flyover and bridge approaches, overpasses, ROB and any other locations identified in consultation with Authority Engineer during the execution of the project highway.

12. Special Requirement for Hill Roads

[Refer to the provision of relevant manual and provide details where relevant and required.]

13. Change of Scope

The number, length and height/width of Structures and bridges specified hereinabove shall be treated as an approximate assessment. The actual numbers, lengths and sizes as required on the basis of detailed investigations shall be

determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths specified in this Schedule- B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

14. RAINWATER HARVESTING

(i) As per Ministry of Environment and Forests Notification, New Delhi dated 14.01.1997 (as amended on 13.01.1998, 05.01.1999 & 6.11.2000), the construction of Rainwater, harvesting structure is mandatory in and around Water Crisis area, notified by the Central Ground Water Board.

(ii) Rainwater harvesting structures shall be provided at every 1000m on either side.

(iii) Rainwater harvesting structure shall be provided as per IRC: SP:42-2014 (Guideline for road drainage) and IRC: SP:50-2013 (Guidelines on Urban Drainage)

15. Utility Shifting

Deleted.

NOTE: Only the relevant clauses of Schedule-B in respect of subject work is to be considered.

Schedule B

Schedule-C

SCHEDULE - C

(SeeClause2.1)

PROJECT FACILITIES

1 Project Facilities

This schedule indicates the minimum spatial and functional requirements of the facilities to be provided on the Project Highway Package No. NHIDCL/RO-Imphal/I-J/R&R/km133.00-km163.00/2021-22 starting from chainage km 133.00 to km 163.00 with an aim to cater to the envisaged demand till the end of the maintenance period.

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

NIL.

2 Description of Project Facilities

Each of the Project Facilities is described below:

NIL.

Schedule-D

SCHEDULE- D

(SeeClause2.1)

SPECIFICATIONSAND STANDARDS

1 Construction

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

2 Design Standards

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

Manual of Specifications and Standards for Two Laning of Highways (IRC: SP: 73: 2015 or latest) referred to herein as a Manual.

IRC-37-2018 or latest: Guidelines for the design of flexible pavement.

Code for Practice of Road Signage- IRC 67: 2001 or latest

Hill Road Manual IRC SP 48:1998 or latest should be referred.

The NGT ordered dated 01.11.2018 should be followed for disposal of muck.

Annex-I

(Schedule-D)

Specificationsand Standardsfor Construction

1 Specifications and Standards

All Materials, works and construction operations shall conform to the manual of Specifications and Standards for Two Laning of Highways (IRC: SP: 73: 2015 or latest), 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 "Contractor", "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.

Schedule-E

Schedule – E

(See Clause 2.1 and 14.2)

MAINTENANCE REQUIREMENTS

1 Maintenance Requirements

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

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

iii. All Materials, works and construction operations shall conform to the "SPECIFICATIONS FOR ROAD AND BRIDGE WORKS (FIFTH REVISION, April 2013)", including latest corrections slips, issued by the Ministry of Surface Transport & Highways, Government of India and published by the Indian Roads Congress.

Where the specifications for a work are not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

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: SP:35. Report of this inspection together with details of proposed maintenance works as required on the basis of this inspection shall be sent to the Authority's Engineer before the [10th June] every year. The Contractor shall complete the required repairs before the onset of the monsoon and send to the Authority's Engineer a compliance report. Post monsoon inspection shall be done by the [30th September] and the inspection report together with details of any damages observed and proposed action to remedy the same shall be sent to the Authority's Engineer.

8 Repairs on account of natural calamities

All damages occurring to the Project Highway on account of torrential rains, floods, earthquake or other natural disasters shall be undertaken by the Contractor at its own cost and/or out of the proceeds of insurance.

Annex -I

(Schedule-E)

Annex –I 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, FHWA 2003 (http://www.tfhrc.com/pavement/ltp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2
	Cracking	Nil	< 5 % subject to limit of 0.5 sqm for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15 -30 days	MORT&H Specification 3004.2
	Corrugations and Shoving	Nil	< 0.1 % of area	Daily	Length Measurement Unit like Scale, Tape, odometer etc.		2-7 days	IRC:82-2015
	Bleeding	Nil	< 1 % of area	Daily			3-7 days	MORT&H Specification 3004.4
	Ravelling/ Stripping	Nil	< 1 % of area	Daily			7-15 days	IRC:82-2015 read with IRC SP 81
	Edge Deformation/ Breaking	Nil	< 1 m for any 100 m section and width < 0.1 m at any location, restricted to 30 cm from the edge	Daily			7- 15 days	IRC:82-2015
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)	Class I Profilometer : ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	180 days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-Annually			180 days	BS: 7941-1: 2006
	Pavement Condition Index	3	2.1	Bi-Annually			180 days	IRC:82-2015
	Other Pavement Distresses			Bi-Annually			2-7 days	IRC:82-2015

<table>
<tr><th rowspan="2">Asset Type</th><th rowspan="2">Performance Parameter</th><th colspan="2">Level of Service (LOS)</th><th rowspan="2">Frequency of Inspection</th><th rowspan="2">Tools/ Equipment</th><th rowspan="2">Standards and References for Inspection and Data Analysis</th><th rowspan="2">Time limit for Rectification/Repair</th><th rowspan="2">Maintenance Specifications</th></tr>
<tr><th>Desirable</th><th>Acceptable</th></tr>
<tr><td></td><td>Deflection/ Remaining Life</td><td></td><td></td><td>Annually</td><td>Falling Weight Deflectometer</td><td>IRC 115: 2014</td><td>180 days</td><td>IRC:115-2014</td></tr>
<tr><td rowspan="2">Rigid Pavement (Pavement of MCW, Service Road, Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)</td><td>Roughness BI</td><td>2200mm/km</td><td>2400mm/km</td><td>Bi-Annually</td><td>Class I Profilometer</td><td>ASTM E950 (98) :2004 and ASTM E1656 -94: 2000</td><td>180 days</td><td>IRC:SP:83-2008</td></tr>
<tr><td>Skid</td><td colspan="2">Skid Resistance no. at different speed of vehicles
<table><tr><th>Minimum SN</th><th>Traffic Speed (Km/h)</th></tr><tr><td>36</td><td>50</td></tr><tr><td>33</td><td>65</td></tr><tr><td>32</td><td>80</td></tr><tr><td>31</td><td>95</td></tr><tr><td>31</td><td>110</td></tr></table></td><td>Bi-Annually</td><td>SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)</td><td>IRC:SP:83-2008</td><td>180 days</td><td>IRC:SP:83-2008</td></tr>
<tr><td rowspan="5">Embankment/ Slope</td><td>Edge drop at shoulders</td><td>Nil</td><td>40mm</td><td>Daily</td><td rowspan="3">Length Measurement Unit like Scale, Tape, odometer etc.</td><td rowspan="5">IRC</td><td>7-15 days</td><td>MORT&H Specification 408.4</td></tr>
<tr><td>Slope of camber/cross fall</td><td>Nil</td><td><2% variation in prescribed slope of camber /cross fall</td><td>Daily</td><td>7-15 days</td><td>MORT&H Specification 408.4</td></tr>
<tr><td>Embankment Slopes</td><td>Nil</td><td><15 % variation in prescribe side slope</td><td>Daily</td><td>7-15 days</td><td>MORT&H Specification 408.4</td></tr>
<tr><td>Embankment Protection</td><td>Nil</td><td>Nil</td><td>Daily</td><td>NA</td><td>7-15 days</td><td>MORT&H Specification</td></tr>
<tr><td>Rain Cuts/ Gullies in slope</td><td>Nil</td><td>Nil</td><td>Daily Specially During Rainy Season</td><td>NA</td><td>7-15 days</td><td>MORT&H Specification</td></tr>
</table>

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						

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
1	**Single Discrete Cracks Not intersecting with any joint**	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	Not applicable
			1	w < 0.2 mm. hair cracks		
			2	w = 0.2 - 0.5 mm, discernible from slow-moving car	Seal without delay	Seal, and stitch if L >lm. Within 7days
			3	w = 0.5 - 1.5 mm, discernible from fast-moving car		
			4	w = 1.5 - 3.0 mm	Seal, and stitch if L > l m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15days
			5	w > 3 mm.		
2	**Single Transverse (or Diagonal) Crack intersecting with one or more joints**	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Route and seal with epoxy. 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 > 1 m. Within 7 days	
			4	w = 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected. Portion with norms and specifications - See Para 5.5 & 9.2 Within 15days
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	
3	**Single Longitudinal Crack intersecting with one or more joints**	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	w < 0.5 mm, discernable from slow moving vehicle	Seal with epoxy, if L > 1 m. Within 7 days	Staple or dowel bar retrofit. Within 15days
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > l m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair with stapling. Within 15 days
			4	w = 6.0 - 12.0 mm, usually associated with spalling	Not Applicable, as it may be full depth	
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic		Full Depth Repair Dismantle and reconstruct affected portion as per norms and specifications - See Para 5.6.4 Within 15 days
4	**Multiple Cracks intersecting with one or more joints**	**w = width of crack**	0	Nil, not discernible	No Action	-
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > l m. 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
			4	w = 3.0 - 6.0 mm panel broken into 2 or 3 pieces		

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	w > 6 mm and/or panel broken into more than 4 pieces		specifications within 30 days
5	**Corner Break**	w = width of crack L = length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to secure broken parts Within 7 days	Seal with epoxy seal with epoxy Within 7days
			2	w < 1.5 mm; L < 0.6 m, only one corner broken		
			3	w < 1.5 mm; L < 0.6 m, two corners broken	Partial Depth (Refer Figure 8.3 of IRC:SP: 83-2008) Within 15 days	Full depth repair
			4	w > 1.5 mm; L > 0.6 m or three corners broken		
			5	three or four corners broken		Reinstate sub-base, and reconstruct the slab as per norms and specifications within 30days
6	**Punchout (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)**	w = width of crack L = length (m/m2)	0	Nil, not discernible		No Action
			1	w < 0.5 mm; L < 3 m/m^2	Not Applicable, as it may be full depth	Seal with low viscosity epoxy to secure broken parts. Within 15days
			2	either w > 0.5 mm or L < 3 m/m^2		
			3	w > 1.5 mm and L < 3 m/m^2		
			4	w > 3 mm, L < 3 m/m^2 and deformation		Full depth repair - Cut out and replace damaged area taking care not to damage reinforcement. Within 30days
			5	w > 3 mm, L > 3 m/m^2 and deformation		
Surface Defects						
7	Ravelling or Honeycomb type 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 liable to 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 %		
			5	r > 50% and h > 25 mm	Reconstruct slabs, 4 or more slabs if affecting. Within 30 days	
8	**Scaling**	r = damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	r <**2 %**	Local repair of areas damaged and liable to be damaged. Within 7days	
			2	r = 2 - 10 %		
			3	r = 10 - 20%	Bonded Inlay within 15 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
			4	r = 20 - 30 %		
			5	r > 30 % and h > 25 mm	Reconstruct slab within 30 days	
9	**Polished Surface/Glazing**	t = texture depth, sand patch test	0		No action.	Not Applicable
			1	t > 1 mm		
			2 '	t = 1 - 0.6 mm	Monitor rate of deterioration	
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		
			5	t < 0.1 mm	Diamond Grinding if affecting 50% or more slabs in a continuous stretch of minimum 5 km. Within 30 days	
10	**Popout (Small Hole), Pothole Refer Para 8.4**	n = number/m^2 d = diameter h = maximum depth	0	d < 50 mm; h < 25 mm; n < 1 per 5 m^2	No action.	Not Applicable
			1	d = 50 - 100 mm; h < 50 mm; n < 1 per 5 m^2	Partial depth repair 65 mm deep. Within 15 days	
			2	d = 50 - 100 mm; h > 50 mm; n < 1 per 5 m^2		
			3	d = 100 - 300 mm; h < 100 mm n < 1 per 5 m^2	Partial depth repair 110mm i.e.10 mm more than the depth of the hole. Within 30 days	
			4	d = 100 - 300 mm; h > 100 mm; n < 1 per 5 m^2		
			5	d > 300 mm; h > 100 mm: n > 1 per 5 m^2	Full depth repair. Within 30 days	
Joint Defects						
11	**Joint Seal Defects**	loss or damage L = Length as % total joint length	0	Difficult to discern.	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	Discernible, L< 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	
			3	Notable. L > 25% insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days	
			5	Severe; w > 3 mm negligible protection against ingress of water and trapping incompressible material.	Clean, widen and reseal the joint. Within 7 days	
12	**Spalling of Joints**	w = width on either side of the joint L = length of spalled portion (as %	0	Nil, not discernible	No action.	Not Applicable
			1	w < 10 mm	Apply low viscosity epoxy resin/ mortar in cracked portion.	
			2	w = 10 - 20 mm, L < 25%		

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
		joint length)			Within 7 days	
			3	w = 20 - 40 mm, L > 25%	Partial Depth Repair. Within 15 days	
			4	w = 40 - 80 mm, L > 25%	30 - 50 mm deep, h = w + 20% of w, within 30 days	
			5	w > 80 mm, and L > 25%	50 - 100 mm deep repair. H = w + 20% of w. Within 30 days	
13	**Faulting (or Stepping) in Cracks or Joints**	f = difference of level	0	not discernible, < 1 mm	No action.	No action.
			1	f < 3 mm		
			2	f = 3 - 6 mm	Determine cause and observe, take action for diamond grinding	Replace the slab as appropriate. 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 grouting and raising sunken slab	
14	**Blowup or Buckling**	h = vertical displacement from normal profile			**Short Term**	**Long Term**
			0	Nil, not discernible	No Action	
			1	h < 6 mm		
			2	h = 6 - 12 mm	Install Signs to Warn Traffic within 7 days	
			3	h = 12 - 25 mm		
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shattered slabs, ie 4 or more pieces	Replace broken slabs. Within 30 days	
15	**Depression**	h = negative vertical displacement from normal profile L =length	0	Not discernible, h < 5 mm	No action.	Not Applicable
			1	h = 5 - 15 mm		
			2	h = 15-30 mm, Nos <20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Strengthen sub-grade. Reinstate pavement at normal level if L < 20 m. Within 30 days	
			5	h > 100 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
16	**Heave**	h = positive vertical displacement from normal profile. L = length	0	Not discernible. h < 5 mm	**Short Term**	**Long Term**
					No action.	scrabble
			1	h = 5 - 15 mm	Follow up.	
			2	h = 15 - 30 mm, Nos <20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Stabilise subgrade. Reinstate pavement at normal level if length < 20 m. Within 30 days	
			5	h > 100 mm		
17	**Bump**	h = vertical displacement from normal profile	0	h < 4 mm	No action	
			1	h = 4 - 7 mm	Grind, in case of new construction within 7 days	Construction Limit for New Construction.
			3	h = 7 - 15 mm	Grind, in case of ongoing Maintenance within 15 days	Replace in case of new construction. Within 30days
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	**Lane to Shoulder Dropoff**	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	
			4	f = 50 - 75 mm		For any 100 m stretch Reconstruct shoulder, if affecting 25% or more of stretch. Within 30days
			5	f > 75 mm		
Drainage						
19	**Pumping**	quantity of fines and water expelled through open joints and cracks Nos	0	not discernible	No Action	
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints Without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	appreciable/ Frequent 10 - 25%	Lift or jack slab within 30 days.	
		Nos/100 m stretch	5	abundant, crack development > 25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab.	

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

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

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td>Highway</td><td>Availability of Safe Sight Distance</td><td>As per IRC SP: 84-2014, a minimum of safe stopping sight distance shall be available throughout.
<table><tr><th>Design Speed, kmph</th><th>Desirable Minimum Sight Distance (m)</th><th>Safe Stopping Sight Distance (m)</th></tr><tr><td>100</td><td>360</td><td>180</td></tr><tr><td>80</td><td>260</td><td>130</td></tr></table></td><td>Monthly</td><td>Manual Measurements with Odometer along with video/ image backup</td><td colspan="2">Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments.
In case of permanent structure or design deficiency:
Removal of obstruction/improvement of deficiency at the earliest
Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.</td><td>IRC:SP 84-2014</td></tr>
<tr><td rowspan="3">Pavement Marking</td><td>Wear</td><td><70% of marking remaining</td><td>Bi-Annually</td><td>Visual Assessment as per Annexure-F of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect - within 2 months</td><td>IRC:35-2015</td></tr>
<tr><td>Day time Visibility</td><td>During expected life Service Time
Cement Road - 130mcd/m^2/lux
Bituminous Road - 100mcd/m^2/lux</td><td>Monthly</td><td>As per Annexure-D of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
<tr><td>Night Time Visibility</td><td><u>Initial and Minimum Performance for Dry Retro reflectivity during night time:</u>
<table><tr><td>Design Speed</td><td colspan="2">(RL) Retro Reflectivity (mcd/m^2/lux)</td></tr><tr><td></td><td>Initial (7 days)</td><td>Minimum Threshold level (TL) & warranty period required up to 2 years</td></tr><tr><td>Up to 65</td><td>200</td><td>80</td></tr><tr><td>65 - 100</td><td>250</td><td>120</td></tr><tr><td>Above 100</td><td>350</td><td>150</td></tr></table><u>Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):</u>
Initial 7 days Retro reflectivity: 100</td><td>Bi-Annually</td><td>As per Annexure-E of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
</table>

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		mcd/m^2/lux Minimum Threshold Level: 50 mcd/m^2/lux					
	Skid Resistance	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 crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc	Bi-Annually	As per Annexure-G of IRC:35-2015		Within 24 hours	IRC:35-2015
Road Signs	Shape and Position	Shape and Position as per IRC:67-2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is damaged. Relocation as per requirement	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/Cantilever Sign boards	IRC:67-2012
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of each signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.	hange of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/Cantilever Sign boards	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

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

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

Table 4: Maintenance Criteria for Structures and Culverts:

Pipe/box/ slab culverts	Free waterway/ unobstructed flow	85% of culvert normal flow area to available.	2 times in a year (before	Inspection by Bridge Engineer as per IRC	Cleaning silt up soils and debris in culvert	15 days before onset of monsoon and within 30	IRC 5-2015, IRC SP:40-1993 and IRC

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	section		and after rainy season)	SP: 35-1990 and recording of depth of silting and area of vegetation.	barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrel before rainy season.	days after end of rainy season.	SP:13-2004
	Leak-proof expansion joints if any	No leakage through expansion joints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35-1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-1993 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25 sqm Delamination of concrete not more than 0.25 sq.m. Cracks wider than 0.3 mm not more than 1m aggregate length	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording the defects	Repairs to spalling, cracking, delamination, rusting shall be followed as per IRC: SP: 40-1993.	15 days	IRC SP 40-1993 and MORTH Specifications clause 2800
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid 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 and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Bridges including ROBs Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811
Bridge - Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach	15 days	MORT&H Specification 3004.2 & 2811.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
					embankment		
	User safety (condition of crash barrier and guard rail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed condition survey as per IRC SP: 35-1990.	Repairs and replacement of safety barriers as the case may be	3days	IRC: 5-1998, IRC SP: 84-2014 and IRC SP: 40-1993.
	Rusted reinforcement	Not more than 0.25 sqm	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out the repairs to affected concrete portion with epoxy mortar / concrete.	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
	Spalling of concrete	Not more than 0.50 sqm					
	Delamination	Not more than 0.50 sq.m					
	Cracks wider than 0.30 mm	Not more than 1m total length	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting with epoxy mortar, investigating causes for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP: 40-1993 and MORTH Specification 2800.
	Rainwater seepage through deck slab	Leakage - nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting of deck slab at leakage areas, waterproofing, repairs to drainage spouts	1 months	MORTH specifications 2600 & 2700.
	Deflection due to permanent loads and live loads	Within design limits.	Once in every 10 years for spans more than 40 m	Load test method	Carry out major rehabilitation works on bridge to retain original design loads capacity	6 months	IRC SP: 51-1999.
	Vibrations in bridge deck due to moving trucks	Frequency of vibrations shall not be more than 5 Hz	Once in every 5 years for spans more than 30m and every 10 years for spans between 15 to	Laser displacement sensors or laser vibro-meters	Strengthening of super structure	4 months	AASHTO LRFD specifications

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
			30 m				
	Leakage in Expansion joints	No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rain water through expansion joint in case of buried and asphalt plug and copper strip joint.	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Replace of seal in expansion joint	15 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Debris and dust in strip seal expansion joint	No dust or debris in expansion joint gap.	Monthly	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Cleaning of expansion joint gaps thoroughly	3 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No silt, debris, clogging of drainage spout collection chamber.	Monthly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainage spout if any leakages observed.	3 days	MORTH specification 2700.
Bridge-substructure	Cracks/spalling of concrete/rusted steel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting/guniting and micro concreting depending on type	30 days	IRC SP: 40-1993 and MORTH specification 2800.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
					of defect noticed		
	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture of reinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment shall be replaced, in order to get uniform load transfer on to bearings.	3 months	MORTH specification 2810 and IRC SP: 40-199.
Bridge Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection as per IRC SP:35-1990 using Mobile Bridge Inspection Unit. In case of doubt, use Underwater camera for inspection of deep wells in major Rivers.	Suitable protection works around pier/abutment	1 month	IRC SP: 40-1993, IRC 83-2014, MORTH specification 2500
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sq.m, damage to solid apron (concrete apron) not more than 1 sq.m	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching.	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of the contractor.							

Table 5: Maintenance Criteria for Hill Roads

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

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

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

A. Flexible Pavement

Nature of Defect or deficiency		Time limit for repair/ rectification
(b)	**Granular earth shoulders, side slopes, drains and culverts**	
(i)	Variation by more than 1 % in the prescribed slope of camber/cross fall (shall not be less than the camber on the main carriageway)	7 (seven) days
(ii)	Edge drop at shoulders exceeding 40 mm	7 (seven) days
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	30 (thirty) days
(iv)	Rain cuts/gullies in slope	7 (seven) days
(v)	Damage to or silting of culverts and side drains	7 (seven) days
(vi)	Desilting of drains in urban/semi- urban areas	24 (twenty four) hours
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)
(c)	**Road side furniture including road sign and pavement marking**	
(i)	Damage to shape or position, poor visibility or loss of retro- reflectivity	48 (forty eight) hours
(ii)	Painting of km stone, railing, parapets, crash barriers	As and when required/ Once every year
(iii)	Damaged/missing signs road requiring replacement	7 (seven) days
(iv)	Damage to road mark ups	7 (seven) days
(d)	**Road lighting**	
(i)	Any major failure of the system	24 (twenty four) hours
(ii)	Faults and minor failures	8 (eight) hours
(e)	**Trees and plantation**	
(i)	Obstruction in a minimum head- room of 5 m above carriageway or obstruction in visibility of road signs	24 (twenty four)hours
(ii)	Removal of fallen trees from carriageway	4 (four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiring replacement	30 (thirty) days
(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

Nature of Defect or deficiency		Time limit for repair/ rectification
(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	within 48 (forty eight) hours
	Permanent measures	within15 (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

Nature of Defect or deficiency		Time limit for repair/ rectification
(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

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 Panchayat and Pollution Control Board for installation of crushers;

(c) License for use of explosives;

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

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

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

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

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

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

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

Schedule-G

Schedule-G

(See Clauses 7.1 and 19.2)

Annex-I : Form of Bank Guarantee

(See Clause 7.1)

[Performance Security /Additional Performance Security]

To
National Highways & Infrastructure Development Corporation Ltd
Regional Office, Imphal
Manipur

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.

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

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

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

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the 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.

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

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

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

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

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

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

12. 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.

13. This guarantee shall also be operatable at our…….Branch at Imphal, 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.

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

[$] 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.

S.No.	Particulars	Details
1	Name of Beneficiary	NHIDCL, RO-Imphal
2	Beneficiary Bank Account No.	79513210000015
3	Beneficiary Bank Branch IFSC	CNRB0017951
4	Beneficiary Bank Branch Name	Canara Bank (erstwhile Syndicate Bank)
5	Beneficiary Bank Address	RIMS Road, Imphal

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

SIGNED, SEALED AND DELIVERED
For and on behalf of the Bank by:
(Signature)
(Name)
(Designation)
(Code Number)
(Address)

NOTES:

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

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

Annex - II

(Schedule - G)

(See Clause 19.2)

Annex – II: Form for Guarantee for Advance Payment

To

National Highways & Infrastructure Development Corporation Ltd
Regional Office, Imphal, Manipur

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 construction of the ***** section of [National Highway No. **] on Engineering, Procurement and Construction (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement

(B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing @Bank Rate + 3% advance payment (herein after called "**Advance Payment**") equal to 10% (ten per cent) of the Contract Price; and that the Advance Payment shall be made in two installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} installment of the Advance Payment is Rs._____cr. (Rupees_____crore) and the amount of this Guarantee is Rs._____cr. (Rupees_____crore) (the "**Guarantee Amount**")[2].

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

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

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

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

2 The Guarantee Amount should be equivalent to 110% of the value of the applicable instalment

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

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

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

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

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

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

7. The Guarantee shall cease to be in force and effect on ****[3] 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.

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

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

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

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

11. This Guarantee 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.

12. This guarantee shall also be operatable at our…….Branch at Imphal, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

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

S.No.	Particulars	Details
1	Name of Beneficiary	NHIDCL, RO-Imphal
2	Beneficiary Bank Account No.	79513210000015
3	Beneficiary Bank Branch IFSC	CNRB0017951
4	Beneficiary Bank Branch Name	Canara Bank (erstwhile Syndicate Bank)
5	Beneficiary Bank Address	RIMS Road, Imphal

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:
(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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 on the covering letter of issuing branch.

Schedule-H

Schedule-H

(See Clauses10.1 (iv) and 19.3)

1. Contract Price Weightages

1.1 The Contract Price for this Agreement is Rs. .....

1.2 Proportions of the Contract Price for different stages of Construction of the Project Highway shall be as specified below:

Item	Weightage in % of CP	Stage for Payment	Percentage
1	2	3	4
Restoration and Rehabilitation of Existing Road	100 %	**Repairing of existing road**	
		(1) Scarifying Existing Bituminous Layer	2.12%
		(2) Granular Sub- Base	3.03 %
		(3) Water Bound Macadam	4.59 %
		(4) Dense Bituminous Macadam	51.42 %
		(5) Bituminous Concrete	33.90 %
		(6) Prime Coat	3.47 %
		(7) Tack Coat	1.02 %
		(8) Hill Side Drain Clearance	0.45 %
		B.1-Reconstruction/New 2-Lane Realignment /Bypass (Flexible Pavement)	-
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) Non bituminous Base course	[Nil]
		(4) Dense Bituminous Macadam	[Nil]
		Bituminous Concrete	[Nil]
		B.2-Reconstruction/New 8-Lane Realignment/ Bypass (Rigid Pavement)	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) Dry Lean Concrete (DLC) Course	[Nil]
		(4) Pavement Quality Control (PQC) Course	[Nil]
		C.1-Reconstruction/ New Service Road (Flexible Pavement)(	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) Non bituminous Base course	[Nil]
		(4) Bituminous Basecourse	[Nil]
		(5) Wearing Coat	[Nil]
		C.2- Reconstruction/New Service road (Rigid Pavement)	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) Dry Lean Concrete (DLC) Course	[Nil]

		(4) Pavement Quality Control (PQC) Course	[Nil]
		D- Reconstruction & New Culverts on existing road, realignments, bypasses Culverts (length <6m)	[]

1.3 Procedure of estimating the value of work done

1.3.1 Road works

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

Table 1.3.1

Stage of Payment	Percentage weightage	Payment Procedure
Repairing of existing road		Unit of measurement is linear length. Payment of each stage shall be made on pro-rata basis on completion of a stage in a length of not less than 5 (five) percent of the total length.
(1) Scarifying Existing Bituminous Layer	2.12%	
(2) Granular Sub- Base	3.03 %	
(3) Water Bound Macadam	4.59 %	
(4) Dense Bituminous Macadam	51.42 %	
(5) Bituminous Concrete	33.90 %	
(6) Prime Coat	3.47 %	
(7) Tack Coat	1.02 %	
(8) Hill Side Drain Clearance	0.45 %	
B.1- Reconstruction/New2-Lane Realignment/Bypass(Flexible Pavement)		-
(1)Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Non bituminous Base course	[Nil]	
(4) Bituminous Base course	[Nil]	
(5) Wearing Coat	[Nil]	
B.2- Reconstruction/New 8-Lane Realignment/Bypass (Rigid Pavement)		-
(1)Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Dry Lean Concrete (DLC) Course	[Nil]	
(4) Pavement Quality Control (PQC) Course	[Nil]	
C.1- Reconstruction/New Service Road/ Slip Road (Flexible Pavement)		-
(1)Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Non bituminous Base course	[Nil]	
(4) Bituminous Basecourse	[Nil]	
(5) Wearing Coat	[Nil]	
C.2- Reconstruction/New Service road (Rigid Pavement)		-
(1)Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Dry Lean Concrete (DLC)Course	[Nil]	
(4) Pavement Quality Control (PQC) Course	[Nil]	
D-Reconstruction & New Culverts on		-

Stage of Payment	Percentage weightage	Payment Procedure
existing road, realignments, bypasses		
Culverts (length <6m)	[Nil]	

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

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

Where,

P = Contract Price

L = Total length in km

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

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

1.3.2 Minor Bridges and Underpasses/Overpasses.

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

1.3.3 Major Bridge works, ROB/RUB and Structures.

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

1.3.4 Other works.

Procedure for estimating the value of other works done shall be as stated in table 1.3.4

Table 1.3.4

Stage of Payment	Weightage	Payment Procedure
1	2	3
(1) Toll Plaza	[Nil]	
(2) Roadside drains	[Nil]	-
(3) Road signs, markings, km stones, safety devices etc.	[Nil]	
(4) Project Facilities	[Nil]	-
a) Bus Bays	[Nil]	
b) Truck Lay-byes	[Nil]	
c) Passenger Shelter	[Nil]	
d) Rest Area	[Nil]	
e) Diversion Works	[Nil]	

Stage of Payment	Weightage	Payment Procedure
(5) Road side Plantation including Horticulture in Wayside Amenities	[Nil]	-
(6) Repair of Protection Works other than approaches to the bridges, elevated sections/flyover/grade separators and ROBs/ RUBs	[Nil]	-
(7) Safety and traffic management during construction	[Nil]	-
(8) Protection Works	[Nil]	-
(a) Breast Wall	[Nil]	
(b) Toe Wall	[Nil]	
(c)Retaining Wall	[Nil]	
(c) Crash Barrier	[Nil]	
(9) Site Clearance & Dismantling	[Nil]	-
(10) Protection Works	[Nil]	-
(11) Tunnel	[Nil]	-

2. Procedure for payment for Maintenance

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

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

Schedule-I

Schedule - I

(See Clause 10.2 (iv))

1 Drawings

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

2 Additional Drawings

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

Annex – I

(Schedule - I)

List of Drawings

1 A minimum list of the drawings of the various components/elements of the project highway and project facility required to be submitted by the Contractor is given below:

a. Drawing of horizontal alignment, vertical profile and typical cross sections.

b. Drawings of cross drainage works, i.e. Bridges/Culverts/Flyovers and Other Structures;

c. Drawings of interchanges, major intersections and underpasses.

d. Drawing of control center.

e. Drawings of road furniture items including traffic signage, marking, safety barriers, etc.;

f. Drawings of traffic diversions plans and traffic control measures.

g. Drawings of road drainage measures.

h. Drawings of typical details slope protection measures.

i. Drawings of landscaping and horticulture.

j. Drawings of pedestrian crossing.

k. Drawings of street lighting.

l. General Arrangement showing Base Camp and Administrative Block.

m. Any other drawings as per instruction of Authority Engineer.

Schedule-J

Schedule-J

(See Clause 10.3 (ii))

PROJECT COMPLETION SCHEDULE

1 Project Completion Schedule

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

2 Project Milestone-I

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

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

3 Project Milestone-II

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

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

4 Project Milestone-III

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

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

5 Schedule Completion Date

i) The Scheduled Completion Date shall occur on the **183th**(One Hundred Eighty Three) 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

Schedule-K

(See Clause 12.1 (ii))

Tests on Completion

1 Schedule for Tests

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

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

2 Tests

i) Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include all the tests specified in IRC code, manual and MORTH specifications for the road and Bridge works, 5th revision, 2013.

ii) 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 [2,000 (two thousand)] mm for each kilometer.

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

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

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

3 Agency for conducting Tests

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

4 Completion Certificate

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

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

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

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

Schedule-L

Schedule-L

(See Clause 12.2)

COMPLETION CERTIFICATE

1 I, …….(Name of the Authority's Engineer), acting as Authority's Engineer, under and in accordance with the Agreement dated ……..(the "Agreement"), for construction of the "**Restoration & Rehabilitation of Imphal-Jiribam Road from Km 133.00 to Km 163.00 (Length: 30 Km) on NH-37 in the state of Manipur in the year 2021-2022 on EPC**" 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 safety and reliably placed in service of the Users thereof.

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

SIGNED, SEALED AND DELIVERED

For and on behalf of

The Authority's Engineer by:

(Signature)

(Name)

(Designation)

(Address)

Schedule-M

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 deduction shall continue to be made every month until compliance is done.

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

2 Percentage reductions in lump sum payments

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 crossfall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
(d)	**Roadside Drains**	
(i)	Cleaning and repair of drains	5%

(e)	**Road Furniture**	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th km stones	5%
(f)	**Miscellaneous Items**	
(i)	Removal of dead animals, broken down/accidented vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	**Defects in Other Project Facilities**	5%

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

R=P/100 x M xL1/L

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

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

L1 = Non-complying length

L = Total length of the road,

R = Reduction (the amount to be deducted for noncompliance 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 noncompliance.

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

Schedule-N

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 or 'Guidelines for Employment of Consultants under Japanese ODA Loans' or a combination of certain provisions 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 above Paragraphs 1.1 to 1.3, the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of this Schedule-N.

2 Terms of Reference

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

3 Appointment of Government entity as Authority's Engineer

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

Annex – I

(Schedule - N)

TERMS OF REFERENCE FOR AUTHORITY'S ENGINEER

1 Scope

i) These Terms of Reference (the "**TOR**") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated..... (the "**Agreement**), which has been entered into between the NHIDCL (the "**Authority**") and ..... (the "**Contractor**") for **"Restoration & Rehabilitation of Imphal-Jiribam Road from Km 133.00 to Km 163.00 (Length: 30 Km) on NH-37 in the state of Manipur in the year 2021-2022 on EPC.."** and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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 Clauses 1.2, 1.3 and 1.4 of the Agreement shall apply, mutatis mutandis, to this TOR.

3 General

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

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

(a) any Time extension;
(b) any additional cost to be paid by the Authority to the Contractor;
(c) the Termination Payment; or
(d) any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding 0.2% of Contract Price.

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 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 10.1.6. The Authority's Engineer shall complete such review and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

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

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

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

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

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

vii) The Authority's Engineer shall inspect the Construction Works and the Project Highway and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In

particular, the Authority's Engineer shall include in its Inspection Report, the compliance of the recommendations made by the Safety Consultant.

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

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

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

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

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

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

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

xvi) Authority's Engineer may recommend to the Authority suspension of the whole or part of

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

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

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

5 Maintenance Period

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

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

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

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

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

6 Determination of costs and time

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

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

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

7 Payments

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

(ii) Authority's Engineer shall -

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

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

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

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

8 Other duties and functions

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

9 Miscellaneous

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

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

(iii) Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as-built Drawings, in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Project

Highway as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project Highway and setback lines, if any, of the buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.

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

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

Schedule-O

SCHEDULE - O

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

Forms of Payment Statements

1 Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

(a) The estimated amount for the Works executed in accordance with Clause 19.3.1 subsequent to the last claim;

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

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

(d) Amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2.3 (a);

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

(f) Deductions:

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

(ii) Any amount towards deduction of taxes; and

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

(g) Net claim: (e) – (f) (iii);

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

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

(ii) For Change of Scope Orders, and

(iii) Taxes deducted

2 Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

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

(b) the deductions for maintenance work not done;

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

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

(e) amount towards deduction of taxes

3 Contractor's claim for Damages

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

Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

(f) the monthly payment admissible in accordance with the provisions of the agreement;

(g) the deductions for maintenance work not done;

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

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

(j) amount towards deduction of taxes

4 Contractor's claim for Damages

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

Schedule-P

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 last 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 paragraph 1.1 (a) and (b) above shall cover the authority and the Contractor against all loss or damage from whatsoever 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 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 arises from a cause occurring prior to the issue of 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 each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Paragraph l 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 the Contract Price.

(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 and 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

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 2,500 (two thousand five hundred) 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

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 **"Restoration & Rehabilitation of Imphal-Jiribam Road from Km 133.00 to Km 163.00 (Length: 30 Km) on NH-37 in the state of Manipur in the year 2021-2022 on EPC."**……. (Name of Contractor), hereby certify that the Tests on completion of Maintenance Period in accordance with Article 14 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement and I hereby certify that the Authority has Taken over the Project Highway from the Contractor on this day .....

SIGNED, SEALED AND DELIVERED

(Signature)
(Name and designation of Authority's Representative)
(Address)