Schedules

Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

1 TheSite

(i) Site of the 4-lane Project Highway shall include the land, buildings, structures and road works as described in Annex-I of thisSchedule-A.

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

(iv) The alignment plans of the Project Highway are specified in Annex-III. In the case of sections where no modification in the existing alignment of the Project Highway is contemplated, the alignment plan has not been provided. Alignment plans have only been given for sections where the existing alignment is proposed to be upgraded. The proposed profile of the Project Highways shall be followed by the contractor with minimum FRL as indicated in the alignment plan. The Contractor, however, improve/upgrade the Road Profile as indicated in Annex-III based on site/design requirement.

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

Annex – I

(Schedule-A)

Site

Through suitable drawings and description in words, the land, buildings, structures and road works comprising the Site shall be specified briefly but precisely in this Annex-I.

1. Site

The Site of the Project (4-Lane at-grade road)comprises the section ofNH-29 (Old NH-36) commencing from design ch.km 113+830 (existing Ch. km 113+300 of NH 29)) to km 145+712 (existing Ch. km 146+230 of NH 29) i.e.Daboka - Lahorijan section in the State ofAssam. The land, carriageway and structures comprising the Site are described below. The design Ch. Corresponding to existing Ch. Is presented below. All chainages in this section are design chainages.

Sl. No.	Existing KM Stone (NH-29)	Design Ch.(km)
1	115	115+360
2	116	116+310
3	117	NA
4	118	NA
5	119	NA
6	120	120+700
7	121	NA
8	122	NA
9	123	NA
10	124	NA
11	125	124+610
12	126	Bypass
13	127	Bypass
14	128	Bypass
15	129	Bypass
16	130	Bypass
17	131	130+660
18	132	131+650
19	133	132+640
20	134	133+630
21	135	134+610
22	136	135+650
23	137	136+620
24	138	137+610
25	139	138+580
26	140	139+560
27	141	140+550

Sl. No.	Existing KM Stone (NH-29)	Design Ch.(km)
28	142	141+540
29	143	142+510
30	144	143+550
31	145	144+460
32	146	145+480

2. Land

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

Design Chainage (km)	EROW (m) with respect to existing CL (approx.)
113+830 to 145+712	30m

3. Carriageway

The present carriageway of the Project Highway is double Lane with paved shoulderand earthen shoulder on both sides. Average width of the carriageway is9.0 to 10.0 m. The type of the existing pavement is flexible.

4. MajorBridges

The Site includes the following Major Bridges:

SL NO.	Existing Chainage	No. of Spans	Span Arrangement (m)	Clear Span (m)	Length of Bridge (m)	Clear Roadway Width (m) between kerbs	Total Width (m)	Width of Footpath (m)	Super structure Type
1	119+400	4	1x21.6+1x21.5+1x21.5+1x21.6	-	86.2	7.50	11.70	NA	RCC T Girder
2	127+700	3	3x22.4	22.0	67.2	9.20	10.20	NA	RCC T Girder

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

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

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

6. Gradeseparators

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. Minorbridges

The Site includes the following minor bridges:

SL NO.	Existing Chainage (km)	No. of Spans	Span Arrangement (m)	Length of Bridge (m)	Total Width (m)	Super structure Type
1	116+400	1	1x10.6	10.6	8.10	Solid Slab
2	118+700	1	1x15.1	15.1	10.80	RCC T Girder
3	119+900	2	2x10.5	21.0	11.70	Solid Slab
4	121+500	2	2x8.9	17.8	8.30	Solid Slab
5	129+100	1	1x22.4	22.4	8.20	RCC T Girder
6	131+900	2	2x7.6	15.2	8.1	Solid Slab
7	133+600	1	1x7.6	7.2	8.5	Solid Slab
8	134+700	1	1x23.6	23.6	8.5	RCC T Girder
9	140+400	1	1x22.5	22.5	8.2	RCC T Girder
10	142+700	2	1x6.1+1x6.2	12.3	8.5	Solid Slab
11	143+700	2	2x6.1	12.2	8.0	Solid Slab
12	144+100	2	2x7.0	14.0	8.5	Solid Slab
13	144+600	2	2x7.0	14.0	8.1	Solid Slab

8. Railway levelcrossings

The Site includes the following railway level crossings:

S. No.	Location (km)	Remarks
NIL		

9. Underpasses (vehicular, non-vehicular)

The Site includes the followingunderpasses:

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

10. Culverts

The Site has the following culverts:

Sl. No.	Existing Chainage (km)	Type of Culvert	Span Arrangement/Dia. (m)	Total Width of Structure (m)	Total Roadway Width (m)	Remarks
1	113+500	Pipe Culvert	1x1.2	13.2	12.1	Ext. Retain
2	113+600	HP Culvert	1x0.6	17.566	9.923	Reconstruction
3	114+500	HP Culvert	1x1.2	13.2	12.1	Ext. Retain
4	115+660	Pipe Culvert	1x0.6	17.98	12.54	Reconstruction
5	115+770	Pipe Culvert	1x0.6	17.64	11	Reconstruction
6	116+020	Pipe Culvert	1x0.6	17.6	11.2	Reconstruction
7	116+500	HP Culvert	1x1.2	22.82		Ext. Retain
8	116+650					Chocked
9	116+900					Chocked
10	117+120					Chocked
11	117+500					Chocked
12	118+200					Chocked
13	118+450					Chocked
14	118+800	HP Culvert				chocked
15	119+000					Chocked
16	119+320					Chocked
17	119+730					Chocked
18	121+300	HP Culvert				Chocked
19	121+800	HP Culvert	1x1.2	17.64	11	Ext. Retain
20	122+700					Chocked
21	123+500	HP Culvert				Chocked
22	124+300	HP Culvert				Chocked
23	124+400	HP Culvert				Chocked
24	124+800	HP Culvert				Chocked
25	127+500	HP Culvert	1x1.2	17.776	10.932	Ext. Retain
26	127+750	HP Culvert	1x1.2	17.725	11.703	Ext. Retain
27	128+120	HP Culvert	1x1.2	24.864	9.469	Ext. Retain
28	132+510	HP Culvert	1x1.0	27.6	12.5	Ext. Retain
29	133+900	HP Culvert	1x1.0	24.6	13.6	Ext. Retain
30	134+000	HP Culvert	1x1.0	24.4	12.8	Ext. Retain
31	134+950	HP Culvert	1x1.0	24.8	11.2	Ext. Retain
32	135+500	HP Culvert	1x1.0	17.4	12.5	Ext. Retain
33	135+730	HP Culvert	1x1.0	17.2	14.1	Ext. Retain
34	136+080	HP Culvert	1x0.6	14.9	12.7	Reconstruction
35	136+230	HP Culvert	1x1.2	16.5	10.1	Ext. Retain
36	136+460	HP Culvert	1x1.0	16.8	12.3	Ext. Retain
37	136+510	HP Culvert	1x1.2	17.1	10.1	Ext. Retain
38	136+820	HP Culvert	1x0.9	15.9	10.6	Ext. Retain
39	137+050	HP Culvert	1x0.6	17.2	10	Reconstruction
40	137+150	HP Culvert	2x1.0	16	11.2	Ext. Retain

Sl. No.	Existing Chainage (km)	Type of Culvert	Span Arrangement/Dia. (m)	Total Width of Structure (m)	Total Roadway Width (m)	Remarks
41	137+290	HP Culvert	1x1.0	15.7	10.6	Ext. Retain
42	137+340	HP Culvert	1x0.9	14.6	10	Realignment
43	137+670	HP Culvert	1x0.6	13.2	9.5	Realignment
44	138+030	HP Culvert	1x1.2	16.8	11.7	Ext. Retain
45	138+225	HP Culvert	1x1.2	17.1	11.5	Ext. Retain
46	138+495	HP Culvert	2x1.0	14.4	12.3	Ext. Retain
47	138+540	HP Culvert	1x1.2	16.6	13.5	Ext. Retain
48	138+720	HP Culvert	1x1.0	14	10.4	Ext. Retain
49	138+920	Under Construction				Under Construction
50	139+260	HP Culvert	1x1.2	14.7	11.6	Ext. Retain
51	139+330	HP Culvert	1x1.0	14.9	12.6	Ext. Retain
52	139+500	HP Culvert	1x1.2	19.5	12.5	Ext. Retain
53	139+550	HP Culvert	1x0.6	21.2	10.5	Reconstruction
54	139+840	HP Culvert	1x1.2	17.1	10.2	Ext. Retain
55	141+500	HP Culvert	2x1.0	17.43	10.8	Realignment
56	141+640	HP Culvert	2x1.2	15.5	10.6	Ext. Retain
57	141+700	HP Culvert	2x1.2	15.5	10.4	Ext. Retain
58	142+120	HP Culvert	1x0.6	21	11.5	Reconstruction
59	142+150	HP Culvert	1x0.6	20.7	11	Reconstruction
60	142+470	HP Culvert	1x1.2	14.7	12.6	Ext. Retain
61	143+440	HP Culvert	1x0.6	15.7	11.2	Reconstruction
62	145+080	HP Culvert	1x1.0	12.6	25	Ext. Retain
63	145+800	HP Culvert	1x1.0	13.6	31.2	Ext. Retain

11. Busbays

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

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

12. Truck Laybyes

The details of truck lay byes are as follows:

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

13. Road sidedrains

The details of the roadside drains are as follows:

S. No.	Location		Type	
	From km	to km	Masonry/cc (Pucca)	Earthen (Kutcha)
NIL				

14. Majorjunctions

The details of major junctions are as follows:

Sl No.	Existing Chainage (km)	Road Segment	Side	Destination	Surfacing Type	Carriageway Width (m)
1	128+350	NH-29	RHS	To Diphu	Bituminous	7.0
2	145+400	NH-29	LHS	To Sukhanjan/ Golaghat	Bituminous	7.0

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

15. Minorjunctions

The details of the minor junctions are as follows:

Sl No.	Existing Chainage (km)	Road Segment	Side	Destination	Category	Surfacing Type	Carriageway Width (m)
1	113+570	NH-29	RHS	To Village	-	Bituminous	3.5
2	117+500	NH-29	LHS	To Village	-	Bituminous	3.5
3	119+590	NH-29	LHS	To Siloni	-	Bituminous	3.5
4	121+110	NH-29	LHS	To Village	-	Bituminous	3.5
5	121+360	NH-29	LHS	To Longnit Borjan	-	Bituminous	3.5
6	127+300	NH-29	LHS	To Village	P.M.G.S.Y	Bituminous	3.5
7	131+770	NH-29	RHS	To Village	P.M.G.S.Y	Bituminous	3.5
8	143+950	NH-29	LHS	To Village	-	Bituminous	3.5

16. Bypasses

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

S. No.	Name of bypass (town)	Chainage (km) From km to km	Length (in Km)
NIL			

Annex – II

(As per Clause 8.3 (i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

The dates on which the Authority shall provide Right of Way of Construction Zone to the Contractor on different stretches of the Site are stated below:

Sl. No	Chainage (KM)		Length (km)	Width (m)		Total Width (m)	Date of providing Right of Way
	FROM	TO		Left	Right		
(i) Full Right of Way (full width)	113+830	125+600	11770	21	21	42	At appointed date
	125+600	127+000	1400	30	30	60	
	127+000	128+100	1100	21	21	42	
	128+100	128+450	350	30	30	60	
	128+450	128+650	200	21	21	42	
	128+650	129+600	950	30	30	60	
	129+600	130+000	400	21	21	42	
	130+000	130+600	600	30	30	60	
	130+600	131+152	552	21	21	42	
	131+152	133+625	2473	21	21	42	
	133+625	133+775	150	26	21	47	
	133+775	133+975	200	21	21	42	
	133+975	134+125	150	21	26	47	
	134+125	138+125	4000	21	21	42	
	138+125	138+275	150	26	21	47	
	138+275	138+425	150	21	21	42	
	138+425	138+575	150	21	26	47	
	138+575	141+540	2965	21	21	42	
	141+540	141+660	120	24	21	45	
	141+660	141+740	80	21	21	42	
	141+740	141+860	120	21	24	45	
	141+860	143+905	2045	21	21	42	
	143+905	144+055	150	26	21	47	
	144+055	144+425	370	21	21	42	
	144+425	144+575	150	21	26	47	
	144+575	144+760	185	21	21	42	
	144+760	145+150	390	24	21	45	
	145+150	145+712	562	21	21	42	

Sl. No	Chainage (KM)		Length (km)	Width (m)		Total Width (m)	Date of providing Right of Way
	FROM	TO		Left	Right		
(ii) Part Right of Way (part width)			NIL				
(a) Stretch							
(b) Stretch							
(c) Stretch							
(iii) Balance Right of Way (width)			NIL				
(a) Stretch							
(b) Stretch							
(c) Stretch							

Annex - III

(Schedule-A)

Alignment Plans

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

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

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

(Annexure-IV)
Schedule-A
Utilities

The Site includes the following Utilities:

(i) Electrical utilities

(a) Extra High-tension Lines

(EHTLines)

Sl no.	Chainage		Length (in Km)				Crossings				
	From	To	400KV	220KV	110KV	66KV	800KV	765KV	400KV	220KV	110KV
-	-	-	-	-	-	-	-	-	-	-	-

(b) High Tension/Low Tension Lines

(HT/LT Lines)

Sl no.	Chainage		Length (in Km)			Crossings			Transformer	
	From	To	33KV	11KV	LT	33KV	11KV	LT	No.	Capacity
1	113830	114000						1		
2	114000	115000		0.700			1	1		
3	115000	116000			0.3		1	1		
4	116000	117000		0.500	0.1		4	1		11KV(DTR)
5	117000	118000		0.500	0.1		3	1		63KV(DTR)
6	118000	119000		0.300	0.2		2			11KV(DTR)
7	119000	120000			0.100					37KV(DTR)
8	120000	121000		0.500	0.5			2		
9	121000	122000		0.200	0.15		2	2		
10	122000	123000		0.800			2	3		11KV(DTR)
11	123000	124000		0.400	0.3		3	1		
12	124000	125000		0.800	0.4			2		
13	125000	126000		0.200			1			
14	126000	127000		0.100	0.2		1	2		
15	127000	128000								
16	128000	129000		0.300			2	1		
17	129000	130000			0.2		1			

18	130000	131000		0.400	0.1		1	1		
19	131000	132000			0.792		1			
20	132000	133000					2			
21	133000	134000		0.350	0.300			1	1	63 KVA
22	134000	135000					4			
23	135000	136000		0.100						
24	136000	137000			0.600		5			
25	137000	138000		0.250			2			
26	138000	139000		0.300	0.500		2			
27	139000	140000			0.200		4	2	1	16 KVA
28	140000	141000		0.100			8		1	125 KVA
29	141000	142000		0.230	0.100		6	1		
30	142000	143000		0.050	0.300		2	1		
31	143000	144000		0.100	0.400			1		
32	144000	145000						1		
33	145000	146000								

(ii) Public Health utilities (Water/Sewage Pipe lines):

Sl no.	**Chainage**		**Length (in Km)**				**Crossings**			
	From	**To**	**Water Supply Line**		**Sewage Line**		**Water Supply Line**		**Sewage Line**	
			With Pumping	**With Gravity Flow**	**With Pumping**	**With Gravity Flow**	**With Pumping**	**With Gravity Flow**	**With Pumping**	**With Gravity Flow**
1	123+600	124+520		0.92						
2	124+520	124+600						1		
3	124+600	125+600		1.0						

Annex – V

(Schedule-A)

Environment Clearances

The following environment clearances have been obtained:

Environment Clearances is not applicable for the project

The following environment clearances are awaited:

-NIL-

Schedule - B

(See Clause 2.1)

Development of the Project Highway

1. Development of the ProjectHighway

Development of the Project Highway shall include design and construction of the Project Highway as described in this Schedule-B and in Schedule-C.

2. Rehabilitation andaugmentation

Rehabilitation and augmentationshall include four lane at grade improvement of the Project Highway as described in Annex-I of this Schedule-B and in Schedule-C.

3. Specifications andStandards

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 highway

Description of the Project Highway shall be given by the Authority in detail together with explanatory drawings (where necessary) to explain the Authority's requirements precisely in order to avoid subsequent changes in the Scope of the Project. The particulars that must be specified in this Schedule-B are listed below as per the requirements of the Manual of Specifications and Standards for Four Laning of Highways (IRC: SP:84-2019), referred to as the Manual. If any standards, specifications or details are not given in the Manual, the minimum design/construction requirements shall be specified in this Schedule. In addition to these particulars, all other essential project specific details, as required, should be provided in order to define the Scope of the Project clearly andprecisely.

1. Widening of the ExistingHighway

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

(ii) Width ofCarriageway

(a) In rural areas, at grade four-Laningwith paved shoulders shall be undertaken. The paved carriageway shall be 7(seven) m (excluding paved shoulder and kerb shyness) wide on either side in accordance with the typical cross section's drawings in theManual.

Provided that in the built-up areas: the width of the carriageway (either side) shall be as specified in the following table:

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

(b) Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1.1 above.

2. Geometric Design and GeneralFeatures

(i) General

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

(ii) Design speed

The design speed shall be the ruling design speed of 100 kmph in Plain/ Rolling terrain and 60 kmph in hilly terrain for this project.

(iii) Improvement of the existing roadgeometrics

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 beprovided:

Details of Proposed Bypasses:

Sl. No.	Design Ch.(km)		Length (m)	Remarks
	From	To		
1	125+340	130+630	5290	Manja Bypass

Details of Realignments:

Sl. No.	Design Ch.(km)		Length (m)	Remarks
	From	To		
1	114+470	114+590	120	Realignment
2	114+700	114+890	190	Realignment
3	114+940	115+170	230	Realignment
4	115+850	115+980	130	Realignment
5	116+180	116+500	320	Realignment
6	117+120	117+260	140	Realignment
7	117+570	117+710	140	Realignment
8	117+810	118+150	340	Realignment
9	118+250	118+420	170	Realignment
10	118+830	119+840	1010	Realignment
11	120+750	121+100	350	Realignment
12	121+330	121+470	140	Realignment
13	123+150	123+650	500	Realignment
14	130+840	130+990	150	realignment
15	132+900	133+200	300	Realignment
16	134+292	134+550	258	Realignment
17	134+700	134+900	200	Realignment
18	136+900	137+100	200	Realignment
19	137+200	137+500	300	Realignment
20	139+000	139+200	200	Realignment
21	139+430	139+550	120	Realignment
22	139+800	139+904	104	Realignment
23	139+927	140+100	173	Realignment
24	140+500	140+750	250	Realignment
25	141+000	141+200	200	Realignment

Sl. No.	Design Ch.(km)		Length (m)	Remarks
	From	To		
26	143+500	143+616	116	Realignment
27	143+624	143+800	176	Realignment
28	144+400	144+700	300	Realignment
29	145+200	145+550	350	Realignment

- These details are excluding of bridge length

(iv) Right ofWay

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

(v) Type ofshoulders

(a) In built-up sections, footpaths/fully paved shoulders shall be provided in either side in the followingstretches:

Sl. NO	Stretch		Fully paved shoulders/ footpaths	Width (m)		Reference to cross section
	From (km)	To (km)		Paved shoulder	Footpath	
NIL						

(b) In open country area, 2.5 m width paved shoulder on either side and 1.5m width Earthenshoulder has been proposed in TCS-1, 1A, 2

(c) In hilly area or cut section, 1.5 m width paved shoulder on either side and 1.0m width Earthen shoulder on valley side has been proposed in TCS-8, 8A, 9

(d) Design and specifications of paved shoulders and granular material shall conform to the requirements specified in the relevantManual.

(vi) Lateral and vertical clearances atunderpasses

(a) Lateralandvertical clearances and provision of guardrails/crash barriers shall be as per the provision of theManual.

(b) Lateral clearance: The width of the openingshall be as follows:

Sl. No	Chainage (km)	Type	Lateral clearance (m)	Minimum vertical clearance (m)
NIL				

(vii) Lateral and vertical clearances atoverpasses

(a) Lateral and vertical clearances at overpasses shall be as per the provision of theManual.

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

Sl. No	Chainage (km)	Type	Lateral clearance (m)	Minimum vertical clearance (m)
1	129+230	VOP	2 x 10.85	5.5

(viii) Serviceroads/Slip road

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

Sl No.	Location of Service/slip Road (km)		Right Hand Side (RHS) / Left Hand Side (LHS) / Both Sides	Length (km) of Service/slip Road	Remarks
	From	To			
NIL					

(ix) Grade separatedstructures

(a) Grade separated structures shall be provided as per provision of the relevant Manual. The requisite particulars are givenbelow:

Sl No.	Type of Underpasses	Design Chainage (km)	Span Arrangement (Nos. x Length in m)	Total Length (m)	Overall Width (m)	Structure Type
1	VOP	129+230	2 x 10.9	24.9	12	RCC Box

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

Sl. No.	Location	Type of structure Length (m)	Cross road			Remarks, if any
			Existing Level	Raised Level	Lowered Level	
1	129+230	VOP	166.542	-	-	-

(x) Cattle and pedestrian underpass/overpass

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

Sl. No.	Location	Type of crossing
NIL		

(xi) Typical cross-sections of the ProjectHighway

Typical cross section details are given below:

Sl. No.	Design Ch.(km)		Length(m)	TCS No.
	From	To		
1	113830	114020	190	2

Sl. No.	Design Ch.(km)		Length(m)	TCS No.
	From	To		
2	114020	114200	180	2
3	114200	114420	220	9
4	114420	114470	50	2
5	114470	114590	120	1A
6	114590	114640	50	2
7	114640	114700	60	2
8	114700	114890	190	1A
9	114890	114940	50	2
10	114940	115170	230	1A
11	115170	115300	130	1
12	115300	115360	60	2
13	115360	115520	160	2
14	115520	115590	70	1
15	115590	115750	160	2
16	115750	115850	100	2
17	115850	115980	130	1A
18	115980	116110	130	2
19	116110	116180	70	1
20	116180	116500	320	1A
21	116500	116635	135	2
22	116635	116645	11	STR
23	116645	117050	405	2
24	117050	117120	70	2
25	117120	117163	43	1A
26	117163	117178	15	1A
27	117178	117260	82	1A
28	117260	117410	150	2
29	117410	117470	60	2
30	117470	117540	70	1
31	117540	117570	30	2
32	117570	117710	140	1A
33	117710	117810	100	2
34	117810	118000	190	9
35	118000	118150	150	8A
36	118150	118250	100	1
37	118250	118420	170	1A
38	118420	118460	40	2
39	118460	118550	90	2
40	118550	118610	60	1
41	118610	118665	55	2
42	118665	118681	15	STR
43	118681	118710	29	2
44	118710	118830	120	2

Sl. No.	Design Ch.(km)		Length(m)	TCS No.
	From	To		
45	118830	119490	660	1A
46	119490	119580	90	STR
47	119580	119840	260	1A
48	119840	120200	360	1
49	120200	120310	110	2
50	120310	120420	110	1
51	120420	120590	170	2
52	120590	120750	160	2
53	120750	121100	350	1A
54	121100	121191	91	2
55	121191	121209	18	STR
56	121209	121330	121	2
57	121330	121470	140	1A
58	121470	121690	220	2
59	121690	121730	40	1
60	121730	121830	100	2
61	121830	122030	200	2
62	122030	122210	180	2
63	122210	122350	140	2
64	122350	122390	40	1
65	122390	122490	100	2
66	122490	122830	340	1
67	122830	122900	70	2
68	122900	123150	250	1
69	123150	123650	500	1A
70	123650	124210	560	2
71	124210	124480	270	2
72	124480	124625	145	2
73	124625	124780	155	2
74	124780	124970	190	2
75	124970	125340	370	2
76	125340	125560	220	1A
77	125560	125880	320	9
78	125880	126000	120	1A
79	126000	126300	300	9
80	126300	126866	566	1A
81	126866	126874	8	STR
82	126874	128293	1419	1A
83	128293	128308	15	STR
84	128308	128704	397	1A
85	128704	128716	12	STR
86	128716	128800	84	1A
87	128800	128932	132	1A

Sl. No.	Design Ch.(km)		Length(m)	TCS No.
	From	To		
88	128932	129022	90	STR
89	129022	129100	78	1A
90	129100	129130	30	1A
91	129130	129370	240	9
92	129370	129480	110	1A
93	129480	129740	260	9
94	129740	129870	130	1A
95	129870	130000	130	8A
96	130000	130300	300	9
97	130300	130400	100	1A
98	130400	130600	200	9
99	130600	130630	30	1A
100	130630	130840	210	2
101	130840	130990	150	1A
102	130990	131152	162	2
103	131152	131350	198	2
104	131350	131470	120	8
105	131470	131592	122	8
106	131592	131607.2	15.2	
107	131607.2	131720	112.8	2
108	131720	131800	80	8
109	131800	131920	120	8
110	131920	132030	110	2
111	132030	132110	80	8
112	132110	132250	140	2
113	132250	132420	170	8
114	132420	132500	80	2
115	132500	132600	100	8
116	132600	132900	300	2
117	132900	133200	300	1A
118	133200	133208	8	
119	133208	133720	512	2
120	133720	134200	480	8
121	134200	134268.2	68.2	2
122	134268.2	134291.8	23.6	
123	134291.8	134430	138.2	1A
124	134430	134550	120	8A
125	134550	134700	150	8
126	134700	134900	200	8A
127	134900	134950	50	8
128	134950	135200	250	2
129	135200	135300	100	8
130	135300	135400	100	2

Sl. No.	Design Ch.(km)		Length(m)	TCS No.
	From	To		
131	135400	135500	100	8
132	135500	135600	100	2
133	135600	135800	200	8
134	135800	136000	200	1A
135	136000	136100	100	2
136	136100	136200	100	1A
137	136200	136300	100	8
138	136300	136400	100	8
139	136400	136600	200	8
140	136600	136900	300	2
141	136900	136950	50	1A
142	136950	137220	270	9
143	137220	137500	280	1A
144	137500	137900	400	2
145	137900	138500	600	2
146	138500	138600	100	2
147	138600	138800	200	8
148	138800	139000	200	2
149	139000	139150	150	1A
150	139150	139200	50	8A
151	139200	139430	230	2
152	139430	139550	120	1A
153	139550	139800	250	2
154	139800	139904.3	104.3	1A
155	139904.3	139926.8	22.5	
156	139926.8	140100	173.2	1A
157	140100	140500	400	2
158	140500	140600	100	1A
159	140600	140750	150	8A
160	140750	140950	200	8
161	140950	141030	80	8
162	141030	141200	170	1A
163	141200	141700	500	2
164	141700	141800	100	2
165	141800	141950	150	8
166	141950	142189	239	2
167	142189	142201.2	12.2	
168	142201.2	142600	398.8	2
169	142600	142750	150	2
170	142750	143249	499	2
171	143249	143261.2	12.2	
172	143261.2	143500	238.8	2
173	143500	143616	116	1A

Sl. No.	Design Ch.(km)		Length(m)	TCS No.
	From	To		
174	143616	143624	8	
175	143624	143800	176	1A
176	143800	144093	293	2
177	144093	144107	14	
178	144107	144150	43	2
179	144150	144330	180	8
180	144330	144400	70	8
181	144400	144530	130	8A
182	144530	144700	170	1A
183	144700	145150	450	2
184	145150	145200	50	9
185	145200	145350	150	9
186	145350	145550	200	1A
187	145550	145712	162	2

Refer to Typical cross section drawing in Annexure III of schedule A

3. Intersections and GradeSeparators

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

Properly designed intersections shall be provided at the locations and of the types and features given in the tablesbelow:

(i) At-gradeintersections

Properly designed at grade intersections i.e major and minor intersection shall be provided at the locations and of the features given in the table below:

Sl. No.	Design Chainage (km)	Type of Intersection	Type	Side	Improvement Proposals
1	125+500	Major	3 - legged	Right	At Grade
2	130+500	Major	3 - legged	Right	At Grade
3	144+940	Major	3 legged	Left	At Grade

Sl. No.	Design Chainage (km)	Type of Intersection	Type	Side	Improvement Proposals
1	114+000	Minor	3 legged	Right	At Grade
2	114+530	Minor	3 legged	Right	At Grade
3	115+100	Minor	3 legged	Left	At Grade
4	116+500	Minor	3 legged	Left	At Grade
5	116+950	Minor	3 legged	Right	At Grade
6	117+420	Minor	3 legged	Left	At Grade
7	118+200	Minor	3 legged	Left	At Grade
8	119+860	Minor	3 legged	Left	At Grade

Sl. No.	Design Chainage (km)	Type of Intersection	Type	Side	Improvement Proposals
9	120+660	Minor	3 legged	Left	At Grade
10	121+300	Minor	3 legged	Right	At Grade
11	121+950	Minor	3 legged	Both	At Grade
12	123+800	Minor	3 legged	Left	At Grade
13	124+000	Minor	3 legged	Right	At Grade
14	124+600	Minor	3 legged	Left	At Grade
15	125+890	Minor	3 legged	Both	At Grade
16	126+850	Minor	3 legged	Both	At Grade
17	129+190	Minor	4 legged	Both	Grade Separated
18	131+480	Minor	3 legged	Right	At Grade
19	131+940	Minor	3 legged	Right	At Grade
20	132+170	Minor	3 legged	Left	At Grade
21	132+880	Minor	3 legged	Left	At Grade
22	133+370	Minor	3 legged	Left	At Grade
23	135+100	Minor	3 legged	Left	At Grade
24	135+640	Minor	3 legged	Left	At Grade
25	135+770	Minor	3 legged	Left	At Grade
26	139+650	Minor	3 legged	Left	At Grade
27	139+760	Minor	3 legged	Right	At Grade
28	140+680	Minor	3 legged	Left	At Grade
29	140+950	Minor	4 Legged	Both	At Grade
30	141+650	Minor	3 legged	Left	At Grade
31	142+120	Minor	3 legged	Right	At Grade
32	143+480	Minor	4 Legged	Both	At Grade
33	143+950	Minor	3 legged	Left	At Grade
34	144+680	Minor	3 legged	Left	At Grade
35	144+770	Minor	3 legged	Left	At Grade

Note: In case any additional junction is identified during construction period, the same shall be improved as per manual and will not qualify for Change of Scope

(ii) Grade separated intersection with/withoutramps

Sl No.	Type of Intersection	Design Chainage (km)	Span Arrangement (Nos. x Length in m)	Total Length (m)	Overall Width (m)	Structure Type
1	Minor (VOP)	129+230	2 x 10.9	24.9	12	RCC Box

4. Road Embankment and CutSection

(i) Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/ cuttings shall conform to the Specifications and Standards given in Section 4 of the Manual and the specified cross-sectional details. Deficiencies in the plan and profile of the existing road shall becorrected.

(ii) Raising of the existing road as per Section 4 of the Manual
The existing road shall be raised in the following sections:

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

5. Pavement Design

(i) Pavement design shall be carried out in accordance with the provision of section 5 of the Manual.

(ii) Type ofpavement

Flexible pavement shall be proposed at the entire project road except toll plaza location. Rigid pavement shall be proposed at toll plaza location.

(iii) Design requirements

Design of new pavement has been carried out based on IRC: 37-2018 "Guidelines for the design of Flexible Pavements"

(a) Design Period andstrategy

Flexible pavement for new pavement or for widening and strengthening of the existing pavement shall be designed for a minimum design period of 15 years. Stage construction shall not be permitted.

(b) Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for minimum design traffic of 20 msa. However, in case the traffic is more than 20 msa at the time of design of project highway, then the higher design traffic will be adopted for pavement design.
Service Roads/ Slip Roads shall be designed for 10 msa design traffic.

(c) Design Subgrade CBR

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for minimum subgrade CBR of 8%.

(iv) Reconstruction ofstretches

Contractor shall investigate the existing pavement and finalize the reconstruction stretch in consultation with Authority's Engineer.
Those shall be designed as new pavement.

(v) Overlaystretches

Contractor shall investigate the existing pavement and finalize the overlay stretch in consultation with Authority's Engineer. However, the overlay thickness will not be less than 30mm BC & 70mm DBM

6. Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per section 6 of the manual and as per cross section schedule provided as Annexure -I to this schedule.

- Lined trapezoidal drain (min area 0.4 sqm) need to be provided at hill side with a minimum length of 8782m.
- Unlined trapezoidal drain needs to be provided at both side in rural area with a minimum length of 52834m.
- RCC Covered drain need to be provided at both side in built up area, at Major Junction of Dillaiand truck lay bye areawith a minimum length of 1600 m.
- Median Drain need to be provided in super elevation stretch with a minimum length of 11950m

Note: The length of lined drain as specified is indicative. In case any additional length is identified during construction period, the same shall be improved as per manual and will not qualify for Change of Scope.
The EPC Contractor shall ensure proper functioning of road side drain by designing them as per site condition and considering the outfall location.

7. Design ofStructures

(i) General

(a) All Grade separator, Bridges, culverts and structures shall be designed and constructed in accordance with the section 7 of the Manual and shall conform to the cross- sectional features and other details specifiedtherein.

(b) Width of the carriageway of new bridges shall be asfollows:

Sl No	Design Chainage (km)	Proposed Span Arrang (No. of Span x Span length in m)	Proposed Total Length (m)	Width of proposed structure (m)	Proposed Type of Superstructure	Improvement Proposal	Remarks
1	118+763	1x15.1	15.1	2x13.5	RCC T-Girder	New 4 lane	Realignment
2	119+535	3x30	90.0	2x13.5	PSC I-Girder	New 4 lane	New Construction (Realignment)

Sl No	Design Chainage (km)	Proposed Span Arrang (No. of Span x Span length in m)	Proposed Total Length (m)	Width of proposed structure (m)	Proposed Type of Superstructure	Improvement Proposal	Remarks
3	126+870	1x7.5	7.5	2x13.5	RCC Box	New 4 lane	New Construction (Bypass)
4	128+320	2x7.5	15.0	2x13.5	RCC Box	New 4 lane	New Construction (Bypass)
5	128+727	2x6.0	12.0	2x13.5	RCC Box	New 4 lane	New Construction (Bypass)
6	128+950	3x30.0	90.0	2x13.5	RCC T Girder	New 4 lane	New Construction (Bypass)
7	139+915	1x22.5	23	2x13.5	RCC T-Girder	New 4 lane	Realignment
8	143+620	1x8.0	8	2x13.5	RCC Box	New 4 lane	Realignment

Width of the carriageway of new grade separator structure shall be asfollows:

Sl No.	Type of Intersection	Design Chainage (km)	Span Arrangement (Nos. x Length in m)	Total Length (m)	Overall Width (m)	Structure Type
1	Minor (VOP)	129+230	2 x 10.85	24.9	12	RCC Box

(c) The following structures shall be provided withfootpaths:

Sl N-o.	Design Chainage (km)	Remarks
1	116+640	-
2	118+673	-
3	119+535	-
4	121+200	-
5	126+870	-
6	128+320	-
7	128+727	-
8	128+950	-
9	131+600	-
10	133+210	-
11	134+270	-
12	139+915	-
13	142+195	-
14	143+255	-
15	143+620	-
16	144+100	-

(d) All bridges shall be high-levelbridges

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

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

(f) Cross-section of the new culverts for the Project Highway shall conform to the typical cross-sections given in the section 7 of the Manual.

(ii) Culverts

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

(b) Reconstruction of existingculverts:

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

Sl. No.	Design Chainage (km)	Type of Existing Culvert	Existing Span Arrangement/ Dia. (m)	Type of Proposed Culvert	Proposed Span Arrangement (m)	Improvement Proposal	Remarks
1	114+090	HP Culvert	1x0.6	Pipe Culvert	1x1.2	New 4Lane	Reconstruction
2	115+765			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
3	115+920			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
4	115+980	Pipe Culvert	1x0.6	Pipe Culvert	1x1.2	New 4Lane	Reconstruction
5	116+090	Pipe Culvert	1x0.6	Pipe Culvert	1x1.2	New 4Lane	Reconstruction
6	116+340	Pipe Culvert	1x0.6	Pipe Culvert	1x1.2	New 4Lane	Reconstruction
7	116+525			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
8	116+920			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
9	117+350			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
10	117+530			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
11	117+780			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
12	117+920			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
13	118+350			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
14	118+470			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
15	120+000			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
16	120+250			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
17	120+630			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
18	122+340			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
19	123+060	HP Culvert		Pipe Culvert	1x1.2	New 4Lane	Reconstruction
20	123+600			Pipe Culvert	1x1.2	New 4Lane	Reconstruction
21	123+820	HP Culvert		Pipe Culvert	1x1.2	New 4Lane	Reconstruction
22	124+220	HP Culvert		Pipe Culvert	1x1.2	New 4Lane	Reconstruction

Sl. No.	Design Chainage (km)	Type of Existing Culvert	Existing Span Arrangement/ Dia. (m)	Type of Proposed Culvert	Proposed Span Arrangement (m)	Improvement Proposal	Remarks
23	124+330	HP Culvert		Pipe Culvert	1x1.2	New 4Lane	Reconstruction
24	135+660	HP Culvert	1x0.6	Pipe Culvert	1x1.2	New 4Lane	Reconstruction
25	136+630	HP Culvert	1x0.6	Pipe Culvert	1x1.2	New 4Lane	Reconstruction
26	139+130	HP Culvert	1x0.6	Pipe Culvert	1x1.2	New 4Lane	Reconstruction
27	141+700	HP Culvert	1x0.6	Pipe Culvert	1x1.2	New 4Lane	Reconstruction
28	141+730	HP Culvert	1x0.6	Pipe Culvert	1x1.2	New 4Lane	Reconstruction
29	143+020	HP Culvert	1x0.6	Pipe Culvert	1x1.2	New 4Lane	Reconstruction

Note: The span and opening of these culverts as specified are indicative. The design of waterway has to be done as per site requirement, considering the site requirements. Change in this configuration **shall not attract provisions of Article of this Agreement**

(c) Widening of existingculverts:

All existing culverts which are not to be reconstructed shall be widened tothe roadway width of the Project Highway as per the typical cross section given in the section 7 of the Manual. Repairs and strengthening of existing structures where required shall be carried out.

Sl. No.	Design Chainage (km)	Type of Existing Culvert	Existing Span Arrangement/Dia. (m)	Type of Proposed Culvert	Proposed Span Arrangement (m)	Improvement Proposal	Remarks
1	113+935	Pipe Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
2	114+820	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
3	116+770	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
4	121+520	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
5	124+740	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
6	124+980	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
7	125+260	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
8	132+160	HP Culvert	1x1.0	Pipe Culvert	1x1.0	New 2Lane	Ext. Retain
9	133+510	HP Culvert	1x1.0	Pipe Culvert	1x1.0	New 2Lane	Ext. Retain
10	133+600	HP Culvert	1x1.0	Pipe Culvert	1x1.0	New 2Lane	Ext. Retain
11	134+530	HP Culvert	1x1.0	Pipe Culvert	1x1.0	New 2Lane	Ext. Retain
12	135+080	HP Culvert	1x1.0	Pipe Culvert	1x1.0	New 2Lane	Ext. Retain
13	135+310	HP Culvert	1x1.0	Pipe Culvert	1x1.0	New 2Lane	Ext. Retain
14	135+810	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
15	136+040	HP Culvert	1x1.0	Pipe Culvert	1x1.0	New 2Lane	Ext. Retain
16	136+090	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
17	136+400	HP Culvert	1x0.9	Pipe Culvert	1x0.9	New 2Lane	Ext. Retain
18	136+730	HP Culvert	2x1.0	Pipe Culvert	2x1.0	New 2Lane	Ext. Retain
19	136+870	HP Culvert	1x1.0	Pipe Culvert	1x1.0	New 2Lane	Ext. Retain
20	137+610	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
21	137+805	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain

Sl. No.	Design Chainage (km)	Type of Existing Culvert	Existing Span Arrangement/Dia. (m)	Type of Proposed Culvert	Proposed Span Arrangement (m)	Improvement Proposal	Remarks
22	138+075	HP Culvert	2x1.0	Pipe Culvert	2x1.0	New 2Lane	Ext. Retain
23	138+120	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
24	138+300	HP Culvert	1x1.0	Pipe Culvert	1x1.0	New 2Lane	Ext. Retain
25	138+500	HP Culvert	Under Construction	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
26	138+840	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
27	138+910	HP Culvert	1x1.0	Pipe Culvert	1x1.0	New 2Lane	Ext. Retain
28	139+080	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
29	139+420	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
30	141+220	HP Culvert	2x1.2	Pipe Culvert	2x1.2	New 2Lane	Ext. Retain
31	141+280	HP Culvert	2x1.2	Pipe Culvert	2x1.2	New 2Lane	Ext. Retain
32	142+050	HP Culvert	1x1.2	Pipe Culvert	1x1.2	New 2Lane	Ext. Retain
33	144+660	HP Culvert	1x1.0	Pipe Culvert	1x1.0	New 2Lane	Ext. Retain
34	145+380	HP Culvert	1x1.0	Pipe Culvert	1x1.0	New 2Lane	Ext. Retain

Note: The span and opening of these culverts as specified are indicative. The design of waterway has to be done as per site requirement, considering the site requirements. Change in this configuration **shall not attract provisions of Article of this Agreement**

(d) Additional new culverts shall be constructed as per particulars given in the tablebelow:

Sl. No.	Design Chainage (km)	Type of Proposed Culvert	Proposed Span Arrangement (m)	Improvement Proposal
1	114+570	Pipe Culvert	1x1.2	New 4Lane
2	117+660	Pipe Culvert	1x1.2	New 4Lane
3	118+060	Pipe Culvert	1x1.2	New 4Lane
4	118+390	Pipe Culvert	1x1.2	New 4Lane
5	118+660	Pipe Culvert	1x1.2	New 4Lane
6	118+850	Pipe Culvert	1x1.2	New 4Lane
7	120+510	Pipe Culvert	1x1.2	New 4Lane
8	120+900	Pipe Culvert	1x1.2	New 4Lane
9	121+330	Pipe Culvert	1x1.2	New 4Lane
10	123+300	Pipe Culvert	1x1.2	New 4Lane
11	123+540	Pipe Culvert	1x1.2	New 4Lane
12	125+960	Pipe Culvert	1x1.2	New 4Lane
13	126+220	Pipe Culvert	1x1.2	New 4Lane
14	126+570	Pipe Culvert	1x1.2	New 4Lane
15	126+760	Pipe Culvert	1x1.2	New 4Lane
16	127+080	Pipe Culvert	1x1.2	New 4Lane
17	127+280	Pipe Culvert	1x1.2	New 4Lane

Sl. No.	Design Chainage (km)	Type of Proposed Culvert	Proposed Span Arrangement (m)	Improvement Proposal
18	127+580	Pipe Culvert	1x1.2	New 4Lane
19	127+940	Pipe Culvert	1x1.2	New 4Lane
20	128+210	Pipe Culvert	1x1.2	New 4Lane
21	128+550	Pipe Culvert	1x1.2	New 4Lane
22	128+860	Pipe Culvert	1x1.2	New 4Lane
23	129+290	Pipe Culvert	1x1.2	New 4Lane
24	129+600	Pipe Culvert	1x1.2	New 4Lane
25	129+850	Pipe Culvert	1x1.2	New 4Lane
26	130+220	Pipe Culvert	1x1.2	New 4Lane
27	130+480	Pipe Culvert	1x1.2	New 4Lane
28	130+620	Pipe Culvert	1x1.2	New 4Lane
29	130+850	Pipe Culvert	1x1.2	New 4Lane
30	130+950	Pipe Culvert	1x1.2	New 4Lane
31	136+920	Pipe Culvert	1x1.2	New 4Lane
32	137+250	Pipe Culvert	1x1.2	New 4Lane
33	141+080	Pipe Culvert	2x1.2	New 4Lane
34	143+700	Pipe Culvert	3x1.2	New 4Lane

Note: The span and opening of these culverts as specified are indicative. The design of waterway has to be done as per site requirement, considering the site requirements. Change in this configuration **shall not attract provisions of Article of this Agreement**

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

Sl. No.	Location at km	Type of repair required
Locations as mentioned in Para 7 II-(c), above. All necessary repairs as per Manual		

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

(iii) Bridges: NIL

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

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

Sl No	Design Chainage (km)	Proposed Span Arrang (No. of Span x Span length in m)	Proposed Category	Proposed Total Length (m)	Width of proposed structure (m)	Proposed Type of Superstructure	Improvement Proposal	Remarks
1	133+210	1x8.0	MNB	8	2x13.5	RCC Box	New 4 lane	Reconstruction

Note: The span and opening of these bridges as specified are indicative. The design of waterway has to be done as per site requirement, considering the site requirements. Change in this configuration **shall not attract provisions of Article of this Agreement**

(ii) The following narrow bridges shall bewidened:

Sl No	Design Chainage (km)	Proposed Span Arrang (No. of Span x Span length in m)	Proposed Total Length (m)	Width of proposed structure (m)	Proposed Type of Superstructure	Improvement Proposal	Remarks
1	116+640	1x10.6	10.6	Widening + 13.5	RCC Box	New 2 lane	Widening
2	121+200	2x8.9	17.8	Widening + 13.5	RCC Box	New 2 lane	Widening
3	131+600	2x7.6	15	Widening + 13.5	RCC Box	New 2 lane	Widening
4	134+270	1x23.6	24	Retain + 13.5	RCC T-Girder	New 2 lane	Retain & Repair
5	142+195	2x6.1	12	Widening + 13.5	RCC Box	New 2 lane	Widening
6	143+255	2x6.1	12	Widening + 13.5	RCC Box	New 2 lane	Widening
7	144+100	2x7.0	14	Widening + 13.5	RCC Box	New 2 lane	Widening

Note: The span and opening of these bridges as specified are indicative. The design of waterway has to be done as per site requirement, considering the site requirements. Change in this configuration **shall not attract provisions of Article of this Agreement**

(b) Additional newbridges:

New bridges at the following locations on the Project Highway shall be constructed. GADs for the new bridges are attached in the drawings folder.The details is given below:

Sl No	Design Chainage (km)	Proposed Span Arrang (No. of Span x Span length in m)	Proposed Total Length (m)	Width of proposed structure (m)	Proposed Type of Superstructure	Improvement Proposal	Remarks
1	118+673	1x15.1	15.1	2x13.5	RCC T-Girder	New 4 lane	MNB
2	119+535	3x30	90	2x13.5	PSC I-Girder	New 4 lane	MJB
3	126+870	1x7.5	7.5	2x13.5	RCC Box	New 4 lane	MNB
4	128+320	2x7.5	15	2x13.5	RCC Box	New 4 lane	MNB
5	128+727	2x6.0	12	2x13.5	RCC Box	New 4 lane	MNB

Sl No	Design Chainage (km)	Proposed Span Arrang (No. of Span x Span length in m)	Proposed Total Length (m)	Width of proposed structure (m)	Proposed Type of Superstructure	Improvement Proposal	Remarks
6	128+950	3x30.0	90	2x13.5	PSC I-Girder	New 4 lane	MJB
7	139+915	1x22.5	23	2x13.5	RCC T-Girder	New 4 lane	MNB
8	143+620	1x8.0	8	2x13.5	RCC Box	New 4 lane	MNB

Note: The span and opening of these bridges as specified are indicative. The design of waterway has to be done as per site requirement, considering the site requirements. Change in this configuration **shall not attract provisions of Article of this Agreement**

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

Sl No	Design Chainage (km)	Proposed Span Arrang (No. of Span x Span length in m)	Proposed Total Length (m)	Width of proposed structure (m)	Proposed Type of Superstructure	Improvement Proposal	Remarks
1	134+270	1x23.6	24	Retain + 13.5	RCC T-Girder	New 2 lane	Retain & Repair

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

Sl No	Design Chainage (km)	Proposed Span Arrang (No. of Span x Span length in m)	Proposed Total Length (m)	Width of proposed structure (m)	Proposed Type of Superstructure	Improvement Proposal	Remarks
1	134+270	1x23.6	24	Retain + 13.5	RCC T-Girder	New 2 lane	Retain & Repair

(e) Drainage system for bridgedecks

An effective drainage system for bridge decks shall be provided as specified in section 7 of the Manual

(f) Structures in marineenvironment

NIL

(iv) Rail-roadbridges: NIL

(a) Design, construction and detailing of ROB/RUB shall be as specified in the provision of Manual.

(b) Roadover-bridges

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

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

(c) Roadunder-bridges

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

Sl.	Location of Level crossing (Chainage	Number and length of
NIL		

(v) Grade separatedstructures

Design of grade separator shall be as per section 7 of the manual. Locations and type of the grade separated structures specified in paragraphs 2 (ix).

(vi) Repairs and strengthening of bridges andstructures

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

(a) Bridges

Sl. No.	Location of bridge (km)	Nature and extent of repairs /strengthening to be carried out
1	134+270	As decided by AE as per site requirement

(b) ROB /RUB

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

(c) Overpasses/Underpasses and otherstructures

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

(vii) List of Major Bridges andStructures

The following is the list of the Major Bridges andStructures:

Sl no.	Design Chainage (km)	Proposed Span Arrang (No. of Span x Span length in m)	Proposed Category	Proposed Total Length (m)	Width of proposed structure (m)	Proposed Type of Superstructure
1	119+535	3x30	MJB	90	2x13.5	PSC I-Girder
2	128+977	3x30.0	MJB	90	2x13.5	PSC I-Girder

8. Traffic Control Devices and Road SafetyWorks

(i) Traffic control devices and road safety works shall be provided in accordance with section 9 of the Manual.

(ii) Specificationsofthereflectivesheeting should be of high intensity grade with encapsulated lens or with micro prismatic retro reflective element in accordance with ASTM Standard D 4956 – 04

9. RoadsideFurniture

(i) Roadside furniture shall be provided in accordance with the provision of section 9 of the Manual.

(ii) Overhead traffic signs:

Minimum 3 nos. overhead traffic signs shall be provided for the project stretch.

Note: The exact location of Signs and size shall be finalized as per provisions in Manual and as per site conditions.

10. CompulsoryAfforestation

Compulsory afforestation should be as per section 11 of the manual

11. HazardousLocations

Metal Beam Crash Barrier:
Metal Beam Crash Barrier need to be provided as per site requirement with a minimum length of 36742m

Note: The length of crash barrier is indicative. In case any additional length is identified during construction period, the same shall be improved as per manual and will not qualify for Change of Scope

12. Special Requirement for HillRoads

Breast Wall:
Breast need to be provided at hill side with a minimum length of 4662m

Soil Nailing:
Soil nailing need to be provided at cut section with a minimum area of 1250sqm.

Lined Drain:
Trapezoidal Lined drain need to be provided at hill side with a minimum length of 9082m

Note: The lengths of these protection works are indicative. In case any additional length is identified during construction period, the same shall be improved as per manual and will not qualify for Change of Scope

13. Special Requirement for High Embankment Zone

Toe Wall:
Toe wall need to be provided at high embankment location with a minimum length of 3240m

Note: The lengths of these protection works are indicative. In case any additional length is identified during construction period, the same shall be improved as per manual and will not qualify for Change of Scope

14. Utilities

A minimum 2m wide strip of land at the extreme edge of ROW shall be kept for

accommodating utilities.

Utility duct shall be provided as per Schedule –C.

15. Change ofScope

The length of Structures and bridges specified hereinabove shall be treated as an approximate assessment. The actual lengths as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

(Schedule B-1)

1. The shifting of utilities and felling of trees shall be carried out by the Contractor. The cost of the same shall be borne by the Authority. The details of utilities are asfollows:

Sr. No	Type of Utility	Unit	Quantity
A			
A1	33 KV (HT) Pole	Nos.	288
A2	LT Pole	Nos.	
A3	11 KV Pole	Nos.	
A4	Transformers	Nos.	7
B			
B1	Water Pipe Line	meters	2290
C	***Felling of Tress***	***Nos.***	***8080***
Note: The quantity given above is indicative, the contractor has to finalize the actual requirement of shifting various utilities in due consultation with Authority's Engineer and Authority, duly verified by the concerned utility authorities and approved by Authority			

Sheet-II (Annexure-I to Sch-B1)

Utility Shifting

Shifting of obstructing existing utilities indicated in Schedule A to an appropriate location in accordance with the standards and Specification of concern Utility Owning Departments is a part of scope of work for the Contractor/Concessionaire. The bidder may visit the site and assess the quantum of shifting of utilities for the project before submission of the bid. Copy of Utility relocation plan is enclosed. The specifications of concerned Utility Owning Department shall be applicable and followed.

Notes:

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

(b) The supervision charges at the rates/charges applicable of the Utility Owning Department shall be paid directly by the Authority to the Utility owning Department as and when Contractor / Concessionaire furnishes demand of Utility Owning Department along with a copy of estimates cost given by the utility owning agencies.

(c) The dismantled material /scrap of existing Utility to be shifted/dismantled shall belong to the Contractor/Concessionaire who would be free to dispose-off the dismantled material as deemed fit by them unless the Contractor/Concessionaire is required to deposit the dismantled material to utility owning department as per the norms and practice and, in that case the amount of credit for dismantled material may be availed by the Contractor/Concessionaire as per the estimate agreed between them.

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

Note II: - Copy of Utility shifting plans enclosed as Annexure II to Schedule-B1

Schedule - C

(See Clause 2.1)

Project Facilities

1. ProjectFacilities

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

(a) tollplaza;

(b) roadsidefurniture;

(c) Street lighting;

(d) pedestrianfacilities;

(e) treeplantation;

(f) trucklay-byes;

(g) bus-bays and busshelters;

(h) rest areas;and

(i) others to bespecified

2. Description of ProjectFacilities

Each of the Project Facilities is described below:

(a) Toll Plaza

Toll plaza shall be designed as per the guidelines of the manual and it is provided at following locations: -

Sl. No.	Location(Design km)
Nil	

(b) Road side Furniture

The roadside furniture shall include the provision of the;

i. Traffic Signs

Traffic signs include roadside signs, overhead signs, curb mounted signs etc. provided for the entire Project Highway as per Manual.

ii. Pavement Markings

Pavement markings shall cover road marking provided for the entire Project Highway as per Manual.

iii. LED Traffic Blinkers

LED Traffic Blinker signal provided for entire project as per Manual.

iv. Delineators

Delineators for the entire Project Highway at the locations as suggested in IRC Manual.

v. Boundary stones

For the entire Project Highway as suggested in relevant IRC Manual.

vi. Hectometer / Kilometer stones

For the entire Project Highway as suggested in relevant IRC Manual.

(c) Street Lighting

Lighting shall be provided at the following locations:

i. Lighting shall be provided at built up areas, bus stops, and as per manual recommended in Schedule D.

ii. High Mast Lighting shall be provided at Major Junction,

The EPC Contractor will obtain all permissions / load sanctions / power supply, etc. from the Electricity Authorities. The Contractor shall be solely responsible for submission of application along with all necessary documents to supply authority. Further the Contractor shall be responsible for follow up of the application and getting the release of the supply to lighting. All statutory approvals / permissions have to be obtained by the Contractor for energizing / operating the lights.

(d) pedestrianfacilities;

Pedestrian facilities shall be provided at the locations of urban sections in order to ensure safety of pedestrians while crossing in consultation with NHIDCL and as per manual

(e) treeplantation;

Landscaping and Tree plantation shall be provided. The location for these provisions shall be finalized in consultation with Independent Engineer

(f) trucklay-byes;

Truck lay bays shall be provided at locations given below:

Sl no.	Design Chainage(km)	Side
1	114+400	RHS
2	114+500	LHS
3	141+600	LHS

4	141+800	RHS

(g) bus-bays and busshelters;

Bus bays shall be provided at locations given below:

Sl. No.	Design Chainages (km)	Side
1	115+000	BOTH
2	118+050	BOTH
3	120+130	LHS
4	120+360	RHS
5	123+900	BOTH
6	133+700	LHS
7	134+050	RHS
8	138+200	LHS
9	138+500	RHS
10	143+980	LHS
11	144+500	RHS

(h) Rest Areas

NIL

(i) Utilities

Provision of accommodating utilities shall be made within utility corridor on either side of Project Highway. At an interval of 0.5 Km, utility ducts in form of NP-4 Hume Pipe shall be provided across the Project Highway and along with inspection chamber as per IRC: SP: 84-2019 requirements. Location & diameter for such utility crossing shall be finalized in consultation with Authority Engineer & concerned Utility Agency.

Schedule - D

(See Clause 2.1)

Specifications and Standards

1. Construction

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

2. Design Standards

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

Manual of Specifications and Standards for Four Laning of Highways (IRC: SP: 84 2019), referred to herein as the Manual

Annex –

I*(Schedule-D)*

Specifications and Standards for Construction

1. Specifications andStandards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Four-Laning of Highways (IRC: SP:84-2019), 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'sEngineer.

2. Deviations from the Specifications andStandards

(i) The terms "Concessionaire", "Independent Engineer" and "Concession Agreement" used in the Manual shall be deemed to be substituted by the terms "Contractor", "Authority's Engineer" and "Agreement"respectively.

(ii) Notwithstanding anything to the contrary contained in Paragraph 1 above, the following Specifications and Standards shall apply to the Project Highway, and for purposes of this Agreement, the aforesaid Specifications and Standards shall be deemed to be amended to the extent set forthbelow:

Sl no.	Clause Referred in Manual	Item	Provision as per Manual	Modified provision	Remarks
1	2.5	Median	Table 2.2 of IRC: SP:84-2019	Width of median in rural area is 1.5 m (Excluding 0.5 m kerb shyness on either side)	
2	2.2	Design Speed	Table 2.1 of IRC: SP:84-2019	Design speed is restricted at stretches mentioned in Table D1.	

Table D1 : Speed Restricted Stretches

SL No.	Curve Details				Transition Details				Speed (Kmph)
	Start Chainage	End Chainage	Radius (m)	Direction	Start Chainage	L1	L2	End Chainage	
1	113+988.151	114+149.158	400	Left	113+873.151	55	55	114+264.158	65
2	114+729.298	114+797.288	300	Right	114+654.298	115	115	114+872.288	80
3	115+135.652	115+283.236	280	Left	115+060.652	75	75	115+358.236	65
4	115+572.340	115+809.879	350	Left	115+497.340	75	75	115+884.879	80

SL No.	Curve Details				Transition Details				Speed (Kmph)
	Start Chainage	End Chainage	Radius (m)	Direction	Start Chainage	L1	L2	End Chainage	
5	116+013.112	116+283.112	300	Right	115+938.112	75	75	116+358.112	80
6	116+469.346	116+498.639	400	Left	116+414.346	75	75	116+553.639	80
7	117+030.759	117+065.180	300	Left	116+955.759	55	55	117+140.180	65
8	117+266.947	117+295.891	170	Right	117+196.947	75	75	117+365.891	65
9	117+445.421	117+576.309	170	Left	117+375.421	70	70	117+646.309	65
10	117+733.663	117+827.996	200	Right	117+673.663	70	70	117+887.996	65
11	118+205.926	118+352.617	300	Left	118+130.926	60	60	118+427.617	65
12	118+620.921	119+273.526	400	Right	118+565.921	75	75	119+328.526	80
13	119+706.498	119+888.656	170	Right	119+666.498	55	55	119+928.656	65
14	119+954.198	120+055.636	260	Left	119+929.198	40	40	120+080.636	65
15	120+215.572	120+308.992	170	Right	120+175.572	25	25	120+348.992	65
16	120+412.470	120+462.294	170	Left	120+372.470	40	40	120+502.294	65
17	120+634.957	120+648.424	300	Right	120+559.957	40	40	120+723.424	65
18	120+816.339	120+860.614	200	Left	120+756.339	75	75	120+920.614	65
19	120+994.292	121+122.242	200	Right	120+934.292	60	60	121+182.242	65
20	121+274.528	121+361.581	200	Left	121+214.528	60	60	121+421.581	65
21	121+473.057	121+541.145	500	Right	121+428.057	60	60	121+586.145	80
22	121+680.117	121+824.412	200	Left	121+620.117	45	45	121+884.412	65
23	122+471.093	122+491.418	400	Left	122+416.093	65	65	122+546.418	80
24	122+617.522	122+715.006	500	Right	122+592.522	55	55	122+740.006	80
25	122+829.890	122+913.966	170	Left	122+759.890	25	25	122+983.966	65
26	123+533.314	123+724.601	300	Right	123+458.314	30	30	123+799.601	65
27	124+057.592	124+183.052	400	Left	123+942.592	75	75	124+298.052	80
28	130+844.797	130+869.576	300	Left	130+769.797	75	75	130+944.576	80
29	131+059.239	131+072.751	350	Right	130+999.239	75	75	131+132.751	80
30	131+213.808	131+220.690	350	Right	131+163.808	50	50	131+270.690	65
31	131+334.446	131+432.339	150	Left	131+274.446	60	60	131+492.339	60
32	131+776.621	131+910.146	255	Right	131+691.621	85	85	131+995.146	80
33	132+183.931	132+209.360	170	Left	132+113.931	70	70	132+279.360	65
34	132+359.627	132+398.757	300	Right	132+284.627	75	75	132+473.757	80
35	132+524.075	132+629.111	600	Left	132+479.075	45	45	132+674.111	80
36	132+854.173	132+864.524	400	Right	132+799.173	55	55	132+919.524	80
37	132+974.249	132+981.562	130	Left	132+924.249	50	50	133+031.562	60
38	133+091.830	133+138.896	130	Right	133+041.830	50	50	133+188.896	60
39	133+434.874	133+539.807	170	Left	133+359.874	75	75	133+614.807	65
40	134+330.494	134+409.334	90	Right	134+290.494	40	40	134+449.334	50
41	135+406.745	135+623.724	255	Right	135+321.745	85	85	135+708.724	80
42	136+207.866	136+386.196	400	Left	136+152.866	55	55	136+441.196	80
43	136+639.875	136+709.979	500	Left	136+594.875	45	45	136+754.979	80
44	136+831.212	136+883.853	400	Right	136+791.212	40	40	136+923.853	80
45	137+243.055	137+300.594	400	Right	137+168.055	75	75	137+375.594	80
46	137+462.399	137+698.064	220	Left	137+392.399	70	70	137+768.064	65
47	137+987.164	138+057.957	300	Right	137+912.164	75	75	138+132.957	80

SL No.	Curve Details				Transition Details				Speed (Kmph)
	Start Chainage	End Chainage	Radius (m)	Direction	Start Chainage	L1	L2	End Chainage	
48	138+706.213	138+766.789	170	Left	138+636.213	70	70	138+836.789	65
49	138+923.442	138+935.407	300	Right	138+853.442	70	70	139+005.407	80
50	139+219.883	139+279.448	170	Right	139+149.883	70	70	139+349.448	65
51	139+435.598	139+477.929	200	Left	139+365.598	70	70	139+547.929	65
52	139+655.138	139+696.829	170	Right	139+585.138	70	70	139+766.829	65
53	139+832.372	139+857.069	200	Left	139+782.372	50	50	139+907.069	65
54	141+902.039	142+047.328	500	Left	141+857.039	45	45	142+092.328	80
55	142+306.503	142+329.966	170	Left	142+236.503	70	70	142+399.966	65
56	142+496.737	142+603.650	170	Right	142+426.737	70	70	142+673.650	65
57	142+734.094	142+755.049	300	Left	142+684.094	50	50	142+805.049	65
58	143+353.324	143+365.369	200	Right	143+303.324	50	50	143+415.369	65
59	143+506.630	143+562.190	170	Left	143+456.630	50	50	143+612.190	65
60	144+222.472	144+300.376	300	Left	144+147.472	75	75	144+375.376	80
61	144+643.372	144+748.771	150	Right	144+573.372	70	70	144+818.771	60
62	144+887.865	144+986.275	100	Right	144+847.865	40	40	145+026.275	50
63	145+067.674	145+107.525	130	Right	145+027.674	40	40	145+147.525	60
64	145+242.848	145+412.747	150	Left	145+192.848	50	50	145+462.747	60
65	145+515.693	145+548.732	150	Right	145+465.693	50	50	145+598.732	60

SCHEDULE - E

(See Clauses 2.1 and 14.2)

MAINTENANCE REQUIREMENTS

1 Maintenance Requirements

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

1.2 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.

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

2 Repair/rectification of Defects and deficiencies

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

3 Other Defects and deficiencies

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

4 Extension of time limit

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

5 Emergency repairs/restoration

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

6 Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

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

8. Repairs on account of natural calamities

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

Annex – I

(Schedule-E)

Repair/rectification of Defects and deficiencies

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

Table -1: Maintenance Criteria for Pavements:

Asset Type	**Performacne Parameter**	**Level ofService (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	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/lttp/ reports/03031/)	24-48 hours	MORT&H Specification 3004.2

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**					
s of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Cracking	Nil	< 5 % subject to limitof 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% ofarea	Daily	Length Measurement Unit like		2-7 days	IRC:82- 2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
	Bleeding	Nil	< 1 % of area	Daily	Scale, Tape, odometer etc.		3-7 days	MORT&H Specification 3004.4
	Ravelling / Stripping	Nil	< 1 % of area	Daily			7-15 days	IRC:82-2015 read with IRC SP 81
	Edge Deformation/ Breaking	Nil	< 1 m for any 100 m section and width < 0.1 m at any location, restricte	Daily			7- 15 days	IRC:82-2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	**Acceptable**					
			d to 30 cm from the edge					
	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

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**					
	Other Pavement Distresses			Bi-Annually			2-7 days	IRC:82-2015
	Deflection/ Remaining Life			Annually	Falling Weight Deflectometer	IRC 115: 2014	180 days	IRC:115-2014
Rigid Pavement (Pavement of MCW, Service Road, Grade structure,	Roughness BI	2200mm/km	2400mm/km	Bi-Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656 - 94: 2000	180 days	IRC:SP:83-2008
	Skid	Skid Resistance no. at different speed of vehicles		Bi-Annually	SCRIM (Sideway-force	IRC:SP:83-2008	180 days	IRC:SP:83-2008

AssetType	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**					
approaches of connecting roads, slip roads, layb yes etc. as applicable)		**Minimum SN**	**Traffic Speed (Km/h)**		Coefficient Routine Investigation Machine or equivalent)			
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					

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

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**					
			side slope					
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification
	Rain Cuts/ Gullies in slope	Nil	Nil	Daily Specially During Rainy Season	NA		7-15 days	MORT&H Specification

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

Table -2: **Maintenance Criteria for Rigid Pavements:**

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
CRACKING						
1	**Single Discrete Cracks Not intersecting with any joint**	w = width of crack L = length of crack d = depth of crack D = depth ofslab	0	Nil, not discernible	No Action	Not applicable
			1	w < 0.2 mm. hair cracks		
			2	w = 0.2 - 0.5 mm, discernible from slow-moving car	Seal without delay	Seal, and stitch if L > lm.
			3	w = 0.5 - 1.5 mm, discernible from fast-moving car		Within 7days

S.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	w = 1.5 - 3.0 mm	Seal, and stitch if L > l m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15days
			5	w > 3 mm.		
2	**Single Transverse (or Diagonal) Crack intersecting with one or morejoints**	w = width of crack L = length of crack d = depth of crack D = depth ofslab	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Route and seal with epoxy. Within 7 days	Staple or Dowel Bar Retrofit. Within 15days
			2	w = 0.2 - 0.5 mm, discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1m. Within 7 days	

S.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	w = 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstructaffected. Portion with norms and specifications - See Para 5.5 & 9.2 Within 15days
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may befull depth	
3	**Single Longitudinal Crack intersecting with one or more joints**	w = width of crack L = length of crack d = depth of crack D = depth ofslab	0	Nil, not discernible	No Action	
			1	w < 0.5 mm, discernable from slow moving vehicle	Seal with epoxy, if L > 1 m. Within 7 days	Staple or dowel bar retrofit. Within 15days

S.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
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, ifL > l m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair withstapling. Within 15 days
			4	w = 6.0 - 12.0 mm, usually associated withspalling	Not Applicable, as it may 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 pernorms and specifications -

S.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**
						See Para 5.6.4 Within 15 days
4	**Multiple Cracks intersecting with one or morejoints**	**w = width of crack**	0	Nil, not discernible	No Action	-
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > l m. Within 15 days	
			2	w = 0.2 - 0.5 mm. discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, Reinstate subbase, Reconstruct whole slab as per specifications within 30 days
			4	w = 3.0 - 6.0 mm panel broken into 2 or 3pieces		
			5	w > 6 mm and/or panelbroken		

S.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**
				into more than 4 pieces		
5	**Corner Break**	w = width of crack L = length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to secure broken parts Within 7 days	Seal with epoxy seal withepoxy Within 7days
			2	w < 1.5 mm; L < 0.6 m, only one cornerbroken		
			3	w < 1.5 mm; L < 0.6 m, two corners broken	Partial Depth (Refer Figure 8.3 of IRC:SP: 83-2008) Within 15 days	Full depth repair
			4	w > 1.5 mm; L > 0.6 m or three corners broken		
			5	ree or four corners broken		Reinstate sub-base, and reconstructthe

S.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**
						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 fulldepth	Seal with low viscosity epoxy to secure broken parts. Within 15days
			2	either w > 0.5 mm or L < 3 m/m^2		
			3	w > 1.5 mm and L < 3 m/m^2		
			4	w > 3 mm, L < 3 m/m^2 and deformation		Full depth repair - Cut out and replace damaged area taking care not to damage reinforcement. Within30days
			5	w > 3 mm, L > 3 m/m^2 and deformation		

S.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
Surface Defects						
7	**Ravellingor Honeycomb type surface**	r = area damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term** No action.	**Long Term** 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.	
			4	r = 25 - 50 %		

S.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	
			5	r > 50% and h > 25 mm	Reconstruct slabs, 4 or more slabs ifaffecting. Within 30 days	
8	**Scaling**	r = damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	r <**2 %**	Local repair of areas damaged and liable to be damaged. Within 7days	
			2	r = 2 - 10 %		

S.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
			3	r = 10 - 20%	Bonded Inlay within 15 days	
			4	r = 20 - 30 %		
			5	r > 30 % and h > 25 mm	Reconstruct slab within 30 days	
9	**Polished Surface/Glazing**	t = texture depth, sand patchtest	0		No action.	Not Applicable
			1	t > 1 mm		
			2 '	t = 1 - 0.6 mm	Monitor rate of deterioration	
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		

S.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	t < 0.1 mm	Diamond Grinding if affecting 50% or more slabs in a continuou stretch of minimum 5 km. Within 30 days	
10	**Popout (Small Hole), Pothole Refer Para 8.4**	n = number/m^2 d = diameter h = maximumdepth	0	d < 50 mm; h < 25 mm; n < 1 per 5 m^2	No action.	Not Applicable
			1	d=50-100mm;h<50mm;n<1 per 5 m^2	Partial depth repair 65 mm deep.	
			2	d=50-100mm;h>50mm;n<1 per 5 m^2	Within 15 days	

S.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
			3	d = 100 - 300 mm; h < 100 mm n < 1 per 5m^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 5m^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** No action.	**Long Term** 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	Clean, widen and reseal the joint. Within 7 days	

				and trapping Incompressible material.		
12	**Spalling of Joints**	w = width on either side of the joint L = length of spalled portion (as % joint length)	0	Nil, not discernible	No action.	Not Applicable
			1	w < 10 mm	Apply low viscosity epoxy resin/ mortar in crackedportion.	
			2	w = 10 - 20 mm, L < 25%	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)**	f = difference of level	0	not discernible, < 1 mm	No action.	No action.

	in Cracks or Joints		1	f < 3 mm		
			2	f = 3 - 6 mm	Determine cause and observe, take action for diamondgrinding	Replace the slab as appropriate. Within 30days
			3	f = 6 - 12 mm	Diamond Grinding	
			4	f= 12 - 18 mm	Raise sunken slab.	Replace the slab as appropriate. Within 30days
			5	f> 18 mm	Strengthen subgrade and sub-base by groutingand raising sunken slab	
14	**Blowup or Buckling**	h = vertical displacement from normalprofile	0	Nil, not discernible	**Short Term**	**Long Term**
			1	h < 6 mm	No Action	
			2	h = 6 - 12 mm	Install Signs to Warn Traffic	

			3	h = 12 - 25 mm	within 7 days	
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shattered slabs, ie 4 or morepieces	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 subgrade. Reinstate pavement at normal level	

			5	h > 100 mm	if L < 20 m. Within 30 days	
16	**Heave**	h = positive vertical displacement from normal profile. L = length	0	Not discernible. h < 5 mm	**Short Term**	**Long Term**
					No action.	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	0	h < 4 mm	No action	

		displacement from normalprofile	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** No action.	**Long Term**
			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	

			4	f = 50 - 75 mm	within 7 dayss	For any 100 m stretch Reconstruct shoulder, if affecting 25% or more ofstretch. 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. 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 84-2019</td></tr>
<tr><td>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 2months</td><td>IRC:35-2015</td></tr>
</table>

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td></td><td>Day time Visibility</td><td>During expected life Service Time
Cement Road - 130mcd/m²/lux
Bituminous Road - 100mcd/m²/lux</td><td>Monthly</td><td>As per Annexure-D of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
<tr><td></td><td>Night Time Visibility</td><td><u>Initial and Minimum Performancefor Dry Retro reflectivity during night time:</u>
<table>
<tr><th>Design Speed</th><th colspan="2">(RL) Retro Reflectivity (mcd/m²/lux)</th></tr>
<tr><td></td><td>Initial (7 days)</td><td>Minimum Threshold level (TL) & warranty period required up to 2 years</td></tr>
<tr><td>Up to 65</td><td>200</td><td>80</td></tr>
<tr><td>65 - 100</td><td>250</td><td>120</td></tr>
<tr><td>Above 100</td><td>350</td><td>150</td></tr>
</table>
<u>Initial and Minimum Performance for Night Visibility under wet condition(Retro reflectivity):</u></td><td>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
		Initial 7 days Retro reflectivity: 100 mcd/m²/lux Minimum Threshold Level: 50 mcd/m²/lux					
	Skid Resistance	Initial and Minimum performance for SkidResistance: 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	hange of ignboard	48 hours in case of Mandatory	RC:67-2012

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	TestingMethod	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
				Signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.		Signs, Cautionary and Informatory Signs (Single and Dual post-signs) 1 Month in case of Gantry/Cantilever Sign boards	
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:84-2019,IRC:35-2015
	Pedestrian Guardrail	Functionality: Functioning of guardrail asintended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2019
	Traffic Safety Barriers	Functionality: Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2019, IRC:119-2015
	End Treatment of	Functionality: Functioning of End Treatment as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2019,

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measuremen t	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specification s and Standards
	Traffic Safety Barriers			backup			IRC:119-2015
	Attenuators	Functionality: Functioning of Attenuators asintended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP-2014, IRC:119-2015
	Guard Posts and Delineators	Functionality: Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/image backup	Rectificatio n	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:84-2019
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:84-2019
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84-2019
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84-2019
	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:84-2019
		No major/minor failure in the lighting system	Daily	-	Rectification of failure	8 hours	IRC:SP:84-2019

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:84-2019
	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:84-2019
	Vegetation affecting sight line and road structures	Sight line shall be free from obstruction byvegetation	Daily	Visual with video/image backup	Removal of Trees	Immediate	IRC:SP 84-2019
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every 4 hours	
	Defects in electrical, water and sanitary installations	-	Daily	-	Rectification	24 hours	

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
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 84-2019

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Pipe/box/slab culverts	Free waterway/ unobstructed flow section	85% of culvert normal flow area to available.	2 times in a year (before and after rainy season)	Inspection by Bridge Engineer as per IRC SP: 35-1990 and recording of depth of silting and area of vegetation.	Cleaning silt up soils and debris in culvert barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrelbefore rainy season.	15 days before onset of monsoon and within 30 days after end ofrainy season.	IRC 5-2015, IRC SP:40-1993 and IRC SP:13-2004
	Leak-proof expansion joints if any	No leakage through expansionjoints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35-1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-1993 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25 sqm	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording the defects	Repairs to spalling, cracking, delamination, rusting shall be followed as perIRC: SP: 40-1993.	15 days	IRC SP 40-1993 and MORTH Specifications clause 2800
		Delamination of concrete not more than 0.25 sq.m.					
		Cracks wider than 0.3 mm not more than 1m aggregatelength					

	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons andpitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 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 expansionjoint	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORT&H Specification 3004.2 & 2811.
	User safety (condition of crash barrier andguard 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: 84-2019 and IRC SP: 40-1993.

	Rusted reinforcement	Not more than 0.25 sq.m	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out the repairs to affected concrete portionwith epoxy mortar / concrete.	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
	Spalling of concrete	Not more than 0.50 sq.m					
	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	Within design limits.	Once in every 10 years for spans more	Load test method	Carry out major rehabilitation works on bridge to retain original design loads capacity	6 months	IRC SP: 51-1999.

	live loads		than 40 m				
	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 15m to 30 m	Laser displacement sensors or laser vibro-meters	Strengthening of super structure	4 months	AASHTO LRFD specifications
	Leakage in Expansion joints	No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rain water 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 seal in	15 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Debris and dust in strip seal	No dust or debris in expansion joint	Monthly	Detailed condition survey as per IRC SP:35-1990 using	Cleaning of expansion joint gaps thoroughly	3 days	MORTH specifications 2600 and

	expansion joint	gap.		Mobile Bridge Inspection Unit			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 InspectionUnit	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 InspectionUnit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting/guniting and micro concreting depending on type of defect noticed	30 days	IRC SP: 40-1993 and MORTH specification 2800.

	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture ofreinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment shall be replaced, in order to get uniform load transfer on tobearings.	3 months	MORTH specification 2810and 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 inmajor 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	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons andpitching.	30 days after defect observation or 2	IRC: SP 40-1993 and IRC:SP:13-2004.

		sq.m, damage to solid apron (concrete apron) not more than 1 sq.m				weeks before onset of rainy season whichever is earlier.	
Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of thecontractor.							

Table 4: Maintenance Criteria for Structures and Culverts:

Table 5: Maintenance Criteria for Hill Roads

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

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

<u>Note:</u> 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**	

Nature of Defect or deficiency		Time limit for repair/ rectification
(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 requiringreplacement	30 (thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
(f)	**Rest area**	
(i)	Cleaning of toilets	Every 4 (four) hours
(ii)	Defects in electrical, water and sanitary installations	24 (twenty four) hours
(g)	**[TollPlaza]**	
(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 mobilecrane	4 (four) hours
Bridges		
(a)	**Superstructure**	
(i)	Any damage, cracks, spalling/ scaling Temporarymeasures Permanentmeasures	within 48 (forty eight) hours within 15 (fifteen) days or as specified by the Authority's Engineer
(b)	**Foundations**	

Nature of Defect or deficiency		Time limit for repair/ rectification
(i)	Scouring and/or cavitation	15 (fifteen) days
(c)	**Piers, abutments, return walls and wingwalls**	
(i)	Cracks and damages including settlement and tilting, spalling, scaling	30 (thirty) days
(d)	**Bearings (metallic) ofbridges**	
(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 guidebunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g)	**Hill Roads**	
(i)	Damage to retaining wall/breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours

Nature of Defect or deficiency		Time limit for repair/ rectification
(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 beforeissuing the bidding document, with the approval of the competent authority.]

Schedule - F

(See Clause 4.1 (vii)(a))

Applicable Permits

1. Applicable Permits

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

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

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

(c) Licence for use of explosives;

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

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

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

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

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

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

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

SCHEDULE - G

(See Clauses 7.1.and 19.2)

FORM OF BANK GUARANTEE

Annexure-I

(See Clause 7.1)

[Performance Security/Additional Performance Security]

The Managing Director,
National Highways & Infrastructural Development Corporation Ltd.
PTI Building, 3rd Floor,
4, Parliament Street
New Delhi - 110001

WHEREAS:

(A) _____ [name and address of contractor] (hereinafter called the "Contractor") and National Highways and Infrastructure Development Corporation Ltd. , (hereinafter called the "Authority") have entered into an agreement (hereinafter called the "Agreement") for "Widening/Improvement to 4 (Four) Lane with Paved Shoulder from KM 113+300 to Km 146+230 (Design Chainage 113+830 to 145+712) of Kwaram Taro Village – Dillai Section (Section 6) of NH 29 in the state of Assam on EPC mode " subject to and in accordance with the provisions of the Agreement

(B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the {Construction Period/ Defects Liability Period and Maintenance Period} (as defined in the Agreement) in a sum of Rs….. cr. (Rupees ……..….. crore) (the "Guarantee Amount ").

(C) We, …….. through our branch at ……. (the "Bank") have agreed to furnish this bank guarantee (hereinafter called the "Guarantee") by way of Performance Security.

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of General Manager in the National Highways& 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 Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between

the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

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

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

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

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

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

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

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

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly 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.

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

12. Bank Guarantee has been sent to authority's bank through SFMS gateway as per the details below:-

Sl.	Particulars	Details
1	Name of the Beneficiary	National Highways and Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC CNRB0019062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Syndicate Bank, Transport Bhawan, 1st Parliament street, New Delhi-110001

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.

Annexure – II
(Schedule - G)

(See Clause 19.2)

Form for Guarantee for Advance Payment

The Managing Director,
National Highways & Infrastructural Development Corporation Ltd.
PTI Building, 3rd Floor,
4, Parliament Street
New Delhi - 110001

WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the National Highways and Infrastructure Corporation Ltd., (hereinafter called the "**Authority**") for the **"**Widening/Improvement to 4 (Four) Lane with Paved Shoulder from KM 113+300 to Km 146+230 (Design Chainage 113+830 to 145+712) of Kwaram Taro Village – Dillai Section (Section 6) of NH 29 in the state of Assam on EPC mode"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 free 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 three 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/third} installment of the Advance Payment is Rs. --- --- cr. (Rupees ------ crore) and the amount of this Guarantee is Rs. ------- cr. (Rupees ------ crore) (the "**Guarantee Amount**") [$] .

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

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid installment 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& Infrastructure Development Corporation Limited], that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the instalment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor

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

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

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

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

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

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

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

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

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

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

Authority pursuant to the provisions of the Agreement.

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

SIGNED , SEALED AND DELIVERED

For and on behalf of the bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

Notes:

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

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

SCHEDULE - H

See Clauses10.1 (iv) and 19.3

Contract Price Weightages

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

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

Item	Weightage in percentage to the Contract Price	Stage of Payment	Percentage Weightage
1	2	3	4
Road works including culverts,widening and repair of culverts.	54.49%	**A- Widening and strengthening of existing road**	
		(1)) Earthwork up to top of sub-grade	9.47%
		(2) Sub Base Course	9.58%
		(3) Non Bituminous Base Course	11.09%
		(4) Bituminous Base Course	21.14%
		(5) Wearing Coat	8.15%
		(6)Widening and repair of culvert	0.00%
		B.1- Reconstruction / New 2-Lane realignment/ bypass (Flexible Pavement)	
		(1)) Earthwork up to top of sub-grade	7.49%
		(2) Sub Base Course	7.75%
		(3) Non Bituminous Base Course	8.25%
		(4) Bituminous Base Course	10.01%
		(5) Wearing Coat	5.24%
		B.2- Reconstruction / New 2-Lane realignment/ bypass (Rigid Pavement)	0.00%
		(1)) Earthwork up to top of sub-grade	0.00%
		(2) Sub Base Course	0.00%
		(3) Dry Lean Concrete (DLC) Course	0.00%
		(4) Pavement Quality Control (PQC) Course	0.00%
		C.1- Reconstruction / New Service road (Flexible Pavement)	0.00%
		(1)) Earthwork up to top of sub-grade	0.00%
		(2) Sub Base Course	0.00%
		(3) Non Bituminous Base Course	0.00%
		(4) Bituminous Base Course	0.00%
		(5) Wearing Coat	0.00%
		C.2- Reconstruction / New Service road (Rigid Pavement)	0.00%

Item	Weightage in percentage to the Contract Price	Stage of Payment	Percentage Weightage
1	2	3	4
		(1)) Earthwork up to top of sub-grade	0.00%
		(2) Sub Base Course	0.00%
		(3) Dry Lean Concrete (DLC) Course	0.00%
		(4) Pavement Quality Control (PQC) Course	0.00%
		D- Re-Construction and New culverts on existing road, realignments, bypasses:	0.00%
		Culverts (Length <6 m)	1.85%
Minor Bridges / Underpasses / Overpasses	10.86%	**A.1- Widening and repairs of Minor Bridges (length>6m and <60m)**	
		Minor Bridges	25.01%
		A.2- New Minor Bridges (length>6m and <60m)	0.00%
		(1) Foundation	21.17%
		(2) Sub-structure	15.69%
		(3) **Super-Structure:** On completion of the super structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road sign & markings tests on completion etc. complete in all respect.	14.84%
		(4) **Approaches:** On completion of approaches including retaining walls, stone pitching, protection works complete in all respect and fit for use.	1.91%
		(5) Guide Bunds and River Training works :	
		On completion of Guide Bunds and river Training works complete in all respects	4.02%
		B.1- Widening and Repair of underpasses/overpasses	
		Underpasses/ Overpasses	0.00%
		B.2- New underpasses/ overpasses	
		(1) Foundation +Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	15.28%

Item	Weightage in percentage to the Contract Price	Stage of Payment	Percentage Weightage
1	2	3	4
		(2) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & makings, tests on completion etc. complete in all respect.	2.08%
		Wearing Coat (a) in case of Overpass- wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass- rigid pavement including drainage facility complete in all respects as specified as specified.	0.00%
		(3) Approaches: On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	0.00%
			0.00%
Major Bridges (Length >60m) works and ROB/RUB/elevated section/flyover including viaducts if any.	9.96%	**A.1 - Widening and repairs of Major Bridges**	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	0.00%
		(6) Wing walls/return walls	0.00%
		(7) Guide Bunds, River Training works etc.	0.00%
		(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
		A.2- New Major Bridges	0.00%
		(1) Foundation	48.02%
		(2) Sub-structure	16.76%
		(3) Super-structure (including bearings)	29.66%
		(4) Wearing Coat including expansion joints	2.03%

Item	Weightage in percentage to the Contract Price	Stage of Payment	Percentage Weightage
1	2	3	4
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	2.51%
		(6) Wing walls/return walls	0.00%
		(7) Guide Bunds, River Training works etc.	0.46%
		(8) Approaches (including Retaining walls, stone pitching and protection works)	0.56%
		B.1- Widening and Repair of underpasses/overpasses	0.00%
		(a) ROB	0.00%
		(b) RUB	0.00%
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat: (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified.	0.00%
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	0.00%
		(6) Wing walls/return walls	0.00%
		(7) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
		B.2- New ROB/RUB	0.00%
		(a) ROB	0.00%
		(b) RUB	0.00%
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat: (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified.	0.00%
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	0.00%

Item	Weightage in percentage to the Contract Price	Stage of Payment	Percentage Weightage
1	2	3	4
		(6) Wing walls/return walls	0.00%
		(7) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
		C.1- Widening and repair of Elevated Section/Flyovers/Grade Separators	0.00%
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat including expansion joints .	0.00%
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	0.00%
		(6) Wing walls/return walls	0.00%
		(7) Approaches (including Retaining walls/ Reinforced Earth wall, stone pitching and protection works)	0.00%
		C.2- New Elevated Section/Flyovers/Grade Separators	0.00%
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat including expansion joints.	0.00%
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	0.00%
		(6) Wing walls/return walls	0.00%
		(7) Approaches (including Retaining walls/ Reinforced Earth wall, stone pitching and protection works)	0.00%
Other works	22.05%	(i) Toll Plaza	0.00%
		(ii) Road side drains	15.22%
		(iii) Road signs, markings, km stones, safety devices, ….	29.31%
		(iv) Project facilities	0.00%
		(a) Bus Bays & Bus Shelter	2.35%
		(b) Truck lay-byes	1.38%
		(c) Rest areas	0.00%
		(d) Electrical Works	0.51%
		(e) Junctions	11.71%
		(f) others	0.00%

Item	Weightage in percentage to the Contract Price	Stage of Payment	Percentage Weightage
1	2	3	4
		(v) Road side plantation	4.28%
		(vi) Protection works other than elevated sections/ flyovers/grade separators and ROBs/RUBs.	33.79%
		(vii) Safety and traffic management during construction	0.00%
		(vii) Maintenance of Existing road	0.00%
		(ix) Median & Island Filling	1.46%
Electrical utilities and Public Health Utilities (Water pipe lines and sewage lines	2.64%	(i) EHT Line	0.00%
		(ii). EHT crossings	0.00%
		(ii). HT/LT line	30.35%
		(iv). HT/LT crossings	43.44%
		(v). Water pipeline	1.31%
		(vi). Water pipeline crossings	24.90%

1.3 Procedure of estimating the value of workdone

1.3.1 Roadworks.

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

Table 1.3.1

Stage of Payment	Percentage - weightage	Payment Procedure
A-Widening and Strengthening of existing road		Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(1) Earthwork up to top of the sub-grade	9.47%	
(2) Sub-Base Course	9.58%	
(3) Non Bituminous Base Course	11.09%	
(4) Bituminous Base Course	21.14%	
(5) Wearing Coat	8.15%	
(6) Widening and repair of culverts	0.00%	Cost of completed culverts shall be determined pro rata with respect to the total number of culverts. Payment shall be made on the completion of atleast five culverts.

Stage of Payment	Percentage - weightage	Payment Procedure
B.1- Reconstruction/New 2-lane realignment/bypass (Flexible pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km. length whichever is less.
(1) Earthwork up to top of the sub-grade	7.49%	
(2) Sub-Base Course	7.75%	
(3) Non Bituminous Base Course	8.25%	
(4) Bituminous Base Course	10.01%	
(5) Wearing Coat	5.24%	
B.2- Reconstruction / New 2-Lane realignment/ bypass (Rigid Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km. length whichever is less.
(1)) Earthwork up to top of sub-grade	0.00%	
(2) Sub Base Course	0.00%	
(3) Dry Lean Concrete (DLC) Course	0.00%	
(4) Pavement Quality Control (PQC) Course	0.00%	
C.1- Reconstruction / New Service road (Flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km. length whichever is less.
(1)) Earthwork up to top of sub-grade	0.00%	
(2) Sub Base Course	0.00%	
(3) Non Bituminous Base Course	0.00%	
(4) Bituminous Base Course	0.00%	
(5) Wearing Coat	0.00%	
C.2- Reconstruction / New Service road (Rigid Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km. length whichever is less.
(1)) Earthwork up to top of sub-grade	0.00%	
(2) Sub Base Course	0.00%	
(3) Dry Lean Concrete (DLC) Course	0.00%	
(4) Pavement Quality Control (PQC) Course	0.00%	
D- Re-Construction and New culverts on existing road, realignments, bypass:		Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of atleast five culvert.
(1) Culverts (Length <6 m)	1.85%	

@. 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 asfollows:

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 ContractAgreement.

1.3.2 Minor Bridges andUnderpasses/Overpasses.

Procedure for estimating the value of Minor bridge and Underpasses/ Overpasses shall be as stated in table1.3.2:

Table 1.3.2

Stage of Payment	Weightage	Payment Procedure
A.1- Widening and repair of minor bridges (length > 6m and <60m)	25.01%	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on completion of widening & repair works of a minor bridge.
A.2- New minor bridges		
(i) Foundation	21.17%	**(i) Foundation**: Cost of each Minor Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Minor Bridge. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the minor Bridge subject to completion of atleast two foundations of the minor Bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	15.69%	**(ii) Sub-structure** : Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-sructure of the minor bridge subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the minor bridge.
(iii) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	14.84%	**(iii) Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure of atleast one span in all respects as specified in the column of "Stage of Payment" in this sub-clause.

Stage of Payment	Weightage	Payment Procedure
(iv) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	1.91%	**(iv) Approachers:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of "Stage of Payment" in this sub-clause.
(v) Guide Bunds and River Training Works: On completion of Guide Bunds and river Training Works complete in all respects	4.02%	**(v) Guide Bunds and River Training Works:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of guide Bunds and River training works in all respects as specified.
B.1- Widening and repair of underpasses/overpasses	0.00%	Cost of each underpass/overpass shall be determined on pro rata basis with respect to the total linear length of the unfderpasses/overpasses. Payment shall be made on the completion of widening & repair works of a underpass/overpass.
B.2- New Underpasses/Overpasses:	0.00%	
(i) Foundation +Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap**.**	15.28%	**(i) foundation +Sub-Structure:** cost of each Underpass/Overpass shall be determined on pro rata basis with respect to the total linear length (m) of the Underpasses/Overpasses. Payment against foundation + sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation +sub-structure of each Underpasses/Overpasses subject to completion of atleast two foundations along with sub-structure upto abutment/pier cap each underpass/overpass. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect. Wearing coat (a)in case of Overpass- wearing coat including expansion joints complete in all respects as specified and **(b** in case of underpass- rigid pavement including drainage facility complete in all respects as specified.	2.08%	**(ii) Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure of atleast one span in all respects as specified in the column of "Stage of Payment" in this sub-clause.

Stage of Payment	Weightage	Payment Procedure
(iii) Approaches: On completion of approaches including Retaining walls/Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	0.00%	**(iii) Approaches:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified.

1.3.3 Major Bridge works, ROB/RUB andStructures.

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

Table 1.3.3

Stage of Payment	Weightage	Payment Procedure
A.1- Widening and repairs of Major Bridges		
(i) Foundation	0.00%	**(i) Foundation:** Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the major Bridge subject to completion of atleast two foundations of the major Bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00%	**(ii) Sub-structure :** Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-sructure of the major bridge subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge.
(iii) Super-structure (including bearings)	0.00%	**(iii) Super-structure :** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structures including bearings of atleast one span in all respects as specified.

Stage of Payment	Weightage	Payment Procedure
(iv) Wearing Coat including expansion joints	0.00%	**(iv) Wearing Coat :** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00%	**(v) Miscellaneous :** Payment shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	0.00%	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Guide Bunds, River Training works etc.	0.00%	**(vii) Guide Bunds, River Training works :** Payment shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(viii) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	**(viii) Approaches :** Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
A.2- New Major Bridges		
(i) Foundation	48.02%	**(i) Foundation:** Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the major Bridge subject to completion of atleast two foundations of the major Bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	16.76%	**(ii) Sub-structure :** Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-sructure of the major bridge subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge.
(iii) Super-structure (including bearings)	29.66%	**(iii) Super-structure :** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structures including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	2.03%	**(iv) Wearing Coat :** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.

Stage of Payment	Weightage	Payment Procedure
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	2.51%	**(v) Miscellaneous :** Payment shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	0.00%	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Guide Bunds, River Training works etc.	0.46%	**(vii) Guide Bunds, River Training works :** Payment shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(viii) Approaches (including Retaining walls, stone pitching and protection works)	0.56%	**(viii) Approaches :** Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
B.1 - Widening and repairs of		
(a) ROB		
(b) RUB		
(i) Foundation	0.00%	**(i) Foundation:** Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROBs/RUBs. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the ROB/RUB subject to completion of atleast two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00%	**(ii) Sub-structure :** Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-sructure of the ROB/RUB subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the ROB/RUB.
(iii) Super-structure (including bearings)	0.00%	**(iii) Super-structure :** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structures including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints in case of ROB. In casea of RUB, rigid pavement under RUB including drainage facility as specified.	0.00%	**(iv) Wearing Coat :** Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion jointds complete in all respects as specified and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified as specified.

Stage of Payment	Weightage	Payment Procedure
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00%	**(v) Miscellaneous :** Payment shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	0.00%	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	**(vii) Approaches :** Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
B.2 - New	0.00%	
(a) ROB	0.00%	
(b) RUB	0.00%	
(i) Foundation	0.00%	**(i) Foundation:** Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROBs/RUBs. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the ROB/RUB subject to completion of atleast two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00%	**(ii) Sub-structure :** Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-sructure of the ROB/RUB subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the ROB/RUB.
(iii) Super-structure (including bearings)	0.00%	**(iii) Super-structure :** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structures including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints in case of ROB. In casea of RUB, rigid pavement under RUB including drainage facility as specified.	0.00%	**(iv) Wearing Coat :** Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion jointds complete in all respects as specified and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00%	**(v) Miscellaneous :** Payment shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as

Stage of Payment	Weightage	Payment Procedure
		specified.
(vi) Wing walls/return walls	0.00%	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%	**(vii) Approaches :** Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
C.1- Widening and repairs of Elevated Section/Flyovers/ Grade Separators	0.00%	
(i) Foundation	0.00%	**(i) Foundation:** Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the major Bridge subject to completion of atleast two foundations of the major Bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00%	**(ii) Sub-structure :** Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-sructure of the major bridge subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge.
(iii) Super-structure (including bearings)	0.00%	**(iii) Super-structure :** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structures including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	0.00%	**(iv) Wearing Coat :** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00%	**(v) Miscellaneous :** Payment shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.

Stage of Payment	Weightage	Payment Procedure
(vi) Wing walls/return walls	0.00%	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%	**(vii) Approaches :** Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
C.2- New Elevated Section/Flyovers/ Grade Separators	0.00%	
(i) Foundation	0.00%	**(i) Foundation:** Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the major Bridge subject to completion of atleast two foundations of the major Bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00%	**(ii) Sub-structure :** Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-sructure of the major bridge subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge.
(iii) Super-structure (including bearings)	0.00%	**(iii) Super-structure :** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structures including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	0.00%	**(iv) Wearing Coat :** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00%	**(v) Miscellaneous :** Payment shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	0.00%	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.

Stage of Payment	Weightage	Payment Procedure
(vii) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%	**(vii) Approaches :** Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.

Note:(1) In case of innovate Major Bridge projects like cable suspension/cable stayed/ Extra Dozed and exceptionally long span bridges, the schedule may be modified as per site requirements before bidding with due approval of CompetentAuthority.

(2) The Schedule for exclusive tunnel projects may be prepared as per site requirements before bidding with due approval of CompetentAuthority.

1.3.4 Otherworks.

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

Table 1.3.4

Stage of Payment	Weightage	Payment Procedure
(i) Toll Plaza	0.00%	Unit of measurement is each completed toll plaza. Payment of each toll plaZa shall be made on pro rata basis with respect to the total of all toll plazas.
(ii) Road side drains	15.22%	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(iii) Road signs, Markings, KM stones, Safety devices, …	29.31%	
(iv) Project facilities	0.00%	Payment shall be made on pro rata basis for completed facilities.
a) Bus bays	2.35%	
b) Truck lay-byes	1.38%	
c) Rest areas	0.00%	
d) Electrical Works	0.51%	
e) Junctions	11.71%	
f) others	0.00%	
(v) Roadside plantation	4.28%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(vi) Protection works other than elevated sections/flyovers/grade separators and ROBs/RUBs	33.79%	
(vii) Safety and traffic management during construction	0.00%	Payment shall be made on prorata basis every six months.
(viii) Median & island Filling	1.46%	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.

Stage of Payment	Weightage	Payment Procedure
(ix) Maintenance of Existing road	0.00%	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.

1.3.5 Electrical Utilities and Public Health Utilities (Water pipe lines and sewage lines)

Procedure for estimating the value of Electrical Utilities and Public Health Utilities (Water pipe lines and sewage lines) shall be as stated in table 1.3.5:

Table 1.3.5

Stage of Payment	Weightage	Payment Procedure
(i) EHT Line	0.00%	Unit of measurement is as per completed activities. Cost per activitiy shall be determined on pro-rata basis as per its weightage nwith reference to total cost of EHT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is (i) Erection of poles-20%, (ii) Conductor stringing including laying of cable-30%, (iii) DTR erection (if involved)- 15% and (iv) Charging of line including dismantling and site clearance-35% (with DTR) and 50% without DTR)
(ii) EHT crossings	0.00%	Cost of each crossing shall be determined on pro-rata basis with reference to the total no. of crossings. Payments shall be made for not less than 25% of the crossings subject to a minimum of 4 crossings.
(iii) HT/LT line (including Transformers if any)	30.35%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of HT/LT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is (i) Erection of poles-20%, (ii) Conductor stringing including laying of cable-30%, (iii) DTR erection (if involved)- 10% and (iv) Charging of line including dismantling and site clearance-40% (with DTR) and 50% without DTR)
(iv) HT/LT line crossings	43.44%	Cost of each crossing shall be determined on pro-rata basis with reference to the total no. of crossings. Payments shall be made for not less than 25% of the crossings subject to a minimum of 10 crossings.

Stage of Payment	Weightage	Payment Procedure
(v) Water pipeline.	1.31%	Unit of measurement is as per completed activities. Cost per activitiy shall be determined on pro-rata basis as per its weightage nwith reference to total cost of pipe line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)
(vi) Water pipeline crossings.	24.90%	Cost of each crossing shall be determined on pro-rata basis with reference to the total no. of crossings. Payments shall be made for not less than 25% of the crossings subject to a minimum of 8 crossings.
(vii) Sewage lines.	-	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipe line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)
(vii) Sewage line crossings.	-	Cost of each crossing shall be determined on pro-rata basis with reference to the total no. of crossings. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)

Schedule - I

(See Clause 10.2 (iv))

Drawings

1. Drawings

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

2. Additional Drawings

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

Annex – I

(Schedule - I)

List of Drawings

[**Note**: The Authority shall describe in this Annex-I, all the Drawings that the Contractor is required to furnish under Clause 10.2.]

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 **319th** 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. ProjectMilestone-II

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

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

4. ProjectMilestone-III

(i) Project Milestone-III shall occur on the date falling on the **776th** day from the Appointed Date (the "**Project Milestone-III**").

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

5. Scheduled Completion Date

(i) The Scheduled Completion Date shall occur on the **913th** day from the Appointed Date.

(ii) On or before the Scheduled Completion Date, the Contractor shall have completed

construction in accordance with thisAgreement.

6. Extension oftime

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

Schedule - K

(See Clause 12.1 (ii))

Tests on Completion

1. Schedule for Tests

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

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

2. Tests

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

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

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

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

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

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

3. Agency for conducting Tests

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

4. Completion Certificate

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

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

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

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

Schedule - L

(See Clause 12.2)

Completion Certificate

1 I, ……. (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated..... (the "**Agreement**"), for "Widening/Improvement to 4 (Four) Lane with Paved Shoulder from KM 113+300 to Km 146+230 (Design Chainage 113+830 to 145+712) of Kwaram Taro Village – Dillai Section (Section 6) of NH 29 in the state of Assam on EPC mode"through (Name of Contractor),herebycertify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Authority's Engineerby:

(Signature)

(Name)

(Designation)(Address)

Schedule - M

(See Clauses 14.6, 15.2 and 19.7)

Payment Reduction for Non-Compliance

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

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

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

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

2. Percentage reductions in lump sum payments on monthly basis

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

S. No.	Item/Defect/Deficiency	Percentage
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, 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%

S. No.	Item/Defect/Deficiency	Percentage
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
(d)	**Roadside Drains**	
(i)	Cleaning and repair of drains	5%
(e)	**Road Furniture**	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th kmstones	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 asunder:

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

Where,

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

M1= Monthly lump-sum payment in accordance para 1.2 above of this Schedule

M2= Monthly lump-sum payment in accordance para 1.2 above of this Schedule

L1= Non-complying length L = Total length of the road,

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

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

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

Schedule - N

(See Clause 18.1 (I))

Selection of Authority's Engineer

1. Selection of Authority's Engineer

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

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

2. Terms of Reference

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

3. Appointment of Government entity as Authority's Engineer

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

Annex – I

(Schedule - N)

Terms of Reference for Authority's Engineer

1. Scope

(i) These Terms of Reference (the "**TOR**")for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "**Agreement**), which has been enteredintobetweenthe[nameandaddressoftheAuthority](the"**Authority**")and ..... (the "**Contractor**")# for "Widening/Improvement to 4 (Four) Lane with Paved Shoulder from KM 113+300 to Km 146+230 (Design Chainage 113+830 to 145+712) of Kwaram Taro Village – Dillai Section (Section 6) of NH 29 in the state of Assam on EPC mode"and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

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

2. Definitions and interpretation

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

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

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

3. General

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

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

(a) any Time Extension;

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

(c) the Termination Payment; or

(d) issuance of Completion Certificate or

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

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

(iv) The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause18.2.

(v) The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article13.

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

4. Construction Period

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

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

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

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

(v) The Authority's Engineer shall grant written approval to the Contractor, where necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Project Highway for purposes of maintenance during the Construction Period in accordance with the provisions of Clause10.4.

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

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

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

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

(x) The Authority's Engineer shall test check at least 50 (fifty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

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

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

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

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

(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 Clause12.2.

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

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

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

5. Maintenance Period

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

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

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

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

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

6. Determination of costs and time

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

(ii) TheAuthority'sEngineershalldeterminetheperiodofTimeExtensionthatisrequired 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 Clause18.5.

7. Payments

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

(ii) Authority's Engineer shall-

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

(b) within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable title

Contractor , after adjustments in accordance with the provisions of Clause 19.10.

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

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

8. Other duties and functions

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

9. Miscellaneous

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

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

(iii) Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as-built Drawings, in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Project Highway as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project Highway and set back 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 in form the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.

Schedule - O

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

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

(a) The estimated amount for the Works executed in accordance with Clause19.3 (i) subsequent to the last claim;

(b) amounts reflecting adjustments in price for the a foresaid claim;

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

(d) amounts reflecting adjustment in price, if any, for(c)above in accordance with the provisions of Clause 13.2 (iii)(a);

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

(f) Deductions:

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

ii. Any amount towards deduction of taxes; and

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

(g) Net claim: (e) – (f)(iii);

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

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

ii. For Change of Scope Orders, and

iii. Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

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

(b) the deductions for maintenance work not done;

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

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

(e) amount towards deduction of taxes

3. Contractor's claim for Damages

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

Schedule - P

(See Clause 20.1)

Insurance

1. Insurance during Construction Period

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

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

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

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

2. Insurance for Contractor's Defects Liability

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

3. Insurance against injury to persons and damage to property

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

The insurance cover shall be not less than: Rs. [*****]

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

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

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

4. Insurance to be in joint names

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

Schedule-Q

(See Clause 14.10)

Tests on Completion of Maintenance Period

1. Riding Quality test:

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

2. Visual and physical test:

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

Schedule-R

(See Clause 14.10)

Taking Over Certificate

I, …….. (Name and designation of the Authority's Representative) under and in accordance with the Agreement dated …… (The "**Agreement**"), for [construction of the ****section (km ** to km **) of

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

SIGNED, SEALED ANDDELIVERED

(Signature)

(Name and designation of Authority's Representative)

(Address)

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