Schedules

Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

1 The Site

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

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

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

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

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

Annex –I

(Schedule-A)

Site

[Note: Through suitable drawings and description in words, the land, buildings, structures and road works comprising the Site shall be specified briefly but precisely in this Annex-I. All the chainages/ location referred to in Annex-I to Schedule-A shall be existing chainages.]

1. Site

The Site of the [Two-Lane] Project Highway comprises the section of NH-129A commencing from km 101+475 to km 114+165 i.e. Paomata Village to Tadubi in the state of Manipur.
The land, carriageway and structures comprising the Site are described below.

2. Land

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

Sl. No.	Existing Chainage (km)		Design Chainage (km)		Length in m (Design)	Existing/Available ROW (m)
	From	To	From	To		
1	101+475	116+145	93+800	105+825	12.025	5m-12m

3. Carriageway

The present carriageway of the Project Highway is Two Lane from km 101+475 to km 114+165. The type of the existing pavement is [flexible].

4. Major Bridges

The Site includes the following Major Bridges: -

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

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

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

under railway line):

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

6. Grade separators

The Site includes the following grade separators:

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

7. Minor bridges

The Site includes the following minor bridges:

Sl. No.	Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-structure	Super-structure		
1	101+789	Open	RCC	RCC	5.5mx5.1m	6

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location(km)	Remarks
Nil		

9. Underpasses (vehicular, non-vehicular)

The Site includes the following underpasses:

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

10. Culverts

The Site has the following culverts:

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length	Width of Culvert (m)
1	102+089	Hume Pipe	1x 0.75m Dia	8
2	102+360	Hume Pipe	1x 1.0m Dia	10
3	102+629	Hume Pipe	1x 1.2m Dia	9

Sl. No.	Chainage (km)	Type of Culvert	Span/Opening with Span Length	Width of Culvert (m)
4	102+861	Hume Pipe	1x 1.2m Dia	7.4
5	103+143	Hume Pipe	1x 1.0m Dia	8.7
6	103+194	Hume Pipe	1x 1.0m Dia	7.5
7	103+402	Hume Pipe	1x 0.9m Dia	10
8	103+723	Hume Pipe	1x 0.9m Dia	7.2
9	104+177	Hume Pipe	1x 0.9m Dia	6.6
10	104+689	Hume Pipe	1x 0.75m Dia	7
11	105+985	Hume Pipe	1x 0.75m Dia	5.6
12	106+199	Hume Pipe	1x 0.75m Dia	7.2
13	106+893	Hume Pipe	1x 1.0m Dia	7.3
14	107+321	Hume Pipe	1x 1.0m Dia	7.7
15	107+461	Hume Pipe	1x 1.0m Dia	8.4
16	107+731	Hume Pipe	1x 1.0m Dia	8.1
17	108+316	Hume Pipe	1x 1.0m Dia	4.8
18	108+647	Hume Pipe	1x 0.9m Dia	8.6
19	109+109	Hume Pipe	1x 1.0m Dia	8.3
20	109+996	Hume Pipe	1x 1.0m Dia	10.2
21	111+329	Hume Pipe	1x 1.0m Dia	7.8
22	111+711	Hume Pipe	1x 1.0m Dia	8.5
23	111+949	Hume Pipe	1x 0.5m Dia	4.6
24	112+044	Hume Pipe	1x 1.0m Dia	7.8
25	112+312	Hume Pipe	1x 1.0m Dia	12.8
26	112+453	Hume Pipe	1x 0.8m Dia	8
27	112+633	Hume Pipe	1x 1.0m Dia	5
28	113+020	Hume Pipe	1x 1.0m Dia	12.2
29	113+228	Hume Pipe	1x 1.0m Dia	13.4
30	113+297	Hume Pipe	1x 0.5m Dia	7.2

11. Bus bays

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

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

12. Truck Lay byes

The details of truck lay byes are as follows:

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

13. Roadside drains

The details of the roadside drains are as follows:

Sl. No.	Location	Type

	From km	To km	Masonry/cc (Pucca)	Earthen (Kutcha)
Nil				

14. Major junctions

The details of major junctions are as follows:

S. No.	Location		At grade	Separated	Category of Cross Road			
	From km	to km			NH	SH	MDR	Others
1	114+165		✓	-	√	-	-	-

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

15. Minor junctions

The details of the minor junctions are as follows:

Sl. No.	Location		Type of intersection	
	From Km	To Km	T-Junction	Cross Road
1	102+470		Y	3-legged
2	103+630		Y	3-legged
3	103+860		Y	3-legged
4	103+940		X	4-legged
5	104+500		Y	3-legged
6	105+500		Y	3-legged
7	105+630		Y	3-legged
8	108+000		Y	3-legged
9	108+250		Y	3-legged
10	109+370		Y	3-legged
11	111+070		Y	3-legged
12	111+310		Y	3-legged
13	111+810		Y	3-legged
14	112+330		Y	3-legged
15	113+280		Y	3-legged
16	113+830		Y	3-legged

6. Bypasses

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

Sl. No.	Name of bypass (town)	Chainage (km) From km to km	Length (in Km)
Nil			

17. Other structures

Existing Retaining Wall

Chainage(m)	Side	Length(L)	Length (R)

From	To	Left	Right		
112720	112790	-	R	-	70
		Total Length			**70**

Existing Breast Wall

Chainage(m)		Side		Length(L)	Length (R)
From	To	Left	Right		
112564	112589	L	-	25	-
112655	112675	L	-	20	-
112715	112795	L	-	80	-
		Total Length		**125**	**-**

Annex – II

(As per Clause 8.3 (i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

Sl. No	**Design Chainage(km)**		**Length in km**	**Existing ROW**	**Proposed ROW Width (m)**	**Date of Providing proposed ROW**
	From	**To**				
(i) Full Right of Way (full width)	93.800	105.825	12.025	5m-12m	16m -34m wide for construction work.	90 % at Appointed Date
ii) Balance Right of Way (full width)	93.800	105.825	12.025	5m-12m	16m -34 m wide for construction work.	Within 90 days after the appointed date as per clause 8.2 of DCA

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/IRC Codes/Manual.

Annex – IV

(Schedule-A)

Environment Clearances

MOEF Clearance: The project highway does not required Environmental clearance as per MoEF corrigendum dated 22.08.2013

Forest Clearance : Forest Clearance is required.

Wildlife Clearance: The project highway does not required Wildlife Clearance as per letter no F. No.8-64/2013-FC dt.20.08.2014 of the Ministry of Environment, Forest and Climate Change (FC Division), Govt. of India.

Schedule - B

(See Clause 2.1)

Development of the Project Highway

1. Development of the Project Highway

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

2. [Rehabilitation and augmentation]

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

3. Specifications and Standards

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

Annex – I

(Schedule-B)

Description of [Two-Lanning]

[Note: Description of the Project Highway shall be given by the Authority in detail together with explanatory drawings (where necessary) to explain the Authority's requirements precisely in order to avoid subsequent changes in the Scope of the Project. The particulars that must be specified in this Schedule-B are listed below as per the requirements of the Manual of Specifications and Standards for [Two Lanning of Highways (IRC: SP: 73-2015)] 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 all other essential project specific details as required should be provided in order to define the Scope of the Project clearly and precisely.]

1. Widening of the Existing Highway

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

(ii) Width of Carriageway

(a) Two-Lanning [with] hard shoulders shall be undertaken. The paved carriageway shall be [7(seven) m] wide.

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

Sl. No.	Built-up stretch (Township)	Location		Width (m)	Typical Cross Section (Refer to Manual)	Remarks
1	Paomata to Tadubi	93+800	105+825	7	As per attached TCS drawing	7 m Carriageway

(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 General Features

(i) General

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

(ii) Design speed

For Mountainous terrain design speed shall be the minimum design speed of 40-60 km/hr and for sharp curve and hair pin bend locations speed reduces up to 30kmph & 20 kmph respectively.

(iii) Improvement of the existing road geometrics

The stretches where design speed reduces below 40 kmph are summarized below:

Sl. No.	HIP No.	Stretch (from km to km)	Type of Deficiency	Remarks
1	652	93+878 to 93+898	Sharp Bend	Design Speed = 30 Kmph
2	653	94+081 to 94+116	Sharp Bend	Design Speed = 25 Kmph
3	654	94+160 to 94+191	Sharp Bend	Design Speed = 30 Kmph
4	655	94+272 to 94+306	Sharp Bend	Design Speed = 30 Kmph
5	656	94+410 to 94+423	Sharp Bend	Design Speed = 30 Kmph
6	661	94+878 to 94+906	Sharp Bend	Design Speed = 30 Kmph
7	662	95+034 to 95+114	Sharp Bend	Design Speed = 30 Kmph
8	663	95+185 to 95+209	Sharp Bend	Design Speed = 30 Kmph
9	664	95+307 to 95+333	Sharp Bend	Design Speed = 30 Kmph
10	665	95+439 to 95+453	Sharp Bend	Design Speed = 30 Kmph
11	666	95+501 to 95+590	Sharp Bend	Design Speed = 30 Kmph
12	667	95+634 to 95+657	Sharp Bend	Design Speed = 30 Kmph
13	670	95+982 to 96+015	Sharp Bend	Design Speed = 30 Kmph
14	672	96+177 to 96+191	Sharp Bend	Design Speed = 30 Kmph
15	674	96+300 to 96+313	Sharp Bend	Design Speed = 30 Kmph
16	675	96+416 to 96+454	Sharp Bend	Design Speed = 30 Kmph
17	676	96+506 to 96+530	Sharp Bend	Design Speed = 30 Kmph
18	679	96+801 to 96+817	Sharp Bend	Design Speed = 25 Kmph
19	681	96+971 to 96+989	Sharp Bend	Design Speed = 20 Kmph
20	682	97+080 to 97+085	Sharp Bend	Design Speed = 25 Kmph
21	683	97+167 to 97+178	Sharp Bend	Design Speed = 30 Kmph
22	686	97+649 to 97+682	Sharp Bend	Design Speed = 20 Kmph
23	702	100+310 to 100+334	Sharp Bend	Design Speed = 30 Kmph
24	703	100+397 to 100+428	Sharp Bend	Design Speed = 30 Kmph
25	704	100+491 to 100+568	Sharp Bend	Design Speed = 30 Kmph
26	707	100+959 to 101+005	Sharp Bend	Design Speed = 30 Kmph
27	714	101+757 to 101+776	Sharp Bend	Design Speed = 30 Kmph
28	715	101+831 to 101+837	Sharp Bend	Design Speed = 25 Kmph
29	717	102+031 to 102+151	Sharp Bend	Design Speed = 30 Kmph
30	726	103+801 to 103+826	Sharp Bend	Design Speed = 30 Kmph
31	727	103+901 to 103+925	Sharp Bend	Design Speed = 30 Kmph
32	728	103+981 to 103+997	Sharp Bend	Design Speed = 30 Kmph

Sl. No.	HIP No.	Stretch (from km to km)	Type of Deficiency	Remarks
33	729	104+183 to 104+194	Sharp Bend	Design Speed = 30 Kmph
34	730	104+247 to 104+259	Sharp Bend	Design Speed = 30 Kmph
35	731	104+330 to 104+347	Sharp Bend	Design Speed = 30 Kmph
36	732	104+402 to 104+414	Sharp Bend	Design Speed = 30 Kmph
37	733	104+452 to 104+459	Sharp Bend	Design Speed = 30 Kmph
38	734	104+499 to 104+542	Sharp Bend	Design Speed = 20 Kmph
39	737	104+954 to 105+027	Sharp Bend	Design Speed = 30 Kmph
40	738	105+092 to 105+103	Sharp Bend	Design Speed = 30 Kmph
41	739	105+156 to 105+164	Sharp Bend	Design Speed = 30 Kmph
42	740	105+226 to 105+230	Sharp Bend	Design Speed = 30 Kmph
43	741	105+297 to 105+302	Sharp Bend	Design Speed = 30 Kmph
44	745	105+646 to 105+672	Sharp Bend	Design Speed = 30 Kmph

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 existing right of way and proper road signs and safety Measures shall be provided.

(iv) Right of Way

Sl. No	Design Chainage(km)		Length(km)	Width (m)
	From	To		
1	93.800	105.825	12.025	16 m - 34 m wide for construction work.

(v) Type of shoulders
[Refer to provision of relevant Manual and specify]

(a) In built-up sections. footpaths/fully paved shoulders shall be provided in the following stretches:

Sl. No.	Stretch (from Km to Km)	Fully Paved shoulders/footpaths	Reference to cross section
1	95+575 to 95+725	2 X 1.5 m width Footpath	TCS-1B
2	95+725 to 95+785	3 X 1.5 m width Footpath	TCS-2C
3	95+785 to 95+845	4 X 1.5 m width Footpath	TCS-1B
4	95+845 to 95+895	5 X 1.5 m width Footpath	TCS-2A
5	95+895 to 95+954	6 X 1.5 m width Footpath	TCS-3
6	95+954 to 95+975	7 X 1.5 m width Footpath	TCS-1B
7	95+975 to 96+025	8 X 1.5 m width Footpath	TCS-3
8	96+025 to 96+145	9 X 1.5 m width Footpath	TCS-1
9	96+145 to 96+185	10 X 1.5 m width Footpath	TCS-1B
10	96+185 to 96+265	11 X 1.5 m width Footpath	TCS-3
11	96+265 to 96+305	12 X 1.5 m width Footpath	TCS-1B
12	96+305 to 96+325	13 X 1.5 m width Footpath	TCS-2B

Sl. No.	Stretch (from Km to Km)	Fully Paved shoulders/footpaths	Reference to cross section
13	103+135 to 103+495	14 X 1.5 m width Footpath	TCS-3
14	103+495 to 103+545	15 X 1.5 m width Footpath	TCS-1
15	103+545 to 103+565	16 X 1.5 m width Footpath	TCS-3
16	103+565 to 103+735	17 X 1.5 m width Footpath	TCS-2B
17	103+735 to 103+755	18 X 1.5 m width Footpath	TCS-2D
18	103+755 to 103+785	19 X 1.5 m width Footpath	TCS-1A
19	103+785 to 103+815	20 X 1.5 m width Footpath	TCS-3
20	103+815 to 103+855	21 X 1.5 m width Footpath	TCS-1A
21	103+855 to 103+925	22 X 1.5 m width Footpath	TCS-2B
22	103+925 to 103+975	23 X 1.5 m width Footpath	TCS-2D
23	103+975 to 104+105	24 X 1.5 m width Footpath	TCS-3
24	104+105 to 104+185	25 X 1.5 m width Footpath	TCS-1B
25	104+185 to 104+205	26 X 1.5 m width Footpath	TCS-2A
26	104+205 to 104+335	27 X 1.5 m width Footpath	TCS-1B
27	104+335 to 104+355	28 X 1.5 m width Footpath	TCS-2C
28	104+355 to 104+555	29 X 1.5 m width Footpath	TCS-3
29	104+555 to 104+615	30 X 1.5 m width Footpath	TCS-1A
30	104+615 to 104+635	31 X 1.5 m width Footpath	TCS-2A
31	104+635 to 104+685	32 X 1.5 m width Footpath	TCS-1B
32	104+685 to 104+695	33 X 1.5 m width Footpath	TCS-2A
33	104+695 to 104+705	34 X 1.5 m width Footpath	TCS-3
34	104+705 to 104+855	35 X 1.5 m width Footpath	TCS-1B
35	104+855 to 104+975	36 X 1.5 m width Footpath	TCS-1
36	104+975 to 104+995	37 X 1.5 m width Footpath	TCS-3
37	104+995 to 105+015	38 X 1.5 m width Footpath	TCS-2B
38	105+015 to 105+065	39 X 1.5 m width Footpath	TCS-3
39	105+065 to 105+265	40 X 1.5 m width Footpath	TCS-1B
40	105+265 to 105+535	41 X 1.5 m width Footpath	TCS-3
41	105+535 to 105+555	42 X 1.5 m width Footpath	TCS-1B
42	105+555 to 105+575	43 X 1.5 m width Footpath	TCS-2C
43	105+575 to 105+735	44 X 1.5 m width Footpath	TCS-1B
44	105+735 to 105+755	45 X 1.5 m width Footpath	TCS-2C
45	105+755 to 105+795	46 X 1.5 m width Footpath	TCS-3
46	105+795 to 105+825	47 X 1.5 m width Footpath	TCS-2A

(b) Hard shoulders of 1.5 m width shall be provided with selected earth wherever applicable as per TCS drawing.

(c) Design and specifications of paved shoulders and granular material shall conform to the requirements specified in the relevant Manual.

(vi) Lateral and vertical clearances at underpasses

(a) Lateral and vertical clearances at underpasses and provision of guardrails/crash barriers shall be as per requirements specified in the relevant Manual.

(b) Lateral clearance: The width of the opening at the underpasses

shall be as follows:

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

(vii) Lateral and vertical clearances at overpasses

(a) Lateral and vertical clearances at overpasses shall be as per requirements specified in the relevant Manual.

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

Sl. No.	Location (Chainage) (from km to km)	Span/Opening (m)	Remarks
Nil			

(viii) Service roads

Service roads shall be constructed at the locations and for the lengths indicated below: [Refer requirements specified in the relevant Manual]

Sl. No.	Location of service road (from km to km)	Right hand side (RHS)/Left hand side (LHS)/ or Both sides	Length (km) of service road
Nil			

(ix) Grade separated structures

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

[Refer to requirements specified in the relevant Manual]

Sl. No.	Location of Structure (VUP)	Length (m)	Number and length of spans	Approach gradient	Remarks. if any
Nil					

(b) In the case of grade separated structures the type of structure and the level of the Project Highway and the cross roads shall be as follows: [Refer to provision of the Manual and specify the type of vehicular under pass/ overpass structure and whether the cross road is to be carried at the existing
Level. raised or lowered]

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

(x) Cattle and pedestrian underpass /overpass

Cattle and pedestrian underpass/overpass shall be constructed as

follows: [Refer to provision of the relevant Manual and specify the requirements of cattle and pedestrian underpass/overpass]

Sl. No.	Location	Type of crossing
Nil		

(xi) Typical cross-sections of the Project Highway
[Give typical cross-sections of the Project Highway by reference to the Manual] As per attached Drawings

Sl No	TCS Type	Description
1	TCS-1:	2 -Lane carriageway with paved shoulder in cutting with both side cover drain cum footpath at built up area
2	TCS-1A:	2 -Lane carriageway with paved shoulder in cutting with both side cover drain cum footpath & Left side breast wall at built up area
3	TCS-1B:	2 -Lane carriageway with paved shoulder in cutting with both side cover drain cum footpath & right side breast wall at built up area
4	TCS-2:	2 -Lane carriageway with paved shoulder in filling with both side cover drain cum footpath at built up area with both side retaining wall
5	TCS-2A:	2 -Lane carriageway with paved shoulder in filling with both side cover drain cum footpath & left side retaining wall at built up area
6	TCS-2B:	2 -Lane carriageway with paved shoulder in filling with both side cover drain cum footpath & right side retaining wall at built up area
7	TCS-2C:	2 -Lane carriageway with paved shoulder in filling with both side cover drain cum footpath & left side retaining wall & right side breast wall at built up area
8	TCS-2D:	2 -Lane carriageway with paved shoulder in filling with both side cover drain cum footpath & left side breast wall & right side retaining wall at built up area
9	TCS-3:	2 -Lane carriageway with paved shoulder with both side cover drain in built up area
10	TCS-4A:	2 -Lane carriageway with paved shoulder with stone masonry trapezoidal drain on right side
11	TCS-4B:	2 -Lane carriageway with paved shoulder with stone masonry trapezoidal drain on left side
12	TCS-4C:	2 -Lane carriageway with paved shoulder with stone masonry trapezoidal both side drain
13	TCS-5:	2 -Lane carriageway with paved shoulder with both side retaining wall
14	TCS-6:	2 -Lane carriageway with paved shoulder with both side breast wall
15	TCS-7A:	2 -Lane carriageway with paved shoulder with left side breast wall
16	TCS-7B:	2 -Lane carriageway with paved shoulder with Right side breast wall
17	TCS-8A:	2 -Lane carriageway with paved shoulder with Left side breast wall with right side Trapezoidal drain
18	TCS-8B:	2 -Lane carriageway with paved shoulder with Left side Trapezoidal drain & right side breast wall
19	TCS-9A:	2 -Lane carriageway with paved shoulder with Left side Retaining wall & right side trapezoidal drain

Sl No	TCS Type	Description
20	TCS-9B:	2 -Lane carriageway with paved shoulder with Left side trapezoidal drain & right side Retaining wall
21	TCS-9C:	2 -Lane carriageway with paved shoulder & right side Retaining wall
22	TCS-9D:	2 -Lane carriageway with paved shoulder & Left side Retaining wall
23	TCS-10A:	2 -Lane carriageway with paved shoulder With Left side Retaining wall & right side breast wall
24	TCS-10B:	2 -Lane carriageway with paved shoulder With Left side breast wall & right side Retaining wall
25	TCS-11:	2 -Lane carriageway with paved shoulder

Sl No	Design Chainage(km)		Length (m)	Tcs Type	Remarks / Location
	From	To			
1	93800	93815	15	TCS-9B	Realignment
2	93815	93875	60	TCS-4C	Realignment
3	93875	93915	40	TCS-4A	Realignment
4	93915	93975	60	TCS-7B	Realignment
5	93975	94085	110	TCS-4A	Realignment
6	94085	94115	30	TCS-9A	Realignment
7	94115	94225	110	TCS-4A	Realignment
8	94225	94235	10	TCS-4C	Realignment
9	94235	94305	70	TCS-4A	Realignment
10	94305	94400	95	TCS-4C	Realignment
11	94400	94625	225	TCS-4C	Reconstruction and Widening
12	94625	94655	30	TCS-4A	Reconstruction and Widening
13	94655	94715	60	TCS-9A	Reconstruction and Widening
14	94715	94830	115	TCS-4A	Reconstruction and Widening
15	94830	94845	15	TCS-4A	Realignment
16	94845	94885	40	TCS-4C	Realignment
17	94885	94900	15	TCS-4A	Realignment
18	94900	95005	105	TCS-4A	Reconstruction and Widening
19	95005	95025	20	TCS-9A	Reconstruction and Widening
20	95025	95125	100	TCS-4A	Reconstruction and Widening
21	95125	95165	40	TCS-9A	Reconstruction and Widening
22	95165	95515	350	TCS-4A	Reconstruction and Widening
23	95515	95545	30	TCS-4C	Reconstruction and Widening
24	95545	95575	30	TCS-4A	Reconstruction and Widening
25	95575	95725	150	TCS-1B	Reconstruction and Widening
26	95725	95785	60	TCS-2C	Reconstruction and Widening
27	95785	95845	60	TCS-1B	Reconstruction and Widening
28	95845	95895	50	TCS-2A	Reconstruction and Widening
29	95895	95954	59	TCS-3	Reconstruction and Widening
30	95954	95975	21	TCS-1B	Reconstruction and Widening
31	95975	96025	50	TCS-3	Reconstruction and Widening

Sl No	Design Chainage(km)		Length (m)	Tcs Type	Remarks / Location
	From	To			
32	96025	96145	120	TCS-1	Reconstruction and Widening
33	96145	96185	40	TCS-1B	Reconstruction and Widening
34	96185	96265	80	TCS-3	Reconstruction and Widening
35	96265	96305	40	TCS-1B	Reconstruction and Widening
36	96305	96325	20	TCS-2B	Reconstruction and Widening
37	96325	96395	70	TCS-4A	Reconstruction and Widening
38	96395	96515	120	TCS-4C	Reconstruction and Widening
39	96515	96815	300	TCS-8B	Reconstruction and Widening
40	96815	97015	200	TCS-4C	Reconstruction and Widening
41	97015	97085	70	TCS-4A	Reconstruction and Widening
42	97085	97265	180	TCS-4C	Reconstruction and Widening
43	97265	97385	120	TCS-4A	Reconstruction and Widening
44	97385	98245	860	TCS-4C	Reconstruction and Widening
45	98245	98465	220	TCS-4A	Reconstruction and Widening
46	98465	98945	480	TCS-4C	Reconstruction and Widening
47	98945	99215	270	TCS-7B	Reconstruction and Widening
48	99215	99320	105	TCS-4A	Reconstruction and Widening
49	99320	99345	25	TCS-9A	Reconstruction and Widening
50	99345	99470	125	TCS-4A	Reconstruction and Widening
51	99470	99585	115	TCS-7B	Reconstruction and Widening
52	99585	99615	30	TCS-4A	Reconstruction and Widening
53	99615	99650	35	TCS-4C	Reconstruction and Widening
54	99650	99765	115	TCS-4C	Realignment
55	99765	99900	135	TCS-4A	Realignment
56	99900	99905	5	TCS-4A	Reconstruction and Widening
57	99905	99945	40	TCS-9D	Reconstruction and Widening
58	99945	99975	30	TCS-9C	Reconstruction and Widening
59	99975	99995	20	TCS-4B	Reconstruction and Widening
60	99995	100145	150	TCS-4C	Reconstruction and Widening
61	100145	100195	50	TCS-4B	Reconstruction and Widening
62	100195	100255	60	TCS-4C	Reconstruction and Widening
63	100255	101065	810	TCS-4B	Reconstruction and Widening
64	101065	101105	40	TCS-4C	Reconstruction and Widening
65	101105	101125	20	TCS-9D	Reconstruction and Widening
66	101125	101175	50	TCS-4B	Reconstruction and Widening
67	101175	101345	170	TCS-11	Reconstruction and Widening
68	101345	101585	240	TCS-4B	Reconstruction and Widening
69	101585	101605	20	TCS-9B	Reconstruction and Widening
70	101605	101675	70	TCS-4B	Reconstruction and Widening
71	101675	101745	70	TCS-9B	Reconstruction and Widening
72	101745	101805	60	TCS-4B	Reconstruction and Widening
73	101805	101825	20	TCS-9B	Reconstruction and Widening
74	101825	102045	220	TCS-4B	Reconstruction and Widening
75	102045	102085	40	TCS-4C	Reconstruction and Widening
76	102085	102105	20	TCS-4B	Reconstruction and Widening

Sl No	Design Chainage(km)		Length (m)	Tcs Type	Remarks / Location
	From	To			
77	102105	102155	50	TCS-9B	Reconstruction and Widening
78	102155	102465	310	TCS-4B	Reconstruction and Widening
79	102465	102495	30	TCS-9B	Reconstruction and Widening
80	102495	102515	20	TCS-4B	Reconstruction and Widening
81	102515	102545	30	TCS-4C	Reconstruction and Widening
82	102545	102885	340	TCS-4B	Reconstruction and Widening
83	102885	102935	50	TCS-11	Reconstruction and Widening
84	102935	103050	115	TCS-4B	Reconstruction and Widening
85	103050	103115	65	TCS-9C	Reconstruction and Widening
86	103115	103135	20	TCS-9B	Reconstruction and Widening
87	103135	103495	360	TCS-3	Reconstruction and Widening
88	103495	103545	50	TCS-1	Reconstruction and Widening
89	103545	103565	20	TCS-3	Reconstruction and Widening
90	103565	103735	170	TCS-2B	Reconstruction and Widening
91	103735	103755	20	TCS-2D	Reconstruction and Widening
92	103755	103785	30	TCS-1A	Reconstruction and Widening
93	103785	103815	30	TCS-3	Reconstruction and Widening
94	103815	103855	40	TCS-1A	Reconstruction and Widening
95	103855	103925	70	TCS-2B	Reconstruction and Widening
96	103925	103975	50	TCS-2D	Reconstruction and Widening
97	103975	104105	130	TCS-3	Reconstruction and Widening
98	104105	104185	80	TCS-1B	Reconstruction and Widening
99	104185	104205	20	TCS-2A	Reconstruction and Widening
100	104205	104335	130	TCS-1B	Reconstruction and Widening
101	104335	104355	20	TCS-2C	Reconstruction and Widening
102	104355	104555	200	TCS-3	Reconstruction and Widening
103	104555	104615	60	TCS-1A	Reconstruction and Widening
104	104615	104635	20	TCS-2A	Reconstruction and Widening
105	104635	104685	50	TCS-1B	Reconstruction and Widening
106	104685	104695	10	TCS-2A	Reconstruction and Widening
107	104695	104705	10	TCS-3	Reconstruction and Widening
108	104705	104855	150	TCS-1B	Reconstruction and Widening
109	104855	104975	120	TCS-1	Reconstruction and Widening
110	104975	104995	20	TCS-3	Reconstruction and Widening
111	104995	105015	20	TCS-2B	Reconstruction and Widening
112	105015	105065	50	TCS-3	Reconstruction and Widening
113	105065	105265	200	TCS-1B	Reconstruction and Widening
114	105265	105535	270	TCS-3	Reconstruction and Widening
115	105535	105555	20	TCS-1B	Reconstruction and Widening
116	105555	105575	20	TCS-2C	Reconstruction and Widening
117	105575	105735	160	TCS-1B	Reconstruction and Widening
118	105735	105755	20	TCS-2C	Reconstruction and Widening
119	105755	105795	40	TCS-3	Reconstruction and Widening
120	105795	105825	30	TCS-2A	Reconstruction and Widening
Total=			**12025**		

3. Intersections and Grade Separators

All intersections and grade separators shall be as per Section 3 of the Manual. Existing intersections which are deficient shall be improved to the prescribed standards.

[Refer to provision of the relevant Manual and specify the requirements. Explain where necessary with drawings/sketches/general arrangement]

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

(i) At-grade intersections

Major Intersections

Sl. No.	Location of intersection (Km)	Type of intersection	Other features	Remarks
1	105+825	3 Legged	RHS- Towards Guwahati	At-grade improvement proposed

Minor Intersections

Sl. No.	Location of intersection (Km)	Type of intersection	Other features
1	94+720	Y-Type	3-legged
2	95+770	Y-Type	3-legged
3	96+000	Y-Type	3-legged
4	96+080	X-Type	4-legged
5	96+600	Y-Type	3-legged
6	97+590	Y-Type	3-legged
7	97+700	Y-Type	3-legged
8	99+955	Y-Type	3-legged
9	100+200	Y-Type	3-legged
10	101+250	Y-Type	3-legged
11	102+830	Y-Type	3-legged
12	103+070	Y-Type	3-legged
13	103+570	Y-Type	3-legged
14	104+060	Y-Type	3-legged
15	104+960	Y-Type	3-legged
16	105+500	Y-Type	3-legged

(ii) Grade separated intersection with/without ramps

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

4. Road Embankment and Cut Section

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

(ii) Raising of the existing road [Refer to provision of the relevant Manual and specify sections to be raised]

The existing road shall be raised in the following sections:

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

5. Pavement Design

(i) Pavement design shall be carried out in accordance with provision of the relevant manual.

(ii) Type of pavement

Flexible Pavement

(iii) Design requirements

[Refer to provision of the relevant Manual and specify design requirements and strategy]

(a) Design Period and strategy

Flexible pavement for new pavement or for widening and strengthening of the existing pavement shall be designed for a minimum design period of 20 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 design traffic of 20 msa.

(iv) Reconstruction of stretches

[Refer to provision of the relevant Manual and specify the stretches if any to be reconstructed.]

The following stretches of the existing road shall be reconstructed. These

shall be designed as new pavement.

SL NO.	Stretch from Km to Km	Remarks	TCS Type
1	94+400 to 94+625	Reconstruction	TCS-4C
2	94+625 to 94+655	Reconstruction	TCS-4A
3	94+655 to 94+715	Reconstruction	TCS-9A
4	94+715 to 94+830	Reconstruction	TCS-4A
5	94+900 to 95+005	Reconstruction	TCS-4A
6	95+005 to 95+025	Reconstruction	TCS-9A
7	95+025 to 95+125	Reconstruction	TCS-4A
8	95+125 to 95+165	Reconstruction	TCS-9A
9	95+165 to 95+515	Reconstruction	TCS-4A
10	95+515 to 95+545	Reconstruction	TCS-4C
11	95+545 to 95+575	Reconstruction	TCS-4A
12	95+575 to 95+725	Reconstruction	TCS-1B
13	95+725 to 95+785	Reconstruction	TCS-2C
14	95+785 to 95+845	Reconstruction	TCS-1B
15	95+845 to 95+895	Reconstruction	TCS-2A
16	95+895 to 95+954	Reconstruction	TCS-3
17	95+954 to 95+975	Reconstruction	TCS-1B
18	95+975 to 96+025	Reconstruction	TCS-3
19	96+025 to 96+145	Reconstruction	TCS-1
20	96+145 to 96+185	Reconstruction	TCS-1B
21	96+185 to 96+265	Reconstruction	TCS-3
22	96+265 to 96+305	Reconstruction	TCS-1B
23	96+305 to 96+325	Reconstruction	TCS-2B
24	96+325 to 96+395	Reconstruction	TCS-4A
25	96+395 to 96+515	Reconstruction	TCS-4C
26	96+515 to 96+815	Reconstruction	TCS-8B
27	96+815 to 97+015	Reconstruction	TCS-4C
28	97+015 to 97+085	Reconstruction	TCS-4A
29	97+085 to 97+265	Reconstruction	TCS-4C
30	97+265 to 97+385	Reconstruction	TCS-4A
31	97+385 to 98+245	Reconstruction	TCS-4C
32	98+245 to 98+465	Reconstruction	TCS-4A
33	98+465 to 98+945	Reconstruction	TCS-4C
34	98+945 to 99+215	Reconstruction	TCS-7B
35	99+215 to 99+320	Reconstruction	TCS-4A
36	99+320 to 99+345	Reconstruction	TCS-9A
37	99+345 to 99+470	Reconstruction	TCS-4A
38	99+470 to 99+585	Reconstruction	TCS-7B
39	99+585 to 99+615	Reconstruction	TCS-4A
40	99+615 to 99+650	Reconstruction	TCS-4C
41	99+900 to 99+905	Reconstruction	TCS-4A
42	99+905 to 99+945	Reconstruction	TCS-9D
43	99+945 to 99+975	Reconstruction	TCS-9C
44	99+975 to 99+995	Reconstruction	TCS-4B
45	99+995 to 100+145	Reconstruction	TCS-4C
46	100+145 to 100+195	Reconstruction	TCS-4B

SL NO.	Stretch from Km to Km	Remarks	TCS Type
47	100+195 to 100+255	Reconstruction	TCS-4C
48	100+255 to 101+065	Reconstruction	TCS-4B
49	101+065 to 101+105	Reconstruction	TCS-4C
50	101+105 to 101+125	Reconstruction	TCS-9D
51	101+125 to 101+175	Reconstruction	TCS-4B
52	101+175 to 101+345	Reconstruction	TCS-11
53	101+345 to 101+585	Reconstruction	TCS-4B
54	101+585 to 101+605	Reconstruction	TCS-9B
55	101+605 to 101+675	Reconstruction	TCS-4B
56	101+675 to 101+745	Reconstruction	TCS-9B
57	101+745 to 101+805	Reconstruction	TCS-4B
58	101+805 to 101+825	Reconstruction	TCS-9B
59	101+825 to 102+045	Reconstruction	TCS-4B
60	102+045 to 102+085	Reconstruction	TCS-4C
61	102+085 to 102+105	Reconstruction	TCS-4B
62	102+105 to 102+155	Reconstruction	TCS-9B
63	102+155 to 102+465	Reconstruction	TCS-4B
64	102+465 to 102+495	Reconstruction	TCS-9B
65	102+495 to 102+515	Reconstruction	TCS-4B
66	102+515 to 102+545	Reconstruction	TCS-4C
67	102+545 to 102+885	Reconstruction	TCS-4B
68	102+885 to 102+935	Reconstruction	TCS-11
69	102+935 to 103+050	Reconstruction	TCS-4B
70	103+050 to 103+115	Reconstruction	TCS-9C
71	103+115 to 103+135	Reconstruction	TCS-9B
72	103+135 to 103+495	Reconstruction	TCS-3
73	103+495 to 103+545	Reconstruction	TCS-1
74	103+545 to 103+565	Reconstruction	TCS-3
75	103+565 to 103+735	Reconstruction	TCS-2B
76	103+735 to 103+755	Reconstruction	TCS-2D
77	103+755 to 103+785	Reconstruction	TCS-1A
78	103+785 to 103+815	Reconstruction	TCS-3
79	103+815 to 103+855	Reconstruction	TCS-1A
80	103+855 to 103+925	Reconstruction	TCS-2B
81	103+925 to 103+975	Reconstruction	TCS-2D
82	103+975 to 104+105	Reconstruction	TCS-3
83	104+105 to 104+185	Reconstruction	TCS-1B
84	104+185 to 104+205	Reconstruction	TCS-2A
85	104+205 to 104+335	Reconstruction	TCS-1B
86	104+335 to 104+355	Reconstruction	TCS-2C
87	104+355 to 104+555	Reconstruction	TCS-3
88	104+555 to 104+615	Reconstruction	TCS-1A
89	104+615 to 104+635	Reconstruction	TCS-2A
90	104+635 to 104+685	Reconstruction	TCS-1B
91	104+685 to 104+695	Reconstruction	TCS-2A
92	104+695 to 104+705	Reconstruction	TCS-3
93	104+705 to 104+855	Reconstruction	TCS-1B

SL NO.	Stretch from Km to Km	Remarks	TCS Type
94	104+855 to 104+975	Reconstruction	TCS-1
95	104+975 to 104+995	Reconstruction	TCS-3
96	104+995 to 105+015	Reconstruction	TCS-2B
97	105+015 to 105+065	Reconstruction	TCS-3
98	105+065 to 105+265	Reconstruction	TCS-1B
99	105+265 to 105+535	Reconstruction	TCS-3
100	105+535 to 105+555	Reconstruction	TCS-1B
101	105+555 to 105+575	Reconstruction	TCS-2C
102	105+575 to 105+735	Reconstruction	TCS-1B
103	105+735 to 105+755	Reconstruction	TCS-2C
104	105+755 to 105+795	Reconstruction	TCS-3
105	105+795 to 105+825	Reconstruction	TCS-2A

6. Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway has been provided in the table given below:

RR Masonry Covered Drain

CHAINAGE (M)		Side	Net Length (m)
From	To		
95575	95725	Both	300
95725	95785	Both	120
95785	95845	Both	120
95845	95895	Both	100
95895	95954	Both	118
95954	95975	Both	42
95975	96025	Both	100
96025	96145	Both	240
96145	96185	Both	80
96185	96265	Both	160
96265	96305	Both	80
96305	96325	Both	40
103135	103495	Both	720
103495	103545	Both	100
103545	103565	Both	40
103565	103735	Both	340
103735	103755	Both	40
103755	103785	Both	60
103785	103815	Both	60
103815	103855	Both	80
103855	103925	Both	140
103925	103975	Both	100
103975	104105	Both	260
104105	104185	Both	160

CHAINAGE (M)		Side	Net Length (m)
From	To		
104185	104205	Both	40
104205	104335	Both	260
104335	104355	Both	40
104355	104555	Both	400
104555	104615	Both	120
104615	104635	Both	40
104635	104685	Both	100
104685	104695	Both	20
104695	104705	Both	20
104705	104855	Both	300
104855	104975	Both	240
104975	104995	Both	40
104995	105015	Both	40
105015	105065	Both	100
105065	105265	Both	400
105265	105535	Both	540
105535	105555	Both	40
105555	105575	Both	40
105575	105735	Both	320
105735	105755	Both	40
105755	105795	Both	80
105795	105825	Both	60
		Total=	**6880 m**

RR Masonry Open Trapezoidal Drain

Left Side		
Chainage (m)		Length (m)
From	To	
93815	93875	60
94225	94235	10
94305	94625	320
94845	94885	40
95515	95545	30
95515	95545	30
96395	96515	120
96515	96815	300
96815	97015	200
97085	97265	180
97385	98245	860
98465	98945	480
99615	99765	150
99975	99995	20
99995	100145	150
100145	100195	50
100195	100255	60

Left Side		
Chainage (m)		Length (m)
From	To	
100255	101065	810
101065	101105	40
101125	101175	50
101345	101585	240
101585	101605	20
101605	101675	70
101675	101745	70
101745	101805	60
101805	101825	20
101825	102045	220
102045	102085	40
102085	102105	20
102105	102155	50
102155	102465	310
102465	102495	30
102495	102515	20
102515	102545	30
102545	102885	340
102935	103050	115
103115	103135	20
Total length =		**5635**

Right Side		
Chainage (m)		Length (m)
From	To	
93815	93875	60
93875	93915	40
93975	94085	110
94085	94115	30
94115	94225	110
94225	94235	10
94235	94305	70
94305	94625	320
94625	94655	30
94655	94715	60
94715	94845	130
94845	94885	40
94885	95005	120
95005	95025	20
95025	95125	100
95125	95165	40
95165	95515	350
95515	95545	30
95545	95575	30

Right Side		
Chainage (m)		Length (m)
From	To	
96325	96395	70
96395	96515	120
96815	97015	200
97015	97085	70
97085	97265	180
97265	97385	120
97385	98245	860
98245	98465	220
98465	98945	480
99215	99320	105
99320	99345	25
99345	99470	125
99585	99615	30
99615	99765	150
99765	99905	140
99995	100145	150
100195	100255	60
101065	101105	40
102040	102085	45
102515	102545	30
Total length =		**4920**

Outlet Drain:

Sl No.	Left Side	Right Side
	Chainage (km)	Chainage (km)
1	93.875	99.905
2	94.305	100.145
3	94.845	100.255
4	95.515	102.515
5	96.325	
6	97.015	
7	97.265	
8	98.245	
9	98.945	
10	99.765	
11	101.175	
12	101.345	
13	102.885	
14	103.05	
15	103.115	

Number of Left side Outlet	**15**	
Number of Left side Outlet	**4**	
Total Number of Outlet	**19**	
Average Length of Outet	**15**	**m**
Total Length of Drain for Outlet =	**285**	**m**
Length of Side Drain	**10555**	**m**
Length of Outlet=	**285**	**m**
Total Length of Drain=	**10840**	**m**

Catch water Drain:

Right Side				
Km		**Length (m)**	**Nos of Catch pit required**	**Length of Catchwater Drain (m)**
From	**To**			
95.858	95.575	283	1	283
95.975	95.858	117	1	117
Total length =				**400**

7. Design of Structures

(i) General

(a) All bridges culverts and structures shall be designed and constructed in accordance with provision of the relevant Manual and shall conform to the cross- sectional features and other details specified therein.

(b) Width of the carriageway of new bridges and structures shall be as follows:

[Refer to provision of the relevant Manual and specify the width of carriageway of new bridges and structures of more than 60 (sixty) metre length. if the carriageway width is different from 7.5 (seven point five) metres in the table below.]

Sl. No.	**Bridge/Structure at km**	**Width of carriageway and cross-sectional features**
1	99+750	7.5
2	100+390	7.5
3	101+465	7.5

(c) The following structures shall be provided with footpaths:

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

new
Structures with footpath]

Sl. No.	Bridge/Structure at km	Width of carriageway and cross-sectional features
Nil		

(d) All bridges shall be high-level bridges.

[Refer to provision of the relevant Manual and state if there is any exception] (e) The following structures shall be designed to carry utility services specified in
Table below:

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

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

(f) Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the typical cross-sections given in provision of the relevant Manual.

(ii) Culverts

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

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

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

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
1	94+355	2X2X1 Cell	Single Span
2	95+058	2X2X1 Cell	Single Span
3	95+318	2X2X1 Cell	Single Span
4	95+372	2X2X1 Cell	Single Span
5	95+555	2X2X1 Cell	Single Span
6	95+858	2X2X1 Cell	Single Span
7	96+312	2X2X1 Cell	Single Span
8	96+812	2X2X1 Cell	Single Span
9	98+046	2X2X1 Cell	Single Span
10	98+250	2X2X1 Cell	Single Span
11	98+917	2X2X1 Cell	Single Span

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
12	99+332	2X2X1 Cell	Single Span
13	99+477	2X2X1 Cell	Single Span
14	100+250	2X2X1 Cell	Single Span
15	100+995	2X2X1 Cell	Single Span
16	101+832	2X2X1 Cell	Single Span
17	103+085	2X3X1 Cell	Single Span
18	103+463	2X2X1 Cell	Single Span
19	103+695	4X4X1 Cell Earth Cushion	Single Span
20	103+786	2X2X1 Cell	Single Span
21	104+048	2X2X1 Cell	Single Span
22	104+180	2X2X1 Cell	Single Span
23	104+715	2X2X1 Cell	Single Span
24	104+975	2X2X1 Cell	Single Span

*[Specify modifications, if any, required in the road level, etc.]

(c) Widening of existing culverts:

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

Sl. No.	Culvert location	Type, span, height and width of existing culvert (m)	Repairs to be carried out [specify]
Nil			

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

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
1	94+228	2X2X1 Cell	Single Span
2	94+697	2X2X1 Cell	Single Span
3	94+828	2X2X1 Cell	Single Span
4	94+908	2X2X1 Cell	Single Span
5	95+142	2X2X1 Cell	Single Span
6	99+168	2X2X1 Cell	Single Span
7	100+667	2X2X1 Cell	Single Span
8	100+692	2X2X1 Cell	Single Span
9	101+105	2X2X1 Cell	Single Span
10	101+293	2X2X1 Cell	Single Span
11	101+708	2X2X1 Cell	Single Span
12	102+040	2X2X1 Cell	Single Span
13	102+142	2X2X1 Cell	Single Span
14	102+318	2X2X1 Cell	Single Span
15	102+468	2X2X1 Cell Earth Cushion	Single Span
16	102+599	2X2X1 Cell	Single Span

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
17	103+568	2X3X1 Cell Earth Cushion	Single Span
18	104+668	2X2X1 Cell	Single Span
19	104+930	2X2X1 Cell	Single Span

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

[Refer provision of the relevant Manual and provide details]

Sl. No.	Location at km	Type of repair required
Nil		

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

(iii) Bridges

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

[(i) The existing bridges at the following locations shall be re-constructed as new Structures]

[Refer provision of the relevant Manual and provide details]

Sl. No.	Bridge location	Salient details of existing bridge		Adequacy or otherwise of the existing waterway, vertical clearance etc.*	Remarks
	(km)	Type of Structures	Span Arrangement and Total Vent way (No. x Length) (m)		
1	94+095	RCC Slab Bridge	1X10m		

(ii) The following narrow bridges shall be widened:

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

(b) Additional new bridges

[Specify additional new bridges if required. And attach GAD]

New bridges at the following locations on the Project Highway shall be constructed. GADs for the new bridges are attached in the drawings folder.

Sl. No.	Location (km)	Total Length (m)	Remarks. If any
Nil			

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

at the following locations:

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

Sl. No.	Location at km	Remarks
Nil		

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

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

Sl. No.	Location at km	Remarks
Nil		

(e) Drainage system for bridge decks

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

(f) Structures in marine environment

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

(v) Rail-road bridges

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

(b) Road over-bridges

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

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

(c) Road under-bridges

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

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

(v) Grade separated structures

[Refer provision of the relevant Manual]

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

(vi) Repairs and strengthening of bridges and structures

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

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

(a) Bridges

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

(b) ROB / RUB

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

(c) Overpasses/Underpasses and other structures

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

(vii) List of Major Bridges and Structures

The following is the list of the Major Bridges and Structures:

Sl. No.	Location (Km)
Nil	

8. Traffic Control Devices and Road Safety Works

(i) Traffic control devices and road safety works shall be provided in accordance with provisions of relevant Manual.

Traffic Signages, Road Marking and other appurtenances	Quantity	unit

Kilometre stones=	11	Nos
5th Kilometre stones=	2	Nos
Boundary Stones=	123	Nos
Delineators (100 cm long and circular shaped) + Hazard marker =	918	Nos
900 mm Octagonal	1	Nos
600 mm circular	727	Nos
900 mm Triangular	358	Nos
800 mm x 600 mm rectangular	3	Nos
Direction Sign < 0.9 sqm	4	sqm
Convex Mirror for Blind Curve	4	Nos
Rumble Strip=	2.3	sqm

(ii) Specifications of the reflective sheeting. [Refer to provision of relevant Manual and specify]

9. Roadside Furniture

(i) Roadside furniture shall be provided in accordance with article 8(i) of this schedule.

(ii) Overhead traffic signs: location and size

Sl. No.	Location (Km)	Size
1	At Tadubi (Ch. 105+825 km)	12 m X 1.2 m (Double Pole)

10. Compulsory Afforestation

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

11. Hazardous Locations

The safety barriers shall also be provided at the following hazardous locations:

a) Breast Wall

Chainage (m)		side	Length
From	To		
93915	93975	Right	60
95575	95725	Right	150
95725	95785	Right	60
95785	95845	Right	60
95954	95975	Right	21
96025	96145	Both	240
96145	96185	Right	40
96265	96305	Right	40
96515	96815	Right	300
98945	99215	Right	270
99470	99585	Right	115

103495	103545	Both	100
103735	103755	Left	20
103755	103785	Left	30
103815	103855	Left	40
103925	103975	Left	50
104105	104185	Right	80
104205	104335	Right	130
104335	104355	Right	20
104555	104615	Left	60
104635	104685	Right	50
104705	104855	Right	150
104855	104975	Both	240
105065	105265	Right	200
105535	105555	Right	20
105555	105575	Right	20
105575	105735	Right	160
105735	105755	Right	20
Total=			**2746**

b) Retaining Wall

Chainage (m)		**side**	**Length**
From	**To**		
94085	94115	Left	30
94655	94715	Left	60
95005	95025	Left	20
95125	95165	Left	40
95725	95785	Left	60
95845	95895	Left	50
96305	96325	Right	20
99320	99345	Left	25
99905	99945	Left	40
99945	99975	Right	30
101105	101125	Left	20
101585	101605	Right	20
101675	101745	Right	70
101805	101825	Right	20
102105	102155	Right	50
102465	102495	Right	30
103050	103115	Right	65
103115	103135	Right	20
103735	103755	Right	20
103565	103735	Right	170
103855	103925	Right	70
103925	103975	Right	50
104185	104205	Left	20

Chainage (m)		side	Length
From	To		
104335	104355	Left	20
104615	104635	Left	20
104685	104695	Left	10
104995	105015	Right	20
105555	105575	Left	20
105735	105755	Left	20
105795	105825	Left	30
Total =			**1140**

Metal Beam Crash Barrier:

Design Chainage (m)		Side	Length (m)
From	To		
95170	95250	Left	80
95450	95568	Left	118
98500	99400	Left	900
101368	101550	Right	182
101750	101800	Right	50
101950	102250	Right	300
Total			**1630**

12. Special Requirement for Hill Roads

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

13. Change of Scope

The 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-B1)

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

Schedule - C

(See Clause 2.1)

Project Facilities

1. Project Facilities

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

(a) Toll plaza[s]

(b) Roadside furniture;

(c) Pedestrian facilities;

(d) Truck Lay byes;

(e) Bus-bays and passenger shelters;

(f) Rest areas; and

(g) Others to be specified

2. Description of Project Facilities

Each of the Project Facilities is described below:

a) Toll Plaza: -

Sl. No.	Design Chainage (km)	Name of the Place
Nil		

b) Roadside furniture: -

Sl. No.	Description	Location	Design Standard
1	Traffic sign & pavement marking	Entire Length (As per Schedule B)	As per Manual
2	Km Stone, 5th kilometre stone	Entire Length	As per Manual
3	Boundary Stone	Entire Length	As per Manual
4	Roadside Delineator, marker & Road Stud	As per Schedule B	As per Manual
5	Metal beam crash barrier	As per Schedule B	As per Manual

C) Pedestrian Facility:-

Pedestrian facilities in the form of foot path shall be provided in the built up area (refer typical cross – section drawing). Pedestrian facilities shall be provided at the locations of urban sections in order to ensure safety of

pedestrians while crossing in consultation with NHIDCL.

d) Truck Lay bye:-

Sl. No.	Truck lay bye Chainage (Both Side)	Name of the Place
Nil		

e) Bus Bay & Passenger shelter: -

Sl. No.	Project Facility	Location (km)	Design Requirements	Other Essential Details
1	Bus Bay & Passenger shelter	105+525 (Both side)	Bus Bays & Passenger shelter have been placed on both side of proposed roadway	Dimension of Bus Bay (L X B = 59.0 m X 3.0 m) Dimension of Passenger Shelter (L X B = 6.0 m X 2.0 m) (Refer Passenger Shelter Drawing)

f) Rest Areas

Sl. No.	Rest Area Chainage	Name of the Place
Nil		

g) Others to be specified

Street Lighting:

Street lighting shall be provided in the built up area and bus bay locations.

Environment

The Project Highway during design, construction and maintenance during implementation period shall conform to the environmental rules and regulations in force. The Construction Contractor shall be responsible for the same.

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

Schedule - D

(See Clause 2.1)

Specifications and Standards

1. Construction

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

2. Design Standards

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

[Manual of Specifications and Standards for Two Lanning of Highways (IRC: SP: 73-2015), referred to herein as the Manual]

[Note: Specify the relevant Manual, Specifications and Standards]

Annex – I

(Schedule-D)

Specifications and Standards for Construction

1. Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for [Two-Lanning of Highways (IRC:SP:73-2015)], referred to as the Manual, and MORTH Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2. Deviations from the Specifications and Standards

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

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

<table>
<tr><th>Item</th><th>Manual Clause Reference</th><th colspan="5">Provision as per Manual</th><th colspan="5">Modified Provision</th></tr>
<tr><td rowspan="4">Shoulder</td><td rowspan="4">2.6</td><td colspan="5"><u>Mountainous Terrain</u></td><td colspan="5"><u>Mountainous Terrain</u></td></tr>
<tr><td rowspan="2">Type of Section</td><td rowspan="2"></td><td colspan="3">Width of Shoulder (m)</td><td rowspan="2">Type of Section</td><td rowspan="2"></td><td colspan="3">Width of Shoulder (m)</td></tr>
<tr><td>Paved</td><td>Earthen</td><td>Total</td><td>Paved</td><td>Earthen</td><td>Total</td></tr>
<tr><td rowspan="2">Open Country with Isolated Built-up Area</td><td>Hill Side</td><td>1.5</td><td>-</td><td>1.5</td><td rowspan="2">Open Country with Isolated Built-up Area</td><td>Hill Side</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Valley Side</td><td>1.5</td><td>1</td><td>2.5</td><td>Valley Side</td><td>-</td><td>Up to 1.0 m</td><td>1</td></tr>
<tr><td rowspan="2">Built-up Area and Approaches to grade separated structures/ bridges</td><td>Hill Side</td><td>0.25 m + 1.5 m (Raised)</td><td>-</td><td>1.75</td><td rowspan="2">Built-up Area and Approaches to grade separated structures/ bridges</td><td>Hill Side</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Valley Side</td><td>0.25 m + 1.5 m (Raised)</td><td>-</td><td>1.75</td><td>Valley Side</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Design Speed</td><td>2.2</td><td colspan="5"><u>Mountainous Terrain:</u>
Ruling : 60 Kmph
Minimum : 40 Kmph</td><td colspan="5"><u>Mountainous Terrain:</u>
Design Speed followed 40-60 kmph in general. However design speed has been reduced to 20 kmph due to site constraints and to accommodate the proposal within EROW.
(Refer Horizontal Alignment Drawing and Table 1.1 below)</td></tr>
<tr><td>Extra Widening</td><td>2.7</td><td colspan="5">Extra Widening has been proposed as per IRC: SP: 73-2015
Radius | Extra Widening
75-100 m | 0.9 m</td><td colspan="5">Extra Widening has been proposed as per IRC: SP: 48-1998 (Table 6.9) of Hill Road Manual.
Radius | Extra Widening
21-40 m | 1.5 m</td></tr>
</table>

Item	Manual Clause Reference	Provision as per Manual			Modified Provision		
		101-300 m	0.6 m		41-60 m	1.2 m	
					61-100 m	0.9 m	
					75-100 m	0.9 m	
					101-300 m	0.6 m	
					Above 300 m	NIL	
Radii of Horizontal Curve	2.9.4	**Mountainous Terrain:** Desirable Minimum Radius: 150 m Absolute Minimum Radius: 75 m			Radius below 75 m has been provided in the location listed in table 1.		

Table 1.1: Locations where Design Speed is less than 40 kmph

Sl. No.	HIP No.	Stretch (from km to km)	Type of Deficiency	Remarks
1	652	93+878 to 93+898	Sharp Bend	Design Speed = 30 Kmph
2	653	94+081 to 94+116	Sharp Bend	Design Speed = 25 Kmph
3	654	94+160 to 94+191	Sharp Bend	Design Speed = 30 Kmph
4	655	94+272 to 94+306	Sharp Bend	Design Speed = 30 Kmph
5	656	94+410 to 94+423	Sharp Bend	Design Speed = 30 Kmph
6	661	94+878 to 94+906	Sharp Bend	Design Speed = 30 Kmph
7	662	95+034 to 95+114	Sharp Bend	Design Speed = 30 Kmph
8	663	95+185 to 95+209	Sharp Bend	Design Speed = 30 Kmph
9	664	95+307 to 95+333	Sharp Bend	Design Speed = 30 Kmph
10	665	95+439 to 95+453	Sharp Bend	Design Speed = 30 Kmph
11	666	95+501 to 95+590	Sharp Bend	Design Speed = 30 Kmph
12	667	95+634 to 95+657	Sharp Bend	Design Speed = 30 Kmph
13	670	95+982 to 96+015	Sharp Bend	Design Speed = 30 Kmph
14	672	96+177 to 96+191	Sharp Bend	Design Speed = 30 Kmph
15	674	96+300 to 96+313	Sharp Bend	Design Speed = 30 Kmph
16	675	96+416 to 96+454	Sharp Bend	Design Speed = 30 Kmph
17	676	96+506 to 96+530	Sharp Bend	Design Speed = 30 Kmph
18	679	96+801 to 96+817	Sharp Bend	Design Speed = 25 Kmph
19	681	96+971 to 96+989	Sharp Bend	Design Speed = 20 Kmph
20	682	97+080 to 97+085	Sharp Bend	Design Speed = 25 Kmph
21	683	97+167 to 97+178	Sharp Bend	Design Speed = 30 Kmph
22	686	97+649 to 97+682	Sharp Bend	Design Speed = 20 Kmph
23	702	100+310 to 100+334	Sharp Bend	Design Speed = 30 Kmph
24	703	100+397 to 100+428	Sharp Bend	Design Speed = 30 Kmph
25	704	100+491 to 100+568	Sharp Bend	Design Speed = 30 Kmph
26	707	100+959 to 101+005	Sharp Bend	Design Speed = 30 Kmph
27	714	101+757 to 101+776	Sharp Bend	Design Speed = 30 Kmph
28	715	101+831 to 101+837	Sharp Bend	Design Speed = 25 Kmph
29	717	102+031 to 102+151	Sharp Bend	Design Speed = 30 Kmph
30	726	103+801 to 103+826	Sharp Bend	Design Speed = 30 Kmph
31	727	103+901 to 103+925	Sharp Bend	Design Speed = 30 Kmph
32	728	103+981 to 103+997	Sharp Bend	Design Speed = 30 Kmph
33	729	104+183 to 104+194	Sharp Bend	Design Speed = 30 Kmph
34	730	104+247 to 104+259	Sharp Bend	Design Speed = 30 Kmph

Sl. No.	HIP No.	Stretch (from km to km)	Type of Deficiency	Remarks
35	731	104+330 to 104+347	Sharp Bend	Design Speed = 30 Kmph
36	732	104+402 to 104+414	Sharp Bend	Design Speed = 30 Kmph
37	733	104+452 to 104+459	Sharp Bend	Design Speed = 30 Kmph
38	734	104+499 to 104+542	Sharp Bend	Design Speed = 20 Kmph
39	737	104+954 to 105+027	Sharp Bend	Design Speed = 30 Kmph
40	738	105+092 to 105+103	Sharp Bend	Design Speed = 30 Kmph
41	739	105+156 to 105+164	Sharp Bend	Design Speed = 30 Kmph
42	740	105+226 to 105+230	Sharp Bend	Design Speed = 30 Kmph
43	741	105+297 to 105+302	Sharp Bend	Design Speed = 30 Kmph
44	745	105+646 to 105+672	Sharp Bend	Design Speed = 30 Kmph

Table 1.2: Locations where Radii of Horizontal Curve is less than 75 m

Sl. No.	HIP No.	Stretch (from km to km)	Radius
1	652	93+878 to 93+898	40
2	653	94+081 to 94+116	25
3	654	94+160 to 94+191	40
4	655	94+272 to 94+306	30
5	656	94+410 to 94+423	40
6	660	94+794 to 94+826	60
7	661	94+878 to 94+906	40
8	662	95+034 to 95+114	60
9	663	95+185 to 95+209	30
10	664	95+307 to 95+333	30
11	665	95+439 to 95+453	40
12	666	95+501 to 95+590	45
13	667	95+634 to 95+657	60
14	670	95+982 to 96+015	50
15	672	96+177 to 96+191	50
16	674	96+300 to 96+313	50
17	675	96+416 to 96+454	60
18	676	96+506 to 96+530	50
19	678	96+704 to 96+742	60
20	679	96+801 to 96+817	25
21	680	96+890 to 96+899	70
22	681	96+971 to 96+989	20
23	682	97+080 to 97+085	25
24	683	97+167 to 97+178	60
25	684	97+248 to 97+297	70
26	686	97+649 to 97+682	20
27	687	97+809 to 97+841	50
28	688	97+963 to 97+992	50
29	689	98+062 to 98+067	70
30	692	98+501 to 98+514	50
31	694	98+850 to 98+894	70

Sl. No.	HIP No.	Stretch (from km to km)	Radius
32	697	99+135 to 99+179	70
33	702	100+310 to 100+334	40
34	703	100+397 to 100+428	40
35	704	100+491 to 100+568	50
36	705	100+682 to 100+714	50
37	706	100+840 to 100+872	70
38	707	100+959 to 101+005	40
39	708	101+072 to 101+082	70
40	710	101+334 to 101+362	70
41	711	101+483 to 101+497	50
42	712	101+575 to 101+605	70
43	714	101+757 to 101+776	40
44	715	101+831 to 101+837	30
45	717	102+031 to 102+151	50
46	718	102+250 to 102+282	50
47	726	103+801 to 103+826	40
48	727	103+901 to 103+925	40
49	728	103+981 to 103+997	50
50	729	104+183 to 104+194	60
51	730	104+247 to 104+259	30
52	731	104+330 to 104+347	30
53	732	104+402 to 104+414	40
54	733	104+452 to 104+459	40
55	734	104+499 to 104+542	30
56	737	104+954 to 105+027	50
57	738	105+092 to 105+103	50
58	739	105+156 to 105+164	40
59	740	105+226 to 105+230	30
60	741	105+297 to 105+302	30
61	745	105+646 to 105+672	50

(iii) [Note 1: Deviations from the aforesaid Specifications and Standards shall be listed out here. Such deviations shall be specified only if they are considered essential in view of project-specific requirements.]

Schedule -E

(See Clauses 2.1 and 14.2)

Maintenance Requirements

1. Maintenance Requirements

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

(ii) The Contractor shall repair or rectify any Defect or deficiency set forth in Paragraph2 of this Schedule-E within the time limit specified therein and any failure in this behalf shall constitute non-fulfilment of the Maintenance obligations by the Contractor. Upon occurrence of any breach hereunder, the Authority shall be entitled to effect reduction in monthly lump sum payment as set forth in Clause 14.6 of this Agreement, without prejudice to the rights of the Authority under this Agreement, including Termination thereof.

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

[Specify all the relevant documents]

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

In respect of any Defect or deficiency not specified in Annex - I of this Schedule-E,the Authority's Engineer may, in conformity with Good Industry Practice, specifythe permissible limit of deviation or deterioration with reference to the Specifications and Standards, and any deviation or deterioration beyond the permissible limitshall be repaired or rectified by the Contractor within the time limit specified bythe 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 wilful default or neglect of the Authority shall be undertaken by the Authority at its own cost. The Authority may instruct the Contractor to undertake the repairs at the rates agreed between the Parties .

Annex –I

(Schedule-E)

Repair/rectification of Defects anddeficiencies

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

Table -1: Maintenance Criteria forPavements:

AssetType	Performance Parameter	Level ofService (LOS)		Frequency of Inspection	Tools/Equipment	Standards and Referencesfor Inspection and DataAnalysis	Time limitfor Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, approache	Potholes	Nil	< 0.1% of area and subjectto limit of 10 mmin depth	Daily	Length Measurement Unitlike Scale,Tape, odometer etc.	IRC 82: 2015 and DistressIdentification Manual for Long TermPavement Performance Program, FHWA 2003(http://www.tfhrc.com/pavement/lttp/reports/03031/)	24-48hours	MORT&H Specification 3004.2

AssetTypes ofGrade structure, approachesof connecting roads,slip roads,lay byes etc. as applicable)	Performance Parameter	Level ofService (LOS)		Frequency of Inspection	Tools/Equipment	Standards and Referencesfor Inspection and DataAnalysis	Time limitfor Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
	Cracking	Nil	< 5% subjectto limitof 0.5sqm forany 50 m length	Daily			7-15 days	MORT&H Specification3004.3
	Rutting	Nil	< 5mm	Daily	Straight Edge		15 -30days	MORT&H Specification3004.2
	Corrugations and Shoving	Nil	< 0.1% ofarea	Daily	Length Measurement Unitlike		2-7days	IRC:82-2015

AssetType	Performance Parameter	Level ofService (LOS)		Frequency of Inspection	Tools/Equipment	Standards and Referencesfor Inspection and DataAnalysis	Time limitfor Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
	Bleeding	Nil	< 1 %of area	Daily	Scale,Tape, odometer etc.		3-7days	MORT&H Specification3004.4
	Ravelling / Stripping	Nil	< 1 %of area	Daily			7-15 days	IRC:82-2015read with IRCSP 81
	Edge Deformation/ Breaking	Nil	< 1 mfor any100 msection and width < 0.1 mat any location,restricte	Daily			7- 15days	IRC:82-2015

AssetType	Performance Parameter	Level ofService (LOS)		Frequency of Inspection	Tools/Equipment	Standards and Referencesfor Inspection and DataAnalysis	Time limitfor Rectification/ Repair	Maintenance Specifications
		Desirable	**Acceptable**					
			d to30 cmfrom theedge					
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM (Sideway-force Coefficient Routine Investigation Machineor 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	180days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-Annually			180days	BS:7941-1: 2006
	Pavement Condition Index	3	2.1	Bi-Annually			180days	IRC:82-2015

AssetType	Performance Parameter	Level ofService (LOS)		Frequency of Inspection	Tools/Equipment	Standards and Referencesfor Inspection and DataAnalysis	Time limitfor Rectification/ Repair	Maintenance Specifications
		Desirable	**Acceptable**					
	Other PavementDistresses			Bi-Annually			2-7days	IRC:82-2015
	Deflection/RemainingLife			Annually	Falling Weight Deflectometer	IRC 115: 2014	180days	IRC:115-2014
Rigid Pavement (PavementofMCW, ServiceRoad,Grade structure,	Roughness BI	2200mm/km	2400mm/km	Bi-Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656-94:2000	180days	IRC:SP:83-2008
	Skid	Skid Resistance no. at different speed of vehicles		Bi-Annually	SCRIM (Sideway-force	IRC:SP:83-2008	180days	IRC:SP:83-2008

AssetType	Performance Parameter	Level ofService (LOS)		Frequency of Inspection	Tools/Equipment	Standards and Referencesfor Inspection and DataAnalysis	Time limitfor Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
approaches of connecting roads, slip roads,lay byes etc. as applicable)		Minimum SN	Traffic Speed(Km/h)		Coefficient Routine Investigation Machineor equivalent)			
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					

AssetType	Performance Parameter	Level ofService (LOS)		Frequency of Inspection	Tools/Equipment	Standards and Referencesfor Inspection and DataAnalysis	Time limitfor Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Embankment/ Slope	Edgedrop at shoulders	Nil	40mm	Daily	Length Measurement Unitlike Scale,Tape, odometer	IRC	7-15 days	MORT&H Specification408.4
	Slopeof camber/crossfall	Nil	<2% variation in prescribedslope of camber/cross fall	Daily			7-15 days	MORT&H Specification408.4
	EmbankmentSlopes	Nil	<15% variation in prescribe	Daily			7-15 days	MORT&H Specification408.4

AssetType	Performance Parameter	Level ofService (LOS)		Frequency of Inspection	Tools/Equipment	Standards and Referencesfor Inspection and DataAnalysis	Time limitfor Rectification/ Repair	Maintenance Specifications
		Desirable	**Acceptable**					
			side slope					
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification
	RainCuts/ Gulliesin 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 followingtable

Table -2: **Maintenance Criteria for RigidPavements:**

S.No.	Type ofDistress	Measured Parameter	Degreeof Severity	AssessmentRating	RepairAction	
					For the case d < D/2	**For the case d > D/2**
CRACKING						
1	**Single Discrete Cracks Not intersecting withany joint**	w = width ofcrack L = length ofcrack d = depth of crack D = depth ofslab	0	Nil, notdiscernible	NoAction	Not applicable
			1	w < 0.2 mm. hair cracks		
			2	w = 0.2 - 0.5 mm, discerniblefrom slow-movingcar	Seal withoutdelay	Seal, and stitch if L> lm. Within7days
			3	w = 0.5 - 1.5 mm, discerniblefrom fast-movingcar		

S.No.	Type ofDistress	Measured Parameter	Degreeof Severity	AssessmentRating	RepairAction	
					For the case d < D/2	For the case d > D/2
			4	w = 1.5 - 3.0mm	Seal, and stitch if L > l m. Within 7days	Staple or DowelBar Retrofit, FDRfor affectedportion. Within 15days
			5	w > 3mm.		
2	**Single Transverse (or Diagonal)Crack intersecting withone or morejoints**	w = width ofcrack L = length ofcrack d = depth of crack D = depth ofslab	0	Nil, notdiscernible	NoAction	
			1	w < 0.2 mm, hair cracks	Route and seal with epoxy. Within 7days	Staple or DowelBar Retrofit. Within 15days
			2	w = 0.2 - 0.5 mm, discerniblefrom slowvehicle		
			3	w = 0.5 - 3.0 mm, discerniblefrom fastvehicle	Route, seal and stitch,if L > 1m. Within 7days	

S.No.	Type ofDistress	Measured Parameter	Degreeof Severity	AssessmentRating	RepairAction	
					For the case d < D/2	For the case d > D/2
			4	w = 3.0 - 6.0mm	Dowel BarRetrofit. Within 15days	Full DepthRepair Dismantle and reconstructaffected. Portion withnorms and specifications-See Para 5.5 &9.2 Within 15days
			5	w > 6 mm, usually associatedwith spalling, and/or slab rockingunder traffic	Not Applicable, as it may befull depth	
3	**SingleLongitudinal Crackintersecting with one ormore joints**	w = width ofcrack L = length ofcrack d = depth ofcrack D = depth ofslab	0	Nil, notdiscernible	NoAction	
			1	w < 0.5 mm, discernable fromslow movingvehicle	Seal with epoxy, if L >1 m. Within 7days	Staple or dowelbar retrofit. Within 15days

S.No.	Type ofDistress	Measured Parameter	Degreeof Severity	AssessmentRating	RepairAction	
					For the case d < D/2	For the case d > D/2
			2	w = 0.5 - 3.0 mm, discerniblefrom fastvehicle	Route seal and stitch, ifL > lm. Within 15days	-
			3	w = 3.0 - 6.0mm	Staple, if L > 1m. Within 15days	Partial DepthRepair withstapling. Within 15days
			4	w = 6.0 - 12.0 mm, usually associated with spalling	Not Applicable, as it may befull depth	
			5	w > 12 mm, usually associatedwith spalling, and/or slab rockingunder traffic		Full DepthRepair Dismantle and reconstructaffected portion as pernorms and specifications -

S.No.	Type ofDistress	Measured Parameter	Degreeof Severity	AssessmentRating	RepairAction	
					For the case d < D/2	**For the case d > D/2**
						See Para5.6.4 Within 15days
4	**Multiple Cracks intersecting withone or morejoints**	**w = width ofcrack**	0	Nil, notdiscernible	NoAction	-
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > l m. Within 15days	
			2	w = 0.2 - 0.5 mm. discerniblefrom slowvehicle		
			3	w = 0.5 - 3.0 mm, discerniblefrom fastvehicle	Full depth repairwithin 15days	Dismantle,Reinstate subbase, Reconstructwhole slab as per specificationswithin 30days
			4	w = 3.0 - 6.0 mm panel brokeninto 2 or 3 pieces		
			5	w > 6 mm and/or panel broken		

S.No.	Type ofDistress	Measured Parameter	Degreeof Severity	AssessmentRating	RepairAction	
					For the case d < D/2	**For the case d > D/2**
				into more than 4 pieces		
5	**CornerBreak**	w = width of crack L = length ofcrack	0	Nil, notdiscernible	NoAction	-
			1	w < 0.5 mm; only 1 cornerbroken	Seal with lowviscosity epoxyto secure broken parts Within 7days	Seal with epoxyseal withepoxy Within 7days
			2	w < 1.5 mm; L < 0.6 m, onlyone cornerbroken		
			3	w < 1.5 mm; L < 0.6 m, twocorners broken	Partial Depth (ReferFigure 8.3of IRC:SP:83-2008) Within 15days	Full depth repair
			4	w > 1.5 mm; L > 0.6 m orthree cornersbroken		
			5	ree or four cornersbroken		Reinstate sub-base, and reconstruct the

S.No.	Type ofDistress	Measured Parameter	Degreeof Severity	AssessmentRating	RepairAction	
					For the case d < D/2	**For the case d > D/2**
						slab as pernorms andspecifications within30days
6	**Punchout (Applicable to ContinuousReinforced Concrete Pavement (CRCP) only)**	w = width ofcrack L = length(m/m2)	0	Nil, notdiscernible		NoAction
			1	w < 0.5 mm; L < 3m/m^2	Not Applicable, as itmay be fulldepth	Seal withlow viscosity epoxyto secure broken parts. Within 15days
			2	either w > 0.5 mm or L < 3m/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 andreplace damaged areataking care not todamage reinforcement. Within 30days
			5	w>3mm,L>3m/m^{2}and deformation		

<table>
<tr><th rowspan="2">S.No.</th><th rowspan="2">Type ofDistress</th><th rowspan="2">Measured Parameter</th><th rowspan="2">Degreeof Severity</th><th rowspan="2">AssessmentRating</th><th colspan="2">RepairAction</th></tr>
<tr><th>For the case d < D/2</th><th>For the case d > D/2</th></tr>
<tr><td colspan="7">Surface Defects</td></tr>
<tr><td rowspan="5">7</td><td rowspan="5">Ravelling or Honeycomb type surface</td><td rowspan="5">r = areadamaged surface/totalsurface of slab (%) h = maximumdepth ofdamage</td><td rowspan="2">0</td><td rowspan="2">Nil, notdiscernible</td><td>ShortTerm</td><td>LongTerm</td></tr>
<tr><td>Noaction.</td><td rowspan="4">NotApplicable</td></tr>
<tr><td>1</td><td>r < 2%</td><td rowspan="2">Local repair of areas damaged and liable to be damaged.
Within 15days</td></tr>
<tr><td>2</td><td>r = 2 - 10%</td></tr>
<tr><td>3</td><td>r =10-25%</td><td rowspan="2">Bonded Inlay, 2 or 3 slabs if affecting.</td></tr>
<tr><td>4</td><td>r = 25 - 50%</td></tr>
</table>

S.No.	Type ofDistress	Measured Parameter	Degreeof Severity	AssessmentRating	RepairAction	
					For the case d < D/2	**For the case d > D/2**
					Within 30days	
			5	r > 50% and h > 25mm	Reconstruct slabs, 4or more slabs if affecting. Within 30days	
8	**Scaling**	r = damagedsurface/totalsurface of slab (%) h = maximumdepth ofdamage	0	Nil, notdiscernible	**ShortTerm**	**LongTerm**
					Noaction.	NotApplicable
			1	r <**2 %**	Local repair of areas damaged and liable to be damaged. Within 7days	
			2	r = 2 - 10%		

S.No.	Type ofDistress	Measured Parameter	Degreeof Severity	AssessmentRating	RepairAction	
					For the case d < D/2	For the case d > D/2
			3	r = 10 - 20%	Bonded Inlay within15 days	
			4	r = 20 - 30%		
			5	r > 30 % and h > 25mm	Reconstruct slabwithin 30days	
9	**Polished Surface/Glazing**	t = texturedepth, sand patchtest	0		Noaction.	NotApplicable
			1	t > 1mm		
			2'	t = 1 - 0.6mm	Monitor rate of deterioration	
			3	t = 0.6 - 0.3mm		
			4	t = 0.3 - 0.1mm		

S.No.	Type ofDistress	Measured Parameter	Degreeof Severity	AssessmentRating	RepairAction	
					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 continuous stretch of minimum 5km. Within 30days	
10	**Popout (SmallHole), Pothole ReferPara 8.4**	n = number/m^2d = diameter h = maximumdepth	0	d < 50 mm; h < 25 mm; n < 1 per5 m^2	Noaction.	NotApplicable
			1	d = 50 - 100 mm; h < 50 mm; n <1 per 5 m^2	Partial depth repair65 mmdeep. Within 15days	
			2	d = 50 - 100 mm; h > 50 mm; n <1 per 5 m^2		

S.No.	Type ofDistress	Measured Parameter	Degreeof Severity	AssessmentRating	RepairAction	
					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 repair110mm i.e.10 mm more than the depth of the hole. Within 30days	
			4	d = 100 - 300 mm; h > 100 mm; n< 1 per 5m^2		
			5	d > 300 mm; h > 100 mm: n > 1per 5 m^2	Full depthrepair. Within 30days	

JointDefects						
11	**Joint SealDefects**	loss or damage L = Length as %total joint length	0	Difficult todiscern.	**ShortTerm** Noaction.	**LongTerm** NotApplicable
			1	Discernible, L< 25% but of littleimmediate consequence withregard to ingress of wateror trappingincompressible material.	Clean joint, inspectlater.	
			3	Notable.L>25% insufficientprotection against ingress ofwater and trapping incompressiblematerial.	Clean and reapply sealantin selected locations. Within 7days	
			5	Severe; w > 3mm negligible protection against ingress ofwater	Clean, widen and reseal thejoint. Within 7days	

				and trapping incompressiblematerial.		
12	**Spalling ofJoints**	w = width oneither side of the joint L= lengthofspalled portion (as %joint length)	0	Nil, notdiscernible	Noaction.	NotApplicable
			1	w < 10mm	Apply low viscosity epoxyresin/ mortar in crackedportion.	
			2	w = 10 - 20 mm, L <25%	Within 7days	
			3	w = 20 - 40 mm, L >25%	Partial Depth Repair. Within 15days	
			4	w = 40 - 80 mm, L >25%	30 - 50 mm deep, h = w + 20%of w, within 30days	
			5	w > 80 mm, and L > 25%	50 - 100 mm deeprepair. H = w + 20% ofw. Within 30days	
13	**Faulting (or Stepping)**	f = difference oflevel	0	not discernible, < 1 mm	Noaction.	Noaction.

	in Cracks or Joints		1	f < 3mm		
			2	f = 3 - 6mm	Determine cause and observe,take action for diamondgrinding	Replace the slabas appropriate. Within 30days
			3	f = 6 - 12mm	DiamondGrinding	
			4	f= 12 - 18 mm	Raise sunkenslab.	Replace the slabas appropriate. Within 30days
			5	f> 18mm	Strengthen subgrade andsub-base by groutingand raising sunkenslab	
14	**Blowup or Buckling**	h = vertical displacementfrom normalprofile	0	Nil, notdiscernible	**ShortTerm**	**LongTerm**
			1	h < 6mm	NoAction	
			2	h = 6 - 12mm	Install Signs to WarnTraffic	

			3	h = 12 - 25 mm	within 7days	
			4	h > 25mm	Full DepthRepair. Within 30days	
			5	shattered slabs, ie 4or more pieces	Replace broken slabs. Within 30days	
15	**Depression**	h = negativevertical displacementfrom normal profile L =length	0	Not discernible, h < 5mm	Noaction.	NotApplicable
			1	h = 5 - 15mm		
			2	h = 15-30 mm, Nos<20% joints	Install Signs to WarnTraffic within 7days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or >20% joints	Strengthensubgrade. Reinstate pavement at normallevel	

			5	h > 100mm	if L < 20m. Within 30days	
16	**Heave**	h = positivevertical displacementfrom normalprofile. L = length	0	Not discernible. h <5 mm	**ShortTerm**	**LongTerm**
					Noaction.	scrabble
			1	h = 5 - 15mm	Followup.	
			2	h = 15 - 30 mm, Nos <20%joints	Install Signs toWarn Traffic within 7days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or >20% joints	Stabilise subgrade. Reinstate pavement at normal level if length < 20 m. Within 30days	
			5	h > 100mm		
17	**Bump**	h = vertical	0	h < 4mm	Noaction	

		displacement from normalprofile	1	h = 4 - 7mm	Grind, in case of new construction within 7days	ConstructionLimit for New Construction.
			3	h = 7 - 15mm	Grind, in case of ongoingMaintenance within 15days	Replace in caseof newconstruction. Within 30days
			5	h > 15mm	Full DepthRepair. Within 30days	Full DepthRepair. Within 30days
18	**Lane to Shoulder Drop-off**	f = differenceof level	0	Nil, not discernible <3mm	**ShortTerm** Noaction.	**LongTerm**
			1	f = 3 - 10mm	Spot repair ofshoulder within 7 days	
			2	f = 10 - 25 mm		
			3	f = 25 - 50 mm	Fill upshoulder	

			4	f = 50 - 75 mm	within 7days	For any 100m stretchReconstruct shoulder, if affecting 25%or more ofstretch. Within 30days
			5	f > 75mm		
Drainage						
19	**Pumping**	quantity offines and waterexpelled through open joints andcracks Nos	0	not discernible	NoAction	
			1 to2	slight/ occasional Nos< 10%	Repair cracks and jointsWithout delay.	Inspect andrepair sub-drainageat distressedsections andupstream.
			3 to4	appreciable/ Frequent 10 -25%	Lift or jack slab within 30 days.	
		Nos/100 m stretch	5	abundant, crack development > 25%	Repair distressedpavement sections. Strengthensubgrade and subbase. Replaceslab. Within 30days	

20	**Ponding**	Ponding onslabs due to blockage of drains	0-2	No discernible problem	Noaction.	
			3 to4	Blockages observedin drains,butwater flowing	Clean drains etc. within 7days, Followup	Action requiredto stop waterdamaging foundation within30 days.
			5	Ponding,accumulation of waterobserved	-do-	

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

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th>Level of Service(LOS)</th><th>Frequencyof Measurement</th><th>TestingMethod</th><th>Recommended Remedial measures</th><th>Time limitfor Rectification</th><th>Specifications and Standards</th></tr>
<tr><td>Highway</td><td>Availability of SafeSight Distance</td><td>As per IRC SP :84-2014, aminimum of safe stopping sight distanceshall be availablethroughout.
<table><tr><th>Design Speed, kmph</th><th>Desirable MinimumSight 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>ManualMeasurements with Odometeralong with video/image backup</td><td colspan="2">Removal of obstruction within24 hours, in case of sight lineaffected by temporary objects such astrees, temporaryencroachments.

In case of permanent structureor designdeficiency:
Removal of obstruction/improvement of deficiency at the earliest
Speed Restrictionboards and suitable trafficcalming measures such as transversebar marking, blinkers, etc. shallbe applied during the periodof rectification.</td><td>IRC:SP84-2014</td></tr>
<tr><td>Pavement Marking</td><td>Wear</td><td><70% of markingremaining</td><td>Bi-Annually</td><td>VisualAssessmentas per Annexure-F ofIRC:35-2015</td><td>Re - painting</td><td>Cat-1Defect– 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>Frequencyof Measurement</th><th>TestingMethod</th><th>Recommended Remedial measures</th><th>Time limitfor Rectification</th><th>Specifications and Standards</th></tr>
<tr><td></td><td>Day time Visibility</td><td>During expected life ServiceTime
Cement Road-130mcd/m²/lux
Bituminous Road -100mcd/m²/lux</td><td>Monthly</td><td>As per Annexure-Dof 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>
<tr><td></td><td>Night Time Visibility</td><td>Initial and MinimumPerformancefor Dry Retro reflectivityduringnight time:
<table><tr><th>Design Speed</th><th colspan="2">(RL) Retro Reflectivity(mcd/ m²/lux)</th></tr><tr><td></td><td>Initial (7days)</td><td>Minimum Thresholdlevel (TL) &warranty periodrequired up to 2years</td></tr><tr><td>Up to65</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>Initial and Minimum PerformanceforNight Visibility under wetcondition(Retroreflectivity):</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 2months</td><td>IRC:35-2015</td></tr>
</table>

Asset Type	Performance Parameter	Level of Service(LOS)	Frequencyof Measurement	TestingMethod	Recommended Remedial measures	Time limitfor Rectification	Specifications and Standards
		Initial 7 days Retro reflectivity:100 mcd/m^2/lux Minimum Threshold Level:50 mcd/m^2/lux					
	Skid Resistance	Initial and Minimumperformance for SkidResistance: Initial (7days):55BPN Min. Threshold: 44BPN *Note: shall be considered under urban/city trafficcondition encompassing the locationslike pedestrian crossings, bus bay,bus stop, cycle trackintersection delineation, transverse barmarkings etc	Bi-Annually	As per Annexure-Gof IRC:35-2015		Within 24hours	IRC:35-2015
Road Signs	Shape and Position	Shape and Position as perIRC:67-2012. Signboard should be clearly visiblefor the design speed of thesection.	Daily	Visual with video/image backup	Improvement of shape, in caseif shape is damaged. Relocation as perrequirement	48 hours incase of Mandatory Signs,Cautionary and Informatory Signs (Singleand Dual post signs) 15 Days in case of Gantry/Cantilever Signboards	IRC:67-2012
	Retro reflectivity	As per specifications inIRC:67-2012	Bi-Annually	Testing of each	hange of ignboard	48 hours incase of Mandatory	RC:67-2012

Asset Type	Performance Parameter	Level of Service(LOS)	Frequencyof Measurement	TestingMethod	Recommended Remedial measures	Time limitfor Rectification	Specifications and Standards
				signboardusing Retro ReflectivityMeasuringDevice. In accordance with ASTMD 4956-09.		Signs, Cautionary and InformatorySigns (Singleand Dual post signs) 1 Month incase of Gantry/Cantilever Signboards	
Kerb	KerbHeight	As per IRC 86:1983 dependingupon type ofKerb	Bi-Annually	Use ofdistance measuringtape	Raising Kerb Height	Within 1 Month	RC 86:1983
	KerbPainting	Functionality: Functioning ofKerb painting asintended	Daily	Visualwith video/image backup	KerbRepainting	Within7-days	RC 35:2015
OtherRoad Furniture	ReflectivePavementMarkers(Road Studs)	Numbers and Functionality asper specifications in IRC:SP:84-2014and IRC:35-2015, unless specifiedin Schedule-B.	Daily	Counting	NewInstallation	Within 2months	IRC:SP:84-2014,IRC:35-2015
	Pedestrian Guardrail	Functionality: Functioning of guardrail asintended	Daily	Visual with video/image backup	Rectification	Within 15days	IRC:SP:84-2014
	Traffic Safety Barriers	Functionality: Functioning ofSafety Barriers asintended	Daily	Visual with video/image backup	Rectification	Within 7days	IRC:SP:84-2014, IRC:119-2015
	End Treatment of	Functionality: Functioning of End Treatment asintended	Daily	Visual with video/image	Rectification	Within 7days	IRC:SP:84-2014,

Asset Type	Performance Parameter	Level of Service(LOS)	Frequencyof Measurement	TestingMethod	Recommended Remedial measures	Time limitfor Rectification	Specifications and Standards
	Traffic Safety Barriers			backup			IRC:119-2015
	Attenuators	Functionality: Functioning of Attenuators asintended	Daily	Visual with video/imageb ackup	Rectification	Within 7days	IRC:SP-2014,IRC:119- 2015
	Guard Posts and Delineators	Functionality: Functioning ofGuard Posts and Delineators as intended	Daily	Visual with video/image backup	Rectificatio n	Within 15days	IRC: 79 - 1981
	OverheadSign Structure	Overhead signstructure shall be structurallyadequate	Daily	Visual with video/image backup	Rectification	Within 15days	IRC:67-2012
	TrafficB linkers	Functionality: Functioning ofTraffic Blinkers asintended	Daily	Visual with video/image backup	Rectification	Within 7days	IRC:SP:84-2014
Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illumination onthe road surface	Daily	Theillumination level shallbe measuredwith luxmeter	Improvement in Lighting System	24hours	IRC:SP:84-2014
		Nomajor failure in the lighting system	Daily	-	Rectification of failure	24hours	IRC:SP:84-2014
		Nominor failure in the lighting system	Monthly	-	Rectification of failure	8hours	IRC:SP:84-2014
	Toll Plaza Canopy Lights	Minimum 40 Lux illumination onthe road surface	Daily	The illuminationlev el shallbe measuredwith luxmeter	Improvementin LightingSystem	24hours	IRC:SP:84-2014
		No major/minor failure in thelighting system	Daily	-	Rectification of failure	8hours	IRC:SP:84-2014

Asset Type	Performance Parameter	Level of Service(LOS)	Frequencyof Measurement	TestingMethod	Recommended Remedial measures	Time limitfor Rectification	Specifications and Standards
Treesand Plantation including medianplantation	Obstruction in aminimum head-room of 5.5 mabove carriagewayor obstruction in visibilityof road signs	No obstruction due totrees	Monthly	Visual with video/image backup	Removal oftrees	Immediate	IRC:SP:84-2014
	Deterioration in healthof treesand bushes	Health of plantation shall be asper requirement of specifications& instructions issued by Authorityfrom time to time	Daily	Visual with video/image backup	Timelywatering andtreatment. OrReplacement of Treesand Bushes.	Within 90days	IRC:SP:84-2014
	Vegetationaffectingsight line androad structures	Sight line shall be free from obstruction byvegetation	Daily	Visual with video/image backup	Removal ofTrees	Immediate	IRC:SP 84 - 2014
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every 4hours	
	Defects in electrical,water and sanitaryinstallations	-	Daily	-	Rectification	24hours	

Asset Type	Performance Parameter	Level of Service(LOS)	Frequencyof Measurement	TestingMethod	Recommended Remedial measures	Time limitfor Rectification	Specifications and Standards
OtherProject Facilities and Approachroads	Damage or deterioration in ApproachRoads, pedestrian facilities, truck lay-bys, bus-bays,bus-shelters, cattle crossings, Traffic Aid Posts,Medical Aid Posts and otherworks		Daily	-	Rectification	15days	IRC:SP 84 - 2014

AssetType	PerformanceParameter	Level ofService (LOS)	FrequencyofMeasurement	TestingMethod	RecommendedRemedial measures	Timelimit for Rectification	SpecificationsandStandards
Pipe/box/slab culverts	Free waterway/ unobstructed flow section	85% ofculvert normal flowarea to available.	2 times ina year(before andafter rainyseason)	Inspection byBridge Engineer as perIRC SP: 35-1990 and recording of depthof silting and areaof vegetation.	Cleaning silt up soilsand debris in culvert barrel after rainy season,removal of bushes andvegetation, U/s of barrel, underbarrel and D/s of barrelbefore rainyseason.	15 days beforeonset ofmonsoon andwithin 30 daysafter end ofrainy season.	IRC5-2015, IRC SP:40-1993 and IRC SP:13-2004
	Leak-proof expansionjoints if any	No leakage throughexpansionjoints	Bi-Annually	Physicalinspection of expansionjoints as per IRC SP:35-1990 if any,for leakage strainson walls at joints.	Fixing with sealant suitably	30 days or beforeonset of rains whicheverc omesearlier	IRCSP:40-1993 andIRC SP:69-2011
	Structurallysound	Spalling of concrete not more than0.25 sqm	Bi-Annually	Detailedinspection of all componentsof culvert as perIRC SP:35-1990 and recording the defects	Repairs tospalling, cracking,delamination, rusting shall befollowed as perIRC:SP:40-1993.	15days	IRC SP 40-1993 and MORTH Specifications clause 2800
		Delaminationof concrete notmore than 0.25 sq.m.					
		Crackswider than 0.3 mmnot more than1m aggregatelength					

	Protection works in good condition	Damaged ofrough stone apronor bankrevetment not more than 3 sqm, damageto solid apron (concreteapron) not more than 1	2 times ina year(before andafter rainy season)	Condition surveyas per IRCSP:35-1990	Repairs to damaged aprons andpitching	30 days afterdefect observation or 2weeks beforeonset of rainy seasonwhic hever isearlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Bridgesincludin gROBs Flyover etc.as applicable	Ridingquali ty or user comfort	No potholein wearing coaton bridgedeck	Daily	Visual inspectionas per IRCSP:35-1990	Repairs to BC orwearing coat	15days	MORT&H Specification 2811
Bridge -Super Structure	Bumps	No bump at expansionjoint	Daily	Visual inspection as per IRCSP:35-1990	Repairs to BC oneither side of expansionjoints, profile correctioncourse on approach slab incase of settlement toapproach embankment	15days	MORT&H Specification 3004.2 & 2811.
	User safety(con ditionof crash barrier and guard rail)	No damagedor missingstretch of crashbarrier orpedestrian handrailing	Daily	Visualinspection and detailed condition surveyas per IRC SP:35- 1990.	Repairs andreplacement of safety barriers asthe case maybe	3days	IRC: 5-1998, IRC SP: 84-2014 and IRC SP: 40-1993.

	Rustedreinforcem ent	Not more than 0.25sq.m	Bi-Annually	Detailedcondition survey as per IRC SP: 35-1990using Mobile Bridge InspectionUnit	All the corroded reinforcement shallneed to be thoroughlycleaned from rusting andapplied with anti-corrosive coating before carrying out the repairs toaffected concrete portionwith epoxy mortar /concrete.	15days	IRC SP:40-1993 and MORTH Specification1600.
	Spallingof concrete	Not more than 0.50sq.m					
	Delaminatio n	Not more than0.50 sq.m					
	Crackswid er than 0.30mm	Not morethan 1m totallength	Bi-Annually	Detailedcondition survey as per IRC SP: 35-1990using Mobile Bridge InspectionUnit	Groutingwithepoxy mortar, investigating causes for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP: 40-1993 and MORTH Specification 2800.
	Rainwater seepageth roughdec kslab	Leakage - nil	Quarterly	Detailedcondition survey as per IRC SP: 35-1990using Mobile Bridge InspectionUnit	Grouting of deck slabat leakage areas, waterproofing, repairsto drainagespouts	1months	MORTH specifications 2600 & 2700.
	Deflectiond ue to permanent loads and	Within design limits.	Once in every 10 years for spans more	Load testmethod	Carry out majorrehabilitation workson bridge to retainoriginal design loads capacity	6months	IRC SP: 51-1999.

	liveloads		than 40m				
	Vibrations in bridge deck dueto movingtrucks	Frequency of vibrationsshall not be morethan 5Hz	Once in every 5years for spans more than 30m and every 10 years for spans between 15 to 30m	Laserdisplacement sensors orlaser vibro-meters	Strengthening of super structure	4months	AASHTO LRFD specifications
	Leakagein Expansionjoints	No damage to elastomeric sealant compound in strip seal expansionjoint, no leakage ofrain waterthrough expansion jointin case of buriedand asphalt plugand copper stripjoint.	Bi-Annually	Detailedcondition survey as perIRC SP:35-1990using Mobile Bridge InspectionUnit	Replace of seal in expansionjoint	15days	MORTH specifications 2600 and IRC SP:40-1993.
	Debrisand dust in strip seal	No dust or debrisexpa in nsion joint	Monthly	Detailedcondition survey as perIRC SP:35-1990 using	Cleaning of expansion joint gapsthoroughly	3days	MORTH specifications 2600 and

	expansion joint	gap.		Mobile Bridge InspectionUnit			IRC SP: 40-1993.
	Drainage spouts	No down take pipe missing/broken below soffitof the deck slab.No silt, debris,clogging of drainage spout collectionchamb	Monthly	Detailedcondition survey as perIRC SP: 35-1990 using Mobile Bridge InspectionUnit	Cleaningofdrainage spouts thoroughly. Replacement of missing/brokendown takepipeswitha minimum pipeextension of 500mm below soffitof slab. Providingsealant around the drainagespout if any leakagesobserved.	3days	MORTH specification 2700.
Bridge-substructure	Cracks/spalling of concrete/ rustedsteel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailedcondition survey as perIRC SP: 35-1990using Mobile Bridge InspectionUnit	All the corrodedreinforcement shallneed to be thoroughlycleaned from rusting andapplied with anti-corrosive coating beforecarrying out repairs to substructure by grouting/gunitingand micro concreting depending on typeof	30days	IRC SP: 40-1993 and MORTH specification 2800.

	Bearings	Delamination of bearingreinforcement not more than 5%, crackingor tearing ofrubber not more than2 locations per side, norupture ofreinforcement orrubber	Bi-Annually	Detailedcondition survey as perIRC SP: 35-1990using Mobile Bridge InspectionUnit	In case of failure ofeven one bearing onany pier/abutment, allthe bearings on that pier/abutment shallbe replaced, in order togetuniform load transferon tobearings.	3months	MORTH specification 2810 and IRC SP: 40-199.
BridgeFoundations	Scouring aroundfoundations	Scouringshall not belower thanmaximum scour levelfor thebridge	Bi-Annually	Conditionsurvey and visual inspection asper IRC SP:35-1990 using Mobile BridgeInspection Unit. In case ofdoubt, useUnderwater camera for inspection ofdeep wells inmajor	Suitable protection works aroundpier/abutment	1month	IRC SP: 40-1993, IRC 83-2014,MORTH specification2500
	Protection works in good condition	Damagedof roughstone apron or bank revetmentnot more than 3	2 times in a year (beforeand afterrainy season)	Condition survey as per IRCSP:35-1990	Repairs to damaged aprons andpitching.	30 days after defectobservatio n or 2	IRC: SP 40-1993 and IRC:SP:13-2004.

		sq.m, damageto solid apron(concreteapron) not more than 1 sq.m				weeksbefore reonset of rainy seasonwhicheverisearlier.	
Note: AnyStructureduringtheentirecontractperiodwhichisfoundthatdoesnotcomplieswithallrequirementsofthisTablewillbeprepared, rehabilitated or even reconstructed under the scope of thecontractor.							

Table 4: Maintenance Criteria for Structures andCulverts:

Table 5: Maintenance Criteria for HillRoads

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

HillRoads		
(i)	Damage to Retaining wall/ Breastwall	7 (Seven)days
(ii)	Landslides requiringclearance	12 (Twelve)hours
(iii)	Snow requiringclearance	24 (Twenty Four) hours

<u>Note:</u>Foralltables1to5above,latestBIS&IRCstandards(eventhosenotindicated herewith) along with MoRTH specifications shall be binding for allmaintenance activities.

A. FlexiblePavement

Nature of Defect or deficiency		Time limit forrepair/ rectification
(b)	**Granular earth shoulders, side slopes, drains andculverts**	
(i)	Variation by more than 1 % in the prescribedslope of camber/cross fall (shall not be less thanthe camber on the maincarriageway)	7 (seven)days
(ii)	Edge drop at shoulders exceeding 40mm	7 (seven)days
(iii)	Variation by more than 15% in the prescribedside (embankment)slopes	30 (thirty) days
(iv)	Rain cuts/gullies inslope	7 (seven)days
(v)	Damage to or silting of culverts and sidedrains	7 (seven)days
(vi)	Desilting of drains in urban/semi- urbanareas	24 (twenty four)hours
(vii)	Railing, parapets, crashbarriers	7 (seven) days(Restore immediately if causingsafety hazard)
(c)	**Road side furniture including road sign and pavementmarking**	
(i)	Damage to shape or position, poor visibility orloss of retro-reflectivity	48 (forty eight)hours
(ii)	Painting of km stone, railing, parapets,crash barriers	As and when required/Once everyyear
(iii)	Damaged/missing signs road requiring replacement	7 (seven)days
(iv)	Damage to road markups	7 (seven)days
(d)	**Roadlighting**	
(i)	Any major failure of thesystem	24 (twenty four)hours
(ii)	Faults and minorfailures	8 (eight) hours
(e)	**Trees andplantation**	

Nature of Defect or deficiency		Time limit forrepair/ rectification
(i)	Obstruction in a minimum head- room of 5m above carriageway or obstruction in visibilityof road signs	24 (twenty four)hours
(ii)	Removal of fallen trees fromcarriageway	4 (four)hours
(iii)	Deterioration in health of trees andbushes	Timely watering andtreatment
(iv)	Trees and bushes requiringreplacement	30 (thirty) days
(v)	Removal of vegetation affecting sight line androad structures	15 (fifteen)days
(f) Restarea		
(i)	Cleaning oftoilets	Every 4 (four)hours
(ii)	Defects in electrical, water and sanitaryinstallations	24 (twenty four)hours
(g) [Toll Plaza]		
(h)	**Other Project Facilities and Approachroads**	
(i)	Damage in approach roads, pedestrianfacilities, truck lay- byes, bus-bays, bus-shelters,cattle crossings, [Traffic Aid Posts, Medical Aid Posts]and serviceroads	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 oras specified by theAuthority's Engineer
(b) Foundations		

Nature of Defect or deficiency		Time limit forrepair/ rectification
(i)	Scouring and/or cavitation	15 (fifteen)days
(c)	**Piers, abutments, return walls and wing walls**	
(i)	Cracks and damages including settlementand tilting, spalling,scaling	30 (thirty) days
(d)	**Bearings (metallic) of bridges**	
(i)	Deformation, damages, tilting or shifting of bearings	15 (fifteen) daysGreasing of metallic bearings oncein ayear
(e)	**Joints**	
(i)	Malfunctioning ofjoints	15 (fifteen)days
(f)	**Otheritems**	
(i)	Deforming of pads in elastomericbearings	7 (seven)days
(ii)	Gathering of dirt in bearings and joints; orclogging of spouts, weep holes andvent-holes	3 (three)days
(iii)	Damage or deterioration in kerbs,parapets, handrails and crashbarriers	3 (three) days(immediately within 24 hours ifposing danger tosafety)
(iv)	Rain-cuts or erosion of banks of the side slopesof approaches	7 (seven)days
(v)	Damage to wearingcoat	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 structureor obstructing thewaterway	15 (fifteen)days
(g)	**Hill Roads**	
(i)	Damage to retaining wall/breastwall	7 (seven)days
(ii)	Landslides requiringclearance	12 (twelve)hours

Nature of Defect or deficiency		Time limit forrepair/ rectification
(iii)	Snow requiringclearance	24 (twenty four)hours

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) LicencefrominspectoroffactoriesorothercompetentAuthorityforsetting up batching plant;

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

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

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

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

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

Schedule – G

(See Clauses 7.1 and 19.2)

Annex-I

(See Clause 7.1)

Annex-I : Form of Bank Guarantee
[Performance Security/Additional Performance Security]

To,
Managing Director, NHIDCL,
National Highways & Infrastructure Development Corporation Ltd.

(A) _____[name and address of contractor] (hereinafter called the "**Contractor**") and [name and address of the authority], (hereinafter called the **"Authority"**) have entered into an agreement (hereinafter called the "**Agreement**") for the **"Name of Work"** (the "**EPC**") basis, 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 Ltd. , 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.

[$] Insert date being 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 7.2 of the Agreement).

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. This guarantee shall also be operatable at our…….. Branch at New Delhi (Complete Address of bank branch is mandatory), from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

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

Sl. No	Particulars	Details
1	Name of the Beneficiary	lational Highways and Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	yndicate Bank, Transport Bhawan, 1st Parliament street, New Delhi-110001

Signed and sealed this ……. day of ……., 20…… at …….
SIGNED, SEALED AND DELIVERED
For and on behalf of the Bank by:
(Signature)
(Name)
(Designation)
(Code Number)
(Address)

NOTES:

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

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

Annex – II

(Schedule - G)

(See Clause 19.2)

Annex-II : Form for Guarantee for Advance Payment

To,
Managing Director, NHIDCL,
National Highways & Infrastructure Development Corporation Ltd.
WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the authority], (hereinafter called the "**Authority**") for the "**Name of Work"** (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement

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

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

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

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

A letter from the Authority, under the hand of an officer not below the rank of General Manager in the National Highways & Infrastructure Development Corporation Ltd., 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

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

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

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

the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

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

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

11. This guarantee shall also be operatable at our…….. Branch at New Delhi (Complete Address of bank branch is mandatory), from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

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

Sl. No	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 SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Syndicate Bank, Transport Bhawan, 1st Parliament street, New Delhi-110001

Signed and sealed this ……. day of ……., 20…….. at ……..
SIGNED, SEALED AND DELIVERED
For and on behalf of the Bank by:
(Signature)
(Name)
(Designation)
(Code Number)
(Address)
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 Clauses 10.1 (iv) and 19.3)

Contract Price Weightages

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

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

Item	Weightage in % of CP	Stage for Payment	Percentage
1	2	3	4
Road Works including Culverts, widening and repair of culverts	66.60 %	**A- Widening and strengthening of existing road**	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) Non bituminous Base course	[Nil]
		(4) Bituminous Basecourse	[Nil]
		(5) Wearing Coat	[Nil]
		(6) Widening and repair of culverts	[Nil]
		B.1-Reconstruction/New 2-Lane Realignment /Bypass (Flexible Pavement)	
		(1) Earthwork up to top of the sub- grade	25.04%
		(2) Sub-base Course	21.09%
		(3) Non bituminous Base course	16.17%
		(4) Bituminous Basecourse	17.35%
		(5) Wearing Coat	8.33%
		B.2-Reconstruction/New 8-Lane Realignment/ Bypass (Rigid Pavement)	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) Dry Lean Concrete (DLC) Course	[Nil]
		(4) Pavement Quality Control (PQC) Course	[Nil]
		C.1-Reconstruction/ New Service Road (Flexible Pavement)	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) Non bituminous Base course	[Nil]
		(4) Bituminous Basecourse	[Nil]
		(5) Wearing Coat	[Nil]
		C.2- Reconstruction/New Service road(Rigid Pavement)	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) DryLean Concrete (DLC) Course	[Nil]
		(4) Pavement Quality Control (PQC) Course	[Nil]
		D- Reconstruction &New Culverts onexisting road, realignments, bypasses Culverts (length <6m)	12.02%

Item	Weightage in % of CP	Stage for Payment	Percentage
Minor bridge/ Underpasses/ Overpasses	1.76 %	**A.1-widening and repairing of Minor Bridges (length >6 m&<60m)**	
		Minor Bridges	Nil
		A.2- New Minor bridges (length >6 mand<60m)	
		(1)Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	53.76%
		(2)Super-structure:On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road,signs & markings, tests on completion etc. complete in all respect.	28.57%
		(3)Approaches:On completionof approaches includingRetainingwalls, stonepitching, protection works complete in all and fit for use	17.67%
		(4) GuideBundsand River Training Works:On completion of GuideBunds andriver training works complete in all respects	[Nil]
		B.1- Widening and repairs of underpasses/overpasses	
		Underpasses/ Overpasses	[Nil]
		B.2-NewUnderpasses/Overpasses	
		(1)Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	[Nil]
		(2)Super-structure:On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails,crash barriers, road signs & markings, tests on completion etc. complete in all respect. Wearing Coat (a) in case of Overpass- wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass- rigid pavement including drainage facility complete in all respects as specified.	[Nil]
		(3) Approaches: On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	[Nil]

Item	Weightage in % of CP	Stage for Payment	Percentage
Major bridge(length>60 m)worksand ROB/RUB/elevatedsections/flyovers including viaducts,ifany	0.000 %	**A.1- Wideningand repairs of Major Bridges**	
		(1)Foundation	[Nil]
		(2)Sub-structure	[Nil]
		(3)Super-structure(including bearings)	[Nil]
		(4)WearingCoatincludingexpansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7)Guidebunds,RiverTrainingworks etc.	[Nil]
		(8)Approaches(including Retaining walls, stone pitchingandprotection works)	[Nil]
		A.2-NewMajorBridges	
		(1)Foundation	[Nil]
		(2)Sub-structure	[Nil]
		(3)Super-structure(including bearings)	[Nil]
		(4)WearingCoatincludingexpansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7)Guidebunds,RiverTrainingworks etc.	[Nil]
		(8)Approaches(including Retaining walls, stone pitchingand protection works)	[Nil]
		B.1-Wideningandrepairsof (a) ROB (b) RUB	
		(1) Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3) Super-Structure (Including bearings)	[Nil]
		(4)Wearing Coat(a)in case of ROB- wearing coat including expansion joints complete in all respectsas specified and (b) incase of RUB-rigid pavement under RUB including drainagefacility completein all respects as specified	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/Return walls	[Nil]
		(7) Approaches (Including Retaining walls,Stone Pitching and protection works)	[Nil]
		B.2-NewROB/RUB	
		(1)Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3) Super-Structure (Including bearings)	[Nil]
		(4)Wearing Coat (a) in case of ROB- wearing coat including expansion joints complete in all respectsas specified and (b) incase of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/Return walls	[Nil]
		(7)Approaches (including Retaining	[Nil]

Item	Weightage in % of CP	Stage for Payment	Percentage
		walls/Reinforced Earth wall, stone pitching and protection works)	
		C.1- Widening and repair of Elevated Section/Flyovers/Grade Separators	
		(1) Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3)Super-Structure(Including bearings)	[Nil]
		(4)WearingCoatincludingexpansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/Return walls	[Nil]
		(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]
		C.2- New Elevated Section/Flyovers/GradeSeparators	
		(1) Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3)Super-Structure(Including bearings)	[Nil]
		(4)WearingCoatincludingexpansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/Return walls	[Nil]
		(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]
Other Works	31.64 %	(i) Toll Plaza	[Nil]
		(ii) Road side drains	41.41%
		(iii) Road signs,markings,km stones,safety devices etc	3.52%
		(iv) Project facilities	
		a) Bus Bays	2.42%
		b) Truck Lay-byes	[Nil]
		c) Passenger Shelter	0.11%
		d) Rest Area	[Nil]
		(v) Road side Plantation	[Nil]
		(viRepair of Protection Works other than approaches to the bridges, elevated sections/flyover/grade separators and ROBs/ RUBs	[Nil]
		(vii) Safety &Traffic Management during const.	[Nil]
		(viii) Breast Wall	26.19%
		(ix) Toe Wall	[Nil]
		(x) Retaining Wall	16.01%
		(xi) Boundary wall	[Nil]
		(xii) Site Clearance & Dismantling	0.24%
		(xiii) Protection Works (Erosion Control & parapet wall)	10.1%

Item	Weightage in % of CP	Stage for Payment	Percentage

1.3 Procedure of estimating the value of work done

1.3.1 Road works

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

Table 1.3.1

Stage of Payment	Percentage weightage	Payment Procedure
A- Widening & Strengthening of road		Unit of measurement is linear length. Payment of each stage shall be made on prorata basis on completion of a stage in a length of not less than 10(ten) percent of the total length.
(1)Earthwork up to top of the sub-grade	[Nil]	
(3) Sub-base Course	[Nil]	
(4) Non bituminous Base course	[Nil]	
(5) Bituminous Base course	[Nil]	
(6) Wearing Coat	[Nil]	
(7) Widening and repair of culverts	[Nil]	Cost of ten completed culverts shall be determined on pro rata basis with respect to the total number of culverts.
B.1- Reconstruction/New2-Lane Realignment/Bypass(Flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on prorata 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	25.04%	
(3) Sub-base Course	21.09%	
(4) Non bituminous Base course	16.17%	
(5) Bituminous Base course	17.35%	
(6) Wearing Coat	8.33%	
(7) Widening and repair of culverts		
B.2- Reconstruction/New 8-Lane Realignment/Bypass(Rigid Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km length, whichever is less.
(1)Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) DryLean Concrete (DLC) Course	[Nil]	
(4) Pavement Quality Control (PQC) Course	[Nil]	
C.1- Reconstruction/New Service Road/ Slip Road (Flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km length, whichever is less.
(1)Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Non bituminous Base course	[Nil]	
(4) Bituminous Basecourse	[Nil]	
(5) Wearing Coat	[Nil]	
C.2- Reconstruction/New Service road (Rigid Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km length, whichever is less.
(1)Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Dry Lean Concrete (DLC)Course	[Nil]	
(4) Pavement Quality Control (PQC) Course	[Nil]	
D-Reconstruction & New Culverts on existing road, realignments, bypasses		Cost of each culverts shall be determined on pro rata basis with respect to the total number of culverts.
Culverts (length <6m)	12.02%	

Stage of Payment	Percentage weightage	Payment Procedure
		Payment shall be made on the completion of at least one culvert.

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

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

Where,

P = Contract Price

L = Total length in km

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

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

1.3.2 Minor Bridges and Underpasses/Overpasses.

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

Table 1.3.2

Stage of Payment	Weightage	Payment Procedure
1	2	3
A.1-Widening and repairs of Minor Bridges(length>6m&<60m)	Nil	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of widening & repair works of a minor bridge
A.2- New Minor Bridges (length > 6m & < 60m)		
(1)Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap.	53.76%	Foundation: Cost of each minor bridge shall be determined on pro-rata basis with respect to the total linear length (m) of the minor bridges. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. Not less than 25% of the scope of foundation of each bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.

Stage of Payment	Weightage	Payment Procedure
(2)Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road,signs & markings, tests on completion etc. complete in all respect.	28.57%	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super structure of at least one span in all respects as specified in the column of "Stage of Payment" in this sub-clause. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(3)Approaches :On completion of approaches including Retaining walls, stone pitching, protection works complete in all and fit for use	17.67%	Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of "Stage of Payment" in this sub-clause.
(4) Guide Bunds and River Training Works: On completion of Guide Bunds and river training works complete in all respects	[Nil]	Guide Bunds and River Training Works: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of Guide Bund sand River training Works in all respects as specified
B.1- Widening and repairs of underpasses/overpasses	[Nil]	Cost of each underpass/overpass shall be determined on pro rata basis with respect to the total linear length of the underpasses/ overpasses. Payment shall be made on the completion of widening & repair works of a underpass/overpass.
B.2- New Underpasses/Overpasses		
(1)Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	[Nil]	Foundation: 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 shall be made on pro-rata basis on completion of a stage i.e. Not less than 25% of the scope of foundation of each Underpasses/ Overpasses. Incase where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2)Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect. Wearing Coat (a) in case of Overpass-wearing coat	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure of at least one span in all respects as specified in the column of "Stage of Payment" in this sub-clause. In case of structures where pre-cast girders have been proposed by the Contractor,50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above

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

1.3.3 Major Bridge works, ROB/RUB and Structures.

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

Table 1.3.3

Stage of Payment	Weightage	Payment Procedure
A.1- Widening and repairs of Major Bridges		
(1) Foundation	[Nil]	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. Incase where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-structure	[Nil]	Sub-structure: Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub- structure of majorbridge.
(3)Super-structure(including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of at least one span in all respects as specified. In case of structures where pre-cast girders have been proposed by the Contractor,50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)Wearing Coat including expansion joints	[Nil]	Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc.complete in all respects as specified.
(6) Wing walls/return walls	[Nil]	Wingwalls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7)Guidebunds, River Training works etc.	[Nil]	Guide Bunds, River Training works: Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(8)Approaches(including Retaining walls, stone pitching and protection works)	[Nil]	Approaches: Payments shall be made on pro rata basis on completion of 10% of the scope of each stage.
A.2-NewMajorBridges		
(1)Foundation	[Nil]	Foundation: Cost of each Major Bridge shall be

Stage of Payment	Weightage	Payment Procedure
		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. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2)Sub-structure	[Nil]	Sub-structure:Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e. not lessthan25% ofthe scope of sub- structure of major bridge.
(3)Super-structure(including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e.c ompletion of super-structure including bearings of atleast one span in all respects as specified. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)Wearing Coat including expansion joints	[Nil]	Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings. complete in all respects as specified.
(6) Wing walls/return walls	[Nil]	Wingwalls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7)Guide bunds, River Training works etc.	[Nil]	Guide Bunds, River Training works: Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(8)Approaches(including Retaining walls, stone pitching and protection works)	[Nil]	Approaches: Payments shall be made on pro rata basis on completion of 10% of the scope of each stage.
B.1- Widening and repairs of (a)ROB (b)RUB		
(1) Foundations	[Nil]	Foundation: Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m)of the ROB/RUB. 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. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.

Stage of Payment	Weightage	Payment Procedure
(2) Sub-Structure	[Nil]	Sub-structure: Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub- structure of ROB/RUB.
(3) Super-Structure (Including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of at least one span in all respects as specified. In case of structures where pre-cast girders have been proposed by the Contractor,50%ofthe stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)Wearing Coat(a)in case of ROB-wearing coat including expansion joints complete in all respects as specified and (b) incase of RUB-rigid pavement under RUB including drainagefacility completein all respects as specified	[Nil]	Wearing Coat: Payment shall be made on completion (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.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/Return walls	[Nil]	Wingwalls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7) Approaches (Including Retaining walls,Stone Pitching and protection works)	[Nil]	Payments shall be made on pro rata basis on completion of 20% of the total area.
B.2-NewROB/RUB		
(1) Foundation	[Nil]	Foundation: Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m)oftheROB/RUB.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.
(2) Sub-structure	[Nil]	Sub-structure:Payment against sub- structure shall be made on pro-rata basis on completion of a stagei.e. Not lessthan 25% of the scope of sub- structure of ROB/RUB.
(3) Super-structure (includingbearing)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e.completion of super-structure including bearings of at least one span in all respects as specified.In case of structures where pre-cast girders have been proposed by the Contractor,50% of the stage payment shall be due and payable on casting of

Stage of Payment	Weightage	Payment Procedure
		girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)Wearing Coat (a) in case of ROB- wearing coat including expansion joints complete in all respectsas specified and (b) incase of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	[Nil]	Wearing Coat: Payment shall be made on completion (a) incase of ROB-wearing coat including expansio joints complete in all respects as specified and (b) In caseofRUB-rigid pavement under RUB including drainage facility complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc. Complete in all respects as specified.
(6) Wing walls/Return walls	[Nil]	Wingwalls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects asspecified.
(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]	Payment shall be made on pro-rata basis on completion of a stage in all respects as specified
C.1-Wideningandrepairs of ElevatedSection/ Flyovers/Grade Separators		
(1) Foundations	[Nil]	Foundation: Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m)of the structure. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-Structure	[Nil]	Sub-structure: Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub- structure of structure.
(3)Super-Structure(Including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of at least one span in all respects a sspecified. In case of structures where pre-cast girders have been proposed by the Contractor,50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)Wearing Coat including	[Nil]	Wearing Coat: Payment shall be made on completion of

Stage of Payment	Weightage	Payment Procedure
expansion joints		wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc. Complete in all respects as specified.
(6) Wing walls/Return walls	[Nil]	Wingwalls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]	Payment shall be made on pro-rata basis on completion of a stage in all respects as specified
C.2- New Elevated Section/ Flyovers/Grade Separators		
(1) Foundations	[Nil]	Foundation: Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m)of the structure. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-Structure	[Nil]	Sub-structure: Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub- structure of structure.
(3)Super-Structure(Including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of at least one span in all respects as specified. In case of structures where pre-cast girders have been proposed by the Contractor,50% of the stage payment shall be due and payable on casting of girders foreach span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)WearingCoatincludingexpansion joints	[Nil]	Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/Return walls	[Nil]	Wingwalls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]	Payments shall be made on pro rata basis on completion of 20% of the total area.

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

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

1.3.4 Other works.

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

Table 1.3.4

Stage of Payment	Weightage	Payment Procedure
1	2	3
(1) Toll Plaza	[Nil]	Unit of measurement is each completed toll plaza. Payment of each toll plaza shall be made on pro rata basis with respect to the total of all toll plaza.
(2) Roadside drains	41.41%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five percent)of the total length.
(3) Road signs, markings, km stones, safety devices etc.	3.52%	
(4) Project Facilities		Payment shall be made on pro rata basis for completed facilities.
a) Bus Bays	2.42%	
b) Truck Lay-byes	[Nil]	
c) Passenger Shelter	0.11%	
d) Rest Area	[Nil]	
(5) Road side Plantation including Horticulture in Wayside Amenities	[Nil]	Unit of measurement is linear length
(6) Repair of Protection Works other than approaches to the bridges, elevated sections/flyover/grade separators and ROBs/ RUBs	[Nil]	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 percent)of the total length.
(7) Safety and traffic management during construction	[Nil]	Payment shall be made on prorate basis every six months.
(8) Protection Works		Unit of measurement is linear length. Payment shall be made
(a) Breast Wall	26.19%	

Stage of Payment	Weightage	Payment Procedure
(b) Toe Wall	[Nil]	on pro rata basis on completion of a stage in a length of not less than 5% (five percent)of the total length.
(c) Retaining Wall	16.01%	
(9) Site Clearance & Dismantling	0.24%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five percent)of the total length.
(10) Protection Works (Erosion Control & parapet wall)	10.1%	Unit of measurement is square metre.

2. Procedure for payment for Maintenance

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

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

Schedule -I

(See Clause 10.2(iv))

Drawings

1. Drawings

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

2. Additional Drawings

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

Annex - I

(Schedule - I)

List of Drawings

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

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

a) A broad list of the drawings of the various components/elements of the project Highway and project facilities required to be submitted by the Contractor is given below:

a) Horizontal and Vertical Alignment (Plan & Profile) with:

- Details of Reference Pillars,
- Horizontal Intersection Point
- Vertical Intersection Point
- Elements of Curves, Details of Structures, etc.

b) Detailed Designed Cross Sections with Pavement layers at 20 m interval

c) Detailed Drawings of individual Cross Drainage Structures

d) Detailed drawing of Individual Minor & Major Bridges

e) Detailed Drawing of Breast wall, PPC wall, Retaining walls and Slope Protection work

f) Detailed Drawing of Drainage including lined drain and other drains.

g) Drawings of Major and Minor junctions,

h) Detailed Drawing of Light Vehicular Underpass

i) Drawings of a Truck lay bye and Bus bay with furniture and drainage system

j) Drawings of road furniture items including traffic signage, markings, safety barriers, etc.

k) Drawings of traffic diversion plans and traffic control measures

l) Drawings of landscaping and horticulture

m) Drawings of pedestrian crossings

n) General arrangement of Base camp and Administrative Block

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 ofeach Project Milestone, the Contractor shall notify the Authority of such compliance along with necessary particulars thereof.

2. *Project Milestone-I*

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

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

3. *Project Milestone-II*

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

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

4. *Project Milestone-III*

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

(ii) Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 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 [Scheduled Construction Period] day from the Appointed Date.

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

6. ***Extension of time***

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

Schedule - K

(See Clause 12.1 (ii))

Tests on Completion

1. ***Schedule for Tests***

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

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

2. ***Tests***

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

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

(iii) Tests for bridges: All major and minor bridges shall be subjected to the rebound hammer and ultrasonic pulse velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on 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 Clause12.2)

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 **"…….Name of Work……"**on Engineering, Procurement and Construction(EPC) basis through …….. (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users there of.

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 Engineer by:

(Signature)

(Name)

(Designation)(Address)

Schedule - M

(See Clauses 14.6, 15.2 and 19.7)

Payment Reduction for Non-Compliance

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

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

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

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

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%
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
(d)	**Roadside Drains**	
(i)	Cleaning and repair of drains	5%

S. No.	Item/Defect/Deficiency	Percentage
(e)	**Road Furniture**	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th km stones	5%
(f)	**Miscellaneous Items**	
(i)	Removal of dead animals, broken down/accidented vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	**Defects in Other Project Facilities**	5%

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

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

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)

Annex-I : Terms of Reference for Authority's Engineer

1. Scope

(i) These Terms of Reference (the "**TOR**") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "**Agreement**), which has been entered into between the [name and address of the Authority] (the "**Authority**") and ..... (the "**Contractor**")# for [Two-Laning] of the **** section (km ** to km **) of National Highway No. ** in the State of *** on Engineering, Procurement, Construction (EPC) basis, and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

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

2. Definitions and interpretation

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

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

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

3. General

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

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

(a) any Time Extension;

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

(c) the Termination Payment; or

(d) issuance of Completion Certificate or

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

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

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

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

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

4. Construction Period

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5. Maintenance Period

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

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

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

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

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

6. Determination of costs and time

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

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

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

7. Payments

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

(ii) Authority's Engineer shall -

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

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

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

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

8. Other duties and functions

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

9. Miscellaneous

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

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

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

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

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

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

Schedule - O

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

Forms of Payment Statements

1. ***Stage Payment Statement for Works***

The Stage Payment Statement for Works shall state:

(a) the estimated amount for the Works executed in accordance with Clause 19.3 (i) subsequent to the last claim;

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

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

(d) amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2 (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 upto the last claim:

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

ii. For Change of Scope Orders, and

iii. Taxes deducted

2. ***Monthly Maintenance Payment Statement***

The monthly Statement for Maintenance Payment shall state:

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

b) the deductions for maintenance work not done;

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

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

e) amount towards deduction of taxes

3. ***Contractor's claim for Damages***

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

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 kilometre.

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 AND DELIVERED

(Signature)

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