

Widening/Improvement to 2-lane with earthen shoulder of Finch Corner to Ukhrul section from existing km 34+650 to km 50+520 (Design Chainage km 30+970 to km 45+600) of NH-202 in the State of Manipur on EPC mode. (Package-3, Length-14.63 km)

SCHEDULES



Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

- 1 The Site
 - (i) Site of the proposed 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.
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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 unless otherwise specified.]

1. Site

The Site of the Two-Lane Project Highway comprises the section of NH-202 commencing from existing km 34/650 to km 50/520 (Design km 30+970 to km 45+600) i.e. Finch Corner to Ukhrul section 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)		Right of Way (m)	Remarks
	From	To	From	To		
1	34+650	50+520	30+970	45+600	24 – 48	

3. Carriageway

The present carriageway of the Project Highway is 6 - 7 m from km 34/650 to km 50/520. 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:

S. No.	Design Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundat ion	Sub- structure	Super- structure		
1.	34.180	Open	RCC Wall Type	Slab	1 x 6.0	12.5
2.	35.110	Open	RCC Wall Type	Box-Girder	1 x 44.0	13.5

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location(km)	Remarks
Nil		

9. Underpasses (vehicular, non-vehicular)

The Site includes the following underpasses:

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

10. Culverts

The Site has the following culverts:

S. No.	Design Chainage	Type of Culvert	Span/Opening with span length (m)	Width (m)
1.	31.140	SLAB	1 X 1.5	11.50
2.	31.208	SLAB	1 X 1.5	11.87
3.	31.264	SLAB	1 X 1.3	11.80
4.	31.785	SLAB	1 X 1.3	11.40
5.	32.020	SLAB	1 X 1.5	11.80
6.	32.295	SLAB	1 X 1.5	11.70

S. No.	Design Chainage	Type of Culvert	Span/Opening with span length (m)	Width (m)
7.	32.390	SLAB	1 X 1.5	14.28
8.	32.705	SLAB	1 X 1.5	11.90
9.	32.833	SLAB	1 X 1.5	12.00
10	32.945	SLAB	1 X 1.5	12.00
11	33.060	SLAB	1 X 1.5	11.62
12	33.820	SLAB	1 X 1.5	12.10
13	34.413	SLAB	1 X 1.5	11.56
14	34.550	SLAB	1 X 1.5	12.79
15	34.722	SLAB	1 X 1.5	11.86
16	34.845	SLAB	1 X 4.3	13.18
17	35.305	SLAB	1 X 1.5	11.93
18	35.590	SLAB	1 X 0.6	11.45
19	35.720	SLAB	1 X 1.3	12.20
20	35.932	SLAB	1 X 1.3	12.64
21	36.350	SLAB	1 X 1.6	11.84
22	36.505	SLAB	1 X 1.5	11.23
23	36.610	SLAB	1 X 1.6	10.78
24	36.795	SLAB	1 X 1.6	11.07
25	36.995	SLAB	1 X 1.5	12.22
26	37.165	SLAB	1 X 1.5	11.83
27	37.360	SLAB	1 X 1.2	11.51
28	37.592	SLAB	1 X 1.5	11.73
29	37.775	SLAB	1 X 1.5	11.65
30	38.046	SLAB	1 X 1.0	13.07
31	38.195	SLAB	1 X 1.5	11.30
32	38.365	SLAB	1 X 1.5	10.78
33	38.583	SLAB	1 X 2.5	14.14
34	38.735	SLAB	1 X 1.0	13.73
35	38.868	SLAB	1 X 1.5	19.60
36	38.980	SLAB	1 X 1.5	10.98
37	39.127	SLAB	1 X 1.5	10.94
38	39.446	SLAB	1 X 1.0	12.77
39	39.506	SLAB	1 X 1.0	12.45
40	39.660	Hume pipe	2 X 0.3	4.50
41	39.818	SLAB	1 X 1.5	11.42
42	39.942	SLAB	1 X 3.8	12.90
43	40.270	SLAB	1 X 3.0	12.18
44	40.387	SLAB	1 X 1.2	11.10
45	40.482	SLAB	1 X 1.5	11.35
46	40.690	SLAB	1 X 1.5	11.89
47	41.035	SLAB	1 X 1.5	11.36
48	41.320	SLAB	1 X 1.5	11.20
49	41.544	SLAB	1 X 0.9	12.70

S. No.	Design Chainage	Type of Culvert	Span/Opening with span length (m)	Width (m)
50	41.767	SLAB	1 X 0.9	6.44
51	41.845	SLAB	1 X 1.2	11.55
52	42.290	SLAB	1 X 1.2	12.40
53	42.365	SLAB	1 X 1.5	11.42
54	42.640	SLAB	1 X 1.5	10.98
55	43.183	SLAB	1 X 1.5	12.61
56	43.337	SLAB	1 X 1.5	11.63
57	43.515	SLAB	1 X 1.5	12.14
58	43.675	SLAB	1 X 1.5	12.00
59	43.790	SLAB	1 X 1.5	12.04
60	44.040	SLAB	1 X 1.5	12.00
61	44.325	SLAB	1 X 3.0	12.15
62	44.480	SLAB	1 X 1.5	12.00
63	44.560	SLAB	1 X 1.5	11.92
64	45.206	SLAB	1 X 1.5	12.00
65	45.590	SLAB	1 X 1.5	12.00

11. Bus bays

The project road has no bus-bay and no bus shelters. 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:

S. No	Location (Design Chainage)		Masonry/CC (Pucca) (in m)		Earthen (Kutchra) (in m)	
	From km	To km	Left	Right	Left	Right
1	31+000	31+200			200	
2	32+200	32+300				100
3	32+300	32+328			28	
4	32+328	32+349		21	21	
5	32+349	32+350			1	
6	32+350	32+400				50

S. No	Location (Design Chainage)		Masonry/CC (Pucca) (in m)		Earthen (Kutchha) (in m)	
	From km	To km	Left	Right	Left	Right
7	32+400	32+700			300	
8	32+750	32+800			50	
9	32+800	33+000				200
10	33+000	33+150			150	
11	33+300	33+500			200	
12	33+430	33+510				80
13	33+500	33+620				120
14	33+620	33+720			100	
15	33+720	33+760				40
16	35+300	35+440		140		
17	35+530	35+600		70		
18	35+600	35+700	100			
19	35+700	35+740		40		
20	36+200	36+320			120	
21	36+600	36+660				60
22	37+665	37+785		120		
23	37+800	38+060				260
24	38+060	38+180			120	
25	38+180	38+270				90
26	38+270	38+350			80	
27	38+350	38+500				150
28	38+500	38+550			50	
29	38+550	38+600				50
30	38+600	38+640			40	
31	38+640	38+760				120
32	38+900	39+160				260
33	39+300	39+420			120	
34	39+420	39+540				120
35	39+600	39+660			60	
36	40+400	40+650			250	
37	40+800	40+830			30	
38	42+560	42+900	340			
39	43+185	43+220	35			
40	43+220	43+265		45		
41	43+330	43+400				70
42	43+400	43+450			50	
43	43+450	43+510				60
44	44+780	44+900				120
TOTAL			475	436	1970	1950

	TOTAL	NIL
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b) High Tension/Low Tension Lines (HT/LT Lines)*

S. No.	Existing Chainage (Km)		Length (in Km)				Crossings			Nos of Poles infringing/obstructing ROW		
	From	To	33KV	11KV	LT		33KV	11KV	LT	33KV	11KV	LT
					240v	440v						
1	34.650	50.520	1.54	1.16	0.378	0	22	5	1	23	12	9
	TOTAL		1.54	1.16	0.378		22	5	1	23	12	9

c) Transformer details:

S. No.	Existing Chainage(km)		11KV	
			No.	Capacity (KVA)
1				
	TOTAL			NIL

(ii) Public Health utilities (Water/Sewage Pipe Lines)*

The site includes the following Public Health utilities:-

SL No	Chainage		Length in (Km)				Crossing			
	from	To	Water supply Line		Sewage Line		Water supply Line		Sewage Line	
			With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	With Pumping	With Gravity Flow
NIL										

(iii) Any Other line

(* This illustrative and may change as per features of existing utilities.)

Annex – II

(As per Clause 8.3 (i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

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

S. No	Design Chainage (From km to km)	Length (km)	Width (m)	Date of providing ROW*
1	km 30.970 to km 45.600	14.630	24 m – 48 m	90% RoW at appointed date
				Balance RoW within 90 days after the appointed date as per Clause 8.2 of DCA.

**The dates specified herein shall in no case be beyond 150 (One Hundred and Fifty) days after the appointed date.*

Annex - III

(Schedule-A)

Alignment Plans

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

- (i) The alignment of the Project Highway is enclosed in alignment plan. Finished road level indicated in the alignment plan shall be followed by the contractor as minimum FRL. In any case, the finished road level of the project highway shall not be less than those indicated in the alignment plan. The contractor shall, however, improve/upgrade the Road profile as indicated in Annex-III based on site/design requirement.
 - (ii) Traffic Signage plan of the Project Highway showing numbers & location of traffic signs is enclosed. The contractor shall, however, improve/upgrade upon the traffic signage plan as indicated in Annex-III based on site/design requirement as per the relevant specifications/IRC Codes/Manual.
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Annex – IV

(Schedule-A)

Environment Clearances

MOEF Clearance:

The project highway does not require Environmental clearance as per MoEF&CC corrigendum dated 22.08.2013

Forest Clearance:

Proposal uploading on Parivesh portal is in progress.

Wildlife Clearance:

The project alignment falls near the proposed Shirui Wildlife Sanctuary which is yet to be notified. Wildlife Clearances, if required, shall be taken accordingly.

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 with earthen shoulder of the Project Highway as described in Annex-I of this Schedule-B and in Schedule-C.

3. Specifications and Standards

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

Annex – I

(Schedule-B)

Description of Project Highway

[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: 73-2018)] referred to as the Manual. If any standards specifications or details are not given in the Manual the minimum design/construction requirements shall be specified in this Schedule. In addition to these particulars, all other essential project specific details as required should be provided in order to define the Scope of the Project clearly and precisely.]

1. Widening of the Existing Highway

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

(ii) Width of Carriageway

(a) Two-Lanning with earthen shoulders shall be undertaken. The paved carriageway shall be 7m wide in accordance with the Typical cross section drawings in the Manual.

Sl. No.	Open Area		Location		Width (m)	Typical Cross Section
	From	To	From (km)	To (km)		(Refer to Manual)
1	Finch Corner	Ukhrul	30.970	45.600	7	As per attached TCS drawing

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	Location	Width (m)	Typical Cross Section
	(Township)			(Refer to Manual)
Nil				

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

2. Geometric Design and 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 30 kmph.

(iii) Improvement of the existing road geometrics

The stretches where design speed reduces below 20 kmph (as per Clause 6.10 of SP 48: 1998) are summarized below:

Sl. No.	Chainage		Type of Deficiency	Remarks (Design Speed in kmph)
	From	To		
Nil				

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

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

(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
Nil			

(b) Earthen shoulders of 1.5 m on Hill side and 2.5 m width towards valley side shall be provided with selected earth wherever applicable as per TCS drawing.

(c) Design and specifications of earthen shoulders and granular material shall confirm 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

TCS TYPE	DESCRIPTION	Length (m)
TCS-1	2-lane with 2.5 m earthen shoulders with W-beam crash barrier on valley side and 1.50 m earthen shoulder with 0.6 m lined drain on hill side	700
TCS-2	2-lane with 1.5 m earthen shoulders with 0.6m lined drain on both side	130
TCS-2(A)	2-lane with 1.5 m earthen shoulders with 0.6 m lined drain and hill section on both side	1460
TCS-3	2-lane with 2.50 m earthen shoulder on valley side and 1.5 m earthen shoulders with 0.6 m lined drain on hill side	110
TCS-3(A)	2-lane with 1.5 m earthen shoulders with breast wall on hill side and 2.50 m earthen shoulder on valley side	1370
TCS-3(B)	2-lane with 1.5 m earthen shoulders with breast wall on hill side and 2.50 m earthen shoulder with gabion retaining wall on valley side	1050
TCS-3(C)	2-lane with 1.5 m earthen shoulders with gabion wall on hill side and 2.50 m earthen shoulder on valley side	2320
TCS-4	2-lane with 1.5 m earthen shoulders with breast wall on hill side and 2.50 m earthen shoulder with W-beam crash barrier on valley side	920
TCS-5	2-lane with 1.5 m with 0.6 m lined drain on hill side and 2.50 m earthen shoulder with retaining gabion wall & W-beam crash barrier on valley side	1250
TCS-6	2-lane with 2.5 m earthen with retaining wall & W-beam crash barrier on both side	1030
TCS-7	2-lane with 1.5 m earthen with Breast Wall and 0.60 m lined drain on both side	40
TCS-7(A)	2-lane with 1.5 m earthen with Gabion Wall and 0.60 m lined drain on both side	2980
TCS-7(B)	2-lane with 1.5 m earthen with gabion wall and 0.60 m lined drain and 1.5 m earthen with breast wall and 0.60 m lined drain	1270
Total length =		14630

S. No.	Chainage		Length (m)	TCS Type
	From (m)	To (m)		
1	30970	31320	350	3A
2	31320	31750	430	7A
3	31750	31850	100	3C
4	31850	31980	130	7A
5	31980	32050	70	3A
6	32050	32140	90	7A
7	32140	32550	410	3B
8	32550	32670	120	7A
9	32670	32710	40	5
10	32710	32770	60	7B
11	32770	32930	160	3A
12	32930	32960	30	1
13	32960	33040	80	7B
14	33040	33090	50	3A
15	33090	33160	70	7A
16	33160	33270	110	6
17	33270	33300	30	5
18	33300	33320	20	4

S. No.	Chainage		Length (m)	TCS Type
	From (m)	To (m)		
19	33320	33360	40	7
20	33360	33460	100	2A
21	33460	33520	60	3
22	33520	33600	80	7A
23	33600	33760	160	3C
24	33760	33880	120	6
25	33880	34000	120	3C
26	34000	34130	130	7A
27	34130	34200	70	6
28	34200	34360	160	7B
29	34360	34550	190	3A
30	34550	34820	270	3C
31	34820	34870	50	2
32	34870	35030	160	7A
33	35030	35210	180	6
34	35210	35290	80	2
35	35290	35470	180	6
36	35470	35600	130	2A

S. No.	Chainage		Length (m)	TCS Type
	From (m)	To (m)		
37	35600	35710	110	7B
38	35710	35840	130	7A
39	35840	35910	70	3C
40	35910	35950	40	6
41	35950	36110	160	7A
42	36110	36150	40	3B
43	36150	36190	40	6
44	36190	36320	130	7A
45	36320	36370	50	3
46	36370	36460	90	7A
47	36460	36530	70	6
48	36530	36600	70	7A
49	36600	36640	40	3B
50	36640	36760	120	7B
51	36760	36830	70	5
52	36830	36960	130	2A
53	36960	37020	60	5
54	37020	37460	440	2A
55	37460	37580	120	3C
56	37580	37670	90	2A
57	37670	37750	80	1
58	37750	37830	80	7B
59	37830	37960	130	3B
60	37960	38190	230	7A
61	38190	38270	80	2A
62	38270	38670	400	7B
63	38670	38770	100	5
64	38770	38850	80	7A
65	38850	39130	280	2A
66	39130	39190	60	3C
67	39190	39280	90	3B
68	39280	39420	140	3C
69	39420	39590	170	3B
70	39590	39640	50	7A
71	39640	39850	210	4
72	39850	39940	90	3A

S. No.	Chainage		Length (m)	TCS Type
	From (m)	To (m)		
73	39940	40000	60	6
74	40000	40080	80	7B
75	40080	40150	70	3B
76	40150	40210	60	7B
77	40210	40300	90	6
78	40300	40370	70	7B
79	40370	40760	390	3C
80	40760	40820	60	7A
81	40820	40940	120	3C
82	40940	40990	50	3B
83	40990	41200	210	3C
84	41200	41290	90	7A
85	41290	41350	60	5
86	41350	41910	560	3C
87	41910	41960	50	3B
88	41960	41990	30	3A
89	41990	42250	260	7A
90	42250	42940	690	4
91	42940	43150	210	7A
92	43150	43400	250	5
93	43400	43450	50	7B
94	43450	43700	250	5
95	43700	43750	50	2A
96	43750	43820	70	1
97	43820	43920	100	2A
98	43920	44160	240	1
99	44160	44440	280	3A
100	44440	44720	280	1
101	44720	44930	210	7A
102	44930	45010	80	5
103	45010	45070	60	2A
104	45070	45140	70	6
105	45140	45190	50	3A
106	45190	45300	110	5
107	45300	45400	100	3A
108	45400	45600	200	5

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

A. Major Intersections

Sl. No.	Location of intersection	Type of intersection	Other features
1.	At km 44+750	T	Ukhrul Bypass

B. Minor Intersections

Sl. No.	Location of intersection	Type of Intersection	Other features
1.	At km 31+000	Y	Gamnoum
2.	At km 33+170	T	Patkai Chirstian Academy

(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- s e c t i o n a l 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

(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.

S. No.	Stretch from km to km	Remarks
Nil		

6. Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per relevant Manual.

Lined Drain

S. No.	Proposed TCS NO		Net Length (m)		Remarks
1.	From	To	676.30		Length of the drain is excluding the CD length
	32.930	32.960			
	37.670	37.750			
	43.750	43.820			
	43.920	44.160			
	44.440	44.720			
2.	From	To	2821.12	Both Side	
	33.360	33.460			
	35.470	35.600			
	36.830	36.960			
	37.020	37.460			
	37.580	37.670			
	38.190	38.270			
	38.850	39.130			
	43.700	43.750			
	43.820	43.920			
	45.010	45.070			
3.	From	To	106.28		
	33.460	33.520			
	36.320	36.370			
4.	From	To	2241.44		
	31.750	31.850			
	33.600	33.760			
	33.880	34.000			
	34.550	34.820			
	35.840	35.910			
	37.460	37.580			
	39.130	39.190			

	39.280	39.420		
	40.370	40.760		
	40.820	40.940		
	40.990	41.200		
	41.350	41.910		
5.			251.20	Both Side
	From	To		
	34.820	34.870		
	35.210	35.290		
6.			1207.68	
	From	To		
	32.670	32.710		
	33.270	33.300		
	36.760	36.830		
	36.960	37.020		
	38.670	38.770		
	41.290	41.350		
	43.150	43.400		
	43.450	43.700		
	44.930	45.010		
	45.190	45.300		
	45.400	45.600		
7.			5758.20	Both Side
	From	To		
	31.320	31.750		
	32.050	32.140		
	32.550	32.670		
	33.090	33.160		
	33.520	33.600		
	34.000	34.130		
	34.870	35.030		
	35.710	35.840		
	35.950	36.110		
	36.190	36.320		
	36.370	36.460		
	36.530	36.600		
	37.960	38.190		
	38.770	38.850		
	39.590	39.640		
	40.760	40.820		
	41.200	41.290		
	41.990	42.250		
	42.940	43.150		
	44.720	44.930		
8.			1227.00	
	From	To		
	32.710	32.770		
	32.960	33.040		
	34.200	34.360		
	35.600	35.710		
	36.640	36.760		
	37.750	37.830		
	38.270	38.670		
	40.000	40.080		

	40.150	40.210		
	40.300	40.370		
	43.400	43.450		
	Total Length		14289.22m	

Unlined Drain

For the adequate drainage at other locations, unlined drain to be constructed at the sections of the alignment as per site requirement where there is a possibility of hill water passing through the alignment but the alignment itself has both side valleys and is not adjacent to a hill.

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
All Major and Minor Bridges shall be provided as per GAD attached.		

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

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

(d) All bridges shall be high-level bridges

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

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:

S. No.	Chainage	Span Size	Width(m)	Type	Remarks
1.	31.264	1 X 2.0	10.9	SLAB	RECONSTRUCTION
2.	31.785	1 X 2.0	10.9	SLAB	RECONSTRUCTION
3.	35.590	1 X 2.0	10.9	SLAB	RECONSTRUCTION
4.	35.720	1 X 2.0	10.9	SLAB	RECONSTRUCTION
5.	37.360	1 X 2.0	10.9	SLAB	RECONSTRUCTION
6.	38.046	1 X 2.0	10.9	SLAB	RECONSTRUCTION
7.	39.446	1 X 2.0	10.9	SLAB	RECONSTRUCTION
8.	39.506	1 X 2.0	10.9	SLAB	RECONSTRUCTION
9.	39.660	1 X 2.0	10.9	SLAB	RECONSTRUCTION
10.	39.942	1 X 4.0	10.9	SLAB	RECONSTRUCTION
11.	40.387	1 X 2.0	10.9	SLAB	RECONSTRUCTION
12.	41.544	1 X 2.0	10.9	SLAB	RECONSTRUCTION
13.	41.767	1 X 2.0	10.9	SLAB	RECONSTRUCTION
14.	41.845	1 X 2.0	10.9	SLAB	RECONSTRUCTION
15.	42.290	1 X 2.0	10.9	SLAB	RECONSTRUCTION
16.	31.140	1 X 1.5	10.9	SLAB	RECONSTRUCTION
17.	31.208	1 X 1.5	10.9	SLAB	RECONSTRUCTION
18.	32.295	1 X 1.5	10.9	SLAB	RECONSTRUCTION
19.	32.390	1 X 1.5	10.9	SLAB	RECONSTRUCTION
20.	32.705	1 X 1.5	10.9	SLAB	RECONSTRUCTION
21.	32.833	1 X 1.5	10.9	SLAB	RECONSTRUCTION
22.	32.945	1 X 1.5	10.9	SLAB	RECONSTRUCTION
23.	33.060	1 X 1.5	10.9	SLAB	RECONSTRUCTION
24.	34.413	1 X 1.5	10.9	SLAB	RECONSTRUCTION
25.	34.550	1 X 1.5	10.9	SLAB	RECONSTRUCTION
26.	34.722	1 X 1.5	10.9	SLAB	RECONSTRUCTION
27.	35.305	1 X 1.5	10.9	SLAB	RECONSTRUCTION
28.	36.350	1 X 1.6	10.9	SLAB	RECONSTRUCTION
29.	36.505	1 X 1.5	10.9	SLAB	RECONSTRUCTION
30.	36.795	1 X 1.6	10.9	SLAB	RECONSTRUCTION
31.	37.165	1 X 1.5	10.9	SLAB	RECONSTRUCTION
32.	37.592	1 X 1.5	10.9	SLAB	RECONSTRUCTION
33.	37.775	1 X 1.5	10.9	SLAB	RECONSTRUCTION
34.	38.365	1 X 1.5	10.9	SLAB	RECONSTRUCTION
35.	38.868	1 X 1.5	10.9	SLAB	RECONSTRUCTION
36.	38.980	1 X 1.5	10.9	SLAB	RECONSTRUCTION
37.	39.127	1 X 1.5	10.9	SLAB	RECONSTRUCTION
38.	39.818	1 X 1.5	10.9	SLAB	RECONSTRUCTION
39.	40.482	1 X 1.5	10.9	SLAB	RECONSTRUCTION
40.	41.035	1 X 1.5	10.9	SLAB	RECONSTRUCTION
41.	41.320	1 X 1.5	10.9	SLAB	RECONSTRUCTION
42.	42.365	1 X 1.5	10.9	SLAB	RECONSTRUCTION
43.	43.183	1 X 1.5	10.9	SLAB	RECONSTRUCTION
44.	43.337	1 X 1.5	10.9	SLAB	RECONSTRUCTION
45.	43.675	1 X 1.5	10.9	SLAB	RECONSTRUCTION
46.	44.325	1 X 3.0	10.9	SLAB	RECONSTRUCTION
47.	45.590	1 X 1.5	10.9	SLAB	RECONSTRUCTION

(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.

SI 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:

SI No	Chainage	Span Size	Width(m)	Type	Remarks
1.	32.020	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
2.	33.300	1 X 3.0	10.9	SLAB	NEW CONSTRUCTION
3.	33.450	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
4.	33.685	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
5.	36.060	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
6.	36.610	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
7.	37.920	1 X 3.0	10.9	SLAB	NEW CONSTRUCTION
8.	38.195	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
9.	38.735	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
10.	39.295	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
11.	40.100	1 X 3.0	10.9	SLAB	NEW CONSTRUCTION
12.	40.180	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
13.	40.840	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
14.	42.940	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
15.	43.580	1 X 3.0	10.9	SLAB	NEW CONSTRUCTION
16.	43.790	1 X 3.0	10.9	SLAB	NEW CONSTRUCTION
17.	43.955	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
18.	44.480	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
19.	44.560	1 X 3.0	10.9	SLAB	NEW CONSTRUCTION
20.	45.000	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
21.	45.120	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION
22.	45.206	1 X 2.0	10.9	SLAB	NEW CONSTRUCTION

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

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.

(g) The following culverts shall be retained as follows:

SI No	Chainage	Ex. Span Size	Width(m)	Type	Proposal
1.	34.845	1 X 4.3	13.2	SLAB	RETAIN
2.	38.583	1 X 2.5	14.2	SLAB	RETAIN
3.	40.690	1 X 1.5	11.8	SLAB	RETAIN
4.	44.040	1 X 1.5	11.8	SLAB	RETAIN

Note- The contractor may construct pre-cast culverts during construction of project

highway.

(iii) Bridges

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

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

Sl. No.	Bridge Location (km)	Salient details of existing bridge	Adequacy or other wise of the existing waterway, vertical clearance etc. (GAD attached)	Remarks
1	34+180	1 x 6.0m; 12.5 m wide; Open Foundation; RCC Slab Superstructure	As per attached GAD	To be reconstructed as RCC Slab bridge with span arrangement of 1x 10 m; Width: 13m

(ii) The following narrow bridges shall be widened:

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

(b) Additional new bridges

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

Details of Minor bridges proposed:

Sl No	Chainage	Span (m)	Width (m)	Type	Remarks
1.	33.230	1 X 10.0	13	RCC SLAB	NEW CONSTRUCTION
2.	33.820	1 X 10.0	13	RCC SLAB	NEW CONSTRUCTION
3.	35.932	1 X 10.0	13	RCC SLAB	NEW CONSTRUCTION
4.	36.170	1 X 10.0	13	RCC SLAB	NEW CONSTRUCTION
5.	36.995	1 X 10.0	13	RCC SLAB	NEW CONSTRUCTION
6.	40.270	1 X 10.0	13	RCC SLAB	NEW CONSTRUCTION
7.	42.640	1 X 10.0	13	RCC SLAB	NEW CONSTRUCTION
8.	43.515	1 X 10.0	13	RCC SLAB	NEW CONSTRUCTION
9.	44.700	1 X 10.0	13	RCC SLAB	NEW CONSTRUCTION

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

Sl. No.	Location at km	Remarks
Nil		

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

Sl.	Location at km	Span Arrangement	Existing Type	Remarks
1	35.110	1 x 44	Box-Girder	Repair

(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

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.

Sl. No	Traffic Signage, Road Marking and other appurtenances	unit	Quantity
1.	Ordinary Kilometer stones=	Nos	16
2.	5th Kilometer stones=	Nos	4
3.	hectometer Stones=	Nos	60
4.	Delineators (100 cm long and circular shaped) =	Nos	539
5.	60 cm circular	Nos	599
6.	90 cm octagon	Nos	31
7.	90 cm equilateral triangle	Nos	624
8.	80 cm x 60 cm rectangular	Nos	930
9.	Hazard Marker	Nos	589
10.	Overt Head Sign Board	Nos	1
11.	Fluorescent Strips (3 m per roll) for marking the structures	Rolls	7

(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.	44+650	Standard

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 1.5 m height

Sl No	FROM (m)	TO (m)	Length	Sides
1.	32960	33040	80	Left
2.	33040	33090	50	Right
3.	33320	33360	80	Both
4.	34360	34550	190	Left
5.	36600	36640	40	Right
6.	37750	37830	80	Left
7.	37830	37960	130	Right
8.	38270	38670	400	Left
A. TOTAL			1050 m	
B. CD Work Length			36 m	
Net Length (A. - B.)			1014 m	

Note: Quantity / length of the above-mentioned safety/ protective structure is minimum, actual quantity/length requirement should be as per site requirement and hence any increase in quantity/length due to site requirement shall not qualify as Change of Scope.

b) Breast Wall 2 m height

Sl No	Chainage		Length in m.	Side
	From (m)	To (m)		
1.	30970	31320	350	Right
2.	31980	32050	70	Right
3.	32140	32550	410	Right
4.	32710	32770	60	Left
5.	32770	32930	160	Right
6.	33300	33320	20	Left
7.	34200	34360	160	Right
8.	35600	35710	110	Left
9.	36110	36150	40	Right
10.	36640	36760	120	Left
11.	39190	39280	90	Right
12.	39420	39590	170	Right
13.	39640	39850	210	Right
14.	39850	39940	90	Right
15.	40000	40080	80	Left
16.	40080	40150	70	Right
17.	40150	40210	60	Left
18.	40300	40370	70	Left
19.	40940	40990	50	Right
20.	41910	41960	50	Right
21.	41960	41990	30	Right
22.	42250	42940	690	Left
23.	43400	43450	50	Left

<u>Sl No</u>	<u>Chainage</u>		<u>Length in m.</u>	<u>Side</u>
	<u>From (m)</u>	<u>To (m)</u>		
24.	44160	44440	280	Right
25.	45140	45190	50	Left
26.	45300	45400	100	Left
A. TOTAL			3640 m	
B. CD Work Length			123 m	
Net Length (A. - B.)			3517 m	

Note: Quantity / length of the above-mentioned safety/ protective structure is minimum, actual quantity/length requirement should be as per site requirement and hence any increase in quantity/length due to site requirement shall not qualify as Change of Scope.

c) Gabion Retaining Structure 2 m height

<u>Sl No</u>	<u>From (m)</u>	<u>To (m)</u>	<u>Length(m)</u>	<u>Side</u>
1.	32140	32550	410	Left
2.	32670	32710	40	Left
3.	33160	33270	110	Left
4.	33270	33300	30	Right
5.	33760	33880	240	Both
6.	34130	34200	70	Left
7.	36110	36150	40	Left
8.	36150	36190	40	Right
9.	36460	36530	70	Right
10.	36600	36640	40	Left
11.	36960	37020	60	Left
12.	38670	38770	100	Left
13.	39940	40000	60	Right
14.	40940	40990	50	Left
15.	41910	41960	50	Left
16.	44930	45010	80	Right
A. TOTAL			1490 m	
B. CD Work Length			50 m	
Net Length (A. - B.)			1440 m	

Note: Quantity / length of the above-mentioned safety/ protective structure is minimum, actual quantity/length requirement should be as per site requirement and hence any increase in quantity/length due to site requirement shall not qualify as Change of Scope.

d) Gabion Retaining Structure (Valley Side) 3 m height

<u>Sl No</u>	<u>From (m)</u>	<u>To (m)</u>	<u>Length (m)</u>	<u>Side</u>
1.	33160	33270	110	Right
2.	34130	34200	70	Right
3.	35290	35470	360	Both
4.	36760	36830	70	Left
5.	37830	37960	130	Left
6.	39190	39280	90	Left
7.	39420	39590	170	Left
8.	39940	40000	60	Left

<u>Sl No</u>	<u>From (m)</u>	<u>To (m)</u>	<u>Length (m)</u>	<u>Side</u>
9.	40210	40300	180	Both
10.	43150	43400	250	Left
A. TOTAL			1490 m	
B. CD Work Length			50 m	
Net Length (A. – B.)			1440 m	

Note: Quantity / length of the above-mentioned safety/ protective structure is minimum, actual quantity/length requirement should be as per site requirement and hence any increase in quantity/length due to site requirement shall not qualify as Change of Scope.

e) Gabion Retaining Structure (Valley Side) 4 m height

<u>Sl No</u>	<u>From (m)</u>	<u>To (m)</u>	<u>Length (m)</u>	<u>Side</u>
1.	35030	35210	360	Both
2.	35910	35950	80	Both
3.	36150	36190	40	Left
4.	36460	36530	70	Left
5.	40080	40150	70	Left
6.	41290	41350	60	Left
7.	45070	45140	140	Both
A. TOTAL			820 m	
B. CD Work Length			28 m	
Net Length (A. – B.)			792 m	

Note: Quantity / length of the above-mentioned safety/ protective structure is minimum, actual quantity/length requirement should be as per site requirement and hence any increase in quantity/length due to site requirement shall not qualify as Change of Scope.

f) Gabion Retaining Structure (Valley Side) 5 m height

<u>Sl No</u>	<u>From (m)</u>	<u>To (m)</u>	<u>Length (m)</u>	<u>Side</u>
1.	43450	43700	250	Left
2.	45190	45300	110	Right
3.	45400	45600	200	Right
A. TOTAL			560 m	
B. CD Work Length			19 m	
Net Length (A. – B.)			541 m	

Note: Quantity / length of the above-mentioned safety/ protective structure is minimum, actual quantity/length requirement should be as per site requirement and hence any increase in quantity/length due to site requirement shall not qualify as Change of Scope.

g) Gabion Wall (Hill Side; Ht. = 5.0 m)

<u>Sl No.</u>	<u>Chainage</u>		<u>Length in m.</u>	<u>Side</u>
	<u>From (m)</u>	<u>To (m)</u>		
1.	31320	31750	860	Both
2.	31750	31850	100	Right
3.	31850	31980	260	Both
4.	32050	32140	180	Both
5.	32550	32670	240	Both

<u>Sl No.</u>	<u>Chainage</u>		<u>Length in m.</u>	<u>Side</u>
	<u>From (m)</u>	<u>To (m)</u>		
6.	32710	32770	60	Right
7.	32960	33040	80	Right
8.	33090	33160	140	Both
9.	33520	33600	160	Both
10.	33600	33760	160	Left
11.	33880	34000	120	Left
12.	34000	34130	260	Both
13.	34200	34360	160	Left
14.	34550	34820	270	Left
15.	34870	35030	320	Both
16.	35600	35710	110	Right
17.	35710	35840	260	Both
18.	35840	35910	70	Right
19.	35950	36110	320	Both
20.	36190	36320	260	Both
21.	36370	36460	180	Both
22.	36530	36600	140	Both
23.	36640	36760	120	Right
24.	37460	37580	120	Right
25.	37750	37830	80	Right
26.	37960	38190	460	Both
27.	38270	38670	400	Right
28.	38770	38850	160	Both
29.	39130	39190	60	Right
30.	39280	39420	140	Right
31.	39590	39640	100	Both
32.	40000	40080	80	Right
33.	40150	40210	60	Right
34.	40300	40370	70	Right
35.	40370	40760	390	Right
36.	40760	40820	120	Both
37.	40820	40940	120	Right
38.	40990	41200	210	Right
39.	41200	41290	180	Both
40.	41350	41910	560	Right
41.	41990	42250	520	Both
42.	42940	43150	420	Both
43.	43400	43450	50	Right
44.	44720	44930	420	Both
A. TOTAL			9550 m	
B. CD Work Length			323 m	
Net Length (A. - B.)			9227 m	

Note: Quantity / length of the above-mentioned safety/ protective structure is minimum, actual quantity/length requirement should be as per site requirement and hence any increase in quantity/length due to site requirement shall not qualify as Change of Scope.

h) Gabion Wall for Muck-Disposal

A gabion retaining wall (8.0m height) with a length of 400m is being constructed for the

designated for the muck disposal area.

Note: Quantity / length of the above-mentioned safety/ protective structure is minimum, actual quantity/length requirement should be as per site requirement and hence any increase in quantity/length due to site requirement shall not qualify as Change of Scope.

i) Thrie-Beam Crash Barrier

S. No.	From (km)	To (km)	Length (Km)	Remarks
1.	30.999	31.213	0.214	
2.	31.253	31.320	0.067	
3.	31.782	31.850	0.068	
4.	31.980	32.050	0.070	
5.	32.140	32.550	0.410	
6.	32.670	32.710	0.040	
7.	32.770	32.960	0.190	
8.	33.057	33.090	0.033	
9.	33.160	33.270	0.220	Both Side
10.	33.270	33.320	0.050	
11.	33.460	33.520	0.060	
12.	33.600	33.760	0.160	
13.	33.760	33.880	0.240	Both Side
14.	33.880	34.000	0.120	
15.	34.130	34.200	0.140	Both Side
16.	34.360	34.473	0.113	
17.	34.500	34.820	0.320	
18.	35.030	35.210	0.360	Both Side
19.	35.290	35.470	0.360	Both Side
20.	35.840	35.863	0.023	
21.	35.910	35.950	0.080	Both Side
22.	36.110	36.150	0.040	
23.	36.150	36.190	0.080	Both Side
24.	36.460	36.530	0.140	Both Side
25.	36.600	36.640	0.040	
26.	36.760	36.830	0.070	
27.	36.960	37.020	0.060	
28.	37.460	37.480	0.020	
29.	37.495	37.580	0.085	
30.	37.670	37.750	0.080	
31.	37.830	37.960	0.130	
32.	38.670	38.770	0.100	
33.	39.130	39.280	0.150	
34.	39.373	39.590	0.217	
35.	39.640	39.940	0.300	
36.	39.940	40.000	0.120	Both Side
37.	40.080	40.150	0.070	
38.	40.210	40.300	0.180	Both Side
39.	40.370	40.394	0.024	
40.	40.401	40.589	0.188	
41.	40.617	40.760	0.143	
42.	40.893	41.005	0.112	
43.	41.138	41.200	0.062	
44.	41.290	41.350	0.060	
45.	41.393	41.489	0.096	
46.	41.534	41.816	0.282	

S. No.	From (km)	To (km)	Length (Km)	Remarks
47.	41.845	41.960	0.115	
48.	42.250	42.472	0.222	
49.	42.515	42.940	0.425	
50.	43.150	43.400	0.250	
51.	43.450	43.700	0.250	
52.	43.750	43.820	0.070	
53.	43.920	44.218	0.298	
54.	44.262	44.373	0.111	
55.	44.422	44.720	0.298	
56.	44.930	45.010	0.080	
57.	45.070	45.140	0.140	Both Side
58.	45.140	45.600	0.460	
A. TOTAL			8.906 km	
B. CD Work Length			0.302 km	
Net Length (A. – B.)			8.604 km	

Note: Quantity / length of the above-mentioned safety/ protective structure is minimum, actual quantity/length requirement should be as per site requirement and hence any increase in quantity/length due to site requirement shall not qualify as Change of Scope.

12. Special Requirement for Hill Roads

12.1 Seeding and Mulching: Seeding and Mulching (Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, mulching material, applying bituminous emulsion at the rate of 0.23 litres per sqm and laying and fixing jute netting, including watering for 3 months all as per clause 308) has been provided along project road. Details of seeding and mulching has been described below:

S. No.	From (m)	To (m)	Length (m)	Height Avg (m)	Area (sqm)	Side
1.	35600	35710	110	5	550	Right
2.	36190	36320	260	5	1300	Both
3.	37960	38190	230	5	1150	Right
TOTAL			600 m		3000 sqm	

Note: Quantity / length of the above-mentioned safety/ protective structure is minimum, actual quantity/length requirement should be as per site requirement and hence any increase in quantity/length due to site requirement shall not qualify as Change of Scope.

12.2 Bamboo Plantation

For protection earth slope on hill side provision of plantation has been made as detailed below.

Sl No.	From (m)	To (m)	Length (m)	Avg. Width	Area (sqm)	Side
1.	35600	35710	110	5	550	Right
2.	36190	36320	260	5	1300	Both
3.	37960	38190	230	5	1150	Right
TOTAL			600 m		3000 sqm	

Note: Quantity / length of the above-mentioned safety/ protective structure is minimum, actual quantity/length requirement should be as per site requirement and hence any increase in

quantity/length due to site requirement shall not qualify as Change of Scope.

12.3 Hydro seeding:

Details of Hydro seeding has been described below:

S. No.	From (m)	To (m)	Length (m)	Height Avg (m)	Area (sqm)	Side
1.	31320	31750	860	5	4300	Both
2.	31850	31980	260	5	1300	Both
3.	32050	32140	90	5	450	Right
4.	34000	34130	130	5	650	Left
5.	34200	34360	160	5	800	Left
6.	34550	34820	270	5	1350	Left
7.	35710	35840	260	5	1300	Both
8.	36370	36460	180	5	900	Both
9.	40760	40820	60	5	300	Right
10.	41200	41290	180	5	900	Both
11.	41990	42250	520	5	2600	Both
12.	42940	43150	420	5	2100	Both
TOTAL			3390 m		16950 sqm	

Note: Quantity / length of the above-mentioned safety/ protective structure is minimum, actual quantity/length requirement should be as per site requirement and hence any increase in quantity/length due to site requirement shall not qualify as Change of Scope.

12.4 Soil Nailing:

S. No.	From (m)	To (m)	Length (m)	Height Avg (m)	Area (sqm)	Side
1.	31320	31750	860	5	4300	Both
2.	36370	36460	90	5	450	Right
3.	40760	40820	60	5	300	Right
4.	42120	42200	80	5	400	Left
5.	43000	43080	160	5	800	Both
TOTAL			1250 m		6250 sqm	

Note: Quantity / length of the above-mentioned safety/ protective structure is minimum, actual quantity/length requirement should be as per site requirement and hence any increase in quantity/length due to site requirement shall not qualify as Change of Scope.

13. Change of Scope

The length of Structures and bridges specified here in above 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 Contractor. Shifting of obstructing existing utilities indicated in Schedule A to an appropriate location in accordance with the standards and specification of concerned Utility Owning Department is part of the scope of work of the Contractor. The bidders may visit the site and assess the quantum of shifting of utilities for the projects before submission of their bid. The Contractor has to verify & shift all the utilities on the Project Site under the supervision of concerned Utility owning Department/Agency.

All the Utilities which affect the execution of EPC work or Maintenance of Project highway shall be shifted in accordance with Article-9 of EPC Agreement.

Annexure - I to Schedule – B1

Utility Shifting

Shifting of obstructing existing utilities indicated in Schedule A to an appropriate location in accordance with the standards and specification of concerned Utility Owning Department is part of the scope of work of the Contractor. The bidders may visit the site and assess the quantum of shifting of utilities for the projects before submission of their bid. Copy of utility relocation plan is enclosed. The specification of concerned Utility Owning Department shall be applicable and followed.

Note-I:

- a) The type/spacing/size/specifications of poles/towers/lines/cables to be used in shifting work shall be as per the guidelines of utility owning department and it is to be agreed solely between the contractor and the utility owning department. No change of scope shall be admissible and no cost shall be paid for using different type/spacing/size/specifications in shifted work in comparison to those in the existing work or for making any overhead crossing to underground as per requirement of utility owning department and/or construction of project highway. The contractor shall carry out joint inspection with utility owning department and get the estimates from the utility owning department. The assistance of the Authority is limited to giving forwarding letter on the proposal of contractor to utility owning department whenever asked by the contractor. The decision/ approval of utility owning department shall be binding on the contractor.
- b) The supervision charges at the rates/charges applicable of the utility owning department shall be paid directly by the Authority to the Utility Owning department as and when contractor furnishes demand of Utility Owning Department along with a copy of estimated cost given by later.
- c) The dismantled material/scrap of existing Utility to be shifted/Dismantled shall belong to the contractor who would be free to dispose-off the dismantled material as deemed fit by them unless the contractor is required to deposit the dismantled material to the Utility Owning department as per the norm and practice and in that case the amount of credit for dismantled material may be availed by the Contractor as per estimate agreed between them.
- d) The utilities shall be handed over after shifting work is completed to utility Owning Department to their entire satisfaction. The maintenance liability shall rest with the Utility Owning Department after handing over process is complete as far as utility shifting works are concerned.

Note –II: Copy of utility shifting plans enclosed as Annexure-II to Schedule B1.

Utility Shifting/Relocation Plan along with details such as the length and category of lines, types of circuits, type and number of poles, size and type of conductor/cable, the number and type of crossings and the capacity and the number of transformers, the length and category of pipes etc., shall be provided in due course of time. However, the actual requirements at site shall be assessed by the bidders before submission of their bids. The utility shifting works shall be executed by the Contractor in consultation with Utility Owning Department and the Authority's Engineer.

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) Tree Plantation;
- (e) Truck Lay byes;
- (f) Bus-bays and passenger shelters;
- (g) Rest areas; and
- (h) 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 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	Thrie 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) Tree Plantation – NIL

e) Truck Lay bye:-

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

f) Bus Bay & Passenger shelter: -

S. No.	Design Chainage (km)	Location
1.	31.000	Right side
2.	45.600	Left side

f) Rest Areas

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

g) Others to be specified

i) Street Lighting:

Street lighting shall be provided at all the bus bays, passenger shelter locations, junctions, Toilet Blocks etc. as per IRC SP:73-2018.

ii) Toilets:

S. No.	Design Chainage (km)	Side	Remarks
1	31000	Right	Junction
2	33300	Left	Junction
3	44700	Left	Near Junction
4	45600	Left	Hungpong Village

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: 73-2018) and Hill Road Manual (IRC SP: 48-1998) referred to herein as the Manual.

Annex – I
(Schedule-D)

Specifications and Standards for Construction

1. Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Two-Laning of Highways (IRC:SP:73-2018) and Hill Road Manual (IRC-SP-48-1998), 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.

As regards, the work of Utility Shifting, the relevant specification, relevant rules, regulations and acts of Utility owning department / Agencies shall be applicable.

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:

Item	Manual Clause Reference	Provision as per Manual	Modified Provision																				
Design Speed	2.2	Mountainous Terrain: Ruling: 60 Kmph Minimum: 40 Kmph	Mountainous Terrain: Design Speed followed 40-60 kmph in general. However, design speed has been reduced to 30 kmph due to site constraints and to accommodate the proposal within EROW. Refer Table 1.1 below.																				
Extra Widening	2.7	Extra Widening has been proposed as per IRC: SP: 73-2018	Extra Widening has been proposed as per IRC: SP: 48-1998 (Table 6.9) of Hill Road Manual.																				
		<table border="1" style="width: 100%;"> <thead> <tr> <th>Radius</th> <th>Extra Widening</th> </tr> </thead> <tbody> <tr> <td>75-100 m</td> <td>0.9 m</td> </tr> <tr> <td>101-300 m</td> <td>0.6 m</td> </tr> </tbody> </table>	Radius	Extra Widening	75-100 m	0.9 m	101-300 m	0.6 m	<table border="1" style="width: 100%;"> <thead> <tr> <th>Radius</th> <th>Extra Widening</th> </tr> </thead> <tbody> <tr> <td>21-40 m</td> <td>1.5 m</td> </tr> <tr> <td>41-60 m</td> <td>1.2 m</td> </tr> <tr> <td>61-100 m</td> <td>0.9 m</td> </tr> <tr> <td>75-100 m</td> <td>0.9 m</td> </tr> <tr> <td>101-300 m</td> <td>0.6 m</td> </tr> <tr> <td>Above 300 m</td> <td>NIL</td> </tr> </tbody> </table>	Radius	Extra Widening	21-40 m	1.5 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
		Radius	Extra Widening																				
		75-100 m	0.9 m																				
		101-300 m	0.6 m																				
		Radius	Extra Widening																				
		21-40 m	1.5 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	Refer Table 1.1 below.																				

Table 1.1: Locations where Radii of Horizontal Curve is less than 75 m

S. No.	Chainage	RADIUS (in m)	Design Speed (in kmph)
1.	33096.984	50.000	30
2.	33399.251	50.000	30
3.	34967.114	50.000	30
4.	41884.71	50.000	30
5.	41964.328	50.000	30
6.	42871.272	50.000	30
7.	44657.027	50.000	30

Schedule - E

(See Clauses 2.1 and 14.2)

Maintenance Requirements

1. Maintenance Requirements

- (i) The Contractor shall, at all times maintain the Project Highway in accordance with the provisions of this Agreement, Applicable Laws and Applicable Permits.
- (ii) The Contractor shall repair or rectify any Defect or deficiency set forth in Paragraph 2 of this Schedule-E within the time limit specified therein and any failure in this behalf shall constitute non-fulfilment of the Maintenance obligations by the Contractor. Upon occurrence of any breach hereunder, the Authority shall be entitled to effect reduction in monthly lump sum payment as set forth in Clause 14.6 of this Agreement, without prejudice to the rights of the Authority under this Agreement, including Termination thereof.
- (iii) All Materials, works and construction operations shall conform to the MORTH Specifications for Road and Bridge Works, and the relevant IRC publications. Where the specifications for a work are not given, Good Industry Practice shall be adopted.

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

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

4. Extension of time limit

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

5. Emergency repairs/restoration

Notwithstanding anything to the contrary contained in this Schedule-E, if any Defect, deficiency or deterioration in the Project Highway poses a hazard to safety or risk of

damage to property, the Contractor shall promptly take all reasonable measures for eliminating or minimizing such danger.

6. Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

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

8. Repairs on account of natural calamities

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

Annex - I

(Schedule-E) Repair/rectification of Defects and deficiencies

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

Table -1: Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, approach)	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm in depth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA 2003 (http://www.tfhrc.com/pavement/ltp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	Acceptable					
s of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Cracking	Nil	< 5 % subject to limit of 0.5 sqm for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15 -30 days	MORT&H Specification 3004.2
	Corrugations and Shoving	Nil	< 0.1% of area	Daily	Length Measurement Unit like		2-7 days	IRC:82-2015

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

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	Acceptable					
			0 to 30 cm from the edge					
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer	Class I Profilometer : ASTM E950 (98) :2004 -Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	180 days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-Annually	SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)		180 days	BS: 7941-1:2006
	Pavement Condition Index	3	2.1	Bi-Annually			180 days	IRC:82-2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications	
		Desirable	Acceptable						
Asset Type	Other Pavement Distresses			Bi-Annually			2-7 days	IRC:82-2015	
	Deflection/Remaining Life			Annually	Falling Weight Deflectometer	IRC 115: 2014	180 days	IRC:115-2014	
	Rigid Pavement (Pavement of MCW, Service Road, Grade structure,	Roughness BI	2200m m/km	2400mm /km	Bi-Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656 - 94: 2000	180 days	IRC:SP:83-2008
		Skid	Skid Resistance no. at different speed of vehicles		Bi-Annually	SCRIM (Sideway-force	IRC:SP:83-2008	180 days	IRC:SP:83-2008

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	Acceptable					
approaches of connecting roads, slip roads, lay byes etc. as applicable)		Minimum SN	Traffic Speed (Km/h)		Coefficient Routine Investigation Machine or equivalent)			
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	Acceptable					
Embankment/ Slope	Edge drop at shoulders	Nil	40m m	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC	7-15 days	MORT&H Specification 408.4
	Slope of camber/cross fall	Nil	<2% variation in prescribed slope of camber/cross fall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15 % variation in prescribe	Daily			7-15 days	MORT&H Specification 408.4

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	Acceptable					
			side slope					
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification
	Rain Cuts/Gullies in slope	Nil	Nil	Daily Specially During Rainy Season	NA		7-15 days	MORT&H Specification

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

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

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

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
2	Single Transverse (or Diagonal) Crack intersecting with one or more joints	w = width of crack L = length of crack d = depth of crack D = depth of slab	4	w = 1.5 - 3.0 mm	Seal, and stitch if L > 1 m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15 days
			5	w > 3 mm.		
			0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Route and seal with epoxy.	Staple or Dowel Bar Retrofit.
			2	w = 0.2 - 0.5 mm, discernible from slow vehicle	Within 7 days	Within 15 days
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1m. Within 7 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
			4	$w = 3.0 - 6.0 \text{ mm}$	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected. Portion with norms and specifications - See Para 5.5 & 9.2
			5	$w > 6 \text{ mm}$, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	Within 15 days
			0	Nil, not discernible	No Action	
3	Single Longitudinal Crack intersecting with one or more joints	w = width of crack L = length of crack d = depth of crack D = depth of slab	1	$w < 0.5 \text{ mm}$, discernible from slow moving vehicle	Seal with epoxy, if $L > 1 \text{ m}$. Within 7 days	Staple or dowel bar retrofit. Within 15 days

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > 1 m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair with stapling. Within 15 days
			4	w = 6.0 - 12.0 mm, usually associated with spalling	Not Applicable, as it may be full	
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic	depth	Full Depth Repair Dismantle and reconstruct affected portion as per norms and specifications -

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
						See Para 5.6.4 Within 15 days
4	Multiple Cracks intersecting with one or more joints	w = width of crack	0	Nil, not discernible	No Action	-
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > 1 m.	
			2	w = 0.2 - 0.5 mm. discernible from slow vehicle	Within 15 days	
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, Reinstatement subbase, Reconstruct whole slab as per specifications within 30 days
			4	w = 3.0 - 6.0 mm panel broken into 2 or 3 pieces		
			5	w > 6 mm and/or panel broken		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
				into more than 4 pieces		
5	Corner Break	w = width of crack L = length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to secure broken parts	Seal with epoxy seal with epoxy
			2	w < 1.5 mm; L < 0.6 m, only one corner broken	Within 7 days	Within 7 days
			3	w < 1.5 mm; L < 0.6 m, two corners broken	Partial Depth (Refer Figure 8.3 of IRC:SP: 83-2008)	Full depth repair
			4	w > 1.5 mm; L > 0.6 m or three corners broken		
			5	three or four corners broken		
				Within 15 days	Reinstate sub-base, and reconstruct the	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
						slab as per norms and specifications within 30days
6	Punchout (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)	w = width of crack L = length(m/m ²)	0	Nil, not discernible		No Action
			1	$w < 0.5 \text{ mm}; L < 3 \text{ m/m}^2$	Not Applicable, as it may be fulldepth	Seal with low viscosity epoxy to secure broken parts. Within 15days
			2	either $w > 0.5 \text{ mm}$ or $L < 3 \text{ m/m}^2$		
			3	$w > 1.5 \text{ mm}$ and $L < 3 \text{ m/m}^2$		
			4	$w > 3 \text{ mm}$, $L < 3 \text{ m/m}^2$ and deformation		
			5	$w > 3 \text{ mm}$, $L > 3 \text{ m/m}^2$ and deformation		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
Surface Defects						
7	Ravelling Honeycomb surface	$r = \frac{\text{area damaged}}{\text{surface/total surface of slab}} (\%)$ $h = \text{maximum depth of damage}$	0	Nil, not discernible	Short Term No action.	Long Term Not Applicable
			1	$r < 2 \%$	Local repair of areas damaged and liable to be damaged. Within 15 days	
			2	$r = 2 - 10 \%$	Bonded Inlay, 2 or 3 slabs if affecting.	
			3	$r = 10-25\%$		
			4	$r = 25 - 50 \%$		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
					Within 30 days	
			5	$r > 50\%$ and $h > 25$ mm	Reconstruct slabs, 4 or more slabs if affecting. Within 30 days	
8	Scaling	$r = \frac{\text{damaged surface}}{\text{total surface of slab}} (\%)$ $h = \text{maximum depth of damage}$	0	Nil, not discernible	Short Term No action.	Long Term
			1	$r < 2\%$	Local repair of areas damaged	Not Applicable
			2	$r = 2 - 10\%$	and liable to be damaged. Within 7 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
			3	$r = 10 - 20\%$	Bonded Inlay within 15 days	
			4	$r = 20 - 30 \%$		
			5	$r > 30 \%$ and $h > 25 \text{ mm}$	Reconstruct slab within 30 days	
			0		No action.	
			1	$t > 1 \text{ mm}$		
9	Polished Surface/Glazing	$t = \text{texture depth, sand patchtest}$	2'	$t = 1 - 0.6 \text{ mm}$	Monitor rate of deterioration	Not Applicable
		3	$t = 0.6 - 0.3 \text{ mm}$			
		4	$t = 0.3 - 0.1 \text{ mm}$			

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
			5	$t < 0.1 \text{ mm}$	Diamond Grinding if affecting 50% or more slabs in a continuous stretch of minimum 5 km. Within 30 days	
10	Popout (Small Hole) , n = number/m ² Pothole Refer Para 8.4 d = diameter h = maximum depth		0	$d < 50 \text{ mm}; h < 25 \text{ mm}; n < 1 \text{ per } 5 \text{ m}^2$	No action.	Not Applicable
			1	$d=50-100\text{mm}; h<50\text{mm}; n<1 \text{ per } 5 \text{ m}^2$	Partial depth repair 65 mm deep.	
			2	$d=50-100\text{mm}; h>50\text{mm}; n<1 \text{ per } 5 \text{ m}^2$	Within 15 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
			3	$d = 100 - 300 \text{ mm}; h < 100 \text{ mm}$ $n < 1$ per 5m^2	Partial depth repair 110mm	
			4	$d = 100 - 300 \text{ mm}; h > 100 \text{ mm}; n < 1$ per 5m^2	i.e.10 mm more than the depth of the hole. Within 30 days	
			5	$d > 300 \text{ mm}; h > 100 \text{ mm}; n > 1$ per 5 m^2	Full depth repair. Within 30 days	

Joint Defects								
11	Joint Seal Defects	loss or damage L = Length as % total jointlength	0	Difficult to discern.	Short Term	Long Term		
					No action.	Not Applicable		
					1		Discernible, L < 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.
					3		Notable. L > 25% insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days
5	Severe; w > 3 mm negligible protection against ingress of water	Clean, widen and reseal the joint. Within 7 days						

				and trapping incompressible material.		
12	Spalling of Joints	w = width on either side of the joint L = length of spalled portion (as % joint length)	0	Nil, not discernible	No action.	Not Applicable
			1	w < 10 mm	Apply low viscosity epoxy resin/ mortar in cracked portion.	
			2	w = 10 - 20 mm, L < 25%	Within 7 days	
			3	w = 20 - 40 mm, L > 25%	Partial Depth Repair. Within 15 days	
			4	w = 40 - 80 mm, L > 25%	30 - 50 mm deep, h = w + 20% of w, within 30 days	
			5	w > 80 mm, and L > 25%	50 - 100 mm deep repair. H = w + 20% of w. Within 30 days	
13	Faulting (orStepping)	f = difference of level	0	not discernible, < 1 mm	No action.	No action.

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

			3	h = 12 - 25 mm	within 7 days	
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shattered slabs, ie 4 or morepieces	Replace broken slabs. Within 30 days	
15	Depression	h = negative vertical displacement from normal profile L =length	0	Not discernible, h < 5 mm	No action.	Not Applicable
			1	h = 5 - 15 mm		
			2	h = 15-30 mm, Nos<20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Strengthen subgrade. Reinstate pavement at normal level	

			5	$h > 100 \text{ mm}$	if $L < 20 \text{ m}$. Within 30 days	
16	Heave	h = positive vertical displacement from normal profile. L = length	0	Not discernible. $h < 5 \text{ mm}$	Short Term	Long Term
					No action.	scrabble
			1	$h = 5 - 15 \text{ mm}$	Follow up.	
			2	$h = 15 - 30 \text{ mm}$, Nos $< 20\%$ joints	Install Signs to Warn Traffic within 7 days	
			3	$h = 30 - 50 \text{ mm}$		
			4	$h > 50 \text{ mm}$ or $> 20\%$ joints	Stabilise subgrade. Reinstate pavement at normal level if length $< 20 \text{ m}$. Within 30 days	
			5	$h > 100 \text{ mm}$		
17	Bump	h = vertical	0	$h < 4 \text{ mm}$	No action	

		displacement from normal profile	1	$h = 4 - 7 \text{ mm}$	Grind, in case of new construction within 7 days	Construction Limit for New Construction.
			3	$h = 7 - 15 \text{ mm}$	Grind, in case of ongoing Maintenance within 15 days	Replace in case of new construction. Within 30days
			5	$h > 15 \text{ mm}$	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	Lane to Shoulder Drop of f	f = difference of level	0	Nil, not discernible $< 3\text{mm}$	Short Term	Long Term
					No action.	
			1	$f = 3 - 10 \text{ mm}$	Spot repair of shoulder within 7 days	
			2	$f = 10 - 25 \text{ mm}$		
3	$f = 25 - 50 \text{ mm}$	Fill up shoulder				

			4	f = 50 - 75 mm	within 7 dayss	For any 100 m stretch Reconstruct shoulder, if a
			5	f > 75 mm		
Drainage						
19	Pumping	quantity of fines and water expelled through open joints and cracks Nos	0	not discernible	No Action	
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints Without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	appreciable/ Freque nt 10 -25%	Lift or jack slab within 30 days.	
		Nos/100 m stretch	5	abundant, cra ck development >25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab. Within 30 days	

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

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

Asset Type	Performance Parameter	Level of Service (LOS)			Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Highway	Availability of Safe Sight Distance	As per IRC SP :84-2014, a minimum of safe stopping sight distance shall be available throughout.			Monthly	Manual Measurements with Odometer along with video/image backup	Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments. In case of permanent structure or design deficiency: Removal of obstruction/improvement of deficiency at the earliest Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.		IRC:SP 84-2014
		Design Speed, kmph	Desirable Minimum Sight Distance (m)	Safe Stopping Sight Distance (m)					
		100	360	180					
		80	260	130					
Pavement Marking	Wear	<70% of marking remaining			Bi-Annually	Visual Assessment as per Annexure-F of IRC:35-2015	Re - painting	Cat-1 Defect - within 24 hours Cat-2 Defect - within 2months	IRC:35-2015

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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		Initial 7 days Retro reflectivity: 100 mcd/m ² /lux Minimum Threshold Level: 50 mcd/m ² /lux					
	Skid Resistance	Initial and Minimum performance for SkidResistance: Initial (7days): 55BPN Min. Threshold: 44BPN *Note: shall be considered under urban/city traffic condition encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc	Bi-Annually	As per Annexure-G of IRC:35-2015		Within 24 hours	IRC:35-2015
Road Signs	Shape and Position	Shape and Position as per IRC:67-2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is damaged. Relocation as per requirement	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/Cantilever Sign boards	IRC:67-2012
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of each	change of signboard	48 hours in case of Mandatory	RC:67-2012

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
				signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.		Signs, Cautionary and Informatory Signs (Single and Dual postsigns) 1 Month in case of Gantry/Cantilever Sign boards	
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance measuring tape	Raising Kerb Height	Within 1 Month	RC 86:1983
	Kerb Painting	<u>Functionality:</u> Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	RC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2014 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:84-2014,IRC:35-2015
	Pedestrian Guardrail	<u>Functionality:</u> Functioning of guardrail asintended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014
	Traffic Safety Barriers	<u>Functionality:</u> Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014, IRC:119-2015
	End Treatment of	<u>Functionality:</u> Functioning of End Treatment as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2014,

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

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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Other Project Facilities and Approach roads	Damage or deterioration in Approach Roads, pedestrian facilities, truck lay-bys, bus-bays, bus-shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works		Daily	-	Rectification	15 days	IRC:SP 84-2014

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

	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Bridges including ROBs Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811
Bridge -Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORT&H Specification 3004.2 & 2811.
	User safety (condition of crash barrier and guard rail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed condition survey as per IRC SP: 35-1990.	Repairs and replacement of safety barriers as the case may be	3days	IRC: 5-1998, IRC SP: 84-2014 and IRC SP: 40-1993.

Rusted reinforcement	Not more than 0.25 sq.m	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out the repairs to affected concrete portion with epoxy mortar / concrete.	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
Spalling of concrete	Not more than 0.50 sq.m					
Delamination	Not more than 0.50 sq.m					
Cracks wider than 0.30 mm	Not more than 1m total length	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting with epoxy mortar, investigating causes for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP: 40-1993 and MORTH Specification 2800.
Rainwater seepage through deck slab	Leakage - nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting of deck slab at leakage areas, waterproofing, repairs to drainage spouts	1 months	MORTH specifications 2600 & 2700.
Deflection due to permanent loads and	Within design limits.	Once in every 10 years for spans more	Load test method	Carry out major rehabilitation works on bridge to retain original design load capacity	6 months	IRC SP: 51-1999.

live loads		than 40 m				
Vibrations in bridge deck due to moving trucks	Frequency of vibrations shall not be more than 5 Hz	Once in every 5 years for spans more than 30m and every 10 years for spans between 15 to 30 m	Laser displacement sensors or laser vibro-meters	Strengthening of super structure	4 months	AASHTO LRFD specifications
Leakage in Expansion joints	No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rain water through expansion joint in case of buried and asphalt plug and copper stripjoint.	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge InspectionUnit	Replace of seal in expansionjoint	15 days	MORTH specifications 2600 and IRC SP: 40-1993.
Debris and dust in strip seal	No dust or debris in expansion joint	Monthly	Detailed condition survey as per IRC SP:35-1990 using	Cleaning of expansion joint gapsthoroughly	3 days	MORTH specifications 2600 and

	expansion joint	gap.		Mobile Bridge Inspection Unit			IRC SP: 40-1993.
	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No silt, debris, clogging of drainage spout collection chamber.	Monthly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainagespout if any leakages observed.	3 days	MORTH specification 2700.
Bridge-substructure	Cracks/spalling of concrete/rusted steel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting/guniting and micro concreting depending on type of defect noticed	30 days	IRC SP: 40-1993 and MORTH specification 2800.

	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture of reinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment shall be replaced, in order to get uniform load transfer on to bearings.	3 months	MORTH specification 2810 and IRC SP: 40-199.
Bridge Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection as per IRC SP:35-1990 using Mobile Bridge Inspection Unit. In case of doubt, use Underwater camera for inspection of deep wells in major Rivers.	Suitable protection works around pier/abutment	1 month	IRC SP: 40-1993, IRC 83-2014, MORTH specification 2500
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching.	30 days after defect observation or 2	IRC: SP 40-1993 and IRC:SP:13-2004.

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

Table 4: Maintenance Criteria for Structures and Culverts:

Table 5: Maintenance Criteria for Hill Roads

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

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

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

A. Flexible Pavement

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

Nature of Defect or deficiency		Time limit for repair/rectification
(i)	Obstruction in a minimum head- room of 5 m above carriageway or obstruction in visibility of road signs	24 (twenty four)hours
(ii)	Removal of fallen trees from carriageway	4 (four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiringreplacement	30 (thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
(f) Rest area		
(i)	Cleaning of toilets	Every 4 (four) hours
(ii)	Defects in electrical, water and sanitary installations	24 (twenty four) hours
(g) [TollPlaza]		
(h) Other Project Facilities and Approach roads		
(i)	Damage in approach roads, pedestrian facilities, truck lay- byes, bus-bays, bus-shelters, cattle crossings, [Traffic Aid Posts, Medical Aid Posts] and service roads	15 (fifteen) days
(ii)	Damaged vehicles or debris on the road	4 (four) hours
(iii)	Malfunctioning of the mobilecrane	4 (four) hours
Bridges		
(a) Superstructure		
(i)	Any damage, cracks, spalling/ scaling Temporarymeasures Permanentmeasures	within 48 (forty eight) hours within 15 (fifteen) days or as specified by the Authority's Engineer
(b) Foundations		

Nature of Defect or deficiency		Time limit for repair/rectification
(i)	Scouring and/or cavitation	15 (fifteen) days
(c) Piers, abutments, return walls and wingwalls		
(i)	Cracks and damages including settlement and tilting, spalling, scaling	30 (thirty) days
(d) Bearings (metallic) of bridges		
(i)	Deformation, damages, tilting or shifting of bearings	15 (fifteen) days Greasing of metallic bearings once in a year
(e) Joints		
(i)	Malfunctioning of joints	15 (fifteen) days
(f) Other items		
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3 (three) days
(iii)	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guidebunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g) Hill Roads		
(i)	Damage to retaining wall/breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours

Nature of Defect or deficiency		Time limit for repair/ rectification
(iii)	Snow requiring clearance	24 (twenty four) hours

[Note: Where necessary, the Authority may modify the time limit for repair/rectification, or add to the nature of Defect or deficiency before issuing the bidding document, with the approval of the competent authority.]

Schedule - F

(See Clause 4.1 (vii)(a))

Applicable Permits

1. Applicable Permits

- (i) The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:
- (a) Permission of the State Government for extraction of boulders from quarry;
 - (b) Permission of Village Panchayats and Pollution Control Board for installation of crushers;
 - (c) Licence for use of explosives;
 - (d) Permission of the State Government for drawing water from river/reservoir;
 - (e) Licence from inspector of factories or other competent Authority for setting up batching plant;
 - (f) Clearance of Pollution Control Board for setting up batching plant;
 - (g) Clearance of Village Panchayats and Pollution Control Board for setting up asphalt plant;
 - (h) Permission of Village Panchayats and State Government for borrow earth; and
 - (i) Any other permits or clearances required under Applicable Laws.
- (ii) Applicable Permits, as required, relating to environmental protection and conservation shall have been procured by the Authority in accordance with the provisions of this Agreement.

Schedule – G

(See Clauses 7.1 and 19.2)

Annex-I

(See Clause 7.1)

Form of Bank Guarantee [Performance Security/Additional Performance Security]

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

WHEREAS:

- (A) [name and address of contractor] (hereinafter called the “Contractor”) and [name and address of the authority], (hereinafter called the “Authority”) have entered into an agreement (hereinafter called the “Agreement”) for the Widening/Improvement to 2-lane with earthen shoulder of Finch Corner to Ukhrul section from existing km 34+650 to km 50+520 (Design Chainage km 30+970 to km 45+600) of NH-202 in the State of Manipur (Package-3, Length-14.63 km) on Engineering, Procurement and Construction (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 Rscr. (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.
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, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment amounts so demanded under the said invocation.
13. Bank Guarantee has been sent to authority's bank through SFMS gateway as per the details below:-

S. 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 CNRB0019062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank, Transport Bhawan, 1 st 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)

Form for Guarantee for Advance Payment

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

WHEREAS:

- (A) [name and address of contractor] (hereinafter called the “**Contractor**”) has executed an agreement (hereinafter called the “**Agreement**”) with the [name and address of the authority], (hereinafter called the “**Authority**”) for the Widening/Improvement to 2-lane with earthen shoulder of Finch Corner to Ukhrul section from existing km 34+650 to km 50+520 (Design Chainage km 30+970 to km 45+600) of NH-202 in the State of Manipur (Package-3, Length-14.63 km) on Engineering, Procurement and Construction (the “**EPC**”) basis, subject to and in accordance with the provisions of the Agreement.
- (B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing @*Bank Rate + 3%* advance payment (herein after called “**Advance Payment**”) equal to 10% (ten per cent) of the Contract Price; and that the Advance Payment shall be made in two installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} installment of the Advance Payment is Rs. ----- cr. (Rupees crore) and the amount of this Guarantee is Rs. ----- cr. (Rupees crore) (the “**Guarantee Amount**”) s.
- (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 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.

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

2. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
3. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
4. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
5. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Advance Payment.
6. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from

its liabilities hereunder.

7. The Guarantee shall cease to be in force and effect on ***, unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.
8. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
9. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.
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, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment amounts so demanded under the said invocation.
12. Bank Guarantee has been sent to authority's bank through SFMS gateway as per the details below:-

S. 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 CNRB0019062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank, Transport Bhawan, 1 st 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-III

(Schedule - G)

(See Clause 7.1)

Form of Surety Bond

[Performance Security/Additional Performance Security]

National Highways & Infrastructural Development Corporation Ltd.

PTI Building, 3rd Floor,

4, Parliament Street

New Delhi - 110001

WHEREAS:

- (A) _____ [name and address of contractor] (hereinafter called the "**Contractor**") and [name and address of the authority], (hereinafter called the "Authority") have entered into an agreement (hereinafter called the "Agreement") for the "***** EPC Mode" subject to and in accordance with the provisions of the Agreement
- (B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the {Construction Period/ Defects Liability Period and Maintenance Period}{as defined in the Agreement} in a sum of Rs. cr. (Rupees crore) (the "**Surety Bond Amount**").
- (C) We, through our branch at (the "**Surety Insurer**") have agreed to furnish this bank guarantee (*hereinafter called the "**Surety Bond**"*) by way of Performance Security.

NOW, THEREFORE, the **Surety Insurer** hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The **Surety Insurer** 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 **Surety Bond** Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways Infrastructure Development Corporation Limited], that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the **Surety Insurer**. The **Surety Insurer** 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 **Surety Insurer**, 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 **Surety Bond**, the Authority shall be entitled to act as if the **Surety Insurer** were the principal debtor and any change in the constitution of the Contractor and/or the **Surety Insurer**, 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 **Surety Insurer** under this **Surety Bond**.
4. It shall not be necessary, and the **Surety Insurer** hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this **Surety Bond**.
5. The Authority shall have the liberty, without affecting in any manner the liability of the **Surety Insurer** under this **Surety Bond**, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfilment 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 **Surety Insurer** 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 **Surety Insurer** from its liability and obligation under this **Surety Bond** and the **Surety Insurer** hereby waives all of its rights under any such law.
6. This **Surety Bond** is in addition to and not in substitution of any other **Surety Bond** or security now or which may hereafter be held by the Authority in respect of or relating to the Agreement or for the fulfilment, 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 **Surety Insurer** under this **Surety Bond** is restricted to the **Surety Bond** Amount and this **Surety Bond** 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 **Surety Insurer** under this **Surety Bond** all rights of the Authority under this **Surety Bond** shall be forfeited and the **Surety Insurer** shall be relieved from its liabilities hereunder.
8. The **Surety Bond** shall cease to be in force and effect on ****\$. Unless a demand or claim under this **Surety Bond** is made in writing before expiry of the **Surety Bond**, the **Surety Insurer** shall be discharged from its liabilities hereunder.
9. The **Surety Insurer** undertakes not to revoke this **Surety Bond** 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 **Surety Bond** and the undersigned has full powers to do so on behalf of the **Surety Insurer** .
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the **Surety Insurer** at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.
11. This **Surety Bond** 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 **Surety Bond** is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.
13. This **Surety Bond** shall also be operatable at our Branch at New Delhi, from whom confirmation regarding the issue of this **Surety Bond** or extension / renewal thereof shall be made available on demand. In the contingency of this **Surety Bond** being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.
14. The Insurance Surety Bond shall be verified from the branch concerned/ specific portal created for this purpose.

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 Surety Bond should contain the name, designation and code number of the officer(s) signing the Surety Bond.
- (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 ₹ _____

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	47.63 %	A- Widening and strengthening of existing road	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) Non-bituminous Base course	[Nil]
		(4) Bituminous Base course	[Nil]
		(5) Wearing Coat	[Nil]
		(6) Widening and repair of culverts	[Nil]
		B.1-Reconstruction/New 2-Lane Realignment / Bypass (Flexible Pavement)	
		(1) Earthwork up to top of the sub- grade	46.67%
		(2) Sub-base Course	13.38%
		(3) Non-bituminous Base course	9.68%
		(4) Bituminous Base course	8.94%
		(5) Wearing Coat	5.79%
		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 Base course	[Nil]
		(5) Wearing Coat	[Nil]
		C.2- Reconstruction/New Service Road (Rigid Pavement)	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) Dry Lean Concrete (DLC) Course	[Nil]
(4) Pavement Quality Control (PQC) Course	[Nil]		
D- Reconstruction & New Culverts on existing road, realignments, bypasses Culverts (length <6m)		15.54%	
Minor bridge / Underpasses / Overpasses	8.56 %	A.1-widening and repairing of Minor Bridges (length >6 m<60m)	
		Minor Bridges	2.95%

Item	Weightage in % of CP	Stage for Payment	Percentage
1	2	3	4
		A.2- Re-construction/New Construction Minor bridges (length >6 m and <60m)	
		(1) Foundation: On completion of the foundation work including foundation for wing and return wall	23.41%
		(2) Sub-Structure: On completion of abutments, piers upto the abutment / pier cap.	47.44%
		(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.	24.57%
		(3) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all and fit for use	1.63%
		(4) Guide Bunds and River Training Works: On completion of Guide Bunds and river training works complete in all respects	[Nil]
		B.1- Widening and repairs of underpasses/overpasses	
		Underpasses/ Overpasses	[Nil]
		B.2-New Underpasses/Overpasses	
		(1) Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap.	[Nil]
		(2) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect. Wearing Coat (a) in case of Overpass-wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass-rigid pavement including drainage facility complete in all respects as specified.	[Nil]
		(3) Approaches: On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	[Nil]
Major bridge (length >60 m) works and ROB / RUB / elevated sections / flyovers including viaducts, if any	0.00 %	A.1- Widening and repairs of Major Bridges	
		(1) Foundation	[Nil]
		(2) Sub-structure	[Nil]
		Super-structure (including bearings)	
		(a) Super-structure: casting of girder / fabrication of girders (steel)	[Nil]
		(b) Super-structure: casting of segments	[Nil]

Item	Weightage in % of CP	Stage for Payment	Percentage
1	2	3	4
		(c) Super-structure: erection of girder, deck slab and bearings	[Nil]
		(4) Wearing Coat including expansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7) Guide bunds, River Training works etc.	[Nil]
		(8) Approaches (including Retaining walls, stone pitching and protection works)	[Nil]
		A.2-New Major Bridges	
		(1) Foundation	[Nil]
		(2) Sub-structure	[Nil]
		Super-structure (including bearings)	
		(a) Super-structure: casting of girder / fabrication of girders (steel)	[Nil]
		(b) Super-structure: casting of segments	[Nil]
		(c) Super-structure: erection of girder, deck slab and bearings	[Nil]
		(4) Wearing Coat including expansion joints	[Nil]
		(5) Miscellaneous: stone pitching, protection works, excluding retaining walls / reinforced earth walls etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7) Guide bunds, River Training works etc.	[Nil]
		(8) Retaining walls / reinforced earth walls etc.	
		(a) Panel Casting	[Nil]
		(b) Erection of panel / construction of retaining wall	[Nil]
		B.1-Widening and repairs of (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 respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	[Nil]
		(5) Miscellaneous Items like 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 respects	[Nil]

Item	Weightage in % of CP	Stage for Payment	Percentage
1	2	3	4
		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]
		(6) Wing walls/Return walls	[Nil]
		(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]
		C.1- Widening and repair of Elevated Section/Flyovers/Grade Separators	
		(1) Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3) Super-Structure (Including bearings)	[Nil]
		(4) Wearing Coat including expansion 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/Grade Separators	
		(1) Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3) Super-Structure (Including bearings)	[Nil]
		(4) Wearing Coat including expansion 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	43.06 %	(i) Toll Plaza	[Nil]
		(ii) Road side drains	4.95%
		(iii) Road signs, markings, km stones, safety devices, street lightings etc.	
		a. Pavement Marking	0.86%
		b. Traffic /Road Sign	1.94%
		c. Road Boundary stone, km Stone,5th km stone and hectometer stone	0.03%
		d. Traffic blinker LED delineator, stud, reflective payment marker, tree reflector	0.28%
		e. Road furniture (overhead signboard etc.)	0.19%
		f. Others including Toilet Blocks and Street lightings	0.98%
		(iv) Project facilities	
		a) Bus Bay & Passenger Shelter	0.61%
		b) Truck Lay-byes	[Nil]

Item	Weightage in % of CP	Stage for Payment	Percentage
1	2	3	4
		c) Junction	0.75%
		d) Rest Area	[Nil]
		e) Diversion Works	[Nil]
		(v) Road side Plantation	[Nil]
		(vi) Repair 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	16.49%
		(ix) Toe Wall	[Nil]
		(x) Gabion Structure	44.59%
		(xi) Retaining Wall	15.55%
		(xii) Thrie Beam Crash Barrier	8.00%
		(xiii) Parapet Wall	[Nil]
		(xiv) Protection Works	
		a. Hydroseeding	0.10%
		b. Seeding & Mulching	0.17%
		c. Soil Nailing	4.49%
c. Bamboo Plantation	0.02%		
Electrical Utilities & Public Health Utilities (Water Pipe Line & Sewage Line)	0.75%	a) EHT line	100%
		b) EHT Crossing	
		c) HT/LT line (including transformers if any)	
		d) HT / LT line crossings	
		e) Water Pipe Line	[Nil]
		f) Water Pipe Line Crossing	[Nil]
		g) Sewage Line	[Nil]
		h) Sewage Line Crossing	[Nil]

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 pro-rata basis on completion of a stage in a length of not less than 500m.
(1) Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Non-bituminous Base course	[Nil]	
(4) Bituminous Base course	[Nil]	
(5) Wearing Coat	[Nil]	
(6) Widening and repair of culverts	[Nil]	Cost of 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 pro-

Stage of Payment	Percentage weightage	Payment Procedure
(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock including Cleaning & grubbing with required site clearance etc.	46.67%	rata basis on completion of a stage in a length of not less than 500m. In case of Hill Cutting, the payment procedure will be as under: Hill Cutting: 40% of weightage specified in B1 Preparation of sub-grade: 60% of weightage specified in B1
(2) Sub-base Course	13.38%	
(3) Non-bituminous Base course	9.68%	
(4) Bituminous Base course	8.94%	
(5) Wearing Coat	5.79%	
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 a length of not less than 500m.
(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]	Unit of measurement is linear length. Payment of each stage shall be made on pro-rata basis on completion of a stage in a length of not less than 500m.
C.1- Reconstruction/New Service Road/ Slip Road (Flexible Pavement)		
(1) Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Non-bituminous Base course	[Nil]	
(4) Bituminous Basecourse	[Nil]	
(5) Wearing Coat	[Nil]	Unit of measurement is linear length. Payment of each stage shall be made on pro-rata basis on completion of a stage in a length of not less than 500m.
C.2- Reconstruction/New Service road (Rigid Pavement)		
(1) Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Dry Lean Concrete (DLC) Course	[Nil]	Cost of each culvert shall be determined on pro-rata basis with respect to the total number of culverts. Payment shall be made on the completion of at least 01 (one) culvert.
(4) Pavement Quality Control (PQC) Course	[Nil]	
D-Reconstruction & New Culverts on existing road, realignments, bypasses		
Culverts (length <6m)	15.54%	

@ 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 & Repairs of Minor Bridges (length >6m & <60m)	2.95%	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- Re-construction / New Construction Minor Bridges (length > 6m & < 60m)		
(1) Foundation: On completion of the foundation work including foundation for wing and return wall	23.41%	Foundation: Payment against foundation shall be made on pro-rata basis on completion of at least two foundations. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-Structure: On completion of abutments, piers upto the abutment / pier cap.	47.44%	Sub Structure: Payment sub structure shall be made on pro-rata basis on completion of at least two substructure upto abutment / pier cap level of each bridge.
(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.	24.57%	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.
(3) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all and fit for use	1.63%	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 an 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 up to 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.

Stage of Payment	Weightage	Payment Procedure
		In case 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 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]	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/ 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. 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 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. 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

Stage of Payment	Weightage	Payment Procedure
		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) 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 completion of the scope of stage.
A.2-NewMajorBridges		
(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. 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 the bridge subject to completion of atleast two foundations along with sub-structure upto abutment/pier cap level of the bridge
(3) Super-structure: including girder, deck slab, bearings (excluding wearing coat and expansion joints)		
(a) Super-structure: casting of girder / fabrication of girders (steel)	[Nil]	Super-structure (casting of girder): Unit of measurement is numbers. Payment against casting of girder shall be made on pro rata basis with respect to total number of girders required in the structure on completion of a stage i.e. not less than completion of casting of atleast five girders of the structures.
(b) Super-structure: casting of segments	[Nil]	Super-structure (casting of segments) : Unit of measurement is numbers. Payment against casting of segment shall be made on pro rata basis with respect to total number of segments required in the structure on completion of a stage i.e. not less than completion of casting of atleast 10 segments of the structures.
(c) Super-structure: erection of girder, deck slab and bearings	[Nil]	Super-structure(erection of girder, deck slab and bearings) : 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.

Stage of Payment	Weightage	Payment Procedure
(4) Other Ancillary works: wearing coat, expansion joints, hand rails, crash barriers, tests on completion etc. completion in all respects.	[Nil]	Payment shall be made on pro rata basis on in all respects as specified, for each structure.
(5) Miscellaneous: stone pitching, protection works, excluding retaining walls / reinforced earth walls etc.	[Nil]	Payment shall be made on pro rata basis on in all respects as specified, for each structure.
(6) Wing walls/return walls upto full height.	[Nil]	Wing walls/return walls upto full height: Payments shall be made on completion of all wing walls/return walls for a bridges as per Weightage given in the table, complete in all respects as specified.
(7) Guide bunds, River Training works etc.	[Nil]	Payment shall be made on pro rata basis on in all respects as specified, for each structure.
(8) Retaining walls / reinforced earth walls etc.		
(a) Panel Casting:	[Nil]	Panel Casting: Unit of measurement is area in Sqm. Payment against casting of panels shall be made on pro rata basis with respect to total area panels required for the structure on completion of a stage i.e. not less than completion of casting of 25% of scope of the RE wall panel of each bridge.
(b) Erection of panel / construction of retaining wall	[Nil]	Erection of panel / construction of retaining wall: Unit of measurement is area in Sqm. Payment shall be made on pro rata basis on completion of a stage i.e. completion of erection of panels / construction of retaining wall complete in all respect for atleast 25% scope of work for each structure.
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.
(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) in case of RUB-	[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

Stage of Payment	Weightage	Payment Procedure
rigid pavement under RUB including drainage facility 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)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.
(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 bearing)	[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 (a) in case of ROB-wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	[Nil]	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/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 Elevated Section/ Flyovers/Grade Separators		

Stage of Payment	Weightage	Payment Procedure
(1) Foundations	[Nil]	<p>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.</p> <p>In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.</p>
(2) Sub-Structure	[Nil]	<p>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.</p>
(3) Super-Structure (Including bearings)	[Nil]	<p>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</p>
(4) Wearing Coat including expansion joints	[Nil]	<p>Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.</p>
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	<p>Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc. Complete in all respects as specified.</p>
(6) Wing walls/Return walls	[Nil]	<p>Wingwalls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.</p>
(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]	<p>Payment shall be made on pro-rata basis on completion of a stage in all respects as specified</p>
C.2- New Elevated Section/ Flyovers/Grade Separators		
(1) Foundations	[Nil]	<p>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.</p> <p>In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.</p>
(2) Sub-Structure	[Nil]	<p>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.</p>
(3) Super-Structure (Including bearings)	[Nil]	<p>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</p>

Stage of Payment	Weightage	Payment Procedure
		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) 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	Payment shall be made on pro rata basis for completed facilities.
(2) Road side drains	4.95%	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, street lightings etc.		
a. Pavement markings	0.86%	
b. Traffic /Road Sign	1.94%	
c. Road Boundary Stone,5 th km stone and hectometre stone	0.03%	
d. Traffic blinker LED delineator, stud, reflective payment marker, tree reflector etc.	0.28%	
e. Road Furniture (Overhead sign board)	0.19%	Payment shall be made on pro rata basis for completed facilities.

Stage of Payment	Weightage	Payment Procedure
f. Others including toilet blocks and street lighting.	0.98%	Payment shall be made on pro rata basis for completed facilities.
(4) Project Facilities		Payment shall be made on pro rata basis for completed facilities.
a) Bus Bay with Passenger Shelter	0.61%	
b) Truck Lay-byes	[Nil]	
c) Junction (Major & Minor)	0.75%	
d) Rest Area	[Nil]	
e) Diversion Works	[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 5% (five percent) of the total length.
(5) Road Side Plantation	[Nil]	
(6) Repair of Protection Works other than approaches to the bridges, elevated sections/flyover/grade separators and ROBs/ RUBs	[Nil]	
(7) Safety & Traffic Management during const.	[Nil]	
(8) Breast Wall	16.49%	
(9) Toe Wall	[Nil]	
(10) Gabion Structure	44.59%	
(11) Retaining wall	15.55%	
(12) Thrie Metal Beam Crash Barrier	8.00%	
(13) Parapet Wall	[Nil]	
(14) Protection Works	0.17%	
a) Hydroseeding	0.10%	
b) Seeding & Mulching	0.17%	
c) Soil Nailing	4.49%	
d) Bamboo Plantation	0.02%	

1.3.5 Utility Shifting

Procedure for estimating the value of other works done shall be as stated in Table 1.3.5

Table 1.3.5

Stage of Payment	Weightage	Payment Procedure
1	2	3
Electrical Utilities & Public Health Utilities(Water Pipe Line & Sewage Line)		
a) EHT line	100%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rate basis as per its weightage with reference to total cost of

Stage of Payment	Weightage	Payment Procedure
		EHT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is (i) Erection of Poles-20%, (ii) Conductor stringing including laying of cable-30%, (iii) DTR erection (if involved)-15% and (iv) Charging of line including dismantling and site clearance-35% (with DTR) and 50% (without DTR)
b) EHT Crossing		Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 4 crossings.
c) HT/LT line (including transformers if any)		Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of LT / HT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is (i) Erection of Poles-20% (ii) Conductor stringing including laying of cable-30% (iii) DTR erection (if involved) -10% and (iv) Charging of line including dismantling and site clearance-40% (with DTR) and 50% without DTR)
d) HT / LT line crossings		Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 10 crossings.
e) Water Pipe Line	[Nil]	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipe line. Payment shall be made for completed activity. (The average Weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)
f) Water Pipe Line Crossing	[Nil]	Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 8 crossings.
g) Sewage Line	[Nil]	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipe line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)

Stage of Payment	Weightage	Payment Procedure
h) Sewage Line Crossing	[Nil]	Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for completed activity. (The average weightage of major activities in shifting work is laying pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)

Stage of Payment	Weightage	Payment Procedure
1	2	3
Electrical Utilities & Public Health Utilities (Water Pipe Line & Sewage Line) (Excluding taxes and supervision)	100%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rate basis as per its weightage with reference to total cost of EHT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is (i) Erection of Poles-20%, (ii) Conductor stringing including laying of cable-30%, (iii) DTR erection (if involved)-15% and (iv) Charging of line including dismantling and site clearance-35% (with DTR) and 50% (without DTR) and for Water pipe line payment shall be made for completed activity. (The average Weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)

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

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

A minimum list of the drawings of the various components / elements of the Project Highway and project facilities required to be submitted by the Contractors given below:

- a) Drawings of horizontal alignment, vertical profile and detailed cross sections.
- b) Drawings of all Major and Minor Bridges.
- c) Drawings of cross-drainage works.
- d) Drawings of Major intersections.
- e) Drawing of Toll Plaza layout and building.
- f) Drawing of bus-bay and bus shelters.
- g) Drawing of road furniture including traffic signage, marking, safety barriers etc.
- h) Drawing of traffic diversion plan.
- i) Drawing as per instruction of Authority's Engineer.
- j) General arrangement showing area 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 of each Project Milestone, the Contractor shall notify the Authority of such compliance along with necessary particulars thereof.

2. Project Milestone-I

- (i) Project Milestone-I shall occur on the date falling on the **256th** day from the Appointed Date (the "**Project Milestone- I**").
- (ii) Prior to the occurrence of Project Milestone-I, the Contractor shall have commenced construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 10% (ten per cent) of the Contract Price.

3. Project Milestone-II

- (i) Project Milestone-II shall occur on the date falling on the **438th** 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 **621th** 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 **730th day** from the Appointed Date.
- (ii) On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

2. 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 Clause 12.2)

Completion Certificate

1 I, (Name of the Authority’s Engineer), acting as the Authority’s Engineer, under and in accordance with the Agreement dated (the “Agreement”), for [construction of the ****section (km ** to km **) of National Highway No. ***] (the “Project Highway”) on Engineering,Procurement and Construction (EPC) basis through (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

2 It is certified that, in terms of the 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 of20.....

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%

S. No.	Item/Defect/Deficiency	Percentage
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
(d)	Roadside Drains	
(i)	Cleaning and repair of drains	5%
(e)	Road Furniture	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5 th km stones	5%
(f)	Miscellaneous Items	
(i)	Removal of dead animals, broken down/accident 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:

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

Where,

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

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

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

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

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

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

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

Schedule - N

(See Clause 18.1 (i))

Selection of Authority's Engineer

1. Selection of Authority's Engineer

- (i) The provisions of the Model Request for Proposal for Selection of Technical Consultants, issued by the Ministry of Finance in May 2009, or any substitute thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority's Engineer.
- (ii) In the event of termination of the Technical Consultants appointed in accordance with the provisions of Paragraph 1.1, the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of this Schedule-N.

2. Terms of Reference

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

3. Appointment of Government entity as Authority's Engineer

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

Annex – I

(Schedule - N)

Terms of Reference for Authority’s Engineer

1. Scope

- (i) These Terms of Reference (the “**TOR**”) for the Authority’s Engineer are being specified pursuant to the EPC Agreement dated (the “**Agreement**”), which has been 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 - 0

(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)

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