Schedule- A

(See Clause 2.1 and 8.1)

SITE OF THE PROJECT

1 The Site

1.1 Site of the Two-Lane with earthen shoulder Project Highway shall include the land, buildings, Structures and road works as described in **Annex-I** of this Schedule-A.

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

1.3 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 8.2.1 of this Agreement.

1.4 The proposed 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.

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

Annex – I

(Schedule-A)

The Site

1. The Site

The Site of the Two-Lane Project Highway i.e. Nongstoin – Rambrai – Kyrshai Road in the State of Meghalaya, starts at km 0+335(Design Chainage) which is a newly proposed T junction with NH-44E and ends at km 34+039(Design Chainage) near Mawthir town. The land, carriageway width 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 processed) as described below:

S. No	Chainage	Existing ROW (m)	Remark
1	0+335	Nil	
2	0+450	7	
3	1+000	7	
4	2+000	7	
5	3+000	7	
6	4+000	7	
7	5+000	7	
8	6+000	7	
9	7+000	7	
10	8+000	7	
11	9+000	7	
12	10+000	7	
13	11+000	7	
14	12+000	7	
15	13+000	7	
16	14+000	7	
17	15+000	7	
18	16+000	7	
19	17+000	7	
20	18+000	7	
21	19+000	7	
22	20+000	NIL	
23	21+000	NIL	
24	22+000	NIL	
25	23+000	NIL	
26	24+000	NIL	Katcha Road Exits, New Alignment
27	25+000	NIL	
28	26+000	NIL	
29	27+000	NIL	
30	28+000	NIL	
31	29+000	NIL	

S. No	Chainage	Existing ROW (m)	Remark
32	30+000	NIL	
33	31+000	NIL	
34	32+000	NIL	
35	33+000	NIL	
36	34+000	NIL	
37	35+000	NIL	

3. Carriageway

The present carriageway of the Project Highway is a Single Lane. The type of the existing pavement is flexible. Details of carriageway width are given below.

S. No	Start Chainage	End Chainage	Existing Carriageway (m)	Remarks
1	0+335	19+200	4	Single Lane Bituminous Road
2	19+200	30+000	NIL	Katcha Road
3	30+000	35+000	NIL	No Road Exists

4. Major Bridges

The Site includes the following Major Bridges:

S. No.	Chainage (km)	Type of Structure			Span or viaduct		Width of carriage way between kerbs (m)
		Super Structure	Sub Structure	Foundation	No. of spans	Length of spans	
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)
Nil				

7. a) Minor bridges

The Site includes the following minor bridges:

S. No	Chainage	Type of Structure			Span or viaduct		Width of carriage way between kerbs (m)
		Super Structure	Sub Structure	Foundation	No. of spans	Length of spans	
1	6+755	Timber decking	Cement concrete	Open	1	1x12	4.3
2	7+925	Steel Girder with Timber Decking	Cement concrete	Open	1	1x6.00	3.8
3	13+122	Steel Girder with RCC Decking	Cement concrete	Open	1	1x11.75	3.6
4	16+420	Steel Girder with Timber Decking	Cement concrete	Open	1	1x9.3	3.2
5	19+910	Steel Girder with RCC	Cement concrete	Open	1	1x36.20	3.9

b) Causeways

The Site includes the following causeways:

Chainage (km)	Existing Type	Existing Size/Span(m)
NIL		

FCW: Flush Causeway

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Chainage (km)	Remark
Nil		

9. Underpasses (vehicular, non vehicular)

The Site includes the following underpasses:

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

10. Culverts

The Site has the following culverts:

Sl. No	Chainage	Type of Existing Culvert	Existing Span Arrangement	Existing Span Width (m)
1	450	HP	1	0.9
2	570	RCC Slab	1	0.45
3	815	Wooden	1	5
4	1135	RCC Slab	1	0.6
5	1357	Stone Slab	1	0.5
6	1577	RCC Slab	1	0.5
7	1635	RCC Slab	1	1
8	1790	Stone Slab	1	1
9	1845	Stone Slab	1	0.6
10	1920	HP	1	0.9
11	1960	RCC Slab	1	1
12	2300	Stone Slab	1	1
13	2370	Stone Slab	1	0.6
14	2610	HP	1	0.9
15	2780	RCC Slab	1	1
16	2840	Stone Slab	1	0.6
17	2910	Stone Slab	1	0.6
18	3130	HP	1	0.9
19	3560	Stone Slab	1	0.6
20	3650	Stone Slab	1	0.6
21	4070	Stone Slab	1	0.6
22	4158	Choked		
23	4230	Stone Slab	1	0.6
24	4290	Choked		
25	4350	Stone Slab	1	0.6
26	4580	Stone Slab	1	0.6
27	5280	Stone Slab	1	0.6
28	5680	Stone Slab	1	0.6
29	5820	Stone Slab	1	0.6

Sl. No	Chainage	Type of Existing Culvert	Existing Span Arrangement	Existing Span Width (m)
30	5915	Stone Slab	1	0.6
31	6020	Stone Slab	1	0.6
32	6100	Stone Slab	1	0.6
33	6660	Stone Slab	1	1
34	6710	Stone Slab	1	1
35	6923	Stone Slab	1	1
36	6960	Stone Slab	1	1
37	7090	Stone Slab	1	1
38	7160	Stone Slab	1	0.6
39	7272	Stone Slab	1	0.6
40	7310	Stone Slab	1	0.6
41	7360	Stone Slab	1	0.6
42	7460	Stone Slab	1	0.6
43	7505	Stone Slab	1	0.6
44	7620	Stone Slab	1	0.6
45	7763	Stone Slab	1	0.6
46	8050	Stone Slab	1	0.6
47	8288	Stone Slab	1	0.6
48	8430	Stone Slab	1	0.6
49	8545	Stone Slab	1	1
50	8760	Stone Slab	1	1
51	8820	Stone Slab	1	1
52	9012	Stone Slab	1	0.9
53	9188	Stone Slab	1	1
54	9305	Stone Slab	1	0.6
55	9487	Stone Slab	1	0.6
56	9635	Stone Slab	1	0.6
57	9775	Stone Slab	1	1
58	9845	Stone Slab	1	1
59	9975	Stone Slab	1	0.6
60	10090	Stone Slab	1	0.6
61	10163	Stone Slab	1	0.6
62	10200	Stone Slab	1	0.6
63	10230	HP	1	0.9
64	10272	HP	1	0.9
65	10822	HP	1	0.9
66	10900	Stone Slab	1	0.6
67	10978	Stone Slab	1	0.6
68	11152	Stone Slab	1	0.6

Sl. No	Chainage	Type of Existing Culvert	Existing Span Arrangement	Existing Span Width (m)
69	11820	Stone Slab	1	1
70	12063	Stone Slab	1	0.6
71	12210	Stone Slab	1	0.6
72	12398	Stone Slab	1	1
73	12535	Stone Slab	1	1
74	12821	Stone Slab	1	1
75	12920	Choked		
76	13055	Stone Slab	1	0.6
77	13208	Stone Slab	1	0.6
78	13275	Stone Slab	1	0.6
79	13470	Wooden	1	4.1
80	13583	Wooden	1	0.3
81	13720	Stone Slab	1	0.6
82	13832	Choked		
83	13875	Stone Slab	1	1
84	14045	Stone Slab	1	0.6
85	14110	Stone Slab	1	0.6
86	14235	Stone Slab	1	0.6
87	14380	Stone Slab	1	0.6
88	14595	Stone Slab	1	0.6
89	14810	Stone Slab	1	0.6
90	14870	HP	1	0.9
91	15465	Stone Slab	1	0.6
92	15575	Stone Slab	1	0.6
93	15610	Stone Slab	1	0.6
94	15775	HP	1	0.9
95	15870	Stone Slab	1	0.6
96	16015	Stone Slab	1	0.6
97	16080	Stone Slab	1	0.6
98	16163	Stone Slab	1	0.6
99	16200	Stone Slab	1	0.6
100	16315	Stone Slab	1	0.6
101	16530	Stone Slab	1	0.6
102	16905	Stone Slab	1	0.6
103	17000	HP	1	0.9
104	17833	HP	1	0.9
105	17880	Stone Slab	1	1.5
106	17942	Stone Slab	1	1.5
107	17960	Stone Slab	1	1

Sl. No	Chainage	Type of Existing Culvert	Existing Span Arrangement	Existing Span Width (m)
108	18020	HP	1	0.9
109	18100	Stone Slab	1	0.6
110	18347	Stone Slab	1	0.6
111	18500	Stone Slab	1	0.6
112	18680	Stone Slab	1	0.6
113	18763	Stone Slab	1	0.6
114	18900	Stone Slab + HP	2	1.5
115	19125	HP	2	0.9
116	19560	Stone Slab	1	0.6
117	19655	Stone Slab	1	0.6
118	19705	Stone Slab	1	0.6
119	20010	Stone Slab	1	0.6
120	20060	Stone Slab	1	0.6
121	20220	Stone Slab	1	0.6
122	20305	Stone Slab	1	1
123	20410	Stone Slab	1	1
124	20600	Stone Slab	1	1
125	20660	Stone Slab	1	0.5
126	20688	Stone Slab	1	0.5
127	20708	Stone Slab	1	0.5
128	20812	Stone Slab	1	0.5
129	20880	Stone Slab	1	1
130	20965	Stone Slab	1	0.5
131	21085	Stone Slab	1	0.5
132	21175	Stone Slab	1	1
133	21390	Stone Slab	1	2

11. Bus Bays

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

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

12. Truck Lay byes

The details of truck lay byes are as follows:

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

13. Road side drains

The details of roadside drains are as follows:

S. No.	Chainage (km)		Type	
	From	To	Masonry/cc (Pucca)	Earthen (Kutcha)
Nil				

14. Major junctions

The details of major junctions are as follows:

S. No.	Location	At grade	Separated	Category of Cross Road				Remarks
				NH	SH	MDR	Others	
1	0+000	4 Legged		NH 44E				Bypassed Shillong-Nongstoin - Tura
2	5+600	3 Legged		NH 44E Bypass				

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

15. Minor junctions

The details of the minor junctions are as follows:

Sl No	Existing Chainage	Type	Cross Road
1	0+800	T	Church Road
2	1+223	T	Village Road
3	1+322	T	Village Road
4	2+070	T	Village Road
5	2+200	T	Village Road
6	2+335	T	Village Road
7	3+270	T	Village Road
8	4+300	T	Village Road
9	5+600	T	NH Bypass Shillong – Nongstoin – Tura Road
10	8+600	T	Village Road
11	8+850	T	Village Road
12	8+900	⊥	Village Road
13	9+200	T	Village Road
14	9+350	T	Village Road
15	10+300	T	Village Road

Sl No	Existing Chainage	Type	Cross Road
16	10+800	T	Village Road
17	14+300	T	Village Road
18	16+000	T	Village Road
19	16+900	T	Village Road
20	17+140	T	Village Road
21	17+350	T	Village Road
22	17+670	T	Nongstoin Rambrai Road
23	18+250	T	Village Road
24	18+600	T	Rambrai Nongriat Road
25	18+740	T	Village Road
26	18+600	T	Rambrai Nongriat Road
27	19+670	T	Village Road

16. Bypasses

Existing road sections have following bypass-

S. No.	Name of Bypass (town)	Existing Chainage (km)		Length (Km)
		From	To	
	Nil			

17. Detail of any other structures

Nil

Annex- II

(Schedule-A)

Dates for providing Right of Way

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

Sl.No.	Location stretch		Length(m)	Width(m)	Date of providing ROW
	From(km)	To(km)			
1	0+335	34+039*	33.704	16 m to 30 m	Minimum 90% on Appointed Date and remaining within 150 days of 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, FRL 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 in soft/hard copy based on site/design requirement.

ii) Typical Road marking and Signages are provided in Annex III. The contractor shall prepare the detailed traffic signage plan based on site/ design requirement as per IRC 67-2012 and other relevant specification/ IRC codes/ Manual consultation with Authority Engineer.

Annex – IV

(Schedule-A)

Environment Clearances

The following environment clearances have been obtained:

- Environmental clearance is not required as per new notification of MoEF dated 22/08/2013.
- The muck dumping sites shall be identified by the EPC contractor in consultation with Authority Engineer and forest department for dumping of muck, in addition to the applicable permits as stated in Schedule F

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 Two Lane

Two lanes shall include reconstruction of existing single/double lane along 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 Two/four-Laning with earthen shoulder

1. Widening of the existing highway

1.1 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. **Chainage equation has been applied on the stretch as per the table given in Appendix B1**

1.2 Width of carriageway

1.2.1 Two-Laning with earthen shoulder shall be undertaken. The paved carriageway including earthen shoulder shall be 12(7+2.5*2) m wide in accordance with the typical cross-section drawings.

1.2.2 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

2.1 General

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

2.2 Design speed

In general, the Project Highway has been designed for a speed 50 kmph for mountainous terrain but at few locations, 30kmph speed has been provided due to unavoidable circumstances such as steep terrain & sharp curves in accordance with table 6.1 of Hill Road Manual (IRC SP:48-1998)

2.3 Improvement of the existing road geometrics

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

S.No.	Stretch (From km to km)	Type of Deficiency	Remarks
NIL			

2.4 Right of Way

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

2.5 Type of shoulders

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

S. No.	Stretch		Length(km)	Fully paved shoulders/ footpaths
	From (km)	To (km)		
1	0+335	2+300	1.965	Drain cum footpath.
2	17+010	18+020	1.010	

The area between paved carriageway and drain in built-up area will be covered with paver block as per TCS-V.

b) In open country, earthen shoulder of 2.5m width (both sides) shall be provided.

(c) Design and specifications of earthen shoulders and granular material shall conform to the requirements specified in paragraphs 5.11 of the Manual.

2.6 Lateral and vertical clearances at underpasses

2.6.1 Lateral and vertical clearances at underpasses and provision of guardrails/crash barriers shall be as per the paragraph 2.10 of the Manual.

2.6.2 Lateral clearance: The width of the opening at the underpasses shall be as follows:

S. No.	Location(chainage) (km)	Span/opening(m)	Remarks
NIL			

2.7 Lateral and vertical clearance at overpasses

2.7.1 Lateral and vertical clearances at over passes shall be as per paragraph 2.11 of the Manual.

2.7.2 Lateral clearance: The width of the opening at the overpasses shall be as follows:

S. No.	Location(chainage) (km)	Span/opening(m)	Remarks
NIL			

2.8 Service/Slip roads

Service/Slip roads shall be constructed at the locations and for the lengths indicated below as per paragraph 2.13 of manual:

S. No.	Location of slip road (km)		Right hand side (RHS)/Left hand side (LHS)/ or Both sides	Length (km) of service road
	From	To		
NIL				

2.9 Grade separated structures

2.9.1 Grade separated structures shall be provided as per paragraph 2.14.1 of the Manual. The requisite particulars are given below:

S. No.	Location of structure (km)	Length (m)	Number and length of spans*	Approach gradient	Remarks (if any)
NIL					

2.9.2 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:

S. No.	Location (km)	Type of structure /Length (m)	Cross road at			Remarks, if any
			Existing Level	Raised Level	Lowered Level	
NIL						

2.10 Cattle and pedestrian under pass / over pass

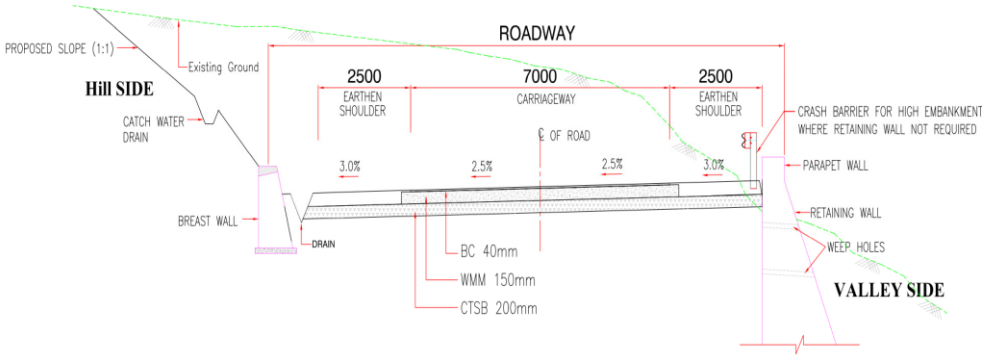
Cattle and pedestrian underpass/ overpass shall be constructed as follows:

S. No.	Location (km)	Type of crossing
NIL		

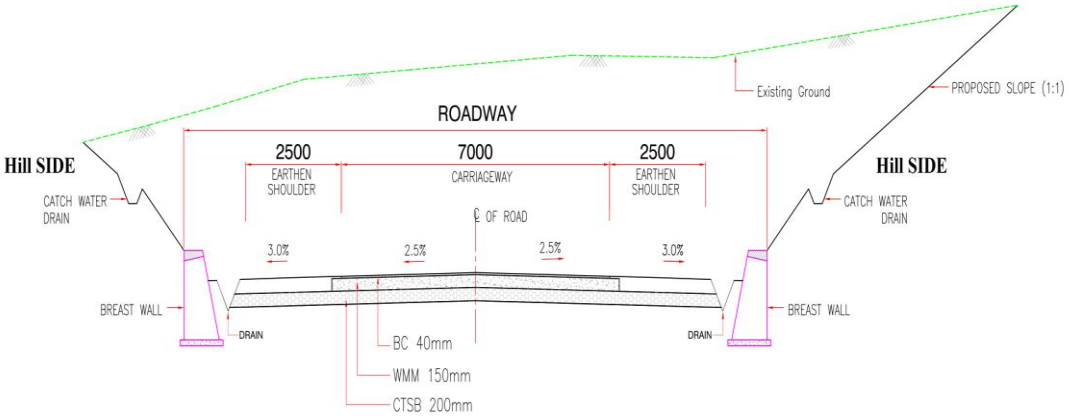
2.11 Typical cross-sections of the Project Highway

Proposed Typical Cross-section				
Sl No	Design Chainage (km)		TCS Type	Length
	From	To		
1	0+335	2+300	5	1965
2	2+300	2+370	2	70
3	2+370	2+430	3	60
4	2+430	2+510	3	80
5	2+510	2+900	2	390
6	2+900	3+550	3	650
7	3+550	3+640	2	90
8	3+640	4+800	3	1160
9	4+800	4+900	4	100
10	4+900	5+100	2	200
11	5+100	5+410	4	310
12	5+410	6+310	3	900
13	6+310	6+580	2	270
14	6+580	6+880	3	300
15	6+880	6+930	2	50
16	6+930	7+420	3	490
17	7+420	7+680	2	260
18	7+680	7+700	3	20
19	7+700	8+300	2	600
20	8+300	8+537	3	237
21	8+537	8+927	2	390
22	8+927	9+700	3	773
23	9+700	9+750	2	50
24	9+750	10+500	3	750
25	10+500	10+650	2	150
26	10+650	10+790	3	140
27	10+790	10+830	2	40
28	10+830	11+750	3	920
29	11+750	12+100	2	350
30	12+100	12+350	3	250
31	12+350	12+450	2	100
32	12+450	12+680	3	230
33	12+680	12+790	2	110
34	12+790	14+950	3	2160
35	14+950	15+200	2	250
36	15+200	16+790	3	1590
37	16+790	16+950	2	160
38	16+950	17+010	3	60
39	17+010	18+020	5	1010
40	18+020	18+120	2	100
41	18+120	18+410	3	290
42	18+410	18+690	2	280

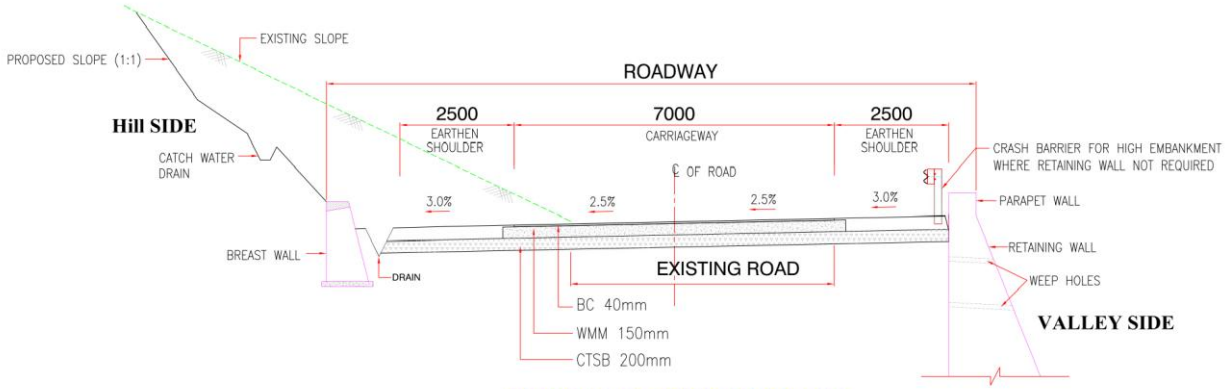
Proposed Typical Cross-section				
Sl No	Design Chainage (km)		TCS Type	Length
	From	To		
43	18+690	19+630	3	940
44	19+630	19+700	2	70
45	19+700	20+700	3	1000
46	20+700	22+780	1	2080
47	22+780	22+820	2	40
48	22+820	23+050	1	230
49	23+050	23+450	2	400
50	23+450	23+880	1	430
51	23+880	24+110	2	230
52	24+110	27+100	1	2990
53	27+100	27+250	2	150
54	27+250	28+200	1	950
55	28+200	28+350	2	150
56	28+350	30+250	1	1900
57	30+250	30+350	2	100
58	30+350	34+039	1	3689



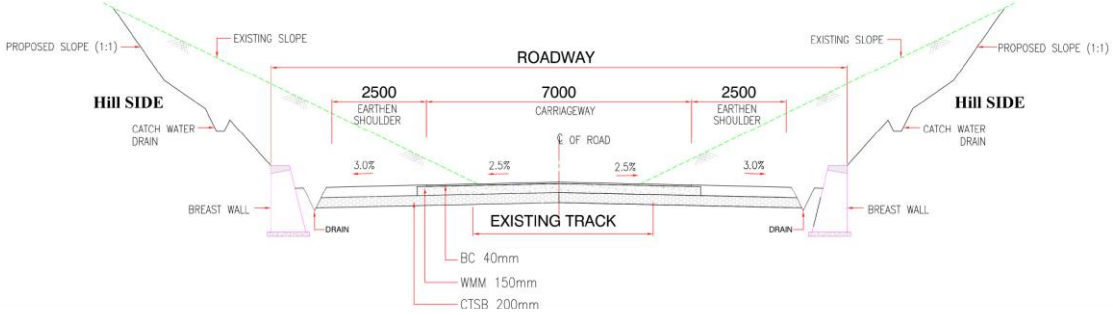
TYPICAL CROSS SECTION-I
2-Lane Carriageway for new construction
(One side Hill)



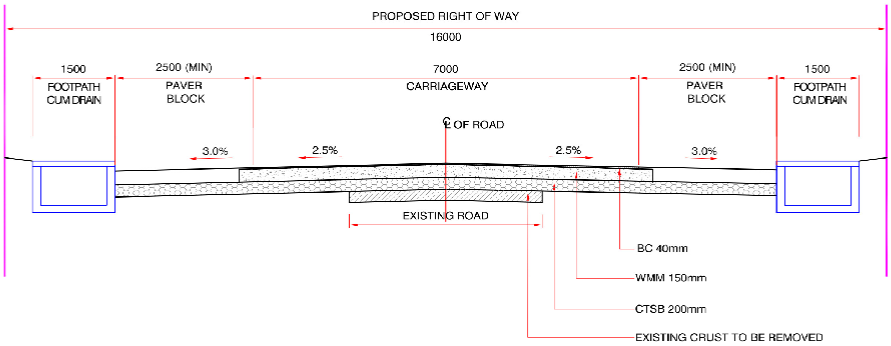
TYPICAL CROSS SECTION-II
2-Lane Carriageway for new construction
(Box cut Section)



TYPICAL CROSS SECTION-III
2-Lane Carriageway for Widening
(One side Hill)



TYPICAL CROSS SECTION-IV
2-Lane Carriageway for Widening
(Both side Hill)



TYPICAL CROSS SECTION-V :- 2 LANE CARRIAGEWAY
FOR BUILT-UP SECTION

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.

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

(a) At-grade intersections

(i) Major Junction

S. No.	Location of intersection (km)	Type of intersection	Other features
1	0+335	T	intersection with Nongstoin – Riangdo Road (starting point of alignment)
2	0+450	Y	Cross road leading to Nongstoin town
3	5+400	+	Intersection with NH-44E bypass

(ii)Minor Junctions

S. No	Location of intersection (km)	Type of intersection	Other Features
1	0+800	T	
2	4+100	T	
3	8+610	T	
4	8+800	T	
5	10+330	T	
6	15+950	T	
7	17+250	T	

S. No	Location of intersection (km)	Type of intersection	Other Features
8	17+740	T	
9	18+650	T	

Note: All other junctions, if any, identified during the execution of the work shall be developed as per the extant guidelines and shall not be treated as change in scope of work.

At the locations of geometric improvements, the connectivity of built-up area, along existing road, with the proposed highway shall be provided. All such locations shall be finalized as per site requirement in consultation with Authority Engineer and it will not be treated as change in scope of work.

(b) Grade separated intersection with/without ramps

S. No.	Location (km)	Salient Features	Minimum Length of viaduct to be provided	Road to be carried over/under the structures
Nil				

4. Road embankment and cut section

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

4.2 ***Raising of the existing road***

The existing road shall be raised as per plan and profile and site requirements. Existing Pavement is raised as follows:

From(km)	To(km)	Length(m)	Avg Raising(m)
0+340	0+720	380	1.16
6+320	6+660	340	2.05
7+000	7+600	600	0.522
8+680	8+780	100	1.05
9+740	10+060	320	1.17
11+820	11+880	60	3.641
12+280	12+360	80	0.915
15+440	15+620	180	1.16
16+300	16+440	140	1.9
18+520	18+560	40	2.67
18+780	19+300	520	1.25
20+040	20+160	120	0.85

5. Pavement design

5.1 Pavement design shall be carried out in accordance with Section 5 of the Manual.

5.2 Type of pavement

Type of pavement shall be flexible.

5.3 Design requirements

Pavement design shall be as per Section 5 of IRC: SP 73-2018. Design of flexible pavement applies to the new carriageway and widening of existing carriageway. The methodologies recommended in IRC: 37-2018 shall be adopted.

5.3.1 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 15 years. Stage construction shall not be permitted.

5.3.2 Design Traffic

Notwithstanding anything to contrary contained in this agreement or the Manual, the Contractor shall design the pavement for design traffic of 20 million standard axles for granular layers and 10 million standard axles for bituminous layer. In case the traffic is more than 10 MSA on Main Carriageway at the time of Traffic survey done by EPC contractor, then the higher traffic will be adopted for design. However, in any case, the proposed pavement design at Main Carriageway shall not be less than that given below: -
Main new Carriageway (flexible):-
The minimum thickness of various layers shall be as given as: -
BC = 40 mm WMM =150 mm CTSB = 200 mm.

5.4 Reconstruction of stretches

The following stretches of the existing road shall be reconstructed. These shall be designed as new pavement.

S. No	From	To	Length (m)	TCS
1	0+335	20+304	20304	Refer Section 4.2 of the Schedule B

6. Roadside drainage

An effective drainage system for drainage of road shall be designed as per stipulations of IRC SP: 42-2014.

V shaped unlined drain will be adopted in the hard rock hill sections and V shaped lined drain will be provided in soil and soft rock sections. The superstructure of bridges shall be drained with suitable drainage spouts.

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per section 6 of the Manual.

7 DESIGN OF STRUCTURES

7.1 General

7.1.1 All bridges, culverts and structures shall be designed and constructed in accordance with section 7 of the Manual and shall conform to the cross-sectional features and other details specified therein.

7.1.2 Width of the carriageway of new bridges and structures shall be as follows**:**

S. No.	Design Chainage	Foundation	Sub-structure	Superstructure	Width of Carriageway (m)	Total Deck width (m)	Span Arrangement
1	0+410	Open	RCC Abutment	RCC Girder	11	16	1x24
2	18+890	Open	RCC Pier	RCC Girder	11	12	3x14

7.1.3 The following structures shall be provided with footpaths:

S. No.	Location(Km)	*Remarks
1	0+410	Bridge in habitation

7.1.4 All bridges shall be high-level bridges.

7.1.5 The following structures shall be designed to carry utility services specified in table below:

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

7.1.6 Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the typical cross-sections given in section 7 of the Manual.

7.2 Culverts

7.2.1 Overall width of all culverts shall be equal to the roadway width of the approaches.

7.2.2 Reconstruction of existing culverts:

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

Sl. No	Culvert Location(Design Chainage)	Proposed Span Arrangement	Proposed Span Width (m)	*Remarks
1	0+445	1	1.5	RCC Box
2	0+563	1	2	RCC Box
3	0+810	2	3	RCC Box
4	1+100	1	2	RCC Box
5	1+338	1	2	RCC Box
6	1+535	1	2	RCC Box
7	1+590	1	2	RCC Box
8	1+745	1	2	RCC Box
9	1+800	1	1.5	RCC Box
10	1+867	1	1.5	RCC Box
11	1+905	1	2	RCC Box
12	2+200	1	2	RCC Box
13	2+270	1	1.5	RCC Box
14	2+485	1	1.5	RCC Box
15	2+650	1	2	RCC Box
16	2+710	1	1.5	RCC Box
17	2+775	1	2	RCC Box
18	2+966	1	1.5	RCC Box
19	3+390	1	1.5	RCC Box
20	3+480	1	1.5	RCC Box
21	3+880	1	2	RCC Box
22	3+965	1	1.5	RCC Box
23	4+035	1	1.5	RCC Box
24	4+095	1	2	RCC Box
25	4+145	1	2	RCC Box
26	4+380	1	1.5	RCC Box
27	5+080	1	1.5	RCC Box
28	5+445	1	1.5	RCC Box
29	5+570	1	2	RCC Box
30	5+660	1	2	RCC Box
31	5+765	1	2	RCC Box
32	5+840	1	2	RCC Box
33	6+390	1	2	RCC Box
34	6+440	1	2	RCC Box

Sl. No	Culvert Location(Design Chainage)	Proposed Span Arrangement	Proposed Span Width (m)	*Remarks
35	6+640	1	2	RCC Box
36	6+680	1	2	RCC Box
37	6+810	1	2	RCC Box
38	6+875	1	2	RCC Box
39	6+960	1	1.5	RCC Box
40	7+000	1	1.5	RCC Box
41	7+055	1	1.5	RCC Box
42	7+155	1	2	RCC Box
43	7+200	1	1.5	RCC Box
44	7+310	1	1.5	RCC Box
45	7+685	1	1.5	RCC Box
46	8+055	1	1.5	RCC Box
47	8+390	1	2	RCC Box
48	8+635	1	2	RCC Box
49	8+925	1	1.5	RCC Box
50	9+100	1	1.5	RCC Box
51	9+240	1	1.5	RCC Box
52	9+380	1	2	RCC Box
53	9+450	1	2	RCC Box
54	9+570	1	1.5	RCC Box
55	9+735	1	2	RCC Box
56	9+770	1	1.5	RCC Box
57	9+800	1	2	RCC Box
58	10+360	1	1.5	RCC Box
59	10+655	1	2	RCC Box
60	11+245	1	2	RCC Box
61	11+630	1	1.5	RCC Box
62	11+735	1	2	RCC Box
63	11+845	1	2	RCC Box
64	12+065	1	2	RCC Box
65	12+165	1	1.5	RCC Box
66	12+495	1	2	RCC Box
67	12+620	2	3	RCC Box
68	12+870	1	1.5	RCC Box
69	13+030	1	2	RCC Box
70	13+195	1	1.5	RCC Box
71	13+385	1	2	RCC Box
72	13+525	1	1.5	RCC Box
73	14+010	1	1.5	RCC Box
74	14+590	1	1.5	RCC Box
75	14+690	1	1.5	RCC Box
76	14+860	1	1.5	RCC Box

Sl. No	Culvert Location(Design Chainage)	Proposed Span Arrangement	Proposed Span Width (m)	*Remarks
77	15+090	1	1.5	RCC Box
78	15+240	1	2	RCC Box
79	15+390	1	1.5	RCC Box
80	15+605	1	2	RCC Box
81	15+975	1	2	RCC Box
82	16+845	1	1.5	RCC Box
83	16+900	1	2	RCC Box
84	16+980	1	1.5	RCC Box
85	17+030	1	1.5	RCC Box
86	17+105	1	1.5	RCC Box
87	17+350	1	2	RCC Box
88	17+500	1	2	RCC Box
89	17+680	1	1.5	RCC Box
90	17+760	1	1.5	RCC Box
91	17+885	2	2	RCC Box
92	18+105	1	1.5	RCC Box
93	18+540	1	1.5	RCC Box
94	18+640	1	2	RCC Box
95	18+685	1	2	RCC Box
96	18+995	1	1.5	RCC Box
97	19+040	1	1.5	RCC Box
98	19+195	1	2	RCC Box
99	19+280	1	3	RCC Box
100	19+390	1	2	RCC Box
101	19+555	1	2	RCC Box
102	19+670	1	1.5	RCC Box
103	19+765	1	2	RCC Box
104	19+835	1	1.5	RCC Box
105	19+915	1	2	RCC Box
106	20+035	1	2	RCC Box
107	20+125	1	2	RCC Box
108	20+310	1	2	RCC Box

Note –
i) The proposed locations are minimum. Any change in number (as per site requirement) /length/span/height shall not be treated as change in scope of work.
ii) The culvert location planned as Table above shall be adjusted accordingly to the exact location of cross-water stream or existing culvert located based on the topographic survey performed by the Contractor for the final drawings of the Detailed Design.
iii) Cross road culvert to be provided at the location of Major Junction/ Minor Junctions for proper drainage facilities and utility purposes etc. as per manual and shall not be treated as change of scope.

7.2.3 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 section 7 of the Manual. Repairs and strengthening of existing structures where required shall be carried out.

NIL

7.2.4 Additional Culverts (New Construction)

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

Sl. No	Design Chainage	Proposed Span Arrangement	Proposed Span Width (m)	*Remarks
1	2+335	1	1.5	RCC Box
2	2+600	1	1.5	RCC Box
3	3+610	1	2	RCC Box
4	3+740	1	2	RCC Box
5	4+285	1	1.5	RCC Box
6	5+900	1	1.5	RCC Box
7	6+000	1	1.5	RCC Box
8	6+020	1	1.5	RCC Box
9	6+060	1	1.5	RCC Box
10	6+130	1	2	RCC Box
11	6+210	1	2	RCC Box
12	6+260	1	1.5	RCC Box
13	9+305	1	1.5	RCC Box
14	10+000	1	1.5	RCC Box
15	10+025	1	1.5	RCC Box
16	10+050	1	1.5	RCC Box
17	10+700	1	1.5	RCC Box
18	10+750	1	1.5	RCC Box
19	11+030	1	1.5	RCC Box
20	11+140	1	1.5	RCC Box
21	11+490	1	1.5	RCC Box
22	12+525	1	1.5	RCC Box
23	12+930	1	1.5	RCC Box
24	13+290	1	1.5	RCC Box
25	16+340	1	2	RCC Box
26	16+605	1	2	RCC Box
27	16+720	1	2	RCC Box
28	20+410	1	2	RCC Box
29	20+670	1	2	RCC Box
30	20+960	1	2	RCC Box
31	21+300	1	1.5	RCC Box
32	21+485	1	2	RCC Box
33	21+685	1	2	RCC Box
34	21+960	1	2	RCC Box
35	22+195	1	3	RCC Box
36	22+475	1	2	RCC Box
37	22+715	1	2	RCC Box
38	22+885	1	3	RCC Box
39	23+070	2	3	RCC Box

Sl. No	Design Chainage	Proposed Span Arrangement	Proposed Span Width (m)	*Remarks
40	23+530	2	3	RCC Box
41	23+655	1	2	RCC Box
42	23+830	1	2	RCC Box
43	24+225	1	2	RCC Box
44	24+365	1	2	RCC Box
45	24+640	1	2	RCC Box
46	25+050	1	2	RCC Box
47	25+345	1	2	RCC Box
48	25+565	1	2	RCC Box
49	25+745	1	2	RCC Box
50	26+105	1	2	RCC Box
51	26+350	1	2	RCC Box
52	26+530	1	2	RCC Box
53	26+830	1	2	RCC Box
54	26+970	1	2	RCC Box
55	27+400	1	2	RCC Box
56	27+790	1	2	RCC Box
57	27+900	1	3	RCC Box
58	28+130	1	2	RCC Box
59	28+450	1	2	RCC Box
60	28+685	1	2	RCC Box
61	28+920	1	2	RCC Box
62	28+955	1	2	RCC Box
63	29+215	1	2	RCC Box
64	29+510	1	2	RCC Box
65	29+755	1	2	RCC Box
66	29+965	1	2	RCC Box
67	30+235	1	3	RCC Box
68	30+975	2	2	RCC Box
69	31+300	1	2	RCC Box
70	31+460	1	2	RCC Box
71	31+660	1	1.5	RCC Box
72	31+925	1	2	RCC Box
73	32+070	1	2	RCC Box
74	32+385	1	1.5	RCC Box
75	32+655	1	2	RCC Box
76	32+915	1	1.5	RCC Box
77	33+225	1	3	RCC Box
78	33+425	1	2	RCC Box
79	33+655	1	3	RCC Box
80	33+785	1	2	RCC Box

Note –

i) The proposed locations are minimum. Any change in number (as per site requirement) /length/span/height shall not be treated as change in scope of work.

ii) The culvert location planned as Table above shall be adjusted accordingly to the exact location of cross-water stream or existing culvert located based on the topographic survey performed by the Contractor for the final drawings of the Detailed Design.

iii) Cross road culvert to be provided at the location of Major Junction/ Minor Junctions for proper drainage facilities and utility purposes etc. as per manual and shall not be treated as change of scope.

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

Nil

7.2.5 Floor protection works shall be as specified in the relevant IRC Codes and Specifications.

7.3 Bridges

7.3.1 Existing bridges to be re-constructed/widened

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

(ii) Structures as per paragraph 7.3.2 of manual:

S. No.	Design Chainage (Km)	Existing Chainage (km)	Salient details of Proposed bridge						Remarks
			Foundation	Sub-structure	Superstructure	Deck Width	No. of spans	Length of spans	
1	6+500	6+755	Open	RCC Abutment	RCC Girder	12	1	14	Minor Bridge
2	7+600	7+925	Open	RCC Abutment	RCC Slab	12	1	8	Minor Bridge
3	12+340	13+122	Open	RCC Abutment	RCC Girder	12	1	14	Minor Bridge
4	15+495	16+420	Open	RCC Abutment	RCC Slab	12	1	10	Minor Bridge

*Attach GAD

(ii) The following narrow bridges shall be widened:

S. No.	Chainage (km)	Existing width (m)	Extent of widening (m)	Cross section at deck level for widening
Nil				

@ Attach cross-section

7.3.2 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.

S. No.	Design Chainage	Foundation	Sub-structure	Superstructure	Width of Carriageway (m)	Total Deck width (m)	Span Arrangement
1	0+410	Open	RCC Abutment	RCC Girder	11	16	1x24
2	18+890	Open	RCC Pier	RCC Girder	11	12	3x14

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

S. No.	Chainage (km)	Remarks
NIL		

7.3.4 Repairs/replacements of railing/parapet of the existing bridges shall be undertaken as follows:

S. No.	Chainage (km)	Remarks
NIL		

7.3.5 Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in paragraph 7.20 of the Manual.

7.3.6 Structures in marine environment

Nil.

7.4 Rail-road bridges

7.4.1 Design, construction and detailing of ROB/RUB shall be as specified in section 7 of the Manual.

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

S. No.	Chainage (km)	Length of bridge (m)
NIL		

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

S. No.	Chainage (km)	Length of bridge (m)	Remarks
NIL			

7.5 Grade separated structures

S. No.	Chainage (km)	Number and length of spans*	Remarks (if any)
NIL			

7.6 Repairs and strengthening of structures

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

A. Bridges

S. No.	Chainage (km)	Nature and extent of repairs /strengthening to be carried out
NIL		

- The proposed treatment is tentative. Any other work required for repair and rehabilitation of bridge shall not be treated as change of scope.

B. ROB / RUB

S. No.	Chainage (km)	Nature and extent of repairs/strengthening to be carried out
Nil		

C. Overpasses/Underpasses and other structures

S. No.	Chainage (km)	Nature and extent of repairs/strengthening to be carried out
NIL		

7.7 List of Major Bridges and Structure

S. No.	Chainage (km)
NIL	

8. TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

8.1 Traffic control devices and road safety works shall be provided in accordance with Section 9 of the Manual.

8.2 Specifications of the reflective sheeting

Retro reflective sheeting should be of high intensity grade with micro prismatic retro reflective element type – 9 as per IRC specification shall be provided.

9. ROADSIDE FURNITURES

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

9.2 Overhead traffic signs: 3 Nos

9.3 Noise Barrier – Nil

10. COMPULSORY AFFORESTATION

The number of trees which are required to be planted by the Contractor as compensatory forestation should be as per environmental and forest clearance/ State Govt.

11. LOCATION OF RETAINING WALL AND BREAST WALL

Retaining wall are to be provided on the outer edges of the roadway where the valley/river/nala/ edge exist. The minimum length of the retaining wall to be provided is as per the table below

Location(Km)	Length (m)	Average Height (m)
5+660	20	2
5+740	20	2
5+760	20	2
5+840	20	4
18+880	20	2
18+900	20	2
Approaches of culverts (appx.)*	1000	4
Total length (m)	**1120**	

Breast walls are to be provided as per the table below at the hill side to stabilize the disturbed hill slope due to cutting. Minimum length of the breast wall to be provided is as per the table below

Chainage	Side	Length	Total length(m)	Average Height(m)
2680	2	20	40	3
2900	2	20	40	3
3060	1	20	20	3
3180	1	20	20	3
3320	1	60	60	3
6080	1	20	20	5
6600	1	20	20	3
7500	2	20	40	3
7540	2	20	40	3
7780	2	20	40	3
7800	2	20	40	3
8460	1	20	20	3
8480	1	20	20	3
8500	1	20	20	3
8520	1	20	20	3
9300	1	20	20	5
9320	1	20	20	5
9540	1	20	20	4
9600	1	20	20	5
9620	1	20	20	5
10520	2	20	40	5
10540	2	20	40	5
10560	2	20	40	5
10580	2	20	40	5
11520	1	20	20	3
11540	1	20	20	3
11560	1	20	20	3
11660	1	20	20	6
11680	1	20	20	6
11700	1	20	20	6
12200	1	20	20	4
12220	1	20	20	4
12520	1	20	20	5
12540	1	20	20	5
12560	1	20	20	5
12960	1	20	20	3
13080	1	20	20	6
13100	1	20	20	6
14140	1	20	20	3
14160	1	20	20	3
14180	1	20	20	3
14780	1	20	20	6

Chainage	Side	Length	Total length(m)	Average Height(m)
2680	2	20	40	3
2900	2	20	40	3
3060	1	20	20	3
3180	1	20	20	3
3320	1	60	60	3
14800	1	20	20	6
14820	1	20	20	6
16580	1	20	20	4
16600	1	20	20	4
16620	1	20	20	4
19580	1	20	20	3
22500	1	20	20	5
22520	1	20	20	5
22540	1	20	20	5
24560	1	20	20	4
24580	1	20	20	4
24600	1	20	20	4
26800	1	20	20	6
26820	1	20	20	6
26840	1	20	20	6
26860	1	20	20	6
26880	1	20	20	6
26900	1	20	20	6
26920	1	20	20	6
26940	1	20	20	6
26960	1	20	20	6
27260	1	20	20	3
27280	1	20	20	3
27920	1	20	20	6
27940	1	20	20	6
27960	1	20	20	6
27980	1	20	20	6
28000	1	20	20	6
28020	1	20	20	6
28040	1	20	20	6
28060	1	20	20	6
Total(m)		**1700**		

Note: Length of retaining wall and breast wall is minimum and additional length shall be provided by the contractor as per site requirement and shall not be treated as change of scope. Location and height of retaining/breast wall may be finalized as per site requirement and in consultation with Authority Engineer and increase in height, if required, shall not be treated as Change of Scope.

12. SPECIAL REQUIREMENTS FOR HILL

ROADS Nil

13. CHANGE OF SCOPE

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

(Schedule B-1)

Nongstoin-Rambrai-Kyrshai Road from km 0.335 to km 34.039 (Package-I) under SARDP-NE "Phase-A" in the state of Meghalaya.

Sr. No	Type of Utility	Unit	Quantity	Location/Stretch LHS/RHS
A	Electrical Utilities			
A1	**Electrical Poles**	Nos.		
(i)	S.T Pole 14.5m H/D (Galvanised)	Nos.	5.00	
(ii)	S.T Pole 12 m H/D (Galvanised)	Nos.	9.00	
(iii)	S.T Pole 12 m N/D (Galvanised)	Nos.	125.00	
(iv)	S.T Pole 9.5 m (Galvanised)	Nos.	66.00	
(v)	S.T Pole 8 m (Galvanised)	Nos.	80.00	
A2	**Electrical cables**			
i	ACSR Racoon Conductor	kms	22.93	
ii	ACSR Wolf Conductor	kms	0.63	
ii	ACSR Weasel Conductor	kms	47.58	
iv	GI Stay wire	Kgs	1540.00	
A3	**Re-construction/shifting of 11/0.44 KV, 63KVA Sub-station**	**Nos.**	**2.00**	
A4	**Re-construction/shifting of 11/0.44 KV, 25KVA Sub-station**	**Nos.**	**1.00**	
B	**Water/Sewage pipeline**			
B1	**Water supply pipeline (Public Health Engineering Dept., PHED)**			
	150 mm GI Pipe dia nominal bore	meters	900.00	
a	**Supplyng fitting fixing and Laying of G.I. pipes ln trenches including carriage of pipes from stock yard to the site within a distance of 8 km. Except socket joints, all fittings required for the work will be paid extra as per current schedule of rates. Trenching and earth filling is also exclusive and shall be paid extra. (Medium quality). (New pipes)**			
(i)	15mm dia nominal bore	meters	241.25	
(ii)	20mm dia nominal bore	meters	153.75	
(iii)	25mm dia nominal bore	meters	152.50	
(iv)	40mm dia nominal bore	meters	357.50	

(v)	50mm dia nominal bore	meters	166.25	
(vi)	65 mm dia nominal bore	meters	447.50	
(vii)	80 mm dia nominal bore	meters	237.50	
(viii)	100 mm dia nominal bore	meters	187.50	
(ix)	150 mm dia nominal bore	meters	188.75	
b	**Labour charge for laying, fitting and fixing of GI Pipe in trenches in line and level with special fitting, fixing & clearing the inside of pipe all complete as directed (old pipes) Relaying of Servicable GI Pipes**			
(i)	15mm dia nominal bore	meters	620.00	
(ii)	20mm dia nominal bore	meters	435.00	
(iii)	25mm dia nominal bore	meters	450.00	
(iv)	40mm dia nominal bore	meters	996.00	
(v)	50mm dia nominal bore	meters	345.00	
(vi)	65 mm dia nominal bore	meters	1755.00	
(vii)	80 mm dia nominal bore	meters	1040.00	
(viii)	100 mm dia nominal bore	meters	640.00	
(ix)	150 mm dia nominal bore	meters	589.00	
C	**Water Pipeline (Water Resource Department, WRD)**			
i	Reconstruction of supporting pillars	Nos.	100.00	
ii	Taking out & refitting of 100 mm dia GI pipes	meters	400.00	
iii	Taking out & refitting of 80 mm dia GI pipes	meters	1000.00	
iv	supply & laying of 2 rows of 150 mm dia GI pipes	meters	600.00	
v	cutting of welded joints	Nos.	168.00	
vi	Re-welding of joints	Nos.	268.00	

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 plazas;

b) roadside furniture;

c) pedestrian facilities;

d) tree plantation;

e) truck lay-bys;

f) bus-bays and bus shelters;

g) rest areas;

2 Description of Project Facilities

Each of the Project Facilities is described below:

a) Toll Plaza:

Toll Plaza shall be designed as per the guidelines prescribed on following locations:-

Sr No	Project Facility	Toll Location (Design Ch.)	Design Requirements	Other Essential Details
NIL				

b) Roadside Furniture

The roadside furniture shall include the provision of the;

i. Traffic Signs

Traffic signs include roadside signs, overhead signs and curb mounted signs along the entire Project Highway as per Section 9.2 of the Manual.

ii. Pavement Markings

Pavement markings shall cover road marking for the entire Project Highway as per Section 9.3 of the Manual.

iii. LED Traffic Blinkers

LED traffic blinker signal shall be provided on entire project length.

iv. Crash barrier

W-beam crash barrier shall be provided along the project highway at the locations as suggested in Manual.

v. Delineators

Delineators for the entire Project Highway at the locations as suggested in relevant IRC Manual shall be provided

vi. Boundary stones

For the entire Project Highway as suggested in Manual.

vii. Hectometer / Kilometer stones

For the entire Project Highway as suggested in Manual.

c) Pedestrian Facilities

The pedestrian facilities shall be provided as per Manual.

d) Tree Plantation

The landscaping and tree plantation shall be provided as per IRC:SP:21-2009.

e) **Truck Lay byes**:

Truck lay byes shall be provided at the following locations:-

S. No.	Design Chainage	Location
NIL		

f) Bus Stops

Bus stops shall be provided at locations given below:

Sl. No.	RHS Design Chainage LHS	
1	0+050	0+100
2	1+180	1+220
3	4+660	4+600
4	9+000	8+750
5	11+450	11+500
6	15+550	15+575
7	17+300	17+350
8	17+750	17+725
9	29+250	29+200

Rest Areas :NIL

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 Laning of Highways published by the Indian Roads Congress – IRC: SP: 73-2018.

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-Lane Highways published by IRC (referred to as "Manual" in this Schedule) and MORTH Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2 Deviations from the Specifications and Standards

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.

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

<table>
<tr><th>S. No.</th><th>Item</th><th colspan="4">Description of Deviation</th><th>Clause reference of IRC: SP: 73-2015</th></tr>
<tr><td rowspan="16">1</td><td rowspan="16">Minimum desirable radius</td><td>S. No.</td><td>Design chainage (km)</td><td>Radius</td><td>Design Speed</td><td rowspan="16">Clause 2.9.4 Minimum desirable radius of horizontal curves minimum 150 m in mountaneous and steep terrain.</td></tr>
<tr><td>1</td><td>5458.052</td><td>60</td><td>40</td></tr>
<tr><td>2</td><td>5774.566</td><td>60</td><td>40</td></tr>
<tr><td>3</td><td>5880.811</td><td>60</td><td>40</td></tr>
<tr><td>4</td><td>6159.445</td><td>100</td><td>50</td></tr>
<tr><td>5</td><td>6243.641</td><td>100</td><td>50</td></tr>
<tr><td>6</td><td>6370.693</td><td>50</td><td>35</td></tr>
<tr><td>7</td><td>6475.294</td><td>50</td><td>35</td></tr>
<tr><td>8</td><td>6558.796</td><td>60</td><td>40</td></tr>
<tr><td>9</td><td>6620.966</td><td>60</td><td>40</td></tr>
<tr><td>10</td><td>6675.638</td><td>70</td><td>40</td></tr>
<tr><td>11</td><td>6896.178</td><td>60</td><td>40</td></tr>
<tr><td>12</td><td>6990.316</td><td>70</td><td>40</td></tr>
<tr><td>13</td><td>7078.832</td><td>100</td><td>50</td></tr>
<tr><td>14</td><td>7226.029</td><td>100</td><td>50</td></tr>
<tr><td>15</td><td>7286.418</td><td>60</td><td>40</td></tr>
</table>

		16	7360.542	60	40	
		17	7419.822	60	40	
		18	7475.976	60	40	
		19	7547.916	50	35	
		20	7639.826	60	40	
		21	7700.85	100	50	
		22	7886.174	100	50	
		23	8154.347	100	50	
		24	8212.436	70	40	
		25	8415.75	100	50	
		26	8499.791	80	40	
		27	8615.57	60	40	
		28	8828.901	60	40	
		29	8932.701	60	40	
		30	8981.026	60	40	
		31	9095.371	100	50	
		32	9195.657	60	40	
		33	9257.264	70	40	
		34	9302.199	100	50	
		35	9447.123	70	40	
		36	9544.097	60	40	
		37	9589.176	60	40	
		38	9637.335	60	40	
		39	9683.479	60	40	
		40	9775.861	60	40	
		41	9861.765	70	40	
		42	9960.683	70	40	
		43	10069.64	60	40	
		44	10133.25	60	40	
		45	10209.23	60	40	
		46	10413.89	60	40	
		47	10456.17	60	40	
		48	10564.67	60	40	
		49	10625.14	60	40	
		50	10733.16	85	40	
		51	10861.93	60	40	
		52	11218.33	100	50	
		53	11271.59	60	40	
		54	11329.73	130	50	
		55	11691.73	60	40	

		56	11758.89	60	40	
		57	11831.1	60	40	
		58	11887.66	60	40	
		59	11937.57	60	40	
		60	12013.32	60	40	
		61	12081.78	60	40	
		62	12121.43	70	40	
		63	12159.69	60	40	
		64	12209.87	60	40	
		65	12273.64	60	40	
		66	12354.79	60	40	
		67	12416.45	100	50	
		68	12569.78	70	40	
		69	12740	60	40	
		70	12807.71	60	40	
		71	12866.02	90	50	
		72	13081.1	80	40	
		73	13142.76	100	50	
		74	13207.9	70	40	
		75	13270.12	70	40	
		76	13412.65	130	50	
		77	13506.79	100	50	
		78	14118.22	120	50	
		79	14163.09	100	50	
		80	14204.64	100	50	
		81	14258.77	60	40	
		82	14300.62	100	50	
		83	14468.21	90	50	
		84	14572.86	60	40	
		85	14732.86	65	40	
		86	14799.51	60	40	
		87	14868.59	60	40	
		88	14937.96	60	40	
		89	15000.28	60	40	
		90	15078.81	60	40	
		91	15185.58	70	40	
		92	15304.08	60	40	
		93	15470.27	100	50	
		94	15575.02	100	50	
		95	15847.45	100	50	

		96	16080.08	70	40	
		97	16168.04	100	50	
		98	16211.67	100	50	
		99	16332.59	100	50	
		100	16577.46	60	40	
		101	16652.09	60	40	
		102	16715.17	60	40	
		103	16787.54	100	50	
		104	16957.41	50	35	
		105	17099.01	50	35	
		106	17145.21	60	40	
		107	17217.15	70	40	
		108	17286.7	60	40	
		109	17353.2	70	40	
		110	17423.52	70	40	
		111	17530.56	110	50	
		112	17704.07	80	40	
		113	17751.35	60	40	
		114	17804.91	100	50	
		115	17908.96	60	40	
		116	17954.14	100	50	
		117	18066.25	60	40	
		118	18135.56	70	40	
		119	18223.15	100	50	
		120	18335.91	120	50	
		121	18446.94	60	40	
		122	18899.15	60	40	
		123	18679.92	70	40	
		124	18831.92	60	40	
		125	18906.76	100	50	
		126	19078.96	70	40	
		127	19190.12	50	35	
		128	19243.84	70	40	
		129	19427.58	60	40	
		130	19493.16	100	50	
		131	19557.47	70	40	
		132	19623.5	100	50	
		133	19694.12	60	40	
		134	19826.26	70	40	
		135	19953.6	60	40	

		136	20019.89	80	40	
		137	20098.01	60	40	
		138	20141.95	60	40	
		139	20210.38	60	40	
		140	20272.61	80	40	
		141	20396.15	60	40	
		142	20454.04	60	40	
		143	20515.72	60	40	
		144	20717.67	90	50	
		145	21025.63	130	50	
		146	21226.65	125	50	
		147	21365.27	60	40	
		148	21702.28	40	30	
		149	21820.83	40	30	
		150	22065.65	40	30	
		151	22295.58	90	50	
		152	22453.92	125	50	
		153	22822.14	40	30	
		154	23282.96	40	30	
		155	23417.26	90	50	
		156	23750.47	40	30	
		157	23965.19	33	30	
		158	24793.15	135	50	
		159	25124.64	90	50	
		160	25399.74	90	50	
		161	25544.22	90	50	
		162	25890.37	125	50	
		163	26469.72	90	50	
		164	26947.47	90	50	
		165	27087.03	90	50	
		166	27268.89	90	50	
		167	28021.19	90	50	
		168	28265.45	40	30	
		169	28515.99	90	50	
		170	28674.53	60	40	
		171	29846.97	100	50	
		172	30062.69	125	50	
		173	30625.6	120	50	
		174	30915.2	90	50	
		175	31048.78	90	50	

		176	31841.38	40	30	
		177	32558.84	90	50	
		178	34073.6	90	50	
		179	34773.61	90	50	
		180	34957.72	60	40	

Annex - I

(Schedule-E)

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-fulfillment of the Maintenance obligations by the Contractor. Upon occurrence of any breach hereunder, the Authority shall be entitled to effect reduction in monthly lump sum payment as set forth in Clause 14.6 of this Agreement, without prejudice to the rights of the Authority under this Agreement, including Termination thereof.

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

[Specify all the relevant documents]

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

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

4. Extension of time limit

Notwithstanding anything to the contrary specified in this Schedule-E, if the nature and extent of any Defect or deficiency justifies more time for its repair or

rectification than the time specified herein, the Contractor shall be entitled to additional time in conformity with Good Industry Practice. Such additional time shall be determined by the Authority's Engineer and conveyed to the Contractor and the Authority with reasons thereof.

5. Emergency repairs/restoration

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

6. Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

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

8. Repairs on account of natural calamities

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

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, approaches of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm indepth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA 2003 (http://www.tfhrc.com/pavement/lttp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2
	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
	Bleeding	Nil	< 0.1 % of area	Daily	Scale, Tape, odometer etc.		3-7 days	MORT&H Specification 3004.4
	Raveling / Stripping	Nil	< 0.1 % of area	Daily			7-15 days	IRC:82- 2015 read with IRC SP 81
	Edge Deformation/ Breaking	Nil	< 1 m for any 100 m section and width < 0.1 m at any location, restricted to 30 cm from the edge	Daily	Scale, Tape, odometer etc.			IRC:82- 2015
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM	Class I Profilometer : ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of	180 days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-			180 days	BS: 7941-1: 2006

				Annually	(Sideway-force Coefficient Routine Investigation Machine or equivalent)	Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment		
	Pavement Condition Index	3	2.1	Bi-Annually			180 days	IRC:82- 2015
	Other Pavement Distresses			Bi-Annually			2-7 days	IRC:82- 2015
	Deflection/ Remaining Life			Annually	Falling Weight Deflect meter	IRC 115: 2014	180 days	IRC:115-2014
Rigid Pavement (Pavement of MCW, Service Road, Grade Structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	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 Coefficient Routine Investigation Machine or equivalent)	RC:SP:83-2008	180 days	IRC:SP:83-2008
		Minimum SN	**Traffic Speed (Km/h)**					
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					

Embankment/ Slope	Edge drop at shoulders	Nil	40 mm	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 side slope	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification
	Rain Cuts/ Gullies in slope	Nil	Nil	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 Short Term	For the case d > D/2 Long Term
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, and stitch if L > lm.
			3	w = 0.5 - 1.5 mm, discernible from fast-moving car	Seal without delay	Within 7days
			4	w = 1.5 - 3.0 mm	Seal, and stitch if L > l m.	Staple or Dowel Bar Retrofit, FDR for affected portion.
			5	w > 3 mm.	Within 7 days	Within 15days
2.	**Single Transverse (or Diagonal) Crack intersecting with one or more joints**	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Route and seal with epoxy.	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 > 1 m. Within 7 days	
			4	w = 3.0 - 6.0 mm	Dowel Bar Retrofit.	Full Depth Repair Dismantle and

					Within 15 days	reconstruct affected.
			5	w > 6 mm, usually associated with spelling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	Portion with norms and specifications - See Para 5.5 & 9.2 Within 15days
3	Single Longitudinal Crack intersecting with one or more joints	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	w < 0.5 mm, discernable from slow moving vehicle	Seal with epoxy, if L > 1 m. Within 7 days	Staple or dowel bar retrofit. Within 15days
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > l m. Within 15 days	
			3	w = 3.0 – 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair with stapling. Within 15days
			4	w = 6.0 - 12.0 mm, usually associated with spalling	Not Applicable, as it may be full depth	
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic		Full Depth Repair Dismantle and reconstruct affected portion as per norms and specifications - See Para 5.6.4 Within 15days

4	Multiple Cracks intersecting with one or more joints	w = width of crack	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > l m.	
			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, Reinstate Sub-base, 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 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	Seal with epoxy seal with epoxy
			2	w < 1.5 mm; L < 0.6 m, only one corner broken	secure broken parts Within 7 days	Within 7 days
			3	w < 1.5 mm; L < 0.6 m, two corners broken		
			4	w > 1.5 mm; L > 0.6 m or three corners broken	Partial Depth (Refer Figure 8.3 of IRC:SP: 83-2008) Within 15 days	Full depth repair
			5	three or four corners broken		Reinstate sub-base, and reconstruct the

						slab as per norms and specifications within 30days
6	Punchout (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)	w = width of crack L = length (m/m2)	0	Nil, not discernible	**Not Applicable, as it may be full depth**	No Action
			1	w < 0.5 mm; L < 3 m/m2		Seal with low viscosity epoxy to secure broken parts. Within 15 days
			2	either w > 0.5 mm or L < 3 m/m2		
			3	w > 1.5 mm and L < 3 m/m2		
			4	w > 3 mm, L < 3 m/m2 and deformation		Full depth repair - Cut out and replace damaged area taking care not to damage Reinforcement. Within 30days
			5	w > 3 mm, L > 3 m/m2 and deformation		
7	Raveling or Honeycomb type surface	r = area damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	No Action	
			1	r < 2 %	Local repair of areas Damaged	
			2	r = 2 - 10 %	and liable to be damaged. Within 15 days	
			3	r = 10-25%	Bonded Inlay, 2 or 3 slabs if	

			4	r = 25 - 50 %	Affecting Within 30 days	
			5	r > 50% and h > 25 mm	Reconstruct slabs, 4 or more slabs if affecting. Within 30 days	
8	Scaling	r = damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	Short Term No Action	Long Term
			1	r < 2 %	Local repair of areas Damaged and liable to be damaged. Within 7days Bonded Inlay within 15 Days	
			2	r = 2 - 10 %		
			3	r = 10 - 20%		
			4	r = 10 - 30%	Reconstruct slab within 30 days	
			5	r>30 % and h> 25mm		
9	Polished Surface/Glazing	t = texture depth, sand patch test	0		No action	
			1	t > 1 mm		

			2	t = 1 – 0.6 mm		Not Applicable
			3	t = 0.6 – 0.3 mm	Monitor rate of deterioration	
			4	t = 0.3 – 0.1 mm	Diamond Grinding if Affecting	
			5	t < 0.1 mm	50% or more slabs in a Continuous stretch of minimum 5 km. Within 30 days	
10	Popout (Small Hole), Pothole Refer Para 8.4	n = number/m^2 d = diameter h = maximum depth	0	d < 50 mm; h < 25 mm; n < 1 per 5 m^2	No action.	Not Applicable
			1	d = 50 - 100 mm; h < 50 mm; n < 1 per 5 m^2	Partial depth repair 65 mm deep. Within 15 days	
			2	d = 50 - 100 mm; h > 50 mm; n < 1 per 5 m^2		
			3	d = 100 - 300 mm; h < 100 mm n < 1 per 5 m^2	Partial depth repair 110mm	
			4	d = 100 - 300 mm; h > 100	i.e.10 mm more than the depth of the hole.	

				mm; n < 1 per 5 m^2	Within 30 days	
			5	d > 300 mm; h > 100 mm: n > 1 per 5 m^2	Full depth repair. Within 30 days	
11	Joint Seal Defects	loss or damage L = Length as % total joint length	0	Difficult to discern.	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.	
			2	Notable. L > 25% insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in Selected locations. Within 7 days	
			4	Severe; w > 3 mm negligible protection against ingress of water and trapping incompressible material.	Clean, widen and reseal the joint. Within 7 days	
12	Spalling of Joints	w = width on either side of the joint L = length of spalled portion (as % joint	0	Nil, not discernible	No action.	
			1	w < 10 mm	Apply low viscosity epoxy resin/ mortar	

		length)	2 3 4 5	w = 10 - 20 mm, L < 25% w = 20 - 40 mm, L > 25% w = 40 - 80 mm, L > 25% w > 80 mm, and L > 25%	in cracked portion. Within 7 days Partial Depth Repair. Within 15 days 30 - 50 mm deep, h = w + 20% of w, within 30 days 50 - 100 mm deep repair. H = w + 20% of w. Within 30 days	Not Applicable
13	Faulting (or Stepping) in Cracks or Joints	f = difference of level	0 1	not discernible, < 1 mm f < 3 mm	No action.	No action.
			2 3	f = 3 - 6 mm f = 6 - 12 mm	Determine cause and observe, take action for diamond grinding Diamond Grinding	Replace the slab as appropriate. Within 30days

			4 5	f= 12 - 18 mm f> 18 mm	Raise sunken slab. Strengthen sub-grade and sub-base by grouting and raising sunken slab	Replace the slab as appropriate. Within 30days
14	Blowup or Buckling	h = vertical displacement from normal profile	0	Nil, not discernible	No Action	
			1 2 3 4 5	h < 6 mm h = 6 - 12 mm h = 12 - 25 mm h > 25 mm shattered slabs, ie 4 or more pieces	Install Signs to Warn Traffic within 7 days Full Depth Repair. Within 30 days 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.	
			1	h = 5 - 15 mm		

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

					Within 30 days	
17	Bump	h = vertical displacement from normal profile	0 1	h < 4 mm h = 4 - 7 mm	No action Grind, in case of new construction within 7 days	Construction Limit for New Construction.
			3	h = 7 - 15 mm	Grind, in case of ongoing Maintenance within 15 days	Replace in case of new construction. Within 30days
			4	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	**Lane to Shoulder Dropoff**	f = difference of level			**Short Term**	**Long Term**
			0	Nil, not discernible < 3mm	No Action	
			1 2	f = 3 - 10 mm f = 10 - 25 mm	Spot repair of shoulder within 7 days	

			3 4	f = 25 - 50 mm f = 50 - 75 mm	Fill up shoulder within 7 dayss	For any 100 m Stretch Reconstruct shoulder, if affecting 25% or more of stretch. Within 30days
			5	f > 75 mm		
Drainage						
19	Pumping	quantity of fines and water expelled through open joints and cracks Nos	0	not discernible	No Action	
			1 to 2 3 to 4	slight/ occasional Nos < 10% appreciable/ Frequent 10 - 25%	Repair cracks and joints Without delay. Lift or jack slab within 30 days.	Inspect and repair sub-drainage at distressed sections and upstream.
			5	abundant, crack development > 25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab. Within 30 days	
20	Ponding	Ponding on slabs due to blockage of drains	0-2	No discernible problem	No action.	

			3 to 4	Blockages observed in drains, but water flowing	Clean drains etc within 7 days, Follow up	Action required to stop water damaging foundation within 30 days.
			5	Ponding, accumulation of water observed	-do	

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

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 O dometer 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**	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect -	IRC:35-2015

<table>
<tr><td></td><td></td><td></td><td></td><td>of IRC:35-2015</td><td></td><td>within 2 months</td><td></td></tr>
<tr><td></td><td>Day time Visibility</td><td>During expected life Service Time
Cement Road - 130mcd/m2/lux
Bituminous Road - 100mcd/m2/lux</td><td>Monthly</td><td>As per Annexure-D of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
<tr><td></td><td rowspan="6">Night Time Visibility</td><td><u>Initial and Minimum Performance for Dry Retro reflectivity during night time:</u></td><td rowspan="6">Bi-Annually</td><td rowspan="6">As per Annexure-E of IRC:35-2015</td><td rowspan="6">Re - painting</td><td rowspan="6">Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months</td><td rowspan="6">IRC:35-2015</td></tr>
<tr><td></td><td>Design Speed</td><td>(RL) Retro Reflectivity (mcd/m2/lux)</td></tr>
<tr><td></td><td>Up to 65</td><td>200</td><td>80</td></tr>
<tr><td></td><td>65-100</td><td>250</td><td>120</td></tr>
<tr><td></td><td>Above 100</td><td>350</td><td>150</td></tr>
<tr><td></td><td>Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):</td></tr>
<tr><td>Road Signs</td><td>Shape and Position</td><td>Shape and Position as per IRC:67-2012.
Signboard should be clearly visible for
the design speed of the section.</td><td>Daily</td><td>Visual with video/image backup</td><td>Improvement of shape, in case if shape is damaged.

Relocation as Per requirement</td><td>48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of</td><td>IRC:67-2012</td></tr>
</table>

						Gantry/Cantilever Sign boards	
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of Each signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.	Change of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/ Cantilever Sign boards	IRC:67-2012
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance measuring tape	Raising Kerb Height	Within 1 Month	IRC 86:1983
	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	IRC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2014 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:84-2014, IRC:35-2015
	Pedestrian Guardrail	Functionality: Functioning of guardrail as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014
	Traffic Safety Barriers	Functionality: Functioning of Safety Barriers as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2014,

				backup			IRC:119- 2015
	End Treatment of Traffic Safety Barriers	Functionality: Functioning of End Treatment as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014, IRC:119- 2015
	Attenuators	Functionality: Functioning of Attenuators as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP-2014, IRC:119- 2015
	Guard Posts and Delineators	Functionality: Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: 79 - 1981
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67-2012
	Traffic Blinkers	Functionality: Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014
Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84-2014
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84-2014
	Toll Plaza Canopy Lights	Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major/minor failure in the lighting system	Daily	-	Rectification of failure	8 hours	IRC:SP:84-2014

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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Pipe/box/slab culverts	Free waterway/ unobstructed 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	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
		Delamination of concrete not more than 0.25 sq.m.					
		Cracks wider than 0.3 mm not					

		more than 1m aggregatelength					
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concreteapron) 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	**3** days	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 live loads	Within design limits.	Once in every 10 years for spans more than 40 m	Load test method	Carry out major rehabilitation works on bridge to retain original design loads	6 months	IRC SP: 51-1999.

					capacity		
	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 strip joint	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Replace of seal in expansion joint	15 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Debris and dust in strip seal expansion joint	No dust or debris in expansion joint gap.	Monthly	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Cleaning of expansion joint gaps thoroughly	3 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes	3 days	MORTH specification 2700.

		silt, debris, clogging of drainage spout collection chamber.		Mobile Bridge Inspection Unit	with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainage spout if any leakages observed		
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	Delaminating of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per	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	3 months	MORTH specification 2810 and IRC SP: 40-199.

		side, no rupture of reinforcement or rubber			load transfer on to bearings.		
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 oubt, use Underwater camera for inspection of deep wells in major Rivers.	suitable protection works around pier/abutment	1 months	IRC SP: 40-1993, IRC 83-2014, MORTH specification 2500
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sq.m, damage to solid apron (concrete apron) not more than 1 sq.m	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching.	30 days After defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of the contractor.							

Table 4: Maintenance Criteria for Structures and Culverts:

Table 5: Maintenance Criteria for Hill Roads

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

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

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
(vi)	Damage to road mark ups	7 (seven) days
(d) Road lighting		
(i)	Any major failure of the system	24 (twenty four) hours
(ii)	Faults and minor failures	8 (eight) hours
(e) Trees and plantation		
(i)	Obstruction in a minimum head- room of 5 m above carriageway or obstruction in visibility of road signs	24 (twenty four)hours
(ii)	Removal of fallen trees from carriageway	4 (four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(vi)	Trees and bushes requiring replacement	30 (thirty) days
(v)	Removal of vegetation affecting sight line and	15 (fifteen) days

	road structures	
(f) Rest area		
(i)	Cleaning of toilets	Every 4 (four) hours
(ii)	Defects in electrical, water and sanitary installations	24 (twenty four) hours
(g) [Toll Plaza]		
(h)	**Other Project Facilities and Approach roads**	
(i)	Damage in approach roads, pedestrian facilities, truck lay- byes, bus-bays, bus-shelters, cattle crossings, [Traffic Aid Posts, Medical Aid Posts] and service roads	15 (fifteen) days
(ii)	Damaged vehicles or debris on the road	4 (four) hours
(iii)	Malfunctioning of the mobile crane	4 (four) hours
Bridges		
(a) Superstructure		
(i)	Any damage, cracks, spalling/ scaling Temporary measures Permanent measures	within 48 (forty eight) hours within 15 (fifteen) days or as specified by the Authority's Engineer
(b) Foundations		
(i)	Scouring and/or cavitation	15 (fifteen) days
(c) Piers, abutments, return walls and wing walls		
(i)	Cracks and damages including settlement and tilting, spalling, scaling	30 (thirty) days
(d) Bearings (metallic) of bridges		
(i)	Deformation, damages, tilting or shifting of bearings	15 (fifteen) days Greasing of metallic bearings once in a year
(e) Joints		
(i)	Malfunctioning of joints	15 (fifteen) days
(f) Other items		
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3 (three) days
(iii)	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
(vi)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g) Hill Roads		
(i)	Damage to retaining wall/breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours
(iii)	Snow requiring clearance	24 (twenty four) hours
[Note: Where necessary, the Authority may modify the time limit for repair/rectification, or add to the nature of Defect or deficiency before issuing the bidding document, with the approval of the competent authority.]		

SCHEDULE - F
(See Clause 3.1.7(a))

APPLICABLE PERMITS

1 Applicable Permits

1.1 The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:

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

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

(c) License for use of explosives;

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

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

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

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

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

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

1.2 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 7.1.1, 7.5.3 and 19.2)

FORM OF BANK GUARANTEE

Annex-I
(See Clause 7.1.1)
Performance Security

To,

Authority

……,

……

……,
.....

WHEREAS:

(A) _____[name and address of contractor] (hereinafter called the Contractor") and ....., (hereinafter called the "Authority") have entered into an agreement (hereinafter called the "Agreement") for the ***"Upgradation of Road Nongstoin-Rambrai-Kyrshai road up to Meghalaya-Assam Border to 2-Lane under SARDE-NE "Phase-A" in the state of Meghalaya – Package I"*****,** subject to and in accordance with the provisions of the Agreement

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

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

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

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

2. A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways Authority of India], 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

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

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

13. Intimation regarding issuance of this Bank Guarantee shall be sent to Authority's Bank through SFMS gateway as per the details below:

S.No.	**Particulars**	**Details**
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Syndicate Bank transport Bhawan, 1st Parliament Street, New Delhi-110001

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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

Annex – II

(Schedule - G)

(See Clause 7.5.3)

Form for Guarantee for Withdrawal of Retention Money

To,

Authority ……..

……..

WHEREAS:

(A) name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "Agreement") with ..... (hereinafter called the "**Authority**") **for the *"***Upgradation of Road Nongstoin-Rambrai-Kyrshai road up to Meghalaya-Assam Border to 2-Lane under SARDE-NE "Phase-A" in the state of Meghalaya – Package I***",*** subject to and in accordance with the provisions of the Agreement.

(B) In accordance with Clause 7.5.3 of the Agreement, the Contractor may withdraw the retention money (hereinafter called the "**Retention Money**") after furnishing to the Authority a bank guarantee for an amount equal to the proposed withdrawal.

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

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

1. The Bank hereby unconditionally and irrevocably 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, National Highways Authority of India, that the Contractor has committed default in the due and faithful performance of all or any of its obligations for 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 Retention Money and 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 Retention Money.

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 90 (ninety) days after the date of the Completion Certificate specified in Clause 12.4 of the Agreement.

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 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 of amounts so demanded under the said invocation.

13. Intimation regarding issuance of this Bank Guarantee shall be sent to Authority's Bank through SFMS gateway as per the details below:

S.No.	**Particulars**	**Details**
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Syndicate Bank transport Bhawan, 1st Parliament Street, New Delhi-110001

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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

Annex – III
(Schedule - G)
(See Clause 19.2)

Form for Guarantee for Advance Payment

To,

Authority

.....,

.....

.....,
.....

WHEREAS:

(A) ***---------*** ***----------*** name and address of contractor] (hereinafter called the "Contractor") has executed an agreement (hereinafter called the "Agreement") with ....., (hereinafter called the "Authority") for the ***"***Upgradation of Road Nongstoin-Rambrai-Kyrshai road up to Meghalaya-Assam Border to 2-Lane under SARDE-NE "Phase-A" in the state of Meghalaya – Package I***",*** subject to and in accordance with the provisions of the Agreement

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

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

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

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

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

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

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 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.

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 Advance Payment.

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 on or before the aforesaid date, 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 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

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

available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

13. Intimation regarding issuance of this Bank Guarantee shall be sent to Authority's Bank through SFMS gateway as per the details below:

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Syndicate Bank transport Bhawan, 1st Parliament Street, New Delhi-110001

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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

Schedule-H

(See Clauses 10.1.4 and 19.3)

Contract Price Weightages

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

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

Table 1.2.1

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
Road works including culverts, widening and repair of culverts.	74.82%	**A- Widening and strengthening of existing road**	
		(1) Earthwork up to top of the sub-grade	18.55%
		(2) Sub-base Course	9.38%
		(3) Non Bituminous Base Course	3.67%
		(4) Bituminous Base Course	0.68%
		(5) Wearing Coat	2.88%
		(6) Widening and repair of culvert	0.00%
		B1- Reconstruction/ New 2-Lane realignment/bypass (Flexible Pavement)	
		(1) Earthwork up to top of the sub-grade	27.97%
		(2) Sub-base Course	10.86%
		(3) Non Bituminous Base Course	3.98%
		(4) Bituminous Base Course	0.73%
		(5) Wearing Coat	3.13%
		B2- Reconstruction/ New 2-Lane realignment/bypass (Rigid Pavement)	
		(1) Earthwork up to top of the sub-grade	0.00%
		(2) Sub-base Course	0.00%
		(3) Dry Lean Concrete (DLC)	0.00%

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		Course	
		(4) Pavement Quality Control (PQC) Course	0.00%
		C1- Reconstruction/ New Service Road (Flexible Pavement)	
		(1) Earthwork up to top of the sub-grade	0.00%
		(2) Sub-base Course	0.00%
		(3) Non Bituminous Base Course	0.00%
		(4) Bituminous Base Course	0.00%
		(5) Wearing Coat	0.00%
		C2- Reconstruction/ New Service Road (Rigid Pavement)	
		(1) Earthwork up to top of the sub-grade	0.00%
		(2) Sub-base Course	0.00%
		(3) Dry Lean Concrete (DLC) Course	0.00%
		(4) Pavement Quality Control (PQC) Course	0.00%
		D - Re-Construction and new culverts on existing road, realignments on existing road, realignments,bypasses:	
		Culverts(Length<6m)	18.16%
Minor Bridges/Underpasses/Overpasses	4.55%	**A1-<u>Widening and Repairs of Minor Bridges (Length>6m and <60m)</u>**	
		Minor bridges	0.00%
		A2-New <u>Minor Bridges (Length>6m and <60m)</u>	

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		(1) Foundation+Sub Structure: On completion of the foundation work including foundations for wing and return walls ,abutments,piers upto the abutment/pier cap	67.00%
		(2) Super Structure: On completion of the super structure in all respect includong wearing coat, bearings, expansion joints, hand rails, crash barriers,road sign & markings, tests on completion etc. complete in all respect,	30.00%
		(3) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use	3.00%
		(4) Guide Bund and River Training Works: On completion of Guide Bund and River Training Works complete in all respect.	0.00%
		B.1- Widening and repair of Underpasses/overpasses	
		Underpasses/Overpasses	0.00%
		B.2- New Underpasses/overpasses	
		(1) Foundation+Sub Structure: On completion of the foundation work including foundations for wing and return walls ,abutments,piers upto the abutment/pier cap	0.00%

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		(2) Super Structure: On completion of the super structure in all respect including wearing coat, bearings, expansion joints, hand rails, crash barriers,road sign & markings, tests on completion etc. complete in all respect. Wearing Coat (a) in case of Overpass-wearing coat including expansion joint complete in all respect as specified and (b) in case of underpass rigid pavement including drainage facility complete in all respects as specified. **(3) Approaches:** On completion of approaches including Retaining Walls, stone pitching, protection works complete in all respect and fit for use	0.00% 0.00%
Major Bridge (length>60m) works and RUB/ROB/elevated sections/flyovers including viaducts, if any	0.00%	**A.1 -<u>Widening and repairs of Major Bridges</u>** (1) Foundation (2) Sub-structure (3) Super-structure (including bearings) (4) Wearing coat including expansion joints (5) Miscellaneous items like hand rails, crash barriers, road markings etc. (6) Wing walls/Return Walls (7) Guide bunds, River Training Works etc (8) Approaches (including retaining walls, stone pitching and protection works) **A.2 -New <u>Major Bridges</u>**	 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00%

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
			0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc.	0.00%
		(6) Wing walls/Return Walls	0.00%
		(7) Guide bunds, River Training Works etc	0.00%
		(8) Approaches (including retaining walls, stone pitching and protection works)	0.00%
		B.1-<u>Widening and repair of</u>	
		(a) ROB	
		(b) RUB	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat (a) in case of ROB - wearing coat including expansion joint complete in all respect as specified and (b) in case of RUB rigid pavement under RUB including drainage facility complete in all respects as specified.	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc.	0.00%
		(6) Wing walls/Return Walls	0.00%
		(7) Approaches (including retaining walls, stone pitching and protection works)	0.00%
		B.2-<u>New ROB/RUB</u>	
		(a) ROB	

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		(b) RUB	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat (a) in case of ROB - wearing coat including expansion joint complete in all respect as specified and (b) in case of RUB rigid pavement under RUB including drainage facility complete in all respects as specified.	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc.	0.00%
		(6) Wing walls/Return Walls	0.00%
		(7) Approaches (including retaining walls, stone pitching and protection works)	0.00%
		C.1- Widening and repair of Elevated Sections/Flyovers/Grade Separators	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat including expansion joints.	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc.	0.00%
		(6) Wing walls/Return Walls	0.00%
		(7) Approaches (including retaining walls, stone pitching and protection works)	0.00%
		C.2- New Elevated Sections/Flyovers/Grade Separators	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including	0.00%

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		bearings)	
		(4) Wearing Coat including expansion joints.	0.00%
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc.	0.00%
		(6) Wing walls/Return Walls	0.00%
		(7) Approaches (including retaining walls, stone pitching and protection works)	0.00%
Other works	19.15%	(i) Toll Plaza	0.00%
		(ii)Road side drains	19.82%
		(iii)Road signs, markings, km stones, safety devices, …	26.85%
		(iv)Project facilities	0.00%
		a) Bus bays	6.26%
		b) Truck lay bye	0.00%
		c) Rest Areas	0.00%
		d) Others(Miscellaneous items and Site Clearance)	0.74%
		(v)Road side plantation	0.00%
		(vi) Repair of protection works other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs/RUBs	0.00%
		(vii)Safety and traffic management during construction	0.00%
		(viii)Construction/Repair of protection works other than approaches to the bridges, elevated sections/flyovers/grade separators and ROBs/RUBs	
		a) Retaining Wall (2m)	0.43%
		b) Retaining Wall (4m)	12.46%
		b) Breast Wall (3m)	7.28%
		b) Breast Wall (4m)	2.64%
		b) Breast Wall (5m)	8.32%
		b) Breast Wall (6m)	15.20%
Utility Shifting	1.48%	PHED	29.87%

		Electric Shifting	63.02%
		Water Resource shifting	7.11%

1.3 Procedure of estimating the value of work done.

1.3.1 Road works including approaches to minor bridges, Major Bridges and Structures (excluding service roads).

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

Table 1.3.1

Stage of Payment	Percentage - weightage	Payment Procedure
A- Widening and strengthening of existing road		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 5 (five) percent of the total length.
(1) Earthwork up to top of the sub-grade	18.55%	
(2) Sub-base Course	9.38%	
(3) Non Bituminous Base Course	3.67%	
(4) Bituminous Base Course	0.68%	
(5) Wearing Coat	2.88%	
(6) Widening and repair of culvert	0.00%	Cost of completed culverts shall be determined pro rate with respect to the total number of culverts. Payment shall be made on the completion of atleast one culverts.
B1- Reconstruction/ New 2-Lane realignment/bypass (Flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 1 (one) km length whichever is less.
(1) Earthwork up to top of the sub-grade	27.97%	
(2) Sub-base Course	10.86%	
(3) Non Bituminous Base Course	3.98%	
(4) Bituminous Base Course	0.73%	
(5) Wearing Coat	3.13%	

B2- Reconstruction/ New 2-Lane realignment/bypass (Flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 1 (one) km length whichever is less.

Stage of Payment	Percentage - weightage	Payment Procedure
(1) Earthwork up to top of the sub-grade	0.00%	
(2) Sub-base Course	0.00%	
(3) Dry Lean Concrete (DLC) Course	0.00%	
(4) Pavement Quality Control (PQC) Course	0.00%	
C1- Reconstruction/ New Service Road (Flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 1 (one) km length whichever is less.
(1) Earthwork up to top of the sub-grade	0.00%	
(2) Sub-base Course	0.00%	
(3) Non Bituminous Base Course	0.00%	
(4) Bituminous Base Course	0.00%	
(5) Wearing Coat	0.00%	
C2- Reconstruction/ New Service Road (Rigid Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 1 (one) km length whichever is less.
(1) Earthwork up to top of the sub-grade	0.00%	
(2) Sub-base Course	0.00%	
(3) Dry Lean Concrete (DLC) Course	0.00%	
(4) Pavement Quality Control (PQC) Course	0.00%	
D - Re-Construction and new culverts on existing road, realignments on existing road, realignments,bypasses:		Cost of completed culverts shall be determined pro rate with respect to the total number of culverts. Payment shall be made on the completion of atleast one culverts.
Culverts(Length<6m)	18.16%	

@ 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 stages (1), (2), (3), (4) and (5) above shall be worked out.

1.3.2 Minor Bridges and Underpass/Overpass

Procedure for estimating the value of Major Bridge works shall be as stated in table 1.3.2:

Table 1.3.2

Stage of Payment	Percentage - weightage	Payment Procedure
1	**2**	**3**
A1-<u>Widening and Repairs of Minor Bridges (Length>6m and <60m)</u>	0.00%	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of widening and repair works of a minor bridge.
A2-New <u>Minor Bridges</u> **(i) Foundation+Sub Structure:** On completion of the foundation work including foundations for wing and return walls ,abutments,piers upto the abutment/pier cap	67.00%	**(i) Foundation+Sub Structure:** Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. Payment against foundation+sub structure shall be made on pro rata basis on copletion of a stage i.e. not less than 25% of the scope of foundation+ sub structure of each bridge subject to completion of atleast two foundations along with sub structure upto abutment/pier cap level of each bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Super Structure: On completion of the super structure in all respect including wearing coat, bearings, expansion joints, hand rails, crash barriers,road sign & markings, tests on completion etc. complete	30.00%	**(ii) Super Structure:** Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure of atleast one span in all respect as specified in the column of " Stage of Payment" in this sub clause.

Stage of Payment	Percentage - weightage	Payment Procedure
in all respect, **(iii) Approaches:** On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use **(iv) Guide Bund and River Training Works:** On completion of Guide Bund and River Training Works complete in all respect.	3.00% 0.00%	**(iii) Approaches:** Payment shall be made on pro rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of " Stage of Payment" in this sub clause. **(iv) Guide Bund and River Training Works:** Payment shall be made on pro rata basis on completion of a stage i.e. completion of Guide Bunds and River Training Works in all respect as specified.
B.1- Widening and repair of Underpasses/overpasses	0.00%	Cost of each overpass/underpass shall be determined on pro rata basis with respect to the total linear length of the underpass/overpass. Payment shall be made on the completion of wiening & repair works of a underpass/overpass.
B.2- New Underpasses/overpasses **(i) Foundation+Sub Structure:** On completion of the foundation work including foundations for wing and return walls ,abutments,piers upto the abutment/pier cap **(ii) Super Structure:**	0.00%	**(i) Foundation+Sub Structure:** Cost of each Underpass/Overpass shall be determined on pro rata basis with respect to the total linear length (m) of the Underpass/Overpass. Payment against foundation+sub structure shall be made on pro rata basis on copletion of a stage i.e. not less than 25% of the scope of foundation+ sub structure of each Underpass/Overpass subject to completion of atleast two foundations along with sub structure upto abutment/pier cap level of each Underpass/Overpass. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified. **(ii) Super Structure:**

Stage of Payment	Percentage - weightage	Payment Procedure
On completion of the super structure in all respect including wearing coat, bearings, expansion joints, hand rails, crash barriers,road sign & markings, tests on completion etc. complete in all respect. Wearing Coat (a) in case of Overpass- wearing coat including expansion joint complete in all respect as specified and (b) in case of underpass rigid pavement including drainage facility complete in all respects as specified.	0.00%	Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure of atleast one span in all respect as specified in the column of " Stage of Payment" in this sub clause.
(iii) Approaches: On completion of approaches including Retaining Walls, stone pitching, protection works complete in all respect and fit for use	0.00%	**(iii) Approaches:** Payment shall be made on pro rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of " Stage of Payment" in this sub clause.

1.3.3 Major Bridge Works, ROB/RUB and Structures

Procedure for estimating the value of structure work shall be as stated in table 1.3.3:

Table 1.3.3

Stage of Payment	Percentage - weightage	Payment Procedure
1	**2**	**3**
A1-Widening and Repairs of Major Bridges		
(i) Foundation:	0.00%	**(i) Foundation:** Cost of each Major bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major bridges. Payment against foundation shall be made on pro rata basis on copletion of a stage i.e. not less than 25% of the scope of foundation of Major Bridge subject to completion of atleast two Foundations of the Major Bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub Structure:	0.00%	**(ii) Sub Structure:** Payment against sub structure shall be made on pro rata basis on completion of a stage i.e. not less than 25% of the scope of sub structure of Major Bridge subject to completion of atleast two sub structure of the abutment/pier upto abutment/pier cap level of the major bridge.
(iii) Super Structure (including bearings)	0.00%	**(iii) Super Structure:** Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure including bearings of atleast one span in all respect as specified.
(iv) Wearing Coat including expansion joints.	0.00%	**Wearing Coat** Payment shall be made on completion of wearing coat including expansion joints complete in all respect as specified.
(v) Miscellaneous items like hand rails, crash barriers, road markings etc.		**(v) Miscellaneous**

Stage of Payment	Percentage - weightage	Payment Procedure
	0.00%	Payment shall be made on completion of all Miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respect as specified.
(vi) Wing walls/Return Walls	0.00%	**(vi) Wing walls/Return Walls** Payment shall be made on completion of all Wing walls/Return Walls complete in all respect as specified.
(vii) Guide bunds, River Training Works etc	0.00%	**(vii) Guide bunds, River Training Works etc** Payment shall be made on completion of all Guide bunds/River Training Works etc. complete in all respect as specified.
(viii) Approaches (including retaining walls, stone pitching and protection works)	0.00%	**(viii) Approaches:** Payment shall be made on completion of both approaches including stone pitching, protection works,etc. complete in all respects as specified.
A2-New Major Bridges		
(i) Foundation:	0.00%	**(i) Foundation:** Cost of each Major bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major bridges. Payment against foundation shall be made on pro rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of Major Bridge subject to completion of at least two foundations of the Major Bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub Structure:	0.00%	**(ii) Sub Structure:** Payment against sub structure shall be made on pro rata basis on completion of a stage i.e. not less than 25% of the scope of sub structure of Major Bridge subject to completion of atleast two sub structure of the abutment/pier upto abutment/pier cap level of the major bridge.

Stage of Payment	Percentage - weightage	Payment Procedure
(iii) Super Structure (including bearings)	0.00%	**(iii) Super Structure:** Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure including bearings of atleast one span in all respect as specified.
(iv) Wearing Coat including expansion joints.	0.00%	**Wearing Coat** Payment shall be made on completion of wearing coat including expansion joints complete in all respect as Specified.
(v) Miscellaneous items like hand rails, crash barriers, road markings etc.	0.00%	**(v) Miscellaneous** Payment shall be made on completion of all Miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respect as specified.
(vi) Wing walls/Return Walls	0.00%	**(vi) Wing walls/Return Walls** Payment shall be made on completion of all Wing walls/Return Walls complete in all respect as specified.
(vii) Guide bunds, River Training Works etc	0.00%	**(vii) Guide bunds, River Training Works etc** Payment shall be made on completion of all Guide bunds/River Training Works etc. complete in all respect as specified.
(viii) Approaches (including retaining walls, stone pitching and protection works)	0.00%	**(viii) Approaches:** Payment shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
B1 - Widening and repairs of **(a) ROB** **(b) RUB**		

Stage of Payment	Percentage - weightage	Payment Procedure
(i) Foundation:	0.00%	**(i) Foundation:** Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the 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 ROB/RUB subject to completion of atleast two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub Structure:	0.00%	**(ii) Sub Structure:** Payment against sub structure shall be made on pro rata basis on completion of a stage i.e. not less than 25% of the scope of sub structure of ROB/RUB subject to completion of atleast two sub structure of the abutment/pier upto abutment/pier cap level of the ROB/RUB.
(iii) Super Structure (including bearings)	0.00%	**(iii) Super Structure:** Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure including bearings of atleast one span in all respect as specified.
(iv) Wearing Coat including expansion joints in case of ROB. In case of RUB, rigid pavement under RUB including drainage facility as specified.	0.00%	**(iv) Wearing Coat:** Payment shall be made on completion of (a) in case of ROB - wearing coat including expansion joint complete in all respect as specified and (b) in case of RUB rigid pavement under RUB including drainage facility complete in all respects as specified.
(v) Miscellaneous items like hand rails, crash barriers, road markings etc.		**(v) Miscellaneous**

Stage of Payment	Percentage - weightage	Payment Procedure
	0.00%	Payment shall be made on completion of all Miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respect as specified.
(vi) Wing walls/Return Walls	0.00%	**(vi) Wing walls/Return Walls** Payment shall be made on completion of all Wing walls/Return Walls complete in all respect as specified.
(vii) Approaches (including retaining walls, stone pitching and protection works)	0.00%	**(viii) Approaches:** Payment shall be made on completion of both approaches including stone pitching, protection works,etc. Complete in all respects as specified.
B2 - New **(a) ROB** **(b) RUB**		
(i) Foundation:	0.00%	**(i) Foundation:** Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROB/RUB. Payment against foundation shall be made on pro rata basis on copletion of a stage i.e. not less than 25% of the scope of foundation of ROB/RUB subject to completion of atleast two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub Structure:	0.00%	**(ii) Sub Structure:** Payment against sub structure shall be made on pro rata basis on copletion of a stage i.e. not less than 25% of the scope of sub structure of ROB/RUB subject to completion of atleast two sub structure of the abutment/pier upto abutment/pier cap level of the ROB/RUB.
(iii) Super Structure (including bearings)		**(iii) Super Structure:**

Stage of Payment	Percentage - weightage	Payment Procedure
	0.00%	Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure including bearings of atleast one span in all respect as specified.
(iv) Wearing Coat including expansion joints in case of ROB. In case of RUB, rigid pavement under RUB including drainage facility as specified.	0.00%	**(iv) Wearing Coat:** Payment shall be made on completion of (a) in case of ROB - wearing coat including expansion joint complete in all respect as specified and (b) in case of RUB rigid pavement under RUB including drainage facility complete in all respects as specified.
(v) Miscellaneous items like hand rails, crash barriers, road markings etc.	0.00%	**(v) Miscellaneous** Payment shall be made on completion of all Miscellaneous works like hand rails, crash barriers, road markings etc.complete in all respect as specified.
(vi) Wing walls/Return Walls	0.00%	**(vi) Wing walls/Return Walls** Payment shall be made on completion of all Wing walls/Return Walls complete in all respect as specified.
(vii) Approaches (including retaining walls, stone pitching and protection works)	0.00%	**(viii) Approaches:** Payment shall be made on completion of both approaches including stone pitching, protection works,etc. complete in all respects as specified.
C1 - Widening and repairs of Elevated Section/Flyovers/ Grade Separators		

Stage of Payment	Percentage - weightage	Payment Procedure
(i) Foundation:	0.00%	**(i) Foundation:** Cost of each Structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures. Payment against foundation shall be made on pro rata basis on copletion of a stage i.e. not less than 25% of the scope of foundation of structures subject to completion of atleast two foundations of the structures. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub Structure:	0.00%	**(ii) Sub Structure:** Payment against sub structure shall be made on pro rata basis on copletion of a stage i.e. not less than 25% of the scope of sub structure of structures subject to completion of atleast two sub structure of the abutment/pier upto abutment/pier cap level of the structures.
(iii) Super Structure (including bearings)	0.00%	**(iii) Super Structure:** Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure including bearings of atleast one span in all respect as specified.
(iv) Wearing Coat including expansion joints.	0.00%	**Wearing Coat** Payment shall be made on completion of wearing coat including expansion joints complete in all respect as specified.
(v) Miscellaneous items like hand rails, crash barriers, road markings etc.	0.00%	**(v) Miscellaneous** Payment shall be made on completion of all Miscellaneous works like hand rails, crash barriers, road markings etc.complete in all respect as specified.
(vi) Wing walls/Return Walls		**(vi) Wing walls/Return Walls**

Stage of Payment	Percentage - weightage	Payment Procedure
	0.00%	Payment shall be made on completion of all Wing walls/Return Walls complete in all respect as specified.
(vii) Approaches (including retaining walls, stone pitching and protection works)	0.00%	**(viii) Approaches:** Payment shall be made on completion of both approaches including stone pitching, protection works,etc. complete in all respects as specified.
C2 - New Elevated Section/Flyovers/ Grade Separators		
(i) Foundation:	0.00%	**(i) Foundation:** Cost of each Structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures. 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 structures subject to completion of atleast two foundations of the structures. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub Structure:	0.00%	**(ii) Sub Structure:** Payment against sub structure shall be made on pro rata basis on completion of a stage i.e. not less than 25% of the scope of sub structure of structures subject to completion of atleast two sub structure of the abutment/pier upto abutment/pier cap level of the structures.
(iii) Super Structure (including bearings)	0.00%	**(iii) Super Structure:** Payment shall be made on pro rata basis on completion of a stage i.e. completion of super structure including bearings of atleast one span in all respect as specified.
(iv) Wearing Coat including expansion joints.		**Wearing Coat**

Stage of Payment	Percentage - weightage	Payment Procedure
	0.00%	Payment shall be made on completion of wearing coat including expansion joints complete in all respect as specified.
(v) Miscellaneous items like hand rails, crash barriers, road markings etc.	0.00%	**(v) Miscellaneous** Payment shall be made on completion of all Miscellaneous works like hand rails, crash barriers, road markings etc.complete in all respect as specified.
(vi) Wing walls/Return Walls	0.00%	**(vi) Wing walls/Return Walls** Payment shall be made on completion of all Wing walls/Return Walls complete in all respect as specified.
(vii) Approaches (including retaining walls, stone pitching and protection works)	0.00%	**(viii) Approaches:** Payment shall be made on completion of both approaches including stone pitching, protection works,etc. complete in all respects as specified.

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
(i) Toll Plaza	0.00%	Unit of measurement is each completed toll plaza. Payment of each toll plaza shall be made on pro rata basis with respect to the total of all toll plazas.
(ii)Road side drains	19.82%	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five per cent) of the total length.
(iii)Road signs, markings, km stones, safety devices, etc.	26.85%	
(iv)Project facilities	0.00%	Payment shall be made on pro rata basis for completed facilities.
a) Bus Bays	6.26%	

Stage of Payment	Weightage	Payment Procedure
b) Truck Lay Bye	0.00%	
c) Rest Areas	0.00%	
d) Others	0.74%	
(v)Road side plantation	0.00%	
(vi) Repair of Protection works other than approaches to the bridges, elevated sections/ flyovers/ grade separators and ROBs/RUBs.	0.00%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five per cent) of the total length.
(vii) Safety and traffic management during construction	0.00%	Payment shall be made on prorate basis every six month.
(viii)Protection works		Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five per cent) of the total length.
a) Retaining Wall (2m)	0.43%	
b) Retaining Wall (4m)	12.46%	
c) Breast Wall (3m)	7.28%	
d) Breast Wall (4m)	2.64%	
e) Breast Wall (5m)	8.32%	
f) Breast Wall (6m)	15.20%	

1.3.5 Utility Shifting.

Procedure for estimating the value of utility shifting works done shall be as stated in table 1.3.5:

Table 1.3.5

<table>
<tr><th>Stage of Payment</th><th>Weightage</th><th>Payment Procedure</th></tr>
<tr><td>PHED</td><td rowspan="3">29.87%
63.02%
7.11%</td><td rowspan="3">Payment is divided in following activities and Payment of each activity shall be made on pro rata basis on completion of 5km of linear project length.
<table><tr><td>Removal of existing utility</td><td>30%</td></tr><tr><td>Erection/Laying</td><td>30%</td></tr><tr><td>Commissioning</td><td>40%</td></tr></table>Dismantling will include proper listing and stocking of usable and non-usable items.
Commissioning will be completed on furnishing the commissioning certificate from concerned utility owning department.</td></tr>
<tr><td>Electric Utility Shifting</td></tr>
<tr><td>Water resource shifting</td></tr>
</table>

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 installments in accordance with the provisions of Clause 19.7.

SCHEDULE - I

(See Clause 2.1)

DRAWINGS

1 Drawings

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

2 Additional Drawings

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

Annex - I (Schedule-I)

List of Drawings

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

a) Drawings of horizontal alignment, vertical profile and cross section.

b) Drawings of drainage plan and profile.

c) Drawing of cross drainage works.

d) Drawings of major intersections and ROB.

e) Drawing of toll plaza layout, toll collection systems and roadway near toll plaza

f) Drawings of bus-bay and bus shelters with furniture and drainage system.

g) Drawing of road furniture items including traffic signage, markings, safety barriers, etc.

h) Drawings of traffic diversion plans and traffic control measures.

i) Drawings of road drainage measures

j) Drawing of typical details slope protection measures.

k) Drawing of a landscaping and horticulture.

l) Drawings of pedestrian crossings

m) Drawings of street lighting.

n) General arrangement of Base camp and Administrative Block

o) Drawings of catch water drains check drains.

p) Any other drawings which Authority's Engineer may review.

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 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 621st 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% (sixty 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.

6 Extension of time

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

Schedule-K

(See Clause 12.1.2)

Tests on Completion

1. Schedule for Tests

1.1 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.

1.2 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

2.1 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 (to be decided with Authority's Engineer at the time of physical tests as per relevant IRC/ Code Manual).

2.2 Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of NSV and the maximum permissible roughness for purposes of this Test shall be 2,000 (two thousand) mm for each kilometer.

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

2.4 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.

2.5 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.

2.6 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.

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 and 12.4)

PROVISIONAL 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 the ***"*Rehabilitation and Upgradation of Nongstoin-Rambrai-Kyrshai road up to Meghalaya-Assam Border from km 0.335 to km 34.039 to 2-Lane under SARDP-NE "Phase-A" in the state of Meghalaya on EPC mode (Package-I)**(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 undertaken to determine compliance of the Project Highway with the provisions of the Agreement.

2 Works that are incomplete on account of Time Extension have been specified in the Punch List appended hereto, and the Contractor has agreed and accepted that it shall complete all such works in the time and manner set forth in the Agreement. In addition, certain minor works are incomplete and these are not likely to cause material inconvenience to the Users of the Project Highway or affect their safety. The Contractor has agreed and accepted that as a condition of this Provisional Certificate, it shall complete such minor works within 30 (thirty) days hereof. These minor works have also been specified in the aforesaid Punch List.

3 In view of the foregoing, I am satisfied that the **Project Highway *"*Rehabilitation and Upgradation of Nongstoin-Rambrai-Kyrshai road up to Meghalaya-Assam Border from km 0.335 to km 34.039 to 2-Lane under SARDP-NE "Phase-A" in the state of Meghalaya on EPC mode (Package-I)*"*** can be safely and reliably placed in service of the Users thereof, and in terms of the Agreement, the Project Highway is hereby provisionally declared fit for entry into operation on this the …… day of …….. 20…...

ACCEPTED, SIGNED, SEALED AND DELIVERED For and on behalf of CONTRACTOR by:	SIGNED, SEALED AND DELIVERED For and on behalf of AUTHORITY's ENGINEER by:
(Signature)	(Signature)

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 the *"*Rehabilitation and Upgradation of Nongstoin-Rambrai-Kyrshai road up to Meghalaya-Assam Border from km 0.335 to km 34.039 to 2-Lane under SARDP-NE "Phase-A" in the state of Meghalaya on EPC mode (Package-I)*"*** (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…..

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

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

1.2 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.

1.3 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

2.1 The following percentages shall govern the payment reduction:

S. No.	**Item/Defect/Deficiency**	**Percentage**
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, rain cuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
S. No.	**Item/Defect/Deficiency**	**Percentage**
(ii)	Any Defects in superstructures, bearings and sub-structures	10%
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
(d)	**Roadside Drains**	
(i)	Cleaning and repair of drains	5%
(e)	**Road Furniture**	

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

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

R=P/IOO x M x L1/L

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

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

L1 = Non-complying length

L = Total length of the road,
R = Reduction (the amount to be deducted for 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 18.1.1)

SELECTION OF AUTHORITY'S ENGINEER

1 Selection of Authority's Engineer

1.1 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.

1.2 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

1.1 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 **Authority")** and ..... (the "**Contractor**") for **the "*Rehabilitation and Upgradation of Nongstoin-Rambrai-Kyrshai road up to Meghalaya-Assam Border from km 0.335 to km 34.039 to 2-Lane under SARDP-NE "Phase-A" in the state of Meghalaya on EPC mode (Package-I)*** and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

1.2 The TOR shall apply to construction and maintenance of the Project Highway.

2 Definitions and interpretation

2.1 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.

2.2 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.

2.3 The rules of interpretation stated in Clauses 1.2, 1.3 and 1.4 of the Agreement shall apply, *mutatis mutandis*, to this TOR.

3. General

3.1 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.

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

(a) any Time Extension;
(b) any additional cost to be paid by the Authority to the Contractor;
(c) the Termination Payment; or
(d) any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding Rs. 5,000,000 (Rs. fifty lakh).

3.3 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.

3.4 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.

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

3.6 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

4.1 During the Construction Period, the Authority's Engineer shall review the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1.6. The Authority's Engineer shall complete such review and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended up to 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

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

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

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

4.5 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.

4.6 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.

4.7 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.

4.8 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.

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

4.10 The Authority's Engineer shall test check at least 20 (twenty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

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

4.12 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.

4.13 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.

4.14 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.

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

4.16 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.

4.17 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.

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

5. Maintenance Period

5.1 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.

5.2 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.

5.3 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.

5.4 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.

5.5 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

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

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

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

7. Payments

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

7.2 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.

7.3 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.

7.4 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

9.1 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.

9.2 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.

9.3 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.

9.4 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.

9.5 The Authority's Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence

SCHEDULE - O

(See Clauses 19.4.1, 19.6.1, and 19.8.1)
Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

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

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

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

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

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

(f) Deductions:

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

(ii) Any amount towards deduction of taxes; and

(i) 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

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

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

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

1.2. The insurance under paragraph 1.1 (a) and (b) above shall cover the Authority and the Contractor against all loss or damage from whatsoever cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

2. Insurance for Contractor's Defects Liability

The Contractor shall effect and maintain insurance cover for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and 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

3.1 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 the value of the Contract Price.

3.2 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 **"Rehabilitation and Upgradation of Nongstoin-Rambrai-Kyrshai road up to Meghalaya-Assam Border from km 0.335 to km 34.039 to 2-Lane under SARDP-NE "Phase-A" in the state of Meghalaya on EPC mode (Package-I)"** (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 *****