National Highways & Infrastructure Development Corporation Limited

EPC Schedules

FOR

Package-II - Improvement to 2 lane with paved shoulder of NH-40 section from Km 93+490 to Km 123+800 (design Km 10+670 to Km 37+550) design length 26.55 km in the State of Meghalaya on EPC Mode under JICA Loan Assistance

NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD

(MINISTRY OF ROAD TRANSPORT & HIGHWAYS, GOVT. OF INDIA)

June, 2020

NHIDCL, 3RD FLOOR, PRESS TRUST OF INDIA BUILDING, 4, PARLIAMENT STREET, NEW DELHI – 110001

SCHEDULE - A

(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

1 The Site

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

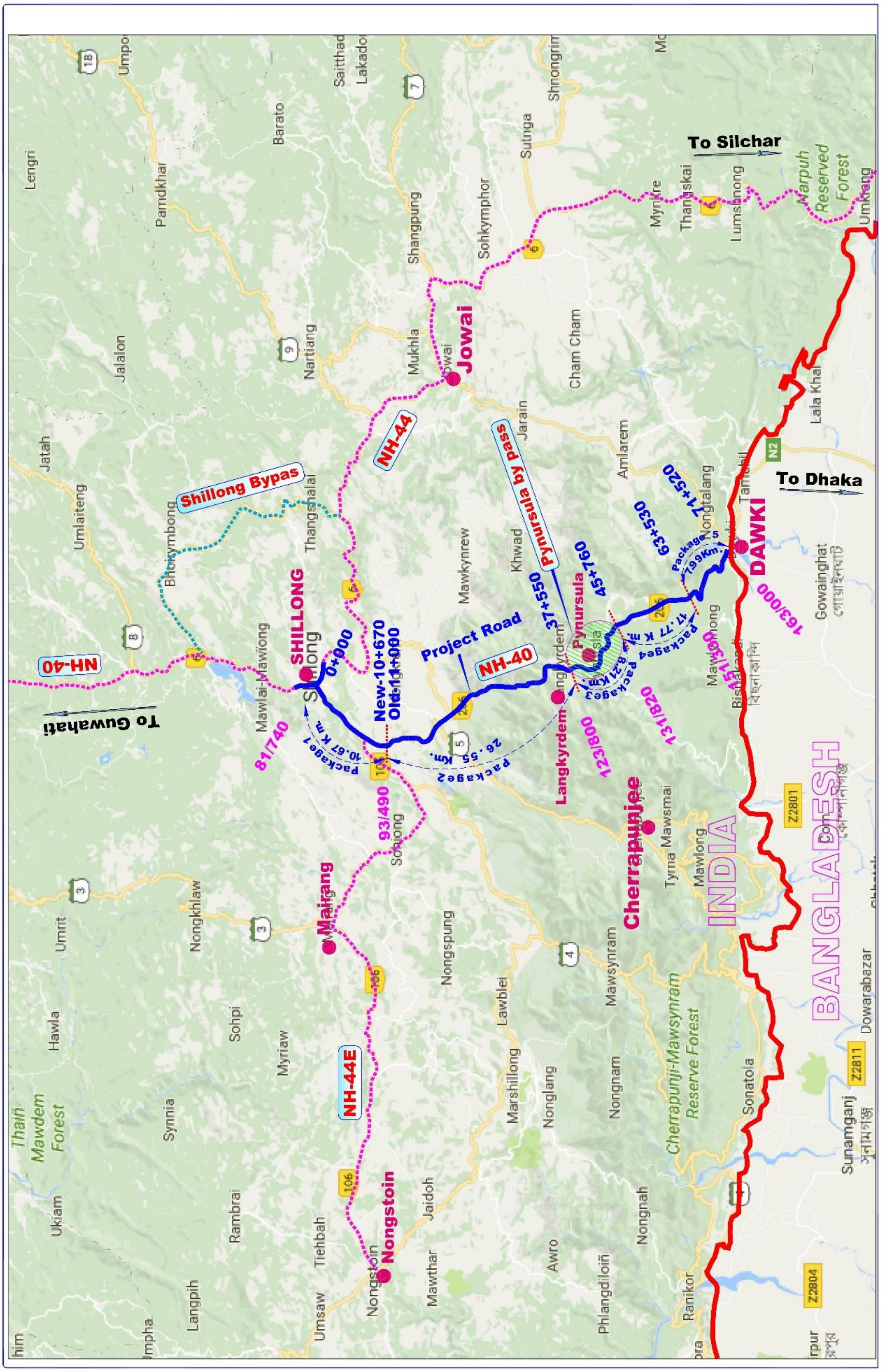
(ii) The dates of handing over the Right of Way to the Contractor are specified in **Annex-II** of this **Schedule-A**.

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

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

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

Index Map


To Silchar
To Dhaka
To Guwahati
Shillong Bypass
NH-44
NH-40
NH-44E
SHILLONG
Jowai
Project Road
Pynursula by pass
Pynursula
DAWKI
Langkyrdem
Cherrapunjee
Mairang
Nongstoin
INDIA
BANGLADESH
0+000
New-10+670
Old-11+000
37+550
45+160
63+530
71+520
81/740
93/490
123/800
131/820
163/000
Package 1 10.67 Km.
Package 2 26.55 Km.

Annex-I

(Schedule-A)

SITE

1. Site

The project road from Shillong to Dawki is a section of NH-40 starting from existing km.93/490 (New design ch. 10+670/ old design ch. 11+000 at a junction with Marbajan village road) and ending at existing km.123/800 (design ch. 37+550, just before Pynursula bypass start point) in the State of Meghalaya. The land, carriageway and structures comprising the Site are described below.

2. Land

The Site of the Project Highway comprises the land as described below:

S. No.	Chainage (km)		ROW (m)
	From	To	
1	93/490	123/800	12 m

3. Carriageway

The present carriageway of the Project Highway is two Lane. The type of existing pavement is flexible. The details are given below.

S. no	Existing Chainage. From	Existing Chainage. To	C/W width (m)
1	93/490	120/700	6.5 - 7.0
2	120/700	123/800	5.5 – 6.0

4. Major Bridges

The Site includes the following Major Bridges:

S. No.	Existing Chainage (Km)	Type of Structure			Span Arrangement (m)	Width (m)
		Foundation	Sub-structure	Super structure		
Nil						

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

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

S. No.	Existing Chainage (Km)	Type of Structure		Span Arrangement (m)	Width (m)
		Foundation	Super structure		
Nil					

6. Grade separators

The Site includes the following grade separators:

S. No.	Existing Chainage (Km)	Type of Structure		Span Arrangement (m)	Width (m)
		Foundation	Super structure		
Nil					

7. Minor bridges

The Site includes the following minor bridges:

S. No.	Existing Chainage/ (Km)	Type of Structure			No of spans with Span Length (m)	Width (m)
		Foundation	Sub structure	Super Structure		
1	96/777	Open	RCC Wall	RCC T-beam	1 x 25.4	8.4
2	100/808	Open	RCC Wall/ Circular Pier	RCC T-beam	1x9.6 + 1x25.5 + 1x9.6 (Skew)	8.4
3	101/930	Open	RCC Wall	RCC T-beam	1 x 25.0	11.5
4	107/487	Open	RCC Wall	RCC T-beam	1 x 25.4	8.4

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location (km)	Remarks
NIL		

9. Underpasses (vehicular, non-vehicular)

The Site includes the following underpasses:

S.No	Existing Chainage (Km)	Type of structure	No. of span with Span Arrangement (m)	width (m)
Nil				

10. Culverts

The Site has the following culverts:

S. No.	Existing Chainage	Type of Culvert	No. x span length /diameter (m)	Width (m)	Remarks
1	93/500	Pipe	1 x 0.90	8.70	
2	93/600	Pipe	1 x 0.90	9.80	
3	93/680	Slab	2 x 2.00	10.00	
4	93/750	Slab	1 x 1.00	9.60	
5	93/900	Pipe	1 x 0.90	9.60	
6	94/000	Box	1 x 1.00	9.80	
7	94/500	Box	1 x 1.10	11.00	
8	94/600	Pipe	1 x 0.90	7.30	
9	94/750	Box	1 x 1.10	10.00	
10	94/950	Slab	1 x 0.90	10.00	
11	96/050	Pipe	1 x 0.90	9.20	
12	96/130	Pipe	1 x 0.90	10.00	
13	96/350	Slab	1 x 0.70	9.50	
14	96/500	Pipe	1 x 0.90	12.40	

S. No.	Existing Chainage	Type of Culvert	No. x span length /diameter (m)	Width (m)	Remarks
15	97/350	Slab	1 x 5.50	10.00	
16	97/700	Pipe	1 x 0.90	9.20	
17	97/750	Pipe	1 x 0.90	8.80	
18	97/950	Pipe	2 x 0.60	9.80	
19	98/100	Pipe	1 x 0.90	9.20	
20	98/450	Pipe	1 x 0.90	7.50	
21	98/690	Pipe	1 x 0.90	10.00	
22	98/800	Slab	1 x 0.50	10.80	
23	98/850	Pipe	2 x 0.90	7.50	
24	98/980	Pipe	1 x 0.90	9.60	
25	99/200	Pipe	1 x 0.90	7.50	
26	99/350	Pipe	1 x 0.60	7.50	
27	99/700	Pipe	1 x 0.60	8.50	
28	99/800	Pipe	1 x 0.60	9.60	
29	99/860	Pipe	1 x 0.90	9.60	
30	99/910	Pipe	1 x 0.90	9.40	
31	99/940	Pipe	1 x 0.90	10.10	
32	100/150	Pipe	1 x 0.60	10.40	
33	100/250	Pipe	1 x 0.60	10.40	
34	100/400	Pipe	1 x 0.60	7.70	
35	100/500	Pipe	1 x 0.60	7.70	
36	100/550	Pipe	1 x 0.60	8.80	
37	100/650	Pipe	1 x 0.60	8.10	
38	100/750	Pipe	1 x 0.90	9.60	
39	100/810	Pipe	1 x 0.90	14.50	
40	101/200	Pipe	1 x 0.90	10.50	
41	101/500	Pipe	1 x 0.90	8.80	
42	101/700	Slab	1 x 1.00	9.50	
43	101/850	Pipe	1 x 0.90	18.00	
44	102/150	Pipe	1 x 0.60	10.60	
45	102/350	Arch	1 x 3.00	10.00	
46	102/500	Pipe	1 x 0.90	10.60	
47	102/530	Pipe	1 x 0.90	9.90	
48	102/700	Pipe	1 x 0.60	9.70	
49	102/800	Pipe	1 x 0.90	9.00	
50	102/850	Pipe	1 x 0.90	9.00	
51	102/900	Pipe	1 x 0.90	9.80	

S. No.	Existing Chainage	Type of Culvert	No. x span length /diameter (m)	Width (m)	Remarks
52	102/950	Pipe	1 x 0.90	9.60	
53	103/020	Pipe	1 x 1.20	9.60	
54	103/200	Pipe	1 x 0.60	9.50	
55	103/350	Pipe	1 x 0.90	7.80	
56	103/450	Pipe	1 x 0.90	7.40	
57	103/530	Pipe	1 x 0.90	8.20	
58	103/670	Pipe	1 x 0.90	8.60	
59	103/950	Pipe	1 x 0.90	7.90	
60	104/420	Slab	2 x 1.50	9.00	
61	104/770	Pipe	1 x 0.60	8.70	
62	104/930	Pipe	1 x 0.60	9.30	
63	105/080	Arch	1 x 3.00	8.60	
64	105/500	Pipe	1 x 0.60	8.20	
65	106/080	Pipe	1 x 0.60	8.30	
66	106/430	Pipe	1 x 0.60	7.10	
67	106/570	Slab	1 x 1.00	8.40	
68	106/670	Pipe	1 x 0.90	10.90	
69	106/820	Pipe	1 x 0.90	8.40	
70	107/170	Pipe	1 x 0.90	11.00	
71	107/500	Pipe	1 x 0.90	8.90	
72	107/570	Pipe	1 x 0.90	15.00	
73	107/690	Pipe	1 x 0.90	11.80	
74	107/850	Pipe	1 x 0.90	11.00	
75	107/970	Pipe	1 x 0.90	11.70	
76	108/200	Pipe	1 x 0.90	12.50	
77	108/700	Pipe	1 x 0.90	9.20	
78	108/800	Pipe	1 x 0.90	8.20	
79	108/900	Pipe	1 x 0.90	8.50	
80	109/080	Pipe	1 x 0.90	8.80	
81	109/180	Pipe	1 x 0.90	5.40	
82	109/400	Pipe	1 x 0.90	8.60	
83	109/600	Pipe	1 x 0.90	8.80	
84	109/850	Pipe	1 x 0.90	9.10	
85	110/050	Slab	1 x 6.00	11.80	
86	110/150	Pipe	1 x 0.90	9.20	
87	110/400	Slab	1 x 3.20	11.60	
88	110/650	Slab	1x1.00	10.00	

S. No.	Existing Chainage	Type of Culvert	No. x span length /diameter (m)	Width (m)	Remarks
89	110/850	Pipe	1 x 0.90	11.60	
90	110/985	Pipe	1 x 0.90	11.60	
91	111/070	Pipe	1 x 0.90	11.20	
92	111/200	Pipe	1 x 0.90	9.80	
93	111/400	Pipe	1 x 0.90	9.50	
94	111/580	Slab	1 x 3.20	7.80	
95	111/700	Pipe	1 x 0.90	11.20	
96	111/850	Pipe	1 x 1.00	12.30	
97	111/900	Pipe	1 x 0.90	9.60	
98	111/950	Slab	1 x 1.20	9.60	
99	111/980	Pipe	1 x 0.90	9.60	
100	112/040	Slab	1 x 3.50	9.80	
101	112/120	Slab	1 x 1.20	9.20	
102	112/180	Slab	1 x 4.50	9.70	
103	112/220	Pipe	1 x 0.90	13.80	
104	112/500	Box	1 x 2.00	7.00	
105	112/740	Pipe	1 x 0.90	11.50	
106	113/200	Pipe	1 x 0.90	9.00	
107	113/300	Pipe	1 x 0.90	9.00	
108	113/400	Pipe	1 x 0.90	8.80	
109	113/500	Pipe	1 x 0.90	8.80	
110	113/600	Pipe	1 x 0.90	8.80	
111	113/650	Pipe	1 x 0.90	9.80	
112	114/000	Pipe	1 x 0.90	11.00	
113	114/150	Pipe	1 x 0.90	8.50	
114	114/190	Pipe	1 x 0.90	14.00	
115	114/380	Pipe	1 x 0.90	8.10	
116	114/430	Pipe	1 x 0.90	8.20	
117	114/570	Pipe	1 x 0.90	8.10	
118	114/610	Pipe	1 x 0.90	9.60	
119	114/710	Pipe	1 x 0.90	10.00	
120	114/800	Pipe	1 x 0.90	11.00	
121	114/900	Pipe	1 x 0.90	9.80	
122	114/950	Pipe	1 x 0.90	9.80	
123	115/020	Pipe	1 x 0.90	10.30	
124	115/300	Pipe	1 x 1.20	13.30	
125	115/430	Pipe	1 x 0.90	8.80	

S. No.	Existing Chainage	Type of Culvert	No. x span length /diameter (m)	Width (m)	Remarks
126	115/470	Pipe	1 x 0.60	11.10	
127	115/680	Pipe	1 x 0.90	8.20	
128	115/780	Pipe	1 x 0.90	9.20	
129	115/880	Pipe	1 x 0.90	12.60	
130	115/940	Pipe	1 x 0.90	9.30	
131	116/050	Pipe	1 x 0.90	10.20	
132	116/220	Pipe	1 x 0.90	9.20	
133	116/310	Pipe	1 x 0.90	9.40	
134	116/400	Pipe	1 x 0.90	9.80	
135	116/500	Slab	1 x 1.00	10.00	
136	116/580	Slab	1 x 1.00	10.00	
137	116/600	Pipe	1 x 0.90	9.40	
138	116/650	Pipe	1 x 0.90	8.20	
139	116/730	Pipe	1 x 0.90	8.20	
140	116/810	Pipe	1 x 0.90	9.20	
141	116/950	Pipe	1 x 0.90	9.10	
142	117/000	Pipe	1 x 0.90	9.50	
143	117/070	Slab	1 x 1.00	8.20	
144	117/150	Slab	1 x 1.00	8.30	
145	117/200	Pipe	1 x 0.90	10.10	
146	117/250	Slab	1 x 1.00	7.80	
147	117/310	Slab	1 x 1.00	8.40	
148	117/380	Pipe	1 x 0.90	8.10	
149	117/440	Pipe	1 x 0.90	8.20	
150	117/520	Pipe	1 x 0.90	8.10	
151	117/750	Pipe	1 x 0.90	9.10	
152	117/810	Pipe	1 x 0.90	11.00	
153	118/560	Pipe	1 x 0.90	8.20	
154	118/670	Pipe	1 x 0.90	7.40	
155	119/450	Pipe	1 x 0.90	8.60	
156	119/570	Pipe	1 x 0.90	6.70	
157	119/620	Pipe	1 x 0.90	6.80	
158	119/670	Pipe	1 x 0.90	6.80	
159	119/870	Pipe	1 x 0.90	6.80	
160	119/900	Slab	1X0.50	9.50	
161	119/950	Slab	1X0.50	9.50	
162	119/980	Pipe	1 x 0.90	7.60	

S. No.	Existing Chainage	Type of Culvert	No. x span length /diameter (m)	Width (m)	Remarks
163	120/020	Pipe	1 x 1.20	7.60	
164	120/100	Pipe	1 x 1.20	7.90	
165	120/270	Pipe	1 x 1.00	11.10	
166	120/400	Pipe	1 x 1.00	11.50	
167	120/420	Pipe	1 x 1.00	12.00	
168	120/460	Slab	1 x 1.00	10.20	
169	120/980	Pipe	1 x 0.90	7.90	
170	121/250	Slab	1 x 1.00	6.20	
171	121/380	Pipe	1 x 0.90	7.40	
172	121/510	Slab	1 x 0.50	6.80	
173	121/530	Slab	1 x 0.50	9.50	
174	122/160	Slab	1 x 0.80	7.60	
175	122/260	Slab	1 x 0.80	7.50	
176	122/320	Pipe	1 x 1.00	11.00	
177	122/360	Pipe	1 x 0.90	8.00	
178	122/400	Pipe	1 x 0.90	7.30	
179	122/440	Pipe	1 x 0.90	10.40	
180	122/500	Pipe	1 x 0.90	9.30	
181	122/580	Pipe	1 x 1.00	9.30	
182	122/780	Pipe	1 x 0.90	8.30	
183	122/820	Pipe	1 x 0.90	8.30	
184	122/980	Pipe	1 x 0.90	9.10	
185	123/050	Pipe	1 x 0.90	9.10	
186	123/090	Pipe	1 x 0.90	8.40	
187	123/180	Pipe	1 x 0.60	9.00	
188	123/270	Pipe	1 x 0.90	8.80	
189	123/330	Pipe	1 x 0.90	8.80	
190	123/350	Pipe	1 x 0.90	8.80	
191	123/370	Pipe	1 x 0.90	9.00	
192	123/410	Pipe	1 x 0.90	8.10	
193	123/500	Pipe	1 x 0.90	8.10	
194	123/650	Pipe	1 x 0.90	8.10	
195	123/730	Pipe	1 x 0.90	9.70	

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 the road side drains are as follows:

S. No.	Location		Type & Side	
	From	To	Masonry/cc (Pucca)	Earthen (Kutcha)
1	93/600	93/800	LHS	-
2	94/900	95/000	LHS	-
3	95/900	96/600	LHS	-
4	99/100	99/200	LHS	-
5	100/000	100/100	RHS	-
6	100/500	100/900	RHS	-
7	101/000	101/300	RHS	-
8	101/600	102/100	LHS	-
9	113/000	113/100	RHS	-
10	114/000	114/200	LHS	-
11	114/300	115/100	RHS	-
12	115/900	116/100	LHS	-
13	121/500	122/000	RHS	-
14	122/000	122/300	LHS	-
15	122/300	122/900	RHS	-
16	122/900	123/200	LHS	-

14. Major junctions

The details of major junctions are as follows:

S. No	Existing Chainage	Lane Configuration	Type	Sides	Remarks
1	101/200	2-Lane	Y Junction	RHS	With SH 5

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

15. Minor junctions

The details of the minor junctions (all at grade) are as follows:

S. No.	Location of Intersection	Type of Intersection	Other features (Road Leading To)	
			LHS	RHS
1	93/520	Y Junction		Marbajan
2	93/590	T Junction	Marbaniang	

S. No.	Location of Intersection	Type of Intersection	Other features (Road Leading To)	
			LHS	RHS
3	93/970	Y Junction		Marbaniang
4	94/350	T Junction		Marbaniang
5	94/800	T Junction		Mylliem
6	95/820	T Junction	Mawiong	
7	96/520	Y Junction		Mylliem
8	99/120	T Junction	Mawan	
9	102/755	T Junction	Laitlingkot	
10	107/09	Y Junction		Laitlingkot
11	112/980	Y Junction		Pammum village
12	115/170	T Junction	Surok	
13	121/870	Y Junction	-	Mawlieh
14	122/150	Y Junction	Lyngkyerdem	-

16. Bypasses

The details of the bypasses are as follows:

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

17. Other structures

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

17. Design Chainages corresponding to Existing references

Sl. no.	Existing Chainage	Proposed Chainage
1	93/490	New 10+670 / 11+000
2	94/000	11+590
3	94/510	12+000
4	94/780	12+260
5	96/650	14+320
6	97/400	15+000
7	98/000	15+570
8	98/430	16+000
9	99/000	16+550
10	99/460	17+000
11	100/000	17+470
12	100/630	18+000

Sl. no.	Existing Chainage	Proposed Chainage
13	102/000	18+700
14	102/300	19+000
15	103/000	19+560
16	103/280	19+840
17	107/220	22+770
18	107/420	23+000
19	108/000	23+460
20	108/540	24+000
21	109/000	24+340
22	109/840	25+000
23	110/000	25+160
24	110/930	26+000
25	111/000	26+070
26	112/000	27+000
27	113/000	27+890
28	113/110	28+000
29	114/000	28+890
30	114/110	29+000
31	114/620	29+500
32	115/000	29+860
33	116/120	30+600
34	116/600	31+000
35	117/000	31+400
36	117/820	32+000
37	118/000	32+180
38	118/920	33+000
39	119/000	33+080
40	120/000	33+940
41	120/140	34+000
42	120/720	34+600
43	120/720	34+600
44	122/000	35+800
45	122/250	36+000
46	123/000	36+750
47	123/250	37+000
48	123/800	37+550

Annex – II

(See Clauses 8.3 (i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

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

Sl. No	From	To	Length (km)	Width (m)	Date of providing RoW
1	New 10+670 / 11+000	37+550	26.550	24m to 60m	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, the finished road level of the project highway shall not be less than those indicated in the alignment plan. The contractor shall, however, improve/upgrade the Road profile as indicated in **Annex-III** based on site/design requirement.

(ii) Signage plan of the project highway is enclosed. The contractor shall, however, improve/upgrade upon the traffic signage plan as indicated in **Annex-III** based on site/design requirement as per the relevant specifications/IRC codes/Manual.

Annex - IV

(Schedule-A)

Environment Clearances

The project highway does not require environment clearance as per MoEF circular F. No. 21-270/2008-1A.III (dated 22 August 2013).

The muck dumping sites should be identified by the EPC contractor in consultation with the Authority Engineer and forest department for dumping of muck as stated in Schedule F.

Schedule-B

SCHEDULE - B

(See Clause 2.1)

DEVELOPMENT OF THE PROJECT HIGHWAY

1 Development of the Project Highway

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

2. Rehabilitation and Augmentation

Widening and upgradation shall include Two-Laning with Paved shoulder of the Project Highway as described in **Annex-I** of this **Schedule-B** and in **Schedule-C**.

3 Specifications and Standards

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

Annex - I

(Schedule-B)

DESCRIPTION OF PROJECT

Site of the Two-lane with paved shoulder Highway comprises between Shillong to Dawki section (from new design ch. 10+670 / old design ch. 11+000 to ch. 37+550), Design Length = 26.55 km in the State of Meghalaya for execution on EPC Mode under JICA, Package-II

1 Widening of existing Highway

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

(ii) Width of Carriageway

(a) Two-Lanning with paved shoulders shall be undertaken. The paved carriageway shall be in accordance with the typical cross sections given in **Appendix B-I of Schedule –B**. Additional widths for widening at horizontal curve shall be as per the Schedule D.

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

S. No.	Built-up Section Township	Design Chainage		Width of Paved carriageway (m)	TCS Type
		From	To		
1	3rd Mile	New 10+670/ Old 11+000	12+400	10	Type 4
2	Pombot	15+700	17+000	10	Type 4
3	Pomlum	27+800	28+200	10	Type 4
4	Mawkajem	28+800	29+400	10	Type 4

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

(c) All the cross-sectional elements are to be accommodated within the proposed ROW. If required, suitable retaining structures along with

drainage system shall be provided as per site condition and this will not attract any change of scope.

2 Geometric Design and General Features

(i) General

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

(ii) Design speed

The design speed shall be ruling speed of 60 km per hour and minimum speed of 40 km per hour.

(iii) Improvement of the existing road geometrics

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

Bypasses and Realignments

Sl. No	Exist. Chainage		Exist. Length (m)	Design Chainage		Design Length (m)	Remarks
	Start	End		Start	End		
1	94+780	96+650	1870	12+260	14+320	2060	Mylliem Bypass
2	103+280	107+220	3940	19+840	22+770	2930	Laitlingkot Bypass
3	114+620	116+120	1500	29+500	30+600	1100	Mawkajum Re-alignment
	Total Length (m)		**7310**			**6090**	

Locations of Geometric Improvements

Sl. No	Existing Chainage		Existing Length (m)	Design Chainage		Design Length (m)
	Start	End		Start	End	
1	93/490	94/365	875	New 10+670/ Old 11+000	11+920	920
2	96/765	97/200	435	14+440	14+860	420
3	97/895	98/070	175	15+470	15+630	160
4	98/520	103/280	4760	16+080	19+840	3760
5	107/220	112/900	5680	22+770	27+810	5040
6	114/180	114/620	440	29+050	29+500	450
7	117/400	120/720	3320	31+800	34+600	2800
8	120/720	121/845	1125	34+600	35+630	1030

Sl. No	Existing Chainage		Existing Length (m)	Design Chainage		Design Length (m)
	Start	End		Start	End	
	Total Length (m)		16810			14580

Apart from above, the existing road geometric deficiencies, if any shall be corrected as per the manual to the extent possible within given right of way

(iv) Right of Way

The site of the project highway comprises the land as described in **Annex-II** of **Schedule-A.**

(v) Type of shoulders

(a) In built-up sections, Footpaths/covered drains shall be provided as per site condition in accordance with Schedule D.

(b) In open country, paved shoulders of 1.5 m width shall be provided and balance 1.0 m shall be covered with granular material in full depth up to GSB layer as shown in typical cross section.

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

(vi) Lateral and vertical clearances at underpasses

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

(b) Lateral clearance: The width of the opening and vertical clearances at underpasses shall be as follows:

S. No.	Design Chainage	Clear span/opening (m)	Vertical Clearance (m)	Remarks
1	12+760	1 x 7.0	4.0	SVUP
2	13+148	1 x 7.0	4.0	SVUP
3	21+250	1 x 7.0	4.0	SVUP

SVUP: Small Vehicular Underpass;

(vii) Lateral and vertical clearances at overpasses

(a) Lateral and vertical clearances at overpasses shall be as per paragraph 2.11 of the Manual.

(b) Lateral clearances at overpasses shall be as follows:

S. No.	Design Chainage	Clear Span (m)	Vertical Clearance (m)	Remarks
1	12+699	1 x 35.0	9.50	VOP
2	13+788	1 x 35.0	9.50	VOP
3	20+370	1 x 35.0	5.50	VOP

S. No.	Design Chainage	Clear Span (m)	Vertical Clearance (m)	Remarks
4	21+519	1 x 35.0	10.00	VOP

(viii) Slip Roads/Service Roads

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

Ch. From	Ch. To	Width	Length (m)	Remarks
			nil	

(ix) Grade separated structures

(a) Grade separated structures shall be provided as per paragraph 2.13 of the Manual. The requisite particulars are given below:

i) Overpass

Sl.No.	Design Chainage	Span arrangement(m)	Road to be carried under the structure	Width of Structure (m)
1	12+699	1 x 35.0	NH-40	1x6.50
2	13+788	1 x 35.0	NH-40	1x6.50
3	20+370	1 x 35.0	NH-40	1x6.50
4	21+519	1 x 35.0	NH-40	1x6.50

ii) Vehicular Underpass (VUP)

Sl. No.	Design Chainage	Span arrangement (m)	Road to be carried under the structure	Min. Vertical clearance (m)	Width of Structure (m)
			nil		

iii) Light Vehicular Underpass

S. No.	Design Chainage	Span arrangement(m)	Road to be carried under the structure	Min. Vertical clearance (m)	Width of Structure (m)
			Nil		

iv) Small Vehicular Underpass

S. No.	Design Chainage	Span arrangement(m)	Road to be carried under the structure	Min. Vertical clearance (m)	Width of structure (m)
1	12+760	1 x 7.0	Village Road	4.0	1 x 12
2	13+148	1 x 7.0	Village Road	4.0	1 x 12
3	21+250	1 x 7.0	Village Road	4.0	1 x 12

Note: -

(i) Any Change in location/width shall not constitute as Change of Scope or any other claim whatsoever.

(ii) IRC Class Special Vehicle loading shall be taken into account in the structural design of bridges/Flyover/VUP.

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

S. No.	Location (Design Chainage)	Type of Structure	Cross road at		
			Existing level	Raised Level	Lowered Level
1	12+699	VOP	Village Road		NH-40
2	12+760	SVUP	Village Road	NH-40	
3	13+148	SVUP	Village Road	NH-40	
4	13+788	VOP	Mylliem - Pomlakrai Road		NH-40
5	20+370	VOP	Laitlyngkot - Pomlakrai Road		NH-40
6	21+250	SVUP	Village Road	NH-40	
7	21+519	VOP	Village Road		NH-40

(x) Cattle and pedestrian under pass / over pass

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

Sl. No.	Location	Type of crossing
NIL		

(xi) Typical cross-sections of the Project Highway

The schedule of typical cross-sections is given in the table below. Drawings of typical cross-sections are given in **Appendix B-I**.

S. no.	Design chainage		Length (m)	TCS Type
	From	To		
1	11+000	37+550	26550	Type - 4

Note :

(i) The length shown in above table for TCS are minimum and increase in length for type of TCS will not attract COS.

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 table below:

(i) At grade Intersections

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

Sl. No	Proposed Chainage	Classification of cross road	Type of Junction (T,Y,+)	Type of Cross Road	Side	Road Leading to
	Major Junctions					
1	18+520	SH 5	Y Junction	2-Lane BT	Right	Cherrapungi
	Minor Junctions					
1	11+140	Village Road	T Junction	1-Lane BT	Left	Marbaniang
2	11+760	Village Road	Y Junction	1-Lane BT	Right	Marbaniang
3	11+795	Village Road	T Junction	1-Lane BT	Right	Marbaniang
4	12+280	Existing NH40	T Junction	2-Lane BT	Right	Mylliem
5	13+340	Village Road	T Junction	1-Lane BT	Left	Mawiong
6	14+320	Existing NH40	Y Junction	2-Lane BT	Right	Mylliem
7	16+685	MDR 31	T Junction	Intermediate Lane BT	Left	Mawan
8	19+850	Existing NH40	T Junction	2-Lane BT	Left	Laitlingkot
9	22+640	Existing NH40	Y Junction	2-Lane BT	Right	Laitlingkot
10	27+980	Village Road	Y Junction	1-Lane BT	Right	Pammum village
11	30+650	Village Road	T Junction	1-Lane BT	Left	Surok
12	35+670	Village Road	Y Junction	1-Lane BT	Right	Mawlieh
13	35+950	Village Road	Y Junction	1-Lane BT	Left	Lyngkyerdem

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

(ii) Grade separated intersection without ramps

S. No.	Design Chainage	Salient Feature (Formation width) (m)	Minimum Length of Viaduct (m)	Road to be carried Under structure	Type of Structure
			NIL		

4 Road Embankment and Cut Section

(i) Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/ cuttings shall conform to the Specifications and Standards given in Section 4 of the Manual and the specified

cross sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

(ii) Raising of the existing road/New carriageway

The existing road shall be raised as per design requirements in accordance with the manual in conformity to the minimum FRL.

The Contractor may adopt suitable slope (angle) for the embankment as per the availability of fill material/design requirements. The slopes shall be checked for safety against failure. The slopes shall be protected with turfing/geo synthetics /geo green blanket/geo cells/stone pitching or any other method as per schedule D.

Wherever required, toe wall/retaining wall/other protection works along with drainage system shall be provided to contain the toe of the earthwork, so that all the features shown in the TCS are accommodated in the ROW provided.

(iii) All of surplus cutting soils shall be transported and be disposed to the Spoil Banks in accordance with the Clause 3.1 of Schedule D.

5 Pavement Design

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

(ii) Type of pavement

Flexible pavement shall be provided for the entire length of project highway and rigid pavement shall be provided at Toll Plaza approaches.

(iii) Design requirements - as per paragraph 5.4, 5.9 and 5.10 of the manual.

(a) Design Period and strategy

Flexible pavement shall be designed for a minimum design period of 20 years and rigid pavement for 30 years. Stage construction shall not be permitted.

(b) Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for design traffic of not less than 30 MSA.

(iv) Reconstruction of Stretches

The entire stretch of the existing road shall be reconstructed.

6 Road Side Drainage

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

(a) Covered drain / open drain shall be provided in the following stretches

Sl. No	Left			Right		
	From	To	Length (m)	From	To	Length (m)
i) Covered Drain Locations						
			nil			
ii) Lined Open drain locations (On Hill Side)						
1	11+680	12+730	1050	12+280	12+750	470
2	13+680	14+340	660	13+670	13+820	150
3	14+400	14+950	550	15+000	16+800	1800
4	16+380	16+560	180	17+940	18+130	190
5	16+800	18+150	1350	18+200	18+530	330
6	18+200	18+410	210	18+710	18+900	190
7	19+050	19+730	680	19+850	20+460	610
8	20+300	21+150	850	21+330	21+840	510
9	21+300	21+850	550	22+650	23+010	360
10	22+020	22+450	430	23+090	28+000	4910
11	22+550	22+700	150	29+370	30+580	1210
12	27+890	29+350	1460	34+630	35+750	1120
13	30+670	34+500	3830	-	-	-
14	35+750	37+550	1800	-	-	-
Total Length (m)			**13750**	**Total Length (m)**		**11850**
iii) Lined Open drain locations (On Valley Side)						
1	23+130	23+200	70	13+930	14+020	90
2	23+280	23+380	100	14+080	14+150	70
3	24+240	24+420	180	14+210	14+310	100
4	24+490	24+590	100	14+400	14+540	140
5	24+680	24+860	180	17+490	17+580	90
6	25+420	25+550	130	17+700	17+840	140
7	26+240	26+340	100	22+280	22+430	150
8	26+530	26+660	130	29+140	29+220	80
9	29+450	29+570	120	31+850	31+990	140
10	29+890	30+220	330	32+290	32+490	200
11	34+970	35+190	220	32+540	32+650	110
12	35+210	35+350	140	33+755	33+845	90
13				34+190	34+400	210
Total Length (m)			**1800**	**Total Length (m)**		**1610**

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

7 Designs of Structures

(i) General

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

(b) Width of new bridges are shown as follows:.

S. No.	Design Chainage	Existing Chainage	Width of structure and cross-sectional features	Remarks
1	12+997	realignment	16.00 m	New 2 lane in Mylliem Bypass
2	14+376	96/777	13.00 m	Existing retain + New 2 lane
3	18+178.03	100/808	13.00 m	Existing retain + new 2 lane
4	18+630	101/930	16.00 m	New 2 lane
5	23+066.97	107/487	13.00 m	Existing retain + new 2 lane

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

S. No.	Design Chainage	Existing Chainage	Remarks
1	12+997	-	2 lane bridge with both side footpath
2	14+376	96/777	2 lane bridge with One side footpath
3	18+178.031	100/808	2 lane bridge with One side footpath
4	18+630	101/930	2 lane bridge with both side footpath
5	23+066.97	107/487	2 lane bridge with One side footpath

(d) All bridges shall be high level bridges.

(e) The structures shall be designed to carry utility services like electric cable, water pipe line, OFC etc. as per the requirement of site.

(f) Cross-section of the new culverts and bridges at deck level shall conform to the typical cross-sections given in section 7 of the Manual.

(g) IRC Class Special Vehicle loading shall be taken into account in the structural design of bridges/Flyover/VUP/ROB.

(ii) Culverts

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

(b) Reconstruction of existing culverts/ New additional culverts:

Reconstruction of existing culverts / new culverts shall be provided at the following locations:

S. No.	Design Chainage	clear Span (m) (NosxLxH/dia.)	Prop. Type	Proposal for improvement
1	11+180	1 x 3.0 x 3.0	Box	New
2	11+331	1 x 3.0 x 3.0	Box	Reconstruction
3	11+540	1 x 2.0 x 2.0	Box	New
4	11+620	1 x 2.0 x 2.0	Box	New
5	12+075	1 x 2.0 x 1.5	Box	Reconstruction
6	12+210	1 x 2.0 x 2.0	Box	Reconstruction
7	12+530	1 x 3.0 x 3.0	Box	New
8	13+355	1 x 1.20	Pipe	New
9	13+521	1 x 6.0 x 4.0	Box	New
10	13+626	1 x 6.0 x 5.0	Box	New
11	13+872	1 x 3.0 x 3.0	Box	New
12	14+060	1 x 2.0 x 2.0	Box	New
13	14+185	1 x 2.0 x 1.5	Box	New
14	14+620	1 x 2.0 x 1.5	Box	Reconstruction
15	14+975	1 x 5.0 x 4.0	Box	Reconstruction
16	15+300	1 x 2.0 x 1.5	Box	Reconstruction
17	15+510	1 x 2.0 x 1.5	Box	New
18	15+655	1 x 2.0 x 1.5	Box	Reconstruction
19	15+970	1 x 2.0 x 1.5	Box	Reconstruction
20	16+210	1 x 2.0 x 1.5	Box	Reconstruction
21	16+387	1 x 2.0 x 1.5	Box	Reconstruction
22	16+530	1 x 1.20	Pipe	Reconstruction
23	16+795	1 x 2.0 x 2.0	Box	New
24	17+070	1 x 2.0 x 1.5	Box	Reconstruction
25	17+235	1 x 2.0 x 1.5	Box	Reconstruction
26	17+405	1 x 2.0 x 1.5	Box	Reconstruction
27	17+660	1 x 2.0 x 2.0	Box	New
28	17+850	1 x 2.0 x 1.5	Box	Reconstruction
29	18+950	1 x 6.0 x 6.0	Box	New
30	19+230	1 x 2.0 x 2.0	Box	New
31	19+480	1 x 2.0 x 1.5	Box	Reconstruction
32	20+030	1 x 2.0 x 1.5	Box	New
33	20+280	1 x 2.0 x 1.5	Box	New
34	20+500	1 x 2.0 x 2.0	Box	New
35	20+725	1 x 1.20	Pipe	New
36	20+880	1 x 1.20	Pipe	New
37	21+040	1 x 1.20	Pipe	New

S. No.	Design Chainage	clear Span (m) (NosxLxH/dia.)	Prop. Type	Proposal for improvement
38	21+200	1 x 4.0 x 4.0	Box	New
39	21+600	1 x 1.20	Pipe	New
40	21+990	1 x 3.0 x 3.0	Box	New
41	22+110	1 x 1.20	Pipe	New
42	22+260	1 x 1.20	Pipe	New
43	22+520	1 x 5.0 x 5.0	Box	New
44	22+735	1 x 1.20	Pipe	New
45	23+230	1 x 1.20	Pipe	Reconstruction
46	23+480	1 x 1.20	Pipe	New
47	23+630	1 x 1.20	Pipe	Reconstruction
48	23+850	1 x 2.0 x 1.5	Box	Reconstruction
49	24+050	1 x 2.0 x 1.5	Box	Reconstruction
50	24+235	1 x 2.0 x 1.5	Box	Reconstruction
51	24+455	1 x 2.0 x 1.5	Box	New
52	24+660	1 x 3.0 x 6.5	Slab	Reconstruction
53	24+890	1 x 2.0 x 1.5	Box	Reconstruction
54	25+010	1 x 1.20	Pipe	Reconstruction
55	25+198	1 x 6.0 x 7.0	Slab	Reconstruction
56	25+410	1 x 2.0 x 1.5	Box	Reconstruction
57	25+600	1 x 2.0 x 1.5	Box	New
58	25+820	1 x 2.0 x 1.5	Box	Reconstruction
59	25+950	1 x 2.0 x 1.5	Box	Reconstruction
60	26+100	1 x 2.0 x 1.5	Box	Reconstruction
61	26+345	1 x 2.0 x 1.5	Box	Reconstruction
62	26+500	1 x 2.0 x 1.5	Box	Reconstruction
63	26+670	1 x 2.0 x 1.5	Box	Reconstruction
64	26+800	1 x 2.0 x 1.5	Box	Reconstruction
65	26+890	1 x 2.0 x 1.5	Box	Reconstruction
66	27+025	1 x 2.0 x 1.5	Box	Reconstruction
67	27+150	1 x 4.0 x 7.0	Slab	Reconstruction
68	27+320	1 x 2.0 x 1.5	Box	Reconstruction
69	27+470	1 x 2.0 x 1.5	Box	Reconstruction
70	27+620	1 x 2.0 x 1.5	Box	Reconstruction
71	27+860	1 x 2.0 x 1.5	Box	Reconstruction
72	28+050	1 x 2.0 x 1.5	Box	Reconstruction
73	28+315	1 x 2.0 x 1.5	Box	Reconstruction
74	28+485	1 x 2.0 x 1.5	Box	Reconstruction
75	28+680	1 x 1.20	Pipe	Reconstruction
76	28+860	1 x 1.20	Pipe	New

S. No.	Design Chainage	clear Span (m) (NosxLxH/dia.)	Prop. Type	Proposal for improvement
77	29+010	1 x 1.20	Pipe	Reconstruction
78	29+270	1 x 1.20	Pipe	New
79	29+590	1 x 1.20	Pipe	New
80	29+750	1 x 1.20	Pipe	New
81	29+880	1 x 1.20	Pipe	New
82	29+980	1 x 1.20	Pipe	New
83	30+200	1 x 2.0 x 1.5	Box	New
84	30+330	1 x 1.20	Pipe	New
85	30+460	1 x 1.20	Pipe	New
86	30+850	1 x 1.20	Pipe	Reconstruction
87	30+980	1 x 2.0 x 1.5	Box	Reconstruction
88	31+180	1 x 2.0 x 1.5	Box	Reconstruction
89	31+405	1 x 2.0 x 1.5	Box	Reconstruction
90	31+590	1 x 2.0 x 1.5	Box	Reconstruction
91	32+040	1 x 1.20	Pipe	Reconstruction
92	32+690	1 x 1.20	Pipe	Reconstruction
93	33+465	1 x 1.20	Pipe	Reconstruction
94	33+680	1 x 1.20	Pipe	Reconstruction
95	33+850	1 x 1.20	Pipe	Reconstruction
96	33+965	1 x 1.20	Pipe	Reconstruction
97	34+190	1 x 1.20	Pipe	Reconstruction
98	34+330	1 x 1.20	Pipe	Reconstruction
99	34+840	1 x 1.20	Pipe	Reconstruction
100	35+085	1 x 1.20	Pipe	Reconstruction
101	35+195	1 x 1.20	Pipe	New
102	35+550	1 x 2 x 1.50	Box	New
103	35+710	1 x 2 x 1.50	Box	Reconstruction
104	36+070	1 x 2 x 1.50	Box	Reconstruction
105	36+195	1 x 2 x 1.50	Box	Reconstruction
106	36+420	1 x 2 x 1.50	Box	Reconstruction
107	36+600	1 x 2 x 1.50	Box	Reconstruction
108	36+770	1 x 4 x 6.50	Slab	Reconstruction
109	36+920	1 x 2 x 1.50	Box	Reconstruction
110	37+075	1 x 2 x 1.50	Box	Reconstruction
111	37+245	1 x 2 x 1.50	Box	Reconstruction
112	37+400	1 x 1.20	Pipe	Reconstruction

Note:

1. *The proposed locations are minimum. Any change in number/ length/ span/ height shall not be treated as change in scope of work.*

2. *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.*
3. *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.*

(c) Widening of existing culverts

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

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

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

Sl. No.	Design Chainage	Type	Span (m)	Minimum Vent Height (m)
As given in (ii).b table				

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

S. no.	Location	Type of repair required
		Nil

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

(iii) Bridges

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

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

Sl. No.	Bridge location (Ch)	Salient details of existing bridge	Adequacy or otherwise of the existing waterway, vertical clearance, etc.	Remarks
Nil				

(ii) The following narrow bridges shall be widened:

Sl. No.	Design Chainage	Existing Chainage	Span Arrangement	Existing width (m)	Proposed Total Width (m)	Cross-section at deck level for widening
			nil			

(b) Additional new bridges

Major Bridges

Sl. No	Design Chainage	Name of Nallah	Span arrangement (m)	Total Width of Structure (m)
1	18+630	101/930	5 x 30	16.0

Minor Bridges

S No.	Design Chainage	Existing Chainage	Proposed Span (m)	Proposed width (m)	Remarks
1	12+997	Bypass	1x15 + 1x9 + 1x15 (Skew)	16.0	Mylliem Bypass, New 2 lane
2	14+376.50	96/777	1 x 25.4	13	Existing Retain + Additional new 2-lane
3	18+178.031	100/808	1x9.6 + 1x25.5 + 1x9.6 (Skew)	13	Existing Retain + Additional new 2-lane
4	23+066.966	107/487	1 x 25.4	13	Existing Retain + Additional new 2-lane

Note: Proposed span arrangement is minimum and any increase in length/span/height shall not be treated as change in scope of work.

IRC Class Special Vehicle loading shall be taken into account in the structural design of bridges/Flyover/VUP.

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

Sl. No.	Location at Chainage	Remarks
NIL		

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

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

The following bridges shall be retained with repairs:

S. No.	**Design Chainage**	**Existing Chainage**	**Remarks**
1	14+376.50	96/777	• Wearing coat shall be replaced. • Damaged expansion joint shall be replaced. • Spalling of concrete shall be repaired with epoxy

2	18+178.031	100/808	grouting. • Abutment quadrant slopes shall be maintained along with stone pitching on slopes and suitable protection as per site requirement. • Damaged railing/parapet to be replaced. • Missing drainage spouts and gratings with down-take pipe to be provided. • Any other repair required as per site condition in consent with Authority Engineer/Authority
3	23+066.966	107/487	

(e) Drainage system for bridge decks

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

(iv) Rail-road bridges

(a) Design, construction and detailing of ROB shall be as specified in section 7 of the Manual.

(b) Road over-bridges

Road over-bridges (road over rail) shall be provided at the following locations:

Sl. No.	Design Chainage	Route	Span arrangement (m)	Total Length (m)	Width (m)
			nil		

(c) Road under-bridges

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

Sl. No.	Location of Level crossing(Ch)	Number and length of span(m)
NIL		

(v) Grade separated structures

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

(vi) Repairs and strengthening of bridges and structures

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

Bridges

Sl. No.	Location	Nature and extent of repairs to be carried out
As per table on para 7 (iii) d		

ROB / RUB

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

Overpasses/Underpasses and other structures

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

(vii) List of Major/Minor Bridges and Structures

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

Sl. No.	**Location**	**Type**
1	12+669	VOP
2	12+760	SVUP
3	12+997	Minor Bridge
4	13+148	SVUP
5	13+788	VOP
6	14+377	Minor Bridge
7	18+178	Minor Bridge
8	18+630	Major Bridge
9	20+370	VOP
10	21+250	SVUP
11	21+519	VOP
12	23+067	Minor Bridge

(viii) Slope Protection Structures

Structures for Slope protection and Retaining/ Breast Walls shall be designed and constructed as stipulated in Schedule-D.

Structures to be constructed for slope protection shown in the following Table:

(i) Breast wall

S. No.	**LHS**				**RHS**			
	From	**To**	**Length (m)**	**Height above FRL**	**From**	**To**	**Length (m)**	**Height above FRL**
1	11+800	11+900	100	3.0	12+650	12+690	40	1.5
2	12+650	12+690	40	3.0	16+080	16+140	60	3.0
3	13+740	13+810	70	3.0	18+250	18+410	160	3.0
4	14+630	14+780	150	3.0	20+130	20+250	120	3.0
5	17+460	17+540	80	1.5	20+350	20+390	40	1.5

S. No.	LHS				RHS			
	From	To	Length (m)	Height above FRL	From	To	Length (m)	Height above FRL
6	17+690	17+820	130	1.5	21+390	21+500	110	3.0
7	17+890	18+140	250	1.5	21+500	21+540	40	1.5
8	20+350	20+390	40	1.5	34+970	35+180	210	3.0
9	21+390	21+500	110	1.5	35+210	35+540	330	3.0
10	21+500	21+540	40	1.5				
11	27+980	28+100	120	1.5				
12	28+940	29+040	100	3.0				
13	29+140	29+220	80	1.5				
14	36+080	36+180	100	1.5				
15	36+230	36+350	120	3.0				
	Total Length (m)		**1530**		**Total Length (m)**		**1110**	

Note: The proposed locations are minimum and any change in length/height shall not be treated as change in scope of work.

(ii) Retaining wall

LHS				RHS			
S. No.	From	To	Length (m)	S. No.	From	To	Length (m)
1	12+770	12+900	130	1	11+700	11+730	30
2	14+950	15+010	60	2	11+910	12+000	90
3	15+150	15+230	80	3	14+020	14+080	60
4	15+270	15+480	210	4	14+160	14+220	60
5	15+680	15+710	30	5	14+710	14+780	70
6	15+880	16+080	200	6	14+860	14+920	60
7	16+160	16+220	60	7	16+930	16+980	50
8	18+410	18+550	140	8	17+070	17+130	60
9	22+710	22+750	40	9	17+570	17+600	30
10	23+400	23+450	50	10	17+840	17+890	50
11	23+490	23+540	50	11	28+430	28+570	140
12	23+600	23+650	50	12	28+600	28+660	60
13	24+000	24+070	70	13	28+890	29+000	110
14	24+430	24+480	50	14	29+040	29+120	80
15	24+610	24+660	50	15	29+220	29+290	70
16	24+970	25+050	80	16	30+610	30+680	70

LHS				RHS			
S. No.	**From**	**To**	**Length (m)**	**S. No.**	**From**	**To**	**Length (m)**
17	25+150	25+210	60	17	30+810	30+870	60
18	25+390	25+420	30	18	30+960	31+010	50
19	25+800	25+820	20	19	32+230	32+260	30
20	25+930	25+980	50	20	32+480	32+510	30
21	26+200	26+230	30	21	32+660	32+710	50
22	26+380	26+480	100	22	32+950	33+010	60
23	26+750	26+820	70	23	33+230	33+290	60
24	26+990	27+030	40	24	33+450	33+500	50
25	27+140	27+180	40	25	33+610	33+680	70
26	27+270	27+340	70	26	33+930	33+970	40
27	27+450	27+480	30	27	34+070	34+130	60
28	27+820	27+890	70	28	34+390	34+440	50
29	29+360	29+450	90	29	34+510	34+570	60
30	29+850	29+900	50	30	35+940	36+080	140
31	30+560	30+620	60	31	36+760	36+820	60
32	33+290	33+360	70	32	36+980	37+020	40
33	34+510	34+600	90	33	37+060	37+180	120
34	34+930	34+980	50				
35	35+190	35+220	30				
36	35+490	35+580	90				
	Total Length (m)		**2490**		**Total Length (m)**		**2120**

Note: The above proposed locations are minimum and any change in length shall not be treated as change in scope of work.

(ix) Slope Protection

As the project involve cutting of existing hill slopes, it is imperative that slopes are stabilized for insuring longevity of the slopes and the roads.

The contractor shall be responsible for accurate assessment of the actual requirement as per schedule D & prepare design for slope protection & stabilization as per schedule D.

Any increase in quantity over the above will not be considered as change of scope. Therefore, contractor should carry out thorough investigation at site and

assess the requirement of slope protection and slide prone zone and other safety features at his own before submission of bid.

(x) Disposal of Debris: - As per Manual.

8. Traffic Control Devices and Road Safety Works

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

(a) Traffic/ Road Signs:

Traffic signs viz roadside signs, overhead signs, kerb mounted signs etc. along the entire Project highway shall be provided in accordance with section 9 of the manual.

Overhead traffic signs: - Full Width Overhead signs shall be provided in accordance with section 9 of the manual

(b) Pavement Marking:

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

(c) Safety Barrier:

Semi rigid W-beam crash barriers shall be installed all along the project highway on earthen shoulders on either side of main carriageway at the locations given below:

Sl. No	LHS		Length (m)	RHS		Length (m)
	From	To		From	To	
1	11+000	11+700	700	11+020	11+700	680
2	12+900	13+660	760	11+800	11+910	110
3	13+820	13+920	100	12+850	12+960	110
4	15+000	15+150	150	13+020	13+660	640
5	15+760	15+880	120	13+820	13+920	100
6	16+080	16+160	80	14+620	14+710	90
7	16+240	16+380	140	14+780	15+000	220
8	16+620	16+790	170	16+840	16+930	90
9	18+050	18+160	110	17+260	17+440	180
10	18+200	18+250	50	17+600	17+700	100
11	19+750	19+880	130	19+040	19+300	260
12	20+450	20+550	100	20+480	20+620	140
13	21+150	21+300	150	21+150	21+320	170
14	22+450	22+600	150	25+550	25+650	100
15	23+670	23+900	230	32+760	32+950	190
16	24+850	24+970	120	33+010	33+220	210

Sl. No	LHS		Length (m)	RHS		Length (m)
	From	To		From	To	
17	25+550	25+650	100	33+290	33+470	180
18	26+010	26+150	140	33+670	33+750	80
19	27+050	27+140	90	33+960	34+020	60
20	34+720	34+930	210	36+340	36+480	140
21				37+490	37+550	60
Total length (m)			**3800**			**3910**

Note: The above proposed locations are minimum. Crash barrier/other suitable safety barriers along the Project highway shall be provided as per Schedule D. Any change in length shall not be treated as change in scope of work.

(ii) Specifications of the reflecting sheeting

Retro reflective sheeting should be of high intensity grade with encapsulated lens or with micro prismatic retro reflective element in accordance with ASTM Standard D 4956-04 in accordance with Clause 9.2.3 of the Manual.

9. Roadside Furniture

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

a) Road studs - Road studs shall be provided for the entire Project highway bridges, VUP/Interchange/Flyover structures, approaches of bridges, VUP/Interchange/ Flyover, at curves on shoulder edge line, junctions, toll plaza etc. in accordance with the manual.

b) LED traffic beacons - Shall be provided on entire project highway near pedestrian crossings, public gathering places, junctions etc. in accordance with the manual.

c) Pedestrian Guard Rail: Provide pedestrian guardrail at each bus stop location and other locations as per manual.

d) Delineators: Delineators for the entire Project Highway at the locations as suggested in relevant IRC Manual recommended in Schedule D.

e) Noise barriers: shall be provided in accordance with manual; Locations shall be decided as per site condition in consent with Authority.

f) Concrete Crash Barrier, Metal Beam Crash Barrier, Separators (MS Railings) – as per manual.

g) Traffic Safety Devices wherever required.

h) Hectometer/ Kilometer Stones.

10. COMPULSORY AFFORESTATION

The number of trees which are required to be planted by the Agency as compensatory afforestation should be as per Forest Conservation Act, thrice the number of trees to be cut.

11. HAZARDOUS LOCATIONS

The safety measures shall be provided at all hazardous/sinking/land slide locations as per the manual in consultation with the Authority's Engineer The safety barriers shall also be provided at the following hazardous structure (Bridges, culverts) locations**:**

Sl. No.	Location stretch from (Ch) to(Ch)	LHS/RHS
As per schedule D		

12. SPECIAL REQUIREMENTS FOR HILL ROADS

In accordance with Section 13 of the Manual (from IRC: SP: 73-2018), IRC: SP: 1998 & recommended practice for treatment of embankment and road side slopes for erosion control (first revision) IRC: 56-2011 and relevant IRC codes & The cutting slope surface except on Hard Rock classified as per Clause 301.2 of MORTH Specifications for Road and Bridge Works shall be protected by the Seeding and Mulching as per Clause 301.8 of MORTH Specification, and the embankment slope shall be protected by Turfing as per Clause 301.7 of MORTH Specification.

Sl. No.	Design Ch (From)	Design Ch (To)	LHS/RHS
As per schedule D			

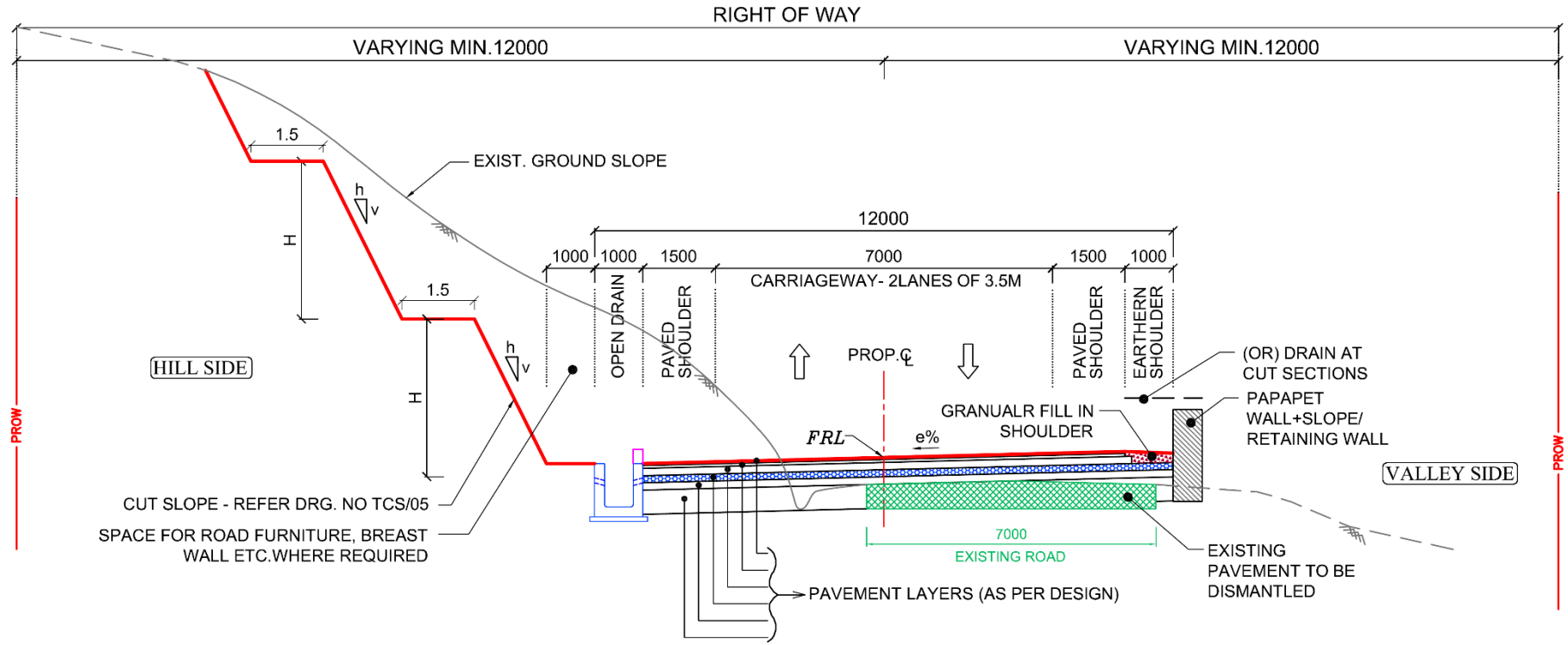
15. UTILITY DUCT

Utility duct across the project highway shall be provided as per manual.

16. CHANGE OF SCOPE

The length of Structures, bridges, culverts, underpasses, flyovers etc. 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 Articled 13.

Appendix B-I



Typical Cross Section (Type - 4)

2-lane with paved shoulders at open areas

Fig 2.11: Typical Cross-Section

Schedule-C

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. The Project Facilities shall include:

(a) Toll plazas;
(b) Roadside furniture;
(c) Pedestrian facilities;
(d) Land Scaping and Tree Plantation;
(e) Truck lay-byes;
(f) Way-side amenities;
(g) Bus-bays and Passenger shelters;
(h) Others;
   1. Highway Patrol Units
   2. Highway lighting
   3. Emergency Medical Services
   4. Crane Services
   5. Communication System
   6. Advance Traffic Management System (A. T. M. S.)
   7. Operation and Maintenance Center

2 Description of Project Facilities

(a) Toll Plazas

Toll Plaza shall be provided as per as stipulated in section 10 of the Manual. Canopy of Toll plaza should be designed to withstand load of solar panels in addition to other design loads. Location of toll plaza is as per the following details.

Sl. No.	Design Chainage	Existing chainage
1	22+850	107/300

Note:

- Installation of two number dedicated ETC lane (one lane in each direction) and Hybrid ETC System with provision of medium speed WIM with bending plate technology in each lane, and Static Weigh Bridge (one lane in each direction) at Toll plaza and Configuration with Advance Traffic Management System.
- Above mentioned toll lanes are indicative. However, the actual requirement of toll lanes shall be assessed by Contractor as per actual site condition and

Manual. The increase in number of toll lanes shall not be treated as change of scope.

- Solar panels shall be erected over the Toll Plaza Canopy to generate the green energy. Same shall be utilized for toll plaza lighting and other energy requirement within toll plaza area along with conventional lighting.

(b) Roadside furniture; as per **clause 9 of Annex-I Schedule B**

(c) Pedestrian facilities;

Pedestrian Guard rails shall be provided at junctions, Truck lay byes, bus bays and near schools and hospitals as per provisions in section 9.8 of the Manual

i. Pedestrian guardrail: Provide pedestrian guardrail at each bus stop location and at other locations as per manual.

ii. Pedestrian Crossings: Provide pedestrian crossing facilities on locations as recommended in Schedule D.

(d) Land Scaping and Tree Plantation;

Land Scaping and tree plantation of the highway shall be provided as per section 11 of the manual. The locations for these provisions shall be finalized in consultation with Authority Engineer**.**

(e) Truck lay-byes

Truck Lay bye shall be provided at the following locations in accordance with section 12.5 of the manual.

Sl. No	Design Chainage	Side	Nearest Village
		nil	

(f) Way-side Amenities

As stipulated in section 12.10 of the manual, Way-side Amenities shall be provided at the following locations:

S. no.	Design Chainage	Side
1	34+450	120/590

(g) Bus-bays and Passenger shelters

Minimum 2x5 nos. of Bus Bays with Bus Shelter shall be provided along the project highway. Tentative locations for Bus Bays are indicated below, however, the same shall be finalized as per suitability of location and site requirement in consultation with the Authority's Engineer/ Authority. As stipulated in section 12.6 of the Manual, Bus-bays and shelters shall be provided at below indicative locations.

S. No.	**Design Chainage**		**Location**
	Left	**Right**	
1	11+080	11+080	Marbaniang Umseiniong
2	16+600	16+600	Pombot

S. No.	Design Chainage		Location
	Left	Right	
3	27+900	28+070	Pomlum
4	29+080	29+020	Mawkajum
5	36+010	35+880	Lyngkyrden

Note : However, the location of bus bays and passenger shelters shall be finalized as per suitability of location and site requirement in consultation with Authority. Any change in location shall not treated as change of scope.

(h) Others

1. Highway pertrol unit – as per manual
2. Highway LED Lighting: LED Lighting shall be provided at the following locations:
   a. LED Lighting shall be provided at approach to bridges, Flyover, built up areas, Toll plaza, Bus stops, truck Lay-byes and rest areas as per manual recommended in Schedule D.
   b. Apart from above locations lighting shall be provided at underpasses and ROB/RUB and as per site condition in consultation with Engineer and shall not be treated as change of scope. On all grade separated structures Lightings will be provided on Top & Underside as per clause 12.4 of IRC SP 73-2018.
   c. High Mast Lighting shall be provided at all Major Junctions, Toll plaza locations or any other location as per clause 12.4.3 of IRC SP 73-2018.
3. Emergency Medical Services : Emergency medical Services shall be provided as per provisions of the manual.
4. Cranes services: One Cranes with 30 MT Capacity.
5. Communication System: Communication System shall be provided as per provisions of the manual.
6. Advance Traffic Management System (ATMS) as per technical specification: Provisions of other facilities, if required may be made in similar manner.
7. Operation and Maintenance Centre: Operation and Maintenance Centre shall be provided as per provisions of the manual.

Schedule-D

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:

a) Manual of Specifications and Standards for Two Laning of Highways with paved shoulder (IRC: SP: 73-2018), referred to herein as the Manual.

Annex - I

(Schedule-D)

Specifications and Standards for Construction

1 Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Two-Laning of Highways with paved shoulder (IRC: SP:73-2018), referred to as the Manual and Indian Road Congress (IRC) Codes and Standards and MORTH Specifications for Road and Bridge Works.

Where the aforesaid Manuals, guidelines, codes, standards and specifications are silent on any aspect, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2 Deviations from the Specifications and Standards

2.1 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.

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

1) IRC Class Special Vehicle loading shall be taken into account in the structural design of bridges/Flyover/VUP.

2) Width of structure

Sl. No.	Item	Description of Deviation	As per manual	Clause Reference
1	Width of bridges	Width minor bridges on hill road – 16m (0.5+1.5+0.5)+(0.5+1.5+7+ 1.5+0.5)+(0.5+1.5+0.5) = 2.5+11+2.5	Width of minor bridge on plain/rolling terrain – 18m (0.5+1.5+0.5)+(0.5+2. 5+7+2.5+0.5)+(0.5+1. 5+0.5) = 2.5+13+2.5	Clause 7.3 (ii) Figure 7.6

Schedule – E

(See Clause 2.1 and 14.2)

MAINTENANCE REQUIREMENTS

1. Maintenance Requirements

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

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

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

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

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

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

4. Extension of time limit

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

5. Emergency repairs/restoration

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

6. Daily inspection by the Contractor

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

and shall be open to inspection by the Authority and the Authority's Engineer at any time during office hours.

7. Pre-monsoon inspection / Post-monsoon inspection

The Contractor shall carry out a detailed pre-monsoon inspection of all bridges, culverts and drainage system before [1st June] every year in accordance with the guidelines contained in IRC: SP:35. Report of this inspection together with details of proposed maintenance works as required on the basis of this inspection shall be sent to the Authority's Engineer before the [10th June] every year. The Contractor shall complete the required repairs before the onset of the monsoon and send to the Authority's Engineer a compliance report. Post monsoon inspection shall be done by the [30th September] and the inspection report together with details of any damages observed and proposed action to remedy the same shall be sent to the Authority's Engineer.

8. Repairs on account of natural calamities

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

Annex – I

(Schedule-E)

Repair/rectification of Defects and deficiencies

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

Nature of Defect or deficiency		Time limit for repair/ rectification
ROADS		
(a)	**Carriageway and paved shoulders**	
(i)	Breach or blockade	Temporary restoration of traffic within 24 hours; permanent restoration within 15 (fifteen) days
(ii)	Roughness value exceeding 2,200 mm in a stretch of 1 km (as measured by a calibrated bump integrator)	120 (one hundred and twenty) days
(iii)	Pot holes	24 hours
(iv)	Any cracks in road surface	15 (fifteen) days
(v)	Any depressions, rutting exceeding 10 mm in road surface	30 (Thirty) days
(vi)	Bleeding/Skidding	7 (seven) days
(vii)	Any other defect/distress on the road	15 (fifteen) days
(viii)	Damage to pavement edges	15 (fifteen) days
(ix)	Removal of debris, dead animals	6 hours
(b)	**Granular earth shoulders, side slopes, drains and culverts**	
(i)	Edge drop at shoulders exceeding 40 mm	7 (Seven) days
(ii)	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
(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 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 hours
(ii)	Painting of KM stone, railing, parapets, crash barriers	As and when required/Once every year
(iii)	Damaged/missing road signs required replacement	7 (Seven) days
(iv)	Damage to road mark ups	7 (Seven) days
(d)	**Road lighting**	
(i)	Any major failure of the system	24 hours

(ii)	Faults and minor failures	8 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 hours
(ii)	Removal of fallen trees from carriageway	4 hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiring replacement	30 (Thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
(f)	**Rest area**	
(i)	Cleaning of toilets	Every 4 hours
(ii)	Defects in electrical, water and sanitary installation	24 hours
(g)	**Toll Plaza**	
(h)	**Other Project Facilities, Rest Area and Approach roads**	
(i)	Damage in pedestrian facilities, truck lay-buys, 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 cranes	4 (four) hours
Bridges		
(a)	**Superstructure**	
(i)	Any damage, cracks, spalling/scaling Temporary measures Permanent measures	 Within 48 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	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 of safety)

(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach Slabs, pitching, apron, toes, floor or guide bunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g)	**Hill Roads**	
(i)	Damage to retaining wall/breast wall	7 (seven) days
(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 3.1.5(a))

APPLICABLE PERMITS

1. **Applicable Permits**

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

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

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

(c) License for use of explosives;

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

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

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

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

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

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

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

Schedule-G
(See Clause 7.1.1, 7.5.3 and 19.2)

FORM OF BANK GUARANTEE

Annex-I
(See Clause 7.1.1)

PERFORMANCE SECURITY

The Managing Director,
NHIDCL,
3rd Floor, PTI Building, 4, Parliament Street,
New Delhi-110001

WHEREAS:

(A) _____ [name and address of contractor] (hereinafter called "the Contractor") and [**NHIDCL**], (**"the Authority"**) have entered into an agreement (the **"Agreement"**) for "***Package-II - Improvement to 2 lane with paved shoulder of NH-40 section from Km 93+490 to Km 123+800 (design Km 10+670 to Km 37+550) design length 26.55 km in the State of Meghalaya on EPC Mode under JICA Loan Assistance"***, 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 and Defects Liability Period (as defined in the Agreement) in a sum of Rs. …. Crore (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 Construction Period and Defects Liability 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 NHIDCL 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 difference 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 ****[$1]. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.

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

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if 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.

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

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

12. This guarantee shall also be operable 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. This Guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication no. 758, except that the supporting statement under Article 15 (a) is hereby excluded.

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

The Managing Director,
NHIDCL,
3rd Floor, PTI Building, 4, Parliament Street
New Delhi-110001

WHEREAS:

(A) [Name and address of contractor] (hereinafter called "**the Contractor**") has executed an agreement (hereinafter called the "Agreement") with the [NHIDCL], (hereinafter called "the Authority") for the "***Package- II - Improvement to 2 lane with paved shoulder of NH-40 section from Km 93+490 to Km 123+800 (design Km 10+670 to Km 37+550) design length 26.55 km in the State of Meghalaya on EPC Mode under JICA Loan Assistance"***, subject to and in accordance with the provisions of the Agreement.

(B) In accordance with the Clause 7.5.3 of the Agreement, the Contractor may withdraw the retention money (hereinafter called "**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……. in words) (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 in the NHIDCL 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 difference 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 authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

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

12. This guarantee shall also be operable 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 there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

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

The Managing Director,
NHIDCL,
3rd Floor, PTI Building, 4, Parliament Street,
New Delhi-110001

WHEREAS:

(A) [name and address of contractor] (hereinafter called "**the Contractor**") has executed an agreement (hereinafter called the "Agreement") with the [**NHIDCL**], (hereinafter called "**the Authority**") for the "***Package- II - Improvement to 2 lane with paved shoulder of NH-40 section from Km 93+490 to Km 123+800 (design Km 10+670 to Km 37+550) design length 26.55 km in the State of Meghalaya on EPC Mode under JICA Loan Assistance"*** subject to and in accordance with the provisions of the Agreement.

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

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

NOW, THEREFORE, the Bank hereby, unconditionally and irrevoc**ably, guarantee**s 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 the NHIDCL, 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

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

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 difference 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 ****.[$3] Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.

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

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if 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

[$]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).

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 Para 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

12. This guarantee shall also be operable 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. This Guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication no. 758, except that the supporting statement under Article 15 (a) is hereby excluded.

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)

Schedule-H

(See Clauses10.1 (iv) and 19.3)

1 Contract Price Weightages

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

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

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
1	Road works including culverts, widening and repair of culverts.	68.18%	**A - Widening and strengthening of existing road**	
			(1) Earthwork up to top of the subgrade	12.54%
			(2) Subbase course (GSB)	2.06%
			(3) Non-bituminous base course (WMM)	1.42%
			(4) Bituminous base	1.86%
			(5) wearing coat	1.23%
			(6) widening and repair of culverts	0.00%
			B.1 - Reconstruction realignment/ bypass (Flexible pavement)	
			(1) Earthwork up to top of the subgrade	44.46%
			(2) Subbase course (GSB)	7.29%
			(3) Non-bituminous base course (WMM)	5.03%
			(4) Bituminous base	6.60%
			(5) wearing coat	4.35%
			B.2 - Reconstruction realignment / bypass (Rigid Pavement)	
			(1) Earthwork up to top of the subgrade	0.16%
			(2) Subbase course (GSB)	0.18%
			(3) Dry lean concrete (DLC)	0.35%
			(4) Pavement quality concrete (PQC) course	1.12%
			C.1 - Reconstruction/ New Service road (flexible Pavement)	
			(1) Earthwork up to top of the subgrade	0.00%
			(2) Subbase course (GSB)	0.00%
			(3) Non-bituminous base course (WMM)	0.00%
			(4) Bituminous base	0.00%
			(5) wearing coat	0.00%
			C.2 - Reconstruction/ New Service road (Rigid Pavement)	
			(1) Earthwork up to top of the subgrade	0.00%
			(2) Subbase course (GSB)	0.00%
			(3) Dry lean concrete (DLC)	0.00%
			(4) Pavement quality concrete (PQC) course	0.00%

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
			D. - Reconstruction/ New culverts on existing road, realignment, bypasses	11.36%
2	Minor Bridges/ Underpasses/ Overpasses	5.64%	**A.1 - Widening and repairs of Minor Bridges**	
			Widening of existing bridges	0.00%
			rehabilitation of existing bridges	0.74%
			A.2 - New of Minor Bridges	
			(1) **Foundation + Substructure** : On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap	24.01%
			(2) **Super-structure**: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	19.94%
			(3) **Approaches**: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	3.23%
			(4) **Guide Bunds and River Training works:** (On completion of Guide Bunds and river training works complete in all respects.)	0.00%
			B.1 - Widening and repairs of Underpasses/Overpasses	
			Underpasses/ Overpasses	0.00%
			B.2 - New Underpasses/Overpasses	
			(1) **Foundation + Substructure** : On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap	35.12%
			(2) **Super-structure**: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect. Wearing Coat (a) in case of Overpass- wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass- rigid pavement including drainage facility complete in all respects as specified as specified.	13.82%
			(3) **Approaches**: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	3.14%
3	Major Bridge works and	2.48%	**A.1 - Widening and repairs of existing major bridges**	
			(1) Foundation:	0.00%

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
	ROB/RUB/ elevated sections/fly overs including viaducts, if any		(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 barrier, 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, protection works).	0.00%
			A.2 - New major bridges	
			(1) Foundation:	8.44%
			(2) Sub-structure:	25.17%
			(3) Super-structure: (including bearings.)	56.81%
			(4) Wearing Coat including expansion joints	5.08%
			(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	2.53%
			(6) Wing walls/return walls	1.39%
			(7) Guide bunds, river training works etc.	
			(8) Approaches (including retaining walls, stone pitching, protection works).	0.59%
			B.1 - Widening and repairs of (a) ROB and (b) RUB	
			(1) Foundation	0.00%
			(2) Sub structure	0.00%
			(3) Superstructure (including bearing)	0.00%
			(4) wearing coat: (a) in case of ROB - wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB - rigid pavement under RUB including drainage facility complete in all respect 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, protection works).	0.00%
			B.2 - New ROB / RUB	
			(1) Foundation	0.00%
			(2) Sub structure	0.00%
			(3) Superstructure (including bearing)	0.00%
			(4) wearing coat: (a) in case of ROB - wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB - rigid pavement under RUB including drainage facility complete in all respect as specified.	0.00%

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
			(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	0.00%
			(6) wing walls/return walls	0.00%
			(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%
			C.1 - Widening and repairs of Elevated section/Flyover/Grade Separators	
			(1) Foundation	0.00%
			(2) Sub structure	0.00%
			(3) Superstructure (including bearing)	0.00%
			(4) wearing coat including expansion joint	0.00%
			(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	0.00%
			(6) wing walls/return walls	0.00%
			(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%
			C.2 - New Elevated section/Flyover/Grade Separators	
			(1) Foundation:	0.00%
			(2) Sub-structure:	0.00%
			(3) Superstructure (including bearing)	0.00%
			(4) wearing coat including expansion joint	0.00%
			(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	0.00%
			(6) wing walls/return walls	0.00%
			(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%
4	Other works	23.70%	(i) Toll plaza	5.21%
			(ii) Road side drains	21.19%
			(iii) Road signs, markings, km stones safety Devices etc	11.68%
			(iv) Project facilities	
			(a) Bus Bay with shelter	0.19%
			(b) Truck laybys	0.00%
			(c) Rest areas	1.86%
			(d) others (to be specified)	
			(i) Street Lighting	0.83%
			(ii) Maintenance of existing road	3.95%
			(iii) Utility Ducts	0.35%
			(iv) Temporary diversion	5.81%
			(v) Junction improvement works including Connecting road & Junction under Grade separator, noise barrier.	2.52%

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
			(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) Protection works retaining wall/toe walls other than approaches to the bridges, elevated sections, flyovers/ grade separators and ROBs/RUBs.	42.71%
			(viii) Safety and traffic management during construction	0.33%
			(ix) Side Slope Protection works Turfing and stone pitching	3.39%

1.3 Procedure of estimating the value of work done.

1.3.1 Road works

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

Table 1.3.1

Stage of Payment	Percentage -weightage	Payment Procedure
A - Widening and strengthening of existing road		
(1) Earthwork up to top of the sub-grade	12.54%	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 05 (Five) percent of the total length.
(2) Sub-base Course	2.06%	
(3) Non bituminous Base course	1.42%	
(4) Bituminous Base course	1.86%	
(5) Wearing Coat	1.23%	
(6) widening and repair of culverts	0.00%	Cost of ten completed culverts shall be determined pro rata with respect to the total number of culverts. Payment shall be made on the completion of at least 01 culverts.
B.1 - Reconstruction 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 01(One) km. length, which ever is less.
(1) Earthwork up to top of the sub-grade	44.46%	
(2) Sub-base Course	7.29%	
(3) Non bituminous Base course	5.03%	
(4) Bituminous Base course	6.60%	

Stage of Payment	Percentage -weightage	Payment Procedure
(5) Wearing Coat	4.35%	
B.2 - Reconstruction/ realignment/bypass (Rigid Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 01 (One) km. length, which ever is less..
(1) Earthwork up to top of the sub-grade	0.16%	
(2) Sub-base Course	0.18%	
(3) Dry lean concrete (DLC)	0.35%	
(4) Pavement quality concrete (PQC) course	1.12%	
C.1 - Reconstruction/ New Service road (flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 01 (One) km length.
(1) Earthwork up to Subgrade top	0.00%	
(2) Subbase course (GSB)	0.00%	
(3) Non-bituminous base course (WMM)	0.00%	
(4) Bituminous base	0.00%	
(5) wearing coat	0.00%	
C.2 - Reconstruction/ New Service road (Rigid Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 01 (One) km length.
(1) Earthwork up to Subgrade top	0.00%	
(2) Subbase course (GSB)	0.00%	
(3) Dry lean concrete (DLC)	0.00%	
(4) Pavement quality concrete (PQC) course	0.00%	
D. - Reconstruction & New Culverts on existing road, realignments, bypasses	11.36%	Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of at least 01 (One) culverts.

@. 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. And L = Total length in km.

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

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

1.3.2 Minor Bridges and Underpasses/Overpasses.

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

Table 1.3.2

Stage of Payment	Weightage	Payment Procedure
A.1 - Widening and repairs of Minor Bridges		Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of widening & repair works of a minor bridge.
Widening of existing bridges	0.00%	
rehabilitation of existing bridges	0.74%	
A.2 - New of Minor Bridges		
(1) **Foundation + Substructure**: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment /pier cap	24.01%	(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 completion of a stage i.e. not less than 25% of the scope of foundation +substructure of each bridge subject to completion of at least 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.
(2)Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	19.94%	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super structure of at least one span in all respects as specified in the column of "Stage of Payment" in this sub-clause.
(3) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	3.23%	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.

Stage of Payment	Weightage	Payment Procedure
(4) Guide Bunds and River Training Works: On completion of Guide Bunds and river training works complete in all respects	0.00%	Payment shall be made on pro-rata basis on completion of a stage i.e. completion of Guide Bunds and River training Works in all respects as specified
B.1 - Widening and repairs of Underpasses/Overpasses	0.00%	Cost of each underpass/overpass shall be determined on pro rata basis with respect to the total linear length of the underpass/overpasses. Payment shall be made on the completion of widening & repair works of an underpass/overpasses.
B.2 - New Underpasses/ Overpasses		
(1) **Foundation + Substructure**: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap	35.12%	Foundation + Substructure: Cost of each Underpass/ Overpass shall be determined on pro- rata basis with respect to the total linear length (m) of the Underpasses/ Overpasses. Payment against foundation + Sub structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation + Sub Structure of each Underpasses/ Overpasses subject to completion of at least two foundations along with sub-structure upto abutment/pier cap level each underpass/overpass. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified..
(2)**Super-structure**: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect Wearing Coat (a) in case of	13.82%	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super- structure of at least one span in all respects as specified in the column of "Stage of Payment" in this sub-clause.

Stage of Payment	Weightage	Payment Procedure
Overpass- wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass- rigid pavement including drainage facility complete in all respects as specified as specified.		
(3) **Approaches**: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use..	3.14%	Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respects as specified

1.3.3 Major Bridge works, ROB/RUB and Structures

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

Table 1.3.3

Stage of payment	Weightage	Payment procedure
A.1 - Widening and repairs of existing major bridges		
(1) Foundation:	0.00%	Foundation: Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the major Bridge subject to completion of 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.
(2) Sub-structure:	0.00%	Payment against Substructure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub- structure of the major bridge subject to completion of at least two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge.
(3) Super-structure: (including bearings.)	0.00%	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 respects as specified.
(4) Wearing Coat including	0.00%	Wearing Coat: Payment shall be made on

Stage of payment	Weightage	Payment procedure
expansion joints		completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%	Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/return walls	0.00%	Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7) Guide bunds, River Training works etc.	0.00%	Guide Bunds, River Training works: Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
A.2 - New major bridges		
(1) Foundation:	8.44%	Foundation: Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the major Bridge subject to completion of 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.
(2) Sub-structure:	25.17%	Payment against Substructure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub- structure of the major bridge subject to completion of at least two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge.
(3) Super-structure: (including bearings.)	56.81%	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 respects as specified.
(4) Wearing Coat including expansion joints	5.08%	Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	2.53%	Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.

Stage of payment	Weightage	Payment procedure
(6) Wing walls/return walls	1.39%	Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7) Guide bunds, River Training works etc.	0.00%	Guide Bunds, River Training works: Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(8) Approaches (including Retaining walls, stone pitching and protection works)	0.59%	Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
B.1 - Widening and repairs of (a) ROB and (b) RUB		
(1) Foundation	0.00%	Foundation: Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROB/RUB. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the ROB/RUB subject to completion of at least 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.
(2) Sub-structure	0.00%	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 at least two sub-structures of abutments/piers upto abutment/pier cap level of the ROB/RUB.
(3) Super-structure (including bearing)	0.00%	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 respects as specified.
(4) Wearing Coat including expansion joints in case of ROB. In case of RUB-rigid pavement under RUB including drainage facility as specified	0.00%	Wearing Coat: Payment shall be made on completion of (a) in case of ROB - wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified.
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%	Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/return walls	0.00%	Wing walls/return walls: Payments shall be

Stage of payment	Weightage	Payment procedure
		made on completion of all wing walls/return walls complete in all respects as specified.
(7) Approaches (including retaining walls, stone pitching, protection works)..	0.00%	Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified
B.2 - New ROB / RUB		
(1) Foundation	0.00%	Foundation: Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROB/RUB. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the ROB/RUB subject to completion of at least 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.
(2) Sub-structure	0.00%	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 bridge subject to completion of at least two sub-structures of abutments/piers upto abutment/pier cap level of the ROB/RUB..
(3) Super-structure (including bearing)	0.00%	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super- structure including bearings of at least one span in all respects as specified.
(4) Wearing Coat including expansion joints in case of ROB. In case of RUB-rigid pavement under RUB including drainage facility as specified	0.00%	Wearing Coat: Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified.
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%	Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/return walls	0.00%	Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%	Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified

Stage of payment	Weightage	Payment procedure
C.1 - Widening and repairs of Elevated section/Flyover/Grade Separators		
(1) Foundation	0.00%	Foundation: Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structure. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the structure. subject to completion of at least two foundations of the Structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-structure	0.00%	Sub-structure: Payment against sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub- structure of structure subject to completion of at least two sub-structures of abutments/piers upto abutment/pier cap level of the structure..
(3) Super-structure (including bearing)	0.00%	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super- structure including bearings of at least one span in all respects as specified.
(4) Wearing Coat including expansion joints	0.00%	Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%	Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/return walls	0.00%	Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%	Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified
C.2 - New Elevated section/Flyover/Grade Separators		
(1) Foundation	0.00%	Foundation: Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structure. Payment against foundation

Stage of payment	Weightage	Payment procedure
		shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the structure. subject to completion of at least two foundations of the Structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-structure	0.00%	Sub-structure: Payment against sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of structure subject to completion of at least two sub-structures of abutments/piers upto abutment/pier cap level of the structure.
(3) Super-structure (including bearing)	0.00%	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super- structure including bearings of at least one span in all respects as specified.
(4) Wearing Coat including expansion joints	0.00%	Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%	Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/return walls	0.00%	Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00%	Approaches: Payments 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	5.21%	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	21.19%	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on
(iii) Road signs, markings, km	11.68%	

Stage of Payment	Weightage	Payment Procedure
stones safety Devices etc		completion of a stage in a length of not less than 5 % (five per cent) of the total length.
(vi) Project Facilities		Payment shall be made on pro rata basis for completed facilities.
a) Bus bays	0.19%	
b) Truck laybys	0.00%	
(c) Rest areas	1.86%	
d) Others (To be specified)		
(i) Street Lighting	0.83%	
(ii) Maintenance of existing road	3.95%	
(iii) Utility Ducts	0.35%	
(iv) Temporary diversion	5.81%	
(v) Junction improvement works including Connecting road & Junction under Grade separator etc.	2.52%	
(v) Road side Plantation	0.00%	Unit of measurement is linear length.
(vi) Repair of protection works other than approaches to the bridges, elevated sections, flyovers/ grade separators and ROBs/RUBs.	0.00%	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) Protection works retaining wall/toe walls other than approaches to the bridges, elevated sections, flyovers/ grade separators and ROBs/RUBs..	42.71%	
(vii) Safety and traffic management during construction	0.33%	Payment shall be made on prorata basis every six months.
(ix) Side Slope Protection works Turfing and stone pitching	3.39%	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

2. Procedure for payment for Maintenance.

2.1 The cost for maintenance shall be as stated in Clause 14.1.(i)

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

Schedule - I

(See Clause 10.2 (iv))

1. Drawings

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

2. Additional Drawings:-

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

Annex – I

(Schedule - I)

List of Drawings

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

(a) Drawing of horizontal alignment, vertical profile and detailed cross sections;

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

(c) Drawings for River Training works;

(d) Drawings of interchanges, major intersections and underpasses;

(e) Drawing of control centre;

(f) Drawings of road furniture items including traffic signage, marking, safety barriers, etc;

(g) Drawings of traffic diversions plans and traffic control measures;

(h) Drawings of road drainage measures;

(i) Drawings of typical details slope protection measures;

(j) Drawings of landscaping and horticulture;

(k) Drawings of pedestrian crossing;

(l) Drawings of street lighting;

(m) General Arrangement showing Base Camp and Administrative Block;

(n) Any other drawings as per instruction of Authority Engineer.

Schedule-J

(See Clause 10.3.2)

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[$]

2.1 2.1 Project Milestone-I shall occur on the date falling on the 274th (Two Hundred and Seventy Fourth) day from the Appointed Date (the "**Project Milestone-I**").

2.2 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[$]

3.1 Project Milestone-II shall occur on the date falling on the 548th (Five hundred and Forty Eighth) day from the Appointed Date (the "**Project Milestone-II**").

3.2 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 30% (thirty per cent) of the Contract Price.

4. Project Milestone-III[$]

4.1 Project Milestone-III shall occur on the date falling on the 821th (Eight hundred and Twenty One) day from the Appointed Date (the "**Project Milestone-III**").

4.2 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 60% (sixty per cent) of the Contract Price.

5 Schedule Completion Date

5.1 The Scheduled Completion Date shall occur on the 1095th (One Thousand and Ninety Five) day from the Appointed Date.

5.2 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.

[$] If total project length is say **'L' km** and the unencumbered length along existing road as handed over on the appointed date is **'L_1' km** (including bypasses, re-alignment, structure etc.) and balance length i.e. **'L2' km (L-L1)** is to be handed over on a later date as per the memorandum signed under provision of Clause 8.2.1 of the Contract Document, then the Project Milestone-I, II and III shall be linked to stage payment statement for amount in percentage of the contract price worked out on prorata basis for the **'L_1' km** length handed over of balance length, the subsequent Project Milestone shall be linked to stage payment statement for amount in percentage of the total contract price.

For example:

If the date for Milestone-I and Milestone-II is 180th and 300th day from appointed date and balance **'L_2' km** length is handed over after 300th day from appointed date, then the stage payment statement required for achieving Milestone-I and Milestone-II should be linked to Contract Price worked out on prorata basis for the **L_1 km length** [**i.e. for Contract Price x L_1/L**]. Subsequent Milestone i.e. Milestone-III will be linked to stage payment statement for amount in percentage of the total contract price. **In no case, there shall be any change in the schedule completion date unless extension of time has been granted by the Authority under Clause 10.3 and 10.5 of the contract agreement.**

In order for the above dispensation to come into operation, it is necessary that a suitable mechanism (like escrow account) is evolved between the parties to the effect that the payments released to the contractor under the above dispensation would be used for completion of the project in the first instance and shall be available to the Contractor only after meeting his project related commitments.

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 all the tests specified in IRC code, manual and MORTH specifications for the road and Bridge works, 5th revision, 2013.

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

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 Nondestructive Testing Techniques, at two spots in every span, to be chosen at random by the Authority's Engineer. Bridges with a span of 15 (fifteen) meters or more shall also be subjected to load testing.

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.

(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 construction of the "***Package-II - Improvement to 2 lane with paved shoulder of NH-40 section from Km 93+490 to Km 123+800 (design Km 10+670 to Km 37+550) design length 26.55 km in the State of Meghalaya on EPC Mode under JICA Loan Assistance"*** 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 that Project Highway from km 8.000 to km 65.000 can be safety 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 Authority's Engineer, under and in accordance with the Agreement dated …….(the "**Agreement**"), for construction of "***Package- II - Improvement to 2 lane with paved shoulder of NH-40 section from Km 93+490 to Km 123+800 (design Km 10+670 to Km 37+550) design length 26.55 km in the State of Meghalaya on EPC Mode under JICA Loan Assistance"*** through ……. (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safety and reliably placed in service of the Users thereof.

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

SIGNED, SEALED AND DELIVERED
For and on behalf of
The Authority's Engineer by:
(Signature)
(Name)
(Designation)
(Address)

Schedule-M

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

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

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/100 x M xL1/L

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

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

L1 = Non-complying length

L = Total length of the road,

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

The total amount of reduction shall be arrived at by summation of reductions for such items/Defects/deficiency or 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 or 'Guidelines for Employment of Consultants under Japanese ODA Loans' or a combination of certain provisions thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority's Engineer.

1.2 The Authority shall invite Expression of Interest from Consulting Engineering firms or bodies corporate to undertake and perform the duties and functions set forth in Annexure-I of Schedule-N and thereupon shortlist qualified firms in accordance with pre-determined criteria.

1.3 The Authority shall invite the aforesaid shortlisted firms to submit their respective technical and financial offers, each in separate sealed cover and/or upload online. All the technical bids so received shall be opened and pursuant to the evaluation thereof, the Authority shall open the financial bids in respect of each shortlisted firm and the order of priority as among these firms shall be determined on the basis of a weighted evaluation where technical and financial score shall be assigned respective weights of 80:20.

1.4 In the event of termination of the Technical Consultants appointed in accordance with the provisions of above Paragraphs 1.1 to 1.3, the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of this Schedule-N.

2 Terms of Reference

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

3 Appointment of Government entity as Authority's Engineer

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

Annex – I

(Schedule - N)

TERMS OF REFERENCE FOR AUTHORITY'S ENGINEER

1. Scope

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 Ministry of Road Transport and Highways (the "**Authority**") and ..... (the "**Contractor**") for "**Pkg. II - Improvement to 2 lane with paved shoulder of NH-40 section from Km 93+490 to Km 123+800 (design Km 10+670 to Km 37+550) design length 26.55 km in the State of Meghalaya on EPC Mode under JICA Loan Assistance"** 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 0.2% of Contract Price.

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 upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

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

(g) Net claim: (e) – (f) (iii);

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

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

(ii) For Change of Scope Orders, and

(iii) Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

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

(b) the deductions for maintenance work not done;

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

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

(e) amount towards deduction of taxes

3. Contractor's claim for Damages

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

4. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

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

(g) the deductions for maintenance work not done;

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

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

(j) amount towards deduction of taxes

5. 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 arises from a cause occurring prior to the issue of Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage to property

3.1. The Contractor shall insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Paragraph l and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences. The insurance cover shall be not less than: Rs. [*****]

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 and unavoidable result of the Contractor's obligations to execute the Works.

4. Insurance to be in joint names

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

SCHEDULE-Q
(See Clause 14.10)

Tests on Completion of Maintenance Period

1. Riding Quality test:

Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator and the maximum permissible roughness for purposes of this Test shall be 2,500 (two thousand five hundred) mm for each kilometer.

2. Visual and physical test:

The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include measurement of cracking, rutting, stripping and potholes and the permissible values are given below: • Area of cracking not more than 2 % area

• Area of rutting with rut depth more than 10 mm - not more than 1 …. % area

• Area of stripping: not more than 2 % area

• Area of potholes: Nil

• Edge drop – Shall not be more than 15 mm

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 "**Package-II - Improvement to 2 lane with paved shoulder of NH-40 section from Km 93+490 to Km 123+800 (design Km 10+670 to Km 37+550) design length 26.55 km in the State of Meghalaya on EPC Mode under JICA Loan Assistance"**……. (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 of Authority's Engineer)
(Address)

SCHEDULE-S
(See Clause 17.7.2)

Performance Certificate

I, ……. (Name and designation of the Authority's representative) under and in accordance with the Agreement dated …… (the "Agreement"), for [construction and maintenance of the "**Package-II - Improvement to 2 lane with paved shoulder of NH-40 section from Km 93+490 to Km 123+800 (design Km 10+670 to Km 37+550) design length 26.55 km in the State of Meghalaya on EPC Mode under JICA Loan Assistance"** ……. (Name of Contractor), hereby certify that the Contractor has discharged all its obligations under the Agreement and in accordance with Article 17 of the Agreement I hereby issue Performance Certificate to the Contractor on this day.....

SIGNED, SEALED AND DELIVERED

(Signature)
(Name of Authority's Engineer)
(Address)

SCHEDULE-T
(See Clause 19.1.6)

Name of Currency	**A Amount of Currency**	**B Rate of Exchange* (Local Currency per Unit of Foreign Currency)**	**C Local Currency Equivalent**	**D Percentage of Net Bid Price (NTP) (100 x C) / NTP**
Local Currency (Indian Rupees)				
Foreign Currency 1 (Japanese Yen)				
Foreign Currency 2 (US Dollar)				
Net Bid Price				100.00

* The fixed rates of exchange shall be the selling rates 28 days prior to the deadline for submission of bids published by the **Reserve Bank of India**.

1. Change in scope would require agreement between parties on currency.
2. Regarding damages by the Authority, financing charges for a payment delays will be in corresponding currency amounts.

3. Delay damages will be recovered in currencies in proportion which in which contract price is payable.