National Highways & Infrastructure Development Corporation Limited

EPC Schedules

FOR

Improvement/Widening to 2-lane with paved shoulder/4-lanning of NH-40 between Shillong to Dawki road upto Bangladesh Border including Dawki Bridge from (Design km 10+670 to km 37+550) design length of 26.550 km in the State of Meghalaya for execution of EPC mode under JICA funding - (Package-II)-Balance Work

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

July 2023

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

SCHEDULE A

(SeeClauses2.1and8.1)

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**.

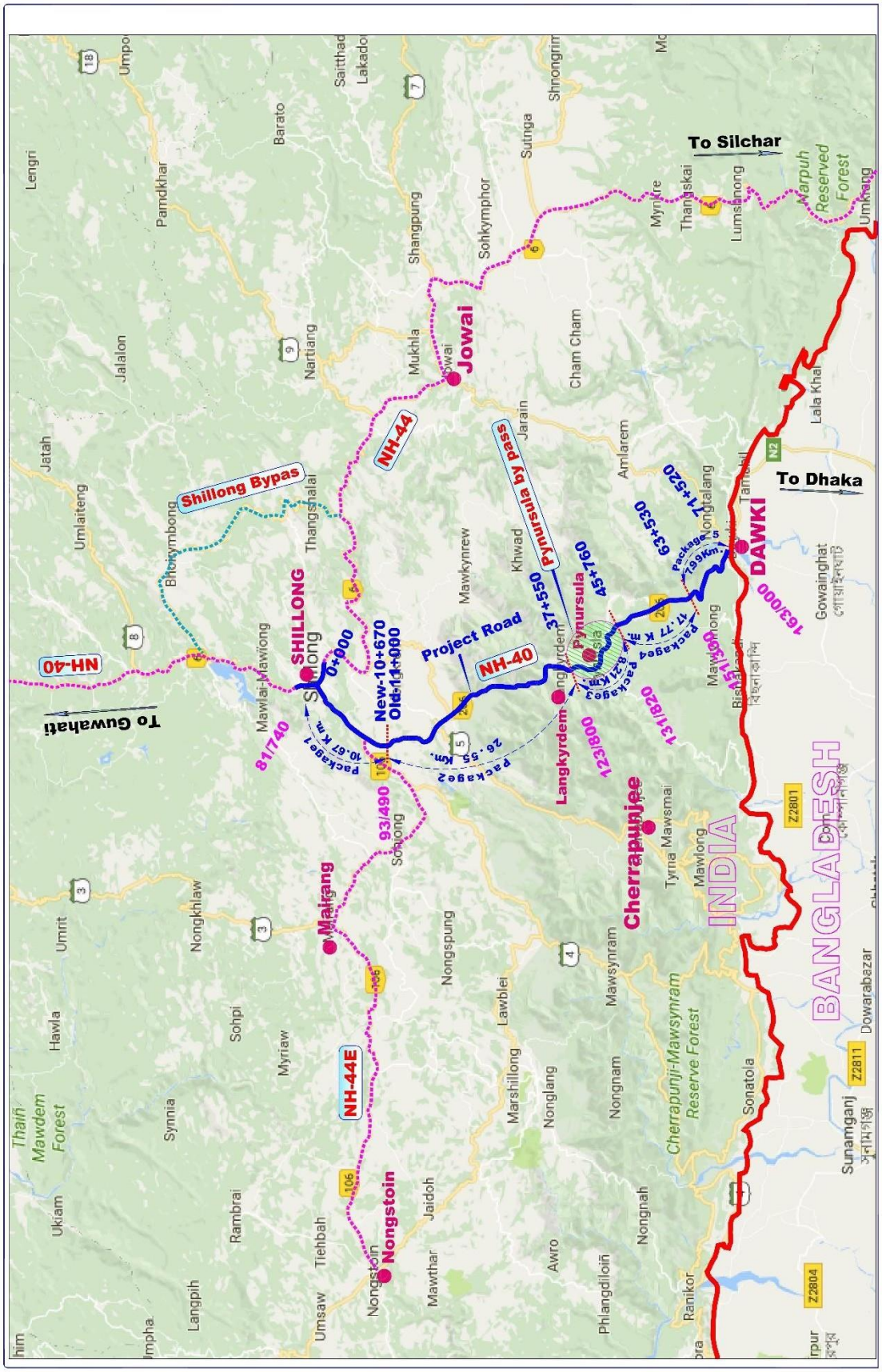
(ii) The dates of handing over the Right of Way to the Contractor are specified in **Annex-II** of this **Schedule-A**.

(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**.

IndexMap


To Silchar
To Dhaka
To Guwahati
Shillong Bypas
NH-44
NH-40
NH-44E
Project Road
Pynursula by pass
SHILLONG
Jowai
DAWKI
Pynursula
Cherrapunjee
Mairang
Nongstoin
Langkyrdem
New-10+670
Old-11+000
0+000
37+550
45+760
63+530
74+520
81/740
93/490
123/800
131/820
163/000
Package 1
10.67 K.m.
Package 2
26.55 Km.
Package 3
11.77 K.m.
Package 4
8.21Km.
Package 5
7.99Km.
INDIA
BANGLADESH
Thain Mawdem Forest
Cherrapunji-Mawsynram Reserve Forest
Narpuh Reserved Forest

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, (Wahlyngkat) 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	24 m-60 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	ExistingChainage.From	ExistingChainage.To	C/Wwidth(m)
1	93/490	120/700	6.5-7.0
2	120/700	123/800	5.5– 6.0

Work executed by previous Contractor partially and considered in existing road are-

A. Bypass/ Realignment / Geometric Improvement (Flexible Pavement):

- A total effective length of 7.289 km of Earthwork up to Subgrade top has been partially executed.
- A total effective length of 5.524 km of GSB has been partially laid.
- A total effective length of 4.298 km of WMM has been partially laid.
- A total effective length of 3.512 km of DBM has been laid.
- A total effective length of 2.329 km of BC has been laid.

B. Widening and Strengthening (Flexible Pavement):

- A total effective length of 1.006 km of Earthwork upto Subgrade top has been partially executed.
- A total effective length of 0.112 km of GSB has been partially laid.

Chainage wise details of partially/ fully executed works-

(i) Partially/ Fully Executed Works to be completed/ rectified are as follows-

(i) Earthwork upto Subgrade Top (Reconstruction/ Realignment/ Bypass/ Geometric Improvement) (Partially Completed)					
Sl No:	**Design Chainage**		**Side**	**Effective Length (m)**	**Remarks**
	From	**To**			
1	011+000	011+210	BHS	210	*To be rectified/ completed as per MoRTH specifications and IRC guidelines.*
2	011+220	011+240	BHS	20	
3	011+333	011+380	BHS	47	
4	011+380	011+530	BHS	150	
5	011+535	011+615	BHS	80	
6	011+630	011+635	BHS	5	
7	011+650	011+680	BHS	30	
8	011+720	011+920	LHS	100	
9	012+260	012+270	BHS	10	
10	012+300	012+365	BHS	65	
11	012+365	012+605	BHS	240	
12	012+605	012+695	BHS	90	
13	012+700	012+720	BHS	20	
14	012+720	012+750	BHS	30	
15	012+750	012+770	BHS	20	
16	012+770	012+900	BHS	130	
17	012+900	012+990	BHS	90	
18	013+030	013+185	BHS	155	
19	013+185	013+510	BHS	325	
20	013+510	013+620	BHS	110	
21	013+660	013+740	BHS	80	
22	013+800	013+870	BHS	70	
23	013+880	013+905	BHS	25	
24	013+905	014+180	BHS	275	
25	014+190	014+320	BHS	130	
26	014+800	014+840	LHS	20	
27	015+520	015+630	BHS	110	
28	016+260	016+330	LHS	35	
29	016+390	016+400	LHS	5	
30	016+560	016+750	BHS	190	
31	016+990	017+050	BHS	60	
32	017+160	017+230	LHS	35	
33	017+240	017+300	LHS	30	
34	017+430	017+580	BHS	150	
35	017+620	017+670	BHS	50	
36	018+720	018+780	BHS	60	
37	018+960	019+020	BHS	60	

38	019+050	019+140	LHS	45	*To be rectified/ completed as per MoRTH specifications and IRC guidelines.*
39	019+140	019+190	BHS	50	
40	019+240	019+290	BHS	50	
41	019+310	019+450	BHS	140	
42	019+500	019+600	LHS	50	
43	019+600	019+750	BHS	150	
44	019+840	020+029	BHS	189	
45	020+030	020+210	BHS	180	
46	020+210	020+279	BHS	69	
47	020+281	020+350	BHS	69	
48	020+390	020+490	BHS	100	
49	020+570	021+190	BHS	620	
50	021+270	021+460	BHS	190	
51	021+540	021+620	BHS	80	
52	021+620	021+940	BHS	320	
53	021+940	021+960	BHS	20	
54	021+960	022+480	BHS	520	
55	022+540	022+730	BHS	190	
56	022+730	022+760	BHS	30	
57	030+400	030+600	BHS	200	
58	032+000	032+250	LHS	125	
59	032+520	032+900	BHS	380	
60	032+900	033+300	LHS	200	
61	032+900	032+920	RHS	10	
	Total Length (m) =			**7289**	

(ii) Earthwork upto Subgrade Top (Widening & Strengthening) (Partially Completed)					
Sl No:	**Design Chainage**		**Side**	**Effective Length (m)**	**Remarks**
	From	**To**			
1	011+920	011+990	LHS	35	*To be rectified/ completed as per MoRTH specifications and IRC guidelines.*
2	012+060	012+074	LHS	7	
3	012+076	012+200	LHS	62	
4	012+230	012+260	BHS	30	
5	015+630	015+640	BHS	10	
6	015+640	015+650	RHS	5	
7	015+660	015+710	RHS	25	
8	015+720	015+880	BHS	160	
9	015+815	015+859	RHS	22	
10	028+052	028+314	LHS	131	
11	028+316	028+484	LHS	84	
12	028+486	028+660	LHS	87	

13	036+226	036+340	LHS	57	*To be rectified/ completed as per MoRTH specifications and IRC guidelines.*
14	036+410	036+420	LHS	5	
15	036+420	036+550	LHS	65	
16	036+773	036+905	LHS	66	
17	036+920	037+230	LHS	155	
	Total Length (m) =			**1006**	

(iii) GSB (Reconstruction/ Realignment/ Bypass/ Geometric Improvement) (Partially Completed)					
SI No:	**Design Chainage**		**Side**	**Effective Length (m)**	**Remarks**
	From	**To**			
1	011+000	011+210	BHS	210	*To be rectified/ completed as per MoRTH specifications and IRC guidelines.*
2	011+350	011+380	BHS	30	
3	011+380	011+530	BHS	150	
4	011+540	011+615	BHS	75	
5	011+630	011+635	BHS	5	
6	011+650	011+680	BHS	30	
7	011+740	011+920	LHS	90	
8	012+300	012+365	BHS	65	
9	012+365	012+605	BHS	240	
10	012+605	012+640	BHS	35	
11	012+700	012+720	BHS	20	
12	012+720	012+750	BHS	30	
13	012+750	012+770	BHS	20	
14	012+770	012+900	BHS	130	
15	013+160	013+185	BHS	25	
16	013+185	013+510	BHS	325	
17	013+530	013+620	BHS	90	
18	013+800	013+870	BHS	70	
19	013+905	014+180	BHS	275	
20	014+190	014+320	BHS	130	
21	016+570	016+750	BHS	180	
22	018+955	019+030	BHS	75	
23	019+140	019+185	BHS	45	
24	019+200	019+240	BHS	40	
25	019+270	019+320	BHS	50	
26	019+840	020+029	BHS	189	
27	020+030	020+210	BHS	180	
28	020+210	020+250	BHS	40	
29	020+390	020+490	BHS	100	
30	020+570	021+190	BHS	620	
31	021+265	021+400	BHS	135	

32	021+540	021+620	BHS	80	*To be rectified/ completed as per MoRTH specifications and IRC guidelines.*
33	021+620	021+940	BHS	320	
34	021+960	022+480	BHS	520	
35	022+540	022+730	BHS	190	
36	022+740	022+760	BHS	20	
37	032+000	032+250	LHS	125	
38	032+520	032+890	BHS	370	
39	032+900	033+300	LHS	200	
	Total Length (m) =			**5524**	

(iv) GSB (Widening & Strengthening) (Partially Completed)					
Sl No:	**Design Chainage**		**Side**	**Effective Length (m)**	**Remarks**
	From	**To**			
1	011+920	011+990	LHS	35	*To be rectified/ completed as per MoRTH specifications and IRC guidelines.*
2	015+660	015+814	RHS	77	
	Total Length (m) =			**112**	

(v) WMM (Reconstruction/ Realignment/ Bypass/ Geometric Improvement) (Partially Completed)					
Sl No:	**Design Chainage**		**Side**	**Effective Length (m)**	**Remarks**
	From	**To**			
1	011+000	011+178	BHS	178	*To be rectified/ completed as per MoRTH specifications and IRC guidelines.*
2	011+182	011+220	BHS	38	
3	011+380	011+539	BHS	159	
4	011+541	011+615	BHS	74	
5	011+630	011+635	BHS	5	
6	011+650	011+680	BHS	30	
7	012+365	012+605	BHS	240	
8	012+700	012+750	BHS	50	
9	012+770	012+900	BHS	130	
10	013+160	013+510	BHS	350	
11	013+530	013+620	BHS	90	
12	013+905	014+180	BHS	275	
13	014+190	014+310	BHS	120	
14	018+955	019+030	BHS	75	
15	019+075	019+185	BHS	110	
16	019+195	019+320	BHS	125	
17	019+600	019+750	BHS	150	
18	019+840	020+029	BHS	189	
19	020+030	020+210	BHS	180	

20	020+210	020+240	BHS	30	*To be rectified/ completed as per MoRTH specifications and IRC guidelines.*
21	020+570	021+170	BHS	600	
22	021+170	021+190	BHS	20	
23	021+540	021+620	BHS	80	
24	021+620	021+930	BHS	310	
25	021+970	022+475	BHS	505	
26	022+540	022+725	BHS	185	
	Total Length (m) =			**4298**	

(vi) DBM (Reconstruction/ Realignment/ Bypass/ Geometric Improvement) (Completed)					
Sl No:	**Design Chainage**		**Side**	**Effective Length (m)**	**Remarks**
	From	**To**			
1	011+000	011+178	BHS	178	*To be rectified/ completed as per MoRTH specifications and IRC guidelines.*
2	011+182	011+220	BHS	38	
3	011+380	011+539	BHS	159	
4	011+541	011+615	BHS	74	
5	011+630	011+635	BHS	5	
6	011+650	011+680	BHS	30	
7	012+365	012+605	BHS	240	
8	012+720	012+750	BHS	30	
9	012+770	012+900	BHS	130	
10	013+185	013+500	BHS	315	
11	013+905	014+175	BHS	270	
12	014+200	014+295	BHS	95	
13	019+845	020+029	BHS	184	
14	020+031	020+210	BHS	179	
15	020+570	021+170	BHS	600	
16	021+620	021+920	BHS	300	
17	021+970	022+470	BHS	500	
18	022+540	022+725	BHS	185	
	Total Length (m) =			**3512**	

(vi) BC (Reconstruction/ Realignment/ Bypass/ Geometric Improvement) (Completed)					
Sl No:	**Design Chainage**		**Side**	**Effective Length (m)**	**Remarks**
	From	**To**			
1	011+000	011+178	BHS	178	*To be rectified/ completed as per MoRTH specifications and IRC guidelines.*
2	011+182	011+220	BHS	38	
3	011+380	011+456	RHS	38	
4	012+870	012+900	RHS	15	
5	013+190	013+500	BHS	310	
6	013+905	014+175	BHS	270	
7	014+200	014+295	BHS	95	
8	020+565	021+170	BHS	605	
9	021+630	021+920	BHS	290	
10	021+975	022+465	BHS	490	
	Total Length (m) =			**2329**	

4. Major Bridges

The Site includes the following Major Bridges:

S.No.	Existing Chainage (Km)	Type of Structure			SpanArrangement(m)	Width(m)
		Foundation	Sub-structure	Superstructure		
Nil						

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

TheSiteincludesthefollowingROB(roadoverrailwayline)/RUB(roadunderrailwayline):

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

6. Grade separators

TheSiteincludesthefollowinggradeseparators:

S.No.	ExistingChainage(Km)	Typeof Structure		Span Arrangement(m)	Width (m)
		Foundation	Superstructure		
Nil					

7. Minor bridges

The Site includes the following minor bridges:

S. No.	Existing Chainage/ (Km)	Type of Structure			No of spanswith SpanLength(m)	Width (m)
		Foundation	Substructure	Super Structure		
1	96/777	Open	RCCWall	RCCT-beam	1x 25.4	8.4
2	100/808	Open	RCCWall/ CircularPier	RCCT-beam	1x9.6 + 1x25.5 + 1x9.6(Skew)	8.4
3	101/930	Open	RCCWall	RCCT-beam	1x 25.0	11.5
4	107/487	Open	RCCWall	RCCT-beam	1x 25.4	8.4

8. Railwaylevel crossings

TheSiteincludesthefollowingrailwaylevelcrossings:

S.No.	**Location (km)**	**Remarks**
NIL		

9. Underpasses(vehicular,non-vehicular)

The Site includes the following underpasses (partially executed):

S. No.	DesignChainage	Structure Type	Spanarrangement (m)	Road to be carried underthestructure	Min. Verticalclearance (m)	Width ofstructure (m)	Remarks
1	13+148	**SVUP**	1x 7.0	Village Road	4.0	1 x 12	Partially Completed upto Deck Slab

10. Culverts

The Site has the following culverts:

(a) Existing Culverts:

S.No.	Existing Chainage	Typeof Culvert	No. xspanlength /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	Typeof Culvert	No. xspanlength /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	Typeof Culvert	No. xspanlength /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	Typeof Culvert	No. xspanlength /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	Typeof Culvert	No. xspanlength /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	Typeof Culvert	No. xspanlength /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 x0.90	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	

(b) Additionally, the following Culverts have been partially executed:

Sl. No.	Design Chainage	Clear Span (Nos.x L x H/dia.)			Type	Proposal for Improvement	Remarks
		Nos.	L	H/dia.			
1	011+220	1.0	3.0	3.0	Box	New	Partially Executed
2	011+530	1.0	2.0	2.0	Box	New	Partially Executed
3	011+620	1.0	2.0	2.0	Box	New	Partially Executed
4	012+525	1.0	3.0	3.0	Box	New	Partially Executed
5	013+355	1.0	-	1.2	Pipe	New	Partially Executed
6	013+521	1.0	6.0	4.0	Box	New	Partially Executed
7	013+626	1.0	6.0	5.0	Box	New	Partially Executed
8	013+872	1.0	3.0	3.0	Box	New	Partially Executed
9	014+060	1.0	2.0	2.0	Box	New	Partially Executed
10	015+520	1.0	2.0	1.5	Box	New	Partially Executed
11	019+230	1.0	2.0	2.0	Box	New	Partially Executed
12	020+030	1.0	2.0	1.5	Box	New	Partially Executed
13	020+725	1.0	-	1.2	Pipe	New	Partially Executed
14	020+880	1.0	-	1.2	Pipe	New	Partially Executed
15	021+040	1.0	-	1.2	Pipe	New	Partially Executed
16	021+600	1.0	-	1.2	Pipe	New	Partially Executed
17	021+950	1.0	3.0	3.0	Box	New	Partially Executed
18	022+110	1.0	-	1.2	Pipe	New	Partially Executed
19	022+260	1.0	-	1.2	Pipe	New	Partially Executed
20	030+460	1.0	-	1.2	Pipe	New	Partially Executed

11. Bus bays

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

S.No.	Chainage (km)	Length (m)	LeftHandSide	RightHand Side
Nil				

12. Truck Lay byes

The details of truck lay byes are as follows:

S.No.	Chainage (km)	Length (m)	LeftHandSide	RightHand Side
Nil				

13. Roadside drains

Thedetailsoftheroadsidedrainsareasfollows:

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	-

(b) Additionally, the following Lined Open Drains have been executed partially:

Sl. No.	LHS			RHS			Remarks
	From	To	Length (m)	From	To	Length (m)	
1	012+400	012+492	92	012+354	012+456	102	Partially Executed
2	012+566	012+609	43	013+942	014+020	78	
3	013+967	014+080	113	014+216	014+303	87	
4	014+080	014+166	86	019+850	020+213	363	
5	014+198	014+313	115	021+330	021+334	04	
6	019+605	019+730	125	022+280	022+430	150	
7	020+561	020+861	300				
8	020+884	021+004	120				
9	021+082	021+150	68				
10	021+318	021+373	55				
11	022+122	022+252	130				
12	022+267	022+450	183				
13	020+561	020+861	300				
	Total Length (LHS)(m) :		**1730.5**	**Total Length (RHS)(m) :**		**784**	

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 SH5

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

15. Minor junctions

Thedetailsoftheminorjunctions(allatgrade)areasfollows:

S. No.	Location ofIntersection	Type ofIntersection	Otherfeatures(RoadLeading To)	
			LHS	RHS
1	93/520	Y Junction		Marbaniang
2	93/590	T Junction	Marbaniang	
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		Pammumvillage
12	115/170	T Junction	Surok	
13	121/870	Y Junction	-	Mawlieh
14	122/150	Y Junction	Lyngkyerdem	-

16. Bypasses

Thedetailsofthebypassesareasfollows:

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

17. Otherstructures

Sl.No.	Chainage(km)	TypeofStructure	No.ofSpanswithspanlength(m)	Width(m)
Nil				

18. OtherProtection Works

Other protection works executed in project stretch are as under:

(i) Breast Wall (Partially Executed)

Sl. No.	LHS			RHS		
	Ch. From	Ch. To	Length(m)	Ch. From	Ch. To	Length(m)
1	012+395	012+440	**45**	012+370	012+440	**70**
	Total (LHS) =		**45**	**Total (RHS) =**		**70**

(ii) Retaining Wall (Partially Executed)

Sl. No.	LHS			RHS		
	Ch. From	Ch. To	Length(m)	Ch. From	Ch. To	Length(m)
1	012+785	012+870	85	011+920	011+990	70
2	015+190	015+220	30	014+040	014+060	20
3	015+270	015+300	30	014+066	014+081	15
4	015+305	015+480	175			
5	015+680	015+710	30			
	TOTAL (LHS) =		**350**	**TOTAL (RHS) =**		**105**

19. Design Chainages corresponding to Existing references.

Sl.no.	Existing Chainage	Proposed Chainage
1	93/490	New10+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
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)	DateofprovidingRoW
1	New10+670/ 11+000	37+550	26.550	24mto60m	Minimum 90% on Appointed date and remaining within 150 days of Appointed date

Note: Total Design Length: 26.550 km

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:

a. 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 onsite/ design requirement.
b. Signage plan of the project highway is enclosed. The contractor shall, however, improve/ upgrade 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/ 2008-1 A.III (dated 22August2013).

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

Schedule-B

SCHEDULE B

(SeeClause2.1)

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

2 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-Laning 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:

Sl. No.	Built-up section Township	Design Chainage		TCS Type	Width of Paved Carriageway (m)
		From	To		
1	3rd Mile	010+670/11+000	012+400	Type-5	10
2	Pombot	015+700	017+000	Type-5	10
3	Pomlum	027+800	028+200	Type-5	10
4	Mawkajem	028+800	029+400	Type-5	10

(b) Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1.(i) 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.

3 Geometric Design and General Features

(i) General

Geometric design and general features of the Project Highway shall be in accordance with Section2 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.

(iv) Scope of Project Highway works

The scope of Project highway works are as follows-

A) Bypass/ Realignment/ Geometric Improvement (Flexible Pavement)

Sl. No.	Design Chainage		Length (m)	Remarks
	Start	End		
1	011+000	011+920	920	
2	012+260	014+320	2060	Mylliem Bypass
3	014+440	014+860	420	
4	015+470	015+630	160	
5	016+080	019+840	3760	
6	019+840	022+770	2930	Laitlingkot Bypass
7	022+920	027+810	4890	
8	029+050	029+500	450	
9	029+500	030+600	1100	Mawkajum Re-alignment
10	031+800	034+600	2800	
11	034+600	035+630	1030	
Total Length (A)=			**20520**	

B) Bypass/ Realignment/ Geometric Improvement (Rigid Pavement)

Sl. No.	Design Chainage		Length (m)	Remarks
	Start	End		
1	022+770	022+920	150	TOLL PLAZA
Total Length (B)=			**150**	

C) Widening and Strengthening (Flexible Pavement)

Sl. No.	Design Chainage		Length (m)	Remarks
	Start	End		
1	011+920	012+260	340	
2	014+320	014+440	120	
3	014+860	015+470	610	
4	015+630	016+080	450	
5	027+810	029+050	1240	
6	030+600	031+800	1200	
7	035+630	037+550	1920	
Total Length (C)=			**5880**	

Total Design Length, A+B+C = 20520 + 150 + 5880 = 26550 m

Summary of Balance Scope:

Category	Pavement Type		Total Scope (m)	Completed/ Partially Executed (m)	Balance Scope (m)
A) Reconstruction/ Realignment/ Bypass/ Geometric Improvement	**Flexible Pavement**	**Subgrade**	20520	7289	13231
		GSB	20520	5524	14996
		WMM	20520	4298	16222
		DBM	20520	3512	17008
		BC	20520	2329	18191
B) Bypass/ Realignment/ Geometric Improvement	**Rigid Pavement**	**Subgrade**	150	0	150
		GSB	150	0	150
		DLC	150	0	150
		PQC	150	0	150
C) Widening and strengthening	**Flexible Pavement**	**Subgrade**	5880	1006	4874
		GSB	5880	112	5768
		WMM	5880	0	5880
		DBM	5880	0	5880
		BC	5880	0	5880

Note:

- **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.**
- ***The above design length of 26.550 km (20.520 km + 0.150 km + 5.880 km) includes partial and completed executed works in Earthwork upto subgrade top, GSB, WMM, DBM& BC as mentioned in Schedule-A & B, which shall be rectified as per extant Ministry's Specifications and IRC Codal Provisions in case any deficiencies are found during execution, without any additional cost implications and also shall not attract any Change of Scope (CoS).***

(v) Right of Way

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

(vi) Type of shoulders

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

(b) In open country, paved shoulders of 1.5 m width shall be provided and balance 1.0 m shall be covered with 150 mm thick compacted layer of 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.

(vii) Lateral and vertical clearances at underpasses

(a) Lateral and vertical clearances at underpasses and provision of guard rails/ 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	1X7.0	4.0	SVUP (Partially executed)
3.	21+250	1 x 7.0	4.0	SVUP

SVUP: Small Vehicular Underpass

(viii) 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:

Sl. No.	Design Chainage	Clear Span(m)	Vertical Clearance(m)	Remarks
1	012+699	1X35.0	9.5	VOP
2	013+788	1X35.0	9.5	VOP
3	020+370	1X35.0	9.5	VOP
4	021+519	1X35.0	10.0	VOP

(ix) 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	

(x) 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 x35.0	NH-40	1x6.50
2	13+788	1 x35.0	NH-40	1x6.50
3	20+370	1 x35.0	NH-40	1x6.50
4	21+519	1 x35.0	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)	**Remarks**
1	12+760	1x 7.0	Village Road	4.0	1 x12	New Scope
2.	13+148	1X7.0	Village Road	4.0	1x12	Partially Executed
3	21+250	1x 7.0	VillageRoad	4.0	1 x 12	New Scope

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.

(iii) For Partially executed Grade Separated structures, i**.e., SVUP at Ch. Km 13 + 148**, the balance scope shall be completed for remaining items and components as per IRC/ MoRT&H specifications.

(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**	**Crossroad at**		
			Existing level	**Raised Level**	**Lowered Level**
1	12+699	VOP	VillageRoad		NH-40
2	12+760	SVUP	VillageRoad	NH-40	
3.	13+148	SVUP	VillageRoad	NH-40	
4.	13+788	VOP	Mylliem - Pomlakrai Road		NH-40
5.	20+370	VOP	Laitlyngkot - PomlakraiRoad		NH-40
6.	21+250	SVUP	VillageRoad	NH-40	
7.	21+519	VOP	VillageRoad		NH-40

(xi) Cattle and pedestrian under pass/over pass

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

Sl.No.	Location	Type of crossing
NIL		

(xii) 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**.

The indicative TCS for Project Highway are as follows-

SL. No	Chainage		Length (m)	Type of TCS
	From	To		
1	11+000	11+015	15	3
2	11+015	11+230	215	4
3	11+230	11+280	50	5
4	11+280	11+670	390	4
5	11+670	11+730	60	1
6	11+730	11+850	120	3
7	11+850	11+910	60	5
8	11+910	12+000	90	4A
9	12+000	12+060	60	5
10	12+060	12+090	30	4
11	12+090	12+170	80	3
12	12+170	12+190	20	5
13	12+190	12+220	30	4A
14	12+220	12+240	20	6
15	12+240	12+320	80	1
16	12+320	12+490	170	3
17	12+490	12+580	90	4
18	12+580	12+740	160	3
19	12+740	12+770	30	4
20	12+770	12+790	20	3
21	12+790	12+978	188	4
22	12+978	13+016	38	Minor Bridge
23	13+016	13+550	534	4
24	13+550	13+570	20	3
25	13+570	13+670	100	4
26	13+670	13+810	140	3
27	13+810	13+920	110	4
28	13+920	14+020	100	3
29	14+020	14+080	60	4
30	14+080	14+150	70	3
31	14+150	14+220	70	4
32	14+220	14+357	137	3
33	14+357	14+382	25	Minor Bridge
34	14+382	14+800	418	3
35	14+800	14+940	140	4
36	14+940	15+010	70	4A

SL. No	Chainage		Length (m)	Type of TCS
	From	To		
37	15+010	15+040	30	6
38	15+040	15+190	150	3
39	15+190	15+290	100	6
40	15+290	15+320	30	4A
41	15+320	15+410	90	6
42	15+410	15+460	50	7
43	15+460	15+500	40	2
44	15+500	15+530	30	4
45	15+530	15+550	20	2
46	15+550	15+610	60	3
47	15+610	15+640	30	6
48	15+640	15+670	30	4A
49	15+670	15+700	30	6
50	15+700	15+750	50	3
51	15+750	15+810	60	2
52	15+810	15+870	60	3
53	15+870	15+980	110	6
54	15+980	16+060	80	4A
55	16+060	16+090	30	6
56	16+090	16+170	80	3
57	16+170	16+220	50	6
58	16+220	16+560	340	3
59	16+560	16+620	60	4
60	16+620	16+730	110	2
61	16+730	16+760	30	3
62	16+760	16+810	50	4
63	16+810	16+830	20	1
64	16+830	16+940	110	3
65	16+940	16+970	30	5
66	16+970	17+060	90	3
67	17+060	17+130	70	4
68	17+130	17+280	150	5
69	17+280	17+560	280	3
70	17+560	17+690	130	4
71	17+690	17+830	140	3
72	17+830	17+880	50	4
73	17+880	17+930	50	1
74	17+930	18+150	220	3
75	18+150	18+173	23	4
76	18+173	18+218	45	**Minor Bridge**
77	18+218	18+410	192	3

SL. No	Chainage		Length (m)	Type of TCS
	From	To		
78	18+410	18+480	70	4
79	18+480	18+520	40	2
80	18+520	18+555	35	3
81	18+555	18+705	150	Major Bridge
82	18+705	18+900	195	3
83	18+900	19+030	130	4
84	19+030	19+200	170	3
85	19+200	19+290	90	4
86	19+290	19+460	170	3
87	19+460	19+510	50	7
88	19+510	19+750	240	3
89	19+750	19+850	100	4
90	19+850	20+010	160	3
91	20+010	20+040	30	2
92	20+040	20+460	420	3
93	20+460	20+540	80	4
94	20+540	20+640	100	1
95	20+640	20+860	220	3
96	20+860	20+900	40	4
97	20+900	20+920	20	1
98	20+920	21+000	80	3
99	21+000	21+050	50	4
100	21+050	21+150	100	3
101	21+150	21+310	160	4
102	21+310	21+830	520	3
103	21+830	22+020	190	4
104	22+020	22+050	30	1
105	22+050	22+130	80	4
106	22+130	22+200	70	3
107	22+200	22+220	20	1
108	22+220	22+260	40	4
109	22+260	22+450	190	3
110	22+450	22590	140	4
111	22+590	22+700	110	3
112	22+700	22+750	50	4
113	22+750	22+980	230	3
114	22+980	23+045	65	1
115	23+045	23+071	26	Minor Bridge
116	23+071	23+210	139	3
117	23+210	23+230	20	2
118	23+230	23+380	150	3

SL. No	Chainage		Length (m)	Type of TCS
	From	To		
119	23+380	23+450	70	4
120	23+450	23+480	30	1
121	23+480	23+510	30	4
122	23+510	23+730	220	2
123	23+730	23+820	90	3
124	23+820	23+850	30	2
125	23+850	24+000	150	3
126	24+000	24+050	50	6
127	24+050	24+180	130	3
128	24+180	24+220	40	6
129	24+220	24+420	200	3
130	24+420	24+450	30	4
131	24+450	24+610	160	3
132	24+610	24+650	40	6
133	24+650	24+850	200	3
134	24+850	24+970	120	2
135	24+970	25+030	60	4
136	25+030	25+140	110	6
137	25+140	25+190	50	4A
138	25+190	25+250	60	3
139	25+250	25+420	170	2
140	25+420	25+530	110	3
141	25+530	25+560	30	2
142	25+560	25+620	60	4
143	25+620	25+930	310	3
144	25+930	25+950	20	4A
145	25+950	25+980	30	2
146	25+980	26+190	210	3
147	26+190	26+230	40	2
148	26+230	26+370	140	3
149	26+370	26+470	100	2
150	26+470	26+650	180	3
151	26+650	26+750	100	2
152	26+750	26+800	50	4A
153	26+800	27+030	230	6
154	27+030	27+070	40	2
155	27+070	27+160	90	3
156	27+160	27+180	20	6
157	27+180	27+220	40	3
158	27+220	27+250	30	6
159	27+250	27+820	570	3

SL. No	Chainage		Length (m)	Type of TCS
	From	To		
160	27+820	27+890	70	6
161	27+890	28+130	240	3
162	28+130	28+240	110	7
163	28+240	28+430	190	3
164	28+430	28+450	20	7
165	28+450	28+880	430	3
166	28+880	28+950	70	4A
167	28+950	29+060	110	3
168	29+060	29+130	70	5
169	29+130	29+230	100	3
170	29+230	29+250	20	1
171	29+250	29+280	30	4
172	29+280	29+360	80	3
173	29+360	29+390	30	6
174	29+390	29+840	450	3
175	29+840	29+880	40	2
176	29+880	30+110	230	3
177	30+110	30+130	20	2
178	30+130	30+300	170	4
179	30+300	30+330	30	2
180	30+330	30+570	240	3
181	30+570	30+670	100	4
182	30+670	30+690	20	1
183	30+690	30+800	110	3
184	30+800	30+910	110	5
185	30+910	30+950	40	3
186	30+950	31+130	180	5
187	31+130	31+150	20	3
188	31+150	31+200	50	5
189	31+200	31+320	120	3
190	31+320	31+550	230	5
191	31+550	31+730	180	3
192	31+730	31+810	80	5
193	31+810	31+990	180	3
194	31+990	32+220	230	4A
195	32+220	32+260	40	5
196	32+260	32+290	30	4A
197	32+290	32+340	50	2
198	32+340	32+380	40	3
199	32+380	32+480	100	2
200	32+480	32+650	170	3

SL. No	Chainage		Length (m)	Type of TCS
	From	To		
201	32+650	32+690	40	5
202	32+690	32+720	30	4A
203	32+720	32+750	30	3
204	32+750	32+780	30	1
205	32+780	32+800	20	3
206	32+800	32+930	130	1
207	32+930	32+970	40	3
208	32+970	33+080	110	5
209	33+080	33+130	50	3
210	33+130	33+160	30	4
211	33+160	33+260	100	7
212	33+260	33+370	110	4A
213	33+370	33+520	150	5
214	33+520	33+620	100	3
215	33+620	33+690	70	5
216	33+690	33+850	160	5
217	33+850	33+930	80	5
218	33+930	33+970	40	4A
219	33+970	34+000	30	7
220	34+000	34+030	30	3
221	34+030	34+200	170	5
222	34+200	34+390	190	3
223	34+390	34+490	100	1
224	34+490	34+650	160	4A
225	34+650	34+750	100	6
226	34+750	34+780	30	3
227	34+780	34+890	110	6
228	34+890	34+910	20	3
229	34+910	34+940	30	6
230	34+940	34+960	20	4A
231	34+960	34+990	30	6
232	34+990	35+190	200	3
233	35+190	35+220	30	2
234	35+220	35+320	100	3
235	35+320	35+470	150	6
236	35+470	35+740	270	4A
237	35+740	35+760	20	5
238	35+760	35+800	40	3
239	35+800	35+830	30	7
240	35+830	35+870	40	4A
241	35+870	35+920	50	7

SL. No	Chainage		Length (m)	Type of TCS
	From	To		
242	35+920	36+080	160	4A
243	36+080	36+290	210	7
244	36+290	36+350	60	3
245	36+350	36+390	40	7
246	36+390	36+590	200	3
247	36+590	36+740	150	4A
248	36+740	36+760	20	7
249	36+760	36+840	80	4A
250	36+840	36+930	90	7
251	36+930	36+950	20	3
252	36+950	36+980	30	7
253	36+980	37+070	90	4A
254	37+070	37+090	20	7
255	37+090	37+330	240	4A
256	37+330	37+360	30	7
257	37+360	37+510	150	4A
258	37+510	37+550	40	7
Total Length (m) =			**26550**	

Note:

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

4 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 the table below**.** Draft layout of major junctions is given in indicative Plan & Profile drawings for reference.

Sl. No	Proposed Chainage	Classification ofcrossroad	Typeof Junction (T,Y,+)	Typeof Cross Road	Side	Road Leading to

	MajorJunctions					
1	18+520	SH 5	Y Junction	2-LaneBT	Right	Cherrapungi
	MinorJunctions					
1	11+140	VillageRoad	T Junction	1-LaneBT	Left	Marbaniang
2	11+760	VillageRoad	Y Junction	1-LaneBT	Right	Marbaniang
3	11+795	VillageRoad	T Junction	1-LaneBT	Right	Marbaniang
4	12+280	ExistingNH40	T Junction	2-LaneBT	Right	Mylliem
5	13+340	VillageRoad	T Junction	1-LaneBT	Left	Mawiong
6	14+320	ExistingNH40	Y Junction	2-LaneBT	Right	Mylliem
7	16+685	MDR31	T Junction	Intermediate Lane BT	Left	Mawan
8	19+850	ExistingNH40	T Junction	2-LaneBT	Left	Laitlingkot
9	22+640	ExistingNH40	Y Junction	2-LaneBT	Right	Laitlingkot
10	27+980	VillageRoad	Y Junction	1-LaneBT	Right	Pammumvillage
11	30+650	VillageRoad	T Junction	1-LaneBT	Left	Surok
12	35+670	VillageRoad	Y Junction	1-LaneBT	Right	Mawlieh
13	35+950	VillageRoad	Y Junction	1-LaneBT	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.

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

(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		

5 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/ geocells/ 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. The locations of these spoil banks should be identified by the EPC contractor in consultation with the Authority Engineer and Competent Authority.

6 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 20years 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.

7 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

i) Lined Covered drain location						
Sl. No.	Left			Right		Remarks
	From	To		From	To	
1	011+680	011+850		015+200	015+400	
2	015+900	016+600		015+600	016+600	
3	035+900	036+200				

ii) Lined Open drain location (on Hill Side)							
Sl. No.	Left			Right			Remarks
	From	To		From	To		
1	011+850	012+400		012+280	012+354		
2	012+492	012+566		012+456	012+750		
3	012+609	012+730		012+850	012+970		
4	013+680	013+967		013+670	013+820		
5	014+166	014+198		015+000	015+200		
6	014+313	014+340		015+400	015+600		
7	014+400	014+950		016+600	016+800		
8	016+800	018+150		017+940	018+130		
9	018+200	018+410		018+200	018+530		
10	019+050	019+605		018+530	018+560		
11	020+300	020+561		018+710	018+900		
12	020+861	020+884		020+213	020+460		
13	021+004	021+082		021+334	021+840		
14	021+300	021+318		022+650	023+010		
15	021+373	021+850		023+090	028+000		
16	022+020	022+122		029+370	030+580		
17	022+252	022+267		034+630	035+750		
18	022+550	022+700					
19	027+890	029+350					
20	030+670	034+500					
21	035+750	035+900					
22	036+200	037+550					

iii) Lined Open drain location(on Valley Side)							
Sl. No.	Left			Right			Remarks
	From	To		From	To		
1	023+130	023+200		013+930	013+941		
2	023+280	023+380		014+080	014+150		
3	024+240	024+420		014+210	014+216		
4	024+490	024+590		014+303	014+310		
5	024+680	024+860		014+400	014+540		
6	025+420	025+550		017+490	017+580		
7	026+240	026+340		017+700	017+840		
8	026+530	026+660		029+140	029+220		
9	029+450	029+570		031+850	031+990		
10	029+890	030+220		032+290	032+490		
11	034+970	035+190		032+540	032+650		
12	035+210	035+350		033+755	033+845		
13				034+190	034+400		

(b)Partially executed open lined drains:

Additionally, the following open lined drain has been executed Partially by previous EPC Contractor, which shall be rectified/ completed as per MoRTH's specification and IRC guidelines.

Sl. No.	LHS			RHS			Remarks
	From	To		From	To		
1	012+400	012+492		012+354	012+456		Balance Scope includes Rectification/ Completion/ Finishing works.
2	012+566	012+609		013+942	014+020		
3	013+967	014+080		014+216	014+303		
4	014+080	014+166		019+850	020+213		
5	014+198	014+313		021+330	021+334		
6	019+605	019+730		022+280	022+430		
7	020+561	020+861					
8	020+884	021+004					
9	021+082	021+150					
10	021+318	021+373					
11	022+122	022+252					
12	022+267	022+450					
13	020+561	020+861					

Note:

(i) 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.

(ii) Further open drains partially executed in project stretch shall be rectified and completed in all respects as per MoRTH specifications and IRC guidelines without any additional cost implications.

8 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	16.00m	New 2 lane in Mylliem Bypass
2	14+376	96/777	13.00m	Existing retain +New 2 lane
3	18+178.03	100/808	13.00m	Existing retain +new 2 lane
4	18+630	101/930	16.00m	New 2 lane
5	23+066.97	107/487	13.00m	Existing retain +new 2 lane

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

S.No.	Design Chainage	Existing Chainage	Remarks
1	12+997	Realignment	2 lane bridge with both side footpath
2	14+376	96/777	2 lane bridge with both side footpath
3	18+178.031	100/808	2 lane bridge with both 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 pipeline, 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:

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

Sl. No.	Design Chainage	Clear Span (Nos.x L x H/dia.)			Type	Proposal for Improvement	Remarks
		Nos.	L	H/dia.			
1	011+331	1.0	3.0	3.0	Box	Reconstruction	
2	012+000	1.0	-	1.2	Pipe	New	
3	012+075	1.0	2.0	1.5	Box	Reconstruction	
4	012+210	1.0	2.0	2.0	Box	Reconstruction	
5	012+844	1.0	-	1.2	Pipe	Reconstruction	
6	014+185	1.0	2.0	1.5	Box	New	
7	014+620	1.0	2.0	1.5	Box	Reconstruction	
8	014+975	1.0	5.0	4.0	Box	Reconstruction	
9	015+300	1.0	2.0	1.5	Box	Reconstruction	
10	015+655	1.0	2.0	1.5	Box	Reconstruction	
11	015+970	1.0	2.0	1.5	Box	Reconstruction	
12	016+210	1.0	2.0	1.5	Box	Reconstruction	
13	016+387	1.0	2.0	1.5	Box	Reconstruction	
14	016+530	1.0	-	1.2	Pipe	Reconstruction	
15	016+795	1.0	2.0	2.0	Box	New	
16	017+070	1.0	2.0	2.0	Box	Reconstruction	
17	017+235	1.0	2.0	1.5	Box	Reconstruction	
18	017+405	1.0	2.0	1.5	Box	Reconstruction	
19	017+660	1.0	2.0	2.0	Box	New	
20	017+850	1.0	2.0	1.5	Box	Reconstruction	
21	018+950	1.0	6.0	6.0	Box	New	
22	019+480	1.0	2.0	1.5	Box	Reconstruction	
23	020+280	1.0	2.0	1.5	Box	New	
24	020+500	1.0	2.0	2.0	Box	New	
25	021+200	1.0	4.0	4.0	Box	New	
26	022+520	1.0	5.0	5.0	Box	New	
27	022+735	1.0	-	1.2	Pipe	New	
28	023+230	1.0	-	1.2	Pipe	Reconstruction	
29	023+480	1.0	-	1.2	Pipe	New	
30	023+630	1.0	-	1.2	Pipe	Reconstruction	

Sl. No.	Design Chainage	Clear Span (Nos.x L x H/dia.)			Type	Proposal for Improvement	Remarks
		Nos.	L	H/dia.			
31	023+850	1.0	2.0	1.5	Box	Reconstruction	
32	024+050	1.0	2.0	1.5	Box	Reconstruction	
33	024+235	1.0	2.0	1.5	Box	Reconstruction	
34	024+455	1.0	2.0	1.5	Box	New	
35	024+660	1.0	3.0	6.5	Slab	Reconstruction	
36	024+890	1.0	2.0	1.5	Box	Reconstruction	
37	025+010	1.0	-	1.2	Pipe	Reconstruction	
38	025+198	1.0	6.0	7.0	Slab	Reconstruction	
39	025+410	1.0	2.0	1.5	Box	Reconstruction	
40	025+600	1.0	2.0	1.5	Box	New	
41	025+820	1.0	2.0	1.5	Box	Reconstruction	
42	025+950	1.0	2.0	1.5	Box	Reconstruction	
43	026+100	1.0	2.0	1.5	Box	Reconstruction	
44	026+345	1.0	2.0	1.5	Box	Reconstruction	
45	026+500	1.0	2.0	1.5	Box	Reconstruction	
46	026+670	1.0	2.0	1.5	Box	Reconstruction	
47	026+800	1.0	2.0	1.5	Box	Reconstruction	
48	026+890	1.0	2.0	1.5	Box	Reconstruction	
49	027+025	1.0	2.0	1.5	Box	Reconstruction	
50	027+150	1.0	4.0	7.0	Slab	Reconstruction	
51	027+320	1.0	2.0	1.5	Box	Reconstruction	
52	027+470	1.0	2.0	1.5	Box	Reconstruction	
53	027+620	1.0	2.0	1.5	Box	Reconstruction	
54	027+860	1.0	2.0	1.5	Box	Reconstruction	
55	028+050	1.0	2.0	1.5	Box	Reconstruction	
56	028+315	1.0	2.0	1.5	Box	Reconstruction	
57	028+485	1.0	2.0	1.5	Box	Reconstruction	
58	028+680	1.0	-	1.2	Pipe	Reconstruction	
59	028+860	1.0	-	1.2	Pipe	New	
60	029+010	1.0	-	1.2	Pipe	New	
61	029+270	1.0	-	1.2	Pipe	New	
62	029+590	1.0	-	1.2	Pipe	New	
63	029+880	1.0	-	1.2	Pipe	New	
64	029+980	1.0	-	1.2	Pipe	New	
65	030+200	1.0	2.0	1.5	Box	New	
66	030+330	1.0	-	1.2	Pipe	New	
67	030+850	1.0	-	1.2	Pipe	Reconstruction	
68	030+980	1.0	2.0	1.5	Box	Reconstruction	
69	031+180	1.0	2.0	1.5	Box	Reconstruction	
70	031+405	1.0	2.0	1.5	Box	Reconstruction	

Sl. No.	Design Chainage	Clear Span (Nos.x L x H/dia.)			Type	Proposal for Improvement	Remarks
		Nos.	L	H/dia.			
71	031+590	1.0	2.0	1.5	Box	Reconstruction	
72	032+690	1.0	-	1.2	Pipe	Reconstruction	
73	033+465	1.0	-	1.2	Pipe	Reconstruction	
74	033+680	1.0	-	1.2	Pipe	Reconstruction	
75	033+850	1.0	-	1.2	Pipe	Reconstruction	
76	033+965	1.0	-	1.2	Pipe	Reconstruction	
77	034+190	1.0	-	1.2	Pipe	Reconstruction	
78	034+330	1.0	-	1.2	Pipe	Reconstruction	
79	034+840	1.0	-	1.2	Pipe	Reconstruction	
80	035+085	1.0	-	1.2	Pipe	Reconstruction	
81	035+195	1.0	-	1.2	Pipe	New	
82	035+550	1.0	2.0	1.5	Box	New	
83	035+710	1.0	2.0	1.5	Box	Reconstruction	
84	036+070	1.0	2.0	1.5	Box	Reconstruction	
85	036+195	1.0	2.0	1.5	Box	Reconstruction	
86	036+420	1.0	2.0	1.5	Box	Reconstruction	
87	036+600	1.0	2.0	1.5	Box	Reconstruction	
88	036+770	1.0	4.0	6.5	Slab	Reconstruction	
89	036+920	1.0	2.0	1.5	Box	Reconstruction	
90	037+075	1.0	2.0	1.5	Box	Reconstruction	
91	037+245	1.0	2.0	1.5	Box	Reconstruction	
92	037+400	1.0	-	1.2	Pipe	Reconstruction	

(ii) Partially Executed Culverts/ Balance Scope

Sl. No.	Design Chainage	Clear Span (Nos.x L x H/dia.)			Type	Proposal for Improvement	Balance Scope
		Nos.	L	H/dia.			
1	011+220	1.0	3.0	3.0	Box	New	Additional remaining items or facilities such as protection works, head wall, or other as required shall be provided in conformity with MoRTH specification and IRC guidelines.
2	011+530	1.0	2.0	2.0	Box	New	
3	011+620	1.0	2.0	2.0	Box	New	
4	012+525	1.0	3.0	3.0	Box	New	
5	013+355	1.0	-	1.2	Pipe	New	
6	013+521	1.0	6.0	4.0	Box	New	
7	013+626	1.0	6.0	5.0	Box	New	
8	013+872	1.0	3.0	3.0	Box	New	
9	014+060	1.0	2.0	2.0	Box	New	
10	015+520	1.0	2.0	1.5	Box	New	
11	019+230	1.0	2.0	2.0	Box	New	

Sl. No.	Design Chainage	Clear Span (Nos.x L x H/dia.)			Type	Proposal for Improvement	Balance Scope
		Nos.	L	H/dia.			
12	020+030	1.0	2.0	1.5	Box	New	
13	020+725	1.0	-	1.2	Pipe	New	
14	020+880	1.0	-	1.2	Pipe	New	
15	021+040	1.0	-	1.2	Pipe	New	
16	021+600	1.0	-	1.2	Pipe	New	
17	021+950	1.0	3.0	3.0	Box	New	
18	022+110	1.0	-	1.2	Pipe	New	
19	022+260	1.0	-	1.2	Pipe	New	
20	030+460	1.0	-	1.2	Pipe	New	

Note:

i. *Proposed span arrangement shall be finalized in consultation with concerned Authority in accordance with the Manual. The proposed locations are minimum. Any change in number/length/span/height shall not be treated as change in scope of work.*

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

iii. *Width of culvert shall be inconformity with Cross-section at that location.*

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

v. *For partially executed culverts, the balance scope shall be completed for remaining items and components as per approved design & drawing and shall not attract CoS.*

(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 ofStructure(m)
1	18+630	101/930	5x 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 2lane
2	14+376.50	96/777	1x 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 new2-lane

4	23+066.966	107/487	1x 25.4	13	Existing Retain+ Additional new2-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 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
2	18+178.031	100/808	
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 theManual.

(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 onpara7(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

Sl. No.	LHS			RHS		
	From	To	Height above FRL	From	To	Height above FRL
1	011+800	011+900	3.0	012+650	012+690	1.5
2	012+650	012+690	3.0	016+080	016+140	3.0
3	013+740	013+810	3.0	018+250	018+410	3.0
4	014+630	014+780	3.0	020+130	020+250	3.0
5	017+460	017+540	1.5	020+350	020+390	1.5
6	017+690	017+820	1.5	021+393	021+440	3.0
7	017+890	018+140	1.5	021+500	021+540	1.5
8	020+350	020+390	1.5	034+970	035+180	3.0
9	021+390	021+500	1.5	035+210	035+540	3.0
10	021+500	021+540	1.5			
11	027+980	028+100	1.5			
12	028+941	029+000	3.0			
13	029+140	029+220	1.5			
14	036+080	036+180	1.5			
15	036+230	036+350	3.0			

(ii) <u>Partially/ Fully executed works to be completed/rectified are as follows</u>

	Breast Wall (Partially completed)					
Sl. No.	LHS			RHS		
	Ch. From	Ch. To	Length(m)	Ch. From	Ch. To	Length(m)
1	012+395	012+440	**45**	012+370	012+440	**70**
	Total (LHS) =		**45**	**Total (RHS) =**		**70**

Note:

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

(ii) Partially executed Breast Wall, as mentioned in Schedule-A &B, shall be rectified and completed in all respects as per MoRTH's specifications and IRC guidelines without attracting any Change of Scope or additional Cost implications.

(iii) Retaining wall

Sl. No.	LHS		RHS	
	From	To	From	To
1	012+770	012+785	011+700	011+730
2	012+870	012+900	011+910	011+920
3	014+950	015+010	011+990	012+000
4	015+150	015+190	014+020	014+040
5	015+220	015+230	014+160	014+220
6	015+880	016+080	014+710	014+780
7	016+160	016+220	014+860	014+920
8	018+410	018+550	016+930	016+980
9	022+710	022+750	017+070	017+130
10	023+400	023+450	017+570	017+600
11	023+490	023+540	017+840	017+890
12	023+600	023+650	019+430	019+450
13	024+000	024+070	028+430	028+570
14	024+430	024+480	028+600	028+660
15	024+610	024+660	028+890	029+000
16	024+970	025+050	029+040	029+120
17	025+150	025+210	029+220	029+290
18	025+390	025+420	030+610	030+680
19	025+800	025+820	030+810	030+870
20	025+930	025+980	030+960	031+010
21	026+200	026+230	032+230	032+260
22	026+380	026+480	032+480	032+510
23	026+750	026+820	032+660	032+710
24	026+990	027+030	032+950	033+010
25	027+140	027+180	033+230	033+290
26	027+270	027+340	033+450	033+500

27	027+450	027+480	033+610	033+680
28	027+820	027+890	033+930	033+970
29	029+360	029+450	034+070	034+130
30	029+850	029+900	034+390	034+440
31	030+560	030+620	034+510	034+570
32	033+290	033+360	035+940	036+080
33	034+510	034+600	036+760	036+820
34	034+930	034+980	036+980	037+020
35	035+190	035+220	037+060	037+180
36	035+490	035+580		

(iv) Partially/fully executed works to be completed/rectified are as follows:

	Retaining Wall (Partially completed)						
Sl. No.	**LHS**			**RHS**			**Remarks**
	Ch. From	**Ch. To**	**Length (m)**	**Ch. From**	**Ch. To**	**Length (m)**	**To be rectified/completed as per MoRTH specification**
1	012+785	012+870	85	011+920	011+990	70	
2	015+190	015+220	30	014+040	014+060	20	
3	015+270	015+300	30	014+066	014+081	15	
4	015+305	015+480	175				
5	015+680	015+710	30				
	TOTAL (LHS) =		**350**	**TOTAL (RHS) =**		**105**	

Note:

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

(ii) Partially executed Retaining Wall, as mentioned in Schedule-A & B , shall be rectified and completed in all respects as per MoRTH's specifications and IRC guidelines without any additional cost implications.

(iii) Parapet wall construction is included in Retaining wall scope and shall be constructed as per MoRTH's specifications and IRC guidelines.

(ix) Slope Protection

As the project involves 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.

The scope of above-mentioned work shall be finalized as per Site Conditions/

requirement in consultation with Authority/ Authority's Engineer during execution of work. 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			RHS		
	From	To	Length(m)	From	To	Length(m)
1	011+000	011+700	700	011+020	011+700	680
2	012+900	013+660	760	011+800	011+910	110
3	013+820	013+920	100	012+850	012+960	110
4	015+000	015+150	150	013+020	013+660	640
5	015+760	015+880	120	013+820	013+920	100
6	016+080	016+160	80	014+620	014+710	90
7	016+240	016+380	140	014+780	015+000	220
8	016+620	016+790	170	016+840	016+930	90
9	018+050	018+160	110	017+260	017+440	180
10	018+200	018+250	50	017+600	017+700	100
11	019+750	019+880	130	019+040	019+300	260
12	020+450	020+550	100	020+480	020+620	140
13	021+150	021+300	150	021+150	021+320	170
14	022+450	022+600	150	025+550	025+650	100

Sl. No.	LHS			RHS		
	From	To	Length(m)	From	To	Length(m)
15	023+670	023+900	230	032+760	032+950	190
16	024+850	024+970	120	033+010	033+220	210
17	025+550	025+650	100	033+290	033+470	180
18	026+010	026+150	140	033+670	033+750	80
19	027+050	027+140	90	033+960	034+020	60
20	034+720	034+930	210	036+340	036+480	140
21				037+490	037+550	60
	Total Length(m) :		**3800**	**Total Length(m) :**		**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 D4956-04 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/ landslide 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 HILLROADS

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 Article 13.

AppendixB-I

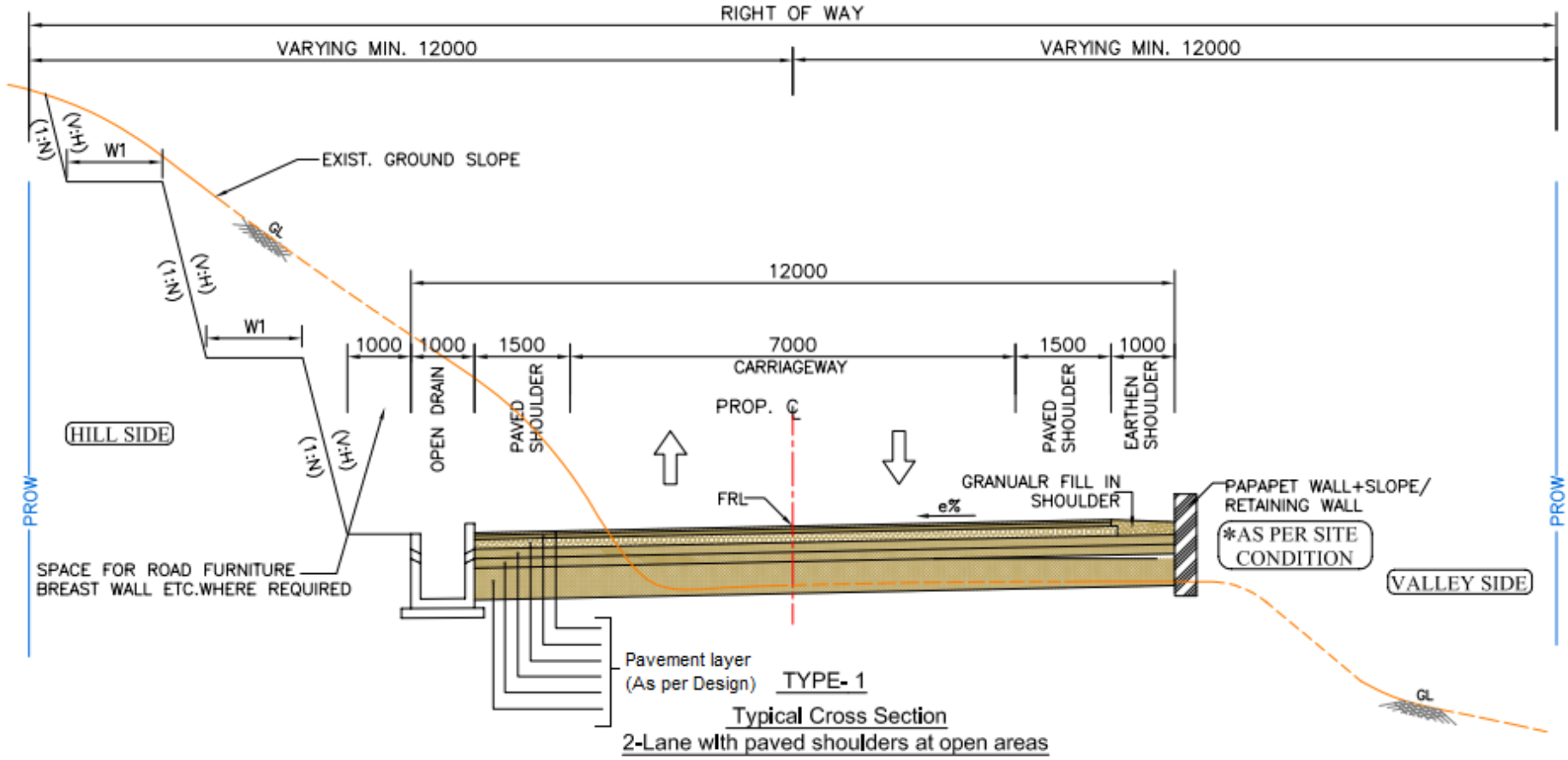


Fig2.11:TypicalCross-Section - 1

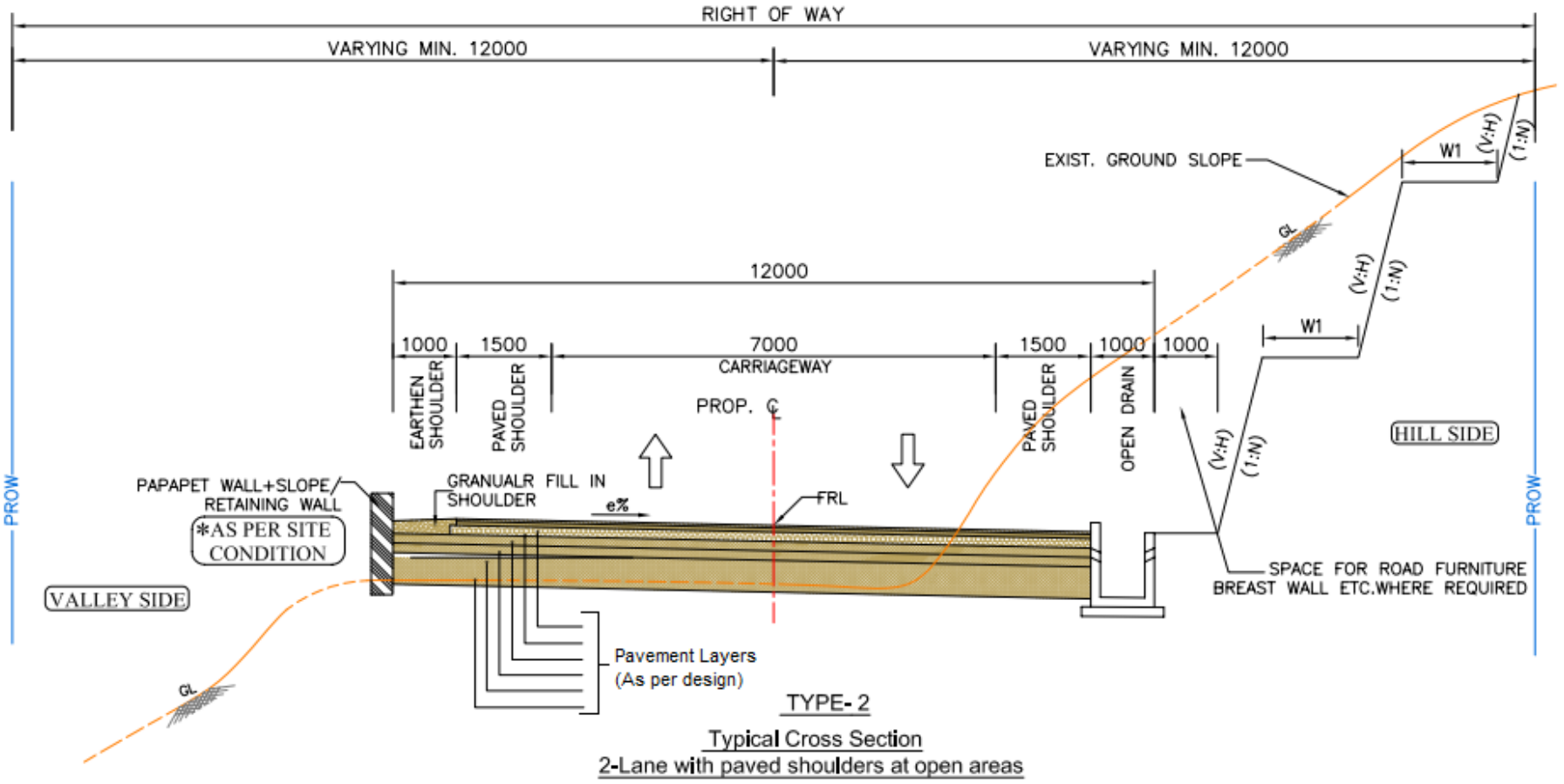


Fig2.12:TypicalCross-Section – 2

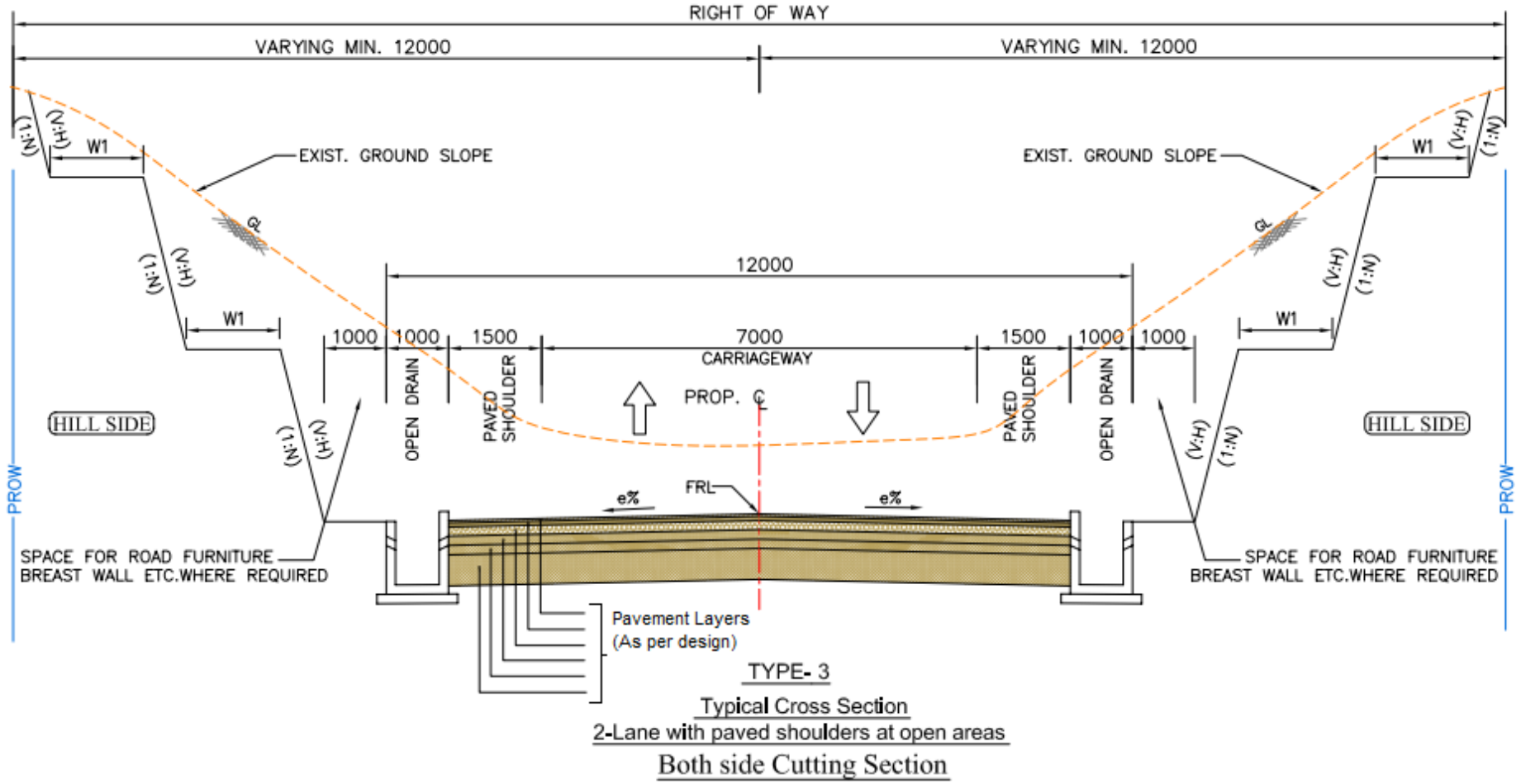


Fig2.13:TypicalCross-Section- 3

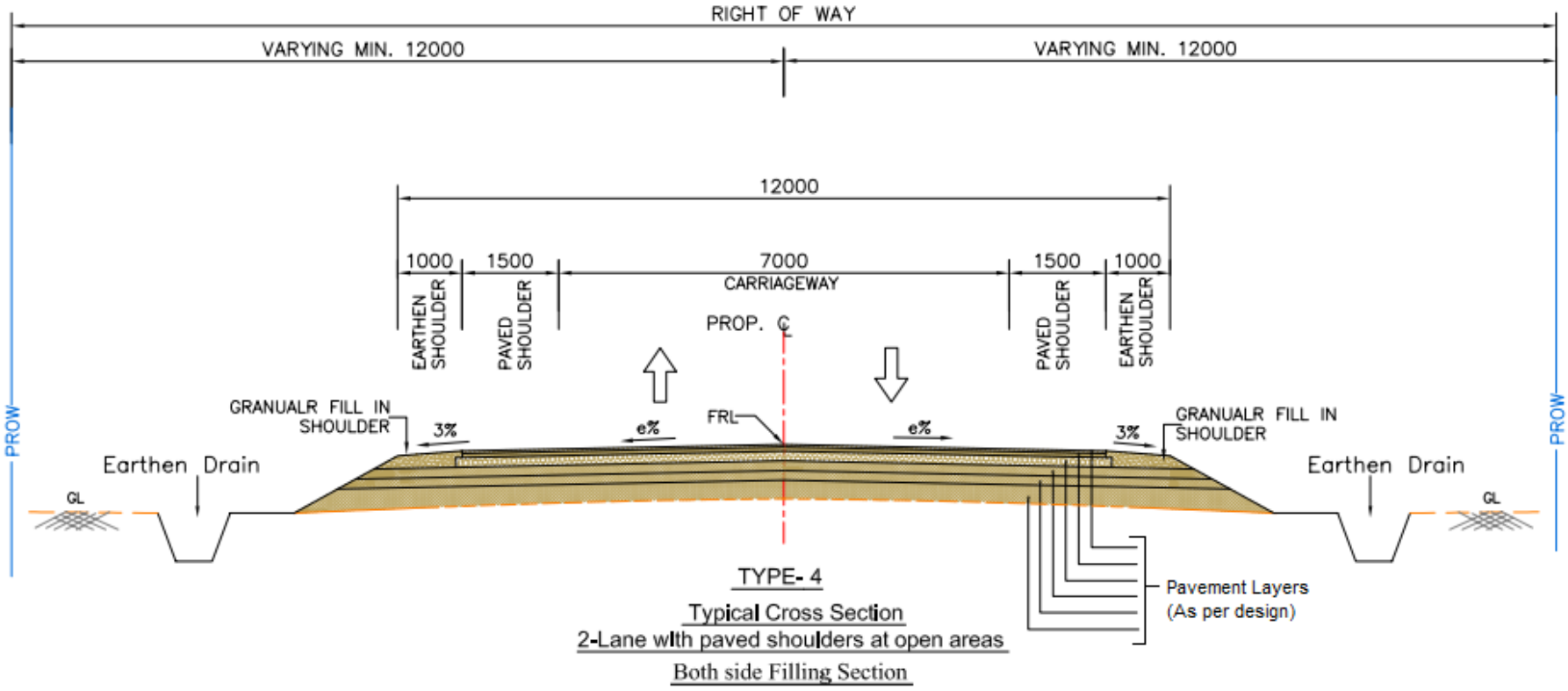


Fig2.14:TypicalCross-Section- 4

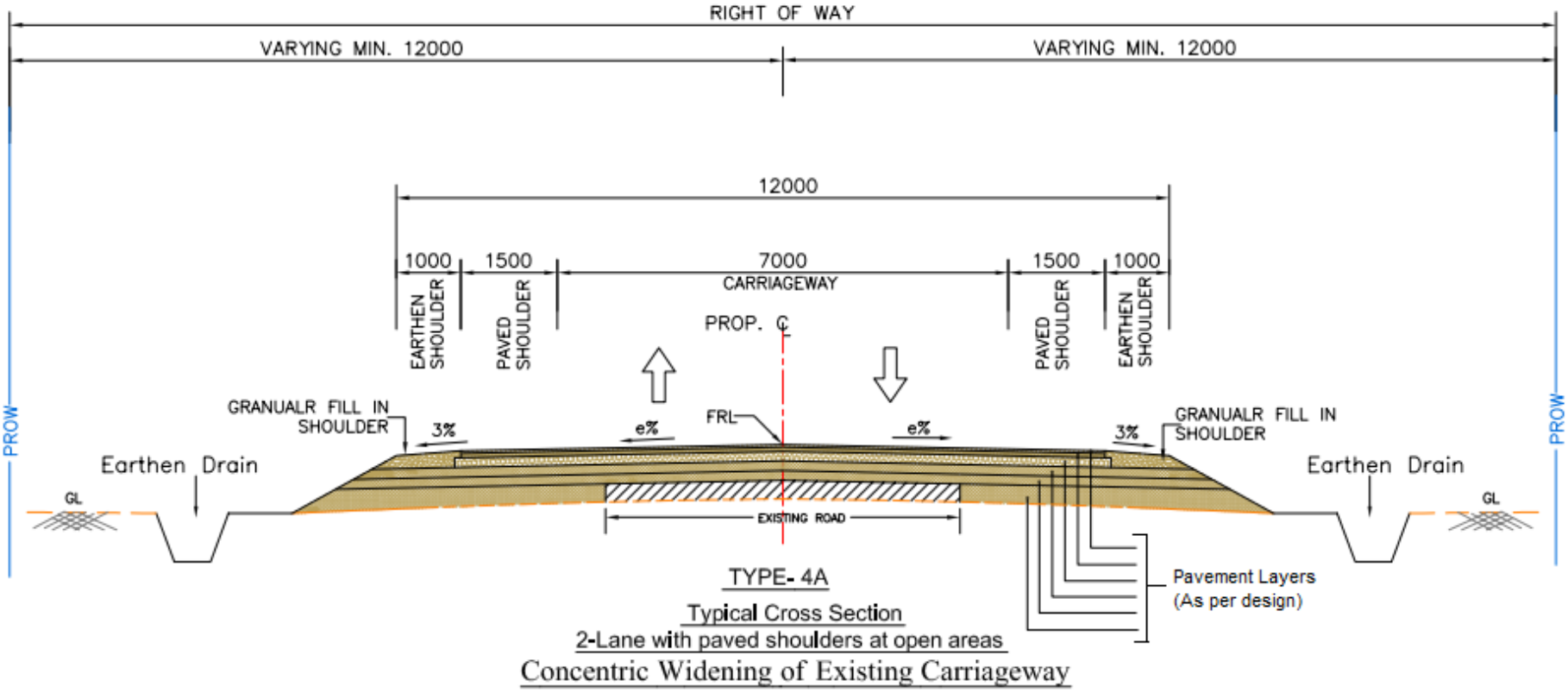


Fig2.15:TypicalCross-Section- 4A

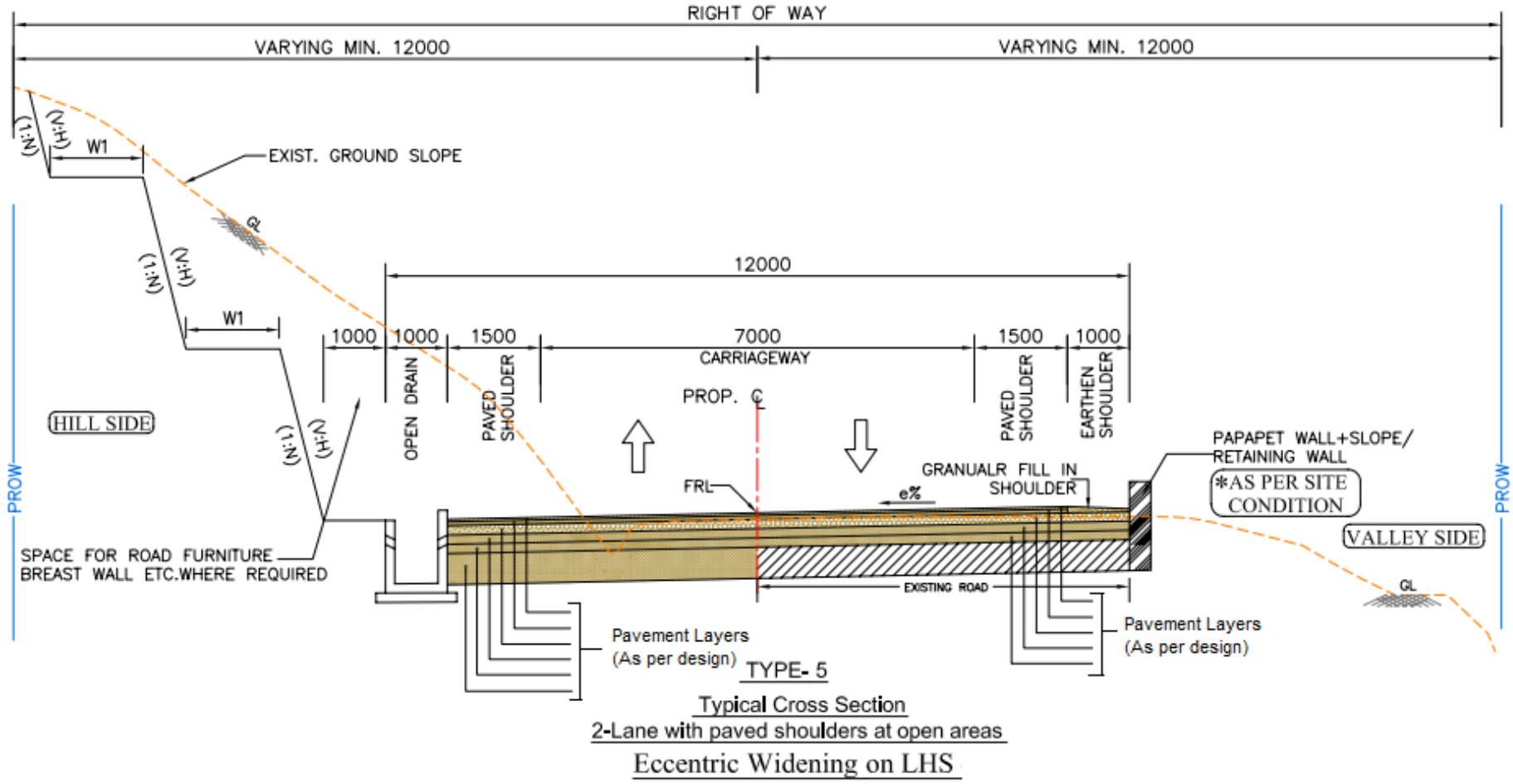


Fig2.16:TypicalCross-Section- 5

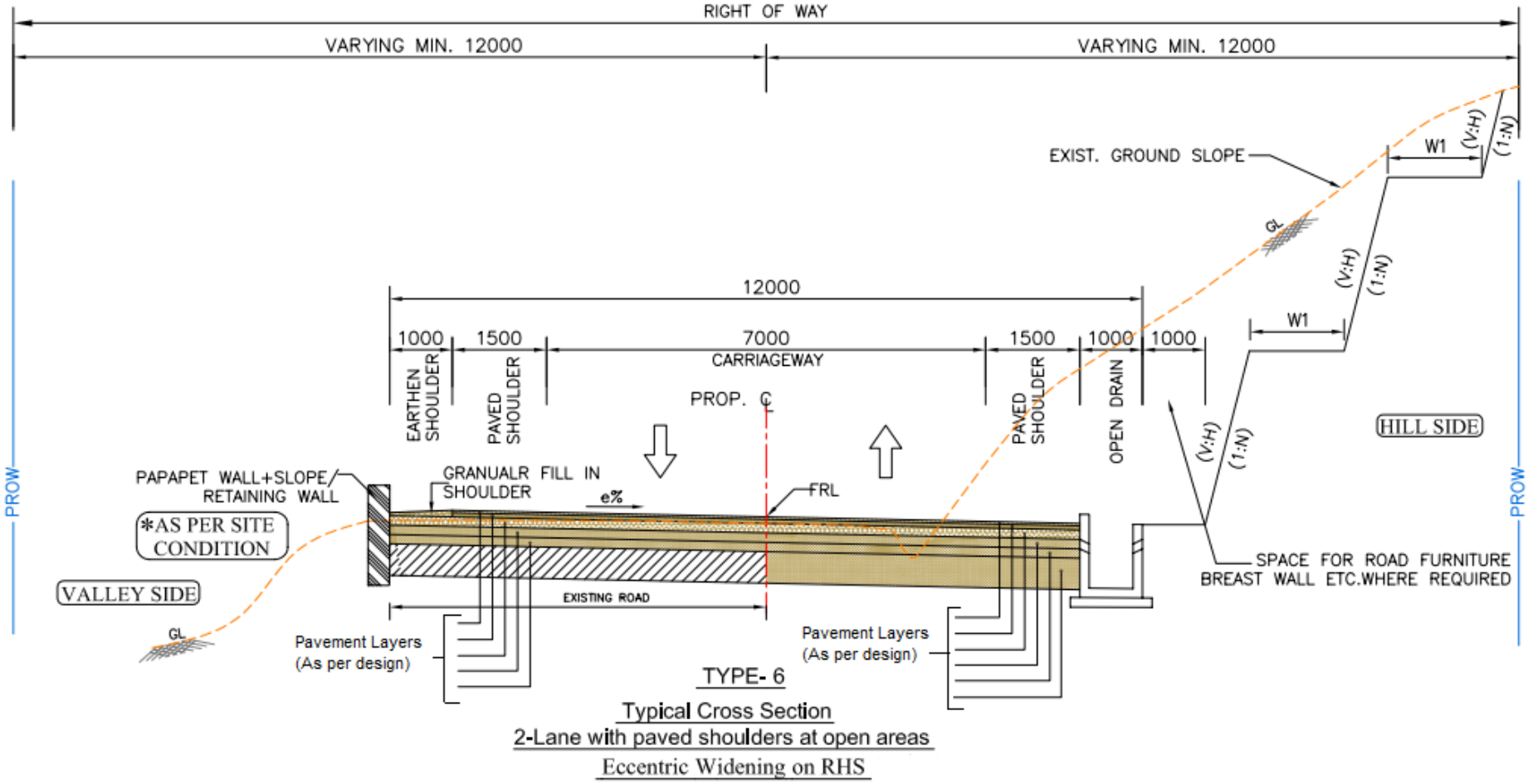


Fig2.17:TypicalCross-Section- 6

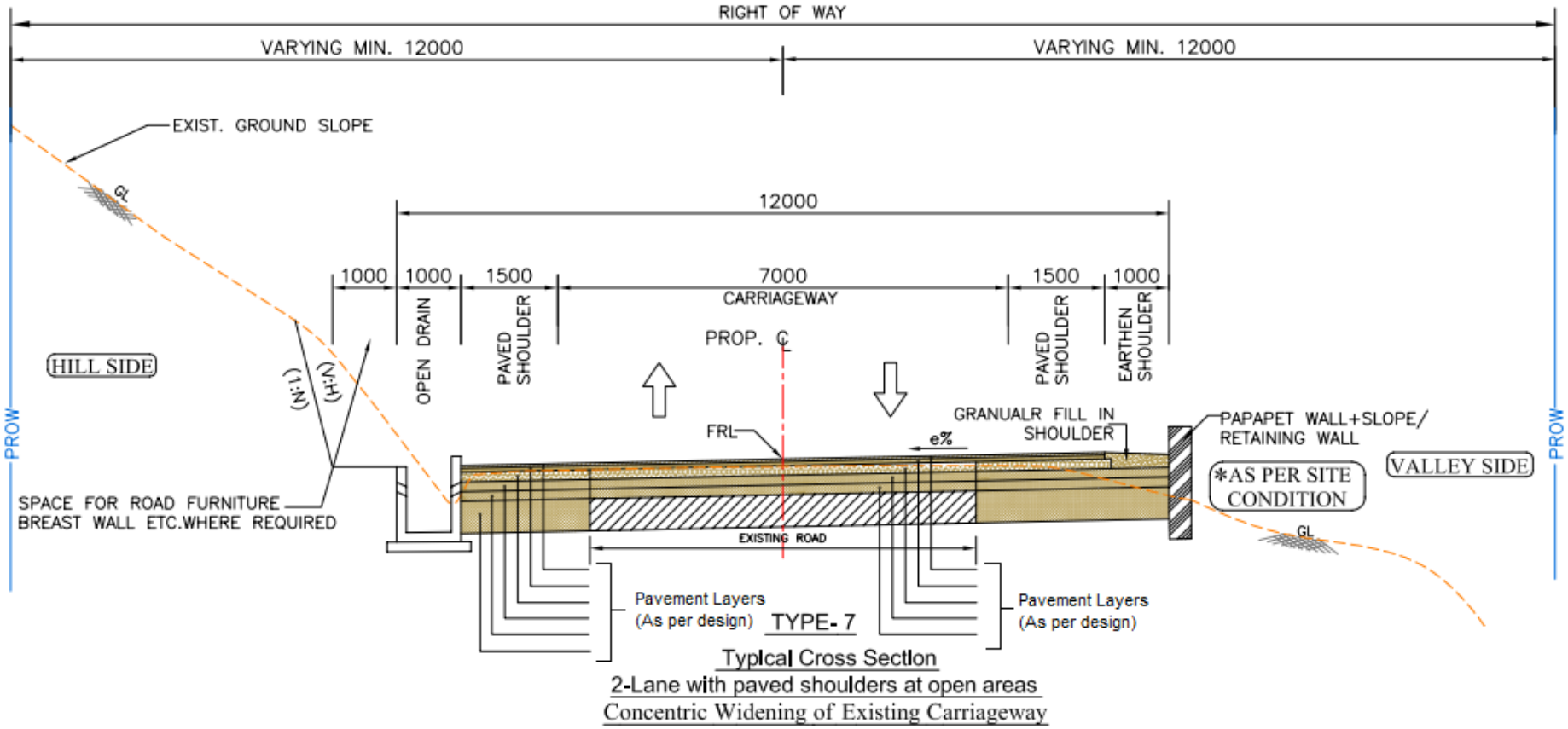


Fig2.18:TypicalCross-Section- 7

Schedule-C

SCHEDULE–C

(SeeClause2.1)

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 with stand 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:

- InstallationoftwonumberdedicatedETClane(onelaneineachdirection)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 Guardrails 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 section11 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	DesignChainage	Side	NearestVillage
		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.	DesignChainage	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.	**DesignChainage**		**Location**
	Left	**Right**	
1	11+080	11+080	MarbaniangUmseiniong
2	16+600	16+600	Pombot

S.No.	DesignChainage		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 asper suitability of location and site requirement in consultation with Authority. Any change in location shall not be treated as change of scope.

(h) Others

1. Highway petrol 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 SP73-2018.
    c. High Mast Lighting shall be provided at all Major Junctions, Tollplaza locations or any other location as per clause 12.4.3 of IRC SP73-2018.
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

(SeeClause2.1)

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)Figure7 .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.

Table -1: Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, approaches	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm in depth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA 2003 (http://www.tfhrc.com/pavement/lttp/ reports/03031/)	24-48 hours	MORT&H Specification 3004.2
S of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Cracking	Nil	< 5 % subject to limit of 0.5 sqm for any 50m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15-30 days	MORT&H Specification 3004.2
	Corrugations and	Nil	< 0.1 % of area	Daily	Length Measureme		2-7 days	IRC:82-2015

	Shoving				nt Unit like			

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
S of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Bleeding	Nil	< 1 % area	Daily	Scale, Tape odometer etc.		3-7 days	MORT&H Specification 3004.4
	Ravelling / Stripping	Nil	< 1 % area	Daily			7-15 days	IRC:82-2015 read with IRC SP 81
	Edge Deformation / Breaking	Nil	< 1 m for any 100m section and width < 0.1m at any location, restricted to 30cm from the edge	Daily			7-15 days	IRC:82-2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
	Roughness	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM (Sideway force Coefficient Routine Investigation Machine or equipment)	Class I Profilometer: ASTM E950 (98): 2004 – Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656-94:2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	180 days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-Annually			180 days	BS: 7941-1: 2006
	Pavement Condition Index	3	2.1	Bi-Annually			180 days	IRC:82-2015
	Other Pavement Distresses			Bi-Annually			2-7 days	IRC:82-2015
	Deflection /Remaining Life			Annually	Falling Weight Deflectometer	IRC 115:2014	180 days	IRC:115-2014
Rigid Pavement (Pavement of MCW, Service Road, Grade structure,	Roughness BI	2200mm/km	2400mm/km	Bi-Annually	Class I Profilometer	ASTME950(98) :2004 and ASTM E1656-94:2000	180 days	IRC:SP:83-2008

Asset Type	**Performance Parameter**	**Level of Service (LOS)**		**Frequency of Inspection**	**Tools/Equipment**	**Standards and References for Inspection and Data Analysis**	**Time limit for Rectification/ Repair**	**Maintenance Specifications**
		Desirable	**Acceptable**					
Approaches of connecting roads, slip roads, lay byes etc. as applicable)	Skid	Skid Resistance no. at different speed of vehicles		Bi-Annually	SCRIM (Sideway-force	IRC:SP:83-2008	180 days	IRC:SP:83-2008
		Minimum SN	**Traffic Speed (Km/h)**		Coefficient Routine Investigation Machine or equivalent)			
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					
Embankment / Slopes	Edge drop at shoulders	Nil	40mm	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC	7-15 days	MORT&H Specification 408.4
	Slope of camber/cross fall	Nil	<20% variation in prescribed slope camber / cross fall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15% variation in prescrib	Daily			7-15 days	MORT&H Specification 408.4

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

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

Table -2: Maintenance Criteria for Rigid Pavements:

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
CRACKING						
1	**Single Discrete Cracks Not intersecting with any joint**	w= width of crack L= length of crack d= depth of crack D= depth of slab	0	Nil, not discernible	No Action	Not applicable
			1	w< 0.2mm.hair cracks		
			2	w= 0.2 -0.5 mm, discernible from slow-moving car	Seal without delay	Seal, and stitch if L >1m. Within 7 days
			3	w= 0.5 -1.5 mm, discernible from fast-moving car		
			4	w= 1.5-3.0 mm	Seal, and stitch if L > 1m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15 days
			5	w > 3 mm		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
2	**Single Transverse (or Diagonal) Crack intersecting with one or more joints**	w= width of crack L= length of crack d= depth of crack D= depth of slab	0	Nil, not discernible	No Action	
			1	w< 0.2mm.hair cracks	Route and seal with epoxy Within 7 days	Staple or Dowel Bar Retrofit. Within 15 days
			2	w= 0.2 -0.5 mm, discernible from slow-moving car		
			3	w= 0.5 - 3.0 mm, discernible from fast-moving car	Route and seal and stitch, if L >1m. Within 7 days	
			4	w= 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected. Portion with norms and specifications – See Para 5.5 &9.2 Within 15 days
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	
3	**Single Longitudional Crack intersecting with one or more joints**	w= width of crack L= length of crack d= depth of crack D= depth of slab	0	Nil, Not discernible	No, Action	
			1	w= 0.5 mm, discernible from slow-moving vehicle	Seal with epoxy, if L > 1m. Within 7 days	Staple or Dowel Bar Retrofit. Within 15 days
			2	w= 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > 1m. Within 15 days	-

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
			3	w= 3.0 - 6.0 mm	Staple, if L> 1m. Within 15 days	Partial Depth Repair with stapling. Within15 days
			4	w= 6.0 - 12.0 mm, usually associated with spalling	Not Applicable, as it may be full depth	
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic		Full depth Repair Dismantle and reconstruct affected portion as per norms and specifications See Para 5.6.4 Within 15 days
4	**Multiple Crack intersecting with one or more joints**	w= width of crack	0	Nil, Not discernible	No, Action	-
			1	w < 0.2 mm, hair cracks	Seal and stitch if L > 1m. Within 15 days	
			2	w= 0.2 - 0.5 mm, discernible from slow vehicle		
			3	w= 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, Reinstate subbase, Reconstruct whole slab as per specifications within 30 days
			4	w= 3.0 - 6.0 mm panel broken into 2 or 3 pieces		
			5	w > 6 mm and /or panel broken into more than 4 pieces		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
5	**Corner Break**	w= width of crack L= length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5mm, only 1 corner broken	Seal with low viscosity epoxy to secure broken parts Within 7 days	Seal with epoxy seal with epoxy Within 7 days
			2	w < 1.5mm, L < 0.6m, only one corner broken		
			3	w < 1.5mm, L < 0.6m, two corners broken	Partial Depth (Refer Figure 8.3 of IRC:83-2008) Within 15 days	Full depth repair
			4	w > 1.5mm, L > 0.6m or three corners broken		
			5	Three or four corners broken		Reinstate sub-base and reconstruct the slab as per norms and specifications Within 30 days
6	**Punchout (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)**	w= width of crack L= length (m/m2)	0	Nil, Not discernible		No, Action
			1	w < 0.5 mm, L< 3m / m^2	Not Applicable, as it may be full depth	Seal with low viscosity epoxy to secure broken parts.
			2	either w > 0.5 mm or L < 3m /m^2		
			3	w > 1.5mm and L < 3m /m^2		
			4	w > 3mm, L < 3m /m^2 and deformation		Full depth repair Cutout and replace damaged area taking care not to damage reinforcement.
			5	w > 3mm, L < 3m /m^2 and deformation		

						Within 30 days

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
Surface Defects						
7	**Ravelling or Honeycomb type surface**	r= area damaged surface / total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term** No action.	**Long Term** Not Applicable
			1	r < 2 %	Local repair of area damaged and liable to be damaged. Within 15 days	
			2	r = 2 - 10 %		
			3	r = 10 - 25 %	Bonded Inlay, 2 or 3 slabs if affecting. Within 30 days	
			4	r = 25 - 50 %		
			5	r > 50% and h > 25mm	Reconstruct slabs, 4 or more slabs if affecting. Within 30 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
Surface Defects						
8	**Scalling**	r= damaged surface / total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term** No action.	**Long Term** Not Applicable
			1	r < 2 %	Local repair of area damaged and liable to be damaged. Within 7 days	
			2	r = 2 - 10 %		
			3	r = 10 - 20 %	Bonded Inlay Within 15 days	
			4	r = 20 - 30 %		
			5	r > 30% and h > 25mm	Reconstruct slabs Within 30 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
9	**Polished Surface /Glazing**	t = texture depth, sand patch test	0		No action.	Not Applicable
			1	t >1 mm		
			2	t = 1 - 0.6 mm	Monitor rate of deterioration Diamond Grinding if affecting 50% or more slabs in a continuous stretch of minimum 5 km. Within 30 days	
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		
			5	t < 0.1 mm		
10	**Popout (Small Hole), Pothole Refer Para 8.4**	n = number/m^2 d = diameter h = maximum depth	0	d < 50 mm; h < 25 mm ; n < 1 per 5 m^2	No action	
			1	d = 50 – 100 mm; h < 50 mm; n < 1 per 5 m^2	Partial depth repair 65 mm deep. Within 15 days	Not Applicable
			2	d = 50 – 100 mm; h > 50 mm; n < 1 per 5 m^2		
			3	d = 100 – 300 mm; h < 100 mm; n < 1 per 5 m^2	Partial depth repair 110 mm i.e. 10mm more that the depth of the hole. Within 30 days	
			4	d = 10 – 300 mm; h > 100 mm; n < 1 per 5 m^2		
			5	d > 300 mm; h > 100 mm ; n > 1 per 5 m^2	Full depth repair. Within 30 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
11	**Joint Seal Defects**	loss or damage L = Length as % total joint length			**Short Term**	**Long Term**
			0	Difficult to discern	No action	Not Applicable
			1	Discernible, L < 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	
			3	Notable. L > 25%insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days	
			5	Severe; w > 3 mm negligible protection against ingress of water and trapping incompressible material.	Clean, widen and reseal the joint. Within 7 days	
12	**Spalling of Joints**	w = width on either side of the joint L = length of spalled portion (as % joint length)	0	Nil, not discernible	No action.	
			1	w < 10 mm	Apply low viscosity epoxy resin / mortar in cracked portion. Within 7 days	
			2	w = 10 - 20 mm, L < 25%		Not Applicable

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
			3	w = 20 – 40 mm, L > 25%	Partial Depth Repair. Within 15 days	Not Applicable
			4	w = 40 – 80 mm, L > 25%	30 – 50 mm deep, h = w + 20 % of w, within 30 days	
			5	w > 80 mm, and L > 25%	50 – 100 mm deep repair. H = w + 20% of w. Within 30 days	
13	**Faulting (or Stepping) in Cracks or Joints**	f = difference of level	0	not discernible, < 1 mm	No action.	No action
			1	f < 3 mm		
			2	f = 3 – 6 mm	Determine cause and observe, take action for diamond grinding	Replace the slab as appropriate. Within 30 days
			3	f = 6 – 12 mm	Diamond Grinding	
			4	f = 12 – 18 mm	Raise sunken slab	Replace the slab as appropriate. Within 30 days
			5	f > 18 mm	Strengthen subgrade and sub – base by grouting and raising sunken slab	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
14	**Blowup or Buckling**	h = vertical displacement from normal profile	0	Nil, not discernible	**Short Term**	**Long Term**
			1	h < 6 mm	No action	
			2	h = 6 – 12 mm	Install Signs to Warn Traffic Within 7 days	
			3	h = 12 – 25 mm		
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shattered slab, ie 4 or more pieces	Replace broken slabs. Within 30 days	
15	**Depression**	h = negative vertical displacement from normal profile L = length	0	Not discernible, h < 5 mm	No action.	Not applicable
			1	h = 5 – 15 mm		
			2	h = 15 -30 mm, Nos < 20% joints	Install Signs to Warn Traffic Within 7 days	
			3	h = 30 – 50 mm		
			4	h > 50 mm or > 20 % joints	Strengthen subgrade. Reinstate pavement at normal level if L < 20 m.	
			5	h > 100 mm		

					Within 30 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
					Short Term	**Long Term**
16	**Heave**	h = positive vertical displacement from normal profile. L = length	0	Not discernible, h < 5 mm	No action	
			1	h = 5 – 15 mm	Follow up	scrabble
			2	h = 15 – 30 mm, Nos < 20% joints	Install Signs to Warn Traffic Within 7 days	
			3	h = 30 – 50 mm		
			4	h > 50 mm or > 20% joints	Stabilise subgrade. Reinstate pavement at normal level if length < 20 m. Within 30 days	
			5	h > 100 mm		
			5	f > 18 mm	Strengthen subgrade and sub – base by grouting and raising sunken slab	
17	**Bump**	h = vertical displacement from normal profile.	0	h < 4 mm	No action	
			1	h = 4 – 7 mm	Grind, in case of new construction Within 7 days	Construction Limit for new Construction
			3	h = 7 – 15 mm	Grind, in case of on going maintenance Within 15 days	Replace in case of new construction. Within 30 days.
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30 days

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
Joints Defects						
					Short Term	**Long Term**
18	**Lane to Shoulder Dropoff**	f = difference of level	0	Nil, Not discernible, < 3 mm	No action	
			1	f = 3 – 10 mm	Spot repair of shoulder Within 7 days	
			2	f = 10 – 25 mm		
			3	f = 25 – 50 mm	Fill up shoulder Within 7 days	For any 100 m stretch Reconstruct shoulder, if affecting 25% or more of stretch. Within 30 days
			4	f = 50 – 75 mm		
			5	f > 75 mm		
Drainage						
19	**Pumping**	quantity of fines and water expelled through open joints and cracks Nos	0	not discernible	No Action	
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	Appreciable/ Frequent 10- 25%	Lift or jack slab within 30 days	
		Nos/100m stretch	5	abundant, crack development > 25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab.	

					Within 30 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
20	**Ponding**	Ponding on slabs due to blockage of drains	0-2	not discernible problem	No Action	
			3 to 4	Blockage observed in drains, but water flowing	Clean drains etc within 7days follow up	Action required to stop water damaging foundation within 30 days
			5	Ponding, accumulation of water observed	-do-	

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

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td>Highway</td><td>Availability of Safe Sight Distance</td><td>As per IRC SP :84-2014, a minimum of safe stopping sight distance shall be available throughout.
<table><tr><th>Design Speed, kmph</th><th>Desirable Minimum Sight Distance (m)</th><th>Safe Stopping Sight Distance (m)</th></tr><tr><td>100</td><td>360</td><td>180</td></tr><tr><td>80</td><td>260</td><td>130</td></tr></table></td><td>Monthly</td><td>Manual Measurements with Odometer along with video/ image backup</td><td colspan="2">Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments.

In case of permanent structure or design deficiency:
Removal of obstruction/improvement of deficiency at the earliest
Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.</td><td>IRC:SP 84-2014</td></tr>
<tr><td>Pavement Marking</td><td>Wear</td><td><70% of marking remaining</td><td>Bi-Annually</td><td>Visual Assessment as per Annexure-F of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect - within 2 months</td><td>IRC:35-2015</td></tr>
</table>

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

		Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):					
Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
		Initial 7 days Retro reflectivity: 100 mcd/m^2/lux Minimum Threshold Level: 50 mcd/m^2/lux					
	Skid Resistance	Initial and Minimum performance for Skid Resistance: Initial (7days): 55BPN Min. Threshold: 44BPN *Note: shall be considered under urban/city traffic condition encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc	Bi-Annually	As per Annexure-G of IRC:35-2015		Within 24 hours	IRC:35-2015

Road Signs	Shape and Position	Shape and Position as per IRC:67-2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is damaged. Relocation as per requirement	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/Cantilever Sign boards	IRC:67-2012

Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
	Retro reflectivity	As per specification in IRC:67-2012	Bi-Annually	Testing of each signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.	Change of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/Cantilever Sign boards	IRC:67-2012
	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance easuring tape	Raising Kerb eight	Within 1 Month	RC 86:1983

Kerb	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	RC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2014 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:84-2014, IRC:35-2015
	Pedestrian Guardrail	Functionality: Functioning of guardrail as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014
	Traffic Safety Barriers	Functionality: Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014, IRC:119-2015
Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
	End Treatment of	Functionality: Functioning of End Treatment as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2014,
	Traffic Safety Barriers			backup			IRC:119-2015
	Attenuators	Functionality: Functioning of Attenuators as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP-2014, IRC:119-2015
	Guard Posts and Delineators	Functionality: Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: 79 - 1981
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67-2012

	Traffic Blinkers	Functionality: Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014
Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84-2014
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84-2014

Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
	Toll Plaza Canopy Lights	Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major/minor failure in the lighting system	Daily	-	Rectification failure	8 hours	IRC:SP:84-2014

Trees and Plantation including median plantation	Obstruction in a minimum head-room of 5.5 m above carriageway or obstruction in visibility of road signs	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC:SP:84-2014
	Deterioration in health of trees and bushes	Health of plantation shall be as per requirement of specifications & instructions issued by Authority from time to time	Daily	Visual with video/image backup	Timely watering and treatment. Or Replacement of Trees and Bushes.	Within 90 days	IRC:SP:84-2014
	Vegetation affecting sight line and road structures	Sight line shall be free from obstruction by vegetation	Daily	Visual with video/image backup	Removal of Trees	Immediate	IRC:SP 84-2014

Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every 4 hours	

	Defects in electrical, water and sanitary installations	-	Daily	-	Rectification	24 hours	
Other Project Facilities and Approach roads	Damage or deterioration in Approach Roads, pedestrian facilities, truck lay- bys, bus-bays, bus-shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works		Daily	-	Rectification	15days	IRC:SP 84-2014

Asset Type	**Performanc e Paramete**	**Level of Service (LOS)**	**Frequency of Measuremen t**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectificatio**	**Specification s and Standards**

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

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

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

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

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

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

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

	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No silt, debris, clogging of drainage spout collection chamber.	Monthly	Detailed condition survey as per IRC SP: 35-1990 Using Mobile Bridge Inspection Unit	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainage spout if any leakages observed.	3 days	MORTH Specification 2700
Bridge sub structure	Cracks/spalling of concrete /rusted steel	No cracks spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting/guniting and micro concreting depending on type of defect noticed.	30 days	IRC:SP: 40-1993. And MORTH Specification 2800.
	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	In case of failure of even one bearing on any pier/ abutment, all the bearings on that pier/ abutment shall be replaced, in order to get uniform load transfer on to bearings.	3 months	MORTH Specification 2810 and IRC SP: 40-199.
Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**

		than 2 locations per side, no rupture of reinforcement or rubber.					
Bridge Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level form the bridge	Bi-Annually	Condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit. In case of doubt, use Underwater camera for inspection of deep wells in major Rivers.	Suitable protection works around pier/ abutment	1 months	IRC:SP: 40-1993. IRC: 83-2014 MORTH Specification 2500.
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sq.m. damage to apron (concrete apron) not more than 1 sq.m.	2 times in a year (before and after rainy season)	Condition survey as per IRC SP: 35-1990	Repairs to damaged aprons and pitching.	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier	MORTH Specification 2810 and IRC SP: 40-199.

Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of the contractor.

Table 4: Maintenance Criteria for Structures and Culverts:

Table 5: Maintenance Criteria for Hill Roads

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

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

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

A. Flexible Pavement

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

	Nature of Defect or deficiency	Time limit for repair/ rectification
(i)	Obstruction in a minimum head- room of 5 m above carriageway or obstruction in visibility of road signs	24 (Twenty Four) days
(ii)	Removal of fallen trees from carriageway	4 (Four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes 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 (four) hours
(ii)	Defects in electrical, water and sanitary installations	24 (Twenty Four) days
(g)	**[Toll Plaza]**	
(h)	**Other Project Facilities and Approach roads**	
(i)	Damage in approach roads, pedestrian facilities, truck lay- byes, bus-bays, bus-shelters, cattle crossing,[Traffic Aid Posts, Medical Aid Posts], and service roads	15 (fifteen) days
(ii)	Damaged vehicles or debris on the road	4 (four) hours
(iii)	Malfunctioning of the mobile crane	4 (four) hours
Bridges		
(a)	**Superstructure**	
(i)	Any damage, cracks, spalling/ scaling Temporary measures Permanent measures	Within 48 (forty eight) hours Within 15 (fifteen) days or as specified by the Authority's Engineer
(b)	**Foundations**	

	Nature of Defect or deficiency	Time limit for repair/ rectification
(i)	Scouring and / or cavitation	15 (fifteen) days
(c) Pipers, abutment, return walls and wing walls		
(i)	Cracks and damages including settlement and tilting, spalling, scaling	30 (thirty) days
(d) Bearings (metallic) of bridges		
(i)	Deformation, damages, tilting or shifting of bearings	15 (fifteen) days Greasing of metallic bearings once in a year
(e) Joints		
(i)	Malfunctioning of joints	15 (fifteen) days
(f) Other items		
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent - holes	3 (three) days
(iii)	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damaged 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

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

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

Schedule-F

(See Clause 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.

(j) Royalty permits as applicable under the state govt. rules.

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 "**Improvement/Widening to 2-lane with paved shoulder/4-lanning of NH-40 between Shillong to Dawki road upto Bangladesh Border including Dawki Bridge from (Design km 10+670 to km 37+550) design length of 26.550 km in the State of Meghalaya for execution of EPC mode under JICA funding - (Package-II)-Balance Work"**, 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.

[$] Insert date being 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 7.2 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 thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

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

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC CNRB0019062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank (erstwhile Syndicate Bank), Transport Bhawan, 1st Parliament Street, NewDelhi110001

14. 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:

[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 **"Improvement/Widening to 2-lane with paved shoulder/4-lanning of NH-40 between Shillong to Dawki road upto Bangladesh Border including Dawki Bridge from (Design km 10+670 to km 37+550) design length of 26.550 km in the State of Meghalaya for execution of EPC mode under JICA funding - (Package-II)-Balance Work."** subject to and in accordance with the provisions of the Agreement.

(A) 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.

(B) 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.

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

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC CNRB0019062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank (erstwhile Syndicate Bank), Transport Bhawan, 1st Parliament Street, NewDelhi110001

14. 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-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:

[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 **"Improvement/Widening to 2-lane with paved shoulder/4-lanning of NH-40 between Shillong to Dawki road upto Bangladesh Border including Dawki Bridge from (Design km 10+670 to km 37+550) design length of 26.550 km in the State of Meghalaya for execution of EPC mode under JICA funding - (Package-II)-Balance Work"** subject to and in accordance with the provisions of the Agreement.

(A) 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]**.**

(B) 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.

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

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

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC CNRB0019062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank (erstwhile Syndicate Bank), Transport Bhawan, 1st Parliament Street, NewDelhi110001

14. 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

[$]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).

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	62.709%	**A - Widening and strengthening of existing road (Flexible pavement)**	
			(1) Earthwork up to top of the subgrade	12.725%
			(1)(a) Rectification of partially executed Earthwork up to Subgrade top.	0.000%
			(2) Subbase course (GSB)	1.867%
			(2)(a) Rectification of partially executed GSB	0.000%
			(3) Non-bituminous base course (WMM)	1.503%
			(4) Bituminous base	2.302%
			(5) wearing coat	1.348%
			(6) widening and repair of culverts	0.000%
			B.1 – Reconstruction/Realignment/ Bypass/Geometric Improvement (Flexible pavement)	
			(1) Earthwork up to top of the subgrade	43.959%
			(1)(a) Rectification of partially executed earthwork upto Subgrade Top	0.000%
			(2) Subbase course (GSB)	6.449%
			(2)(a) Rectification of partially executed GSB	0.000%
			(3) Non-bituminous base course (WMM)	4.163%
			(3)(a) Rectification of partially executed GSB	0.000%
			(4) Bituminous base (DBM)	6.374%
			(4)(a) Rectification of partially executed DBM	0.000%
			(5) wearing coat (BC)	3.733%
			(5)(a) Rectification of partially executed BC	0.000%
			B.2 - Reconstruction realignment/ bypass/Geometric Improvement (Rigid Pavement)	
			(1) Earthwork up to top of the subgrade	0.578%
			(2) Subbase course (GSB)	0.085%
			(3) Dry lean concrete (DLC)	0.405%
			(4) Pavement quality concrete (PQC) course	1.341%
			C.1 - Reconstruction/ New Service Road (flexible Pavement)	

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
			(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%
			D. - Reconstruction/ New culverts on existing road, realignment, bypasses, Geometric Improvement	
			(1) Hume Pipe Culvert	1.513%
			(2) Box culvert	8.971%
			(3) Slab Culvert	1.969%
			(4) Rectification of Partially executed Culverts	0.715%
2	Minor Bridges/ Underpasses/ Overpasses	6.837%	**A.1 - Widening and repairs of Minor Bridges**	
			Widening of existing bridges	0.00%
			Rehabilitation of existing bridges	0.764%
			A.2 - New of Minor Bridges	
			(1) **Foundation:** on completion of foundation work including foundation for wing and return wall	12.483%
			(2) **Substructure :** on completion of abutments, piers upto the abutment/pier cap.	6.621%
			(3) **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.	26.464%
			(4) **Approaches**: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	3.057%
			(5) **Guide Bunds and River Training works:** (On completion of Guide Bunds and river training works complete in all respects.)	0.000%
			B.1 - Widening and repairs of Underpasses/Overpasses	
			Underpasses/ Overpasses	
			B.2 - New Underpasses/Overpasses	

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
			(1) **Foundation** : On completion of the foundation work including foundations for wing and return walls.	11.451%
			(2) **Sub-Structure :** on completion of abutments, piers upto the abutment/pier cap.	6.950%
			(3) **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.	23.477%
			(4) **Approaches**: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	7.641%
			(5) **Rectification/ Completion**: of balance work for partially executed SVUP	1.092%
3	Major Bridge works and ROB/RUB /elevated sections/fl yovers including viaducts, if any	2.913%	**A.1 - Widening and repairs of existing major bridges**	
			(1) Foundation:	0.00%
			(2) Sub-structure:	0.00%
			(3) Super-structure: (including bearings.)	0.00%
			(4) Wearing Coat including expansion joints	0.00%
			(5) Miscellaneous Items like hand rails, crash 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: Foundation for abutment, piers	5.731%
			(2) Sub-structurefor abutment, piers up to abutment/pier cap level	14.538%
			(3) Super-structure: including girder, deck slab, bearings (excluding wearing coat and expansion joints)	

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
			(a) Super Structure : casting of girder/fabrication of girders (Steel)	
			(b) Super structure : Casting of segments	
			(c) Super structure : erection of girders, deck slab and bearings	66.480%
			(4) Other Ancillary works : wearing coat, expansion joints hand rails, crash barriers, tests on completion etc. completion in all respect.	7.101%
			(5) Approaches (including retaining walls, stone pitching, protection works).	6.150%
			(6) Wing walls/return walls	0.000%
			(7) Guide bunds, river training works etc.	0.000%
			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%
			(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	

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
			(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**	27.541%	(i) Toll plaza	4.880%
			(ii) Road side drains	21.608%
			(iii) Road signs, markings, km stones safety Devices etc.	11.046%
			(iv) Project facilities	
			(a) Bus Bay with shelter	0.174%
			(b) Truck laybys	0.000%
			(c) Rest areas	1.742%
			(d) others (to be specified)	
			(i) Street Lighting	0.781%
			(ii) Maintenance of existing road	7.884%
			(iii) Utility Ducts	0.244%
			(iv) Temporary diversion	5.438%
			(v) Junction improvement works including Connecting Road & Junction under Grade separator, noise barrier.	2.413%
			(v) Road side plantation	0.000%
			(vi) Repair of protection works other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs/RUBs.	0.000%
			(vii) Protection works Retaining wall/Toe walls other than approaches to the bridges, elevated sections, flyovers/ grade separators and ROBs/RUBs.	40.307%

S. No.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
			(viii) Safety and traffic management during construction	0.308%
			(ix) Side Slope Protection works Turfing and stone pitching	3.175%

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:

Table1.3.1

Stage of Payment	Percentage -weightage	Payment Procedure
A - Widening and strengthening of existing road		
(1) Earthwork up to top of the sub- grade	12.725%	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 500 m **OR** Stage in Full length, whichever is less. **In case of Hill Cutting, the payment procedure will be as under.**
Hill Cutting		Weightage of Hill cutting shall be 40 % of total cost of Earthwork (B.1 (1) as above). Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 500 m OR Stage in full length, whichever is less.
Preparation of Sub grade		Weightage of Subgrade shall be 60 % of total cost of Earthwork (B.1 (1) as above). Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 500 OR Stage in full length, whichever is less.

Stage of Payment	Percentage -weightage	Payment Procedure
(1)(a) Rectification of partially executed earthwork upto Subgrade Top	0.000%	Unit of measurement is linear length. Payment of each stage shall be made on completion of entire scope in all respects, as given under Schedule B.
(2) Sub-base Course	1.867%	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 500 m **OR** Stage in Full length, whichever is less.
(2) (a) Rectification of partially executedSub-base Course	0.000%	Unit of measurement is linear length. Payment of each stage shall be made on completion of entire scope in all respects, as given under Schedule B.
(3) Non bituminous Base course	1.503%	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 500 m **OR** Stage in Full length, whichever is less.
(4) Bituminous Base course	2.302%	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 500 m **OR** Stage in Full length, whichever is less.
(5) Wearing Coat	1.348%	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 500 m **OR** Stage in Full length, whichever is less.

Stage of Payment	Percentage -weightage	Payment Procedure
(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 One culverts.
B.1 - Reconstruction realignment/ bypass/Geometric Improvement (Flexible pavement)		
(1) Earthwork up to top of the sub- grade	43.959%	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 500 m **OR** Stage in Full length, whichever is less. **In case of Hill Cutting, the payment procedure will be as under:**
Hill Cutting		Weightage of Hill cutting shall be 40 % of total cost of Earthwork (B.1 (1) as above). Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 500 m OR Stage in full length, whichever is less.
Preparation of Sub grade		Weightage of Subgrade shall be 60 % of total cost of Earthwork (B.1 (1) as above). Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 500 OR Stage in full length, whichever is less.
(1)(a) Rectification of partially executed earthwork upto Subgrade Top	0.000%	Unit of measurement is linear length. Payment of each stage shall be made on completion of entire scope in all respects, as given under Schedule B.

Stage of Payment	Percentage -weightage	Payment Procedure
(2) Sub-base Course	6.449%	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 500 m **OR** Stage in Full length, whichever is less
(2) (a) Rectification of partially executedSub-base Course	0.000%	Unit of measurement is linear length. Payment of each stage shall be made on completion of entire scope in all respects, as given under Schedule B.
(3) Non bituminous Base course	4.163%	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 500 m **OR** Stage in Full length, whichever is less
(3)(a) Rectification of partially executed WMM	0.000%	Unit of measurement is linear length. Payment of each stage shall be made on completion of entire scope in all respects, as given under Schedule B.
(4) Bituminous Base course	6.374%	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 500 m **OR** Stage in Full length, whichever is less
(4)(a) Rectification of partially executed DBM	0.000%	Unit of measurement is linear length. Payment of each stage shall be made on completion of entire scope in all respects, as given under Schedule B.

Stage of Payment	Percentage -weightage	Payment Procedure
(5) Wearing Coat	3.733%	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 500 m **OR** Stage in Full length, whichever is less
(5)(a) Rectification of partially executed BC	0.000%	Unit of measurement is linear length. Payment of each stage shall be made on completion of entire scope in all respects, as given under Schedule B.
B.2 - Reconstruction realignment/ bypass/Geometric Improvement (Rigid Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 1 (One) km. length, whichever is less.
(1) Earthwork up to top of the sub- grade	0.578%	
(2) Sub-base Course	0.085%	
(3) Dry lean concrete (DLC)	0.405%	
(4) Pavement quality concrete (PQC) course	1.341%	
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 1 (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 1 (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,		Cost of each culvert shall be determined on pro rata basis with respect to the total number of

Stage of Payment	Percentage -weightage	Payment Procedure
Geometric Improvement		culverts. Payment shall be made on the completion of at least 1 (One) culvert.
(1) Hume Pipe Culvert	1.513%	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 1 (One) culvert.
(2) Box culvert	8.971%	
(3) Slab Culvert	1.969%	
(4) Rectification of partially executed Culverts	0.715%	Payment Shall be made on completion of entire scope in all respect.

@. 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:

Table1.3.2

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 work in at least 1 bridge in all respects.
Widening of existing bridges	0.00%	
Rehabilitation of existing bridges	0.764%	
A.2 - New of Minor Bridges		
(1) **Foundation** : On completion of the foundation work including foundations for wing and return walls	12.483%	(i) Foundation: Payment against Foundation shall be made on pro rata basis on completion of atleast two foundations. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Substructure: on completion of abutments, piers upto the abutment/pier cap.	6.621%	ii) Sub Structure: Payment against Sub Structure shall be made on pro rata basis on completion of atleast two sub structures upto abutment / pier cap level of each bridge.
(3) **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.	26.464%	iii) 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.
(4) **Approaches**: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	3.057%	(iv) 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.
(5) 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

Stage of Payment	Weightage	Payment Procedure
		linear length of the underpass/overpasses. Payment shall be made on the completion of widening & repair works of an underpass/overpass.
B.2 - New Underpasses/ Overpasses		
(1) **Foundation** : On completion of the foundation work including foundations for wing and return walls.	11.451%	(i) Foundation: Payment against Foundation shall be made on pro rata basis on completion of atleast two foundations. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2)**Sub-structure:** on completion of abutments, piers upto the abutment/pier cap.	6.950%	(ii) Sub Structure: Payment against Sub Structure shall be made on pro rata basis on completion of atleast two sub structures upto abutment / pier cap level of each underpass / overpass.
(3) **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.	23.477%	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.
(4) **Approaches**: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	7.641%	Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respects as specified
5. Rectification/completion	1.092%	Payment Shall be made on

Stage of Payment	Weightage	Payment Procedure
of balance work for partially executed SVUP		completion of entire scope in all respect.

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:	0.000%	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:	0.000%	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 up to abutment/pier cap level of the major bridge.
(3) Super-structure: (including bearings.)	0.000%	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	0.000%	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.	0.000%	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	0.000%	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.	0.000%	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)	0.000%	Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.

Table 1.3.3		
Stage of payment	**Weightage**	**Payment procedure**
A.2 - New major bridges		Cost of each structure shall be determined on pro rata basis in respect to the total liner length (m) of all the structures. Payments shall be made on completion of each stage of structures as per weightage given below-
For bridges having span more than 60 m		
(1) Foundation: Foundation for abutment, piers	5.731%	Payment procedure shall be as under-
In case of Well Foundation		Cost of each foundation shall be determined from cost of all foundations as under: Cost of one foundation of depth 'd'= (d/D) * Cost of all foundations D= sum of depth of all foundations; Depth of foundations shall be as per approved designs & drawings by AE. Payment against foundations shall be made on pro-rata basis on completion of a stage as under:
a. Cutting edge + Well curb		Weightage shall be 10 % of total cost of one well foundation. Payment shall be on completion of a stage i.e. completion of cutting edge and well curb.
b. Well staining upto bottom of well cap		Weightage shall be 80 % of total cost of one well foundation. Unit of measurement is linear depth of foundation in meter. Payment shall be made on pro rata basis on completion of a stage in a depth of not less (i) 10 m in first stage and (ii) 5 m in subsequent stages.
c. Bottom Plug+ Top Plug (if provisioned as per design) + Well cap		Weightage shall be 10 % of total cost of one well foundation. Payment shall be on completion of a stage i.e. Bottom Plug+ Top Plug (if provisioned as per design) + Well cap in all respect. In case where load testing is required for foundation, the payment of this stage shall be made after the foundation is passed in the load testing.
In case of Pile Foundation		Cost of each foundation shall be determined from cost of all foundations as under: Cost of one foundation of depth 'd'= (d/D) * Cost of all foundations D= sum of depth of all foundations; Depth of foundations shall be as per approved designs & drawings by AE. Payment against foundations shall be made on pro-rata basis on completion of a stage as under:
a. Piling		Weightage shall be 70 % of total cost of one foundation. Unit of measurement is no. of piles completed till bottom of Pile cap. Payment shall be made on pro rata basis on completion of a stage in nos. of not less than 50 % of total piles.
b. Pile cap		Weightage shall be 30 % of total cost of one foundation. Payment shall be on completion of a stage i.e. completion of Pile cap.

Table 1.3.3		
Stage of payment	**Weightage**	**Payment procedure**
In case of Open Foundations		Cost of each foundation shall be determined from cost of all foundations divided by nos. of all foundations in a Bridge. Payment against foundations shall be made on pro-rata basis on completion of a stage i.e. 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 were specified.
(2) Sub-Structure for abutment, piers up to abutment/pier cap level	14.538%	Cost of one Sub-structure of the Bridge shall be determined from total cost of sub-Structures of a Bridge divided by total nos. of Substructures. Payment shall be on completion of a stage i.e. completion of atleast one substructure upto abutment/pier cap level of each structure.
(3) Super-structure: including girder, deck slab, bearings (excluding wearing coat and expansion joints)		
(a) Super Structure : casting of girder/fabrication of girders (Steel)	0.000%	(a) Super structure (casting of girder): Unit of measurement is numbers. Payment against casting of girders shall be made on pro rata basis with respect to total numbers of girders required in the structure on completion of a stage i.e. not less than completion of casting of at least five girders of the structure.
(b) Super structure : Casting of segments	0.000%	(b) Super structure (Casting of segments): Unit measurement is numbers. Payment against casting of segments shall be made on pro rata basis with respect of total numbers of segments required in the structure on completion of a stage i.e. not less than completion of casting at least 10 (ten) segments of the structure.
(c) Super structure : erection of girders, deck slab and bearings	66.480%	(c) Super structure (Erection of girders, deck slab and bearing): Payment shall be made on pro rata basis on completion of a stage i.e. completion of supers structure including bearings of at least one span in all respects as specified.
(4) Other Ancillary works : wearing coat, expansion joints hand rails, crash barriers, tests on completion etc. completion in all respect.	7.101%	(iv) Other Ancillary works: Payment shall be made on pro-rata basis on completion of the stage in all respect as specified, for each structure.
(5) Approaches including retaining walls, stone pitching, protection works.	6.150%	(v) Approaches: Payment shall be made on pro-rata basis on completion of the stage in all respect as specified, for each structure.
(6) Wing walls/return walls upto full height	0.000%	(vi) Wing/Return wall up to full height: Payment shall be made on completion of all wing wall/return walls for bridge, complete in all respect as specified.

Table 1.3.3		
Stage of payment	**Weightage**	**Payment procedure**
(7) Guide bunds, River Training works etc.	0.000%	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.
B.1 - Widening and repairs of (a) ROB and (b) RUB		
(1) Foundation	0.000%	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	0.000%	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 up to abutment/pier cap level of the ROB/RUB.
(3) Super-structure (including bearing)	0.000%	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	0.000%	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.	0.000%	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	0.000%	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, stone pitching, protection works)..	0.000%	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	0.000%	Foundation: Cost of each ROB/RUB shall be determined on pro rata basis with respect to

Table 1.3.3		
Stage of payment	**Weightage**	**Payment procedure**
		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	0.000%	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 up to abutment/pier cap level of the ROB/RUB.
(3) Super-structure (including bearing)	0.000%	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	0.000%	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.	0.000%	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	0.000%	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)	0.000%	Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified
C.1 - Widening and repairs of Elevated section/Flyover/Grade Separators		
(1) Foundation	0.000%	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.

Table 1.3.3		
Stage of payment	**Weightage**	**Payment procedure**
(2) Sub-structure	0.000%	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 up to abutment/pier cap level of the structure.
(3) Super-structure (including bearing)	0.000%	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	0.000%	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.	0.000%	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	0.000%	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)	0.000%	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	0.000%	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	0.000%	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 up to abutment/pier cap level of the structure.
(3) Super-structure (including bearing)	0.000%	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	0.000%	Wearing Coat: Payment shall be made on completion of wearing coat including

Table 1.3.3		
Stage of payment	**Weightage**	**Payment procedure**
		expansion joints complete in all respects as specified.
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.000%	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	0.000%	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)	0.000%	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	4.880%	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	21.608%	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5 % (five per cent) of the total length.
(iii) Road signs, markings, km stones safety Devicesetc.	11.046%	
(vi) Project Facilities		Payment shall be made on pro rata basis for completed facilities.
a) Bus bays	0.174%	
b) Truck laybys	0.000%	
(c) Rest areas	1.742%	
d) Others (To be specified)		
(i) Street Lighting	0.781%	
(ii) Maintenance of existing road	7.884%	
(iii) Utility Ducts	0.244%	
(iv) Temporary diversion	5.438%	
(v) Rainwater Harvesting	0.000%	
(vi) Junction improvement works including Connecting Road &Junction under Grade separator etc.	2.413%	

Stage of Payment	Weightage	Payment Procedure
(vi) Road side Plantation	0.000%	Payment shall be made on pro rata basis for completed facilities.
(vii) Repair of protection works other than approaches to the bridges, elevated sections, flyovers/ grade separators and ROBs/RUBs.	0.000%	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.	40.307%	
(viii) Safety and traffic management during construction	0.308%	Payment shall be made on prorate basis every six months.
(ix) Side Slope Protection works Turfing and stone pitching	3.175%	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 installments in accordance with the provisions of Clause 19.7.

Schedule-I

(SeeClause10.2(iv))

1. Drawings

DrawingsIncomplianceoftheobligationssetforthinClause10.2ofthisAgreement, 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:-

IftheAuthority'sEngineerdeterminesthatfordischargingitsdutiesandfunctions 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)

Listof Drawings

1. A minimum list of the drawings of the various components/elements oftheprojecthighwayandprojectfacilityrequiredtobesubmittedbytheContractoris 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 roadfurniture items including trafficsignage ,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 streetlighting;

(m) General Arrangement showing Base Campand 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 150th (One Hundred and Fifty) days 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 360th (Three hundred and sixty) days 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 600th (Six hundred) 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 910th (Nine Hundred and Tenth) 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

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[$] 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.

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 asper the memorandum signed under provision of Clause 8.2.1 of the Contract Document, then the Project Milestone-I, II and III shallbe 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 inpercentageofthetotalcontractprice.

Forexample:

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 overafter 300th day from appointed date, then the stage payment statement required for achieving Milestone-I and Milestone-II should belinked 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-IIIwillbelinkedtostagepaymentstatementforamountinpercentageofthetotalcontractprice.**Innocase,thereshallbe any change in the schedule completion date unless extension of time has been granted by the Authority under Clause 10.3and10.5ofthecontractagreement.**

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

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.

Schedule-L

(See Clause 12.2 and 12.4)

PROVISIONAL CERTIFICATE

1. I, …….. (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated …….. (the "**Agreement**"), for construction of the "***Improvement/Widening to 2-lane with paved shoulder/4-lanning of NH-40 between Shillong to Dawki road upto Bangladesh Border including Dawki Bridge from (Design km 10+670 to km 37+550) design length of 26.550 km in the State of Meghalaya for execution of EPC mode under JICA funding - (Package-II)-Balance Work"***, 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	SIGNED, SEALED
AND DELIVERED	DELIVERED
For and on behalf of	For and on behalf of
CONTRACTOR by	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 the "***Improvement/Widening to 2-lane with paved shoulder/4-lanning of NH-40 between Shillong to Dawki road upto Bangladesh Border including Dawki Bridge from (Design km 10+670 to km 37+550) design length of 26.550 km in the State of Meghalaya for execution of EPC mode under JICA funding - (Package-II)-Balance Work"***, 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 "***Improvement/Widening to 2-lane with paved shoulder/4-lanning of NH-40 between Shillong to Dawki road upto Bangladesh Border including Dawki Bridge from (Design km 10+670 to km 37+550) design length of 26.550 km in the State of Meghalaya for execution of EPC mode under JICA funding - (Package-II)-Balance Work"***, 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 I 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 "***Improvement/Widening to 2-lane with paved shoulder/4-lanning of NH-40 between Shillong to Dawki road upto Bangladesh Border including Dawki Bridge from (Design km 10+670 to km 37+550) design length of 26.550 km in the State of Meghalaya for execution of EPC mode under JICA funding - (Package-II)-Balance Work"***, ……. (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 "***Improvement/Widening to 2-lane with paved shoulder/4-lanning of NH-40 between Shillong to Dawki road upto Bangladesh Border including Dawki Bridge from (Design km 10+670 to km 37+550) design length of 26.550 km in the State of Meghalaya for execution of EPC mode under JICA funding - (Package-II)-Balance Work"***, ……. (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.