



SCHEDULES

For

“Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.”

August, 2021 |

National Highways & Infrastructure Development Corporation Ltd
3rd floor, PTI Building, 4-Parliament Street,

New Delhi – 110001

Schedule-A



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Schedule - A

(See Clauses 2.1 and 8.1)

Site of the Project

1. The Site

- (i) Site of the Two-Lane (proposed 4-lane divided carriageway) 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 8.2.1 of this Agreement.
- (iv) The alignment plans of the Project Highway are specified in Annex-III.
- (v) The status of the environment clearances obtained or awaited is given in Annex IV.

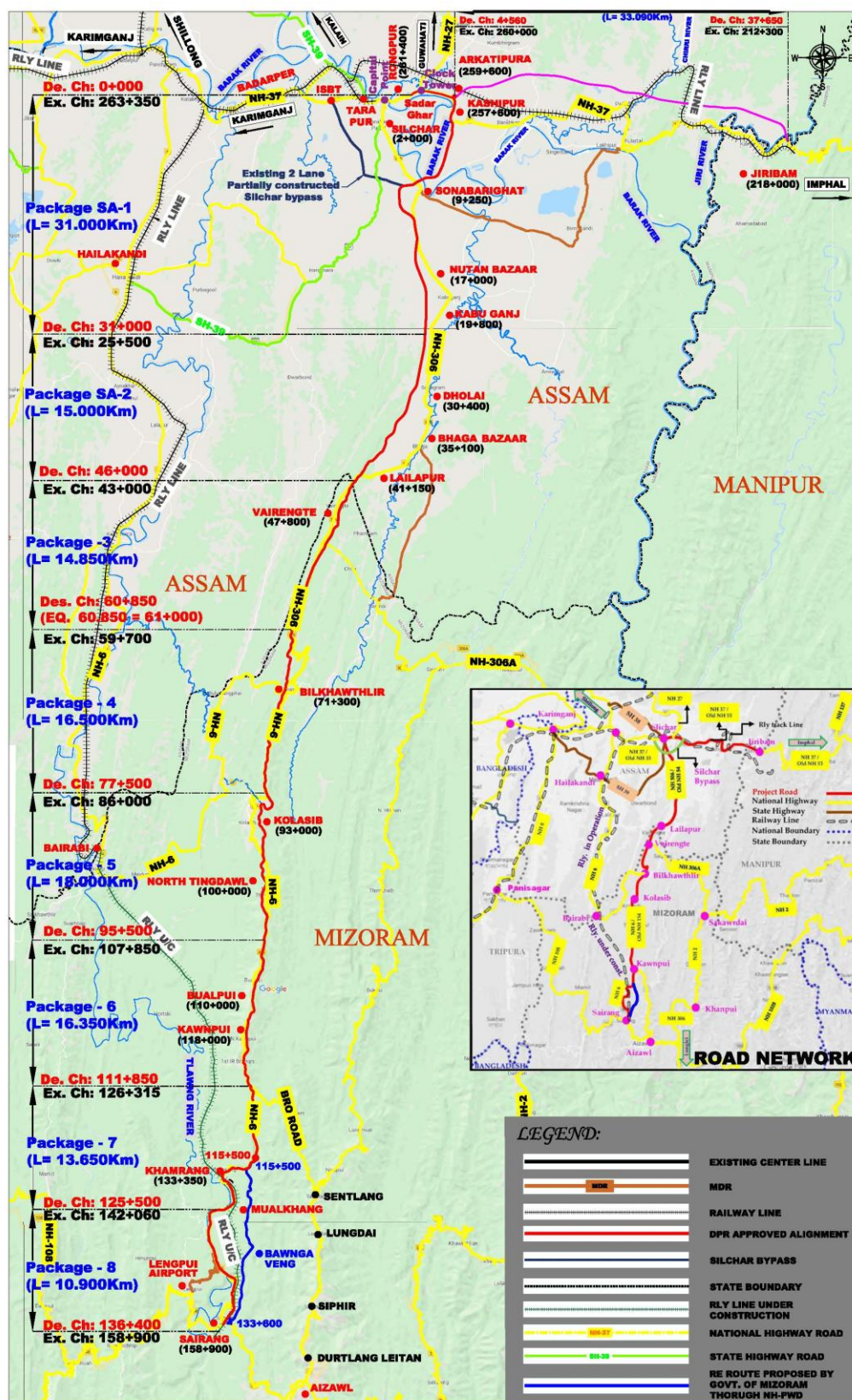


Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



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KEY PLAN



* S= Silchar, A=Aizawl ** EQ (km 60+850 = km 61+000)



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



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Annex - I (Schedule-A)

Site

1. Site

The Site of the two-lane (proposed 4-lane divided carriageway) Project Highway starts from Kolasib and ends at Sethawn (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the state of Mizoram. The land, carriageway and structures comprising the Site are described below.

2. Land

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

SL No.	Chainage (km)		Right of Way (m)	Remarks
	From	To		
1	86+000	86+500	10	
2	86+500	104+000	NA	Kolasib and N.Thingdawl Bypass, green field alignment
3	104+000	107+850	10	

3. Carriageway

The present carriageway of the Project Highway is 7.0 m wide. The type of the existing pavement is flexible. The detail is given below.

SL No.	Existing Chainage		Length (m)	Carriageway width (m)	Remarks
	From	To			
1	86+000	86+500	500	7	
2	86+500	104+000	17500	NA	Kolasib and N.Tingdawl Bypass, green field alignment
3	104+000	107+850	3850	7	

4. Major Bridges

The Site includes the following Major Bridges:

S. No.	Chainage (km)	Type of super structures			No. of Spans with span length (m)	Width (m)
		Foundation	Sub- structure	Superstructure		
NIL						

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

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

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



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6. Grade separators

The Site includes the following grade separators:

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

7. Minor bridges

The Site includes the following minor bridges:

S. No.	Chainage (km)	Type of Structure	No. of Spans with span length (m)	Width (m)
1	91+000	RCC Slab	1x8	6.8

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location (km)	Remarks
NIL		

9. Underpasses (vehicular, non vehicular)

The Site includes the following underpasses:

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

10. Culverts

The Site has the following culverts:

S. No.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)
1	88+200	Pipe	Chocked	10
2	90+500	Pipe	Chocked	8
3	91+000	Pipe	1 x 0.6	10
4	91+280	Pipe	Chocked	10
5	91+500	Pipe	1 x 0.6	10.5
6	92+310	Pipe	Chocked	10.5
7	92+330	Pipe	Chocked	10.5
8	92+360	Pipe	2 x 0.9	10.5
9	92+700	Pipe	Chocked	7.5
10	93+100	RCC Slab	1 X 2	10
11	93+500	Pipe	2 x 0.9	9.5
12	93+700	Pipe	1 x 1	9.5



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S. No.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)
13	93+800	Pipe	1 x 0.9	9.5
14	93+900	RCC Slab	1 x1	10
15	93+950	Pipe	Chocked	12
16	94+300	RCC Slab		10.5
17	94+600	Pipe	1 x 0.9	10
18	94+700	Pipe	1 x 0.9	10
19	94+900	Pipe	1 x 0.9	10
20	95+100	Pipe	1 x 0.9	10
21	95+200	Pipe	1 x 0.9	10
22	95+300	Pipe	1 x 0.9	10
23	95+400	Pipe	2 x 0.9	9.5
24	95+410	Pipe	1 x 0.9	9.5
25	95+800	Pipe	1 x 0.9	10.5
26	96+000	Pipe	1 x 0.9	10
27	96+300	Pipe	1 x 0.9	10
28	96+350	Pipe	1 x 0.9	10
29	96+600	Pipe	1 x 0.9	10
30	96+700	Pipe	1 x 0.9	10
31	97+100	RCC Slab	1x2	10
32	97+300	Pipe	1 x 0.9	9
33	97+500	Pipe	1 x 0.9	9.5
34	97+800	Pipe	1 x 0.9	9.5
35	97+900	Pipe	1 x 0.9	9.5
36	98+500	Pipe	1 x 0.9	8
37	98+700	RCC Slab	1x2	10
38	98+800	Pipe	1 x 0.9	9.5
39	98+900	Pipe	1 x 0.9	9.5
40	99+000	Pipe	1 x 1.2	10.4
41	99+200	Pipe	1 x 1.2	10.1
42	99+400	Pipe	1 x 0.9	12
43	99+600	Pipe	1 x 1.2	9.8
44	99+700	Pipe	1 x 1.2	9.5
45	99+900	Pipe	1 x 1.2	9.8
46	100+000	Pipe	1 x 1.2	9.2
47	100+200	Pipe	1 x 1.2	9.2
48	100+600	Pipe	1 x 1.2	10.5
49	100+800	Pipe	1 x 1.2	10
50	0+103	Pipe	1 x 1.2	10.5
51	103+300	Pipe	1 x 1.2	12
52	103+350	Pipe	1 x 1.2	10
53	103+500	Pipe	1 x 1.2	11.4
54	104+000	Pipe	1 x 1.2	10



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S. No.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)
55	104+100	RCC Slab	1x2.5	18.5
56	104+200	Pipe	1 x 1.2	10
57	105+100	Pipe	1 x 1.2	10.4
58	105+400	Pipe	2 x 0.9	12.5
59	105+500	Pipe	1 x 1.2	9.5
60	105+800	Pipe	1 x 1.2	10
61	105+900	Pipe	1 x 0.9	10
62	106+000	Pipe	1 x 0.9	10
63	106+100	Pipe	1 x 0.9	10
64	106+200	Pipe	1 x 0.9	10
65	106+300	Pipe	1 x 0.9	10
66	106+400	Pipe	1 x 1.2	13
67	106+650	Pipe	1 x 0.9	10
68	106+800	Pipe	1 x 0.9	13
69	107+000	Pipe	1 x 0.9	10
70	107+800	Pipe	1 x 0.9	9.5

11. Bus bays

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

Sl. No.	Chainage (km)	Length (m)	Left Hand Side	Right Hand side
NIL				

12. Truck Lay byes

The details of truck lay byes are as follows:

Sl. No.	Chainage (km)	Length (m)	Left Hand Side	Right Hand side
NIL				

13. Road side drains

The details of the roadside drains are as follows:

S. No.	Location		Type	
	From km	to km	Masonry/cc (Pucca)	Earthen (Kutchra)
NIL				

14. Major Junctions

The details of major junctions are as follow.

S. No.	Location		At grade	Separated	Category of Cross Road			
	From km	To km			NH	SH	MDR	Others



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1	87+700		Y		NH			
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(NH: National Highway, SH: State Highway, MDR: Major District Road)

15. Minor Junctions

The details of the minor junctions are as follows:

Sl. No.	Existing Chainage	Type of Road (BT, CC, Gr.)	Type of Junctions (T,Y,+)	Side	Type of Road (SH/ MDR/ PMGSY/ VR)
1	86+043	ER Road	Y	LHS	Village Road
2	86+816	ER Road	Y	LHS	Village Road
3	87+958	ER Road	Y	LHS	Village Road
4	88+219	BT Road	Y	RHS	Village Road
5	89+069	ER Road	Y	LHS	Hebron Rd
6	89+740	BT Road	Y	RHS	Village Road
7	90+337	ER Road	Y	LHS	Village Road
8	90+344	BT Road	Y	RHS	Village Road
9	90+677	BT Road	Y	LHS	Village Road
10	91+172	BT Road	Y	LHS	Village Road
11	91+300	BT Road	Y	RHS	Village Road
12	91+579	ER Road	T	LHS	Village Road
13	92+064	BT Road	Y	LHS	Village Road
14	92+417	ER Road	Y	LHS	Village Road
15	92+485	BT Road	T	LHS	Village Road
16	92+617	BT Road	Y	LHS	Village Road
17	92+859	BT Road	Y	LHS	Village Road
18	93+000	ER Road	Y	RHS	Village Road
19	93+064	ER Road	Y	LHS	Village Road
20	93+241	BT Road	Y	LHS	Village Road
21	93+332	BT Road	Y	RHS	Village Road
22	93+358	BT Road	T	RHS	Village Road
23	93+452	BT Road	Y	LHS	Village Road
24	93+508	BT Road	Y	LHS	Village Road
25	93+536	BT Road	Y	RHS	Village Road
26	93+662	BT Road	Y	LHS	Village Road
27	93+759	BT Road	T	LHS	Village Road
28	93+791	BT Road	Y	RHS	Village Road
29	93+833	BT Road	T	LHS	Village Road
30	93+884	BT Road	Y	LHS	Village Road
31	93+896	BT Road	T	RHS	Village Road
32	93+978	BT Road	Y	LHS	Village Road
33	94+069	BT Road	T	RHS	Village Road
34	94+425	BT Road	Y	RHS	Village Road
35	94+564	BT Road	Y	RHS	Village Road
36	94+618	BT Road	Y	RHS	Village Road
37	94+774	BT Road	Y	RHS	Village Road
38	95+177	ER Road	Y	RHS	Village Road



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Sl. No.	Existing Chainage	Type of Road (BT, CC, Gr.)	Type of Junctions (T,Y,+)	Side	Type of Road (SH/ MDR/ PMGSY/ VR)
39	95+408	BT Road	Y	RHS	Village Road
40	95+476	BT Road	T	LHS	Village Road
41	95+587	ER Road	Y	LHS	Village Road
42	95+762	BT Road	Y	LHS	Village Road
43	95+766	BT Road	Y	LHS	Village Road
44	95+836	BT Road	Y	LHS	Village Road
45	95+966	ER Road	Y	LHS	Village Road
46	96+100	BT Road	T	LHS	Village Road
47	96+148	ER Road	Y	LHS	Village Road
48	96+268	BT Road	T	LHS	TNT Rd
49	96+294	BT Road	Y	LHS	Village Road
50	96+700	ER Road	Y	LHS	Kodba Rd
51	96+830	BT Road	Y	LHS	Village Road
52	96+926	ER Road	T	LHS	Village Road
53	98+929	ER Road	Y	RHS	Village Road
54	99+160	BT Road	Y	RHS	Village Road
55	99+571	BT Road	Y	LHS	Village Road
56	99+751	BT Road	T	RHS	Thingdawl Rd
57	100+012	BT Road	Y	RHS	middle School Rd
58	100+022	ER Road	Y	RHS	Village Road
59	100+517	ER Road	Y	RHS	Village Road
60	100+658	ER Road	Y	LHS	Village Road
61	101+071	ER Road	T	RHS	Village Road
62	101+193	ER Road	Y	LHS	Village Road
63	101+332	ER Road	Y	RHS	Village Road
64	101+355	ER Road	Y	LHS	Village Road
65	101+512	ER Road	Y	LHS	Village Road
66	102+039	BT Road	Y	RHS	Village Road
67	102+273	ER Road	Y	LHS	Village Road
68	102+386	ER Road	Y	RHS	Village Road
69	102+488	BT Road	X	BOTH	Village Road
70	102+535	ER Road	Y	RHS	Village Road
71	102+631	BT Road	Y	LHS	Village Road
72	102+754	ER Road	Y	LHS	Village Road
73	102+784	ER Road	Y	LHS	Village Road
74	102+834	ER Road	Y	RHS	Village Road
75	103+078	ER Road	Y	LHS	Village Road
76	103+534	ER Road	Y	BOTH	Village Road
77	104+310	BT Road	Y	LHS	Village Road
78	106+525	ER Road	Y	LHS	Village Road
79	107+066	BT Road	Y	RHS	Village Road
80	107+543	BT Road	Y	RHS	Village Road

16. Bypasses

The details of the bypasses are as follows:



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S.No.	Name of bypass (town)	Chainage (km) From km to km	Length
NIL			

17. Details of Existing Utilities Schedule

The existing utilities schedules as below,

17.1 Electrical Utilities

The Site includes the following Electrical Utilities: -

(a) Extra High-Tension Lines (EHT Lines)

Extra High-Tension Lines (EHT LINES)							Remarks
S.No	Chainage		Length of line(km)		Nos. of Crossings		
			Maintained by P&E Department		Maintained by P&E Department		
	From	To	400 KV	132 KV	400 KV	132 KV	
1	78+250	78+350		0.100(1)		1	
2	78+780	79+000					
3	79+600	79+700					
4	87+900	88+100					
5	88+750	89+000					
6	91+300	92+100		0.900 (1)		2	
7	93+100	93+300					
8	94+550	94+650					Nos. of Crossings

Note: (1) denotes Number of pole/towers

(b) High Tension/Low Tension Lines (HT/LT Lines)

High Tension/ Low Tension Lines(HT/LT LINES)												
Sl. No	Chainage		Length of line(km)				Nos. of Crossings				Transformer	
	From	To	HT 33K V	LT 33K V	LT 11K V	LT 440V	HT 33 KV	LT 33K V	LT 11KV	LT 440V	No	Capacity
1	77+700	78+500		0.350 (1)		0.480 (13)		1		1		
2	85+400	86+030	0.200 (1)		0.470 (4)		1		1			
3	87+600	87+800			0.060 (1)	0.100 (3)			1		1	250KV
4	92+000	93+000			0.850 (8)	0.270 (8)			2	1		
5	93+000	94+000			0.650 (5)	0.080 (2)			1		1	500KV



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6	94+300	95+000			0.420 (4)	0.500 (7)				1		
7	95+000	95+100				0.100 (2)				1		

Note: (1) denotes Number of pole/towers

17.2 Public Health Utilities (Water/Sewage Pipelines)

(a) The Site includes the following Public Health Utilities: -

Sl.No	Chainage		Length (in km)				Crossings				Remarks
	From	To	Water Supply Line		Sewage Line		Water Supply Line		Sewage Line		
			With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	
1	78+000	78+200	0.35		NIL			NIL		40mm dia	
2	87+600	87+730	0.395							50 mm dia	
3	89+660	89+700	0.278							20 mm dia	
4	91+870	91+950	1.15							125mm dia	
5	92+050	92+180	1.25							100mm dia	
6	92+200	92+500								Total length= Sl.no(5+6+7)	
7	92+500	92+700									
8			0.565							50mm dia	
9			0.45							20 mm dia	
10	92+700	95+500	2.7							125mm dia	
11	94+100	95+500	1.875							65mm dia	
12			0.285							50mm dia	
13			0.12							20 mm dia	

(b) Bore well/Hand Pump within RoW

Sl. No.	Bore Well**		Hand Pump	
	Chainage	Nos	Chainage	Nos
1			77+800	1
2			94+420	1

(c) Water Tank within RoW

Sl. No.	Water Tank		
	Chainage	Nos	Capacity
1	87+700 (PHED)	1	1 Lac liters
2	91+550 (Horticulture)	1	50,000 liters

17.3 Any Other Lines

No.



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Technical Schedule

Annex – II

(As per Clause 8.3 (i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

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

(i) Full Right of Way (full width)

Sl. No.	Design Chainage (km)		Length (m)	Width (m)	Date of Providing ROW
	From	To			
(i) Full Right of Way (full width)	77+620	77+730	110	75	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	77+730	77+840	110	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	77+840	77+900	60	85	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	77+900	77+950	50	75	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	77+950	78+190	240	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	78+190	78+250	60	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	78+250	78+370	120	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	78+370	78+490	120	65	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	78+490	78+510	20	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	78+510	78+600	90	55	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	78+600	78+630	30	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	78+630	78+740	110	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	78+740	79+050	310	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	79+050	79+150	100	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	79+150	79+380	230	65	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	79+380	79+820	440	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	79+820	80+070	250	55	Within 30 Days of



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					Appointed Date
(i) Full Right of Way (full width)	80+070	80+200	130	70	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	80+200	80+240	40	75	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	80+240	80+500	260	80	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	80+500	80+620	120	31	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	80+620	80+820	200	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	80+820	80+870	50	65	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	80+870	80+960	90	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	80+960	81+030	70	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	81+030	81+820	790	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	81+820	81+940	120	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	81+940	82+010	70	35	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	82+010	82+270	260	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	82+270	82+580	310	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	82+580	82+690	110	55	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	82+690	82+820	130	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	82+820	82+970	150	70	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	82+970	83+130	160	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	83+130	83+300	170	55	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	83+300	83+310	10	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	83+310	83+340	30	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	83+340	83+460	120	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	83+460	83+500	40	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	83+500	83+700	200	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	83+700	83+840	140	45	Within 30 Days of Appointed Date



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



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(i) Full Right of Way (full width)	83+840	84+030	190	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	84+030	84+100	70	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	84+100	84+240	140	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	84+240	84+440	200	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	84+440	84+540	100	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	84+540	85+390	850	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	85+390	85+450	60	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	85+450	85+510	60	65	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	86+065	86+080	15	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	86+080	86+130	50	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	86+130	86+200	70	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	86+200	86+300	100	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	86+300	86+620	320	35	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	86+620	86+700	80	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	86+700	86+850	150	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	86+850	86+950	100	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	86+950	87+110	160	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	87+110	87+160	50	80	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	87+160	87+240	80	70	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	87+240	87+350	110	70	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	87+350	87+450	100	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	87+450	87+460	10	85	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	87+460	87+630	170	70	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	87+630	87+660	30	65	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	87+660	87+700	40	50	Within 30 Days of



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



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					Appointed Date
(i) Full Right of Way (full width)	87+700	87+730	30	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	87+730	87+780	50	55	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	87+780	87+850	70	65	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	87+850	87+890	40	55	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	87+890	88+090	200	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	88+090	88+180	90	55	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	88+180	88+340	160	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	88+340	88+650	310	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	88+650	88+920	270	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	88+920	89+270	350	55	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	89+270	89+520	250	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	89+520	89+540	20	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	89+540	89+760		65	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	89+540	89+840	300	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	89+840	90+100	260	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	90+100	90+300	200	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	90+300	90+520	220	55	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	90+520	90+630	110	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	90+630	90+770	140	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	90+770	90+900	130	70	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	90+900	91+010	110	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	91+010	91+370	360	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	91+370	91+630	260	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	91+630	91+770	140	70	Within 30 Days of Appointed Date



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



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(i) Full Right of Way (full width)	91+770	91+890	120	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	91+890	91+920	30	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	93+000	93+160	160	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	93+360	93+520	160	30	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	94+225	94+300	75	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	94+300	94+395	95	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	94+775	94+820	45	35	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	94+940	94+995	55	45	Within 30 Days of Appointed Date

(ii) Part Right of Way (part width)

Sl. No.	Design Chainage (km)		Length (m)	Width (m)	Date of Providing ROW
	From	To			
(ii) Part Right of Way (part width)	77+500	77+580	80	10	On Appointed Date
(ii) Part Right of Way (part width)	77+580	77+600	20	10	On Appointed Date
(ii) Part Right of Way (part width)	77+600	77+620	20	10	On Appointed Date
(ii) Part Right of Way (part width)	85+510	85+560	50	10	On Appointed Date
(ii) Part Right of Way (part width)	85+560	85+600	40	10	On Appointed Date
(ii) Part Right of Way (part width)	85+600	85+750	150	10	On Appointed Date
(ii) Part Right of Way (part width)	85+750	85+860	110	10	On Appointed Date
(ii) Part Right of Way (part width)	85+860	85+960	100	10	On Appointed Date
(ii) Part Right of Way (part width)	85+960	86+065	105	10	On Appointed Date
(ii) Part Right of Way (part width)	91+920	91+960	40	10	On Appointed Date
(ii) Part Right of Way (part width)	91+960	92+040	80	10	On Appointed Date
(ii) Part Right of Way (part width)	92+040	92+370	330	10	On Appointed Date
(ii) Part Right of Way (part width)	92+370	92+720	350	10	On Appointed Date
(ii) Part Right of Way (part width)	92+720	92+870	150	10	On Appointed Date
(ii) Part Right of Way (part width)	92+870	92+960	90	10	On Appointed Date
(ii) Part Right of Way (part width)	92+960	93+000	40	10	On Appointed Date
(ii) Part Right of Way (part width)	93+160	93+250	90	10	On Appointed Date
(ii) Part Right of Way (part width)	93+250	93+360	110	10	On Appointed Date
(ii) Part Right of Way (part width)	93+520	93+710	190	10	On Appointed Date
(ii) Part Right of Way (part width)	93+710	93+850	140	10	On Appointed Date
(ii) Part Right of Way (part width)	93+850	93+980	130	10	On Appointed Date



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



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(ii) Part Right of Way (part width)	93+980	94+190	210	10	On Appointed Date
(ii) Part Right of Way (part width)	94+190	94+225	35	10	On Appointed Date
(ii) Part Right of Way (part width)	94+395	94+550	155	10	On Appointed Date
(ii) Part Right of Way (part width)	94+550	94+775	225	10	On Appointed Date
(ii) Part Right of Way (part width)	94+820	94+940	120	10	On Appointed Date
(ii) Part Right of Way (part width)	94+995	95+000	5	10	On Appointed Date
(ii) Part Right of Way (part width)	95+000	95+350	350	10	On Appointed Date
(ii) Part Right of Way (part width)	95+350	95+450	100	10	On Appointed Date
(ii) Part Right of Way (part width)	95+450	95+500	50	10	On Appointed Date

(iii) Balance Right of Way (width)

Sl. No.	Design Chainage (km)		Length (m)	Width (m)	Date of Providing ROW
	From	To			
(iii) Balance Right of Way (width)	77+500	77+580	80	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	77+580	77+600	20	40	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	77+600	77+620	20	65	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	85+510	85+560	50	55	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	85+560	85+600	40	55	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	85+600	85+750	150	70	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	85+750	85+860	110	60	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	85+860	85+960	100	40	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	85+960	86+065	105	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	91+920	91+960	40	30	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	91+960	92+040	80	45	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	92+040	92+370	330	40	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	92+370	92+720	350	30	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	92+720	92+870	150	25	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	92+870	92+960	90	30	Within 60 Days of Appointed Date



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



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(iii) Balance Right of Way (width)	92+960	93+000	40	40	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	93+160	93+250	90	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	93+250	93+360	110	20	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	93+520	93+710	190	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	93+710	93+850	140	40	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	93+850	93+980	130	30	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	93+980	94+190	210	25	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	94+190	94+225	35	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	94+395	94+550	155	30	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	94+550	94+775	225	25	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	94+820	94+940	120	25	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	94+995	95+000	5	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	95+000	95+350	350	25	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	95+350	95+450	100	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	95+450	95+500	50	30	Within 60 Days of Appointed Date

* The dates specified herein shall in no case be beyond 150 (one hundred and fifty) days after the Appointed Date.



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Annex - III

(Schedule-A)

Alignment Plans

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

- i. The alignment of the Project Highway is enclosed in alignment plan. Finished road level indicated in the alignment plan shall be followed by the EPC Contractor as minimum FRL if in Fill Section and maximum FRL if in cut section. In any case, the finished road level of the project highway shall not be less than those indicated in the alignment plan. The EPC Contractor shall, however, improve/upgrade the Road profile as indicated in Annex-III based on site/design requirement.
- ii. Traffic Signages of the Project Highway shall be executed based on site/design requirement as per IRC: SP: 84 - 2019. The contractor shall, however, improve/upgrade upon the traffic signage plan as indicated in Annex-III based on site/design requirement as per the relevant specifications/IRC Codes/Manual.



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Annex - IV

(Schedule-A)

Environment Clearances

As per MOEF notification F. No. 21-270/2008-1A.III (dated 22 August 2013), Environmental Clearance is not required for Mizoram state. Forest Clearance is not required.

Schedule-B



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Schedule - B

(See Clause 2.1)

Development of the Project Highway

1 Development of the Project Highway

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

2 4-Laning with Paved Shoulder

Four Laning shall include construction of the Four Lane 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.



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Annex - I

(Schedule-B)

Description of (4-Laning)

Site of the Four-lane divided Project Highway comprises the section of National Highway No. 6 from Kolasib to Sethawn (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram. The coordinates of start and end point of project road are given below.

Co-ordinates of Start and End of Project Stretch

Location		UTM Co-Ordinate	
Description	Design Chainage	Easting (m)	Northing (m)
Start of Project Road	77+500	468795.346	2682163.954
End of Project Road	95+500	468404.087	2666711.966

1. Widening of the Existing Highway

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

(ii) Width of carriageway

- (a) Four-Laning with paved shall be undertaken. The paved carriageway shall be in accordance with the typical cross-sections' drawings in the manual IRC SP 84 -2014. The typical drawings attached in schedules.

Provided that in the built-up areas [refer to paragraphs 2.1 (ii) (a) of the Manual and provide necessary details]: the width of the carriageway shall be as specified in the following table:

Sl. No.	Built-up stretch (Township)	Location (km to km)	Width (m)	Typical cross section (Ref. to Manual)
NIL				

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

 M.O.R.T.H. Govt. Of India	Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.	 BUILDING INFRASTRUCTURE - BUILDING THE NATION
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2. Geometric Design and General Features

(i) General

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the IRC SP-84-2019.

(ii) Design Speed

The design speed given in table 2.1 of IRC: SP: 84-2019 shall be adopted.

(iii) Improvements of the existing road geometrics

In the 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.

a) The bypass has been provided in following location.

Sl. No	Location	Existing Chainage (Km)		Existing Length (m)	Design Chainage (Km)		Design Length (m)
		Start	End		Start	End	
1	Kolasib and N.Thingdawl bypass	86+500	104+000	17500	77+955	91+930	13975
	Total			17500			13975

b) Realignments and Geometric Improvement locations

Sl. No	Exist. Chainage		Exist. Length (m)	Design Chainage		Type of Deficiency	Design Length (m)
	Start	End		Start	End		
1	86+173	86+304	131	77+500	77+740	Geometric Improvements	240
2	103+940	104+050	110	91+955	92+060		105
3	104+403	104+449	46	92+405	92+450		45
4	105+403	105+746	343	93+360	93+520		160
5	106+500	106+705	205	94+225	94+410		185
6	107+070	107+130	60	94+760	94+820		60
7	107+242	107+310	68	94+925	94+990		65
Total Length (m)			963				750

c) Also, apart from above bypass, the existing road geometric deficiencies, if any, in the existing horizontal and vertical profiles shall be corrected as per the



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



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prescribed standards for Mountainous / Hill terrain to the extent land is available.

(iv) Right of Way

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

(v) Type of shoulders

- Paved shoulder shall be provided as per enclosed (below) typical cross section.
- In mountainous / steep terrain, paved shoulder of 1.5m width shall be provided on either side of carriageway whereas, balance 1.0m / 1.5m width shall be provided with open /covered drain on cutting side however on valley side, 2.0m width of ES shall be covered with 150mm thick compacted layer of GSB material below chamber that is sloping down towards valley side. (ref. Typ. Cross-sections).
- Design and specifications of paved shoulders and granular material shall conform to the requirements specified in paragraphs 5.10 and 5.11 of the IRC: SP: 84-2019.

(vi) Lateral and Vertical Clearances at Underpasses

Lateral and vertical clearances at Underpasses and provision of guardrails/crash barriers shall be as per the paragraph 2.10 of IRC SP 84-2019.

a) Lateral clearance: The size of the opening at the Underpasses shall be as follows

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

Vertical clearance: Vertical Clearance at Underpasses shall not be less than 4.0 m (urban area).

(vii) Lateral and Vertical Clearances at overpasses

- Lateral and vertical clearance at overpasses shall be as per the provision of relevant Manual.
- Lateral clearance: The width of the opening at the overpasses shall be as follows:

S. No.	Location (chainage) (from km to km)	Span/ opening	Remarks
V e r		NIL	

	Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.	
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tical clearance: The vertical clearance at the underpass shall be as follows.

S. No.	Location (Km)	Span arrangement and Vertical clearance	Remarks
NIL			

(viii) Service roads

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

Sl. No.	Location of service road (from km to km)		Right Hand side (RHS)/ Left Hand side (LHS)/ Both side	Length (km) of Service Road
1	77+820	78+040	BHS	0.220

Note:

- The above length of slip/service road is excluding the tapering length/merging length of acceleration/deceleration lane. The entry and exit of slip road should be constructed as per Fig 2.1 C and service road as per Fig 2.1 A of IRC: SP: 84: 2019.
- Length of service road and slip road given in above table excludes length across the Project Highway for proper connectivity of crossroad on either side of Project Highway as given in the alignment plan enclosed at **Annex-III, Schedule-A** which shall be deemed to be included in the scope of work.
- The length of slip/service road shown in above table is minimum and may increase as per actual site conditions and No Change of Scope shall be admissible on this account.
- Width and locations of service road/slip road shown above are minimum and may vary as per site condition/as per design. Change in locations of slip/service road, if required, shall be deemed to be part of project.

(ix) Grade Separated Structures

- Grade separated structures shall be provided as per paragraph 2.13 of the IRC SP 84-2019. The requisite particulars are given below:

Sl. No	Location of Structure	Length (m)	Number and length of Spans (m)	Approach gradient	Remarks if Any
1	77+940	30	2 x 15m		Overpass

- In the case of grade separated structures, the type of structure and the level of the Project Highway and the crossroads shall be as follows:

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Sl. No.	Location (Design Chainage)	Type of Structure Length (m)	Cross road at			Remarks, if any
			Existing level	Raised Level	Lowered Level	
1	77+940	Overpass	*	*	*	

(x) **Cattle and pedestrian underpass / overpass**

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

S. No.	Location	Type of Crossing
NIL		

(xi) **Typical cross-sections of the Project Highway**

The cross-sectional elements are below with reference to Manual IRC SP : 84 2019. All the cross-sectional elements 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.

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
77+500	77+590	90	7	Following Existing Alignment	Open Area	TCS 3	Geometric Improvements
77+590	77+740	150	-	New Alignment	Open Area	TCS 4	Geometric Improvements
77+740	77+760	20	7	Following Existing Alignment	Open Area	TCS 3	
77+760	77+790	30	-	New Alignment	Open Area	TCS 8	
77+790	77+800	10	7	Following Existing Alignment	Open Area	TCS 3	
77+800	77+820	20	7	Following Existing Alignment	Open Area	TCS 1	
77+820	77+860	40	-	New Alignment	Open Area	TCS 8	
77+860	77+930	70	7	Following Existing Alignment	Open Area	TCS 1	
77+930	77+950	20	-	New Alignment	Open Area	TCS 9	
77+950	78+260	310	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass

 सत्यमेव जयते M.O.R.T.H. Govt. Of India	Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.	 NADCL BUILDING INFRASTRUCTURE - BUILDING THE NATION
Technical Schedule		

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
78+260	78+330	70	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
78+330	78+380	50	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
78+380	78+490	110	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
78+490	78+500	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
78+500	78+630	130	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
78+630	78+650	20	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
78+650	78+700	50	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
78+700	78+720	20	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
78+720	78+790	70	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
78+790	78+820	30	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
78+820	79+380	560	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
79+380	79+400	20	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
79+400	79+440	40	-	New Alignment	Open Area	TCS 7	Kolasib and N.Tingdawl Bypass
79+440	80+230	790	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
80+230	80+270	40	-	New Alignment	Open	TCS 6	Kolasib and



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
					Area		N.Tingdawl Bypass
80+270	80+310	40	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
80+310	80+500	190	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
80+500	80+640	140	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
80+640	80+740	100	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
80+740	80+840	100	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
80+840	81+410	570	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
81+410	81+450	40	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
81+450	81+660	210	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
81+660	81+670	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
81+670	81+710	40	-	New Alignment	Open Area	TCS 7	Kolasib and N.Tingdawl Bypass
81+710	81+720	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
81+720	81+870	150	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
81+870	81+930	60	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
81+930	82+020	90	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
82+020	82+480	460	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
82+480	82+525	45	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
82+525	82+535	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
82+535	82+560	25	-	New Alignment	Open Area	TCS 7	Kolasib and N.Tingdawl Bypass
82+560	82+570	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
82+570	82+690	120	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
82+690	82+730	40	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
82+730	83+060	330	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
83+060	83+070	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
83+070	83+110	40	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
83+110	83+120	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
83+120	83+300	180	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
83+300	83+310	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
83+310	83+340	30	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
83+340	83+350	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
							Bypass
83+350	83+570	220	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
83+570	83+690	120	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
83+690	83+900	210	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
83+900	83+930	30	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
83+930	83+960	30	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
83+960	84+030	70	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
84+030	84+110	80	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
84+110	84+120	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
84+120	84+340	220	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
84+340	84+380	40	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
84+380	84+400	20	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
84+400	84+450	50	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
84+450	84+530	80	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
84+530	84+650	120	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
84+650	84+660	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
84+660	84+760	100	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
84+760	84+780	20	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
84+780	85+375	595	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
85+375	85+390	15	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
85+390	85+460	70	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
85+460	85+500	40	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
85+500	85+800	300	7	Following Existing Alignment	Open Area	TCS 3	Kolasib and N.Tingdawl Bypass
85+800	85+970	170	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
85+970	86+020	50	7	Following Existing Alignment	Open Area	TCS 1	Kolasib and N.Tingdawl Bypass
86+020	86+130	110	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
86+130	86+300	170	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
86+300	86+450	150	-	New Alignment	Open Area	TCS 7	Kolasib and N.Tingdawl Bypass
86+450	86+610	160	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
86+610	86+720	110	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
							Bypass
86+720	86+790	70	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
86+790	86+830	40	-	New Alignment	Open Area	TCS 7	Kolasib and N.Tingdawl Bypass
86+830	87+120	290	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
87+120	87+240	120	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
87+240	87+350	110	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
87+350	87+360	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
87+360	87+470	110	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
87+470	87+730	260	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
87+730	87+920	190	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
87+920	87+940	20	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
87+940	88+060	120	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
88+060	88+090	30	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
88+090	88+200	110	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
88+200	88+210	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass

 सत्यमेव जयते M.O.R.T.H. Govt. Of India	Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.	 NADCL BUILDING INFRASTRUCTURE - BUILDING THE NATION
Technical Schedule		

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
88+210	88+260	50	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
88+260	88+300	40	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
88+300	88+330	30	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
88+330	88+350	20	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
88+350	88+440	90	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
88+440	88+610	170	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
88+610	88+650	40	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
88+650	89+110	460	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
89+110	89+140	30	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
89+140	89+370	230	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
89+370	89+380	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
89+380	89+410	30	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
89+410	89+430	20	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
89+430	89+490	60	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
89+490	89+520	30	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
							Bypass
89+520	89+780	260	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
89+780	89+800	20	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
89+800	89+840	40	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
89+840	89+850	10	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
89+850	89+960	110	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
89+960	90+020	60	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
90+020	90+100	80	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
90+100	90+300	200	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass
90+300	90+640	340	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
90+640	90+670	30	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
90+670	90+690	20	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
90+690	90+750	60	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
90+750	90+770	20	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
90+770	91+060	290	-	New Alignment	Open Area	TCS 8	Kolasib and N.Tingdawl Bypass



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
91+060	91+260	200	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
91+260	91+290	30	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
91+290	91+380	90	-	New Alignment	Open Area	TCS 4	Kolasib and N.Tingdawl Bypass
91+380	91+410	30	-	New Alignment	Open Area	TCS 2	Kolasib and N.Tingdawl Bypass
91+410	91+440	30	-	New Alignment	Open Area	TCS 6	Kolasib and N.Tingdawl Bypass
91+440	91+610	170	-	New Alignment	Open Area	TCS 4	Geometric Improvements
91+610	91+630	20	-	New Alignment	Open Area	TCS 2	Geometric Improvements
91+630	91+890	260	-	New Alignment	Open Area	TCS 8	Geometric Improvements
91+890	91+970	80	7	Following Existing Alignment	Open Area	TCS 1	Geometric Improvements
91+970	92+070	100	-	New Alignment	Open Area	TCS 4	Geometric Improvements
92+070	92+370	300	7	Following Existing Alignment	Open Area	TCS 3	
92+370	92+400	30	-	New Alignment	Open Area	TCS 2	
92+400	92+450	50	-	New Alignment	Open Area	TCS 6	Geometric Improvements
92+450	92+480	30	7	Following Existing Alignment	Open Area	TCS 1	Geometric Improvements
92+480	92+545	65	7	Following Existing Alignment	Open Area	TCS 3	
92+545	92+580	35	7	Following Existing Alignment	Open Area	TCS 1	
92+580	92+740	160	-	New Alignment	Open Area	TCS 8	
92+740	92+870	130	7	Following Existing Alignment	Open Area	TCS 1	
92+870	93+250	380	-	New Alignment	Open Area	TCS 8	



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
93+250	93+360	110	7	Following Existing Alignment	Open Area	TCS 5	
93+360	93+380	20	-	New Alignment	Open Area	TCS 2	Geometric Improvements
93+380	93+530	150	-	New Alignment	Open Area	TCS 6	Geometric Improvements
93+530	93+630	100	7	Following Existing Alignment	Open Area	TCS 1	
93+630	93+980	350	7	Following Existing Alignment	Open Area	TCS 3	
93+980	94+070	90	7	Following Existing Alignment	Open Area	TCS 1	
94+070	94+140	70	-	New Alignment	Open Area	TCS 7	
94+140	94+190	50	7	Following Existing Alignment	Open Area	TCS 5	
94+190	94+290	100	-	New Alignment	Open Area	TCS 8	Geometric Improvements
94+290	94+310	20	-	New Alignment	Open Area	TCS 2	Geometric Improvements
94+310	94+355	45	-	New Alignment	Open Area	TCS 4	Geometric Improvements
94+355	94+445	90	-	New Alignment	Open Area	TCS 2	Geometric Improvements
94+445	94+540	95	7	Following Existing Alignment	Open Area	TCS 3	
94+540	94+590	50	7	Following Existing Alignment	Open Area	TCS 1	
94+590	94+640	50	7	Following Existing Alignment	Open Area	TCS 3	
94+640	94+680	40	7	Following Existing Alignment	Open Area	TCS 1	
94+680	94+740	60	7	Following Existing Alignment	Open Area	TCS 5	
94+740	94+810	70	-	New Alignment	Open Area	TCS 2	Geometric Improvements
94+810	94+850	40	-	New Alignment	Open Area	TCS 4	Geometric Improvements
94+850	94+890	40	7	Following Existing Alignment	Open Area	TCS 1	
94+890	94+920	30	7	Following Existing Alignment	Open Area	TCS 5	
94+920	94+935	15	7	Following Existing	Open	TCS 1	Geometric

 सत्यमेव जयते M.O.R.T.H. Govt. Of India	Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.	 BUILDING INFRASTRUCTURE - BUILDING THE NATION
Technical Schedule		

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
				Alignment	Area		Improvements
94+935	95+005	70	-	New Alignment	Open Area	TCS 4	
95+005	95+310	305	7	Following Existing Alignment	Open Area	TCS 1	
95+310	95+500	190	7	Following Existing Alignment	Open Area	TCS 3	

3. Intersections and Grade Separators

All intersections and grade separators shall be as per Section 3 of the IRC SP 84-2019. Existing intersections which are deficient shall be improved to the prescribed standards.

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

(i) At-grade intersections

(a) Major Junction

Sl. No.	Location		At Grade	Type of Road (SH/ MDR/ ODR/ VR)	Remarks
	Existing Chainage	Design Chainage			
NIL					

(b) Minor Junction:

Sl. No.	Existing Chainage	Design Chainage	Type of Junctions (T, Y, +)	Side	Type of Road (SH/ MDR/ ODR/ VR)	Remarks
1	-	80+230	+	BHS	VR	
2	97+120	85+840	Y	RHS	NH-6	
3	97+300	86+010	Y	LHS	NH-6	
4	-	87+710	+	BHS	VR	
5	103+900	91+920	T	LHS	NH-6	



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

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 it may increase as per actual site condition and increase in number will not attract change of Scope on this account.

(ii) Grade separated intersection with/without ramps.

Sl. No.	Location	Salient Feature	Minimum Length of Viaduct to be provided	Road to be carried over/ Under the structure
NIL				

4. Road Embankment and Cut Section

- (i) Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/ cuttings shall conform to the Specifications and Standards given in section 4 of the IRC SP 84-2019 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

The height of the embankment shall be measured with respect to the Finished Road Levels. The Finished Road Level of main carriageway shall be designed so that the bottom of the subgrade is minimum 1.0m above the Highest Flood Level (HFL)/ High water table/Natural Ground Level and for service road, bottom of the sub grade is minimum 0.5m high above HFL/ High water table /NGL.

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

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

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

5. Pavement Design

- (i) Pavement design shall be carried out in accordance with Section 5 of the IRC SP 84-2019 and IRC SP: 59-2019.

(ii) Type of pavement

The existing flexible pavement shall be dismantled and reconstructed as new flexible

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pavement from (Design Chainages) Km 77+500 to Km 95+500 including Bus bay, Rest Area, Truck Lay Bye and Intersection.

(iii) Design requirements

Notwithstanding anything to the contrary contained in this agreement or the manual, the contractor shall design the pavement of main carriageway for design traffic of 40 MSA with a minimum design period of 20 years. CBR value as obtained at site shall be taken for design if less than 8%. Maximum value of CBR to be taken for design shall not exceed 8%.

Bituminous Grade VG 30 or VG 40 shall be used for BC.

a) Design Period and strategy

A) Main carriageway:

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

B) Service road/Slip Road:

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

C) Strengthening of Existing pavement:

Nil

b) Design Traffic

A) Main carriageway:

Notwithstanding anything to the contrary contained in this Agreement or the IRC SP 84-2019, the contractor shall design the pavement for design traffic of not less than 40 million standard axles (MSA) for Main carriageway.

B) Service Road

As per clause 5.5.4 of IRC SP 84-2019 service road shall be designed for minimum 10 MSA.

C) Strengthening of Existing pavement

Nil

(iv) Reconstruction of stretches

The existing flexible pavement shall be dismantled and reconstructed as Flexible pavement.

6. Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per the provision of Section 6 of the IRC SP 84-2019 in entire length including drains and culverts required along the crossroads at junctions/



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interchanges/other locations. Any repair/ reconstruction required for the existing culverts along project highway/along crossroads at junctions shall be carried out. This will not attract any change of scope.

In the cutting sections, lined/unlined drain shall be provided at the top of cut slope. All measures shall be taken to prevent ingress of countryside runoff entering into road formation width.

Ref. separate TCS drawings for more details

i) RCC cover drain:

RCC cover drain shall be provided at following locations.

Sl No	LHS			RHS		
	Chainage (m)		Length (m)	Chainage (m)		Length (m)
	From	To		From	To	
1	77+860	78+000	140	77+840	78+170	330
2	80+220	80+470	250	80+200	80+340	140
3	85+500	86+050	550	85+820	86+050	230
4	87+620	87+810	190	87+520	87+800	280
5	91+800	92+010	210	91+810	92+040	230
Total Length=			1340			1210

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

ii) PCC open drain on hill side:

PCC open drain shall be provided on hill side at following locations.

Sl No	LHS			RHS		
	Chainage (m)		Length (m)	Chainage (m)		Length (m)
	From	To		From	To	
1	77+500	77+870	370	78+010	78+370	360
2	86+050	87+620	1570	78+490	80+200	1710
3	87+920	88+080	160	80+340	80+500	160
4	88+420	90+640	2220	80+600	81+940	1340
5	91+040	91+620	580	82+020	82+700	680
6	92+010	92+380	370	82+730	83+080	350
7				83+110	85+820	2710



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LHS			RHS		
Sl No	Chainage (m)		Length (m)	Chainage (m)	
	From	To		From	To
8				87+640	87+700
9				92+040	92+600
10				93+540	95+500
Total Length=			5270		9890

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

iii) PCC open drain on valley side:

PCC open drain shall be provided on valley side at following locations.

LHS			RHS		
Sl No	Chainage (m)		Length (m)	Chainage (m)	
	From	To		From	To
1	78+000	80+200	2200	76+390	76+970
2	80+650	81+200	550	77+150	77+840
3	81+450	81+930	480	78+370	78+490
4	82+030	82+710	680	85+500	85+830
5	82+740	83+075	335	86+050	87+520
6	83+110	83+300	190	87+800	91+810
7	83+880	84+330	450	92+600	93+540
8	84+550	85+000	450		
9	85+360	85+500	140		
10	87+810	87+920	110		
11	88+080	88+420	340		
12	90+640	91+040	400		
13	92+380	94+050	1670		
14	95+300	95+500	200		
Total Length=			8195		8140



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

7. Design of Structures

(i) General

(a) All bridges, culverts and structures shall be designed and constructed in accordance with section 7 of the IRC SP 84-2019 and shall conform to the cross-sectional features and other details specified therein.

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

Refer to paragraph 7.3 (ii) of the IRC SP 84-2019 and specified width of carriageway of all new four lane bridges shall have footpaths on either side. The cross-sectional features shall be as per Fig.7.6 of the IRC SP 84-2019.

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

S. No.	Location at km	Remarks
1	80+551	Major bridge
2	81+979	Minor bridge
3	82+720	Minor bridge
4	83+095	Minor bridge
5	90+845	Minor bridge

(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) All structures are to be planned and designed such that, widening in future can be done with least disturbance to the existing structure and its approaches. The vertical clearance at these structures shall be provided considering 4-lane carriageway on either side.

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

(i) Cross-section of the bridges at deck level for the Project Highway shall conform to the typical cross-sections given in section 7.3 (ii) and Fig.7.6 of the IRC SP 84-2019.

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(ii) Culverts

- (a) Overall width of all culverts shall be equal to the roadway width of the approaches. Cross-section of the culverts at deck level for the Project Highway shall conform to the typical cross-sections given in section 7.3 (i), 7.3 (iii) and Fig.7.1 to Fig.7.5 of the IRC SP 84-2019.

(b) Reconstruction of existing culverts:

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

S. No.	Existing Chainage (Km)	Design Chainage (Km)	Existing Type	Existing Span	Proposed Type	Proposed Span	Remarks
1	104+100	92+120	Slab	1 x 2.5	BOX	1x2x2	
2	104+200	92+430	Pipe	1 x 1.2	BOX	1x2x2	
3	105+800	93+620	Pipe	1 x 1.2	BOX	1x2x2	
4	106+200	93+875	Pipe	1 x 0.9	BOX	1x2x2	
5	106+400	94+160	Pipe	1 x 1.2	BOX	1x2x2	
6	107+000	94+730	Pipe	1 x 0.9	BOX	1x2x2	

(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 7.3 (i), (iii) and Fig. 7.1 to Fig. 7.5 of the IRC SP 84-2019. Repairs and strengthening of existing structures where required shall be carried out.

S. No	Culvert location	Type, span, height and width of existing culvert	Repairs to be carried out [specify]
NIL			

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

S. No.	Existing Chainage (Km)	Design Chainage (Km)	Proposed Type	Proposed Span	Remarks
1	-	77+580	BOX	1x2x2	
2	-	77+780	BOX	1x2x2	



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S. No	Existing Chainage (Km)	Design Chainage (Km)	Proposed Type	Proposed Span	Remarks
3	-	78+235	BOX	1x2x2	
4	-	78+420	BOX	1x3x3	
5	-	78+670	BOX	1x2x2	
6	-	78+805	BOX	1x2x2	
7	-	79+040	BOX	1x2x2	
8	-	79+390	BOX	1x2x2	
9	-	79+560	BOX	1x2x2	
10	-	79+785	BOX	1x2x2	
11	-	80+070	BOX	1x2x2	
12	-	80+245	BOX	1x3x3	
13	-	80+730	BOX	1x2x2	
14	-	80+800	BOX	1x2x2	
15	-	81+040	BOX	1x2x2	
16	-	81+250	BOX	1x3x3	
17	-	81+440	BOX	1x2x2	
18	-	81+690	BOX	1x3x3	
19	-	81+830	BOX	1x2x2	
20	-	82+270	BOX	1x2x2	
21	-	82+375	BOX	1x2x2	
22	-	82+530	BOX	1x3x3	
23	-	83+325	BOX	1x2x2	
24	-	83+668	BOX	1x2x2	
25	-	83+970	BOX	1x2x2	
26	-	84+065	BOX	1x3x3	
27	-	84+360	BOX	1x2x2	
28	-	84+480	BOX	1x2x2	
29	-	84+680	BOX	1x2x2	
30	-	84+755	BOX	1x2x2	



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S. No	Existing Chainage (Km)	Design Chainage (Km)	Proposed Type	Proposed Span	Remarks
31	-	84+960	BOX	1x2x2	
32	-	85+130	BOX	1x2x2	
33	-	85+380	BOX	1x2x2	
34	-	86+100	BOX	1x2x2	
35	-	86+490	BOX	1x2x2	
36	-	86+815	BOX	1x2x2	
37	-	87+200	BOX	1x2x2	
38	-	87+400	BOX	1x2x2	
39	-	87+820	BOX	1x3x3	
40	-	88+140	BOX	1x3x3	
41	-	88+360	BOX	1x2x2	
42	-	88+630	BOX	1x2x2	
43	-	88+870	BOX	1x2x2	
44	-	89+060	BOX	1x2x2	
45	-	89+390	BOX	1x2x2	
46	-	89+505	BOX	1x2x2	
47	-	89+810	BOX	1x2x2	
48	-	89+975	BOX	1x2x2	
49	-	90+130	BOX	1x2x2	
50	-	90+260	BOX	1x2x2	
51	-	90+540	BOX	1x2x2	
52	-	90+650	BOX	1x2x2	
53	-	91+280	BOX	1x2x2	
54	-	91+430	BOX	1x2x2	
55	-	91+540	BOX	1x2x2	
56	-	91+700	BOX	1x2x2	
57	-	91+800	BOX	1x2x2	
58	-	94+375	BOX	1x2x2	



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At Junction and Crossroads

In addition to the above 11 No. of 1x2x2m Box culverts of 7.5 m length are proposed for crossroads.

Sl. No.	Design Chainage (Km)	Proposed Type	Proposed Span	Remarks
1	77+900	BOX	1x2x2	Cross Road
2	78+020	BOX	1x2x2	Cross Road
3	80+180	BOX	1x2x2	Cross Road
4	80+290	BOX	1x2x2	Cross Road
5	80+440	BOX	1x2x2	Cross Road
6	85+300	BOX	1x2x2	Cross Road
7	85+650	BOX	1x2x2	Cross Road
8	86+050	BOX	1x2x2	Cross Road
9	87+650	BOX	1x2x2	Cross Road
10	87+710	BOX	1x2x2	Cross Road
11	91+900	BOX	1x2x2	Cross Road

Note:

- Above vent height (Clear opening height) are minimum and vertical height to be ascertained as per site condition.
- Overall width of all culverts shall be minimum to the roadway width. Wherever Service/Slip/Connecting roads are proposed, the width of the culvert shall be planned beyond the Service/Slip/Connecting roads so as to ensure proper drainage of storm water outside ROW.
- The number of Culverts shown above is minimum, any additional culvert required as per site condition shall be provided as per manual and the culverts for the crossroads at junctions shall be provided as per the site condition in accordance with the manual. Any increase in number/length/span/height of culverts shall not be considered as COS.



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- Floor protection work shall be as specified in the relevant IRC Code and Specification.

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

Sl. No.	Location at km	Type of repair required

(iii) Bridges

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

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

S. No.	Bridge location (km)	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:

S. No.	Location (Km)	Existing Width (m)	Extent of widening (m)	Cross-section at deck level for widening @

(b) Additional new bridges

New bridges at the following locations on the Project Highway shall be proposed for new construction in Realignment, bypass & Green field Section. Refer to paragraph 7.3 (ii) of the IRC SP 84-2019 and specified width of carriageway of all new Four lane bridges shall have footpaths left side of the traffic movement. The cross-sectional features shall be as per Fig.7.6 of the IRC SP 84-2019.

Sl. No.	Location (km)	Total length (m)	Remarks
1	80+551	90	Major bridge
1	81+979	60	Minor bridge
2	82+720	10	Minor bridge
3	83+095	10	Minor bridge



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4	90+845	5	Minor bridge
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Note:

Proposed span arrangement is minimum and the same shall be finalized as per site condition in accordance with the Manual in consent with the concerned authority. 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/ROB.

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

S. No.	Location at km	Remarks
NIL		

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

S. No.	Location at km	Remarks
NIL		

- (e) Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in paragraph 7.21 of the IRC SP 84-2019

- (f) Structures in marine environment

S. No.	Location at km	Remarks
Nil		

(iv) Rail-road bridges

- (a) Design, construction and detailing of ROB/RUB shall be as specified in section 7 of the IRC SP 84-2019.

(b) Road over-bridges

Road over-bridges (road over rail) shall be provided at the following level crossings, as per GAD drawings attached, also as per Fig. 7.9 of IRC SP 84-2019:

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

Note:



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- The proposed span arrangement of ROB's are minimum. It may subject to change as per availability of railway boundaries/ requirement of the railways. Any increase in the cost due to change in the span arrangement and total length shall not be treated as change of scope of work.
- ROB's shall be designed, constructed and maintained as per the requirements of Railway authorities. The construction plans shall be prepared in consultation with the concerned railway authority.
- The ROB's shall be constructed and maintained by the Contractor/ Contractor under supervision of the Railways.
- All expenditure related to construction, maintenance and supervision of ROB's (except plan and estimate (P&E) charges) shall be borne by the Contractor/ Contractor.
- During construction, at the location of the existing level crossing, diversion road with level crossing if any shall be suitably provided by the Contractor/ Contractor.

(c) Road under-bridges

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

S. No.	Location of Level Crossing (chainage km)	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 (ix) and 3 of this Annex-I.

(vi) Repairs and strengthening of bridges and structures.

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

(a) Bridges

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

(b) ROB/ RUB

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



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NIL

(c) Overpasses/Underpasses and other structures

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

(vii) List of Major Bridges and structures

The following is the list of the major Bridges and structures:

Sl. No.	Location
1	80+551

8. Traffic Control Devices and Road Safety Works

- (i) Traffic control devices and road safety works shall be provided in accordance with Section 9 of the IRC SP 84-2019.

(a) Traffic Signs:

Traffic signs shall be provided all along the entire Project Highway as per schedule D. All advance direction/destination, reassurance, place identification signs along main road shall be overhead mounted on gantry. Exact location and number of overhead gantry signs to be decided by Contractor in consultation with AE and NHIDCL as per schedule D. The letter size and siting of all signs along main road shall be designed for the minimum design speed. Minimum number of full overhead gantry sign and cantilever overhead gantry sign shall be provided in accordance of 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 except at structures where concrete crash barrier shall be provided. Minimum length of W-beam crash barrier and RCC crash barrier with/ without friction slab shall be provided as per schedule D.

(d) Row Boundary Wall:

RCC Boundary Wall shall be constructed as per IRC: SP: 84-2019 all along the project

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highway on both sides at Row edge.

(ii) Specifications of the reflective sheeting.

All road signs shall be of Prismatic Grade Sheeting corresponding to Class 'C' Sheeting described in IRC: 67 and as described in IRC: SP:84-2019.

9. Roadside Furniture

(i) Roadside furniture shall be provided in accordance with the provisions of Section 9 of the IRC SP 84-2019.

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

- a) Pedestrian crossing: As per manual.
- b) Delineators: As per manual.
- c) LED traffic blinkers: To be provided at all junctions, pedestrian crossings, exits and at other locations as per manual.
- d) Noise barriers: shall be provided in accordance with manual; Locations shall be decided as per site condition in consent with Authority.

(ii) Overhead traffic signs: Full width overhear signs and Cantilever signs shall be provided as per IRC SP: 84-2019

10. Compulsory Afforestation

NIL

11. Hazardous Locations

Roadside safety barriers shall be provided at all locations of hazards such as high embankment, roadside obstacles, sharp curves, Flyover and bridge approaches, overpasses, ROB and any other locations identified in consultation with Authority Engineer during the execution of the project highway.

12. Special Requirement for Hill Roads

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

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

Any increase in length over the above will not be considered as change of scope.



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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.

Disposal of Debris: - As per Manual.

A. RETAINING WALL/REINFORCES SOIL WALL (RS WALL) /BREAST WALL

Protection wall in the form of Breast/Retaining wall/Reinforced soil wall has also been identified and recommended in below section to mitigate landslide during rainy season, the locations of Breast wall / retaining wall/ Reinforced soil wall ((ref. typ. cross-section and standard drawings.) are given below:

A-1 BREAST WALL

Sl No	LHS				RHS			
	Chainage (m)		Length (m)	Height (m)	Chainage (m)		Length (m)	Height (m)
	From	To			From	To		
1	77+500	77+880	380	8	77+610	77+730	120	4
2	78+520	78+630	110	6	78+180	78+220	40	4
3	78+870	78+935	65	4	78+250	78+350	100	4
4	79+100	79+380	280	6	78+500	78+630	130	6
5	79+825	79+945	120	4	78+720	78+790	70	4
6	80+070	80+210	140	6	78+820	79+350	530	6
7	80+310	80+440	130	6	79+410	80+240	830	6
8	80+685	80+720	35	4	80+300	80+500	200	6
9	80+900	81+025	125	4	80+630	80+770	140	6
10	81+590	81+620	30	4	80+820	81+410	590	6
11	81+740	81+780	40	4	81+450	81+660	210	6
12	82+020	82+080	60	4	81+720	81+930	210	4
13	82+130	82+240	110	4	82+020	82+500	480	6
14	82+390	82+450	60	4	82+570	82+690	120	8
15	82+600	82+670	70	4	82+730	83+060	330	8
16	82+790	82+960	170	6	83+120	83+300	180	8
17	83+150	83+280	130	4	83+350	83+620	270	4
18	83+710	83+790	80	4	83+690	83+960	270	4
19	84+170	84+230	60	4	84+120	84+340	220	4



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Sl No	LHS				RHS			
	Chainage (m)		Length (m)	Height (m)	Chainage (m)		Length (m)	Height (m)
	From	To			From	To		
20	84+570	84+640	70	4	84+400	84+450	50	4
21	84+780	84+850	70	4	84+530	84+650	120	4
22	85+600	85+780	180	8	84+780	85+380	600	4
23	86+020	86+210	190	8	85+440	85+800	360	4
24	86+610	86+720	110	6	86+640	86+720	80	4
25	86+830	87+160	330	6	86+880	86+970	90	4
26	87+230	87+350	120	8	87+270	87+330	60	4
27	87+440	87+705	265	8	87+500	87+615	115	4
28	87+940	88+060	120	4	87+695	87+720	25	4
29	88+210	88+260	50	4	88+000	88+040	40	4
30	88+300	88+330	30	4	88+300	88+330	30	4
31	88+380	88+400	20	4	88+480	88+610	130	4
32	88+440	88+540	100	4	88+690	88+750	60	4
33	88+650	89+110	460	4	88+790	88+850	60	4
34	89+140	89+370	230	6	88+900	89+050	150	4
35	89+430	89+490	60	4	89+150	89+250	100	4
36	89+520	89+770	250	6	89+525	89+560	35	4
37	89+850	89+950	100	4	89+590	89+780	190	6
38	90+020	90+090	70	4	90+035	90+085	50	4
39	90+170	90+200	30	4	90+340	90+510	170	4
40	90+300	90+630	330	6	90+580	90+620	40	4
41	90+690	90+750	60	4	91+090	91+240	150	4
42	91+050	91+260	210	6	91+290	91+360	70	4
43	91+300	91+380	80	6	91+970	92+075	105	4
44	91+440	91+610	170	6	92+150	92+280	130	4
45	92+010	92+370	360	6	92+480	92+545	65	4
46	93+430	93+470	40	4	92+710	92+840	130	4



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Sl No	LHS				RHS			
	Chainage (m)		Length (m)	Height (m)	Chainage (m)		Length (m)	Height (m)
	From	To			From	To		
47	93+720	93+770	50	4	93+630	93+980	350	4
48	93+810	93+840	30	4	94+310	94+355	45	4
49	94+590	94+640	50	4	94+445	94+540	95	4
50	94+810	94+850	40	4	95+310	95+470	160	4
51	94+935	95+005	70	4				
52	95+470	95+500	30	4				
Total Length=			6570				8895	

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

- 1) Breast walls have been proposed under 2 scenarios - a) At built-up areas to restrict the width of cutting and thus the requirement of ROW b) At high cutting locations. The height of breast walls is considered as per site requirement. In general, PCC/RRM (in Cement Mortar 1:4) breast wall shall be provided for the height of 5m max, whereas Gabion/RCC breast wall shall be provided for more than 5m.
- 2) The protection on hill side in free fall embankment using erosion control blankets component of vegetation over erosion control/ coir blanket with "U" shaped hook and steel wire mesh shall be executed above Breast wall / as per site condition in consultation with Authority/AE.
- 3) Cut Slope using Erosion Control Blankets Compartment System is proposed for area of **105270.83sqmt** in **16800m** length.
- 4) 10% of total cutting slope length using erosion control blankets compartment system shall also be executed with soil nailing provision due to Weak Mountain / landslides zone as per site condition in consultation with Authority/IE.

A-2 Retaining wall

Retaining walls are permanent structures usually built at the toe of the slope or at shoulder edge to resist lateral pressure due to existing soil, earth filling, back fill, water pressure etc. Retaining walls have been proposed, a) where the existing ground is steep, and embankment is not feasible b) to restrict the formation width at ROW constraint location, the location is as below,



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Sl No	LHS				RHS			
	Chainage (m)		Length (m)	Height (m)	Chainage (m)		Length (m)	Height (m)
	From	To			From	To		
1	78+330	78+380	50	8	77+960	78+050	90	6
2	78+660	78+700	40	4	78+650	78+690	40	6
3	80+230	80+270	40	6	81+950	81+990	40	6
4	81+870	81+950	80	6	84+040	84+100	60	7
5	82+480	82+530	50	5	89+380	89+410	30	7
6	83+070	83+110	40	6	89+960	90+020	60	6
7	83+570	83+690	120	6	90+640	90+670	30	8
8	83+900	83+930	30	6	91+410	91+440	30	8
9	84+340	84+380	40	6	93+210	93+260	50	7
10	84+660	84+760	100	4	93+380	93+530	150	6
11	85+460	85+500	40	6	94+240	94+270	30	7
12	86+250	86+300	50	4				
13	87+180	87+220	40	4				
14	87+370	87+420	50	7				
15	89+960	90+000	40	6				
16	90+110	90+140	30	6				
17	92+400	92+450	50	6				
18	93+250	93+360	110	7				
19	94+140	94+190	50	8				
20	94+680	94+740	60	7				
21	94+890	94+920	30	6				
Total Length=			1140				610	

Note: 1. The proposed locations are minimum and any change in length shall not be treated as change in scope of work.

2. The height of Retaining walls is considered as per site requirement. In general, PCC/RRM (in Cement Mortar 1:4) Retaining wall shall be provided for the height of 5m max, whereas RCC Retaining wall shall be provided for more than 5m.



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

A-3 Reinforced Soil Slope (RS Slope)/ Reinforcement Soil wall (RS Wall)

Geologically the project area comprises of rocks from the oldest Precambrian gneissic complex to the recent alluvium formations. Hence in valley region where more filling is required, a Reinforced Soil slope (RS Slope protection) and Reinforced soil Wall (RS wall) as per drawings enclosed, is to be provided as below.

Reinforced Soil Slope								
Sl No	LHS				RHS			
	Chainage (m)		Length (m)	Height (m)	Chainage (m)		Length (m)	Height (m)
	From	To			From	To		
1	77+970	78+260	290	25	77+760	77+790	30	13
2	78+380	78+480	100	20	77+820	77+860	40	16
3	80+500	80+640	140	16	78+380	78+430	50	13
4	80+740	80+840	100	17	80+540	80+600	60	13
5	81+950	82+000	50	17	85+900	85+970	70	14
6	83+310	83+340	30	13	86+130	86+300	170	18
7	84+030	84+110	80	14	87+120	87+240	120	35
8	84+450	84+530	80	13	87+360	87+470	110	20
9	85+390	85+460	70	14	87+750	87+920	170	16
10	85+800	85+970	170	20	88+090	88+200	110	14
11	87+730	87+850	120	14	88+350	88+440	90	13
12	88+100	88+190	90	13	89+800	89+840	40	13
13	90+770	90+900	130	22	90+100	90+300	200	16
14	91+630	91+750	120	13	90+770	91+060	290	20
15	92+580	92+740	160	20	91+630	91+890	260	29
16	92+870	92+910	40	25	92+890	93+170	280	18
17	93+010	93+250	240	20				
18	94+190	94+290	100	14				
Total Length=			2110				2090	

Reinforced Soil Wall								
Sl No	LHS				RHS			
	Chainage (m)		Length (m)	Height (m)	Chainage (m)		Length (m)	Height (m)
	From	To			From	To		
1	79+400	79+440	40	9	78+430	78+480	50	10
2	81+670	81+710	40	9	86+300	86+450	150	9
3	82+530	82+560	30	13	86+790	86+830	40	9
4	82+720	82+750	30	9				



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

5	87+850	87+890	40	9				
6	90+900	91+030	130	10				
7	91+750	91+780	30	9				
8	94+070	94+140	70	11				
Total Length=			410				240	

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

The protection on valley side in free fall embankment using erosion control blankets component of vegetation over erosion control/ coir blanket of 6 mm thick laid over topsoil and anchored with "U" shaped G.I. hook 300x100 mm 1 no./sqm. layer of organic manure and soil conditioner over topsoil layer /good earth layer of 100 to 150 mm thick shall also be executed as per site condition in consult with Authority/AE. The fill slope using Erosion Control blanket system has not been required for this package

13. Change of scope

The number, length and height/width of Structures and bridges specified hereinabove shall be treated as an approximate assessment. The actual numbers, lengths and sizes 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.

14. RAINWATER HARVESTING

- (i) As per Ministry of Environment and Forests Notification, New Delhi dated 14.01.1997 (as amended on 13.01.1998, 05.01.1999 & 6.11.2000), the construction of Rainwater, harvesting structure is mandatory in and around Water Crisis area, notified by the Central Ground Water Board.
- (ii) Rainwater harvesting structures shall be provided at every 1000m on either side.
- (iii) Rainwater harvesting structure shall be provided as per IRC: SP:42-2014 (Guideline for road drainage) and IRC: SP:50-2013 (Guidelines on Urban Drainage)

15. Utility Shifting

Shifting of obstructing existing utilities indicated in Schedule A to an appropriate location in accordance with the standards and specifications of concerned Utility

 सत्यमेव जयते M.O.R.T.H. Govt. Of India	Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.	 NHIDCL BUILDING INFRASTRUCTURE - BUILDING THE NATION
	Technical Schedule	

Owning Department is part of the scope of work of the Contractor. The bidders may visit the site and assess the quantum of shifting of utilities for the projects before submission of their bid. The specifications of concerned Utility Owning Department shall be applicable and followed.

Note-I:

(a) The type/ spacing/ size/ specifications of poles/ towers/ lines/ cables to be used in shifting work shall be as per the guidelines of utility owning department and it is to be agreed solely between the Contractor and the utility owning department. No change of scope shall be admissible and no cost shall be paid for using different type/ spacing/ size/ specifications in shifted work in comparison to those in the existing work or for making any overhead crossings to underground as per requirement of utility owning department and/or construction of project highway. The Contractor shall carry out joint inspection with utility owning department and get the estimates from the utility owning department. The assistance of the Authority is limited to giving forwarding letter on the proposal of Contractor to utility owning department whenever asked by the Contractor. The decision/ approval of utility owning department shall be binding on the Contractor.

(b) The supervision charges at the rates/ charges applicable of the utility owning department shall be paid directly by the Authority to the Utility Owning department as and when Contractor furnishes demand of Utility Owning Department along with a copy of estimated cost given by the later.

(c) The dismantled material/scrap of existing Utility to be shifted/ dismantled shall belong to the Contractor who would be free to dispose-off the dismantled material as deemed fit by them unless the Contractor is required to deposit the dismantled material to utility owning department as per the norm and practice and in that case the amount of credit for dismantled material may be availed by the Contractor as per estimate agreed between them.

(d) The utilities shall be handed over after shifting work is completed to Utility Owning Department to their entire satisfaction. The maintenance liability shall rest with the Utility Owning Department after handing over process is complete as far as utility shifting works are concerned.

Note II: - Copy of Utility shifting plan enclosed.

15.1 Details of proposed Utilities Schedules

Utilities Relocation Plan and its Schedule initially prepared by DPR consultant followed by joined verification with P&E&PHE department in presence of NHIDCL officers dully certified, details as shown below.

	Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.	
	Technical Schedule	

15.2 Electrical Utilities

The Site includes the following Electrical Utilities:

(a) Extra High-Tension Lines (EHT Lines)

Extra High-Tension Lines (EHT LINES 132 & 400KV)												
S. No	Chainage		Circuit (TC/DC/ SC)	Type	Crossing (Nos.)		Poles		Conductor (Line Length)		Size of Cable	Remarks
	From	To			Over-Head	Under-Ground	Tower/ Truss/ Uni-pole	No.	KM	Size		
1	78+250	78+350	SC	HT132KV	1		Tower	1	0.1	N/A	N/A	Owned by P&E
4	91+300	92+100	SC	HT132KV	2		Tower	1	0.9	N/A	N/A	Owned by P&E

Note: TC-Triple Circuit, DC-Double Circuit, SC-Single Circuit, U/G-Underground

(b) High Tension/Low Tension Lines (HT/LT Lines)

Low Tension Lines (LT11 KV & LT 440V LINES)												
Sl No.	Types OF Line	Chainage		Circuit (TC/DC/ SC)	Poles		Conductor (Length of Line)		Cable		Crossings (Nos.)	
		From	To		Type	Nos.	*K m	Size	*K m	Size	Over - Head	Under-Ground
1	LT 33 KV	77+700	78+500		Tower	3	0.35	N/A	0.35	N/A	1	
2	HT 33 KV	85+400	86+030	DC	Jose pole/ Rail pole	1	0.2	N/A	0.2	N/A	1	
3	LT11 KV	85+400	86+030			26	0.47	N/A	0.47	N/A	1	
4		87+600	87+800				0.06	N/A	0.06	N/A	1	
5		92+000	93+000				0.85		0.85		2	
6		93+000	94+000				0.65		0.65		1	
7		94+300	95+000				0.35		0.35			
8	LT 440V	77+700	78+500			40	0.48	N/A	0.48	N/A	1	
9		87+600	87+800				0.1	N/A	0.1	N/A		
10		92+000	93+000				0.27	N/A	0.27	N/A	1	
11		93+000	94+000				0.08	N/A	0.08	N/A		
12		94+300	95+000				0.5	N/A	0.5	N/A	1	
13		95+000	95+100				0.1	N/A	0.1	N/A	1	

* 2nos of 11/0.4KV & 250KVA DT Sub-station

Note: TC-Triple Circuit, DC-Double Circuit, SC-Single Circuit, U/G-Underground

15.3 Public Health Utilities (Water/Sewage Pipelines)

(a) The Site includes the following Public Health Utilities: -

Sl.	Chainage	Type of	Pipe	Sluice	Crossings	Remarks
-----	----------	---------	------	--------	-----------	---------



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

No			Lines, Pressure/ under Gravity				Valves			
	From	To		Type	No.	Size	Nos.	Nos.	Length	
1	78+000	78+200		Galvanized Iron	1	40mm				
2	87+600	87+730		Galvanized Iron	1	65mm		1	90meter	
3				Galvanized Iron	1	50mm				
4	89+660	89+700		Galvanized Iron	1	20mm		1	85meter	Private connection from PHED
5	91+870	91+950		Galvanized Iron	1	125mm				
6	92+050	92+180		Galvanized Iron	1	100mm		1	100meter	
7	92+200	92+500		Galvanized Iron	2	50mm & 100mm		2		
8	92+500	92+700		Galvanized Iron	1	100mm				Upto Tuichhuahen pumping house
9	92+700	93+600		Galvanized Iron	1	125mm		1	23Meter	From Tuichhuahen pumping house to Kawnpui
10	93+600	95+500		Galvanized Iron	1	125mm				After crossing at 93+600 FROM R.H.S To L.H. S
11	94+100	95+500		Galvanized Iron	1	65mm		1	20mm	Starting from Bualpui to Sethawn Jordan center and crossing on 95+000 to L.H.S from R.H.S

(b) Bore well/Hand Pump within ROW

Sl. No.	Bore Well		Hand Pump	
	Chainage	Nos	Chainage	Nos
1	Nil		77+800	1
2			94+420	1

(c) Water Tank

Sl. No.	Water Tank		
	Chainage	Nos	Capacity
2	87+700 (PHED)	1	1000000 (1Lac) Liters
1	91+550 (Horticulture)	1	50000 Liters

15.4 Any Other Lines-No.

16. **Utility Duct:** 30nos. (NP-4 class) of 1.0m dia. has been provided across the project highway.

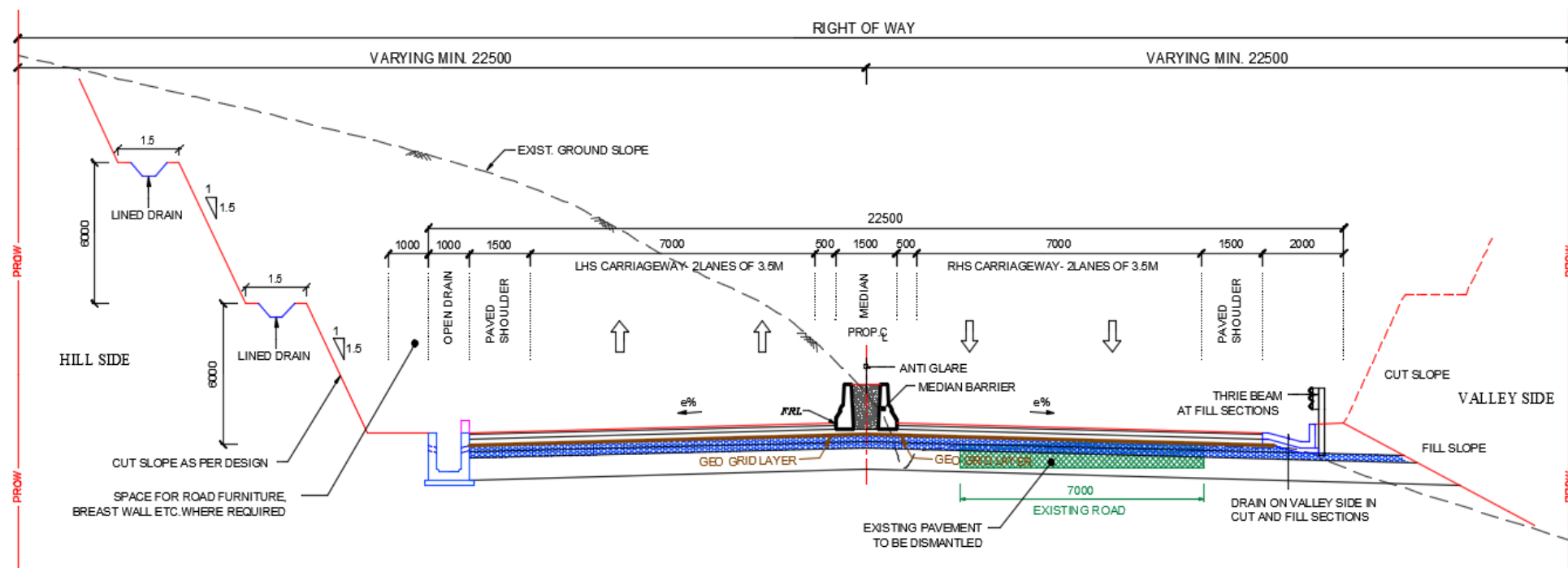


Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Typical Cross-section along the Project Highway



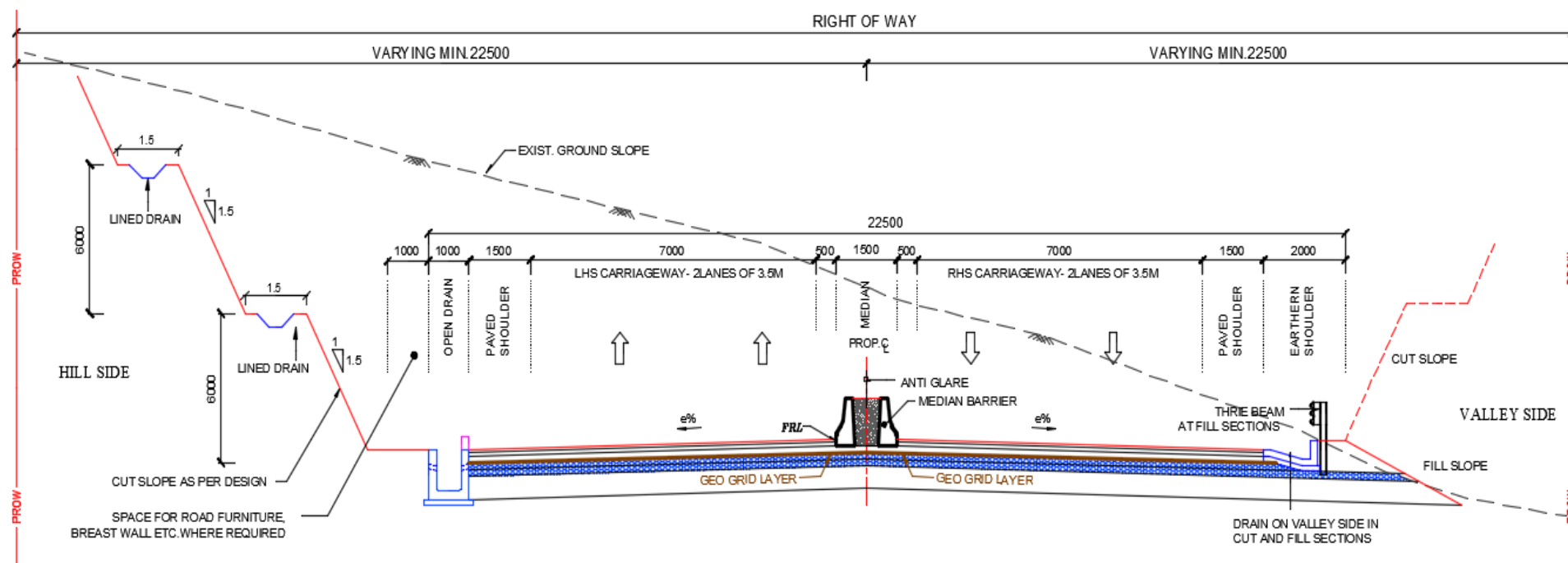
TCS-1: 4-Lane Divided Highway at same level with raised median on existing



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule



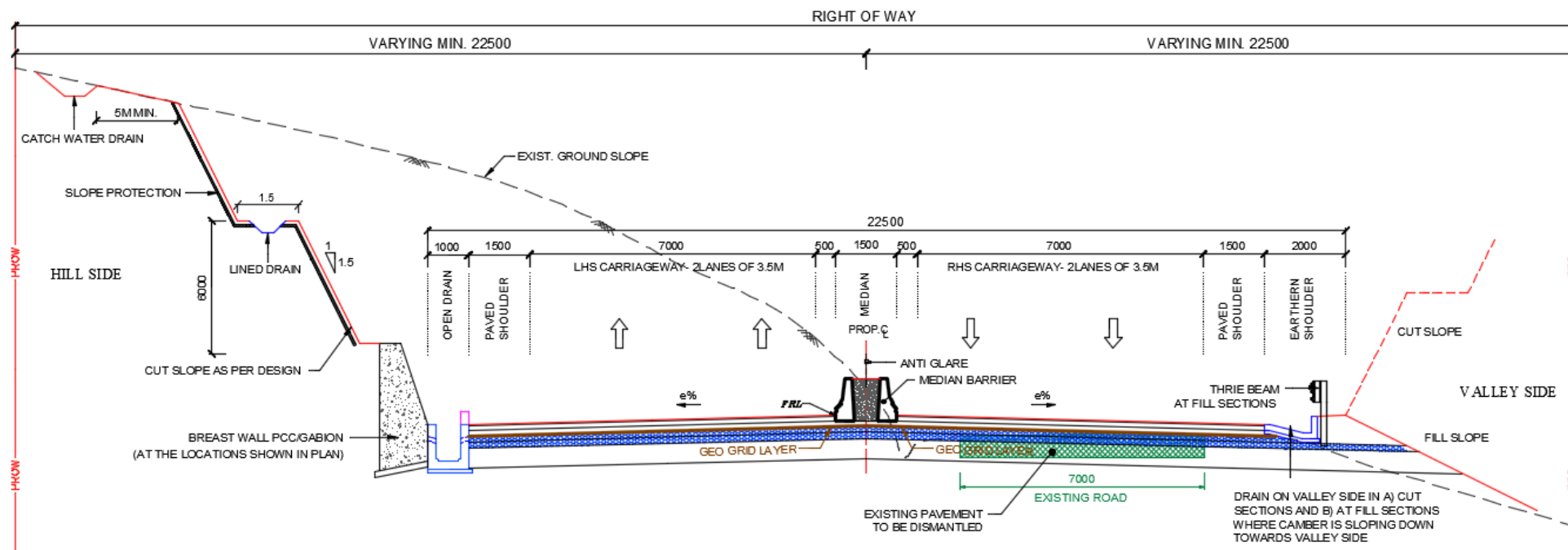
TCS-2: 4-Lane Divided Highway at same level with raised median at Bypass/ Realignment



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule



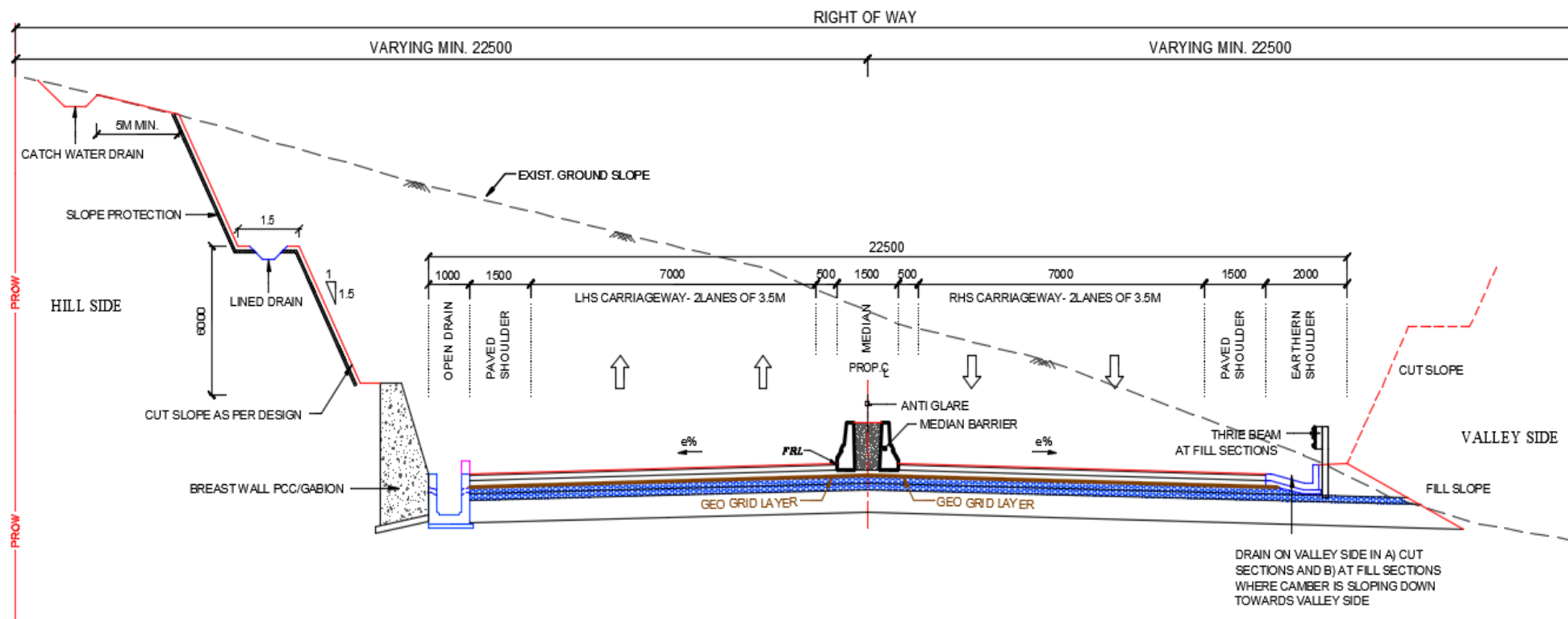
TCS-3: 4-lane divided highway with Breast Wall on Hill Side and Cut/Fill on Valley side (at existing road locations)



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule



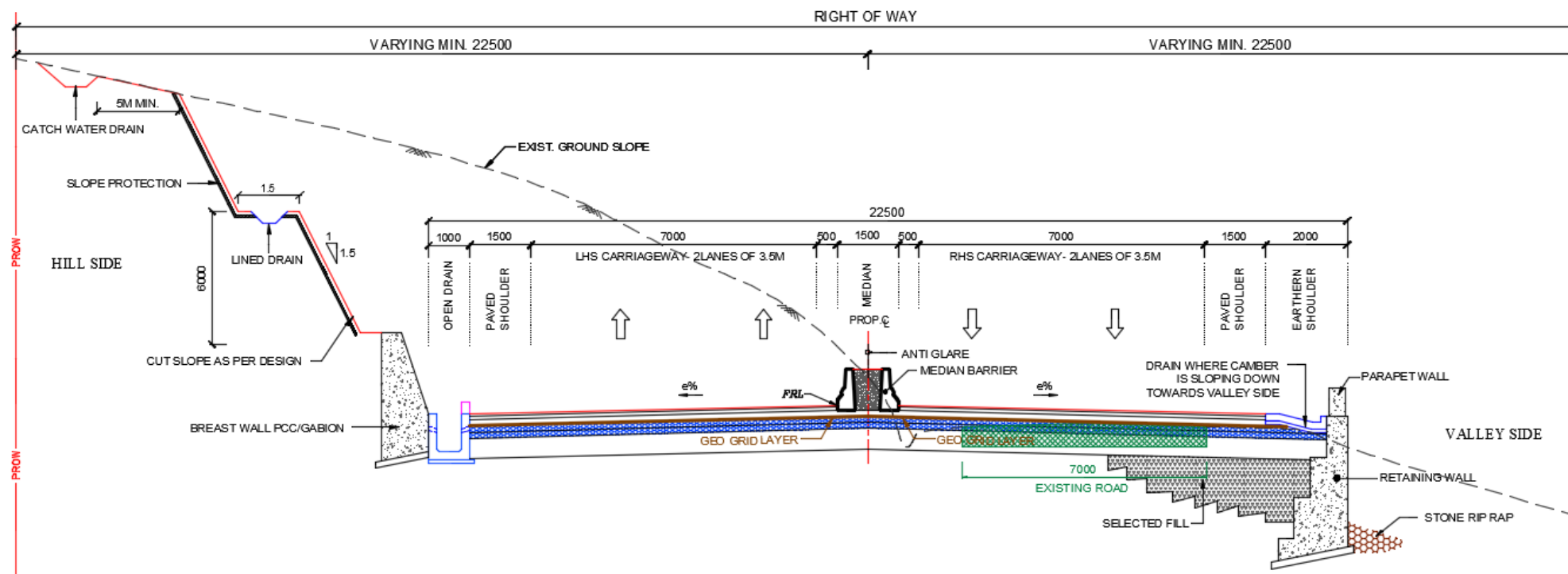
TCS-4: 4-lane divided highway with Breast Wall on Hill Side and Cut/Fill on Valley side (Bypass/Re-alignment locations)



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule



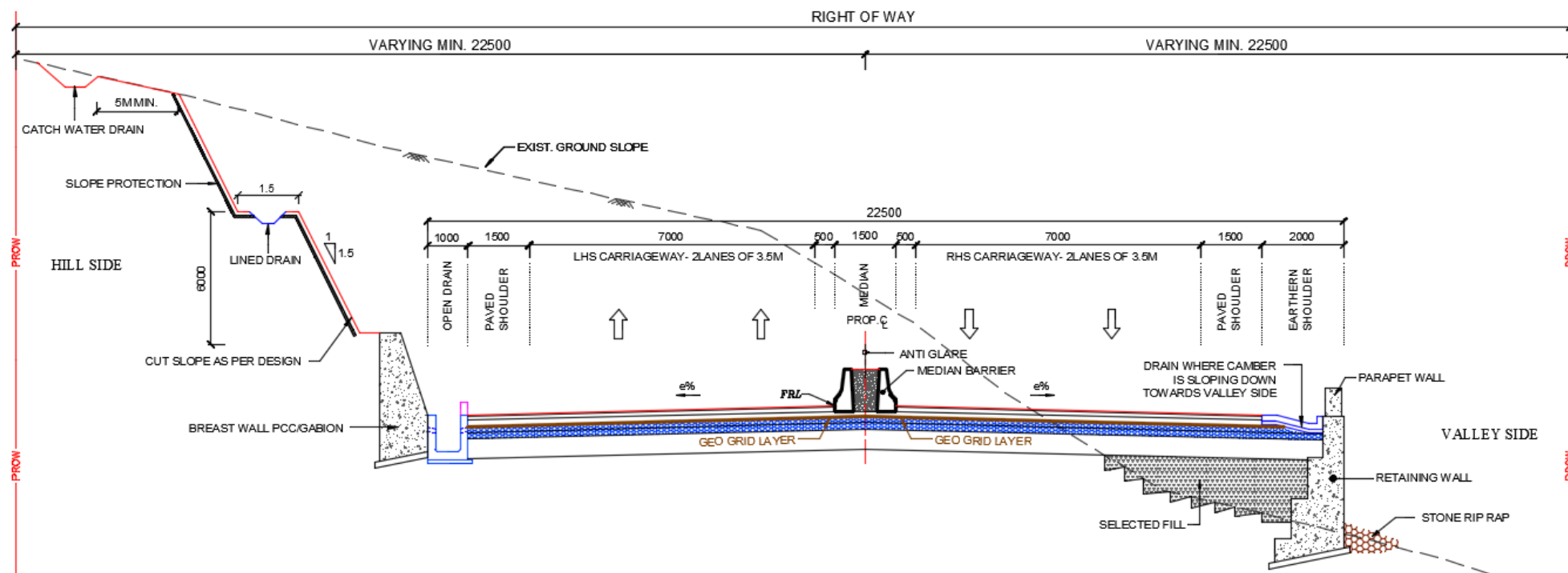
TCS-5: 4-lane divided highway with Breast Wall on Hill Side and Retaining Wall on Valley side (at existing road locations)



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule



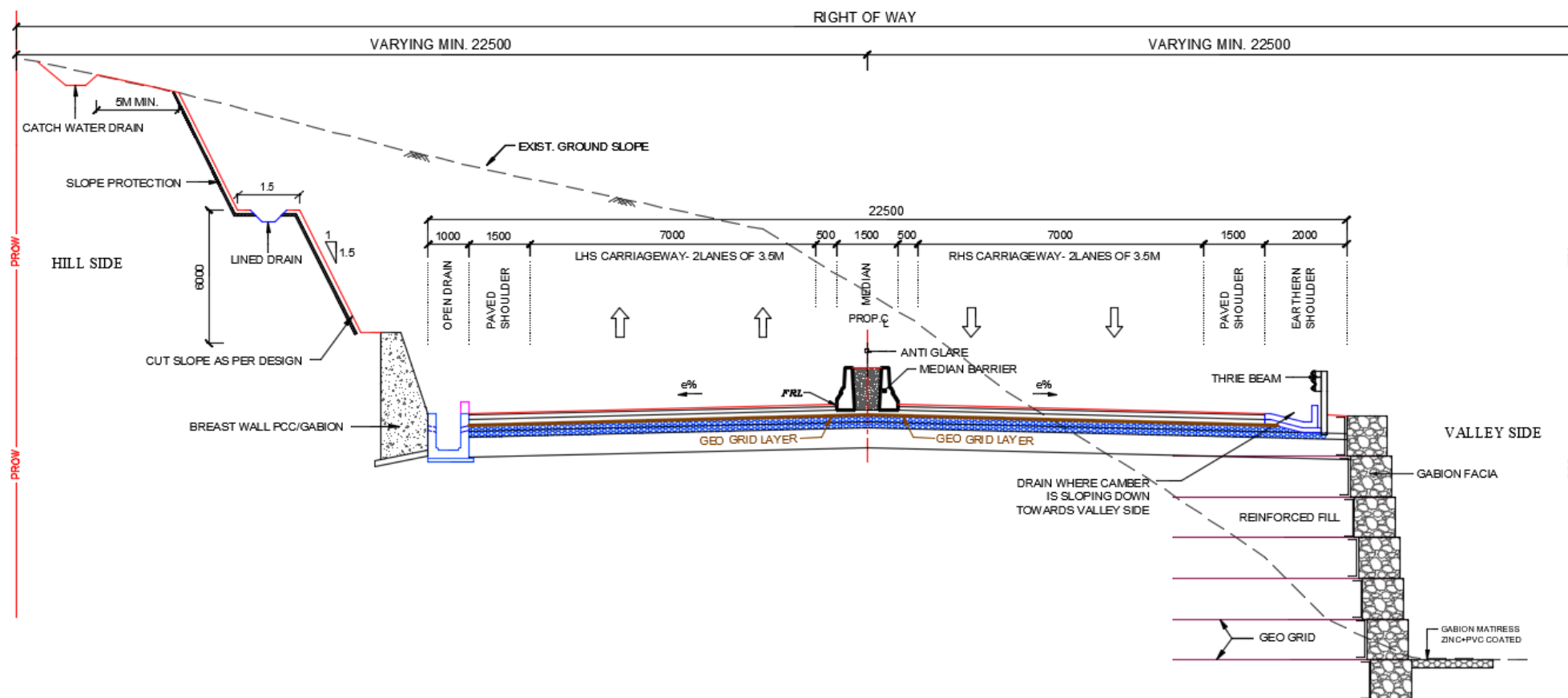
TCS-6: 4-lane divided highway with Breast Wall on Hill Side and Retaining Wall Valley side and (Bypass/Re-alignment locations)



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule



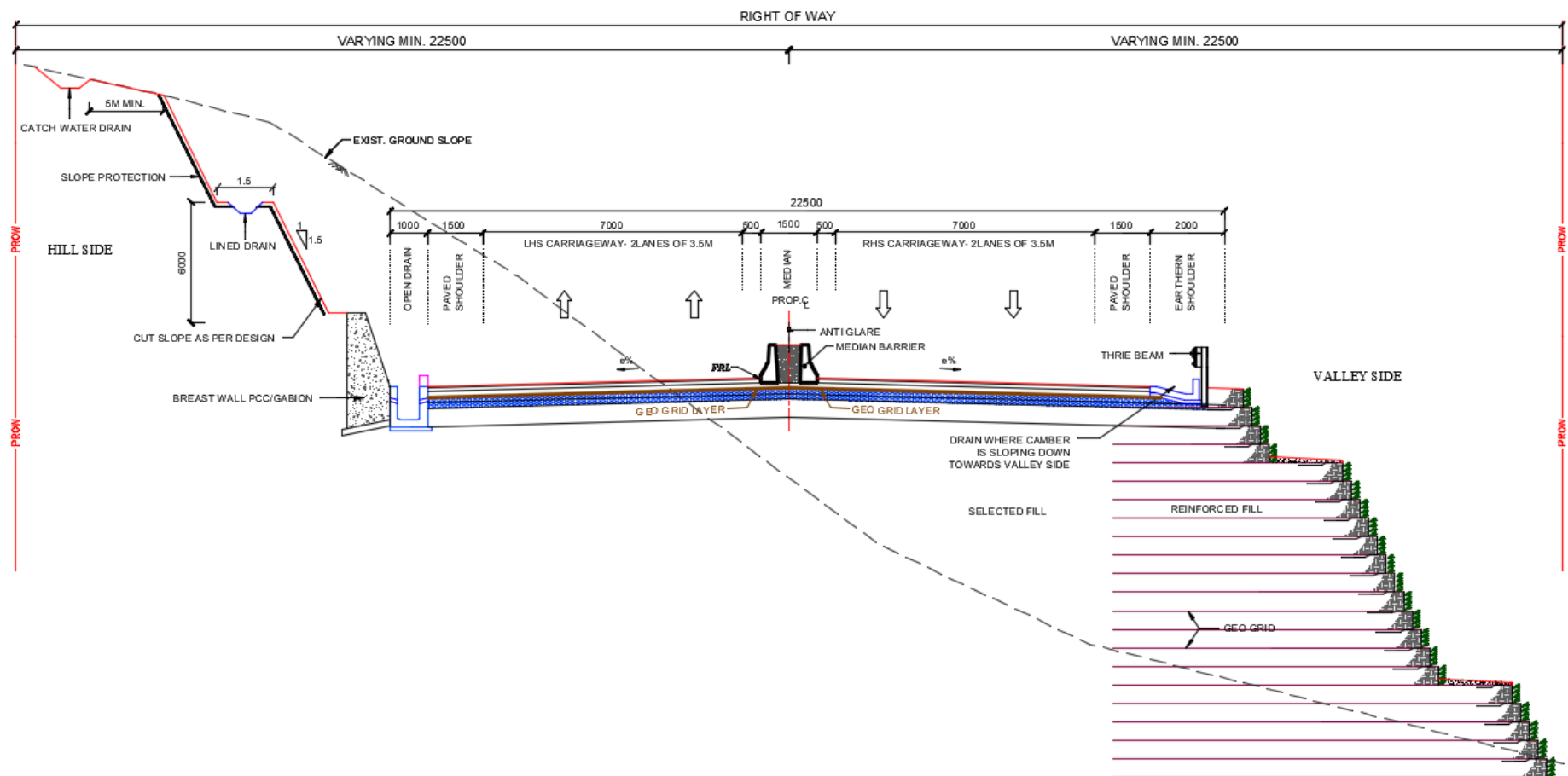
TCS-7: 4-lane divided highway with Breast Wall on Hill Side and Reinforced Soil Wall on Valley side



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule



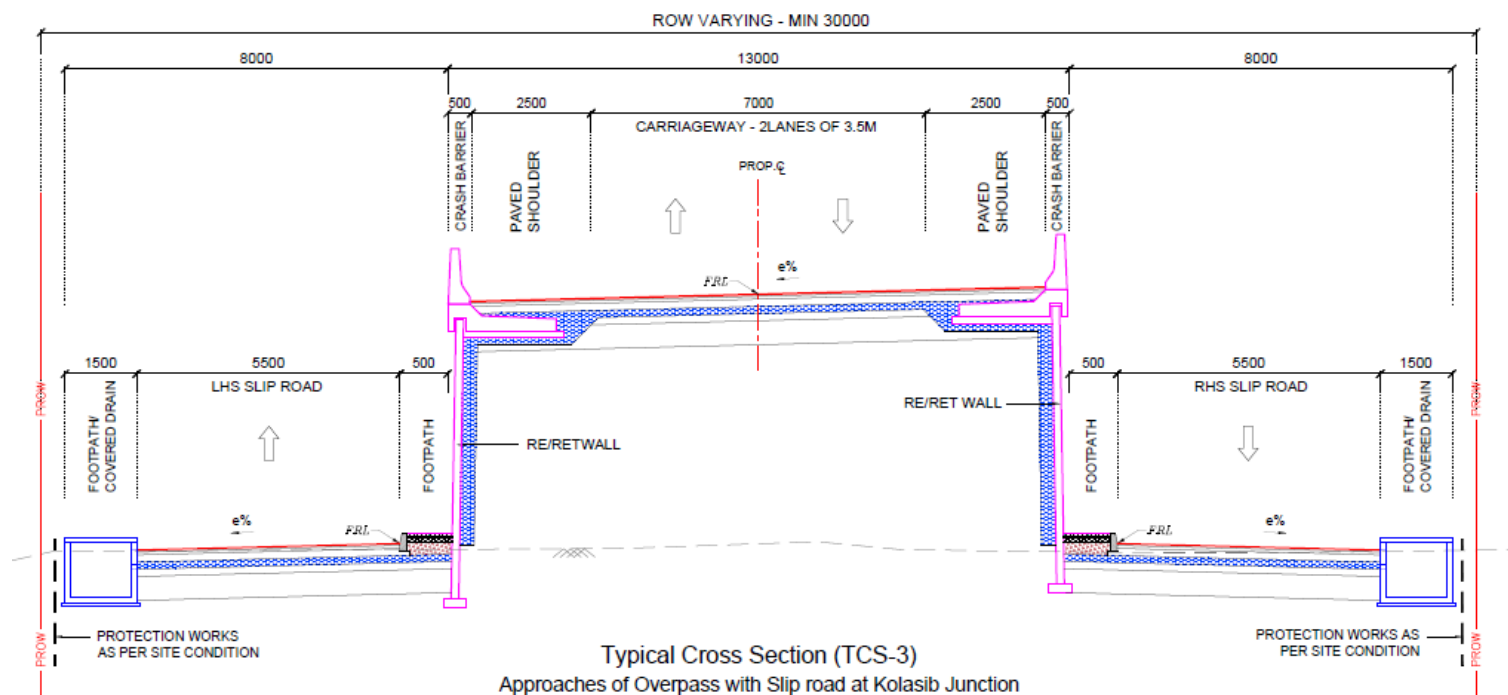
TCS-8: 4-lane divided highway with Breast Wall on Hill Side and Reinforced Soil Slope on Valley side



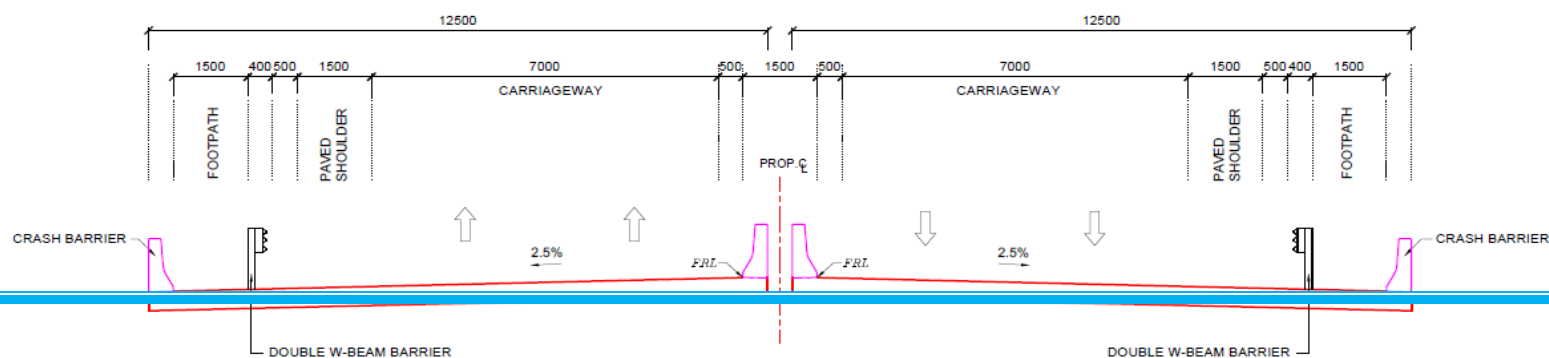
Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule



TCS-9: Approaches of Overpass with Slip Road



Schedule B

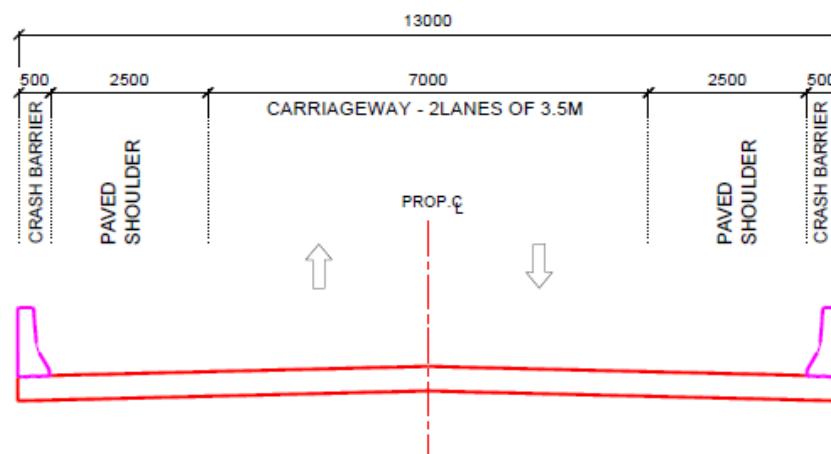


Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

TCS-10: 4-Lane Bridge at deck Level with Footpath



TCS-11: Overpass at deck level

Schedule-C

 M.O.R.T.H. Govt. Of India	Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.	 NADCL BUILDING INFRASTRUCTURE - BUILDING THE NATION
	Technical Schedule	

Schedule - C

(See Clause 2.1)

Project Facilities

1 Project Facilities

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

- (a) Traffic Control Device/Road Safety Device/Roadside furniture.
- (b) Pedestrian facilities.
- (c) Land Scaping and Tree Plantation.
- (d) Truck lay-byes.
- (e) Bus-bays and Passenger shelters.
- (f) Others.

2 Description of Project Facilities

Each of the Project Facilities is described below:

(a) Roadside furniture

Traffic Control Device/Road Safety Device/Roadside furniture as per provisions of manual shall be provided. Yellow flashing lights using solar power with full alternative power back-up shall be provided at all junctions/pedestrian crossings/hazardous locations etc

- i. **Traffic Signs** - Traffic signs include roadside signs, overhead signs and kerb mounted signs along the entire Project highway.
- ii. **Pavement Marking** - Pavement marking shall cover road marking for the entire Project highway as per the IRC SP 84-2019.
- iii. **LED Traffic Blinkers**: LED traffic blinker signal provided for entire project.
- iv. **Roadside Furniture**: Traffic Signs and pavement markings shall include roadside signs, overhead signs, curve mounted signs and road marking along the project highway. The locations for these provisions shall be finalized in consultation with Independent Engineer.
- v. **Crash barrier** - Provide W-beam crash barrier along the Project highway in accordance with Schedule D and at locations given below.



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Sl No	LHS			RHS		
	Chainage (m)		Length (m)	Chainage (m)		Length (m)
	From	To		From	To	
1	77+960	78+850	890	77+500	77+550	50
2	78+980	79+030	50	77+750	77+930	180
3	79+390	79+760	370	78+370	78+490	120
4	79+980	80+010	30	85+860	86+550	690
5	80+230	80+280	50	86+760	86+850	90
6	80+740	80+870	130	87+100	87+250	150
7	81+200	81+550	350	87+350	87+480	130
8	81+660	81+720	60	87+630	87+690	60
9	81+830	81+940	110	87+740	88+450	710
10	82+250	82+290	40	89+370	89+420	50
11	82+470	82+570	100	89+480	89+510	30
12	83+300	83+700	400	89+790	89+850	60
13	83+840	85+500	1660	89+950	90+020	70
14	85+790	85+990	200	90+100	90+310	210
15	87+730	87+920	190	90+630	90+690	60
16	88+080	88+200	120	90+760	91+070	310
17	90+760	91+040	280	91+370	91+900	530
18				92+870	93+540	670
Total Length=			5030			4170

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.

- vi. **Traffic Safety Devices wherever required.**
- vii. **MS Railing** - MS Railing along the Project highway at the location as suggested in Schedule D.
- viii. **Delineators** - Shall be provided as per IRC: 79-1981 and requirements & specifications as per Schedule D.
- ix. **Boundary Stones** - For Entire Project highway at 200m interval.



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

x. **KM Stones and Hectometer Stone** - For Entire Project highway.

(b) Location of Pedestrian facilities:

Pedestrian Guard rails shall be provided at junctions, Truck lay byes, bus bays and near schools and hospitals as per provisions in section 12.2 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.

(c) Landscaping & Tree Plantation

Landscaping and Tree plantation shall be done at Major Intersection.

(d) Location of Truck lay-bye:

Truck Lay bye shall be provided at the following locations in accordance with section 12.4 of the manual. Truck Lay bye shall be provided at below mentioned locations.

Sl. No	Existing Chainage (Km)	Design Chainage (Km)	Side (Left/Right)
1	-	85+650	LHS

(e) Bus-bays and Bus shelters table is given below:

As stipulated in section 12.5 of the Manual, Bus-bays and shelters shall be provided at below indicative locations.

Sl. No.	Design Chainage	Side	Name Of Village
1	77+900	LHS	Kolasib
2	77+965	RHS	Kolasib
3	80+300	RHS	Kolasib Bypass
4	80+370	LHS	Kolasib Bypass
5	87+560	RHS	N. Thingdawl Bypass
6	87+770	LHS	N. Thingdawl Bypass
7	91+850	LHS	N. Thingdawl
8	92+000	RHS	N. Thingdawl

Note: Above shown number of locations are minimum, however, the location of bus bays and passenger shelters shall be finalized as per suitability of location and site requirement in consultation with Client. Any change in location shall not treated as change of scope.



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

(f) Foot Over Bridges:

Foot Over Bridges shall be provided at the following locations:

Sl. No.	Existing Chainage	Design Chainage	Type of Road (SH/ MDR/ ODR/ VR)
1	-	80+230	VR
2	97+120	85+840	NH-6
3	97+300	86+010	NH-6
4	-	87+710	VR
5	103+900	91+920	NH-6

(g) Others to be specified.

i) Highway Lighting:

Highway LED Lighting: LED Lighting shall be provided at the following locations:

- 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.
- 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 3.3.4 & 12.3 of IRC SP 84.
- High Mast Lighting with LED light shall be provided at all Major Junctions, Toll Plaza locations or any other location as per clause 12.3.3 of IRC SP 84.

- Rainwater Harvesting** – As per Ministry of Environment and Forests Notification, New Delhi dated 14.01.1997 (as amended on 13.01.1998, 05.01.1999 & 6.11.2000), the construction of Rainwater, harvesting structure is mandatory in and around Water Crisis area, notified by the Central Ground Water Board. Minimum 1 number per 5 km has to be provided throughout the project length.

Schedule-D



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Schedule - D

(See Clause 2.1)

Specifications and standards

1 Construction

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

2 Design Standards

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

Manual of Specifications and Standards for Four-Laning of Highways (IRC: SP: 84 - 2019), referred to herein as the Manual

 संयोजित जयते M.O.R.T.H. Govt. Of India	Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.	 NADCL BUILDING INFRASTRUCTURE - BUILDING THE NATION
	Technical Schedule	

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 Four-Laning of Highways with Paved Shoulder (Second Revision) (IRC : SP:84-2019), referred to as the manual, and MORTH Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2. Deviations from the Specifications and Standards

- (i) The terms "Contractor", "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.

Schedule-E

Schedule – E

(See Clause 2.1 and 14.2)

MAINTENANCE REQUIREMENTS

1 Maintenance Requirements

- (i) The Contractor shall, at all-time maintain the Project Highway in accordance with the provisions of this Agreement, Applicable Laws and Applicable Permits.
- (ii) The Contractor shall repair or rectify any Defect or deficiency set forth in Paragraph 2 of this Schedule-E within the time limit specified therein and any failure in this behalf shall constitute non-fulfillment of the Maintenance obligations by the Contractor. Upon occurrence of any breach hereunder, the Authority shall be entitled to effect reduction in monthly lump sum payment as set forth in Clause 14.6 of this Agreement, without prejudice to the rights of the Authority under this Agreement, including Termination thereof.
- (iii) All Materials, works and construction operations shall conform to the “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)

Annex –I 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 of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm 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.tfhr.com/pavement/lt/tp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2
	Cracking	Nil	< 5 % subject to limit of 0.5 sqm for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15 -30 days	MORT&H Specification 3004.2
	Corrugations and Shoving	Nil	< 0.1 % of area	Daily	Length Measurement Unit like Scale, Tape, odometer etc.		2-7 days	IRC:82-2015
	Bleeding	Nil	< 1 % of area	Daily			3-7 days	MORT&H Specification 3004.4
	Ravelling/ Stripping	Nil	< 1 % of area	Daily			7-15 days	IRC:82-2015 read with IRC SP 81
	Edge Deformation/ Breaking	Nil	< 1 m for any 100 m section and width < 0.1 m at any location, restricted to 30 cm from the edge	Daily			7- 15 days	IRC:82-2015
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)	Class I Profilometer : ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	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

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					
	Deflection/ Remaining Life			Annually	Falling Weight Deflectometer	IRC 115: 2014	180 days	IRC:115-2014
Rigid Pavement (Pavement of MCW, Service Road, Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Roughness BI	2200mm/km	2400mm/km	Bi-Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656 -94: 2000	180 days	IRC:SP:83-2008
	Skid	Skid Resistance no. at different speed of vehicles		Bi-Annually	SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)	IRC:SP:83-2008	180 days	IRC:SP:83-2008
		Minimum SN	Traffic Speed (Km/h)					
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					
Embankment/ Slope	Edge drop at shoulders	Nil	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	<2% variation in prescribed slope of camber /cross fall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15 % variation in prescribe side slope	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification
	Rain Cuts/ Gullies in slope	Nil	Nil	Daily Specially During Rainy Season	NA		7-15 days	MORT&H Specification

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

Table -2: Maintenance Criteria for Rigid Pavements:

Sr. 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						

Sr. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
1	Single Discrete Cracks Not intersecting with any joint	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	Not applicable
			1	w < 0.2 mm. hair cracks		
			2	w = 0.2 - 0.5 mm, discernible from slow-moving car	Seal without delay	Seal, and stitch if L > 1m. Within 7days
			3	w = 0.5 - 1.5 mm, discernible from fast-moving car		
			4	w = 1.5 - 3.0 mm	Seal, and stitch if L > 1 m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15days
			5	w > 3 mm.		
2	Single Transverse (or Diagonal) Crack intersecting with one or more joints	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Route and seal with epoxy. Within 7 days	Staple or Dowel Bar Retrofit. Within 15days
			2	w = 0.2 - 0.5 mm, discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1 m. Within 7 days	
			4	w = 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected. Portion with norms and specifications - See Para 5.5 & 9.2 Within 15days
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	
3	Single Longitudinal Crack intersecting with one or more joints	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	w < 0.5 mm, discernible from slow moving vehicle	Seal with epoxy, if L > 1 m. Within 7 days	Staple or dowel bar retrofit. Within 15days
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > 1 m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair with stapling. Within 15 days
			4	w = 6.0 - 12.0 mm, usually associated with spalling	Not Applicable, as it may be full depth	
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic		
4	Multiple Cracks intersecting with one or more joints	w = width of crack	0	Nil, not discernible	No Action	-
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > 1 m. Within 15 days	
			2	w = 0.2 - 0.5 mm. discernible from slow vehicle		Full depth repair within 15 days
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle		
			4	w = 3.0 - 6.0 mm panel broken into 2 or 3 pieces		

Sr. 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	w > 6 mm and/or panel broken into more than 4 pieces		specifications within 30 days
5	Corner Break	w = width of crack L = length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to secure broken parts Within 7 days	Seal with epoxy seal with epoxy Within 7days
			2	w < 1.5 mm; L < 0.6 m, only one corner broken	Partial Depth (Refer Figure 8.3 of IRC:SP: 83-2008) Within 15 days	Full depth repair
			3	w < 1.5 mm; L < 0.6 m, two corners broken		Reinstate sub-base, and reconstruct the slab as per norms and specifications within 30days
			4	w > 1.5 mm; L > 0.6 m or three corners broken		
			5	three or four corners broken		
6	Punchout (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)	w = width of crack L = length (m/m ²)	0	Nil, not discernible	Not Applicable, as it may be full depth	No Action
			1	w < 0.5 mm; L < 3 m/m ²		Seal with low viscosity epoxy to secure broken parts. Within 15days
			2	either w > 0.5 mm or L < 3 m/m ²		
			3	w > 1.5 mm and L < 3 m/m ²		Full depth repair - Cut out and replace damaged area taking care not to damage reinforcement. Within 30days
			4	w > 3 mm, L < 3 m/m ² and deformation		
			5	w > 3 mm, L > 3 m/m ² and deformation		
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 areas 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 > 25 mm	Reconstruct slabs, 4 or more slabs if affecting. Within 30 days	
8	Scaling	r = damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	Short Term No action.	Long Term Not Applicable
			1	r < 2 %	Local repair of areas damaged and liable to be damaged. Within 7days	
			2	r = 2 - 10 %		
			3	r = 10 - 20%	Bonded Inlay within 15 days	

Sr. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
			4	$r = 20 - 30 \%$		
			5	$r > 30 \%$ and $h > 25 \text{ mm}$	Reconstruct slab within 30 days	
9	Polished Surface/Glazing	t = texture depth, sand patch test	0		No action.	Not Applicable
			1	$t > 1 \text{ mm}$		
			2	$t = 1 - 0.6 \text{ mm}$		
			3	$t = 0.6 - 0.3 \text{ mm}$	Monitor rate of deterioration	
			4	$t = 0.3 - 0.1 \text{ mm}$		
			5	$t < 0.1 \text{ mm}$	Diamond Grinding if affecting 50% or more slabs in a continuous stretch of minimum 5 km. Within 30 days	
10	Popout (Small Hole), Pothole Refer Para 8.4	n = number/ m^2 d = diameter h = maximum depth	0	$d < 50 \text{ mm}$; $h < 25 \text{ mm}$; $n < 1$ per 5 m^2	No action.	Not Applicable
			1	$d = 50 - 100 \text{ mm}$; $h < 50 \text{ mm}$; $n < 1$ per 5 m^2	Partial depth repair 65 mm deep.	
			2	$d = 50 - 100 \text{ mm}$; $h > 50 \text{ mm}$; $n < 1$ per 5 m^2	Within 15 days	
			3	$d = 100 - 300 \text{ mm}$; $h < 100 \text{ mm}$ $n < 1$ per 5 m^2	Partial depth repair 110mm i.e.10 mm more than the depth of the hole.	
			4	$d = 100 - 300 \text{ mm}$; $h > 100 \text{ mm}$; $n < 1$ per 5 m^2	Within 30 days	
			5	$d > 300 \text{ mm}$; $h > 100 \text{ mm}$: $n > 1$ per 5 m^2	Full depth repair. Within 30 days	
Joint Defects						
11	Joint Seal Defects	loss or damage L = Length as % total joint length	0	Difficult to discern.	Short Term No action.	Not Applicable
			1	Discernible, $L < 25\%$ but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	
			3	Notable. $L > 25\%$ insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days	
			5	Severe; $w > 3 \text{ mm}$ 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 %	0	Nil, not discernible	No action.	Not Applicable
			1	$w < 10 \text{ mm}$	Apply low viscosity epoxy resin/	
			2	$w = 10 - 20 \text{ mm}$, $L < 25\%$	mortar in cracked portion.	

Sr. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
		joint length)			Within 7 days	
			3	w = 20 - 40 mm, L > 25%	Partial Depth Repair. Within 15 days	
			4	w = 40 - 80 mm, L > 25%	30 - 50 mm deep, h = w + 20% of w, within 30 days	
			5	w > 80 mm, and L > 25%	50 - 100 mm deep repair. H = w + 20% of w. Within 30 days	
13	Faulting (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 30days
			3	f = 6 - 12 mm	Diamond Grinding	
			4	f= 12 - 18 mm	Raise sunken slab.	Replace the slab as appropriate. Within 30days
			5	f> 18 mm	Strengthen subgrade and sub-base by grouting and raising sunken slab	
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 slabs, 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 sub-grade. Reinstate pavement at normal level if L < 20 m. Within 30 days	
			5	h > 100 mm		

Sr. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
16	Heave	h = positive vertical displacement from normal profile. L = length	0	Not discernible. $h < 5$ mm	Short Term	Long Term
			1	$h = 5 - 15$ mm	No action.	scrabble
			2	$h = 15 - 30$ mm, Nos $< 20\%$ joints	Follow up.	
			3	$h = 30 - 50$ mm	Install Signs to Warn Traffic within 7 days	
			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		
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 ongoing Maintenance within 15 days	Replace in case of new construction. Within 30days
			5	$h > 15$ mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	Lane to Shoulder Dropoff	f = difference of level	0	Nil, not discernible < 3 mm	Short Term	Long Term
			1	$f = 3 - 10$ mm	No action.	
			2	$f = 10 - 25$ mm	Spot repair of shoulder within 7 days	
			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 30days
			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/100 m stretch	5	abundant, crack development $> 25\%$	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab.	

Sr. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
					Within 30 days	
20	Ponding	Ponding on slabs due to blockage of drains	0-2	No discernible problem	No action.	
			3 to 4	Blockages observed in drains, but water flowing	Clean drains etc within 7 days, Follow up	Action required to stop water damaging foundation within 30 days.
			5	Ponding, accumulation of water observed	-do-	

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

Asset Type	Performance Parameter	Level of Service (LOS)			Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Highway	Availability of Safe Sight Distance	As per IRC SP: 84-2014, a minimum of safe stopping sight distance shall be available throughout.			Monthly	Manual Measurements with Odometer along with video/ image backup	Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments. In case of permanent structure or design deficiency: Removal of obstruction/improvement of deficiency at the earliest Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.		IRC:SP 84-2014
		Design Speed, kmph	Desirable Minimum Sight Distance (m)	Safe Stopping Sight Distance (m)					
		100	360	180					
		80	260	130					
Pavement Marking	Wear	<70% of marking remaining			Bi-Annually	Visual Assessment as per Annexure-F of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect - within 2 months	IRC:35-2015
	Day time Visibility	During expected life Service Time Cement Road - 130mcd/m ² /lux Bituminous Road - 100mcd/m ² /lux			Monthly	As per Annexure-D of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months	IRC:35-2015
	Night Time Visibility	Initial and Minimum Performance for Dry Retro reflectivity during night time:			Bi-Annually	As per Annexure-E of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months	IRC:35-2015
		Design Speed	(RL) Retro Reflectivity (mcd/m ² /lux)						
			Initial (7 days)	Minimum Threshold level (TL) & warranty period required up to 2 years					
		Up to 65	200	80					
		65 - 100	250	120					
		Above 100	350	150					
		Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity): Initial 7 days Retro reflectivity: 100							

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		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
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of each signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.	Change of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/Cantilever Sign boards	IRC:67-2012
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance measuring tape	Raising Kerb Height	Within 1 Month	IRC 86:1983
	Kerb Painting	<u>Functionality</u> : Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	IRC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2014 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:84-2014, IRC:35-2015

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Pedestrian Guardrail	<u>Functionality:</u> Functioning of guardrail as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014
	Traffic Safety Barriers	<u>Functionality:</u> Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014, IRC:119-2015
	End Treatment of Traffic Safety Barriers	<u>Functionality:</u> Functioning of End Treatment as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014, IRC:119-2015
	Attenuators	<u>Functionality:</u> 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	<u>Functionality:</u> 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	<u>Functionality:</u> Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014
Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84-2014
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84-2014
	Toll Plaza Canopy Lights	Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major/minor failure in the lighting system	Daily	-	Rectification of failure	8 hours	IRC:SP:84-2014

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

Table 4: Maintenance Criteria for Structures and Culverts:

Pipe/box/slab culverts	Free waterway/unobstructed flow	85% of culvert normal flow area to available.	2 times in a year (before	Inspection by Bridge Engineer as per IRC	Cleaning silt up soils and debris in culvert	15 days before onset of monsoon and within 30	IRC 5-2015, IRC SP:40-1993 and IRC
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Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	section		and after rainy season)	SP: 35-1990 and recording of depth of silting and area of vegetation.	barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrel before rainy season.	days after end of rainy season.	SP:13-2004
	Leak-proof expansion joints if any	No leakage through expansion joints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35-1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-1993 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25 sqm	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording the defects	Repairs to spalling, cracking, delamination, rusting shall be followed as per IRC: SP: 40-1993.	15 days	IRC SP 40-1993 and MORTH Specifications clause 2800
		Delamination of concrete not more than 0.25 sq.m.					
		Cracks wider than 0.3 mm not more than 1m aggregate length					
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Bridges including ROBs Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811
Bridge - Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach	15 days	MORT&H Specification 3004.2 & 2811.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
					embankment		
	User safety (condition of crash barrier and guard rail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed condition survey as per IRC SP: 35-1990.	Repairs and replacement of safety barriers as the case may be	3days	IRC: 5-1998, IRC SP: 84-2014 and IRC SP: 40-1993.
	Rusted reinforcement	Not more than 0.25 sqm	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out the repairs to affected concrete portion with epoxy mortar / concrete.	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
	Spalling of concrete	Not more than 0.50 sqm					
	Delamination	Not more than 0.50 sq.m					
	Cracks wider than 0.30 mm	Not more than 1m total length	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting with epoxy mortar, investigating causes for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP: 40-1993 and MORTH Specification 2800.
	Rainwater seepage through deck slab	Leakage - nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting of deck slab at leakage areas, waterproofing, repairs to drainage spouts	1 months	MORTH specifications 2600 & 2700.
	Deflection due to permanent loads and live loads	Within design limits.	Once in every 10 years for spans more than 40 m	Load test method	Carry out major rehabilitation works on bridge to retain original design loads capacity	6 months	IRC SP: 51-1999.
	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	Laser displacement sensors or laser vibro-meters	Strengthening of super structure	4 months	AASHTO LRFD specifications

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
			30 m				
	Leakage in Expansion joints	No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rain water through expansion joint in case of buried and asphalt plug and copper strip joint.	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Replace of seal in expansion joint	15 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Debris and dust in strip seal expansion joint	No dust or debris in expansion joint gap.	Monthly	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Cleaning of expansion joint gaps thoroughly	3 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No 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-substructure	Cracks/spalling of concrete/rusted steel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting/guniting and micro concreting depending on type	30 days	IRC SP: 40-1993 and MORTH specification 2800.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Bridge Foundations					of defect noticed		
	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture of reinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment shall be replaced, in order to get uniform load transfer on to bearings.	3 months	MORTH specification 2810 and IRC SP: 40-199.
	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection as per IRC SP:35-1990 using Mobile Bridge Inspection Unit. In case of doubt, use Underwater camera for inspection of deep wells in major Rivers.	Suitable protection works around pier/abutment	1 month	IRC SP: 40-1993, IRC 83-2014, MORTH specification 2500
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sq.m, damage to solid apron (concrete apron) not more than 1 sq.m	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching.	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of the contractor.							



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Table 5: Maintenance Criteria for Hill Roads

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

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

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



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

A. Flexible Pavement

Nature of Defect or deficiency		Time limit for repair/ rectification
(b) Granular earth shoulders, side slopes, drains and culverts		
(i)	Variation by more than 1 % in the prescribed slope of camber/cross fall (shall not be less than the camber on the main carriageway)	7 (seven) days
(ii)	Edge drop at shoulders exceeding 40 mm	7 (seven) days
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	30 (thirty) days
(iv)	Rain cuts/gullies in slope	7 (seven) days
(v)	Damage to or silting of culverts and side drains	7 (seven) days
(vi)	Desilting of drains in urban/semi- urban areas	24 (twenty four) hours
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)
(c) Road side furniture including road sign and pavement marking		
(i)	Damage to shape or position, poor visibility or loss of retro- reflectivity	48 (forty eight) hours
(ii)	Painting of km stone, railing, parapets, crash barriers	As and when required/ Once every year
(iii)	Damaged/missing signs road requiring replacement	7 (seven) days
(iv)	Damage to road mark ups	7 (seven) days
(d) Road lighting		
(i)	Any major failure of the system	24 (twenty four) hours
(ii)	Faults and minor failures	8 (eight) hours
(e) Trees and plantation		
(i)	Obstruction in a minimum head- room of 5 m above carriageway or obstruction in visibility of road signs	24 (twenty four) hours
(ii)	Removal of fallen trees from carriageway	4 (four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(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) hours



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

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



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Nature of Defect or deficiency		Time limit for repair/ rectification
(ii)	Landslides requiring clearance	12 (twelve) hours
(iii)	Snow requiring clearance	24 (twenty four) hours

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

Schedule-F



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Schedule-F

(See Clause 4.1 (vii)(a))

Applicable Permits

1 Applicable Permits

- (i) The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:
- (a) Permission of the State Government for extraction of boulders from quarry;
 - (b) Permission of Village 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.
- (ii) 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



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Schedule-G

(See Clauses 7.1 and 19.2)

Annex-I : Form of Bank Guarantee

(See Clause 7.1)

[Performance Security /Additional Performance Security]

To

_____ [name of Authority]
_____ [address of Authority]

WHEREAS _____ [name and address of Contractor] (hereafter called the "Contractor") has undertaken, in pursuance of Letter of Acceptance (LOA) No. __Dated__ for construction of [name of the Project] (hereinafter called the "Contract")

AND WHEREAS the Contract requires the Contractor to furnish an {Performance Security/ Additional Performance Security} for due and faithful performance of its obligations, under and in accordance with the Contract, during the {Construction Period/ Defects Liability Period and Maintenance Period} in a sum of Rs..... cr. (Rupees crore) (the "**Guarantee Amount**"¹).

AND WHEREAS we, ... through our branch at
(the "**Bank**") have agreed to furnish this Bank Guarantee (hereinafter called the "**Guarantee**") by way of Performance Security.

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Contract, 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 of National Highways & Infrastructure Development Corporation Limited], that the

¹ Guarantee Amount for Performance Security and Additional Performance Security shall be calculated as per Contract.



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Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Contract 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 Contract and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Contract 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 Contract 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 Contract 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 Contract or for the fulfillment, compliance and/or performance of all or any of the obligations of the Contractor under the Contract.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Guarantee shall cease to be in force and effect on ****[§]. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.



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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 paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Contract.
12. 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.
13. This guarantee shall also be operatable at our.....Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.
14. The guarantor/bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of NHIDCL, details of which is as under:

[§]Insert date atleast 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 2.21 of the RFP). The Contractors can submit the BG for periods of two years at one time and keep on renewing the same till the DLP is over if they have problems in getting the BG in one go for the entire DLP.



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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, New Delhi-110001

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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



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Annex - II (Schedule - G) (See Clause 19.2)

Annex – II: Form for Guarantee for Advance Payment

To

_____ [name of Authority]
_____ [address of Authority]

WHEREAS:

- (A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the authority], (hereinafter called the "**Authority**") for the construction of the ***** section of [National Highway No. **] on Engineering, Procurement and Construction (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement
- (B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing @Bank Rate + 3% advance payment (herein after called "**Advance Payment**") equal to 10% (ten per cent) of the Contract Price; and that the Advance Payment shall be made in two installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} installment of the Advance Payment is Rs. _____ cr. (Rupees _____ crore) and the amount of this Guarantee is Rs. _____ cr. (Rupees _____ crore) (the "**Guarantee Amount**")².
- (C) We, through our branch at (the "Bank") have agreed to furnish this bank guarantee (hereinafter called the "Guarantee") for the Guarantee Amount.

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

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

A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways Authority of India], that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the instalment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The

² The Guarantee Amount should be equivalent to 110% of the value of the applicable instalment



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

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

³ 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).



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8. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
9. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.
10. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.
11. This Guarantee 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.
12. This guarantee shall also be operatable at our.....Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.
13. The guarantor/bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of NHIDCL, details of which is as under:

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, New Delhi-110001

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:



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(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.

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 on the covering letter of issuing branch.

Schedule-H



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



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Schedule-H

(See Clauses 10.1 (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.	53.00%	A - Widening and strengthening of existing road	
			B.1 - Reconstruction/ New 2/4-lane realignment/bypass (Flexible pavement)	
			(1) Earthwork upto Subgrade top	41.40%
			(2) Subbase course (GSB)	12.00%
			(3) Non bituminous base course (WMM)	12.00%
			(4) Bituminous base (Prime, tack and DBM)	12.00%
			(5) Wearing coat (Tack coat, BC, shoulder)	10.00%
			B.2 - Reconstruction/ New 2/4-lane realignment/bypass (Rigid Pavement)	
			C.1 - Reconstruction/ New Service road (flexible Pavement)	
			(1) Earthwork upto Subgrade top	0.05%
			(2) Subbase course (GSB)	0.10%
			(3) Non bituminous base course (WMM)	0.15%
			(4) Bituminous base (Prime, tack and DBM)	0.20%
			(5) wearing coat (Tack coat, BC)	0.10%
			C.2 - Reconstruction/ New Service road (Rigid Pavement)	
			D. - Reconstruction/ New culverts on existing road and realignments, bypasses	12.00%
2	Minor Bridges/ Underpasses/ Overpasses	7.50%	A.1 - Widening and repairs of Minor Bridges	
			A.2 - New of Minor Bridges	
			(1) Foundation	20.00%



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S. no.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
3			(2) Sub-structure	16.50%
			(3) Super-structure	40.00%
			(4) Approaches	15.00%
			B.1 - Widening and repairs of Underpasses/Overpasses	
			B.2 - New Underpasses/Overpasses	
			(1) Foundation	3.00%
			(2) Sub-structure	3.00%
			(3) Super-structure	1.00%
			(4) Approaches	1.50%
	Major Bridge works and ROB/RUB/elevated sections/flyovers including viaducts, if any	3.00%	A.1 - Widening and repairs of existing major bridges	
			A.2 - New major bridges	
			(1) Foundation	25.00%
			(2) Sub structure	23.50%
			(3) Superstructure (including bearing)	45.00%
			(4) wearing coat (including expansion joint)	3.50%
			(5) Miscellaneous items (like hand rails, crash barriers, road markings etc.)	2.00%
			(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).	1.00%
			B.1 - Widening and repairs of (a) ROB and (b) RUB	
			B.2 - New ROB / RUB	
			C.1 - Widening and repairs of Elevated section/Flyover/Grade Separators	
			C.2 - New Elevated section/Flyover/Grade Separators	
4	Other works	35.00%	(i) Toll plaza	0.00%
			(ii) Road side drains	10.65%
			(iii) Road signs, markings, km stones, safety devices etc.	14.00%



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S. no.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
			(iv) Project facilities	
			(a) Bus Bay with Bus Shelter	0.35%
			(b) Truck lay bys	0.30%
			(c) others to specified	
			(i) Street light	0.35%
			(ii) Foot Over Bridges	1.00%
			(iii) Junction improvement	3.60%
			(v) Protection works - - retaining wall / toe wall, breast wall etc.	
			a) Breast wall	
			Gabion BW – 4.0m Ht.	15.00%
			Gabion BW - 6m Ht.	10.00%
			Gabion BW - 8m Ht.	4.00%
			b) Retaining /Toe wall	
			PCC RW - 4m Ht.	1.00%
			PCC RW - 5m Ht.	0.20%
			Gabion RW - 6m Ht.	3.75%
			Gabion RW - 7m Ht.	1.60%
			Gabion RW - 8m Ht.	0.65%
			(ix) Side Slope Protection works Turfing and stone pitching	
			a) Cut slope protection soil nailing etc.	5.90%
			b) Fill Slope - Reinforced soil slope	25.50%
			c) Reinforced Soil wall	2.15%
5	Electrical utilities and public Health Utilities (Water pipe lines and sewage lines)	1.50%	(i) EHT line / (ii) EHT crossings	19.00%
			(iii) HT/ LT line / (iv) HT/ LT crossings	40.00%
			(v) Water pipeline / (vi) Water pipeline crossings	41.00%
			(vii) Sewage lines / (viii) Sewage line crossings	0.00%

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:



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Table 1.3.1

Stage of Payment	Percentage -weightage	Payment Procedure
A - Widening and strengthening of existing road		
B.1 - Reconstruction/ New 2/4-lane realignment/bypass (Flexible pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro-rata basis on completion of a stage in a length not less than 5% (five percent) of the total length.
(1) Earthwork upto Subgrade top	41.40%	
(2) Subbase course (GSB)	12.00%	
(3) Non bituminous base course (WMM)	12.00%	
(4) Bituminous base (Prime, tack and DBM)	12.00%	
(5) wearing coat (Tack coat, BC)	10.00%	
B.2 - Reconstruction/ New 2/4-lane realignment/bypass (Rigid Pavement)		
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 a length not less than 5% (five percent) of the total length.
(1) Earthwork upto Subgrade top	0.05%	
(2) Subbase course (GSB)	0.10%	
(3) Non bituminous base course (WMM)	0.15%	
(4) Bituminous base (Prime, tack and DBM)	0.20%	
(5) wearing coat (Tack coat, BC)	0.10%	
C.2 - Reconstruction/ New Service road (Rigid Pavement)		
D. - Reconstruction/ New culverts	12.00%	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 three culverts.

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

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

Where P= Contract Price. And L = Total length in km.

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

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

1.3.2 Minor Bridges and Underpasses/Overpasses.



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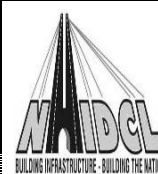
Procedure for estimating the value of Minor Bridge and underpasses/Overpasses shall be as stated in table 1.3.2:

Table 1.3.2

Stage of Payment	Weightage	Payment Procedure
A.1 - Widening and repairs of Minor Bridges		
A.2 - New of Minor Bridges		
(1) Foundation (on completion of the foundation work including foundation for wing wall, return wall, abutments, piers	20.00%	Cost of each minor bridge shall be determined on pro-rata basis with respect to the total linear length (m) of the minor bridges. Payment against foundation shall be made on pro-rata basis on completion of each foundation of the 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 (on completion of the sub-structure work for wing wall, return wall, abutments, piers upto the abutment/pier cap	16.50%	Cost of each minor bridge shall be determined on pro-rata basis with respect to the total linear length (m) of the minor bridges. Payment against Sub-Structure shall be made on pro-rata basis on completion of each Sub-Structure 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 barrier road sign, & marking, tests on completion etc. completion 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.	40.00%	Payment shall be made on prorata 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 payment in this sub clause.
(4) Approaches (on completion of approaches including retaining walls/ Reinforced earth wall, stone pitching, protection works complete in all respect and fit for use.	15.00%	Payment shall be made on prorata basis on completion of a stage i.e. completion of approaches in all respect as specified.
B.1 - Widening and repairs of Underpasses/Overpasses		
B.2 - New Underpasses/Overpasses		
(1) Foundation (on completion of the	3.00%	Cost of each minor bridge shall be



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Stage of Payment	Weightage	Payment Procedure
foundation work including foundation for wing wall, return wall, abutments, piers		determined on pro-rata basis with respect to the total linear length (m) of the minor bridges. Payment against foundation shall be made on pro-rata basis on completion of each foundation of the 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 (on completion of the sub-structure work for wing wall, return wall, abutments, piers upto the abutment/pier cap	3.00%	Cost of each minor bridge shall be determined on pro-rata basis with respect to the total linear length (m) of the minor bridges. Payment against Sub-Structure shall be made on pro-rata basis on completion of each Sub-Structure 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 barrier road sign, & marking, tests on completion etc. completion 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.	1.00%	Payment shall be made on prorata 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 payment in this sub clause.
(4) Approaches (on completion of approaches including retaining walls/ Reinforced earth wall, stone pitching, protection works complete in all respect and fit for use.	1.50%	Payment shall be made on prorata basis on completion of a stage i.e. completion of approaches in all respect as specified.

1.3.3 Major Bridge works, ROB/RUB and Structures

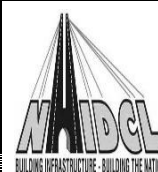
Procedure for estimating the value of major Bridge works, ROB/RUB and structure work shall be as stated in table 1.3.3

Table 1.3.3

Stage of payment	Weightage	Payment procedure
A.1 - Widening and repairs of existing major bridges		
A.2 - New major bridges		
(1) Foundation	25.00%	Cost of each major bridge shall be determined on pro rata basis with respect to the total linear



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Technical Schedule

Stage of payment	Weightage	Payment procedure
		length (m) of the major bridges. Payment against foundation shall be made on prorata basis on completion of each foundation of each bridge In case where load testing is required for foundation, the trigger of the first payment shall include load testing also where specified
(2) Sub structure	23.50%	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. Payment against sub structure shall be made on prorata basis on completion of each sub structure of each bridge
(3) Superstructure (including bearing)	45.00%	Payment shall be made on prorata 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 payment in this sub clause. In Case of structure where pre-cast griders have been proposed by the contractor, 50% of the stage payment shall be due and payable on casting of girder for each span and balance 50% of the stage payment shall be made on completion of stage specified above.
(4) wearing coat (including expansion joint)	3.50%	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 barriers, road markings etc.)	2.00%	Payment shall be made on completion of all miscellaneous works like hand rail, crash barrier, road markings, etc. complete in all respects as specified.
(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).	1.00%	Payment shall be made on prorata basis on completion of both approaches including stone pitching, protection works, etc. complete in all respect as specified.
B.1 - Widening and repairs of (a) ROB and (b) RUB	0.00%	
B.2 - New ROB / RUB	0.00%	
C.1 - Widening and repairs of Elevated section/Flyover/Grade Separators	0.00%	
C.2 - New Elevated section/Flyover/Grade Separators	0.00%	



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Technical Schedule

1.3.4 Other works.

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

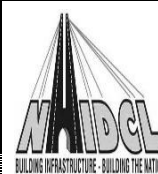
1.3.4:

Table 1.3.4

Stage of Payment	Weightage	Payment Procedure
(i) Toll plaza	0.00%	
(ii) Road side drains	10.65%	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5 % (five per cent) of the total length.
(iii) Road signs, markings, km stones, safety devices	14.00%	
(iv) Project Facilities		Payment shall be made on pro rata basis for completed facilities.
a) Bus bays with bus shelter	0.35%	
b) Truck lay-byes	0.30%	
d) Others to be specified		
(i) Street light	0.35%	
(ii) Foot Over Bridges	1.00%	
(iii) Junctions improvement	3.60%	Unit of measurement is number, payment shall be made on on pro rata basis on completion of stage in a number of not less than 10% (ten percent) of the total number.
(vi) Protection works - - retaining wall / toe wall, breast wall etc.		Unit of measurement is linear length. Payment shall be made on pro-rata basis on completion of a stage in a length of not less than 5% (five percent) of the total length
a) Breast wall		
Gabion BW – 4.0m Ht.	15.00%	
Gabion BW - 6m Ht.	10.00%	
Gabion BW - 8m Ht.	4.00%	
b) Retaining /Toe wall		
PCC RW - 4m Ht.	1.00%	
PCC RW - 5m Ht.	0.20%	
Gabion RW - 6m Ht.	3.75%	
Gabion RW - 7m Ht.	1.60%	
Gabion RW - 8m Ht.	0.65%	
(viii) Side Slope Protection works Turving and stone pitching		Unit of measurement is Sqm. Payment shall be made on pro-rata basis on completion of a stage in an area of not less than 5% (five percent) of the total quantity.
a) Cut slope protection soil nailing etc.	5.90%	
b) Fill Slope - Reinforced soil slope	25.50%	
c) Reinforced Soil wall	2.15%	



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Technical Schedule

1.3.5 Electrical utilities and public Health Utilities (Water pipelines and sewage lines)

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

Table 1.3.5

Stage of Payment	Weightage	Payment Procedure
(i) EHT line	19.00%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rate basis as per its weightage with reference to total cost of EHT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is, (i) Erection of Poles-20% (ii) Conductor stringing including laying of cable-30% (iii) DTR erection (if involved)-15% and (iv) Charging of line including dismantling and site clearance-35% (with DTR) and 50% without DTR)
(ii) EHT crossings		Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 4.
(iii) HT/ LT line (including transformers if any)	40.00%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of LT/ HT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is (i) Erection of Poles-20% (ii) Conductor stringing including laying of cable- 30%, (iii) DTR erection (if involved)-10% and (iv) Charging of line including dismantling and site clearance-40% (with DTR) and 50% without DTR)
(iv) HT/ LT crossings		Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 10 crossings.
(v) Water pipeline	41.00%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipeline. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works



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Technical Schedule

Stage of Payment	Weightage	Payment Procedure
		and dismantling and site clearance-50%)
vi) water pipeline crossings		Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 8 crossings.
(vii) Sewage lines	0.00%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipeline. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)
(viii) Sewage line crossings		Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for completed activity. (The average weightage of major activities in shifting work is laying pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)

2 Procedure for payment for Maintenance.

- 2.1 The cost for maintenance shall be as stated in Clause 14.1. (i)
- 2.2 Payment for Maintenance shall be made in quarterly instalments in accordance with the provisions of Clause 19.7.

Schedule-I

 M.O.R.T.H. Govt. Of India	Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.	 NADCL BUILDING INFRASTRUCTURE - BUILDING THE NATION
Technical Schedule		

Schedule - I

(See Clause 10.2 (iv))

1 Drawings

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

2 Additional Drawings

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



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Technical Schedule

Annex – I

(Schedule - I)

List of Drawings

- 1 A minimum list of the drawings of the various components/elements of the project highway and project facility required to be submitted by the Contractor is given below:
 - a. Drawing of horizontal alignment, vertical profile and typical cross sections.
 - b. Drawings of cross drainage works, i.e. Bridges/Culverts/Flyovers and Other Structures;
 - c. Drawings of interchanges, major intersections and underpasses.
 - d. Drawing of control center.
 - e. Drawings of road furniture items including traffic signage, marking, safety barriers, etc.;
 - f. Drawings of traffic diversions plans and traffic control measures.
 - g. Drawings of road drainage measures.
 - h. Drawings of typical details slope protection measures.
 - i. Drawings of landscaping and horticulture.
 - j. Drawings of pedestrian crossing.
 - k. Drawings of street lighting.
 - l. General Arrangement showing Base Camp and Administrative Block.
 - m. Any other drawings as per instruction of Authority Engineer.

Schedule-J

Schedule-J

(See Clause 10.3 (ii))

Project Completion Schedule

1 Project Completion Schedule

During Construction period, the Contractor shall comply with the requirements set forth in this Schedule J for each of the Project Milestones and the **Scheduled Completion Date**. Within 15 (fifteen) days of the date of each Project Milestone, the Contractor shall notify the Authority of such compliance along with necessary particulars thereof.

2 Project Milestone-I

- (i) Project Milestone-I shall occur on the date falling on the 320th (Three Hundred and Twenty) day from the Appointed Date (the “**Project Milestone-I**”).
- (ii) Prior to the occurrence of Project Milestone-I, the Contractor shall have commenced construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 10% (ten per cent) of the Contract Price.

3 Project Milestone-II

- (i) Project Milestone-II shall occur on the date falling on the 548th (Five hundred and Forty Eighth) day from the Appointed Date (the “**Project Milestone-II**”).
- (ii) Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 35% (thirty five per cent) of the Contract Price.

4 Project Milestone-III

- (i) Project Milestone-III shall occur on the date falling on the 776th (Seven hundred and Seventy Six) day from the Appointed Date (the “**Project Milestone-III**”).
- (ii) Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 70% (seventy per cent) of the Contract Price and should have started construction of all project facilities.

5 Schedule Completion Date

- (i) The Scheduled Completion Date shall occur on the 912th (Nine Hundred Twelve) day from the Appointed Date.
- (ii) On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

6 Extension of time

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

Schedule-K



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Schedule-K

(See Clause 12.1 (ii))

Tests on Completion

1 Schedule for Tests

- (i) The Contractor shall, no later than 30 (thirty) days prior to the likely completion of construction, notify the Authority's Engineer and the Authority of its intent to subject the Project Highway to Tests, and no later than 10 (ten) days prior to the actual date of Tests, furnish to the Authority's Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Works.
- (ii) The Contractor shall notify the Authority's Engineer of its readiness to subject the Project Highway to Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the Authority's Engineer shall, in consultation with the Contractor, determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority's Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule K.

2 Tests

- (i) Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include all the tests specified in IRC code, manual and MORTH specifications for the road and Bridge works, 5th revision, 2013.
- (ii) 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.
- (iii) Tests for bridges: All major and minor bridges shall be subjected to the rebound hammer and ultrasonic pulse velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on Nondestructive Testing Techniques, at two spots in every span, to be chosen at random by the Authority's Engineer. Bridges with a span of 15 (fifteen) meters or more shall also be subjected to load testing.
- (iv) Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Standards.

- (v) Environmental audit: The Authority's Engineer shall carry out a check to determine conformity of the Project Highway with the environmental requirements set forth in Applicable Laws and Applicable Permits.
- (vi) Safety Audit: The Authority's Engineer shall carry out or cause to be carried out, a safety audit to determine conformity of the Project Highway with the safety requirements and Good Industry Practice.

3 Agency for conducting Tests

All Tests set forth in this Schedule-K shall be conducted by the Authority's Engineer or such other agency or person as it may specify in consultation with the Authority.

4 Completion Certificate

Upon successful completion of Tests, the Authority's Engineer shall issue the Completion Certificate in accordance with the provisions of Article 12.

5 The Authority Engineer will carry out tests with following equipment at his own cos in the presence of contractor's representative

Sr. No.	Key metrics of Asset	Equipment to be used	Frequency of condition survey
1	Surface defects of pavement	Network Vehicle Survey (NSV)	At least twice a year (As per survey months defined for the state basis rainy season)
2	Roughness of pavement	Network Vehicle Survey (NSV)	At least twice a year (As per survey months defined for the state basis rainy season)
3	Strength of pavement	Falling Weight Deflectometer (FWD)	At least once a year
4	Bridges	Mobile Bridge Inspection Unit (MBU)	At least twice a year (As per survey months defined for the state basis rainy season)
5	Road signs	Retro-reflectometer	At least twice a year (As per survey months defined for the state basis rainy season)



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Technical Schedule

The first testing with the help of NSV shall be conducted at the time of issue of Completion Certificate.

Schedule-L



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Schedule-L

(See Clause 12.2)

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 **"Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode."** through (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.
- 2 It is certified that, in terms of the aforesaid Agreement, all works forming part of Project Highway have been completed, and the Project Highway is hereby declared fit for entry into operation on this the.....day of..... 20.....

SIGNED, SEALED AND DELIVERED

For and on behalf of

The Authority's Engineer by:

(Signature)

(Name)

(Designation)

(Address)

Schedule-M



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



Technical Schedule

Schedule-M

(See Clauses 14.6., 15.2 and 19.7)

Payment Reduction for Non-Compliance

1 Payment reduction for non-compliance with the Maintenance Requirements

- (i) Monthly lump sum payments for maintenance shall be reduced in the case of non-compliance with the Maintenance Requirements set forth in Schedule-E.
- (ii) Any deduction made on account of non-compliance with the maintenance Requirements shall not be paid even after compliance subsequently. The deduction shall continue to be made every month until compliance is done.
- (iii) The Authority's Engineer shall calculate the amount of payment reduction on the basis of weightage in percentage assigned to non-conforming items as given in Paragraph 2.

2 Percentage reductions in lump sum payments

- (i) The following percentages shall govern the payment reduction:

S. No.	Item/Defect/Deficiency	Percentage
(a)	Carriageway/Pavement	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	Road, Embankment, Cuttings, Shoulders	
(i)	Edge drop, inadequate 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	



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Technical Schedule

(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%

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

$$R = P/100 \times M \times L1/L$$

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

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

L1 = Non-complying length

L = Total length of the road,

R = Reduction (the amount to be deducted for 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 noncompliance.

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

Schedule-N

 संयोजित जयते M.O.R.T.H. Govt. Of India	Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.	 NADCL BUILDING INFRASTRUCTURE - BUILDING THE NATION
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Schedule-N

(See Clause 18.1(i))

Selection of Authority's Engineer

1 Selection of Authority's Engineer

- (i) The provisions of the Model Request for Proposal for Selection of Technical Consultants, issued by the Ministry of Finance in May 2009, or any substitute thereof 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.
- (ii) 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.



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Technical Schedule

Annex – I

(Schedule - N)

Terms of Reference for Authority's Engineer

1 Scope

- (i) These Terms of Reference (the “TOR”) for the Authority's Engineer are being specified pursuant to the EPC Agreement dated..... (the “**Agreement**”), which has been entered into between the NHIDCL (the “**Authority**”) and (the “**Contractor**”) for “**Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.**” and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.
- (ii) The TOR shall apply to construction and maintenance of the Project Highway.

2 Definitions and interpretation

- (i) The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Agreement.
- (ii) References to Articles, Clauses and Schedules in this TOR shall, except where the context otherwise requires, be deemed to be references to the Articles, Clauses and Schedules of the Agreement, and references to Paragraphs shall be deemed to be references to Paragraphs of this TOR.
- (iii) The rules of interpretation stated in Clauses 1.2, 1.3 and 1.4 of the Agreement shall apply, mutatis mutandis, to this TOR.

3 General

- (i) The Authority's Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.
- (ii) The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement, but subject to obtaining prior written approval of the Authority before determining:



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Technical Schedule

- (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.
- (iii) The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.
- iv) The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2.
- v) The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.
- vi) In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.
- (iv)

4 Construction Period

- i) 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



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shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

- ii) The Authority's Engineer shall review any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.
- iii) The Authority's Engineer shall review the Quality Assurance Plan submitted by the Contractor and shall convey its comments to the Contractor within a period of 21 (twenty-one) days stating the modifications, if any, required thereto.
- iv) The Authority's Engineer shall complete the review of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.
- v) The Authority's Engineer shall grant written approval to the Contractor, where necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Project Highway for purposes of maintenance during the Construction Period in accordance with the provisions of Clause 10.4.
- vi) The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.
- vii) The Authority's Engineer shall inspect the Construction Works and the Project Highway and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular, the Authority's Engineer shall include in its Inspection Report, the compliance of the recommendations made by the Safety Consultant.
- viii) The Authority's Engineer shall conduct the pre-construction review of manufacturer's test reports and standard samples of manufactured Materials, and such other Materials as the Authority's Engineer may require.
- ix) For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4.9, 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.

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- x) The Authority's Engineer shall test check at least 50 (Fifty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.
- xi) The timing of tests referred to in Paragraph 4.9, 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.
- xii) In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works, the Authority's Engineer shall require the Contractor to carry out remedial measures.
- xiii) The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project Highway, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 shall apply.
- xiv) In the event that the Contractor fails to achieve any of the Project Milestones, the Authority's Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Authority's Engineer shall determine that completion of the Project Highway is not feasible within the time specified in the Agreement, it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority's Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.
- xv) The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.4.
- xvi) Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measure, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.
- xvii) In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users, and requires the Authority's Engineer to

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inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.

- xviii) The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate 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

- i) The Authority's Engineer shall aid and advise the Contractor in the preparation of its monthly Maintenance Programme and for this purpose carry out a joint monthly inspection with the Contractor.
- ii) The Authority's Engineer shall undertake regular inspections, at least once every month, to evaluate compliance with the Maintenance Requirements and submit a Maintenance Inspection Report to the Authority and the Contractor.
- iii) The Authority's Engineer shall specify the tests, if any, that the Contractor shall carry out, or cause to be carried out, for the purpose of determining that the Project Highway is in conformity with the Maintenance Requirements. It shall monitor and review the results of such tests and the remedial measures, if any, taken by the Contractor in this behalf.
- iv) In respect of any defect or deficiency referred to in Paragraph 3 of Schedule- E, the Authority's Engineer shall, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards and shall also specify the time limit for repair or rectification of any deviation or deterioration beyond the permissible limit.
- v) The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of the Project Highway for undertaking maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure, the Authority's Engineer shall monitor the reopening of such lane(s), and in case of delay, determine the Damages payable by the Contractor to the Authority under Clause 14.5.

6 Determination of costs and time



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- i) The Authority's Engineer shall determine the costs, and/or their reasonableness, that are required to be determined by it under the Agreement.
- ii) The Authority's Engineer shall determine the period of Time Extension that is required to be determined by it under the Agreement.
- iii) The Authority's Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause 18.5.

7 Payments

- i) The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2.4 (d).
- ii) Authority's Engineer shall -
 - (a) within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment, pending issue of the Interim Payment Certificate; and
 - (b) within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor, after adjustments in accordance with the provisions of Clause 19.10.
- iii) The Authority's Engineer shall, within 15 (fifteen) days of receipt of the Monthly Maintenance Statement from the Contractor pursuant to Clause 19.6, verify the Contractor's monthly statement and certify the amount to be paid to the Contractor in accordance with the provisions of the Agreement.
- iv) The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provisions of Clause 19.16.

8 Other duties and functions

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

9 Miscellaneous

- (i) A copy of all communications, comments, instructions, Drawings or Documents sent

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by the Authority's Engineer to the Contractor pursuant to this TOR, and a copy of all the test results with comments of the Authority's Engineer thereon, shall be furnished by the Authority's Engineer to the Authority forthwith.

- (ii) The Authority's Engineer shall retain at least one copy each of all Drawings and Documents received by it, including 'as-built' Drawings, and keep them in its safe custody.
- (iii) Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as-built Drawings, in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Project Highway as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project Highway and setback lines, if any, of the buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.
- (iv) The Authority's Engineer, if called upon by the Authority or the Contractor or both, shall mediate and assist the Parties in arriving at an amicable settlement of any Dispute between the Parties.
- (v) The Authority's Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.

Schedule-O



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SCHEDULE - O

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

Forms of Payment Statements

1 Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

- (a) The estimated amount for the Works executed in accordance with Clause 19.3.1 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;

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- (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.

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

4 Contractor's claim for Damages

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

Schedule-P

Schedule-P

(See Clause 20.1)

INSURANCE

1 Insurance during Construction Period

- i. The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the 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.
- ii. 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

- (i) 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 1 and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences.

The insurance cover shall be not less than the Contract Price.

- (ii) The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor's performance of this Agreement excluding:

- (a) the Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and
- (b) Damage which is 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



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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 shall be as per the requirement of maintenance mentioned in Schedule-E.

Schedule-R



Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode.



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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 **"Four laning of Kolasib - Sethawn section (Package-5) of NH-6 from Existing Chainage km 86+000 to km 107+850 (Design Chainage km 77+500 to km 95+500) on Silchar - Vairengte - Sairang road in the State of Mizoram under Bharatmala Pariyojna on EPC mode."** (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

S

(Signature)

(Name and designation of Authority's Representative)

(Address)