National Highways & Infrastructure Development Corporation Limited

BUILDING INFRASTRUCTURE - BUILDING THE NATION

Ministry of Road Transport & Highways,
(Govt. of India)

SCHEDULES

For

"Four laning of Sethawn - N. Kawnpui section (Package-6) of NH-6 from Existing Chainage km 107+850 to km 126+315 (Design Chainage km 95+500 to km 111+850) 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

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**

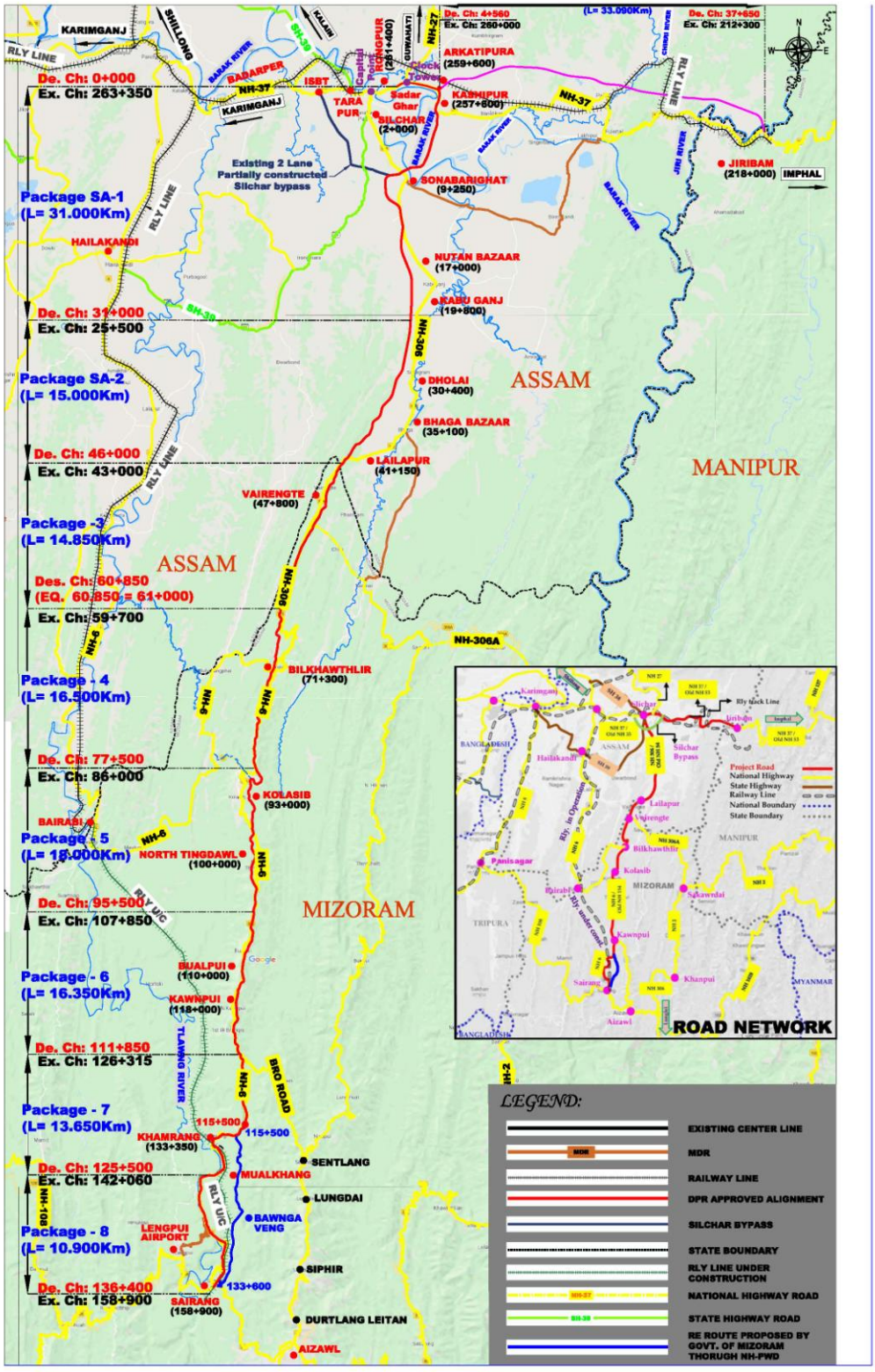
(ii) The dates of handing over the Right of Way to the Contractor are specified in Annex-II of this Schedule-A.

(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 (i) 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.

KEY PLAN



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

Annex - I

(Schedule-A)

Site for the Project

1. Site

The Site of the two-lane (proposed 4-lane divided carriageway) Project Highway starts from Sethawn and ends at N. Kawnpui section (Package-6) of NH-6 from Existing Chainage km 107+850 to km 126+315 (Design Chainage km 95+500 to km 111+850) 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.	Existing Chainage		Length (km)	EROW Width (m)	Remarks
	From	To			
1	107+850	108+050	200	10	
2	108+050	111+550	3500	NA	Bualpui Bypass
3	111+550	114+470	2920	10	
4	114+470	119+340	4870	NA	Kawnpui Bypass
5	119+340	126+315	6975	10	

3. Carriageway

The present carriageway of the Project Highway width is 7.0m. 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	107+850	108+050	200	7	
2	108+050	111+550	3500	NA	Bualpui Bypass
3	111+550	114+470	2920	7	
4	114+470	119+340	4870	NA	Kawnpui Bypass
5	119+340	126+315	6975	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)
		Foundation	Sub- structure	Superstructure		
NIL						

6. Grade separators

The Site includes the following grade separators:

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

7. Minor bridges

The Site includes the following Minor bridges:

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

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Existing Chainage (km)	Name of the crossing	Leads to		Remarks
			On LHS	On RHS	
Nil					

9. Underpasses (vehicular, non-vehicular)

The Site includes the following underpasses:

S. No.	Existing 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.	Km Stone Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width of Culvert (m)
1	109+300	Pipe	1 x 1.2	10
2	109+400	Pipe	1 x 0.9	10
3	110+700	Pipe	1 x 1.2	12.2
4	111+000	Pipe	1 x 0.9	10

S. No.	Km Stone Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width of Culvert (m)
5	111+700	Pipe	1 x 1.2	10
6	111+800	Pipe	1 x 0.9	9.5
7	112+300	Pipe	1 x 0.9	9.8
8	112+350	Pipe	1 x 0.9	10
9	112+370	Pipe	1 x 0.9	10
10	112+380	Pipe	1 x 1.2	10
11	112+400	Pipe	1 x 1.2	10
12	112+500	Pipe	1 x 0.9	10
13	112+700	Pipe	1 x 0.9	10
14	112+800	Pipe	1 x 0.9	9
15	113+100	Pipe	1 x 0.9	10
16	113+300	Pipe	1 x 0.9	10
17	113+600	Pipe	1 x 1.2	10.5
18	113+700	Pipe	1 x 0.9	10
19	**113+750**	RCC Slab	1 x 3	12
20	114+000	Pipe	1 x 0.9	10
21	114+100	Pipe	1 x 0.9	10
22	114+300	Pipe	1 x 1.2	10
23	114+500	Pipe	1 x 1.2	10
24	114+600	Pipe	1 x 1.2	11
25	114+900	Pipe	1 x 1.2	10.5
26	115+100	Pipe	1 x 0.9	10.5
27	115+500	Pipe	1 x 0.9	10
28	115+800	Pipe	1 x 0.9	11
29	116+000	Pipe	1 x 0.9	10
30	116+050	Pipe	1 x 0.9	10.5
31	116+200	Pipe	1 x 0.9	11
32	116+300	Pipe	1 x 0.9	9.5

S. No.	Km Stone Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width of Culvert (m)
33	116+350	Pipe	1 x 0.9	9.8
34	116+400	Pipe	1 x 1.2	9.8
35	116+500	Pipe	1 x 0.9	10.2
36	116+700	Pipe	1 x 0.9	9.5
37	116+700	Pipe	2 x 0.9	9.5
38	116+800	Pipe	1 x 0.9	10.5
39	117+000	Pipe	2 x 0.9	10.5
40	117+050	Pipe	2 x 0.9	10.5
41	117+200	Pipe	1 x 0.9	10.5
42	117+400	Pipe	1 x 1.2	10
43	117+700	Pipe	1 x 0.9	9
44	117+750	Pipe	1 x 0.9	10
45	117+800	Pipe	1 x 0.9	10
46	118+100	RCC Slab	1 x 1.2	13
47	118+150	Pipe	2 x 0.9	17
48	118+300	Pipe	2 x 0.9	16
49	118+400	Pipe	1 x 1.2	11
50	118+600	Pipe	2 x 1.2	13
51	119+100	Pipe	2 x 1.2	14
52	119+300	Pipe	1 x 0.9	12
53	119+600	Pipe	1 x 0.9	13
54	119+700	Pipe	2 x 1.2	13
55	119+750	Pipe	1 x 0.9	13
56	119+800	Pipe	1 x 0.9	13
57	120+100	Pipe	1 x 0.9	12
58	120+300	Pipe	1 x 0.9	12
59	120+900	Pipe	1 x 0.9	11
60	121+300	Pipe	1 x 0.9	13

S. No.	Km Stone Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width of Culvert (m)
61	121+350	Pipe	1 x 0.9	13
62	121+400	Pipe	1 x 1.2	13
63	121+500	Pipe	1 x 0.9	12
64	121+600	Pipe	1 x 0.9	13
65	122+300	Pipe	1 x 0.9	12.8
66	122+400	Pipe	1 x 0.9	12.7
67	123+000	Pipe	1 x 0.9	12.7
68	123+200	Pipe	1 x 1.2	12.8
69	123+600	Pipe	1 x 1.2	12.3
70	124+700	Pipe	1 x 1.2	12.5
71	124+900	Pipe	1 x 1.2	12.6
72	125+100	Pipe	1 x 1.2	12.2
73	125+200	Pipe	1 x 1.2	12.3
74	125+450	Pipe	1 x 1.2	12.1
75	125+700	Pipe	1 x 1.2	12.1
76	126+300	Pipe	1 x 1.2	12.1
*77	126+500	Pipe	1 x 1.2	12.20
*78	126+600	Pipe	1 x 1.2	12.30
*79	126+700	Pipe	1 x 1.2	12.30
*80	127+000	Pipe	1 x 1.2	12.30
*81	127+200	Pipe	1 x 1.2	12.40

11. Bus bay:

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

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

13. Roadside drains

The details of the roadside drains are as follows:

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

14. Major Junctions

Details of major junctions are as follow.

Sl. No.	Location		At Grade	Category of crossroad	Remarks
	Ex. Chainage	Name of junction			
1	122+750	Aizawl via Durtlang	Y	BRO Road	-

(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	108+788	BT Road	Y	RHS	Village Road
2	109+006	ER Road	Y	RHS	Village Road
3	109+082	ER Road	T	RHS	Village Road
4	109+188	ER Road	T	LHS	Village Road
5	109+318	ER Road	Y	RHS	Village Road
6	109+493	ER Road	Y	RHS	Village Road
7	109+651	ER Road	Y	RHS	Village Road
8	109+767	BT Road	Y	RHS	Village Road
9	110+071	BT Road	Y	LHS	Village Road
10	110+080	BT Road	Y	RHS	Village Road
11	110+097	ER Road	T	LHS	Village Road

Sl. No.	Existing Chainage	Type of Road (BT, CC, Gr.)	Type of Junctions (T, Y,+)	Side	Type of Road (SH/ MDR/ PMGSY/ VR)
12	110+148	BT Road	Y	RHS	Village Road
13	110+441	ER Road	Y	LHS	Village Road
14	110+600	ER Road	Y	LHS	Village Road
15	110+656	ER Road	Y	RHS	Village Road
16	111+541	BT Road	Y	LHS	Village Road
17	111+600	ER Road	Y	RHS	Village Road
18	111+694	ER Road	Y	LHS	Village Road
19	113+930	ER Road	Y	LHS	Village Road
20	114+024	ER Road	Y	RHS	Village Road
21	114+365	ER Road	Y	RHS	Village Road
22	115+300	BT Road	Y	LHS	Village Road
23	115+726	ER Road	Y	RHS	Village Road
24	116+285	BT Road	T	LHS	Village Road
25	116+544	ER Road	Y	RHS	Village Road
26	116+766	ER Road	Y	LHS	Village Road
27	116+918	ER Road	X	BOTH	Village Road
28	117+352	BT Road	X	BOTH	Mualvum Rd
29	117+430	ER Road	Y	RHS	Village Road
30	117+509	BT Road	Y	LHS	Village Road
31	117+600	BT Road	X	BOTH	Village Road
32	117+700	BT Road	Y	LHS	Village Road
33	117+735	ER Road	T	LHS	Village Road
34	117+912	BT Road	Y	RHS	Village Road
35	118+060	ER Road	Y	RHS	Village Road
36	118+064	ER Road	Y	RHS	Village Road
37	118+413	ER Road	Y	RHS	Village Road
38	118+619	ER Road	T	LHS	Village Road

Sl. No.	Existing Chainage	Type of Road (BT, CC, Gr.)	Type of Junctions (T, Y,+)	Side	Type of Road (SH/ MDR/ PMGSY/ VR)
39	119+364	BT Road	Y	LHS	Village Road
40	122+142	BT Road	Y	RHS	Village Road

16. Bypasses

The details of the bypasses are as follows:

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

17. Other Structures

Nil

18. Details of Existing Utilities Schedule

The existing utilities schedules as below,

18.1 Electrical Utilities

The Site includes the following Electrical Utilities: -

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

Extra High-Tension Lines (EHT LINES)							
S.No	Chainage		Length of line (km)		Nos. of Crossings		Remarks
			Maintained by P&E Department		Maintained by P&E Department		
	From	To	400KV	132KV	400KV	132KV	
1	96+600	96+900		0.08		1	
2	98+000	98+700		0.25		1	
3	101+600	102+100		.550(1)		1	
4	103+800	104+000		.250(1)			
6	105+000	105+350		0.2		1	Tower is outside of PROW; however, conductor is crossing across the ROW.
7	108+900	109+200		.150 (1)		1	

Extra High-Tension Lines (EHT LINES)							
S.No	Chainage		Length of line (km)		Nos. of Crossings		Remarks
			Maintained by P&E Department		Maintained by P&E Department		
	From	To	400KV	132KV	400KV	132KV	
8	109+700	109+750		0 (1)			Tower exist within ROW but there is no conductor exist.

Note: (1) denotes Number ***of pole/tower***

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

Package -6															Remarks
High Tension/ Low Tension Lines (HT/LT LINES)															
Sl.No	Chainage		Length of line(km)			Nos. of Crossings							Transformer		
	From	To	HT 33 KV MFP	HT 33 KV	LT 11 KV	LT 440 V	LT 11 KV PHED	HT 33 KV MFP	HT 33 KV	LT 11 KV	LT 440 V	LT 11 KV PHED	No	Capacity	
1	95+500	96+000		.150(1)					1						
2	97+000	98+000													One no of LT pole is affected 97+360
3	98+500	99+000		.600(4)		.500 (8)			1		1				
4	99+000	99+500		.100(1)		.200 (4)									
5	99+500	100+000			0.35(1)	.500 (9)				1					
6	100+000	100+500		.350(3)	.550(6)	.550 (15)				1	1				
7	100+500	101+100		.350(2)	.09 (2)	.100 (1)			1						
8	101+100	101+5000			.450(1)	.450 (11)									LT 440V & LT 11KV is going along the Existin

Package -6															
High Tension/ Low Tension Lines (HT/LT LINES)															Remarks
Sl.No	Chainage		Length of line(km)			Nos. of Crossings							Transformer		
	From	To	HT 33 KV MFP	HT 33 KV	LT 11 KV	LT 440 V	LT 11 KV PHED	HT 33 KV MFP	HT 33 KV	LT 11 KV	LT 440 V	LT 11 KV PHED	No	Capacity	
															g Road i.e., project road
9	101+500	102+100		.500(2)	.400(4)	.350 (7)			1						
10	103+500	104+000		0.2 (1)											HT 33KV is not in our ROW needs to be shifted due to clearance between this tower and 132KV tower.
11	104+000	104+200		.100(1)											Since, 132KV to be shifted hence, this tower also needs to be shifted.
12	105+700	106+000	.200(1)			.250 (3)	.300 (2)								
13	106+000	106+500	.350(3)	.300(3)	.300(3)		.350 (4)		1	2					
14	106+500	107+000	.450(3)		.09 (1)		.450 (4)	2		1		2			
15	107+000	108+000	.500(4)		.150(1)	.630 (10)	.300 (2)	1		1		1			

Package -6															Remarks
High Tension/ Low Tension Lines (HT/LT LINES)															
Sl.No	Chainage		Length of line(km)			Nos. of Crossings							Transformer		
	From	To	HT 33 KV MFP	HT 33 KV	LT 11 KV	LT 440 V	LT 11 KV PHED	HT 33 KV MFP	HT 33 KV	LT 11 KV	LT 440 V	LT 11 KV PHED	No	Capacity	
16	108+000	109+000	.950(7)		0.15	.150 (4)	1(6)	1		1		1	1		1 Transformer will affect due to this.
17	109+000	110+000	1(7)				1(6)	3				2			
18	110+000	111+000	1(5)				1(5)	2				3			one line of PHED is coming from lungdai and crossing at 110+850
19	111+000	111+800	.500(2)				.350 (2)	1				1			

*Note: (1) denotes Number **of pole/tower***

MFP- Mega Food Plaza. PHED- Public Health Engineering Dept.

18.2 Public Health Utilities (Water/Sewage Pipelines)

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

(b)

S.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	95+500	95+800		0.8	NIL				NIL		125mm dia pipe

2	98+500	100+500		2.65			1		150mm dia pipe
3				0.1					50mm dia pipe
4				0.585					40mm dia pipe
5	101+000	101+900		1.3					150mm dia pipe

(c) Bore well/Hand Pump within Row :-

Sl. No.	Bore Well		Hand Pump	
	Chainage	Nos	Chainage	Nos
1			98+680	1

(d) Water Tank within RoW:-Nil

18.3 Any Other Lines

No.

Annex - II

(As per Clause 8.3 (i))

(Schedule-A)

Dates for providing Right of Way.

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

(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)	95+740	95+770	30	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	95+770	95+910	140	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	95+910	95+990	80	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	95+990	96+060	70	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	96+060	96+370	310	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	96+370	96+700	330	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	96+700	96+800	100	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	96+800	96+900	100	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	96+900	97+000	100	55	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	97+000	97+020	20	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	97+020	97+660	640	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	97+660	98+100	440	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	98+100	98+180	80	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	98+180	98+470	290	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	98+470	98+640	170	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	98+640	98+660	20	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	100+480	100+740	260	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	100+740	100+850	110	45	Within 30 Days of Appointed Date

Sl.No.	Design Chainage (km)		Length (m)	Width (m)	Date of Providing ROW
	From	To			
(i) Full Right of Way (full width)	100+850	100+970	120	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	100+970	101+060	90	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	101+710	101+870	160	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	101+870	101+940	70	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	101+940	102+060	120	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	102+060	102+130	70	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	102+130	102+250	120	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	102+250	102+400	150	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	102+400	102+550	150	70	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	102+550	102+590	40	65	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	102+590	102+720	130	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	102+720	102+830	110	55	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	102+830	103+020	190	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	103+020	103+170	150	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	103+170	103+410	240	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	103+410	103+960	550	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	103+960	104+070	110	55	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	104+070	104+350	280	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	104+350	104+750	400	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	104+750	104+990	240	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	104+990	105+090	100	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	105+090	105+110	20	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	105+110	105+180	70	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	105+180	105+300	120	40	Within 30 Days of Appointed Date

Sl.No.	Design Chainage (km)		Length (m)	Width (m)	Date of Providing ROW
	From	To			
(i) Full Right of Way (full width)	105+300	105+430	130	60	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	105+430	105+550	120	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	105+550	105+740	190	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	107+140	107+210	70	55	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	107+810	107+920	110	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	107+920	107+890	-30	75	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	108+230	108+280	50	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	108+600	108+760	160	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	108+840	108+960	120	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	109+300	109+370	70	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	109+370	109+450	80	55	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	109+450	109+470	20	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	109+470	109+670	200	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	109+690	109+800	110	65	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	110+140	110+190	50	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	110+190	110+240	50	45	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	110+240	110+300	60	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	110+440	110+510	70	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	110+580	110+660	80	40	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	110+660	110+740	80	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	110+950	111+000	50	50	Within 30 Days of Appointed Date
(i) Full Right of Way (full width)	111+000	111+140	140	75	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)	95+500	95+550	50	5	On Appointed Date
(ii) Part Right of Way (part width)	95+550	95+730	180	10	On Appointed Date
(ii) Part Right of Way (part width)	95+730	95+740	10	10	On Appointed Date
(ii) Part Right of Way (part width)	98+660	98+760	100	10	On Appointed Date
(ii) Part Right of Way (part width)	98+760	98+940	180	10	On Appointed Date
(ii) Part Right of Way (part width)	98+940	99+260	320	10	On Appointed Date
(ii) Part Right of Way (part width)	99+260	99+280	20	10	On Appointed Date
(ii) Part Right of Way (part width)	99+280	99+380	100	10	On Appointed Date
(ii) Part Right of Way (part width)	99+380	99+570	190	10	On Appointed Date
(ii) Part Right of Way (part width)	99+570	99+710	140	10	On Appointed Date
(ii) Part Right of Way (part width)	99+710	99+790	80	5	On Appointed Date
(ii) Part Right of Way (part width)	99+790	99+990	200	10	On Appointed Date
(ii) Part Right of Way (part width)	99+990	100+020	30	10	On Appointed Date
(ii) Part Right of Way (part width)	100+020	100+130	110	10	On Appointed Date
(ii) Part Right of Way (part width)	100+130	100+250	120	10	On Appointed Date
(ii) Part Right of Way (part width)	100+250	100+350	100	10	On Appointed Date
(ii) Part Right of Way (part width)	100+350	100+420	70	10	On Appointed Date
(ii) Part Right of Way (part width)	100+420	100+480	60	10	On Appointed Date
(ii) Part Right of Way (part width)	101+060	101+070	10	10	On Appointed Date
(ii) Part Right of Way (part width)	101+070	101+140	70	10	On Appointed Date
(ii) Part Right of Way (part width)	101+140	101+290	150	10	On Appointed Date
(ii) Part Right of Way (part width)	101+290	101+430	140	10	On Appointed Date
(ii) Part Right of Way (part width)	101+430	101+710	280	10	On Appointed Date
(ii) Part Right of Way (part width)	105+740	106+090	350	10	On Appointed Date
(ii) Part Right of Way (part width)	106+090	106+120	30	10	On Appointed Date
(ii) Part Right of Way (part width)	106+120	106+290	170	10	On Appointed Date
(ii) Part Right of Way (part width)	106+290	106+430	140	10	On Appointed Date
(ii) Part Right of Way (part width)	106+430	106+530	100	10	On Appointed Date
(ii) Part Right of Way (part width)	106+530	106+730	200	10	On Appointed Date

Sl.No.	Design Chainage (km)		Length (m)	Width (m)	Date of Providing ROW
	From	To			
(ii) Part Right of Way (part width)	106+730	107+090	360	10	On Appointed Date
(ii) Part Right of Way (part width)	107+090	107+140	50	10	On Appointed Date
(ii) Part Right of Way (part width)	107+210	107+270	60	10	On Appointed Date
(ii) Part Right of Way (part width)	107+270	107+330	60	10	On Appointed Date
(ii) Part Right of Way (part width)	107+330	107+420	90	10	On Appointed Date
(ii) Part Right of Way (part width)	107+420	107+510	90	10	On Appointed Date
(ii) Part Right of Way (part width)	107+510	107+740	230	10	On Appointed Date
(ii) Part Right of Way (part width)	107+740	107+810	70	10	On Appointed Date
(ii) Part Right of Way (part width)	107+890	108+000	110	10	On Appointed Date
(ii) Part Right of Way (part width)	108+000	108+090	90	10	On Appointed Date
(ii) Part Right of Way (part width)	108+090	108+140	50	10	On Appointed Date
(ii) Part Right of Way (part width)	108+140	108+230	90	10	On Appointed Date
(ii) Part Right of Way (part width)	108+280	108+360	80	10	On Appointed Date
(ii) Part Right of Way (part width)	108+360	108+400	40	10	On Appointed Date
(ii) Part Right of Way (part width)	108+400	108+460	60	10	On Appointed Date
(ii) Part Right of Way (part width)	108+460	108+510	50	10	On Appointed Date
(ii) Part Right of Way (part width)	108+510	108+600	90	10	On Appointed Date
(ii) Part Right of Way (part width)	108+760	108+840	80	10	On Appointed Date
(ii) Part Right of Way (part width)	108+960	109+080	120	10	On Appointed Date
(ii) Part Right of Way (part width)	109+080	109+210	130	10	On Appointed Date
(ii) Part Right of Way (part width)	109+210	109+270	60	10	On Appointed Date
(ii) Part Right of Way (part width)	109+270	109+300	30	10	On Appointed Date
(ii) Part Right of Way (part width)	109+670	109+690	20	10	On Appointed Date
(ii) Part Right of Way (part width)	109+800	109+960	160	10	On Appointed Date
(ii) Part Right of Way (part width)	109+960	110+140	180	10	On Appointed Date
(ii) Part Right of Way (part width)	110+300	110+410	110	10	On Appointed Date
(ii) Part Right of Way (part width)	110+410	110+440	30	10	On Appointed Date
(ii) Part Right of Way (part width)	110+510	110+580	70	10	On Appointed Date
(ii) Part Right of Way (part width)	110+740	110+950	210	10	On Appointed Date
(ii) Part Right of Way (part width)	111+140	111+180	40	10	On Appointed Date
(ii) Part Right of Way (part width)	111+180	111+850	670	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)	95+500	95+550	50	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	95+550	95+730	180	30	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	95+730	95+740	10	30	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	98+660	98+760	100	40	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	98+760	98+940	180	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	98+940	99+260	320	45	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	99+260	99+280	20	60	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	99+280	99+380	100	40	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	99+380	99+570	190	30	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	99+570	99+710	140	25	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	99+710	99+790	80	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	99+790	99+990	200	30	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	99+990	100+020	30	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	100+020	100+130	110	50	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	100+130	100+250	120	55	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	100+250	100+350	100	40	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	100+350	100+420	70	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	100+420	100+480	60	30	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	101+060	101+070	10	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	101+070	101+140	70	55	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	101+140	101+290	150	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	101+290	101+430	140	55	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	101+430	101+710	280	40	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	105+740	106+090	350	60	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	106+090	106+120	30	70	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	106+120	106+290	170	70	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	106+290	106+430	140	45	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	106+430	106+530	100	55	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	106+530	106+730	200	60	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	106+730	107+090	360	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	107+090	107+140	50	45	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	107+210	107+270	60	45	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	107+270	107+330	60	35	Within 60 Days of Appointed Date

Sl.No.	Design Chainage (km)		Length (m)	Width (m)	Date of Providing ROW
	From	To			
(iii) Balance Right of Way (width)	107+330	107+420	90	45	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	107+420	107+510	90	30	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	107+510	107+740	230	40	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	107+740	107+810	70	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	107+890	108+000	110	65	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	108+000	108+090	90	30	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	108+090	108+140	50	60	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	108+140	108+230	90	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	108+280	108+360	80	60	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	108+360	108+400	40	70	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	108+400	108+460	60	45	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	108+460	108+510	50	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	108+510	108+600	90	50	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	108+760	108+840	80	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	108+960	109+080	120	55	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	109+080	109+210	130	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	109+210	109+270	60	55	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	109+270	109+300	30	35	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	109+670	109+690	20	40	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	109+800	109+960	160	45	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	109+960	110+140	180	25	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	110+300	110+410	110	40	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	110+410	110+440	30	30	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	110+510	110+580	70	30	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	110+740	110+950	210	40	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	111+140	111+180	40	65	Within 60 Days of Appointed Date
(iii) Balance Right of Way (width)	111+180	111+850	670	40	Within 60 Days of Appointed Date

Annex - III

(Schedule-A)

Alignment Plans

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

(i) The alignment of the Project Highway is enclosed in alignment plan. Finished road level indicated in the alignment plan shall be followed by the 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.

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

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.

Annex - I

(Schedule-B)

Description of Project Road (4-Laning)

Site of the Four-lane divided Project Highway comprises the section of National Highway No. 6, from Sethawn to N. Kawnpui section (Package-6) of NH-6 from Existing Chainage km 107+850 to km 126+315 (Design Chainage km 95+500 to km 111+850) 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	95+500	468404.0874	2666711.9647
End of Project Road	111+850	467800.4543	2651473.9897

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 shoulders 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.

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

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	Bualpui Bypass	108+050	111+550	3500	95+700	98+700	3000
2	Kawnpui Bypass	114+470	119+340	4870	101+600	105+800	4200
	Total			**8370**			**7200**

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	107+800	107+950	150	95+460	95+600	Geometric Improvement	140
2	112+340	112+410	70	99+470	99+530		60
3	112+580	112+720	140	99+710	99+840		130
4	113+290	113+900	610	100+410	101+060		650
5	114+300	114+450	150	101+440	101+570		130
6	121+400	121+610	210	107+790	107+930		140
7	122+310	122+520	210	108+630	108+770		140
8	122+600	122+760	160	108+870	108+950		80
9	122+920	123+060	140	109+080	109+200		120

10	123+130	123+360	230	109+290	109+460		170
11	123+460	123+910	450	109+580	109+870		290
12	124+020	125+050	1030	109+980	110+760		780
13	125+250	125+550	300	110+950	111+170		220
Total Length (m)			**3850**				**3050**

c) Also, if any, in the existing horizontal and vertical profiles shall be corrected as per the 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**

(a) Paved shoulder shall be provided as per enclosed (below) typical cross section.

(b) 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).

(c) 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/Flyovers**

Lateral and vertical clearances at Underpasses/Flyovers 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 (Km)	Span arrangement and Vertical clearance	Remarks
NIL			

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

(vii) **Laterals and Vertical Clearance at Overpasses**

a) Lateral and Vertical clearances at over passes shall be as per paragraph 2.11 of the IRC SP 84-2019.

b) Lateral clearance: The size of the opening at the overpasses shall be as follows:

Sl. No.	Location (Chainage) (from km to km)	Span/ opening (m)	Remarks
NIL			

c) Vertical 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 /Slip Road

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

Details of Service Road/Slip Road

Sl. No.	Location of service road (from km to km)	Right hand side (RHS)/Left hand side (LHS)/ or Both sides	Length (km) of service road
NIL			

Note:

(i) 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.

(ii) 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.

(iii) 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.

(iv) 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

a) 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 clear Spans (m)	Approach gradient	Remarks if Any
Nil					

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

Sl. No.	Location	Type of structure Length (m)	Cross road at			Remarks, if any
			Existing Level	Raised Level	Lowered Level	
Nil						

X. Cattle and pedestrian underpass / overpass

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

Sl. 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						
95+500	95+600	100	-	New Alignment	Open Area	TCS 1	Geometric Improvement
95+600	95+700	100	7	Following existing alignment	Open Area	TCS 1	
95+700	95+990	290	-	New Alignment	Open Area	TCS 1	Bualpui Bypass
95+990	96+060	70	-	New Alignment	Open Area	TCS 5	Bualpui Bypass

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
96+060	96+560	500	-	New Alignment	Open Area	TCS 1	Bualpui Bypass
96+560	96+620	60	-	New Alignment	Open Area	TCS 3	Bualpui Bypass
96+620	96+690	70	-	New Alignment	Open Area	TCS 1	Bualpui Bypass
96+690	96+820	130	-	New Alignment	Open Area	TCS 5	Bualpui Bypass
96+820	96+880	60	-	New Alignment	Open Area	TCS 1	Bualpui Bypass
96+880	97+280	400	-	New Alignment	Open Area	TCS 5	Bualpui Bypass
97+280	97+410	130	-	New Alignment	Open Area	TCS 1	Bualpui Bypass
97+410	97+490	80	-	New Alignment	Open Area	TCS 4	Bualpui Bypass
97+490	98+080	590	-	New Alignment	Open Area	TCS 1	Bualpui Bypass
98+080	98+180	100	-	New Alignment	Open Area	TCS 5	Bualpui Bypass
98+180	98+430	250	-	New Alignment	Open Area	TCS 1	Bualpui Bypass
98+430	98+470	40	-	New Alignment	Open Area	TCS 3	Bualpui Bypass
98+470	98+700	230	-	New Alignment	Open Area	TCS 1	Bualpui Bypass
98+700	98+890	190	7	Following existing alignment	Open Area	TCS 1	
98+890	99+260	370	7	Following existing alignment	Open Area	TCS 3	
99+260	99+470	210	7	Following existing alignment	Open Area	TCS 5	
99+470	99+530	60	-	New Alignment	Open Area	TCS 5	Geometric Improvement
99+530	99+710	180	7	Following existing alignment	Open Area	TCS 1	
99+710	99+840	130	-	New Alignment	Open Area	TCS 5	Geometric Improvement
99+840	100+160	320	7	Following existing	Open Area	TCS 1	

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
				alignment			
100+160	100+310	150	7	Following existing alignment	Open Area	TCS 3	
100+310	100+410	100	7	Following existing alignment	Open Area	TCS 1	
100+410	100+500	90	-	New Alignment	Open Area	TCS 1	
100+500	100+680	180	-	New Alignment	Open Area	TCS 5	
100+680	101+060	380	-	New Alignment	Open Area	TCS 1	
101+060	101+130	70	7	Following existing alignment	Open Area	TCS 1	
101+130	101+330	200	7	Following existing alignment	Open Area	TCS 3	
101+330	101+440	110	7	Following existing alignment	Open Area	TCS 1	
101+440	101+570	130	-	New Alignment	Open Area	TCS 3	Geometric Improvement
101+570	101+600	30	7	Following existing alignment	Open Area	TCS 1	
101+600	101+930	330	-	New Alignment	Open Area	TCS 1	Kawnpui Bypass
101+930	102+590	660	-	New Alignment	Open Area	TCS 5	Kawnpui Bypass
102+590	102+830	240	-	New Alignment	Open Area	TCS 1	Kawnpui Bypass
102+830	102+920	90	-	New Alignment	Open Area	TCS 3	Kawnpui Bypass
102+920	103+000	80	-	New Alignment	Open Area	TCS 1	Kawnpui Bypass
103+000	103+050	50	-	New Alignment	Open Area	TCS 3	Kawnpui Bypass
103+050	103+150	100	-	New Alignment	Open Area	TCS 1	Kawnpui Bypass
103+150	103+320	170	-	New	Open Area	TCS 4	Kawnpui

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
				Alignment			Bypass
103+320	103+400	80	-	New Alignment	Open Area	TCS 1	Kawnpui Bypass
103+400	103+450	50	-	New Alignment	Open Area	TCS 3	Kawnpui Bypass
103+450	103+520	70	-	New Alignment	Open Area	TCS 1	Kawnpui Bypass
103+520	103+820	300	-	New Alignment	Open Area	TCS 4	Kawnpui Bypass
103+820	103+910	90	-	New Alignment	Open Area	TCS 1	Kawnpui Bypass
103+910	103+960	50	-	New Alignment	Open Area	TCS 4	Kawnpui Bypass
103+960	104+020	60	-	New Alignment	Open Area	TCS 1	Kawnpui Bypass
104+020	104+150	130	-	New Alignment	Open Area	TCS 4	Kawnpui Bypass
104+150	104+440	290	-	New Alignment	Open Area	TCS 1	Kawnpui Bypass
104+440	104+500	60	-	New Alignment	Open Area	TCS 4	Kawnpui Bypass
104+500	104+980	480	-	New Alignment	Open Area	TCS 1	Kawnpui Bypass
104+980	105+010	30	-	New Alignment	Open Area	TCS 4	Kawnpui Bypass
105+010	105+060	50	-	New Alignment	Open Area	TCS 1	Kawnpui Bypass
105+060	105+180	120	-	New Alignment	Open Area	TCS 5	Kawnpui Bypass
105+180	105+300	120	-	New Alignment	Open Area	TCS 1	Kawnpui Bypass
105+300	105+770	470	-	New Alignment	Open Area	TCS 5	Kawnpui Bypass
105+770	105+800	30	-	New Alignment	Open Area	TCS 1	Kawnpui Bypass
105+800	105+870	70	7	Following existing alignment	Open Area	TCS 1	
105+870	106+280	410	7	Following existing alignment	Open Area	TCS 4	
106+280	106+380	100	7	Following existing	Open Area	TCS 2	

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
				alignment			
106+380	106+630	250	7	Following existing alignment	Open Area	TCS 3	
106+630	106+710	80	7	Following existing alignment	Open Area	TCS 2	
106+710	106+940	230	7	Following existing alignment	Open Area	TCS 3	
106+940	107+280	340	7	Following existing alignment	Open Area	TCS 2	
107+280	107+380	100	7	Following existing alignment	Open Area	TCS 3	
107+380	107+450	70	7	Following existing alignment	Open Area	TCS 2	
107+450	107+500	50	7	Following existing alignment	Open Area	TCS 4	
107+500	107+790	290	7	Following existing alignment	Open Area	TCS 2	
107+790	107+930	140	-	New Alignment	Open Area	TCS 4	Geometric Improvement
107+930	108+000	70	7	Following existing alignment	Open Area	TCS 2	
108+000	108+090	90	7	Following existing alignment	Open Area	TCS 4	
108+090	108+200	110	7	Following existing alignment	Open Area	TCS 2	
108+200	108+290	90	7	Following existing alignment	Open Area	TCS 4	
108+290	108+360	70	7	Following existing alignment	Open Area	TCS 2	
108+360	108+520	160	7	Following	Open Area	TCS 5	

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
				existing alignment			
108+520	108+630	110	7	Following existing alignment	Open Area	TCS 2	
108+630	108+770	140	-	New Alignment	Open Area	TCS 5	Geometric Improvement
108+770	108+870	100	7	Following existing alignment	Open Area	TCS 2	
108+870	108+950	80	-	New Alignment	Open Area	TCS 4	Geometric Improvement
108+950	109+080	130	7	Following existing alignment	Open Area	TCS 2	
109+080	109+200	120	-	New Alignment	Open Area	TCS 2	Geometric Improvement
109+200	109+290	90	7	Following existing alignment	Open Area	TCS 2	
109+290	109+310	20	-	New Alignment	Open Area	TCS 2	Geometric Improvement
109+310	109+460	150	-	New Alignment	Open Area	TCS 5	Geometric Improvement
109+460	109+580	120	7	Following existing alignment	Open Area	TCS 2	
109+580	109+680	100	-	New Alignment	Open Area	TCS 4	Geometric Improvement
109+680	109+870	190	-	New Alignment	Open Area	TCS 2	Geometric Improvement
109+870	109+980	110	7	Following existing alignment	Open Area	TCS 2	
109+980	110+140	160	-	New Alignment	Open Area	TCS 2	Geometric Improvement
110+140	110+300	160	-	New Alignment	Open Area	TCS 5	Geometric Improvement
110+300	110+690	390	-	New Alignment	Open Area	TCS 2	Geometric Improvement
110+690	110+760	70	-	New Alignment	Open Area	TCS 4	Geometric Improvement
110+760	111+010	250	7	Following existing	Open Area	TCS 2	

Chainage (m)		Distance (m)	Existing CW	Const. Type	Area Type	TCS Type	Remarks
From	To						
				alignment			
111+010	111+850	840	7	Following existing alignment	Open Area	TCS 5	

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		Type of intersection	Type of Road (SH/ MDR/ ODR/ VR)	Remarks
	Design Chainage	Existing Chainage			
1	98+600	-	T	NH-6	RHS
2	101+840	-	Y	NH-6	RHS
3	106+180	119+765	Y	NH-6	RHS
4	108+700	122+750	T	BRO Road	LHS

(b) Minor Junction:

Sl. No.	Location		Type of intersection	Type of Road (SH/ MDR/ ODR/ VR)	Remarks
	Design Chainage	Existing Chainage			
1	95+745	108+100	Y	RHS	RHS-Bualpui
2	100+440	113+330	T	RHS	RHS-N.Kawnpui
3	108+270	122+000	Y	RHS	RHS-N.Mualvum

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 features	Minimum length of viaduct to be provided	Road to be carried over/under the structures
NIL				

4. ROAD EMBANKMENT AND CUT SECTION

(i) Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/ cuttings shall conform to the Specifications and Standards given in section 4 of the 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 pavement from (Design Chainages) Km 95+500 to Km 111+850 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.

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.

(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 constructed as per Section 6 of the IRC SP 84-2019, in entire length including drains and culverts required along the crossroads at junctions/ 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.

LHS				RHS		
Sl No	Chainage (m)		Length (m)	Chainage (m)		Length (m)
	From	To		From	To	
1	95+690	95+850	160	95+650	95+830	180
2	98+540	98+710	170	98+500	98+710	210
3	100+020	100+480	460	99+960	100+480	520
4	101+730	101+900	170			
5	106+110	106+280	170			
6	108+230	108+410	180			
7	108+650	108+740	90			
Total Length=			**1400**			**910**

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.

LHS				RHS		
Sl No	Chainage (m)		Length (m)	Chainage (m)		Length (m)
	From	To		From	To	
1	CR at 98+600		250	95+500	95+650	150
2	CR at 100+400		100	95+830	98+500	2670
3	CR at 101+840		470	98+710	99+960	1250
4	CR at 106+180		470	100+480	111+850	11370
5	CR at 108+300		100			
6	CR at 108+700		220			
Total Length=			**1610**			**15440**

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)		Length (m)
	From	To		From	To	
1	95+500	95+690	190			
2	95+850	95+970	120			
3	96+080	96+550	470			
4	96+950	97+180	230			
5	97+400	97+610	210			
6	97+830	98+400	570			
7	98+710	99+150	440			
8	99+600	100+020	420			
9	100+970	101+730	760			
10	101+900	102+060	160			
11	102+590	102+730	140			
12	102+920	103+290	370			
13	104+230	104+630	400			
14	105+170	105+530	360			
15	105+930	106+110	180			
16	106+380	106+520	140			
17	106+900	107+390	490			
18	107+630	108+000	370			
19	108+140	108+230	90			
20	108+520	108+650	130			
21	108+740	109+120	380			
22	109+460	109+820	360			
23	110+000	110+280	280			
24	110+510	110+760	250			

LHS				RHS		
Sl No	Chainage (m)		Length (m)	Chainage (m)		Length (m)
	From	To		From	To	
25	111+500	111+750	250			
Total Length=			**7760**			

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.

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

c) The following bridges shall be provided with footpaths:

Sl. No.	Location at km	Remarks
NIL		

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.

(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.	Km Stone Chainage (Km)	Design Chainage (Km)	Existing Type	Existing Span	Proposed Type	Proposed Span	Remarks
1	111+800	98+635	Pipe	1 x 0.9	BOX	1x2x2	
2	112+300	99+510	Pipe	1 x 0.9	BOX	1x2x2	
3	112+380	99+790	Pipe	1 x 1.2	BOX	1x2x2	
4	112+500	100+010	Pipe	1 x 0.9	BOX	1x2x2	
5	112+800	100+220	Pipe	1 x 0.9	BOX	1x2x2	
6	113+100	100+370	Pipe	1 x 0.9	BOX	1x2x2	
7	114+000	101+160	Pipe	1 x 0.9	BOX	1x2x2	
8	120+900	106+420	Pipe	1 x 0.9	BOX	1x2x2	
9	121+300	106+660	Pipe	1 x 0.9	BOX	1x2x2	
10	121+350	107+020	Pipe	1 x 0.9	BOX	1x2x2	
11	121+400	107+090	Pipe	1 x 1.2	BOX	1x2x2	
12	121+500	107+170	Pipe	1 x 0.9	BOX	1x2x2	
13	121+600	107+290	Pipe	1 x 0.9	BOX	1x2x2	
14	122+400	107+780	Pipe	1 x 0.9	BOX	1x2x2	
15	123+000	108+390	Pipe	1 x 0.9	BOX	1x2x2	
16	124+900	110+040	Pipe	1 x 1.2	BOX	1x2x2	
17	111+290	111+400	Pipe	1 x 1.2	BOX	1x3x3	

S. No.	Km Stone Chainage (Km)	Design Chainage (Km)	Existing Type	Existing Span	Proposed Type	Proposed Span	Remarks
18	111+400	111+480	Pipe	1 x 1.2	BOX	1x2x2	
19	111+480	111+595	Pipe	1 x 1.2	BOX	1x3x3	
20	111+720	111+720	Pipe	1 x 1.2	BOX	1x2x2	
21	111+820	111+820	Pipe	1 x 1.2	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	Existing Chainage (km)	Design Chainage (km)	Existing Type	Existing Span	Proposed Type	Proposed Span
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	-	95+880	BOX	1x2x2	
2	-	96+150	BOX	1x3x3	
3	-	96+255	BOX	1x2x2	
4	-	96+595	BOX	1x2x2	
5	-	96+730	BOX	1x3x3	
6	-	96+930	BOX	1x3x3	
7	-	97+070	BOX	1x3x3	
8	-	97+235	BOX	1x3x3	
9	-	97+345	BOX	1x3x3	
10	-	97+460	BOX	1x3x3	
11	-	97+640	BOX	1x2x2	

S. No.	Existing Chainage (Km)	Design Chainage (Km)	Proposed Type	Proposed Span	Remarks
12	-	97+820	BOX	1x2x2	
13	-	98+110	BOX	1x3x3	
14	-	98+240	BOX	1x2x2	
15	-	98+340	BOX	1x2x2	
16	-	98+445	BOX	1x2x2	
17	-	98+530	BOX	1x2x2	
18	-	98+780	BOX	1x2x2	
19	-	98+910	BOX	1x2x2	
20	-	99+070	BOX	1x2x2	
21	-	99+340	BOX	1x2x2	
22	-	100+540	BOX	1x2x2	
23	-	100+650	BOX	1x2x2	
24	-	100+800	BOX	1x2x2	
25	-	100+960	BOX	1x2x2	
26	-	101+300	BOX	1x2x2	
27	-	101+530	BOX	1x2x2	
28	-	101+800	BOX	1x2x2	
29	-	101+980	BOX	1x2x2	
30	-	1021+50	BOX	1x2x2	
31	-	102+250	BOX	1x2x2	
32	-	102+390	BOX	1x3x3	
33	-	102+510	BOX	1x3x3	
34	-	102+750	BOX	1x2x2	
35	-	102+880	BOX	1x2x2	
36	-	103+020	BOX	1x2x2	
37	-	103+180	BOX	1x3x3	
38	-	103300	BOX	1x3x3	
39	-	103420	BOX	1x3x3	

S. No.	Existing Chainage (Km)	Design Chainage (Km)	Proposed Type	Proposed Span	Remarks
40	-	103+550	BOX	1x2x2	
41	-	103+735	BOX	1x3x3	
42	-	103+935	BOX	1x3x3	
43	-	104+115	BOX	1x3x3	
44	-	104+220	BOX	1x2x2	
45	-	104+380	BOX	1x3x3	
46	-	104+480	BOX	1x3x3	
47	-	104+640	BOX	1x2x2	
48	-	104+730	BOX	1x2x2	
49	-	104+910	BOX	1x3x3	
50	-	105+140	BOX	1x3x3	
51	-	105+420	BOX	1x3x3	
52	-	105+510	BOX	1x2x2	
53	-	105+730	BOX	1x2x2	
54	-	105+910	BOX	1x2x2	
55	-	106+080	BOX	1x2x2	
56	-	106+260	BOX	1x2x2	
57	-	106+810	BOX	1x2x2	
58	-	107+475	BOX	1x2x2	
59	-	107+920	BOX	1x3x3	
60	-	108+190	BOX	1x2x2	
61	-	108+640	BOX	1x2x2	
62	-	108+750	BOX	1x2x2	
63	-	108+900	BOX	1x2x2	
64	-	109+140	BOX	1x2x2	
65	-	109+450	BOX	1x2x2	
66	-	109+685	BOX	1x2x2	
67	-	109+845	BOX	1x2x2	

S. No.	Existing Chainage (Km)	Design Chainage (Km)	Proposed Type	Proposed Span	Remarks
68	-	110+130	BOX	1x3x3	
69	-	110+290	BOX	1x2x2	
70	-	110+500	BOX	1x3x3	
71	-	110+650	BOX	1x2x2	
72	-	110+765	BOX	1x4x4	
73	-	110+990	BOX	1x2x2	
74	-	111+175	BOX	1x3x3	
75	-	111+290	BOX	1x3x3	

At Junction and Crossroads

Sl. No.	Design Chainage	Type	Span (m)	Minimum Vent Height (m)
1	98+200 (at Cross Road)	Box Culvert	1x2	2.0
2	101+840 (at Cross Road	Box Culvert	1x2	2.0
3	101+840 (at Cross Road)	Box Culvert	1x2	2.0
4	101+840 (at Cross Road	Box Culvert	1x2	2.0
5	106+180 (at Cross Road	Box Culvert	1x2	2.0
6	106+180 (at Cross Road)	Box Culvert	1x2	2.0
7	108+300(at Cross Road)	Box Culvert	1x2	2.0
8	108+700 (at Cross Road)	Box Culvert	1x2	2.0

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.

- 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
NIL		

(iii) Bridges

a) Existing bridges to be re-constructed/widened/retain.

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

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

(ii) The following narrow bridges shall be widened:

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

(iii) The following bridges shall be retained with minor repair:

S. No.	Existing Chainage (km)	Proposed Chainage (km)	Existing Width (m)	Remarks
NIL				

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 84-2019and 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, if any

NIL

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:

Sl. No.	**Location at km**	**Remarks**
Nil		

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

Sl. 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:

- The proposed span arrangement of ROBs 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.
- ROBs 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 ROBs shall be constructed and maintained by the Contractor/ Concessionaire under supervision of the Railways.
- All expenditure related to construction, maintenance and supervision of ROBs (except plan and estimate (P&E) charges) shall be borne by the Contractor/ Concessionaire.
- During construction, at the location of the existing level crossing, diversion road with level crossing if any shall be suitably provided by the Contractor/ Concessionaire.

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 2.9 and 3 of this Annex-I.

(vi) Repairs and strengthening of bridges and structures.

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

(a) Bridges

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

(b) ROB / RUB

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

(c) Overpasses/Underpasses and other structures

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

(vii) List of Major Bridges and Structures

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

Sl. No.	Location
NIL	

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 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.

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

LHS					RHS			
Sl No	Chainage (m)		Length (m)	Height (m)	Chainage (m)		Length (m)	Height (m)
	From	To			From	To		
1	100+100	100+180	80	2	96+070	96+130	60	6
2	98+600 (at Cross Road)		200	2	96+350	96+580	230	4
3	101+840 (at Cross Road)		450	2	96+610	96+700	90	2
4	106+180 (at Cross Road)		450	2	96+760	96+910	150	4
5	108+300 (at Cross Road)		80	2	97+290	97+420	130	4
6	108+700 (at Cross Road)		110	2	97+490	97+620	130	2
7	-	-	-	-	97+650	98+050	400	2
8	-	-	-	-	98+170	98+420	250	2
9	-	-	-	-	98+460	98+590	130	2
10	-	-	-	-	98+650	98+800	150	2
11	-	-	-	-	98+800	99+300	500	4
12	-	-	-	-	100+410	100+510	100	2
13	-	-	-	-	100+560	100+610	50	6
14	-	-	-	-	100+860	101+020	160	2
15	-	-	-	-	101+020	101+860	840	4
16	-	-	-	-	101+860	101+940	80	2
17	-	-	-	-	102+060	102+140	80	6
18	-	-	-	-	102+160	102+310	150	2

19	-	-	-	-	102+600	102+840	240	6
20	-	-	-	-	102+880	103+170	290	8
21	-	-	-	-	103+210	103+270	60	6
22	-	-	-	-	103+300	103+410	110	8
23	-	-	-	-	103+420	103+630	210	4
24	-	-	-	-	103+750	103+920	170	4
25	-	-	-	-	103+950	104+090	140	8
26	-	-	-	-	104+120	104+200	80	2
27	-	-	-	-	104+240	104+360	120	6
28	-	-	-	-	104+390	104+450	60	2
29	-	-	-	-	104+500	104+870	370	2
30	-	-	-	-	105+170	105+200	30	8
31	-	-	-	-	105+200	105+320	120	2
32	-	-	-	-	105+430	105+590	160	6
33	-	-	-	-	105+690	105+890	200	4
34	-	-	-	-	106+160	106+400	240	6
35	-	-	-	-	106+400	106+410	10	2
36	-	-	-	-	106+430	106+740	310	6
37	-	-	-	-	106+840	107+000	160	2
38	-	-	-	-	107+050	107+270	220	6
39	-	-	-	-	107+330	107+420	90	2
40	-	-	-	-	107+510	107+810	300	2
41	-	-	-	-	107+910	108+600	690	6
42	-	-	-	-	108+740	108+870	130	2
43	-	-	-	-	108+930	109+120	190	6
44	-	-	-	-	109+120	109+280	160	6
45	-	-	-	-	109+280	109+370	90	2
46	-	-	-	-	109+460	109+580	120	6
47	-	-	-	-	109+690	109+810	120	4

48	-	-	-	-	109+300	109+420	120	2
49	-	-	-	-	110+840	110+920	80	2
50	-	-	-	-	111+180	111+250	70	4
51	-	-	-	-	111+400	111+460	60	4
Total Length (m)			**1370**		**Total Length (m)**		**9200**	

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 **47024sqmt** in **12039m** 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,

LHS				
Sl No	**Chainage (m)**		**Length (m)**	**Height (m)**
	From	**To**		
1	96+560	96+620	60	5
2	98+430	98+470	40	3
3	98+890	99+260	370	3

LHS				
Sl No	Chainage (m)		Length (m)	Height (m)
	From	To		
4	100+250	100+400	150	3
5	101+130	101+330	200	5
6	101+440	101+570	130	5
7	102+830	102+920	90	5
8	103+000	103+050	50	3
9	103+400	103+450	50	5
10	104+370	104+400	30	5
11	106+380	106+630	250	5
12	106+710	106+940	230	5
13	107+280	107+380	100	6
Total Length (m)			**1750**	

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.

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.

Reinforce Soil Slope					
Sl No	Chainage (m)		Length (m)	Height (m)	Side
	From	To			
1	95+990	96+060	70	12	LHS
2	96+690	96+820	130	13	LHS
3	96+880	97+280	400	15	LHS
4	98+080	98+180	100	14	LHS
5	99+260	99+530	270	18	LHS

Reinforce Soil Slope					
Sl No	**Chainage (m)**		**Length (m)**	**Height (m)**	**Side**
	From	**To**			
6	99+710	99+840	130	11	LHS
7	100+500	100+680	180	12	LHS
8	101+930	102+590	660	12	LHS
9	105+060	105+180	120	11	LHS
10	105+300	105+770	470	18	LHS
11	108+360	108+520	160	15	LHS
12	108+630	108+770	140	15	LHS
13	109+310	109+460	150	18	LHS
14	110+140	110+300	160	13	LHS
15	111+010	111+850	840	15	LHS
Total Length (m)			**3980**		

Reinforce Soil Wall					
Sl No.	**Chainage (m)**		**Length (m)**	**Height (m)**	**Side**
	From	**To**			
1	97+410	97+490	80	9	LHS
2	103+150	103+320	170	10	LHS
3	103+520	103+820	300	11	LHS
4	103+910	103+960	50	8	LHS
5	104+020	104+150	130	10	LHS
6	104+440	104+500	60	9	LHS
7	104+890	105+010	120	11	LHS
8	105+870	106+280	410	11	LHS
9	107+450	107+500	50	8	LHS
10	107+790	107+930	140	11	LHS
11	108+000	108+090	90	9	LHS

Reinforce Soil Wall					
Sl No.	**Chainage (m)**		**Length (m)**	**Height (m)**	**Side**
	From	**To**			
12	108+200	108+290	90	9	LHS
13	108+870	108+950	80	11	LHS
14	109+580	109+680	100	11	LHS
15	110+690	110+760	70	11	LHS
	Total Length (m)		**1940**		

Note: *The proposed locations are minimum and any change in length 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 1no/sqmt, 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 total fill slope using Erosion Control blanket system has been quantified for area of **10446sqmt** in **1762m** length.

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 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.

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)											
Sl.No	Chainage		Circuit/ DC/SC)	Type	Crossing (No.)		Poles		Conductor (Line Length)		Size of Cable	Remarks
	From	To			Over - Head	Under-Ground	Tower/ Truss/ Unipole	No.	km	Size		
1	96+600	96+900		HT132KV(P&E)	1		Tower		0.08	N/A	N/A	
2	98+000	98+400		HT132KV(P&E)	1		Tower		0.25	N/A	N/A	
3	101+600	102+100		HT132KV(P&E)	1		Tower	1	0.55	N/A	N/A	
4	103+800	104+000		HT132KV(P&E)			Tower	1	0.25	N/A	N/A	
5	104+200	104+400		HT132KV(P&E)			Tower		0.3	N/A	N/A	
6	105+000	105+350		HT132KV(P&E)	1		Tower		0.2	N/A	N/A	
7	108+900	109+200		HT132KV(P&E)	1		Tower	1	0.15	N/A	N/A	

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

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

High Tension/Low Tension Lines (HT/LT Lines)							
Sl	Types OF	Chainage	Circuit	Poles	Conductor	Cable	Crossings

.No.	Line			(TC/DC/ SC)			(Length of Line)				(Nos.)	
		From	To		Type	Nos.	*km	Size	*km	Size	Over-Head	Under-Ground
1	HT 33KV Mega Food Plaza	105+700	106+000		Rail pole /Joss pole	33	0.2	N/A	0.2	N/A		
2		106+000	106+500				0.35	N/A	0.35	N/A		
3		106+500	107+000				0.45	N/A	0.45	N/A	2	
4		107+000	108+000				0.5	N/A	0.5	N/A	1	
5		108+000	109+000				0.95	N/A	0.95	N/A	1	
6		109+000	110+000				1	N/A	1	N/A	3	
7		110+000	111+000				1	N/A	1	N/A	2	
8		111+000	111+800				0.5	N/A	0.5	N/A	1	
9	HT 33KV P&E Department	95+500	96+000		Rail pole /Joss pole	18	0.15	N/A	0.15	N/A	1	
10		98+500	99+000				0.6	N/A	0.6	N/A	1	
11		99+000	99+500				0.1	N/A	0.1	N/A		
12		100+000	100+500				0.35	N/A	0.35	N/A		
13		100+500	101+100				0.35	N/A	0.35	N/A	1	
14		101+500	102+100				0.5	N/A	0.5	N/A	1	
15		103+500	104+000				0.2	N/A	0.2	N/A		
16		104+000	104+200				0.1	N/A	0.1	N/A		
17		106+000	106+500				0.3	N/A	0.3	N/A	1	
18	LT 11KV P&E Department	99+500	100+000		Joss pole	25	0.35	N/A	0.35	N/A	1	
19		100+000	100+500				0.55	N/A	0.55	N/A	1	
20		100+500	101+100				0.09	N/A	0.09	N/A		
21		101+100	101+50				0.45	N/A	0.45	N/A		

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

Sl .No.	Types OF Line	Chainage		Circuit (TC/DC/ SC)	Poles		Conductor (Length of Line)		Cable		Crossings (Nos.)	
		From	To		Type	Nos.	*km	Size	*km	Size	Over-Head	Under-Ground
			0									
22		101+500	102+100				0.4	N/A	0.4	N/A		
23		106+000	106+500				0.3	N/A	0.3	N/A	2	
24		106+500	107+000				0.09	N/A	0.09	N/A	1	
25		107+000	108+000				0.15	N/A	0.15	N/A	1	
26		108+000	109+000				0.15	N/A	0.15	N/A	1	
27	LT 440V P&E Department	98+500	99+000			77	0.5	N/A	0.5	N/A	1	
28		99+000	99+500				0.2	N/A	0.2	N/A		
29		99+500	100+000				0.5	N/A	0.5	N/A		
30		100+000	100+500				0.55	N/A	0.55	N/A	1	
31		100+500	101+100				0.1	N/A	0.1	N/A		
32		101+100	101+500				0.45	N/A	0.45	N/A		
33		101+500	102+100				0.35	N/A	0.35	N/A		
34		105+700	106+000				0.25	N/A	0.25	N/A		
35		107+000	108+000				0.63	N/A	0.63	N/A		
36		108+000	109+000				0.15	N/A	0.15	N/A		
37	LT 11KV PHED Department	105+700	106+000		Rail pole /Joss pole	34	0.3	N/A	0.3	N/A		
38		106+000	106+500				0.35	N/A	0.35	N/A		
39		106+500	107+00				0.45	N/A	0.45	N/A	2	

High Tension/Low Tension Lines (HT/LT Lines)												
Sl .No.	**Types OF Line**	**Chainage**		**Circuit (TC/DC/ SC)**	**Poles**		**Conductor (Length of Line)**		**Cable**		**Crossings (Nos.)**	
		From	**To**		**Type**	**Nos.**	***km**	**Size**	***km**	**Size**	**Over-Head**	**Under-Ground**
			0									
40		107+000	108+000				0.3	N/A	0.3	N/A	1	
41		108+000	109+000				1	N/A	1	N/A	1	
42		109+000	110+000				1	N/A	1	N/A	2	
43		110+000	111+000				1	N/A	1	N/A	3	
44		111+000	111+800				0.35	N/A	0.35	N/A	1	

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. No.	**Chainage**		**Type of Lines, Pressure/ under Gravity**	**Pipe**			**Sluice Valves**	**Crossings**		**Remarks**
	From	**To**		**Type**	**No. of pipelines**	**Size**	**Nos.**	**Nos.**	**Length**	
1	95+500	95+800	Gravity	Galvanized iron	2	125mm				125mm dia pipe
2	98+500	100+500	Gravity	Galvanized iron	1	150mm		1		150mm dia pipe
3			Gravity	Galvanized iron	1	50mm				50mm dia pipe
4			Gravity	Galvanized iron	1	40mm				40mm dia pipe

5	101+000	101+900	Gravity	Galvanized iron	1	150mm				150mm dia pipe

(b) **Bore well/Hand Pump within ROW**

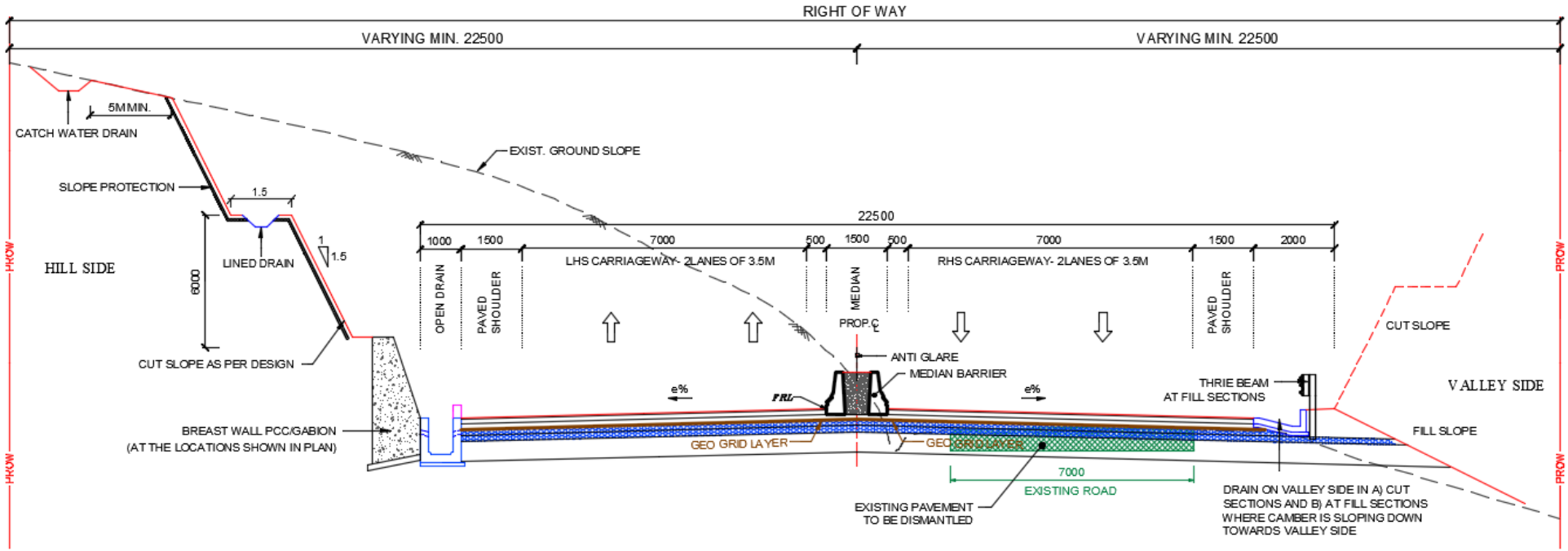
Sl. No.	Bore Well		Hand Pump	
	Chainage	Nos	Chainage	Nos
1			98+680	1

(c) **Water Tank –Nil**

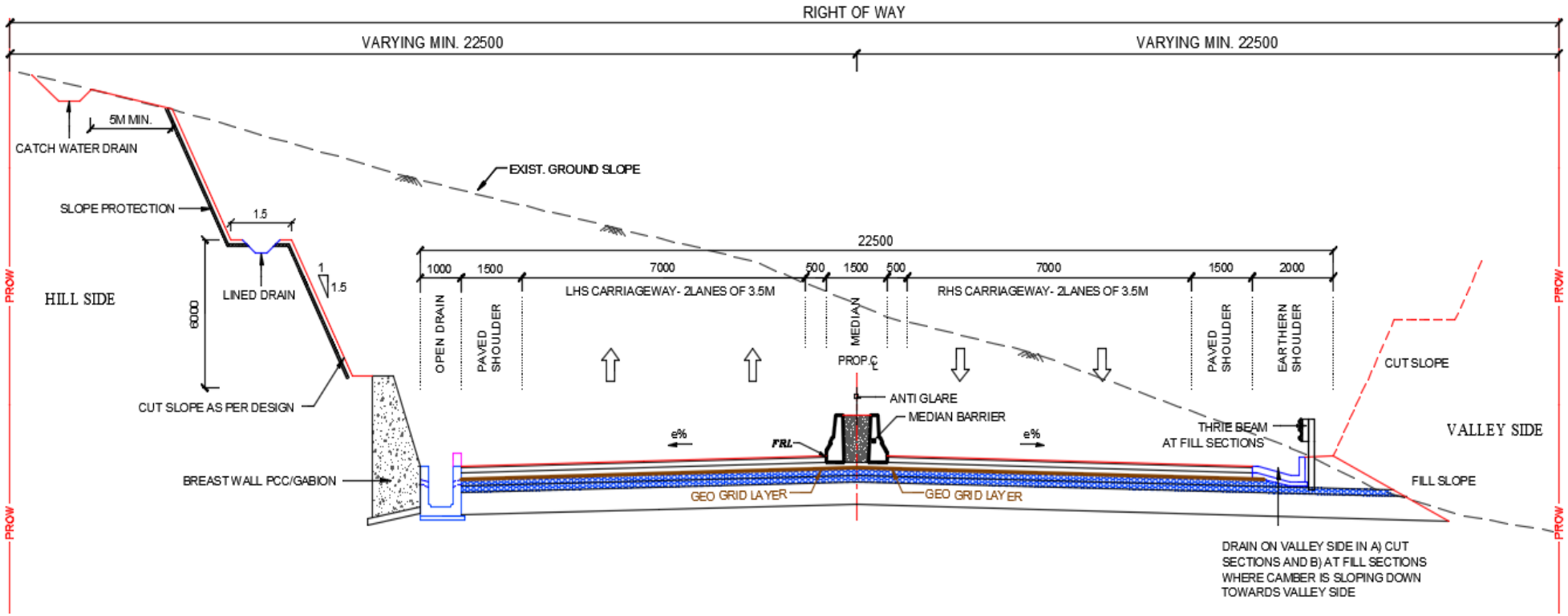
15.4 Any Other Lines- No

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

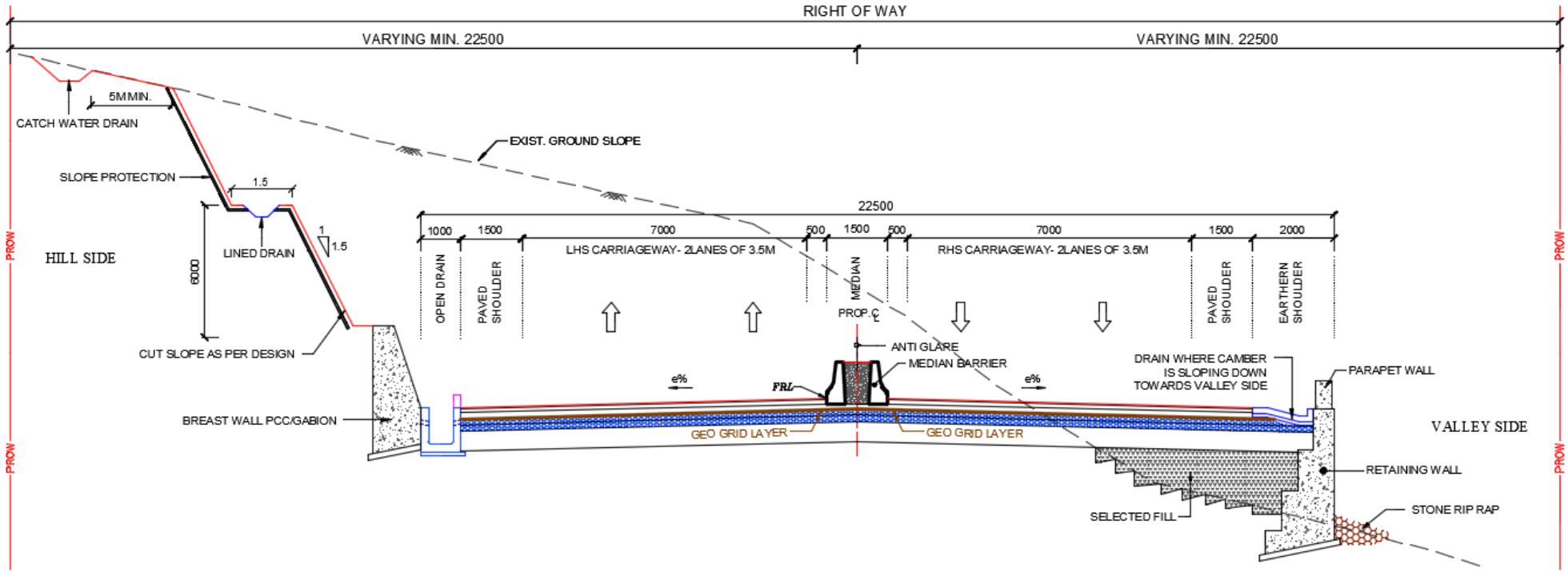
Typical Cross-section along the Project Highway



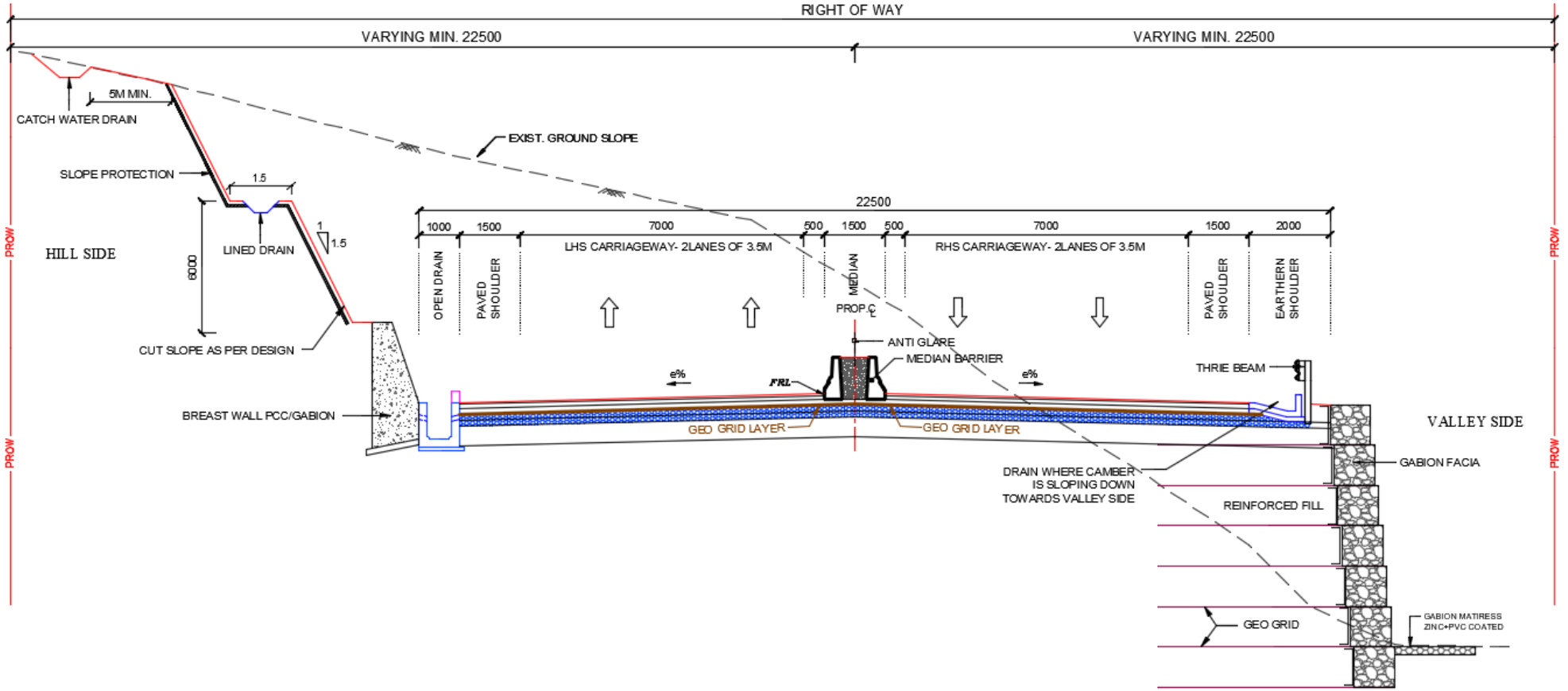
TCS-1: 4-Lane Divided Highway with Breast Wall on Hill Side and Cut/Fill on Valley Side at existing road locations



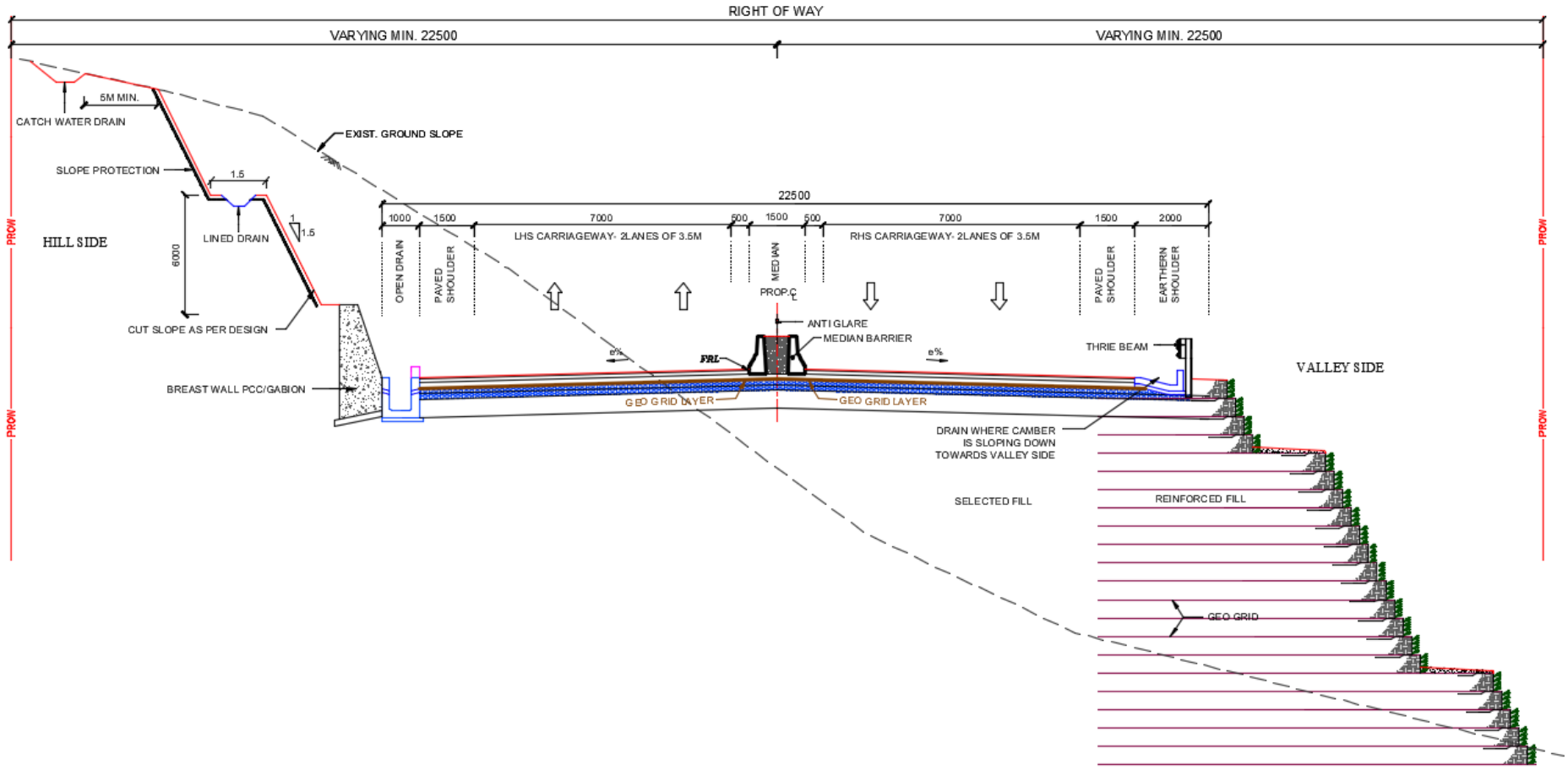
TCS-2: 4-Lane divided highway with Breast Wall on Hill Side and Cut/Fill on Valley Side at Bypass/Re-alignment locations



TCS-3: 4-Lane divided highway with Breast Wall on Hill Side and Retaining Wall on Valley Side



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



TCS-5: 4-Lane divided highway with Breast Wall on Hill Side and Reinforced Soil Slope on Valley Side

Schedule-C

SCHEDULE - C

(See Clause 2.1)

PROJECT FACILITIES

1 Project Facilities

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

LHS				RHS		
Sl No	Chainage (m)		Length (m)	Chainage (m)		Length (m)
	From	To		From	To	
1	95+620	95+710	90	102+350	102+580	230
2	95+970	96+080	110	104+870	105+000	130
3	96+140	96+370	230	110+920	111+180	260
4	96+560	96+610	50			

LHS				RHS		
Sl No	Chainage (m)		Length (m)	Chainage (m)		Length (m)
	From	To		From	To	
5	96+670	97+310	640			
6	97+400	97+520	120			
7	97+610	97+660	50			
8	97+740	97+840	100			
9	98+030	98+240	210			
10	98+330	98+540	210			
11	98+760	98+780	20			
12	98+900	99+600	700			
13	99+710	100+020	310			
14	100+150	100+980	830			
15	101+140	101+340	200			
16	101+440	101+570	130			
17	101+690	102+590	900			
18	102+740	104+240	1500			
19	104+360	104+500	140			
20	104+640	107+120	2480			
21	107+230	107+650	420			
22	107+800	107+930	130			
23	108+010	108+280	270			
24	108+360	108+520	160			
25	108+620	108+950	330			
26	109+120	109+150	30			
27	109+300	109+460	160			
28	109+590	109+690	100			
29	109+830	110+570	740			
30	110+670	111+850	1180			
Total Length (m)			**12540**			**620**

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.

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	-	100+120	RHS
2	-	100+190	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	95+800	LHS	
2	98+660	LHS	Bualpui
3	101+780	LHS	Kawnpui
4	106+240	LHS	
5	108+360	LHS	

Only Bus shelters shall be provided at below mentioned locations.

Sl. No.	Design Chainage	Side	Name Of Village
1	95+690	RHS	
2	98+550	RHS	Bualpui
3	100+360	RHS	
4	100+450	LHS	

Sl. No.	Design Chainage	Side	Name Of Village
5	101+780	RHS	
6	106+210	RHS	Kawnpui
7	108+260	RHS	
8	108+750	LHS	
9	108+650	RHS	

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 be treated as change of scope.

(f) Foot Over Bridges:

Foot Over Bridges shall be provided at the following locations:

Sl. No.	Location		Type of Road (SH/ MDR/ ODR/ VR)
	Design Chainage	Existing Chainage	
	95+745	108+100	RHS
1	98+600	-	NH-6
2	101+840	-	NH-6
3	106+180	119+765	NH-6
4	108+700	122+750	BRO Road

(g) Others to be specified.

i) Highway Lighting:

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

a. LED Lighting shall be provided at approach to bridges, Flyover, built up areas, toll plaza, Bus stops, truck Lay-byes and rest areas as per manual recommended in Schedule D.

b. Apart from above locations lighting shall be provided at underpasses and ROB/RUB and as per site condition in consultation with Engineer and shall not be treated as change of scope. On all grade separated structures Lightings will be provided on Top & Underside as per clause 3.3.4 & 12.3 of IRC SP 84.

c. 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.

ii) 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

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: 86-2019), referred to herein as the Manual]

Annex - I

(Schedule-D)

Specifications and Standards for Construction

1 Specifications and Standards

All Materials, works and construction operations shall conform to the manual of Specifications and Standards for 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.tfhrc.com/pavement/ltp/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

<table>
<tr><th rowspan="2">Asset Type</th><th rowspan="2">Performance Parameter</th><th colspan="2">Level of Service (LOS)</th><th rowspan="2">Frequency of Inspection</th><th rowspan="2">Tools/ Equipment</th><th rowspan="2">Standards and References for Inspection and Data Analysis</th><th rowspan="2">Time limit for Rectification/Repair</th><th rowspan="2">Maintenance Specifications</th></tr>
<tr><th>Desirable</th><th>Acceptable</th></tr>
<tr><td></td><td>Deflection/ Remaining Life</td><td></td><td></td><td>Annually</td><td>Falling Weight Deflectometer</td><td>IRC 115: 2014</td><td>180 days</td><td>IRC:115-2014</td></tr>
<tr><td rowspan="2">Rigid Pavement (Pavement of MCW, Service Road, Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)</td><td>Roughness BI</td><td>2200mm/km</td><td>2400mm/km</td><td>Bi-Annually</td><td>Class I Profilometer</td><td>ASTM E950 (98) :2004 and ASTM E1656 -94: 2000</td><td>180 days</td><td>IRC:SP:83-2008</td></tr>
<tr><td>Skid</td><td colspan="2">Skid Resistance no. at different speed of vehicles
<table><tr><th>Minimum SN</th><th>Traffic Speed (Km/h)</th></tr><tr><td>36</td><td>50</td></tr><tr><td>33</td><td>65</td></tr><tr><td>32</td><td>80</td></tr><tr><td>31</td><td>95</td></tr><tr><td>31</td><td>110</td></tr></table></td><td>Bi-Annually</td><td>SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)</td><td>IRC:SP:83-2008</td><td>180 days</td><td>IRC:SP:83-2008</td></tr>
<tr><td rowspan="5">Embankment/ Slope</td><td>Edge drop at shoulders</td><td>Nil</td><td>40mm</td><td>Daily</td><td rowspan="3">Length Measurement Unit like Scale, Tape, odometer etc.</td><td rowspan="5">IRC</td><td>7-15 days</td><td>MORT&H Specification 408.4</td></tr>
<tr><td>Slope of camber/cross fall</td><td>Nil</td><td><2% variation in prescribed slope of camber /cross fall</td><td>Daily</td><td>7-15 days</td><td>MORT&H Specification 408.4</td></tr>
<tr><td>Embankment Slopes</td><td>Nil</td><td><15 % variation in prescribe side slope</td><td>Daily</td><td>7-15 days</td><td>MORT&H Specification 408.4</td></tr>
<tr><td>Embankment Protection</td><td>Nil</td><td>Nil</td><td>Daily</td><td>NA</td><td>7-15 days</td><td>MORT&H Specification</td></tr>
<tr><td>Rain Cuts/ Gullies in slope</td><td>Nil</td><td>Nil</td><td>Daily Specially During Rainy Season</td><td>NA</td><td>7-15 days</td><td>MORT&H Specification</td></tr>
</table>

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 > lm. 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 > l 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, discernable from slow moving vehicle	Seal with epoxy, if L > 1 m. Within 7 days	Staple or dowel bar retrofit. Within 15days
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > l m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair with stapling. Within 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		Full Depth Repair Dismantle and reconstruct affected portion as per norms and specifications - See Para 5.6.4 Within 15 days
4	**Multiple Cracks intersecting with one or more joints**	**w = width of crack**	0	Nil, not discernible	No Action	-
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > l m. Within 15 days	
			2	w = 0.2 - 0.5 mm. discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, Reinstate subbase, Reconstruct whole slab as per
			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		
			3	w < 1.5 mm; L < 0.6 m, two corners broken	Partial Depth (Refer Figure 8.3 of IRC:SP: 83-2008) Within 15 days	Full depth repair
			4	w > 1.5 mm; L > 0.6 m or three corners broken		
			5	three or four corners broken		Reinstate sub-base, and reconstruct the slab as per norms and specifications within 30days
6	**Punchout (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)**	w = width of crack L = length (m/m2)	0	Nil, not discernible		No Action
			1	w < 0.5 mm; L < 3 m/m^2	Not Applicable, as it may be full depth	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		
			4	w > 3 mm, L < 3 m/m^2 and deformation		Full depth repair - Cut out and replace damaged area taking care not to damage reinforcement. Within 30days
			5	w > 3 mm, L > 3 m/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**	**Long Term**
					No action.	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**	**Long Term**
					No action.	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 mm	Reconstruct slab within 30 days	
9	**Polished Surface/Glazing**	t = texture depth, sand patch test	0		No action.	Not Applicable
			1	t > 1 mm		
			2 '	t = 1 - 0.6 mm	Monitor rate of deterioration	
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		
			5	t < 0.1 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 mm; h < 25 mm; n < 1 per 5 m^2	No action.	Not Applicable
			1	d = 50 - 100 mm; h < 50 mm; n < 1 per 5 m^2	Partial depth repair 65 mm deep. Within 15 days	
			2	d = 50 - 100 mm; h > 50 mm; n < 1 per 5 m^2		
			3	d = 100 - 300 mm; h < 100 mm n < 1 per 5 m^2	Partial depth repair 110mm i.e.10 mm more than the depth of the hole. Within 30 days	
			4	d = 100 - 300 mm; h > 100 mm; n < 1 per 5 m^2		
			5	d > 300 mm; h > 100 mm: n > 1 per 5 m^2	Full depth repair. Within 30 days	
Joint Defects						
11	**Joint Seal Defects**	loss or damage L = Length as % total joint length	0	Difficult to discern.	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	Discernible, L< 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	
			3	Notable. L > 25% insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days	
			5	Severe; w > 3 mm negligible protection against ingress of water 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 mm	Apply low viscosity epoxy resin/ mortar in cracked portion.	
			2	w = 10 - 20 mm, L < 25%		

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			**Short Term**	**Long Term**
			0	Nil, not discernible	No Action	
			1	h < 6 mm		
			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**
					No action.	scrabble
			1	h = 5 - 15 mm	Follow up.	
			2	h = 15 - 30 mm, Nos <20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Stabilise subgrade. Reinstate pavement at normal level if length < 20 m. Within 30 days	
			5	h > 100 mm		
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 < 3mm	**Short Term**	**Long Term**
					No action.	
			1	f = 3 - 10 mm	Spot repair of shoulder within 7 days	
			2	f = 10 - 25 mm		
			3	f = 25 - 50 mm	Fill up shoulder within 7 days	
			4	f = 50 - 75 mm		For any 100 m stretch Reconstruct shoulder, if affecting 25% or more of stretch. Within 30days
			5	f > 75 mm		
Drainage						
19	**Pumping**	quantity of fines and water expelled through open joints and cracks Nos	0	not discernible	No Action	
			1 to 2	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:

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td>Highway</td><td>Availability of Safe Sight Distance</td><td>As per IRC SP: 84-2014, a minimum of safe stopping sight distance shall be available throughout.
<table><tr><th>Design Speed, kmph</th><th>Desirable Minimum Sight Distance (m)</th><th>Safe Stopping Sight Distance (m)</th></tr><tr><td>100</td><td>360</td><td>180</td></tr><tr><td>80</td><td>260</td><td>130</td></tr></table></td><td>Monthly</td><td>Manual Measurements with Odometer along with video/ image backup</td><td colspan="2">Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments.
In case of permanent structure or design deficiency:
Removal of obstruction/improvement of deficiency at the earliest
Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.</td><td>IRC:SP 84-2014</td></tr>
<tr><td rowspan="3">Pavement Marking</td><td>Wear</td><td><70% of marking remaining</td><td>Bi-Annually</td><td>Visual Assessment as per Annexure-F of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect - within 2 months</td><td>IRC:35-2015</td></tr>
<tr><td>Day time Visibility</td><td>During expected life Service Time
Cement Road - 130mcd/m^2/lux
Bituminous Road - 100mcd/m^2/lux</td><td>Monthly</td><td>As per Annexure-D of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
<tr><td>Night Time Visibility</td><td><u>Initial and Minimum Performance for Dry Retro reflectivity during night time:</u>
<table><tr><td>Design Speed</td><td colspan="2">(RL) Retro Reflectivity (mcd/m^2/lux)</td></tr><tr><td></td><td>Initial (7 days)</td><td>Minimum Threshold level (TL) & warranty period required up to 2 years</td></tr><tr><td>Up to 65</td><td>200</td><td>80</td></tr><tr><td>65 - 100</td><td>250</td><td>120</td></tr><tr><td>Above 100</td><td>350</td><td>150</td></tr></table><u>Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):</u>
Initial 7 days Retro reflectivity: 100</td><td>Bi-Annually</td><td>As per Annexure-E of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
</table>

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.	hange 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	RC: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	RC 86:1983
	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	RC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2014 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:84-2014, IRC:35-2015

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

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

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 Delamination of concrete not more than 0.25 sq.m. Cracks wider than 0.3 mm not more than 1m aggregate length	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording the defects	Repairs to spalling, cracking, delamination, rusting shall be followed as per IRC: SP: 40-1993.	15 days	IRC SP 40-1993 and MORTH Specifications clause 2800
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Bridges including ROBs Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811
Bridge - Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach	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
					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.
Bridge Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection as per IRC SP:35-1990 using Mobile Bridge Inspection Unit. In case of doubt, use Underwater camera for inspection of deep wells in major Rivers.	Suitable protection works around pier/abutment	1 month	IRC SP: 40-1993, IRC 83-2014, MORTH specification 2500
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sq.m, damage to solid apron (concrete apron) not more than 1 sq.m	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching.	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of the contractor.							

Table 5: Maintenance Criteria for Hill Roads

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

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

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

A. Flexible Pavement

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

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	within15 (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

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

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

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.

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.

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.

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:

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

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

Annex - II

(Schedule - G)

(See Clause 19.2)

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

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).

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:

(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

Schedule-H

(See Clauses10.1 (iv) and 19.3)

1 Contract Price Weightages

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

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

S. no.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
1	Road works including culverts, widening and repair of culverts.	60.00%	**A - Widening and strengthening of existing road**	
			B.1 - Reconstruction/ New 2/4-lane realignment/bypass (Flexible pavement)	
			(1) Earthwork upto Subgrade top	40.00%
			(2) Subbase course	12.00%
			(3) Non bituminous base course	12.00%
			(4) Bituminous base	10.00%
			(5) Wearing coat	8.00%
			B.2 - Reconstruction/ New 2/4-lane realignment/bypass (Rigid Pavement)	
			C.1 - Reconstruction/ New Service road (flexible Pavement)	
			C.2 - Reconstruction/ New Service road (Rigid Pavement)	
			D. - Reconstruction/ New culverts on existing road and realignments, bypasses	18.00%
2	Other works	37.00%	(i) Toll plaza	0.00%
			(ii) Road side drains	12.50%
			(iii) Road signs, markings, km stones, safety devices etc.	23.00%
			(iv) Project facilities	
			(a) Bus Bay with Bus Shelter	0.50%
			(b) Truck lay bys	0.50%
			(c) others to specified	
			(i) Street light	0.50%
			(ii) Foot Over Bridges	1.00%

S. no.	Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
	1	2	3	4
			(iii) Rainwater harvesting	0.50%
			(iv) Junction improvement	2.00%
			(v) Protection works - - retaining wall / toe wall, breast wall etc.	
			a) Breast wall	
			i) PCC BW - 2m Ht.	9.50%
			ii) PCC BW -4m Ht.	5.50%
			iii) Gabion BW - 6m Ht.	7.00%
			iv) Gabion BW - 8m Ht.	1.50%
			b) Retaining wall	
			i) PCC RW - 3m Ht.	1.50%
			ii) Gabion RW - 5m Ht.	4.00%
			iii) Gabion RW - 6m Ht.	0.50%
			(vi) Side Slope Protection works Turfing and stone pitching	
			a) Cut slope protection soil nailing etc.	3.50%
			b) Fill Slope - Reinforced soil slope	18.00%
			c) Reinforced Soil wall	8.50%
3	Electrical utilities and public Health Utilities (Water pipe lines and sewage lines)	3.00%	(i) EHT line / (ii) EHT crossings	10.00%
			(iii) HT/ LT line / (iv) HT/ LT crossings	70.00%
			(v) Water pipeline / (vi) Water pipeline crossings	20.00%
			(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:

Table 1.3.1

Stage of Payment	Percentage -weightage	Payment Procedure
A - Widening and strengthening of existing road		

Stage of Payment	Percentage -weightage	Payment Procedure
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	40.00%	
(2) Subbase course (GSB)	12.00%	
(3) Non bituminous base course (WMM)	12.00%	
(4) Bituminous base (Prime, tack and DBM)	10.00%	
(5) wearing coat (Tack coat, BC)	8.00%	
B.2 - Reconstruction/ New 2/4-lane realignment/bypass (Rigid Pavement)		
C.1 - Reconstruction/ New Service Road (flexible Pavement)		
C.2 - Reconstruction/ New Service Road (Rigid Pavement)		
D. - Reconstruction/ New culverts	18.00%	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 Deleted

1.3.3 Deleted

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

Stage of Payment	Weightage	Payment Procedure
(i) Toll plaza	0.00%	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.
(ii) Road side drains	12.50%	
(iii) Road signs, markings, km stones, safety devices	23.00%	
(iv) Project Facilities		Payment shall be made on pro rata basis for completed facilities.
a) Bus bays with bus shelter	0.50%	
b) Truck lay-byes	0.50%	
c) Others to be specified		
(i) Street light	0.50%	
(ii) Foot Over Bridges	1.00%	
(iii) Rain Water Harvesting	0.50%	
(iv) Junctions improvement	2.00%	Unit of measurement is number, payment shall be made on pro rata basis on completion of stage in a number of not less than 10% (ten percent) of the total number.
(v) Protection works - - retaining wall / toe wall, breast wall etc.		
a) Breast wall		
i) PCC BW - 2m Ht.	9.50%	
ii) PCC BW -4m Ht.	5.50%	
iii) Gabion BW - 6m Ht.	7.00%	
iv) Gabion BW - 8m Ht.	1.50%	
b) Retaining wall		
i) PCC RW - 3m Ht.	1.50%	
ii) RCC RW - 5m Ht.	4.00%	
iii) RCC RW - 6m Ht.	0.50%	
(vi) Side Slope Protection works		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.	3.50%	
b) Fill Slope - Reinforced soil slope	18.00%	
c) Reinforced Soil wall	8.50%	

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

Stage of Payment	Weightage	Payment Procedure
(i) EHT line	10.00%	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) HTI LT line (including transformers if any)	70.00%	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) HTI 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	20.00%	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 pipe line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)
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.

Stage of Payment	Weightage	Payment Procedure
		Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipe line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)
(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

Schedule - I

(See Clause 10.2 (iv))

1 Drawings

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

2 Additional Drawings

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

Annex – I

(Schedule - I)

List of Drawings

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

a. Drawing of horizontal alignment, vertical profile and 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 **150th** (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 **270th** (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 **420th** (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 **540th** (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

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

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 cost in the presence of contractor's representative.

Sr. No.	Key metrics of Asset	Equipment to be used	Frequency of condition survey
1	Surface defects of pavement	Network 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)

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

Schedule-L

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 Sethawn - N. Kawnpui section (Package-6) of NH-6 from Existing Chainage km 107+850 to km 126+315 (Design Chainage km 95+500 to km 111+850) 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 safety and reliably placed in service of the Users thereof.

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

SIGNED, SEALED AND DELIVERED

For and on behalf of

The Authority's Engineer by:

(Signature)

(Name)

(Designation)

(Address)

Schedule-M

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**	
(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 x M xL1/L

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

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

L1 = Non-complying length

L = Total length of the road,

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

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

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

Schedule-N

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.

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 Vairengte - Chhimluang section (Package-3) of NH-306 from Existing Chainage km 43+000 to km 59+700 (Design Chainage km 46+000 to km 60+850) 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:

(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.

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 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.

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 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

(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 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

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;

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

The insurance cover shall be not less than 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

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

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 Sethawn - N. Kawnpui section (Package-6) of NH-6 from Existing Chainage km 107+850 to km 126+315 (Design Chainage km 95+500 to km 111+850) 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

(Signature)
(Name and designation of Authority's Representative)
(Address)