Schedules

SCHEDULE - A

(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

1 The Site

1.1 Site of the Rehnok - Pakyong section of NH-717A Project Highway shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.

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

1.2 An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2.1 of this Agreement.

1.3 The alignment plans of the Project Highway are specified in Annex-III. In the case of sections where no modification in the existing alignment of the Project Highway is contemplated, the alignment plan has not been provided. Alignment plans have only been given for sections where the existing alignment is proposed to be modified.

1.4 The status of the environment clearances obtained or awaited is given in Annex IV.

Annex – I
(Schedule – A)

Site

Note: Through suitable drawings and description in words, the land, buildings, structures and road works comprising the Site shall be specified briefly but precisely in this Annex-I.

1. Site

The Site of the Two-Lane Project Highway comprises the section of National Highway -717A commencing from km 0+000 to km 26+706 i.e. the Rehnock to Pakyong section (existing length 27+185 km) in the State of Sikkim. The land, carriageway and structures comprising the Site are described below.

2. Land

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

Sr. No.	Chainage (km)		ROW (Meter)
	From	To	
1	0+000	27+185	24-30

3. Carriageway

The width of carriageway varies from 3.75 m to 4.00m as under. The type of the existing pavement is Flexible.

Sr. No.	Carriageway					
	Single Lane		Two Lane		Four Lane	
	From	To	From	To	From	To
1	0+000	27+185	Nil		Nil	

4. Major Bridges

The Site includes the following Major Bridges:

Sr. No.	Existing Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)	Remarks
		Foundation	Sub-structure	Super structure			

1	8+000	Open	RCC	Solid Slab	1x24.4+1x45.9+1x45.7+1x43	7.5	Retained

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

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

Sr. No.	Existing Chainage (km)	Type of Structure		No. of Spans with Span length (m)	Width (m)	ROB/ RUB
		Foundation	Super Structure			
Nil						

6 Grade separators

The Site includes the following grade separators:

Sr. No.	Existing Chainage (km)	Type of Structure		No. of Spans with Span length (m)	Width (m)
		Foundation	Super Structure		
Nil					

7 Minor bridges

The Site includes the following minor bridges:

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

8 Railway level crossings

The Site includes the following railway level crossings:

Sr. No.	Existing Chainage (km)	Remarks
Nil		

9 Underpasses (vehicular, Non-vehicular)

The Site includes the following underpasses:

Sr. 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:

Sl. No.	Existing Chainage	Existing Size	Type of Structure	Remarks
1	Km. 00+061	1X1	RCC Slab	
2	Km. 00+222	1X0.5	HP	
3	Km. 00+287	1X1	RCC Slab	
4	Km.01+009	1X1.5	RCC Slab	
5	Km. 01+524	1X1.5	RCC Slab	
6	Km. 01+706	1X1	RCC Slab	
7	Km.02+033	1X0.8	RCC Slab	
8	Km. 02+071	1X2	RCC Slab	
9	Km. 02+128	1X1.7	RCC Slab	
10	Km. 02+309	1X1.3	RCC Slab	
11	Km. 02+365	1X1.5	RCC Slab	
12	Km. 02+723	-	-	
13	Km. 02+757	-	-	
14	Km.02+926	1X1.4	RCC Slab	
15	Km. 02+958	1X1.4	RCC Slab	
16	Km. 03+223	1X1.1	RCC Slab	
17	Km. 03+374	1X1.45	RCC Slab	
18	Km. 03+397	1X1.45	RCC Slab	
19	Km. 03+447	1X1.6	RCC Slab	
20	Km.04+105	NA	RCC Slab	Chocked
21	Km. 04+155	NA	RCC Slab	
22	Km. 04+179	1x0.9	RCC Slab	
23	Km. 04+684	1X1	RCC Slab	

Sl. No.	Existing Chainage	Existing Size	Type of Structure	Remarks
24	Km. 05+018	1X1.3	RCC Slab	
25	Km. 05+518	1X0.8m	RCC Slab	
26	Km. 05+762	1X1.3	RCC Slab	
27	Km. 06+063	1x1	-	
28	Km. 06+324	1X1.2	RCC Slab	
29	Km. 06+635	-	RCC Slab	
30	Km. 06+804	1X1.1	RCC Slab	
31	Km. 07+059	1X2.1	RCC Slab	
32	Km. 07+154	1X1.2	RCC Slab	
33	Km. 07+222	1X1.35	RCC Slab	
34	Km. 07+344	1X0.8	RCC Slab	
35	Km. 07+449	1X1.4	RCC Slab	
36	Km. 07+583	1x1.5	-	
37	Km. 08+200	1X2	RCC Slab	
38	Km. 09+170	1X1.6	RCC Slab	
39	Km.10+552	1X1.2	RCC Slab	
40	Km. 11+070	1X1.8	RCC Slab	
41	Km. 11+162	1X1.7	RCC Slab	
42	Km. 11+281	1X1.65	RCC Slab	
43	Km. 11+460	1X0.9	RCC Slab	
44	Km. 11+955	1X1	RCC Slab	
45	Km. 12+093	1X0.8	RCC Slab	
46	Km. 12+284	1X0.7	RCC Slab	
47	Km. 12+410	1X0.7	RCC Slab	
48	Km. 12+610	1x1	-	

Sl. No.	Existing Chainage	Existing Size	Type of Structure	Remarks
49	Km. 12+800	1X1.2	RCC Slab	Chocked
50	Km. 13+063	1X1	RCC Slab	
51	Km. 13+165		RCC Slab	Chocked
52	Km. 13+275	1X2.6	RCC Slab	
53	Km.13+400	1X1.4	RCC Slab	
54	Km. 13+600	1X1	RCC Slab	
55	Km. 13+862	1X1.2	RCC Slab	
56	Km. 13+992	1x1.1	RCC Slab	
57	Km. 14+300	1X1.9	RCC Slab	
58	Km. 14+324	1x1.5	RCC Slab	
59	Km. 15+830	1X1	RCC Slab	
60	Km. 16+653	1X0.7	RCC Slab	
61	Km. 17+503	1X1.1	RCC Slab	
62	Km. 17+738	1x1	RCC Slab	
63	Km..17+833	1x0.66	RCC Slab	
64	Km. 18+180	1X1.5	HP	
65	Km. 18+642	1X0.8	HP	
66	Km. 19+028	1X1	HP	
67	Km.19+094	1x1.2	RCC Slab	
68	Km.19+795	1X0.9	RCC Slab	
69	Km. 20+211	1X1	RCC Slab	
70	Km. 20+557	1X0.6	RCC Slab	
71	Km. 20+700	1X0.9	RCC Slab	
72	Km. 20+968	1X0.5	RCC Slab	
73	Km. 21+149	1X0.6	RCC Slab	

Sl. No.	Existing Chainage	Existing Size	Type of Structure	Remarks
74	Km. 21+191	1x1.7	HP	
75	Km. 21+500	1x0.6	RCC Slab	
76	Km. 21+621	1X1.2	RCC Slab	
77	Km. 21+973	1X1	RCC Slab	
78	Km. 22+400	1X1	RCC Slab	
79	Km.22+521	1x0.8	RCC Slab	
80	Km.22+571	1X1.2	RCC Slab	
81	Km. 22+800	1X0.4	RCC Slab	
82	Km. 22+911	1X1	RCC Slab	
83	Km.23+064	1X0.7	RCC Slab	
84	Km. 23+150	1X0.8	RCC Slab	
85	Km.23+243	1X0.8	RCC Slab	
86	Km. 23+400	1x0.8	RCC Slab	
87	Km.23+508	1x1.8	RCC Slab	
88	Km.23+572	1X0.7	RCC Slab	
89	Km. 23+675	1X1.7	RCC Slab	
90	Km. 23+748	1X1.7	RCC Slab	
91	Km. 23+824	1X1.6	RCC Slab	
92	Km. 23+958	1X1.5	RCC Slab	
93	Km.24+029	1X1.7	RCC Slab	
94	Km.24+324	1X1.5	RCC Slab	
95	Km.24+566	1X2.9	RCC Slab	
96	Km. 24+606	1X1.5	HP	
97	Km. 24+641	1X1.5	RCC Slab	
98	Km. 24+714	1X1.3	RCC Slab	

Sl. No.	Existing Chainage	Existing Size	Type of Structure	Remarks
99	Km.24+873	1X1.07	RCC Slab	
100	Km. 25+274	1X0.7	RCC Slab	
101	Km. 25+479	1X2	RCC Slab	
102	Km. 25+617	1X1.2	RCC Slab	
103	Km. 25+682	1X1.1	RCC Slab	
104	Km. 26+100	1X0.5	RCC Slab	
105	Km.26+146	1X1.2	RCC Slab	
106	Km. 26+400	1x1.3	RCC Slab	
107	km 26+448	1X1.2m	RCC Slab	
108	Km.26+800	1x0.6	RCC Slab	

11 Bus stops

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

Sr. No.	EXISTING CHAINAGE	SIDE
1	0+000	Both
2	0+967	Both
3	1+311	Both
4	1+840	Both
5	2+581	Both
6	6+622	Both
7	8+760	Both
8	13+240	Both
9	14+388	Both
10	14+800	Both

Sr. No.	EXISTING CHAINAGE	SIDE
11	18+340	Both
12	19+480	Both
13	20+500	Both
14	21+360	Both
15	21+740	Both
16	22+720	Both
17	24+180	Both
18	25+880	Both
19	26+700	Both
20	28+000	Both

12 Truck Lay byes

The details of truck lay byes are as follows:

Sr. No.	Existing Chainage (Km)	Length (m)	LHS	RHS
Nil				

13 Road side drains

The details of the roadside drains are as follows:

Sr. No.	Location		Type	
	From km	To km	Masonry/cc (Pucca)	Earthen (Kutcha)
1	0+00	1+245	Pucca	
2	1+340	1+380	Pucca	
3	1+480	1+575	Pucca	
4	1+675	1+955	Pucca	
5	2+050	2+520	Pucca	
6	2+620	2+910	Pucca	

Sr. No.	Location		Type	
	From km	To km	Masonry/cc (Pucca)	Earthen (Kutcha)
7	3+010	3+695	Pucca	
8	3+790	4+620	Pucca	
9	5+720	5+285	Pucca	
10	5+380	5+715	Pucca	
11	5+810	6+090	Pucca	
12	6+190	7+950	Pucca	
13	8+156	8+905	Pucca	
14	9+000	9+025	Pucca	
15	9+120	9+390	Pucca	
16	9+490	9+574	Pucca	
17	9+000	9+225	Pucca	
18	9+320	9+480	Pucca	
19	9+580	10+905	Pucca	
20	11+000	11+820	Pucca	
21	11+920	13+525	Pucca	
22	13+620	14+260	Pucca	
23	14+360	14+535	Pucca	
24	14+630	15+685	Pucca	
25	15+780	16+580	Pucca	
26	16+680	17+550	Pucca	
27	17+650	19+415	Pucca	
28	19+510	19+530	Pucca	
29	19+630	19+720	Pucca	
30	19+815	19+900	Pucca	
31	20+000	20+065	Pucca	

Sr. No.	Location		Type	
	From km	To km	Masonry/cc (Pucca)	Earthen (Kutcha)
32	20+180	20+575	Pucca	
33	20+675	20+940	Pucca	
34	21+035	23+475	Pucca	
35	23+570	24+390	Pucca	
36	24+490	24+510	Pucca	
37	24+610	25+405	Pucca	
38	25+500	25+480	Pucca	
39	25+580	26+015	Pucca	
40	26+020	26+140	Pucca	

14 Major junctions

The detail of major junction is as follows:

Sr. No.	Chainage	Type	Link	Direction
1	5+330	T	NH 717 B	R

15 Minor junctions

The details of the minor junctions are as follows:-

Minor Junctions Details

S No.	Existing Chainage	Type	Direction	Remarks
1	0+560	Y	RHS	C C Road
2	0+737	Y	RHS	C C Road
3	1+020	Y	RHS	C C Road
4	1+615	T	RHS	To Home

S No.	Existing Chainage	Type	Direction	Remarks
5	1+860	T	LHS	Shalgari Village (B T Road)
6	6+607	Y	RHS	To Golden Cross (B T Road)
7	8+184	T	LHS	To Rangpo
8	8+578	Y	RHS	To Taja (B T Road)
9	17+088	Y	RHS	Pichierkhani
10	17+216	Y	RHS	To Taja
11	18+390	Y	LHS	To Rangpo (B T Road)
12	19+154	Y	LHS	C C Road
13	21+341	T	RHS	B T Road (To Temple)
14	21+800	T	RHS	B T Road (To Chetri)
15	24+158	T	RHS	To Chalamthan
16	24+300	T	RHS	To Home
17	25+680	Y	LHS	C C Road
18	26+890	T	LHS	B T Road (Airport)

16 Bypasses

The details of the bypasses are as follows:

Sr. No.	Name of Bypass (Town)	Existing Chainage (Km)		Length (Km)	Carriageway	
		From	To		Width (m)	Type
Nil						

17 Other structures

Nil

Annex - II
(Schedule-A)

Dates for providing Right of Way

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

Sr. No.	**From km** **To km**	**Length (Km)**	**Proposed Width (m)**	**Date of providing ROW**
1	**2**	**3**	**4**	**5**
Full Right of Way (full width)	Excluding Bypass & Realignment, Toll Plaza, Bus bays, Truck Lay Bye	17+987	24	At appointed date
Balance Right of Way (Width)	Bypass & Realignment	8+569	24	Within 90 days
	Toll Plaza			
	Bus bays			
	Truck Lay Bye	0+150	50	

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:

An alignment plan is given in soft copy.

Annex - IV
(Schedule-A)

Environment Clearances

The following clearances have been obtained:

Sr. No.	Clearances	Present Status
1	Environment clearance	Not Required (As per Ministry of Environment and Forest Notifications)
2	Forest Clearance	Required & is under Progress

SCHEDULE - B
(See Clause 2.1)

Development of the Project Highway

1 Development of the Project Highway

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

2 Two Lane with Paved shoulder

Two lane with paved shoulder shall strengthening of the existing two lane along with construction of paved shoulders as described in Annex-I & Annex-II of this Schedule-B and Annex-I of Schedule-C.

3 Specifications and Standards

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

Annex - I
(Schedule-B)

Description of Two Lane with Paved Shoulder

The Site of the Two-Lane Project Highway comprises the section of National Highway - 717A commencing from km 0+000 to km 26+706 i.e. the Rehnok to Pakyong section (existing length 27+185 km) in the State of Sikkim. The land, carriageway and structures comprising the Site are described below.

1 WIDENING OF THE EXISTING HIGHWAY

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

1.2 WIDTH OF CARRIAGEWAY

1.2.1 Two Lanning with paved shoulder shall be undertaken. The paved carriageway including paved shoulders shall be 10.5 m wide in accordance with the typical cross sections drawings in the Manual.

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

Sr. No.	Built-up Stretch (Township)	Location/Design Chainage (Km)		Width (m)	Typical Cross Section
		From	To		
1	Rorathrang	8+200	8+700	10.5	Typical Cross Section in built-up area Clause 2.14, IRC:SP:73-2015

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

2. GEOMETRIC DESIGN AND GENERAL FEATURES

2.1 General

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

2.2 Design speed

The design speed shall be minimum design speed of 40 km per hr for Mountainous and Steep terrain.

2.3 Improvement of the existing road geometrics

2.3.1 Details of Bypass

Sr. No.	Existing Chainage		Length (m)	Design Chainage		Length (m)	TCS TYPE	Remarks
	From	To		From	To			
Nil								

Realignment:

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
1	0+800	0+869	0.069	New Alignment	TCS-02
2	1+200	1+435	0.235	New Alignment	TCS-02
3	1+500	1+725	0.225	New Alignment	TCS-02
4	1+871	2+000	0.129	New Alignment	TCS-02
5	2+400	2+800	0.4	New Alignment	TCS-02
6	3+050	3+150	0.1	New Alignment	TCS-02
7	3+285	3+430	0.145	New Alignment	TCS-02
8	3+762	3+950	0.188	New Alignment	TCS-02
9	4+400	4+751	0.351	New Alignment	TCS-02
10	4+818	4+900	0.082	New Alignment	TCS-02
11	4+982	5+060	0.078	New Alignment	TCS-02
12	5+110	5+154	0.044	New Alignment	TCS-02
13	5+200	5+418	0.218	New Alignment	TCS-02
14	5+710	6+078	0.368	New Alignment	TCS-02
15	6+152	6+383	0.231	New Alignment	TCS-02
16	6+758	6+812	0.054	New Alignment	TCS-02
17	6+900	7+016	0.116	New Alignment	TCS-02
18	7+455	7+592	0.137	New Alignment	TCS-02

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
19	8+700	8+800	0.1	New Alignment	TCS-02
20	8+995	9+062	0.067	New Alignment	TCS-02
21	9+446	9+520	0.074	New Alignment	TCS-02
22	9+770	9+821	0.051	New Alignment	TCS-02
23	9+900	10+373	0.473	New Alignment	TCS-02
24	10+450	10+537	0.087	New Alignment	TCS-02
25	10+700	10+800	0.1	New Alignment	TCS-02
26	11+182	11+418	0.236	New Alignment	TCS-02
27	11+521	11+738	0.217	New Alignment	TCS-02
28	11+777	12+070	0.293	New Alignment	TCS-02
29	12+452	12+549	0.097	New Alignment	TCS-02
30	13+100	13+150	0.05	New Alignment	TCS-02
31	14+138	14+211	0.073	New Alignment	TCS-02
32	14+500	14+585	0.085	New Alignment	TCS-02
33	14+800	14+900	0.1	New Alignment	TCS-02
34	14+954	15+049	0.095	New Alignment	TCS-02
35	15+223	15+300	0.077	New Alignment	TCS-02
36	15+390	15+450	0.06	New Alignment	TCS-02
37	16+085	16+168	0.083	New Alignment	TCS-02
38	16+600	16+630	0.03	New Alignment	TCS-02
39	17+075	17+300	0.225	New Alignment	TCS-02
40	18+250	18+323	0.073	New Alignment	TCS-02
41	18+420	18+539	0.119	New Alignment	TCS-02
42	19+620	20+138	0.518	New Alignment	TCS-02

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
43	20+260	20+385	0.125	New Alignment	TCS-02
44	20+536	20+625	0.089	New Alignment	TCS-02
45	20+950	21+020	0.07	New Alignment	TCS-02
46	21+450	21+600	0.15	New Alignment	TCS-02
47	21+800	21+960	0.16	New Alignment	TCS-02
48	22+000	22+332	0.332	New Alignment	TCS-02
49	22+700	22+800	0.1	New Alignment	TCS-02
50	22+850	22+920	0.07	New Alignment	TCS-02
51	23+000	23+100	0.1	New Alignment	TCS-02
52	23+625	23+713	0.088	New Alignment	TCS-02
53	23+865	24+010	0.145	New Alignment	TCS-02
54	24+376	24+410	0.034	New Alignment	TCS-02
55	24+650	24+700	0.05	New Alignment	TCS-02
56	25+475	25+725	0.25	New Alignment	TCS-02
57	25+832	26+027	0.195	New Alignment	TCS-02
58	26+160	26+218	0.058	New Alignment	TCS-02

2.4 Right of Way

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

2.5 Type of shoulders

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

Sr.	Stretch	Fully Paved	Referenc

No.	Existing Chainage(m)		Design Chainage(m)		Shoulder /Footpath	e to Cross Section
	From	To	From	To		
1	7+850	8+350	8+200	8+700	Footpath	3

(a) In open country, (Paved shoulders of 1.5 m width shall be provided and balance 1.0 m width earthen shoulder shall be covered with 150 mm thick compacted layer of granular material).

(b) Design and specifications of paved shoulders and granular material shall conform to the requirements specified in paragraphs 5.10 and 5.11 of the Manual.

2.6 Lateral and vertical clearances at underpasses

2.6.1 Lateral andvertical clearances at underpasses and provision of guardrails/crash barriers shall be as per paragraph 2.10 of 2-lanning Manual.

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

Sr. No.	Location Chainage From km to km)	Span / Opening (m)	Remarks
Nil			

Vertical clearance: Vertical Clearance at underpasses/Flyovers shall not be less than 5.5 m and for Cattle underpass shall not be less than 4.5 m.

2.7 Lateral and vertical clearances at overpasses

2.7.1 Lateral and vertical clearances at overpasses shall be as per paragraph 2.11of the 2-lanning Manual.

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

Sr. No.	Design Chainage km)	Span / Opening (m)	Remarks
Nil			

2.7.3 Vertical clearance: A minimum 5.5 m vertical clearance shall be provided at all points of the carriageway of the project highway.

2.8 Service roads

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

Sr. 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			

Details of Slip Road

Sr. No.	Existing Chainage		Design Chainage		Right Hand side (RHS) or Left Hand side (LHS) or Both side	Length Km of Service Road
	From	To	From	To		
NIL						

2.9 Grade separated structures

2.9.1 Grade separated structures shall be provided as per paragraph 2.13 of the 2-lanning Manual. The requisite particulars are given below:

Sr. No.	Location of structure (Existing)	Location of structure (Design)	Length (m)	Number and length of Spans(m)	Approach Gradient	Remarks, if any
NIL						

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

Sr. No.	Location (Design Chainage)	Location (Design Chainage)	Type of Structure Length	Cross road at		
				Existing level	Raised Level	Lowered Level
NIL						

2.10 Cattle and pedestrian underpass /overpass

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

[Refer to paragraphs 2.13.3 of the Manual and specify the requirements of Cattle and pedestrian underpass/ overpass]

Cattle and pedestrian underpass/ overpass shall be constructed

*2.*11 Typical cross-sections of the Project Highway

Indicative typical cross section of the Project highway shall be Fig. 2.11 to 2.12 for existing road section and Bypasses & Realignment, Fig. 2.13 for built-up section of the manual (IRC: SP: 73-2015).

Sr. No.	Detail	TCS	Length (m)	Length (Km)
1	Two Lane with Paved Shoulder Raised Portion (Hill Section)	01	17477	17.477
2	Two Lane with Paved Shoulder Raised Portion (Hill Section) in new alignment	02	8569	8.569
3	Two Lane with Paved Shoulder including both side drains cum footpath (Built-up area Mountainous Terrain)	03	500	0.5

3 INTERSECTIONS AND GRADE SEPARATORS

All intersections and grade separators shall be as per Section 3 of the Manual. Existing intersections which are deficient shall be improved to the prescribed standards. Properly designed intersections shall be provided at the locations and of the types and features given in the tables below:

3.1 At-Grade Intersections:

a) Major intersections

Major intersections shall be improved at intersecting roads with the Project highway is given below:

Sl. No.	Existing Chainage	Design Chainage	Type	Direction	Remarks
1	5+300	5+330	T	NH 717 B	Right

b) Minor Intersections

At grade minor intersections shall be improved at intersecting roads with the Project highway is given below*:*

	Existing Chainage	**Design Chainage**	**Type**	**Direction**	**Remarks**
1	0+560	0+560	Y	RHS	C C Road
2	0+737	0+735	Y	RHS	C C Road
3	1+020	1+010	Y	RHS	C C Road
4	1+615	1+605	T	RHS	To Home
5	1+860	1+860	T	LHS	Shalgari Village (B T Road)
6	6+607	6+592	Y	RHS	To Golden Cross (B T Road)
7	8+184	8+120	T	LHS	To Rangpo
8	8+578	8+500	Y	RHS	To Taja (B T Road)
9	17+088	17+080	Y	RHS	Pichierkhani
10	17+216	17+490	Y	RHS	To Taja
11	18+390	18+250	Y	LHS	To Rangpo (B T Road)
12	19+154	19+009	Y	LHS	C C Road
13	21+341	20+960	T	RHS	B T Road (To Temple)
14	21+800	21+439	T	RHS	B T Road (To Chetri)
15	24+158	23+720	T	RHS	To Chalamthan
16	24+300	23+862	T	RHS	To Home
17	25+680	25+200	Y	LHS	C C Road
18	26+890	26+380	T	LHS	B T Road (Airport)

3.2 At-Grade Intersections:

Sr. No.	**Location(Existing Chainage) of Intersection (km)**	**Location(Design Chainage) of Intersection (km)**	**Type of Intersection**	**Other features**
NIL				

4 ROAD EMBANKMENT AND CUT SECTION

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

5 Raising of the existing road:

The existing road shall be raised in the following sections:

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
1	0+000	0+800	0.8	Raised Portion	TCS-01
2	0+869	1+200	0.331	Raised Portion	TCS-01
3	1+435	1+500	0.065	Raised Portion	TCS-01
4	1+725	1+871	0.146	Raised Portion	TCS-01
5	2+000	2+400	0.4	Raised Portion	TCS-01
6	2+800	3+050	0.25	Raised Portion	TCS-01
7	3+150	3+285	0.135	Raised Portion	TCS-01
8	3+430	3+762	0.332	Raised Portion	TCS-01
9	3+950	4+400	0.45	Raised Portion	TCS-01
10	4+751	4+818	0.067	Raised Portion	TCS-01
11	4+900	4+982	0.082	Raised Portion	TCS-01
12	5+060	5+110	0.05	Raised Portion	TCS-01
13	5+154	5+200	0.046	Raised Portion	TCS-01
14	5+418	5+710	0.292	Raised Portion	TCS-01
15	6+078	6+152	0.074	Raised Portion	TCS-01
16	6+383	6+758	0.375	Raised Portion	TCS-01
17	6+812	6+900	0.088	Raised Portion	TCS-01
18	7+016	7+455	0.439	Raised Portion	TCS-01
19	7+592	7+950	0.358	Raised Portion	TCS-01

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
20	8+110	8+200	0.09	Raised Portion	TCS-01
21	8+800	8+995	0.195	Raised Portion	TCS-01
22	9+062	9+446	0.384	Raised Portion	TCS-01
23	9+520	9+770	0.25	Raised Portion	TCS-01
24	9+821	9+900	0.079	Raised Portion	TCS-01
25	10+373	10+450	0.077	Raised Portion	TCS-01
26	10+537	10+700	0.163	Raised Portion	TCS-01
27	10+800	11+182	0.382	Raised Portion	TCS-01
28	11+418	11+521	0.103	Raised Portion	TCS-01
29	11+738	11+777	0.039	Raised Portion	TCS-01
30	12+070	12+452	0.382	Raised Portion	TCS-01
31	12+549	13+100	0.551	Raised Portion	TCS-01
32	13+150	14+138	0.988	Raised Portion	TCS-01
33	14+211	14+500	0.289	Raised Portion	TCS-01
34	14+585	14+800	0.215	Raised Portion	TCS-01
35	14+900	14+954	0.054	Raised Portion	TCS-01
36	15+049	15+223	0.174	Raised Portion	TCS-01
37	15+300	15+390	0.09	Raised Portion	TCS-01
38	15+450	16+085	0.635	Raised Portion	TCS-01
39	16+168	16+600	0.432	Raised Portion	TCS-01
40	16+630	17+075	0.445	Raised Portion	TCS-01
41	17+300	18+250	0.95	Raised Portion	TCS-01
42	18+323	18+420	0.097	Raised Portion	TCS-01
43	18+539	19+620	1.081	Raised Portion	TCS-01
44	20+138	20+260	0.122	Raised Portion	TCS-01

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
45	20+385	20+536	0.151	Raised Portion	TCS-01
46	20+625	20+950	0.325	Raised Portion	TCS-01
47	21+020	21+450	0.43	Raised Portion	TCS-01
48	21+600	21+800	0.2	Raised Portion	TCS-01
49	21+960	22+000	0.04	Raised Portion	TCS-01
50	22+332	22+700	0.368	Raised Portion	TCS-01
51	22+800	22+850	0.05	Raised Portion	TCS-01
52	22+920	23+000	0.08	Raised Portion	TCS-01
53	23+100	23+625	0.525	Raised Portion	TCS-01
54	23+713	23+865	0.152	Raised Portion	TCS-01
55	24+010	24+376	0.366	Raised Portion	TCS-01
56	24+410	24+650	0.24	Raised Portion	TCS-01
57	24+700	25+475	0.775	Raised Portion	TCS-01
58	25+725	25+832	0.107	Raised Portion	TCS-01
59	26+027	26+160	0.133	Raised Portion	TCS-01
60	26+218	26+706	0.488	Raised Portion	TCS-01

6 PAVEMENT DESIGN

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

6.2 Type of pavement

6.3 Design requirements

6.3.1 Design Period and strategy

Flexible Pavement shall be designed for a minimum design period of 15 years Stage construction shall not be permitted.

6.3.2 Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for design traffic of 25 million standard axles.

6.4 Reconstruction of stretches

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

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
1	0+000	0+800	0.8	Raised Portion	TCS-01
2	0+869	1+200	0.331	Raised Portion	TCS-01
3	1+435	1+500	0.065	Raised Portion	TCS-01
4	1+725	1+871	0.146	Raised Portion	TCS-01
5	2+000	2+400	0.4	Raised Portion	TCS-01
6	2+800	3+050	0.25	Raised Portion	TCS-01
7	3+150	3+285	0.135	Raised Portion	TCS-01
8	3+430	3+762	0.332	Raised Portion	TCS-01
9	3+950	4+400	0.45	Raised Portion	TCS-01
10	4+751	4+818	0.067	Raised Portion	TCS-01
11	4+900	4+982	0.082	Raised Portion	TCS-01
12	5+060	5+110	0.05	Raised Portion	TCS-01
13	5+154	5+200	0.046	Raised Portion	TCS-01
14	5+418	5+710	0.292	Raised Portion	TCS-01
15	6+078	6+152	0.074	Raised Portion	TCS-01
16	6+383	6+758	0.375	Raised Portion	TCS-01
17	6+812	6+900	0.088	Raised Portion	TCS-01
18	7+016	7+455	0.439	Raised Portion	TCS-01
19	7+592	7+950	0.358	Raised Portion	TCS-01
20	8+110	8+200	0.09	Raised Portion	TCS-01

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
21	8+800	8+995	0.195	Raised Portion	TCS-01
22	9+062	9+446	0.384	Raised Portion	TCS-01
23	9+520	9+770	0.25	Raised Portion	TCS-01
24	9+821	9+900	0.079	Raised Portion	TCS-01
25	10+373	10+450	0.077	Raised Portion	TCS-01
26	10+537	10+700	0.163	Raised Portion	TCS-01
27	10+800	11+182	0.382	Raised Portion	TCS-01
28	11+418	11+521	0.103	Raised Portion	TCS-01
29	11+738	11+777	0.039	Raised Portion	TCS-01
30	12+070	12+452	0.382	Raised Portion	TCS-01
31	12+549	13+100	0.551	Raised Portion	TCS-01
32	13+150	14+138	0.988	Raised Portion	TCS-01
33	14+211	14+500	0.289	Raised Portion	TCS-01
34	14+585	14+800	0.215	Raised Portion	TCS-01
35	14+900	14+954	0.054	Raised Portion	TCS-01
36	15+049	15+223	0.174	Raised Portion	TCS-01
37	15+300	15+390	0.09	Raised Portion	TCS-01
38	15+450	16+085	0.635	Raised Portion	TCS-01
39	16+168	16+600	0.432	Raised Portion	TCS-01
40	16+630	17+075	0.445	Raised Portion	TCS-01
41	17+300	18+250	0.95	Raised Portion	TCS-01
42	18+323	18+420	0.097	Raised Portion	TCS-01
43	18+539	19+620	1.081	Raised Portion	TCS-01
44	20+138	20+260	0.122	Raised Portion	TCS-01
45	20+385	20+536	0.151	Raised Portion	TCS-01

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
46	20+625	20+950	0.325	Raised Portion	TCS-01
47	21+020	21+450	0.43	Raised Portion	TCS-01
48	21+600	21+800	0.2	Raised Portion	TCS-01
49	21+960	22+000	0.04	Raised Portion	TCS-01
50	22+332	22+700	0.368	Raised Portion	TCS-01
51	22+800	22+850	0.05	Raised Portion	TCS-01
52	22+920	23+000	0.08	Raised Portion	TCS-01
53	23+100	23+625	0.525	Raised Portion	TCS-01
54	23+713	23+865	0.152	Raised Portion	TCS-01
55	24+010	24+376	0.366	Raised Portion	TCS-01
56	24+410	24+650	0.24	Raised Portion	TCS-01
57	24+700	25+475	0.775	Raised Portion	TCS-01
58	25+725	25+832	0.107	Raised Portion	TCS-01
59	26+027	26+160	0.133	Raised Portion	TCS-01
60	26+218	26+706	0.488	Raised Portion	TCS-01

7 ROAD SIDE DRAINAGE

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per Section 6 of the Manual. Lined drain is provided in following stretches.

RCC covered drain shall be constructed at given below locations:

Sr. No.	Existing Chainage		Design Chainage		Length (m)	Remarks
	From	To	From	To		
1	7-850	8+350	8+200	8+700	500	Rorathang

8 DESIGN OF STRUCTURES

8.1 General

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

details specified therein

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

[Refer to paragraph 7.3 (ii) of the Manual and specify the width of carriageway of new bridges and structures of more than 60 metre length, if the carriageway width is different from 11 metre including kerb shyness in the table below.]

Sr. No.	Bridge (km)	Width of carriageway and Cross - Sectional feature
Nil		

8.1.3 The following structures shall be provided with footpaths:
[The Manual and provide details of new Structures with footpath.]

Sr. No.	Location at km		Remarks
	(Existing Chainage)	(Design Chainage)	
1	5+220	5+500	Minor Bridge

8.1.4 All bridges shall be high-level bridges.

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

Sr. No.	Bridge (km)	Utility service to be carried	Remarks
Nil			

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

8.2 Culverts

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

8.2.2 Reconstruction of Existing Culverts:

The existing culverts at the following locations shall be reconstructed as new culverts:

Sr. No.	Design Chainage	Design Size	Type of Structure	Proposal
1	0+059	1X3	RCC Slab	Replaced
2	0+220	1X3	RCC Slab	Replaced

Sr. No.	Design Chainage	Design Size	Type of Structure	Proposal
3	0+287	1X3	RCC Slab	Replaced
4	1+002	1X3	RCC Slab	Replaced
5	1+504	1X3	RCC Slab	Replaced
6	1+709	1X3	RCC Slab	Replaced
7	2+047	1X3	RCC Slab	Replaced
8	2+085	1X3	RCC Slab	Replaced
9	2+143	1X3	RCC Slab	Replaced
10	2+323	1X3	RCC Slab	Replaced
11	2+380.21	1X3	RCC Slab	Replaced
12	2+748.59	1X3	RCC Slab	Replaced
13	2+782.43	1X3	RCC Slab	Replaced
14	2+951.88	1X3	RCC Slab	Replaced
15	2+982.60	1X3	RCC Slab	Replaced
16	3+279.38	1X3	RCC Slab	Replaced
17	3+417.53	1X3	RCC Slab	Replaced
18	3+436.76	1X3	RCC Slab	Replaced
19	3+488	1X3	RCC Slab	Replaced
20	4+167	1X3	RCC Slab	Replaced
21	4+218	1X3	RCC Slab	Replaced
22	4+247	1X3	RCC Slab	Replaced
23	4+757	1X3	RCC Slab	Replaced
24	5+067	1X3	RCC Slab	Replaced
25	5+706	1X3	RCC Slab	Replaced
26	6+040	1X3	RCC Slab	Replaced
27	6+309	1x3	RCC Slab	Replaced

Sr. No.	Design Chainage	Design Size	Type of Structure	Proposal
28	6+613	1x3	RCC Slab	Replaced
29	6+779	1x3	RCC Slab	Replaced
30	7+024	1x3	RCC Slab	Replaced
31	7+118.30	1x3	RCC Slab	Replaced
32	7+187.14	1x3	RCC Slab	Replaced
33	7+309.00	1x3	RCC Slab	Replaced
34	7+412.93	1x3	RCC Slab	Replaced
35	7+543.74	1X3	RCC Slab	Replaced
36	8+151.38	1X3	RCC Slab	Replaced
37	9+075.42	1X3	RCC Slab	Replaced
38	10+593.20	1X3	RCC Slab	Replaced
39	11+106.49	1X3	RCC Slab	Replaced
40	11+197.52	1X3	RCC Slab	Replaced
41	11+308.81	1X3	RCC Slab	Replaced
42	11+478.12	1X3	RCC Slab	Replaced
43	11+975.20	1X3	RCC Slab	Replaced
44	12+108.92	1X3	RCC Slab	Replaced
45	12+298.99	1X3	RCC Slab	Replaced
46	12+423.10	1X3	RCC Slab	Replaced
47	12+649.18	1X3	RCC Slab	Replaced
48	12+838	1X3	RCC Slab	Replaced
49	13+101	1X3	RCC Slab	Replaced
50	13+190	1X3	RCC Slab	Replaced
51	13+303	1X3	RCC Slab	Replaced
52	13+423	1X3	RCC Slab	Replaced

Sr. No.	Design Chainage	Design Size	Type of Structure	Proposal
53	13+622	1X3	RCC Slab	Replaced
54	13+886	1X3	RCC Slab	Replaced
55	14+011	1X3	RCC Slab	Replaced
56	14+300	1X3	RCC Slab	Replaced
57	14+324	1X3	RCC Slab	Replaced
58	15+695	1X3	RCC Slab	Replaced
59	16+515	1X3	RCC Slab	Replaced
60	17+380	1X3	RCC Slab	Replaced
61	17+612	1X3	RCC Slab	Replaced
62	17+706	1X3	RCC Slab	Replaced
63	18+045	1X3	RCC Slab	Replaced
64	18+506	1X3	RCC Slab	Replaced
65	18+887	1X3	RCC Slab	Replaced
66	18+950	1X3	RCC Slab	Replaced
67	19+645	1X3	RCC Slab	Replaced
68	19+663	1X3	RCC Slab	Replaced
69	20+175	1X3	RCC Slab	Replaced
70	20+295	1X3	RCC Slab	Replaced
71	20+600	1X3	RCC Slab	Replaced
72	20+780	1X3	RCC Slab	Replaced
73	20+818	1X3	RCC Slab	Replaced
74	21+142	1X3	RCC Slab	Replaced
75	21+275	1X3	RCC Slab	Replaced
76	21+645	1X3	RCC Slab	Replaced
77	22+041	1X3	RCC Slab	Replaced

Sr. No.	Design Chainage	Design Size	Type of Structure	Proposal
78	22+113	1X3	RCC Slab	Replaced
79	22+156	1X3	RCC Slab	Replaced
80	22+360	1X3	RCC Slab	Replaced
81	22+470	1X3	RCC Slab	Replaced
82	22+622	1X3	RCC Slab	Replaced
83	22+706	1X3	RCC Slab	Replaced
84	22+800	1X3	RCC Slab	Replaced
85	22+940	1X3	RCC Slab	Replaced
86	23+047	1X3	RCC Slab	Replaced
87	23+108	1X3	RCC Slab	Replaced
88	23+213	1X3	RCC Slab	Replaced
89	23+285	1X3	RCC Slab	Replaced
90	23+357	1X3	RCC Slab	Replaced
91	23+495	1X3	RCC Slab	Replaced
92	23+562	1X3	RCC Slab	Replaced
93	23+935	1X3	RCC Slab	Replaced
94	24+098	1X3	RCC Slab	Replaced
95	24+141	1X3	RCC Slab	Replaced
96	24+180	1X3	RCC Slab	Replaced
97	24+250	1X3	RCC Slab	Replaced
98	24+395	1X3	RCC Slab	Replaced
99	24+810	1X3	RCC Slab	Replaced
100	25+014	1X3	RCC Slab	Replaced
101	25+152	1X3	RCC Slab	Replaced
102	25+217	1X3	RCC Slab	Replaced

Sr. No.	Design Chainage	Design Size	Type of Structure	Proposal
103	25+627	1X3	RCC Slab	Replaced
104	25+669	1X3	RCC Slab	Replaced
105	25+924	1X3	RCC Slab	Replaced
106	26+307	1X3	RCC Slab	Replaced

8.2.3 Widening and Repairing of existing culverts

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

S. No.	Culvert Location (Km)	Type , Span, Height and width of existing culvert	Type of Repair Required
Nil			

8.2.4 Additional New culverts shall be constructed as per Particulars given in the table below:

Sr. No.	Design Chainage	Design Size	Type of Structure	Proposal
1	10+145	1X3	RCC Slab	New
2	10+187	1X3	RCC Slab	New
3	10+229	1X3	RCC Slab	New
4	10+302	1X3	RCC Slab	New

8.2.5 Repairs/ Replacement of Railing/Parapets, flooring and protection works of the existing culverts shall be undertaken as follows:

Sr. No.	Existing Chainage (km)	Design Chainage (km)	Type of Culvert	Span (m)	Type of Repair
NIL					
1= Replacement of Wearing coat, 2= Repair of parapet wall, 3= Repair of Substructure, 4=Repair of superstructure					

8.2.6 Floor Protection works shall be as specified in the relevant IRC codes and specifications.

8.3 Bridges

8.3.1 Existing Bridges to be retained

(i) The existing bridges at the following locations shall be retained:

Sl. No.	Existing Chainage (Km)	Design Chainage (Km)	Existing no. of Spans with span length (m)	Remarks
1	8+000	8+032	1x24.4+1x 45.9+1x45.7+1x43	Retained

(ii) The following narrow bridges shall be widened:

Sr. No.	Location (Km)	Existing Width (m)	Extent of Widening (m)	Cross-section at deck level for widening
Nil				

8.3.2 Additional New Bridges

New bridges at the following locations on the project highway shall be constructed. GADs for the new bridges are attached in the drawings folder:

Sr. No.	Location		Span Arrangement	Total length (m)	Remarks
	Existing Chainage (Km)	Design Chainage (Km)			
1	-----	5+500	2x20	40	New Minor Bridge
2	-----	26+448	1x20	20	New Minor Bridge

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

Sr. No.	Location (km)	Remarks

Nil

8.3.4 Repairs/ replacements of the existing bridges shall be undertaken as follows:

Sl. No.	Existing Chainage (Km)	Design Chainage (Km)	Existing no. of Spans with span length (m)	Remarks
1	7+600	8+032	1x24.4+1x 45.9+1x45.7+1x43	(1)Replacement of bearings (2) Repair of Construction joint/Expansion joint/wearing coat, parapets, railing etc as per site requirement.

8.3.5 Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in paragraph 7.21 of the Manual.

8.3.6 Structures in marine environment

The Manual and specify the necessary measures / treatments for protecting structures in marine environment, where applicable.

8.4 Rail - Road Bridges

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

8.4.2 Road Over-Bridges

Road over-bridges (road over railway line) shall be provided at the following level crossings, as per manual:

Sl. No.	Location of Level crossing (Chainage km)	Length of bridge (m)
NIL		

8.4.3 Road under-Bridges

Road under-bridges (road under railway line) shall be provided at the following

level crossings, as per GAD drawings attached:

Sl. No.	Location of Level crossings(km)	Number and length of Span (m)
Nil		

8.5 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.

Sr. No.	Location		Span Arrangement	Total length (m)	Remarks
	Existing Chainage (Km)	Design Chainage (Km)			
Nil					

8.6 Repairs and strengthening of bridges and structures

All 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 / Design Chainage (In km)/Span	Side (LHS/RHS)	Nature and Extent of Repairs /
Nil			

B. ROB / RUB

Sl. No.	Location / Design Chainage (In km)	Side (LHS/RHS)	Nature and Extent of Repairs / Strengthening to be carried out
Nil			

C. Overpass / Underpass and Other structures

Sr. No.	Location / Design Chainage (In km)	Side (LHS/RHS)	Nature and Extent of Repairs/ Strengthening to be carried out
Nil			

9. TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

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

(a) Traffic Signs: Traffic signs include roadside signs, overhead signs and curb mounted signs along the entire Project Highway.

(b) Pavement Marking: Pavement markings shall cover road marking for the entire Project Highway.

(c) Safety Barrier: Provide W-beam crash barrier along the project highway at all locations as specified in manual recommended in Schedule D.

9.2 Specifications of the reflecting sheeting.

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

10. ROADSIDE FURNITURE

10.1 Roadside furniture shall be provided in accordance with the provisions of section 11 of the Manual.

(a) Road Boundary Stone: For the entire Project Highway.

(b) Pedestrian Guard Rail: The pedestrian facilities shall include the provision of the;

(i) Pedestrian guardrail: Provide pedestrian guardrail at each bus bay location.

(ii) Pedestrian Crossings: Provide pedestrian crossing facilities on Junctions.

(c) Overhead traffic signs: Location and Size

(i) Full width Overhead signs: Full width Overhead signs shall be provided as suggested in manual recommended in Schedule D.

(ii) Cantilever Overhead signs: Overhead signs shall be provided as suggested in manual recommended in Schedule D.

(iii) Delineators: Delineators for the entire Project Highway at the locations as suggested in manual recommended in Schedule D.

11. COMPULSORY AFFORESTATION

The number of Trees which are required to be planted by the contractor as compensatory afforestation should be as per Forest Conservation Act, twice the

number of trees to be cut.

12. HAZARDOUS LOCATIONS

The safety barriers shall also be provided at the following hazardous locations**:**

Sl. No.	Design Chainage			Remarks
	From	To	Length (m)	
Nil				

13. Special Requirement for Hill Roads

13.1 Reinforced Soil Slope Structure conforming to MORTH specification for road and bridge works and relevant BS codes shall be used as a retaining structure for proposed widening of the Valley Side in those locations wherever requisite design width is sufficiently available to lay the soil reinforcing element of the Reinforced Soil Slope Structure with minimal excavation and disturbance to the existing valley slope and the traffic running on top of it. Equivalent / Higher Protection system will be Technically Evaluated by Approving Authority. The Final Type of product to be used shall be decided upon approval of final design / drawing as per IRC & BS specification.

The minimum requirement of Reinforced Slope Structure indicative as following which may vary as per final drawings and design approved by Authority Engineer. The Contractor is required to conduct detail investigation to assess the work based on site survey, investigations and assessment before commencement of work. Reinforced soil structure: Reinforced soil structure shall be Provided to arrest any leakage damage occurring the valley side and the road due to under cutting by stream or other water course. Such structures shall be provided at the following locations of the Project Highway:

Details of Reinforced Soil Slope Structure to be provided:

Sl. No.	Chainage		Stretch Lenzgth (in Mtr)	Proposed Carriageway width from the edge of existing road in Valley side (in Mtr)	Height of Reinforced Soil slope Wall (in Mtr)
	From	To			
1	0+800	0+850	50	5.6	3.5

Sl. No.	Chainage		Stretch Lenzgth (in Mtr)	Proposed Carriageway width from the edge of existing road in Valley side (in Mtr)	Height of Reinforced Soil slope Wall (in Mtr)
	From	To			
2	0+850	0+900	50	12.7	4
3	1+000	1+010	10	6	10
4	1+100	1+200	100	5	4
5	1+320	1+330	10	7	11
6	1+600	1+725	125	14	6
7	1+900	1+910	10	14	6
8	1+910	1+990	80	6	5
9	2+150	2+170	20	6	4
10	2+200	2+230	30	7.5	10
11	2+230	2+250	20	8	10
12	2+250	2+300	50	7.5	10
13	2+570	2+620	50	12	8
14	3+850	3+960	110	10	12
15	3+970	3+980	10	4.5	8
16	4+100	4+200	100	3	7
17	4+375	4+400	25	3	7
18	4+460	4+480	20	7	8
19	5+350	5+550	200	7	6
20	5+600	5+680	80	6	8
21	8+600	8+680	80	9	15
22	8+820	8+900	80	9	15
23	9+100	9+110	10	7	6
24	9+780	9+820	40	14	9

Sl. No.	Chainage		Stretch Lenzgth (in Mtr)	Proposed Carriageway width from the edge of existing road in Valley side (in Mtr)	Height of Reinforced Soil slope Wall (in Mtr)
	From	To			
25	9+900	10+000	100	11	11
26	10+650	10+660	10	11	7
27	12+450	12+600	150	19	9
28	12+600	12+750	150	24	13
29	13+420	13+470	50	8	10
30	14+300	14+400	100	8	10
31	14+930	14+980	80	11	11
32	19+760	19+860	100	14	15
33	23+000	23+080	80	13	12

13.2 Reinforced Soil Composite System (including Soil Nailing or equivalent system) conforming to MORTH specification for road and bridge works and relevant BS codes shall be used as a retaining structure for proposed widening of the Valley Side for those locations wherever requisite design width is not available to lay the soil reinforcing element of the Reinforced Slope Structure. This includes reinforcing and strengthening the unstable valley slopes with soil nailing while doing the excavation in a top-down manner by incorporating inclusions into the excavated slope surface based on the detail soil investigation and slope stability analysis. Reinforced soil Composite System shall consist of reinforced slope directly attached with stabilized slope mass.

The minimum requirement of Reinforced earth composite system are indicative as following which may vary as per final drawings and design approved by authority engineer. The Contractor is required to conduct detail investigation to assess the work based on site survey, investigations and assessment before commencement of work

Sr. No.	Chainage		Tentative Stretch Length (in Mtr)	Proposed Carriageway width from the edge of existing road in Valley side (in Mtr)	Tentative Height of Retaining Structure in Valley side (in Mtr)
	From	To			
1	3+680	3+690	10	5.5	25
2	4+400	4+420	20	10	30
3	4+420	4+460	40	11	30
4	6+900	6+960	60	11	24
5	9+300	9+350	50	12	22

13.3 Reinforced Soil Composite or equivalent Structure work is Sinking and sliding Zone at Km 14:

The alignment is passing through sinking and sliding zone at few locations which need to be treated with specialized techniques. The reinforced soil composite system or equivalent system conforming to conforming to MORTH specification for road and bridge works and relevant BS codes shall be used as a retaining structure for proposed widening of the Valley Side. This includes reinforcing and strengthening the unstable valley slopes with soil nailing while doing the excavation in a top-down manner by incorporating inclusions into the excavated slope surface based on the detail soil investigation and slope stability analysis. Reinforced Earth Composite System shall consist of reinforced slope directly attached with stabilized slope mass. In addition to above High Steel Wire Mesh shall be provided to avoid sliding of rock mass in sliding zones identified based on geological study of the area.

The minimum requirement of Reinforced Soil Composite System to treat Sliding & Sinking Zone are indicative as following which may vary as per final drawings and design approved by authority engineer. The Contractor is required to conduct detail investigation to assess the work based on site survey, investigations and assessment before commencement of work.

Sr. No.	Tentative Chainage		Tentative Stretch Length (in Mtr)
1	**From**	**To**	
1	14+050	14+400	350

13.4 **Retaining Wall:** The minimum requirement of Retaining wall are suggested as following which may vary as per final drawings and design approved by Authority Engineer. The Contractor is required to conduct detail investigation to assess the work based on site survey, investigations and assessment before commencement of work.

Retaining Walls Locations:

Sl. No.	From	To	Length	Avg. Height
1	1700	1800	100	2.5
2	2+300	2+380	80	2.5
3	5+550	5+700	150	3.6
4	5+800	5+920	120	3.5
5	7+800	7+880	80	2.5
6	9+340	9+440	100	3.3
7	10+060	10+720	660	4
8	11+660	11+780	120	6
9	12+960	13+060	100	2.64
10	13+540	14+760	1220	4.35
11	17+040	17+080	40	2.3
12	17+380	17+560	180	2.6
13	20+040	20+360	320	6
14	22+360	22+620	260	5.5

Sl. No.	From	To	Length	Avg. Height
15	24+000	24+100	100	3.6
16	25+140	25+500	360	6
17	26+000	26+140	140	3

13.5 Breast Wall: The minimum requirement of Breast wall are suggested as following which may vary as per final drawings and design approved by Authority Engineer. The Contractor is required to conduct detail investigation to assess the work based on site survey, investigations and assessment before commencement of work.

In addition to breast wall Landslide zones to be treated with Soil nailing & High Strength Wire Mesh having of minimum diameter 3 mm twisted or Straight of high tensile steel wire as per IRC & BS specifications. The System should be tailor made according to the site conditions and requirements with accessories like Connection Clips / Press Claws / Shackles/ Boundary Ropes / Wire Rope Anchors etc. Equivalent / Higher Protection system will be Technically Evaluated by Approving Authority. The Final Type of product to be used shall be decided upon approval of final design / drawing as per IRC & BS specification.

Breast Wall Location:

Sl. No.	From	To	Length	Avg. Height
1	1220	1260	40	2.5
2	1+520	1+600	80	5
3	2+460	2+500	40	6
4	4+520	4+880	360	6.48
5	5+260	5+300	40	6.8
6	5+720	5+800	80	5.5
7	6+820	7+000	180	2.5
8	8+720	8+760	40	5.5

Sl. No.	From	To	Length	Avg. Height
9	9+020	9+100	80	6
10	11+360	11+560	200	3.7
11	11+980	12+160	180	6.5
12	12+660	12+720	60	2.5
13	14+300	14+340	40	8.5
14	14+420	14+460	40	15
15	14+780	15+100	320	4
16	15+940	16+040	100	3
17	16+000	16+680	680	5.6
18	17+660	17+720	60	4.68
19	20+600	20+660	60	4.75
20	23+240	23+460	220	4
21	24+420	24+500	80	2.6
22	26+960	26+980	20	6

13.6 Stone Pitching and Chute Drain – The following locations has been considered for stone pitching and chute drain

Location of Stone Pitching and Chute Drains

Minor Bridge Locations

Sl. No.	From	To	Length
1	5480	5620	140
2	26420	26540	120

Retaining wall and Valley side Locations

Sl. No.	From	To	Length
1	1700	1800	100
2	2+300	2+380	80
3	5+550	5+700	150
4	5+800	5+920	120
5	7+800	7+880	80
6	9+340	9+440	100
7	10+060	10+720	660

Sl. No.	From	To	Length
8	11+660	11+780	120
9	12+960	13+060	100
10	13+540	14+760	1220
11	17+040	17+080	40
12	17+380	17+560	180
13	20+040	20+360	320
14	22+360	22+620	260
15	24+000	24+100	100
16	25+140	25+500	360
17	26+000	26+140	140

14. CHANGE OF SCOPE

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

15. Indicative Chainages with applicable typical Cross section :

TYPICAL CROSS SECTION

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
1	0+000	0+800	0.8	Raised Portion	TCS-01
2	0+800	0+869	0.069	New Alignment	TCS-02
3	0+869	1+200	0.331	Raised Portion	TCS-01
4	1+200	1+435	0.235	New Alignment	TCS-02
5	1+435	1+500	0.065	Raised Portion	TCS-01
6	1+500	1+725	0.225	New Alignment	TCS-02
7	1+725	1+871	0.146	Raised Portion	TCS-01
8	1+871	2+000	0.129	New Alignment	TCS-02
9	2+000	2+400	0.4	Raised Portion	TCS-01
10	2+400	2+800	0.4	New Alignment	TCS-02
11	2+800	3+050	0.25	Raised Portion	TCS-01

TYPICAL CROSS SECTION

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
12	3+050	3+150	0.1	New Alignment	TCS-02
13	3+150	3+285	0.135	Raised Portion	TCS-01
14	3+285	3+430	0.145	New Alignment	TCS-02
15	3+430	3+762	0.332	Raised Portion	TCS-01
16	3+762	3+950	0.188	New Alignment	TCS-02
17	3+950	4+400	0.45	Raised Portion	TCS-01
18	4+400	4+751	0.351	New Alignment	TCS-02
19	4+751	4+818	0.067	Raised Portion	TCS-01
20	4+818	4+900	0.082	New Alignment	TCS-02
21	4+900	4+982	0.082	Raised Portion	TCS-01
22	4+982	5+060	0.078	New Alignment	TCS-02
23	5+060	5+110	0.05	Raised Portion	TCS-01
24	5+110	5+154	0.044	New Alignment	TCS-02
25	5+154	5+200	0.046	Raised Portion	TCS-01
26	5+200	5+418	0.218	New Alignment	TCS-02
27	5+418	5+710	0.292	Raised Portion	TCS-01
28	5+710	6+078	0.368	New Alignment	TCS-02
29	6+078	6+152	0.074	Raised Portion	TCS-01
30	6+152	6+383	0.231	New Alignment	TCS-02
31	6+383	6+758	0.375	Raised Portion	TCS-01
32	6+758	6+812	0.054	New Alignment	TCS-02
33	6+812	6+900	0.088	Raised Portion	TCS-01
34	6+900	7+016	0.116	New Alignment	TCS-02
35	7+016	7+455	0.439	Raised Portion	TCS-01

TYPICAL CROSS SECTION

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
36	7+455	7+592	0.137	New Alignment	TCS-02
37	7+592	7+950	0.358	Raised Portion	TCS-01
38	7+950	8+110	0.16	**Bridge Portion**	
39	8+110	8+200	0.09	Raised Portion	TCS-01
40	8+200	8+700	0.5	**Built-up Section**	TCS-03
41	8+700	8+800	0.1	New Alignment	TCS-02
42	8+800	8+995	0.195	Raised Portion	TCS-01
43	8+995	9+062	0.067	New Alignment	TCS-02
44	9+062	9+446	0.384	Raised Portion	TCS-01
45	9+446	9+520	0.074	New Alignment	TCS-02
46	9+520	9+770	0.25	Raised Portion	TCS-01
47	9+770	9+821	0.051	New Alignment	TCS-02
48	9+821	9+900	0.079	Raised Portion	TCS-01
49	9+900	10+373	0.473	New Alignment	TCS-02
50	10+373	10+450	0.077	Raised Portion	TCS-01
51	10+450	10+537	0.087	New Alignment	TCS-02
52	10+537	10+700	0.163	Raised Portion	TCS-01
53	10+700	10+800	0.1	New Alignment	TCS-02
54	10+800	11+182	0.382	Raised Portion	TCS-01
55	11+182	11+418	0.236	New Alignment	TCS-02
56	11+418	11+521	0.103	Raised Portion	TCS-01
57	11+521	11+738	0.217	New Alignment	TCS-02
58	11+738	11+777	0.039	Raised Portion	TCS-01
59	11+777	12+070	0.293	New Alignment	TCS-02

TYPICAL CROSS SECTION

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
60	12+070	12+452	0.382	Raised Portion	TCS-01
61	12+452	12+549	0.097	New Alignment	TCS-02
62	12+549	13+100	0.551	Raised Portion	TCS-01
63	13+100	13+150	0.05	New Alignment	TCS-02
64	13+150	14+138	0.988	Raised Portion	TCS-01
65	14+138	14+211	0.073	New Alignment	TCS-02
66	14+211	14+500	0.289	Raised Portion	TCS-01
67	14+500	14+585	0.085	New Alignment	TCS-02
68	14+585	14+800	0.215	Raised Portion	TCS-01
69	14+800	14+900	0.1	New Alignment	TCS-02
70	14+900	14+954	0.054	Raised Portion	TCS-01
71	14+954	15+049	0.095	New Alignment	TCS-02
72	15+049	15+223	0.174	Raised Portion	TCS-01
73	15+223	15+300	0.077	New Alignment	TCS-02
74	15+300	15+390	0.09	Raised Portion	TCS-01
75	15+390	15+450	0.06	New Alignment	TCS-02
76	15+450	16+085	0.635	Raised Portion	TCS-01
77	16+085	16+168	0.083	New Alignment	TCS-02
78	16+168	16+600	0.432	Raised Portion	TCS-01
79	16+600	16+630	0.03	New Alignment	TCS-02
80	16+630	17+075	0.445	Raised Portion	TCS-01
81	17+075	17+300	0.225	New Alignment	TCS-02
82	17+300	18+250	0.95	Raised Portion	TCS-01
83	18+250	18+323	0.073	New Alignment	TCS-02

TYPICAL CROSS SECTION

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
84	18+323	18+420	0.097	Raised Portion	TCS-01
85	18+420	18+539	0.119	New Alignment	TCS-02
86	18+539	19+620	1.081	Raised Portion	TCS-01
87	19+620	20+138	0.518	New Alignment	TCS-02
88	20+138	20+260	0.122	Raised Portion	TCS-01
89	20+260	20+385	0.125	New Alignment	TCS-02
90	20+385	20+536	0.151	Raised Portion	TCS-01
91	20+536	20+625	0.089	New Alignment	TCS-02
92	20+625	20+950	0.325	Raised Portion	TCS-01
93	20+950	21+020	0.07	New Alignment	TCS-02
94	21+020	21+450	0.43	Raised Portion	TCS-01
95	21+450	21+600	0.15	New Alignment	TCS-02
96	21+600	21+800	0.2	Raised Portion	TCS-01
97	21+800	21+960	0.16	New Alignment	TCS-02
98	21+960	22+000	0.04	Raised Portion	TCS-01
99	22+000	22+332	0.332	New Alignment	TCS-02
100	22+332	22+700	0.368	Raised Portion	TCS-01
101	22+700	22+800	0.1	New Alignment	TCS-02
102	22+800	22+850	0.05	Raised Portion	TCS-01
103	22+850	22+920	0.07	New Alignment	TCS-02
104	22+920	23+000	0.08	Raised Portion	TCS-01
105	23+000	23+100	0.1	New Alignment	TCS-02
106	23+100	23+625	0.525	Raised Portion	TCS-01
107	23+625	23+713	0.088	New Alignment	TCS-02

TYPICAL CROSS SECTION

Sr. No.	Proposed Chainage		Length in (Km)	Type of Cross Section	Remarks
	From (Km)	To (Km)			
108	23+713	23+865	0.152	Raised Portion	TCS-01
109	23+865	24+010	0.145	New Alignment	TCS-02
110	24+010	24+376	0.366	Raised Portion	TCS-01
111	24+376	24+410	0.034	New Alignment	TCS-02
112	24+410	24+650	0.24	Raised Portion	TCS-01
113	24+650	24+700	0.05	New Alignment	TCS-02
114	24+700	25+475	0.775	Raised Portion	TCS-01
115	25+475	25+725	0.25	New Alignment	TCS-02
116	25+725	25+832	0.107	Raised Portion	TCS-01
117	25+832	26+027	0.195	New Alignment	TCS-02
118	26+027	26+160	0.133	Raised Portion	TCS-01
119	26+160	26+218	0.058	New Alignment	TCS-02
120	26+218	26+706	0.488	Raised Portion	TCS-01

SCHEDULE - C
(See Clause 2.1)

PROJECT FACILITIES

1 Project Facilities

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

(a) Toll plaza;

(b) Roadside furniture;

(c) Pedestrian facilities;

(d) Tree plantation;

(e) Truck lay-byes;

(f) Bus bays and bus shelters;

(h) Rest areas; and

(i) Others to be specified

2 Description of Project Facilities

Each of the Project Facilities is described below showing:

(a) Toll Plaza

Toll plaza shall be designed as per the guidelines of manual and it is provided at following locations:

S. No.	Toll Plaza Location (Design Chainage in Km)
Nil	

(b) Roadside Furniture

The roadside furniture shall include the provision of the;

i. Traffic Signs

Traffic signs include roadside signs, overhead signs and curb mounted signs etc provided for the entire Project Highway as per manual recommended in Schedule D.

ii. Pavement Markings

Pavement markings shall cover road marking for the entire Project Highway as per manual recommended in Schedule D.

iii. LED Traffic Blinkers

LED traffic blinker signal provided for entire project.

iv. Crash barrier

Provide W-beam crash barrier along the project highway at the locations as suggested in manual recommended in Schedule D.

v. Delineators

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

vi. Boundary stones

For the entire Project Highway as suggested in relevant IRC Manual recommended in Schedule D.

vii. Hectometer / Kilometer stones

For the entire Project Highway as suggested in relevant IRC Manual recommended in Schedule D.

(c) Pedestrian Facilities

The pedestrian facilities shall include the provision of the;

i. Pedestrian guardrail: Provide pedestrian guardrail at each bus bay location.

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

(d) Landscaping and Tree Plantation

The landscaping and tree plantation shall be provided. The locations for these provisions shall be finalized in consultation with Independent Engineer.

(e) Truck Lay-byes

Truck lay byes shall be provided at the following locations for a capacity of minimum 10 trucks at each location.

Sr. No.	Proposed Ch.
1.	7+350 (RHS)

(f) Bus Bays and Shelter

Bus Bays shall be provided at locations given below:

Sr. No.	EXISTING CHAINAGE	DESIGN CHAINAGE	SIDE
1	0+000	0+000	Both
2	0+967	0+960	Both
3	1+311	1+300	Both
4	1+840	1+840	Both
5	2+581	2+575	Both
6	6+622	6+600	Both
7	8+760	8+650	Both
8	13+240	13+270	Both
9	14+388	14+370	Both
10	14+800	14+800	Both
11	18+340	18+200	Both
12	19+480	19+318	Both
13	21+285	20+985	Both
14	21+360	21+385	Both
15	21+740	22+300	Both
16	22+720	23+740	Both
17	24+180	25+650	Both
18	25+880	25+400	Both

Sr. No.	EXISTING CHAINAGE	DESIGN CHAINAGE	SIDE
19	26+700	26+175	Both
20	28+000	26+100	Both

(g) Rest Areas,

Rest areas shall be provided at truck lay byes locations.

(h) Others

1. **Highway Lighting**

   Lighting shall be provided at the following locations:

   (i) Lighting shall be provided at approach to bridges, Built up areas, Toll plaza, Bus bays, truck Lay-bys, and as per manual recommended in Schedule D.

   (ii) High Mast Lighting shall be provided at all Major Junctions, Toll plaza locations,

2. **Highway Patrol**

   Highway Patrol units in adequate number

3. **Ambulances**

   Aambulance units in adequate number

4. **Cranes**

   Cranes in adequate number.

5. **Advance Traffic Management System (ATMS)**

   Provisions of other facilities, if required may be made in similar manner.

SCHEDULE - D
(See Clause 2.1)

SPECIFICATIONS AND STANDARDS

1 Construction

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

2 Design Standards

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

Manual of Specifications and Standards for Two Lanning of Highways (IRC: SP: 73-2015), referred to herein as the Manual

Annex - I
(Schedule-D)

Specifications and Standards for Construction

1 Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Two-Lanning of Highways (IRC:SP:73-2015), 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

2.1 The terms "Concessionaire", "Independent Engineer" and "Concession Agreement" used in the Manual shall be deemed to be substituted by the terms "Contractor", "Authority's Engineer" and "Agreement" respectively.

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

Clause Referred in Manual	Item	Provision as per Manual	Modified Provision	Remarks
2.16.1 Fig. 2.5	Typical Cross Section in built-up area	Four lane divided carriageway with footpath in built-up area.	Two lane carriageway with paved shoulder including both sides RCC drain cum footpath in built-up area.	
2.2.1	Minimum	40 kmph	At Some locations listed	

	design speed in hilly terrain.		below, where the horizontal curve radius is not meeting the criteria as per clause 2.9.4 and table 2.5 of IRC: SP: 73-2015.	

3 DEFECIENT CURVE DETAILS:

Sl. No.	PI	R (m)	Design Speed	Extra Widening (m)
1	1+352.068	20	25 Km/hr	1.5
2	1+373.808	20	25 Km/hr	1.5
3	1+589.904	-20	25 Km/hr	1.5
4	1+619.685	-20	25 Km/hr	1.5
5	1+872.918	20	25 Km/hr	1.5
6	1+906.090	20	25 Km/hr	1.5
7	2+545.478	-20	25 Km/hr	1.5
8	2+580.423	-20	25 Km/hr	1.5
9	3+112.922	20	25 Km/hr	1.5
10	3+144.207	20	25 Km/hr	1.5
11	3+853.581	-20	25 Km/hr	1.5
12	3+883.759	-20	25 Km/hr	1.5
13	4+164.389	20	25 Km/hr	1.5
14	4+692.935	20	25 Km/hr	1.5
15	4+729.689	20	25 Km/hr	1.5
16	5+263.338	30	30 Km/hr	1.5
17	5+314.225	-20	25 Km/hr	1.5

Sl. No.	PI	R (m)	Design Speed	Extra Widening (m)
18	5+349.954	-20	25 Km/hr	1.5
19	5+860.060	18	20 Km/hr	1.5
20	5+891.880	18	20 Km/hr	1.5
21	6+182.344	-19.500 m	25 Km/hr	
22	6+215.009	-19.500 m	25 Km/hr	
23	7+916.307	50	40 Km/hr	1.2
24	8+132.185	15	20 Km/hr	1.5
25	8+281.491	30	30 Km/hr	1.5
26	8+330.449	-30	30 Km/hr	1.5
27	8+386.106	-40	35 Km/hr	1.2
28	8+602.442	-20	25 Km/hr	1.5
29	8+984.349	22	25 Km/hr	1.5
30	9+025.127	22	25 Km/hr	1.5
31	9+299.862	-70	50 Km/hr	0.9
32	9+446.811	-20	25 Km/hr	1.5
33	9+489.458	-20	25 Km/hr	1.5
34	9+523.697	30	30 Km/hr	1.5
35	9+589.542	-70	50 Km/hr	0.9
36	9+627.027	30	30 Km/hr	1.5
37	9+670.735	30	30 Km/hr	1.5
38	10+213.271	20	25 Km/hr	1.5
39	10+241.690	20	25 Km/hr	1.5
40	11+635.297	-20	25 Km/hr	1.5
41	11+661.674	-20	25 Km/hr	1.5

Sl. No.	PI	R (m)	Design Speed	Extra Widening (m)
42	12+544.738	20	25 Km/hr	1.5
43	12+558.221	20	25 Km/hr	1.5
44	14+156.053	-55	40 Km/hr	1.2
45	14+246.784	-55	40 Km/hr	1.2
46	14+332.177	-55	40 Km/hr	1.2
47	14+425.149	-55	40 Km/hr	1.2
48	14+510.125	-55	40 Km/hr	1.2
49	14+627.321	-55	40 Km/hr	1.2
50	14+928.230	20	25 Km/hr	1.5
51	14+961.451	20	25 Km/hr	1.5
52	14+998.290	-30	30 Km/hr	1.5
53	15+099.473	-20	25 Km/hr	1.5
54	15+232.269	20	25 Km/hr	1.5
55	15+261.908	20	25 Km/hr	1.5
56	15+405.315	-20	25 Km/hr	1.5
57	15+438.988	-20	25 Km/hr	1.5
58	15+470.797	30	30 Km/hr	1.5
59	15+507.412	-70	50 Km/hr	0.9
60	16+489.569	20	25 Km/hr	1.5
61	16+517.913	20	25 Km/hr	1.5
62	17+408.157	-20	25 Km/hr	1.5
63	17+506.641	-20	25 Km/hr	1.5
64	18+338.970	-30	30 Km/hr	1.5
65	18+387.220	30	30 Km/hr	1.5

Sl. No.	PI	R (m)	Design Speed	Extra Widening (m)
66	18+425.438	-20	25 Km/hr	1.5
67	18+480.337	40	35 Km/hr	1.2
68	18+540.560	-40	35 Km/hr	1.2
69	18+585.947	20	25 Km/hr	1.5
70	18+676.054	20	25 Km/hr	1.5
71	18+696.490	-50	40 Km/hr	1.2
72	18+760.820	30	30 Km/hr	1.5
73	18+817.021	-30	30 Km/hr	1.5
74	20+344.480	50	40 Km/hr	1.2
75	20+430.785	-20	25 Km/hr	1.5
76	20+486.016	-20	25 Km/hr	1.5
77	20+655.457	20	25 Km/hr	1.5
78	20+726.751	20	25 Km/hr	1.5
79	20+768.724	-30	30 Km/hr	1.5
80	21+291.656	-20	25 Km/hr	1.5
81	21+372.231	-20	25 Km/hr	1.5
82	21+830.473	20	25 Km/hr	1.5
83	21+872.807	20	25 Km/hr	1.5
84	24+058.025	-20	25 Km/hr	1.5
85	24+107.901	-20	25 Km/hr	1.5
86	25+050.438	20	25 Km/hr	1.5
87	25+108.931	20	25 Km/hr	1.5
88	26+552.965	-20	25 Km/hr	1.5
89	26+614.446	-20	25 Km/hr	1.5

Sl. No.	PI	R (m)	Design Speed	Extra Widening (m)
90	26+652.280	50	40 Km/hr	1.2
91	26+727.271	-50	40 Km/hr	1.2
92	26+778.537	20	25 Km/hr	1.5
93	26+843.221	20	25 Km/hr	1.5

4 CRITERIA FOR REINFORCED SOIL SLOPE STRUCTURE

Reinforced soil Slope Structure as mentioned in Schedule B shall be used as a retaining structure for proposed widening of the Valley Side .The specification for the work shall conform to MORTH specifications for road and bridge works 2013 (Fifth revision) and relevant BS codes.

5 CRITERIA FOR REINFORCED SOIL COMPOSITE SYSTEM OR EQUIVALENT SYSTEM

Reinforced Soil Composite System or equivalent system as mentioned in Schedule B shall be used as a retaining structure for proposed widening of the Valley Side for those locations wherever requisite design width is not available to lay the soil reinforcing element of the Reinforced Slope Structure and to protect Sliding and Sinking Zones adjoin to proposed road alignment.

This includes reinforce and strengthen the unstable valley slopes while doing the excavation in a top-down manner by incorporating inclusions into the excavated slope surface based on the detail soil investigation and slope stability analysis.

The specification for the work shall conform to MORTH specifications for road and bridge works 2013 (Fifth revision) and relevant BS codes.

- **Soil Nails** : Soil Nail shall be fully threaded solid hot laminated geotechnical bars which are hot – dip galvanized conforming to IS 4759:1996 / relevant BS code requirements.

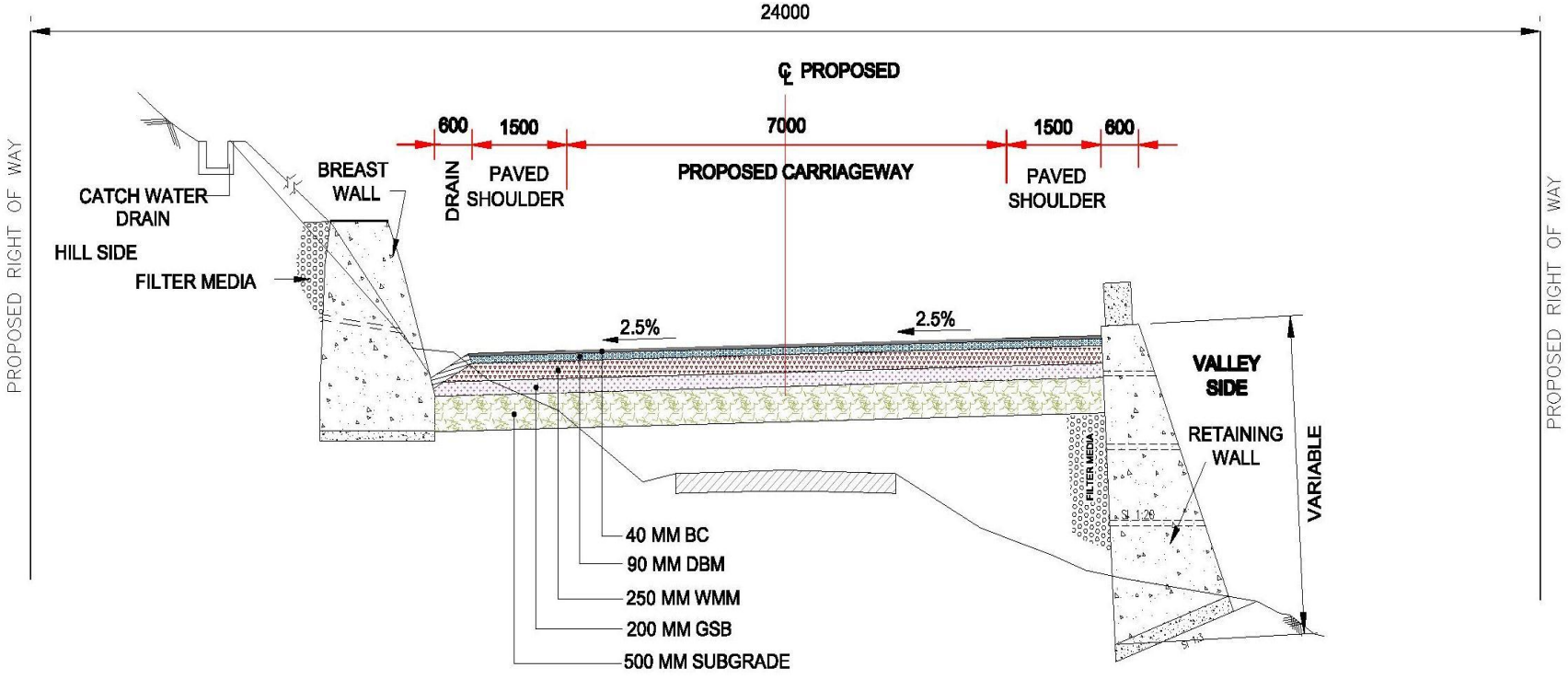
- **Ground Anchors :**Depending on the soil strata, height of the structure and slope stability design, the excavated slope surface needs to be strengthened by Permanent Ground Anchors as per MORTH / BS code specifications.

  Connection between soil reinforcing element and stabilized slope mass: The reinforced slope mass shall be connected with stabilized existing soil mass in such a way that the total long term design force is effectively transferred to the stabilized soil mass. This is possible by either directly connecting the soil reinforcement with soil nail or anchor head or through another welded wire mesh or in combination of both. All steel components shall be hot-dip galvanized to BS 729:1971 requirements or IS 4759:1996, except that the average zinc coat weight is not less than 600 gm/m2. The work shall conform to MORTH specifications for road and bridge works 2013 (Fifth revision) and relevant BS codes. In addition to above measures mentioned Landslide zones to be treated with Soil nailing & High Strength Wire Mesh having of minimum diameter 3 mm twisted or Straight of high tensile steel wire as per IRC & BS specifications. The System should be tailor made according to the site conditions and requirements with accessories like Connection Clips / Press Claws / Shackles/ Boundary Ropes / Wire Rope Anchors etc. Equivalent / Higher Protection system will be Technically Evaluated by Approving Authority. The Final Type of product to be used shall be decided upon approval of final design / drawing as per IRC & BS specification.

- The Provision of the Reinforced slope structure and Reinforced earth composite structure will be provided basing on the site condition and Alternate arrangement can be proposed by the Contractor and decision for The Final Type of product to be used shall be decided upon approval of final design / drawing.

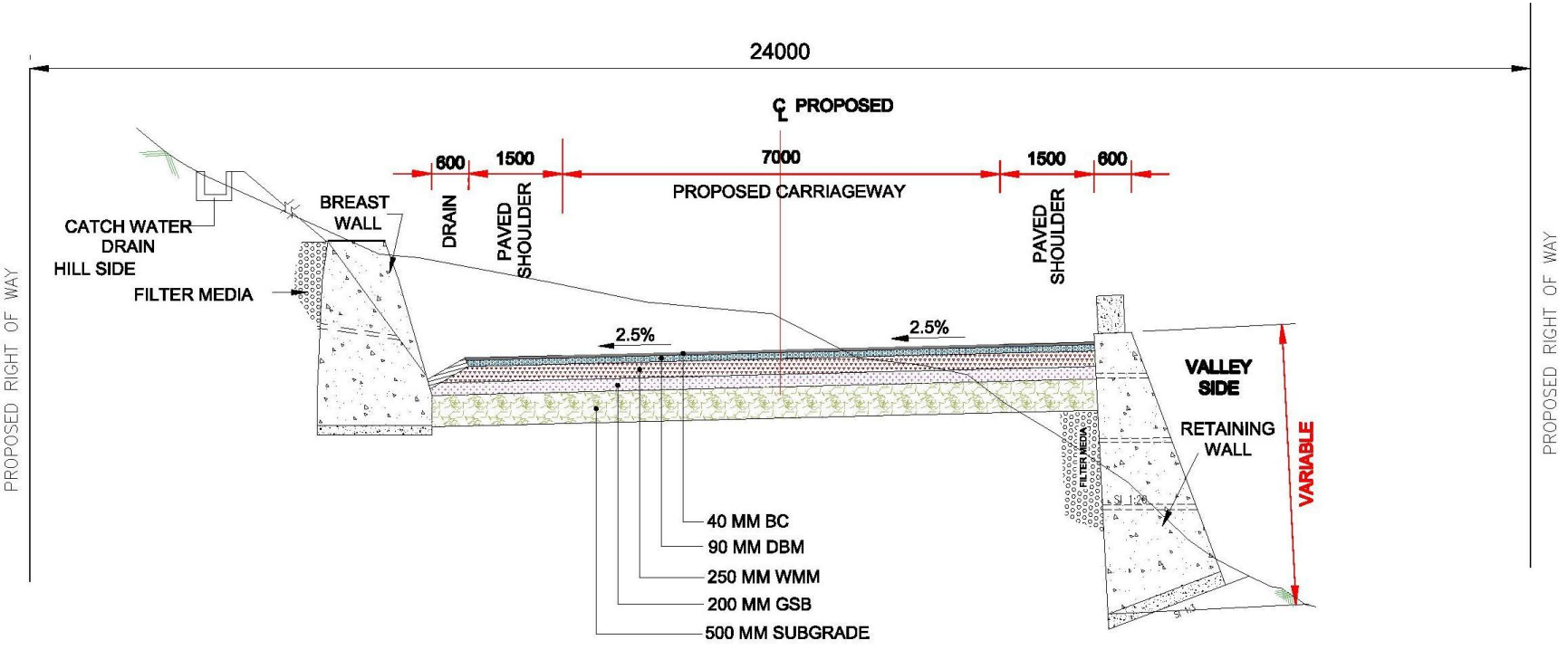
Applicable Typical Cross Section:

Typical Cross Section-01



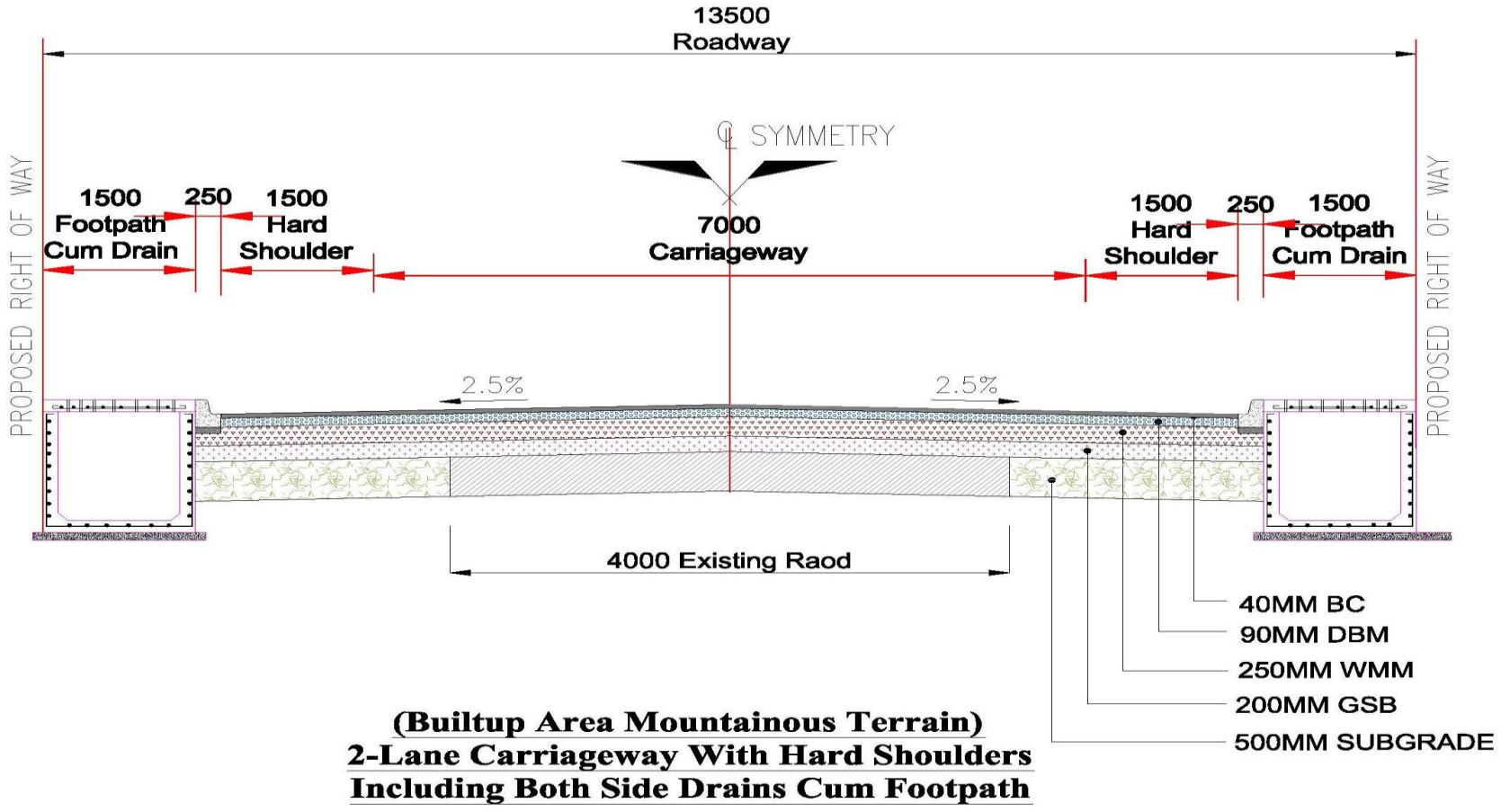
Two Lane With Paved Shoulder Raised Portion(Hill Section)

Typical Cross Section-02



Two Lane With Paved Shoulder Raised Portion(Hill Section)
(New Alignment)

Typical Cross Section-03



(Builtup Area Mountainous Terrain)
2-Lane Carriageway With Hard Shoulders
Including Both Side Drains Cum Footpath

Schedule – E

(See Clause 2.1 and 14.2)

MAINTENANCE REQUIREMENTS

1. Maintenance Requirements

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

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

1.3. All Materials, works and construction operations shall conform to the "SPECIFICATIONS FOR ROAD ANDBRIDGE 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.

This being not an item rate contract, the procedure for Measurement and Payment for the items of works shall be in accordance with provision of Article 19 of the Agreement. Therefore the Sub Clauses of measurement for payment and rates in above specifications stand deleted.

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

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

In respect of any Defect or deficiency not specified in Annex-I of this Schedule-E, the Authority's Engineer may, in conformity with Good Industry Practice, specify the

permissible limit of deviation or deterioration with reference to the Specifications and Standards, and any deviation or deterioration beyond the permissible limit shall be repaired or rectified by the Contractor within the time limit specified by the Authority's Engineer.

4. Extension of time limit

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

5. Emergency repairs/restoration

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

6. Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

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

8. Repairs on account of natural calamities

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

Annex – I

(Schedule-E)

Repair/rectification of Defects and deficiencies

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

Nature of Defect or deficiency		Time limit for repair/ rectification
ROADS		
(a)	**Carriageway and paved shoulders**	
(i)	Breach or blockade	Temporary restoration of traffic within 24 hours; permanent restoration within 15 (fifteen) days.
(ii)	Any significant change in roughness value from original value [more than 5%] in a stretch of 1 km (as measured by a Calibrated bump integrator)	120 (one hundred and twenty) days
(iii)	Pot holes	24 hours
(iv)	Any cracks in road surface	15 (fifteen) days
(v)	Any depressions, rutting exceeding 10 mm in road surface.	30 (thirty) days
(vi)-	Bleeding/skidding-	7 (seven) days
(vii)	Any other defect/distress on the road	15 (fifteen) days
(viii)	Damage to pavement edges	15 (fifteen) days
(ix)	Removal of debris, dead animals	6 hours
(x)	Any other defects/deficiency not covered above but pointed out by Engineer	3 (Three) days
(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	24 hours

Nature of Defect or deficiency		Time limit for repair/ rectification
	areas	
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)
(c)	**Road side furniture including road sign and pavement marking**	
(i)	Damage to shape or position, poor visibility or loss of retro-reflectivity	48 hours
(ii)	Painting of Km stone, railing, parapets, crash barriers	As and when required/Once every year
(iii)	Damaged/missing road signs 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 hours
(ii)	Faults and minor failures	8 hours
(e)	**Trees and plantation**	
(i)	Obstruction in a minimum head-room of 5 m above carriageway or obstruction in visibility of road signs	24 hours
(ii)	Removal of fallen trees from carriageway	4 hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiring replacement	30 (Thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
(f)	**Rest area**	
(i)	Cleaning of toilets	Every 4 hours
(ii)	Defects in electrical, water and sanitary installations	24 hours
(g)	[Toll Plaza]	
(h)	Other Project Facilities and Approach roads	
(i)	Damage in approach roads, pedestrian facilities, truck lay- byes, bus-bays, bus-shelters, cattle crossings, [Traffic Aid Posts, Medical Aid Posts] and service roads	15 (fifteen) days
(ii)	Damaged vehicles or debris on the road	4 (four) hours
(iii)	Malfunctioning of the mobile crane	4 (four) hours
	Bridges	
(a)	**Superstructure**	
(i)	Any damage, cracks, spalling/ scaling Temporary measures Permanent measures	within 48 hours within 15 (fifteen) days or as specified by the Authority's Engineer
(b)	**Foundations**	
(i)	Scouring and/or cavitations	15 (fifteen) days
(c)	**Piers, abutments, return walls and wing**	

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

The failure to address above measures for any of the defects/deficiency may attract reduction in payment as per schedule M

Schedule-F

(See Clause 3.1.5(a))

APPLICABLE PERMITS

1. **Applicable Permits**

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

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

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

(c) License for use of explosives;

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

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

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

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

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

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

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

Schedule-G

(See Clause 7.1.1, 7.5.3 and 19.2)

FORM OF BANK GUARANTEE

Annex-I

(See Clause 7.1.1)

PERFORMANCE SECURITY

The Managing Director,
NHIDCL,
3rd Floor, PTI Building, Sansad Marg,
New Delhi

WHEREAS:

(A) _____ [name and address of contractor] (hereinafter called "the Contractor") and [**NHIDCL, Government of India**], (**"the Authority"**) have entered into an agreement (the **"Agreement"**) for"**Construction of upgradation of existing road to 2-lane with paved shoulder including geometric improvement from Km. 0.00 0to Km. 26.706 in Rhenok-Rorathang-Pakyong of NH-717A on EPC basis under SARDP-NE Phase 'Á' in the State of Sikkim**

(B) through Engineering, Procurement & Construction (EPC) Basis Contract", subject to and in accordance with the provisions of the Agreement.

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

(D) 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 and under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the guarantee amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of [Executive Engineer, CGPWD], that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any difference between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other Authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfillment and/or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Agreement or for the fulfillment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Performance Security shall cease to be in force and effect upto 90 (ninety) days after the end of the Defects Liability Period as set forth in Clauses 17.1 of EPC agreement.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

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

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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

Annex-II

(Schedule-G)

(See Clause 7.5.3)

Form for Guarantee for Withdrawal of Retention Money

The Managing Director,
NHIDCL,
3rd Floor, PTI Building, Sansad Marg,
New Delhi

WHEREAS:

[Name and address of contractor] (hereinafter called "**the Contractor**") has executed an agreement (hereinafter called the "Agreement") with the [**NHIDCL, Government of India**], (hereinafter called "**the Authority**") for the **Construction of upgradation of existing road to 2-lane with paved shoulder including geometric improvement from Km. 0.00 0to Km. 26.706 in Rhenok-Rorathang-Pakyong of NH-717A on EPC basis under SARDP-NE Phase 'Á' in the State of Sikkim** through Engineering, Procurement & Construction (EPC) Basis Contract", subject to and in accordance with the provisions of the Agreement.

a. in accordance with the Clause 7.5.3 of the Agreement, whenever the amount of the retention money (hereinafter called "Retention Money") held by the Authority exceeds 1% (one per cent) of the Contract Price, the Contractor may, at its option, withdraw the Retention Money after furnishing to the Authority a bank guarantee for an amount equal to the proposed withdrawal.

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

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

1. The Bank hereby unconditionally and irrevocably undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of [Executive Engineer, CGPWD], that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any difference between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other Authority or body, or by the discharge of the Contractor for any reason whatsoever.
3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Retention Money and any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Retention Money.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The guarantee shall cease to be in force and effect 90 (ninety) days after the end of the Defects Liability Period specified in Clauses 17.1 of the Agreement.

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

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

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

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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

Annex-III

(Schedule-G)

(See Clause 19.2)

Form for Guarantee for Advance Payment

The Managing Director,
NHIDCL,
3rd Floor, PTI Building, Sansad Marg,
New Delhi

WHEREAS:

(A) [name and address of contractor] (hereinafter called "**the Contractor**") has executed an agreement (hereinafter called the "Agreement") with the [**NHIDCL**], (hereinafter called "**the Authority**") for the "**Construction of upgradation of existing road to 2-lane with paved shoulder including geometric improvement from Km. 0.00 0to Km. 26.706 in Rhenok-Rorathang-Pakyong of NH-717A on EPC basis under SARDP-NE Phase 'Á' in the State of Sikkim** through Engineering, Procurement & Construction (EPC) Basis Contract", subject to and in accordance with the provisions of the Agreement.

(B) in accordance with the Clause 19.2 of the Agreement the Authority shall make to the Contractor advance payment (hereinafter called "Advance Payment") equal to 10% (ten per cent) of the contract price for mobilization expenses and acquisition of equipment; 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 equal to the amount of each 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; and the amount of (first/second) installment of the Advance Payment is Rs. **** cr. (Rupees ***** crore) (the "Guarantee Amount").

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

- -

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

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

2. A letter from the Authority, under the hand of an officer not below the rank of [Executive Director, NHIDCL], that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the installment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any difference between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other Authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or

by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Advance Payment.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The guarantee shall cease to be in force and effect 90 (ninety) days after the end of the one year from the date of payment of the installment of the Advance Payment, as set forth in Clause 19.2 of the Agreement.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

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

12. Notwithstanding anything contained herein before, our liability under this Bank Guarantee is restricted to Rs. _____(Rs. _____in words) and the bank guarantee shall remain valid till _____. Unless a claim or a demand in writing is served upon us on or before _____ all our liability under this Bank Guarantee shall cease.

---

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

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

SCHEDULE - H

(See Clauses10.1.4 and 19.3)

Contract Price Weightages

The Contract Price for this Agreement is Rs. 248.84 Crore

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

Item	**Weightage in percentage to the Contract Price**	**Stage for Payment**	**Percentage weightage to Particular item(col:2)**
1	**2**	**3**	**4**
Road works including culverts, minor bridges, Underpasses, overpasses, approaches to ROB/RUB/ Structures (but excluding service roads)	36.73%	A- <u>Widening and strengthening of existing road to 2-Lane with Paved Shoulder</u>	
		(1) Earthwork up to top of the sub-grade including clearing and grubbing	16.51%
		(2) Granular work (sub-base, base, shoulders)	9.98%
		(3) Dense Bituminous Macadam	18.8%
		(4) Bituminous Concrete	9.4%
		(5) Widening and repair of culverts	0.00%
		(6) Concrete Pavement	0.00%
		(7) Widening and repair of Minor bridges	0.00%
		B- <u>Widening and strengthening of existing road to 4-Lane</u>	
		(1) Earthwork up to top of the sub-grade	0.00%
		(2) Granular work (sub-base, base, shoulders)	0.00%
		(3) Dense Bituminous Macadam	0.00%

Item	**Weightage in percentage to the Contract Price**	**Stage for Payment**	**Percentage weightage to Particular item(col:2)**
1	**2**	**3**	**4**
		(4) Bituminous Concrete	0.00%
		(5) Widening and repair of culverts	0.00%
		(6) Widening and repair of Minor bridges	0.00%
		C- <u>New 2-lane, curve improvement, realignment, bypass</u>	
		(1) Earthwork up to top of the sub-grade	1.30%
		(2) Granular work (sub-base, base, shoulders)	4.72%
		(3) Dense Bituminous Macadam	8.96%
		(4) Bituminous Concrete	4.48%
		(5) CC Pavement	0.00%
		D- <u>New culverts, minor bridges, underpasses, overpasses on existing road, realignments, bypasses:</u>	
		(1) Culverts	16.89%
		(2) Minor bridges	8.96%
		(3) Cattle/Pedestrian underpasses	0.00%
		(4) Pedestrian overpasses	0.00%
		(5) Grade separated structures	0.00%
		(a) Underpasses	0.00%
		(b) Overpass	0.00%

Major Bridge works	0.55%	A-<u>Widening and Repairs of major bridges</u>	
		(1)Foundation	7.00%
		(2)Sub-structure	7.00%
		(3)Super-structure (including replacement of bearings etc. complete as per Schedule B)	86.00%
		B-<u>Widening and repair of</u>	
		(a) ROB	0.00%
		(1)Foundation	0.00%
		(2)Sub-structure	0.00%
		(3)Super-structure (including crash barriers etc. complete)	0.00%
		(4) Approaches	
		(b) RUB	0.00%
		(1)Foundation	0.00%
		(2)Sub-structure	0.00%
		(3)Super-structure (including crash barriers etc. complete)	0.00%
		(4) Approaches	

		C-<u>New major bridges</u>	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including crash barriers etc. complete)	0.00%
		D-<u>New rail-road bridges</u>	
		(a) ROB	0.00%
		(1)Foundation	0.00%
		(2)Sub-structure	0.00%
		(3)Super-structure (including crash barriers etc. complete)	0.00%
		(4) Approaches	
		(b) RUB	0.00%
		(1)Foundation	0.00%
		(2)Sub-structure	0.00%
		(3)Super-structure (including crash barriers etc. complete)	0.00%
		(4) Approaches	
Structures (elevated sections, reinforced earth)	0.00%	(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including crash barriers etc. complete)	0.00%
		(4) Reinforced Earth	0.00%

Other Engineering Works	62.72%	(i) Service roads/Slip Roads	0.00%
		(ii) Toll Plaza	0.00%
		(iii) Road side drains	
		(a) Covered Drain	0.50%
		(b) Earthen Drain/Unlined Drain	0.19%
		(iv)Road signs, Markings, Km stones, Boundary stones, Safety devices, Metal Crash Barrier etc.	5.82%
		(v) Project facilities	
		a) Bus bays and shelter	2.58%
		b) Truck lay by	0.28%
		c) Others (Traffic Aid Post, Vehicle Rescue, Lighting etc.)	0.00%
		(vi)Repairs to bridges/ structures	
		a) Providing wearing cost	0.00%
		b) Replacement of bearings, joints	0.00%
		c) Providing crash barriers	0.00%
		d) Other items	0.00%
		(vii) Road side plantation	0.23%
		(viii) Slope/Toe Protection works like pitching on side slopes, Stone Pitching and Chute Drains including Ground anchorage of existing Electric Towers.	
		(a) Reinforced Slope Structures and reinforcing Earth Composite System.	48.81%
		(b) Reinforced Soil Composite or equivalent structure work in Sinking and Sliding zone at Km 14.	8.83%
		(c) Stone Pitching and Chute Drains on the road embankment slopes.	17.35%
		(ix) Safety and traffic management during construction including repair of existing road.	0.40%

		(x) Junctions (xi) Retaining /Breast Wall (xii)Miscellaneous items-Vehicle, Phone, Photographs, Lighting etc.	2.43% 12.21% 0.37%

1.3 Procedure of estimating the value of work done

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

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

Table 1.3.1

Stage of Payment	**Percentage – weightage**	**Payment Procedure**
A-Widening and strengthening (1) Earthwork up to top of the sub-grade including clearing grubbing.	16.51%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length.
(2) Granular work (sub-base, base, shoulders)	9.98%	
(3) Dense Bituminous Macadam	18.80%	
(4) Bituminous Concrete	9.40%	
(5) Widening and repair of culverts	0.00%	Cost of ten completed culverts shall be determined pro rate with respect to the total number of culverts. Payment shall be made on the completion of ten culverts.
(6) Widening and repair of minor bridges	0.00%	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of a minor bridge.
B- Widening and strengthening of existing road to 4-Lane (1) Earthwork up to top of the sub-grade	0.00%	Unit of measurement is linear length. Payment of each stage shall be made on pro- rata basis on completion of a stage in a length of not less than 10 (ten) percent of

Stage of Payment	**Percentage – weightage**	**Payment Procedure**
		the total length.
(2) Granular work (sub-base, base, shoulders)	0.00%	
(3) Dense Bituminous Macadam	0.00%	
(4) Bituminous Concrete	0.00%	
(5) Widening and repair of culverts	0.00%	Cost of ten completed culverts shall be determined pro-rata basis with respect to the total number of culverts. Payment shall be made on the completion of ten culverts.
(6) Widening and repair of minor bridges	0.00%	Cost of each minor bridge shall be determined on pro- rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of a minor bridge.
C- <u>New 2-lane curve improvement, realignment, bypass</u> (1) Earthwork up to top of the sub-grade (2) Granular work (sub-base, base, shoulders) (3) Dense Bituminous Macadam (4) Bituminous Concrete (5) CC Pavement	 1.30% 4.72% 8.96% 4.48% 0.00%	Unit of measurement is linear length. Payment of each stage shall be made on pro- rata basis on completion of a stage in full length or 5 (five) km length.
D- <u>New culverts, minor bridges, underpasses, overpasses on</u>		Cost of each culvert shall be determined on pro- rata basis with

Stage of Payment	**Percentage – weightage**	**Payment Procedure**
existing road, realignments, bypasses: (1) Culverts	16.89%	respect to the total number of culverts. Payment shall be made on the completion of five culverts.
(2) Minor bridges	8.96%	Cost of each minor bridge shall be determined on pro- rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of a minor bridge.
(3) Cattle/Pedestrian underpasses	0.00%	Cost of each cattle/pedestrian underpass shall be determined on pro- rata basis with respect to the total number of cattle/pedestrian underpasses. Payment shall be made on the completion of the number of cattle/pedestrian underpasses specified below: Total no. Stage for Payment (i) 1 to 5 - on completion of all, (ii) 6 or more - on completion of five
(4) Pedestrian Overpasses	0.00%	Same as for (3) above
(5) Grade separated structures (a) Underpasses (b) Overpasses	0.00%	Same as for (3) above

Stage of Payment	**Percentage – weightage**	**Payment Procedure**
	0.00%	Same as for (3) above

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

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

Where P= Contract Price L = Total length in km

Similarly, the rates per km for stages (1), (2) and (4) above shall be worked out.

1.3.2 Major Bridge works and ROB/RUB.

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

Table 1.3.2

Stage of Payment	**Weightage**	**Payment Procedure**
A- <u>Widening and repairs of Major Bridges</u> Foundation: On completion of the foundation work including foundations for wing and return walls	7.00%	Cost of each Major Bridge (widening and repairs) shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridges (widening and repairs). Payment shall be made on completion of each stage of a Major Bridge as per the weightage given in this table.
Sub-structure: On completion of abutments, piers up to the abutment/pier cap	7.00%	
Super-structure: On completion of the super structure in all respects including hand rails/crash barriers,	86.00%	

Stage of Payment	**Weightage**	**Payment Procedure**
wing walls, return walls, guide bunds, if any, tests on completion etc., bridge complete in all respects and fit for use.		
Protection Work		
B- Widening and repairs of		
(a) ROB	0.00%	Cost of each ROB/RUB (widening and repairs) shall be determined on pro rata basis with respect to the total linear length (m) of the ROB/RUB (widening and repairs). Payment shall be made on completion of a ROB/RUB.
(1) Foundation: On completion of the foundation work including foundations for wing and return walls.		
(2) Sub-structure: On completion of abutments, piers up to the abutment/pier cap		
(3) Super-structure: On completion of the super structure in all respects including hand rails/crash barriers, wing walls, return walls, guide bunds, if any, tests on completion etc., complete in all respects and fit for use		
(4) Approaches		
(b) RUB	0.00%	
(1) Foundation: On completion of the foundation work including foundations for wing and return walls.		
a. Sub-structure: On completion of abutments, piers up to the abutment/pier cap		
b. Super-structure: On completion of the super structure in all		

Stage of Payment	**Weightage**	**Payment Procedure**
respects including hand rails/crash barriers, wing walls, return walls, guide bunds, if any, tests on completion etc., complete in all respects and fit for use		
c. Approaches		
C- <u>New Major Bridges</u>		
(iii) Foundation: On completion of the foundation work including foundations for wing and return walls.	0.00%	Cost of each major bridge shall be determined on pro rata basis with respect to the total linear length (m) of the major bridges. Payment shall be made on completion of each stage of a major bridge as per the weightage given in this table.
(iv) Sub-structure: On completion of abutments, piers up to the abutment/pier cap	0.00%	
(v) Super-structure: On completion of the super structure in all respects including hand rails/crash barriers, wing walls, return walls, guide bunds, if any, tests on completion etc., complete in all respects and fit for use	0.00%	
D- <u>New Rail-road bridges</u> (a) ROB 1) Foundation 2) Sub-Structure 3) Super Structure 4) Approaches (b) RUB 1) Foundation 2) Sub-Structure 3) Super Structure 4) Approaches	 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00% 0.00%	Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROB/RUB. Payment shall be made on completion of a ROB/RUB.

1.3.3 Structures

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

Table 1.3.3

Stage of payment	Weightage	Payment procedure
(1) Foundation: On completion of the foundation works including foundations for wing and return walls	0.00%	Cost of each structure shall be determined on pro rata basis in respect to the total linear length (m) of all the structures. Payment shall be made on completion of each stage of a structure as per the weightage given in this table.
(2) Sub-structure: On completion of abutments, piers up to the abutment/pier cap	0.00%	
(3) Super-structure: On completion of the Structure along with super structure, including hand rails/crash barriers, wing walls, return walls, tests on completion etc., elevated structure complete in all respects and fit for use	0.00%	
(4) Reinforced Earth work	0.00%	Payment shall be made on pro rata basis on completion of 25 (twenty five) percent of total area.

1.3.4 Other works.

Procedure for estimating the value of other works done shall be as stated in table 1.3.4:

Table 1.3.4

Stage of Payment	Weightage	Payment Procedure
(i) Service Roads/Slip Roads	0.00%	Unit of measurement is linear length in km. Cost per km shall be determined on pro- rata basis with respect to the total length of the service roads. Payment shall be made for completed service road in a length of not less than 20 (twenty) percent of the total length of service roads.
(ii) Toll plaza	0.00%	Unit of measurement is each completed toll plaza. Payment of each toll plaza shall be made on pro- rata basis with respect to the total of all toll plazas.
(iii) Road side drains	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 10% (ten per cent) of the total length.
(a) Covered Drain	0.50%	
(b) Earthen Drain/Unlined Drain	0.19%	
(iv) Road signs, Markings, Km stones, Boundary Stones, Safety devices etc.	5.82%	
(v) Project Facilities a) Bus bays and shelter b) Truck lay by c) Others (Traffic Aid Post, Vehicle Rescue, Lighting etc.)	 2.58% 0.28% 0.00%	Payment shall be made on pro rata basis for completed facilities.
(vi) Repairs to existing bridges/structures		

Stage of Payment	Weightage	Payment Procedure
a) Providing wearing coat	0.00%	Payment shall be made for completed items.
b) Replacement of bearing, joints	0.00%	
c) Providing crash barriers	0.00%	
d) Other items	0.00%	
(vii) Road side plantation	0.23%	Unit of measurement is linear length. Payment shall be made on pro-rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(viii) Slope/Toe Protection works like pitching on side slopes, Stone Pitching and Chute Drain including Ground anchorage of existing Electric Towers. (a) Reinforced Slope Structures and reinforcing earth composite system. (b) Reinforced Soil Composite or equivalent Structure work in Sinking and Sliding zone at Km 14. (c) Stone Pitching and Chute Drains on the road embankment slopes	 48.81% 8.83% 17.35%	
(ix) Safety and traffic management during construction	0.40%	Payment shall be made on pro-rata basis on every six months.
(x) Junctions	2.43%	Unit of measurement is Number. Payment shall be made on pro- rata basis

Stage of Payment	Weightage	Payment Procedure
		on completion of a stage in a number of not less than 10% (ten per cent) of the total number.
(xi) Retaining/Breast Wall	12.21%	Unit of measurement is linear length. Payment shall be made on pro-rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(xii) Miscellaneous items - Vehicle, Phone, Photographs, Lighting etc.	0.37%	Payment shall be made on pro- rata basis on every six months.

2. Procedure for payment for Maintenance

2.1 The cost for maintenance shall be as stated in Clause 14.1.1.

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

Schedule-I

(See Clause 10.2)

DRAWINGS

1. Drawings

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

2. Additional Drawings

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

Annex-I

(Schedule-I)

List of Drawings

[Note: The Authority shall describe in this Annex-I, all the Drawings that the Contractor is required to furnish under Clause 10.2.]

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

a) General Arrangement Drawings of all protection works and detailed cross section.
b) Detailed drawings showing various protection details for each zone.
c) Drawings of drainage works.
d) Drawings as per instruction of Authority's Engineer

Schedule-J

(See Clause 10.3.2)

PROJECT COMPLETION SCHEDULE

1. Project Completion Schedule

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

2. Project Milestone-I

2.1 Project Milestone-I shall occur on the date falling on the 150th (one hundred and fiftieth) day from the Appointed Date (the "**Project Milestone-I"**).

2.2 Prior to the occurrence of Project Milestone-I, the Contractor shall have commenced construction of the Project and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 10% (ten percent) of the Contract Price.

3. Project Milestone-II

3.1 Project Milestone-II shall occur on the date falling on the 360th (three hundred and sixtieth) day from the Appointment Date (the **"Project Milestone-II**").
Prior to the occurrence of Project Milestone-II, the Contractor shall have commenced construction of the Project and submitted to the Authority duly and validly prepared Stage Payment Statements completion schedule in reference to Schedule-H Items, Stages and Sub-stages payment statements for an amount not less than 30% (thirty percent) of the Contract Price.

4. Project Milestone-III

4.1 Project Milestone-III shall occur on the date falling on the 720th (seven hundred twentieth) day from the Appointed Date (the "**Project Milestone-III"**).

4.2 Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project and submitted to the Authority duly and validly prepared

Stage Payment Statements for an amount not less than 60% (sixty percent) of the Contract Price.

5 Schedule Completion Date

5.1 The Schedule Completion Date shall occur on the 1095th (Ten hundred and Nine fiftieth) day from the Appointed Date.

5.2 On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

6 Extension of time

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

Schedule-K

(See Clause 12.1.2)

Tests on Completion

1. Schedule for Tests

1.1 The Contractor shall, no later than 30 (thirty) days prior to the likely completion of construction, notify the Authority's Engineer and the Authority of its intent to subject the Project Highway to Tests, and no later than 10 (ten) days prior to the actual date of Tests, furnish to the Authority's Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Works.

1.2 The Contractor shall notify the Authority's Engineer of its readiness to subject the Project Highway to Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the Authority's Engineer shall, in consultation with the Contractor, determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority's Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule K.

2 Tests

2.1 Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include: all the tests specified in IRC code, manual and MORTH specifications for the road and Bridge works, 5th revision, 2013.

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

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

2.4 Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and Standards.

2.5 Environmental audit: The Authority's Engineer shall carry out a check to determine conformity of the Project Highway with the environmental requirements set forth in Applicable Laws and Applicable Permits.

2.6 Safety Audit: The Authority's Engineer shall carry out or cause to be carried out, a safety audit to determine conformity of the Project Highway with the safety requirements and Good Industry Practice.

3 Agency for conducting Tests

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

4. Completion Certificate

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

Schedule-L

(See Clause 12.2 and 12.4)

PROVISIONAL CERTIFICATE

1. I, …….. (Name of the Authority's Engineer), acting as Authority's Engineer, under and in accordance with the Agreement dated …….. (the "**Agreement**"), for **Construction of upgradation of existing road to 2-lane with paved shoulder including geometric improvement from Km. 0.00 0to Km. 26.706 in Rhenok-Rorathang-Pakyong of NH-717A on EPC basis under SARDP-NE Phase 'Á' in the State of Sikkim"** through Engineering, Procurement & Construction (EPC) Basis Contract through ……. (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been undertaken to determine compliance of the Project Highway with the provisions of the Agreement.

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

3. In view of the foregoing, I am satisfied that that Project Highway can be safety and reliably placed in service of the users thereof, and in terms of the Agreement, the Project Highway is hereby provisionally declared fit for entry into operation on this the ……day of …….20 …..

ACCEPTED, SIGNED, SEALED AND DELIVERED

For and on behalf of

CONTRACTOR by Authority's Engineer by:

(Signature)

SIGNED, SEALED AND DELIVERED

For and on behalf of

(Signature)

COMPLETION CERTIFICATE

1. I, …….. (Name of the Authority's Engineer), acting as Authority's Engineer, under and in accordance with the Agreement dated …….. (the "**Agreement**"), for **Construction of upgradation of existing road to 2-lane with paved shoulder including geometric improvement from Km. 0.00 0to Km. 26.706 in Rhenok-Rorathang-Pakyong of NH-717A on EPC basis under SARDP-NE Phase 'Á' in the State of Sikkim"** through Engineering, Procurement & Construction (EPC) Basis Contract 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

Authority's Engineer by:

(Signature)

(Name)

(Designation)

(Address)

Schedule-M

(See Clauses 14.6., 15.2 and 19.7)

PAYMENT REDUCTION FOR NON-COMPLIANCE

1. Payment reduction for non-compliance with the Maintenance Requirements

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

1.2 Any deduction made on account of non-compliance with the maintenance Requirements shall not be paid even after compliance subsequently. The deduction shall continue to be made every month until compliance is done.

1.3 The Authority's Engineer shall calculate the amount of payment reduction on the basis of weightage in percentage assigned to non-conforming items as given in Paragraph 2.

2. Percentage reductions in lump sum payments

2.1 The following percentages shall govern the payment reduction:

S. No.	Item/Defect/Deficiency	Percentage
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface defects	-
(ii)	Repairs of Edges, Rutting	-
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	-
(ii)	Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees	-
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	-

S. No.	Item/Defect/Deficiency	Percentage
(ii)	Any Defects in superstructures, bearings and sub-structures	-
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	-
(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	-
(f)	**Miscellaneous Items**	
(i)	Removal of dead animals, broken down/accidented vehicles, fallen trees, road blockades or malfunctioning of mobile crane	-
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	Defects in Protection works	90%

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

R=P/100 * M * L1/L

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

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

L1 = Non-complying length

L = Total length of the road,

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

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

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

Schedule-N

(See Clause 18.1.1)

SELECTION OF AUTHORITY'S ENGINEER

1 Selection of Authority's Engineer

1.1 The provisions of the Model Request for Proposal for Selection of Technical Consultants, issued by the Ministry of Finance in May 2009, or any substitute thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority's Engineer.

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

2 Terms of Reference

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

3 Appointment of Government entity as Authority's Engineer

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

Annex – I
(Schedule - N)

TERMS OF REFERENCE FOR AUTHORITY'S ENGINEER

1. Scope

1.1 These Terms of Reference (the "**TOR**") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "**Agreement**), which has been entered into between the Ministry of Road Transport and Highways (the "**Authority**") and ..... (the "**Contractor**") for "**Construction of upgradation of existing road to 2-lane with paved shoulder including geometric improvement from Km. 0.00 0to Km. 26.706 in Rhenok-Rorathang-Pakyong of NH-717A on EPC basis under SARDP-NE Phase 'Á' in the State of Sikkim** through Engineering, Procurement & Construction (EPC) Contract, and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

2. Definitions and interpretation

2.1 The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Agreement.

2.2 References to Articles, Clauses and Schedules in this TOR shall, except where the context otherwise requires, be deemed to be references to the Articles, Clauses and Schedules of the Agreement, and references to Paragraphs shall be deemed to be references to Paragraphs of this TOR.

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

3. General

3.1 The Authority's Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.

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

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

3.2 The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.

3.4 The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2.

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

3.6 In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

4 Construction Period

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

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

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

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

4.5 The Authority's Engineer shall grant written approval to the Contractor, where necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Project Highway for purposes of maintenance during the Construction Period in accordance with the provisions of Clause 10.4.

4.6 The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.

4.7 The Authority's Engineer shall inspect the Construction Works and the Project Highway and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular, the Authority's Engineer shall include in its Inspection Report, the compliance of the recommendations made by the Safety Consultant.

4.8 The Authority's Engineer shall conduct the pre-construction review of manufacturer's test reports and standard samples of manufactured Materials, and such other Materials as the Authority's Engineer may require.

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

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

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

4.12 In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works, the Authority's Engineer shall require the Contractor to carry out remedial measures.

4.13 The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project Highway, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 shall apply.

4.14 In the event that the Contractor fails to achieve any of the Project Milestones, the Authority's Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Authority's Engineer shall determine that completion of the Project Highway is not feasible within the time specified in the Agreement, it shall

require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority's Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.

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

4.16 Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measure, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.

4.17 In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.

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

5. Maintenance Period

5.1 The Authority's Engineer shall aid and advise the Contractor in the preparation of its monthly Maintenance Programme and for this purpose carry out a joint monthly inspection with the Contractor.

5.2 The Authority's Engineer shall undertake regular inspections, at least once every month, to evaluate compliance with the Maintenance Requirements and submit a Maintenance Inspection Report to the Authority and the Contractor.

5.3 The Authority's Engineer shall specify the tests, if any, that the Contractor shall carry out, or cause to be carried out, for the purpose of determining that the Project Highway is in conformity with the Maintenance Requirements. It shall monitor and review the results of such tests and the remedial measures, if any, taken by the Contractor in this behalf.

5.4 In respect of any defect or deficiency referred to in Paragraph 3 of Schedule- E, the Authority's Engineer shall, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards and shall also specify the time limit for repair or rectification of any deviation or deterioration beyond the permissible limit.

5.5 The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of the Project Highway for undertaking maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure, the Authority's Engineer shall monitor the reopening of such lane(s), and in case of delay, determine the Damages payable by the Contractor to the Authority under Clause 14.5.

6 Determination of costs and time

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

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

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

7. Payments

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

7.2 Authority's Engineer shall -

(a) within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment, pending issue of the Interim Payment Certificate; and

(b) within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor, after adjustments in accordance with the provisions of Clause 19.10.

7.3 The Authority's Engineer shall, within 15 (fifteen) days of receipt of the Monthly Maintenance Statement from the Contractor pursuant to Clause 19.6, verify the Contractor's monthly statement and certify the amount to be paid to the Contractor in accordance with the provisions of the Agreement.

7.4 The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provisions of Clause 19.16.

8. Other duties and functions

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

- -

9 Miscellaneous

9.1 A copy of all communications, comments, instructions, Drawings or Documents sent by the Authority's Engineer to the Contractor pursuant to this TOR, and a copy of all the test results with comments of the Authority's Engineer thereon, shall be furnished by the Authority's Engineer to the Authority forthwith.

9.2 The Authority's Engineer shall retain at least one copy each of all Drawings and Documents received by it, including 'as-built' Drawings, and keep them in its safe custody.

9.3 Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as-built Drawings, in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Project Highway as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project Highway and setback lines, if any, of the buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.

9.4 The Authority's Engineer, if called upon by the Authority or the Contractor or both, shall mediate and assist the Parties in arriving at an amicable settlement of any Dispute between the Parties.

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

SCHEDULE - O

(See Clauses 19.4.1, 19.6.1, and 19.8.1)

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

(a) The estimated amount for the Works executed in accordance with Clause 19.3.1 subsequent to the last claim;
(b) Amounts reflecting adjustments in price for the aforesaid claim;
(c) The estimated amount of each Change of Scope Order executed subsequent to the last claim;
(d) Amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2.3 (a);
(e) Total of (a), (b), (c) and (d) above;
(f) Deductions:
  (i) Any amount to be deducted in accordance with the provisions of the Agreement except taxes;
  (ii) Any amount towards deduction of taxes; and
  (iii) Total of (i) and (ii) above.
(g) Net claim: (e) – (f) (iii);
(h) The amounts received by the Contractor upto the last claim:
  (i) For the Works executed (excluding Change of Scope orders);
  (ii) For Change of Scope Orders, and
  (iii) Taxes deducted
  (iv)

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

(a) the monthly payment admissible in accordance with the provisions of the agreement;
(b) the deductions for maintenance work not done;
(c) net payment for maintenance due, (a) minus (b);
(d) amounts reflecting adjustments in price under Clause 19.12; and
(e) amount towards deduction of taxes

3. Contractor's claim for Damages

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

Schedule-P

(See Clause 20.1)

INSURANCE

1. Insurance during Construction Period

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

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

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

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

2. Insurance for Contractor's Defects Liability

The Contractor shall effect and maintain insurance cover for the works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and arises from a cause occurring prior to the issue of Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage to property

3.1. The Contractor shall insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Paragraph l and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this agreement and occurring before the issue of the Performance Certificate. 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 as per the applicable laws of government and procedure in vogue.

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

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

(b) Damage which is and unavoidable result of the Contractor's obligations to execute the Works.

4. Insurance to be in joint names

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