

# **SCHEDULES**

## **Section ::**

**[Design :: Km 0.000 to Km 17.000]**

**SCHEDULE - A**

*(See Clauses 2.1 and 8.1)*

**SITE OF THE PROJECT****1 The Site**

- 1.1 Site of the Two-Laning of Existing Khupa - Hayuliang – Hawai Road on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawai Road)] in the state of Arunachal Pradesh Under SARDP-NE, Project Highway shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.  
The Project alignment is approachable at any location for execution works.
- 1.2 The dates of handing over the Right of Way to the Contractor are specified in Annex-II of this Schedule-A.
- 1.3 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.
- 1.4 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.
- 1.5 The status of the environment clearances obtained or awaited is given in Annex IV.

Annex - I  
(Schedule-A)

### 1. Site

The site of the two lane Project Highway comprises the section of Khupa - Hayuliang- Hawaii road commencing from Km 95.800 (Khupa) to Km 8.970 (Existing) and from Km 0.000 to Km 17.000 (Design) i.e. Khupa - Hayuliang-Hawaii Section in the State of Arunachal Pradesh. The land, carriageway and structures comprising the Site are described below.

### 2. Chainage References (Existing vs Design)

“Existing Chainage” means Km Stones existing on the Project Highway. During topography survey, observations are made to these Km stones and after finalization of alignment by improving the existing geometry the chainage has been referred to “Design Chainage”. The relationship between the “Existing Chainage” and the “Design Chainage” as per field surveys of the location of existing Km stones for the “Project Highway” is given below.

Sl. No.	Existing Chainage (Km)	Design Chainage (m)	Remark	Sl. No.	Existing Chainage (Km)	Design Chainage (m)	Remark
1	95+800	0		28	4+500	12550	
2	96+000	230		29	5+000	13055	
3	96+500	720		30	5+500	13560	
4	97+000	1220		31	6+000	14075	
5	97+500	1730		32	6+500	14545	
6	98+000	2225		33	7+000	15000	
7	98+500	2720		34	7+500	15500	
8	99+000	3220		35	8+000	15990	
9	99+500	3620		36	8+500	16525	
10	100+000	4115		37	8+970	17000	
11	100+500	4655					
12	101+000	5200					
13	101+500	5740					
14	102+000	6235					
15	102+500	6785					
16	103+000	7285					
17	103+500	7730					
18	104+000	8100					
19	0+000	8100	Hayuliang - Hawaii Road starts, Junction to 116 RCC				

Sl. No.	Existing Chainage (Km)	Design Chainage (m)	Remark	Sl. No.	Existing Chainage (Km)	Design Chainage (m)	Remark
20	0+500	8600					
21	1+000	9100					
22	1+500	9600					
23	2+000	10100					
24	2+500	10585					
25	3+000	11075					
26	3+500	11530					
27	4+000	12060					

**2. Land**

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

Sl. No.	Existing Chainage (Km)		Design Chainage (m)		Length in m (Design)	ROW (m)	Remarks
	From	To	From	To			
1	95.800 (Khupa)	8.970 (Hayuliang – Hawai road)	0.000	17.000	17.000	6-9 m	

**4. Carriageway**

The present carriageway detail is shown in the table below:

The type of the existing pavement is flexible.

Sl. No.	Existing Chainage (Km)		Design Chainage (m)		Length in m (Design)	Lane Width (m)	Remarks
	From	To	From	To			
1	95.800 (Khupa)	8.970 (Hayuliang – Hawai road)	0.000	17.000	17.000	3-3.5 m	

**5. Major Bridges**

The Site includes the following Major Bridges:

Sl. No.	Existing Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-structure	Super structure		
<u>1</u>	<u>99.120 (Khupa – Hayuliang road)</u>	<u>PSC, 70R Double lane</u>			<u>130</u>	<u>8</u>
<u>2</u>	<u>1.440 (Hayuliang – Hawai Road)</u>	<u>TS BB type, steel super structure, class 70 R with open foundation</u>			<u>1 x 65</u>	<u>6</u>

**6 Road over-bridges (ROB)**

The Site includes the following ROB (road over railway line)

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

**7 Grade separators**

The Site includes the following grade separators:

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

**8 Minor bridges**

The Site includes the following minor bridges:

Sl. No.	Existing (m)	Type of Structure			Span length (m)	Width (m)
		Foundation	Sub-structure	Super Structure		
1	3.660	DDR BB			50	8

**9 Railway level crossings / Railway Track**

The Site includes the following railway level crossings / Track:

Sl. No.	Location (km)	Remarks
NIL		

**10 Underpasses (Vehicular, Non Vehicular)**

The Site includes the following underpasses:

Sl. No.	Chainage (km)	Type of Structure	No. of Spans with	Width (m)
NIL				

**11 Culverts**

The Site has the following culverts:

Sl. No.	Existing Chainage	OGL	FRL	Type of Culvert	Span / Dia (m)	Width (m)	Remarks
1	95850	954.912	955.081	SLAB	1	2.49	
2	96145	945.091	944.978	SKEW SLAB	1	1.43	
3	96360	944.199	942.852	SLAB	1	2.17	
4	97235	945.341	945.398	SLAB	1	2.09	
5	97524	945.744	944.949	SLAB	1	2.05	
6	97700	935.044	934.648	SLAB	1	2.15	
7	97770	930.949	931.048	SLAB	1	2.7	
8	97970	927.834	927.658	SLAB	1	2.92	
9	98150	925.625	925.777	SLAB	1	2.24	
10	98215	927.332	927.446	SLAB	1	2.25	
11	98470	937.260	937.398	SLAB	1	1.37	
12	98790	950.956	951.069	SLAB	1	2.71	
13	99050	960.757	960.753	SLAB	1	2.84	
14	99140	962.519	962.556	SLAB	1	2.03	
15	99277	959.810	959.572	SLAB	1	1.95	
16	99352	954.880	954.780	SLAB	1	2.52	
17	99760	936.442	936.482	SLAB	1	1.67	
18	99885	938.775	938.188	SLAB	1	1	
19	99970	938.803	938.851	SLAB	1	2.59	
20	100133	938.403	938.459	SLAB	1	2.04	
21	100310	939.420	939.500	SLAB	1	1.97	
22	100450	946.892	946.688	SLAB	1	2.02	
23	100775	953.181	953.287	SLAB	1	1.38	
24	101050	955.072	955.735	SLAB	1	3.41	
25	101290	964.164	967.918	SLAB	1	1.35	
26	101765	989.364	989.645	SLAB	1	1.01	
27	102290	1004.079	1002.335	SLAB	1	1.27	
28	101865	993.752	994.237	SLAB	1	2.23	
29	102560	1014.453	1014.647	SLAB	1	3.51	
30	102800	1015.625	1013.941	SLAB	1	2.49	
31	103210	987.019	989.981	SLAB	1	1.25	
32	103275	983.062	985.189	SLAB	1	3.53	
33	103350	982.000	981.999	SLAB	1	2.82	
34	103525	985.500	985.582	SLAB	1	3.69	
35	103770	994.872	993.914	SLAB	1	3.85	
36	170	1000.159	1001.012	SLAB	1	2.05	
37	227	1002.903	1002.322	SLAB	2	3.88	

Sl. No.	Existing Chainage	OGL	FRL	Type of Culvert	Span / Dia (m)	Width (m)	Remarks
38	390	999.858	998.468	SLAB	1	1.63	
39	500	990.876	991.280	SLAB	1	1	
40	875	975.133	975.250	SLAB	1	1.4	
41	1275	960.023	959.785	SLAB	1	2.75	
42	1625	956.950	957.022	FCW	1	4.71	
43	1785	963.652	963.763	SLAB	1	5	
44	1885	967.564	967.590	SLAB	1	6	
45	2065	971.230	974.226	SLAB	1	3.2	
46	2200	978.935	979.036	SLAB	1	3.8	
47	2370	982.994	983.107	SLAB	1	4.5	
48	2485	977.305	977.407	SLAB	1	1	
49	2575	973.077	973.208	SLAB	1	1	
50	2765	975.652	975.807	SLAB	1	3	
51	2920	982.194	982.326	SLAB	1	3	
52	3015	987.192	987.269	SLAB	1	1	
53	3150	996.257	995.196	SLAB	1	1	
54	3580	998.270	998.423	SLAB	1	2.5	
55	4250	1017.656	1017.605	SLAB	1	1.5	
56	4780	1031.429	1031.533	SLAB	1	1.5	
57	4850	1032.137	1032.362	SLAB	1	0.5	
58	4900	1034.377	1034.085	SLAB	1	1	
59	5115	1038.213	1038.014	SLAB	1	1.5	
60	5280	1040.383	1040.833	SLAB	1	0.5	
61	5370	1041.565	1045.585	SLAB	1	1	
62	5615	1047.920	1047.911	SLAB	1	1	
63	5800	1048.558	1052.723	SLAB	2	3	
64	6195	1041.246	1041.313	SLAB	2	3.01	
65	6275	1040.521	1040.676	SLAB	1	0.5	
66	6500	1046.717	1046.783	SLAB	1	5	
67	6880	1043.404	1043.487	SLAB	1	6	
68	6900	1042.943	1043.204	SLAB	1	0.5	
69	7630	1051.868	1051.983	SLAB	1	2	
70	7820	1045.656	1046.289	SLAB	1	0.5	
71	8000	1044.175	1043.686	SLAB	1	4	
72	8075	1039.926	1039.993	SLAB	1	0.5	
73	8160	1037.575	1037.694	SLAB	1	1	
74	8630	1050.045	1049.756	FCW	1	6	
75	8745	1051.798	1051.876	SLAB	1	1	
76	8900	1047.441	1047.541	SLAB	1	1.5	
77	8965	1046.876	1047.000	SLAB	1	0.5	



**12 Bus bays**

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

Sl. No.	Chainage (km)	Length (m)	Left Hand Side	Right Hand Side
1	3/675	-		√
2	4/950	-	√	
3	7/700	-		√

**13 Truck Lay byes**

The details of truck lay byes are as follows:

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

**14 Road side drains**

The details of the roadside drains are as follows:

Sl. No.	Location (km)		Side	Type	
	From	To		Masonry/cc (Pucca)	Earthen (Kutchha)
NIL					

**15 Major junctions**

The details of major junctions are as follows:

S. No	Location		At Grade	Separated	Category of Cross Road			
	Existing Ch.	Design Ch.			NH	SH	MDR	Others
NIL								

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

**16 Minor junctions**

The details of the minor junctions are as follows:

Sl. No.	Existing Chainage (Km)	Design Chainage (m)	Type of Junction	Side	Remarks
1	3+330	3+330	Y	LHS	
2	4+110	4+100	T	LHS	

Sl. No.	Existing Chainage (Km)	Design Chainage (m)	Type of Junction	Side	Remarks
3	4+550	4+560	Y	LHS	
4	6+930	7+030	Y	LHS	
5	7+500	7+610	Y	RHS	
6	7+570	7+680	Y	RHS	
7	7+800	7+910	Y	RHS	
8	7+810	7+920	T	RHS	
9	8+000	8+100	T	RHS	
10	8+675	8+780	Y	LHS	

**17 Bypass**

The details of Bypasses on the Site are as follows:

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

**18. Other structures / Details**

The details are :

Sl. No.	Existing Chainage (m)		Design Chainage (m)		Length in m (Design )	Remarks
	From	To	From	To		
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:

Sl. No.	Design Chainage (Km)		Length (km)	Width (m)	Date of providing ROW*
	From	To			
1	2	3	4	5	6
(i) Full Right of way (full width)	0.000	15.000	15.000	18 - 24.0 (as shown in Schedule B, clause 2.4)	At Appointed Date
(iii) Balance Right of Way (width)	15.000	17.000	2.000	24.0	Within 90 days after the Appointed Date

Annex - III  
(Schedule-A)

**Alignment Plans**

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

Annex - IV  
(Schedule-A)

**Environment Clearances**

The Project Highway does not required Environment Clearance as per MoEF corrigendum dated 22 Aug 2013.

SCHEDULE - B  
(See Clause 2.1)

**Development of the Project Highway**

**1 Development of the Project Highway**

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

**2 Rehabilitation and augmentation**

Rehabilitation and augmentation shall include Two-Laning of the Project Highway as described in Annex-I of this Schedule-B and in Schedule-C.

**3 Specifications and Standards**

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

## Annex - I (SCHEDULE-B)

### DESCRIPTION OF TWO-LANING

#### 1 WIDENING OF THE EXISTING HIGHWAY

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

#### 1.2 WIDTH OF CARRIAGEWAY

1.2.1 Construction of Two-Lane pavement without paved shoulders shall be undertaken. The paved carriageway shall be 7 m wide with hard shoulders in accordance with the typical cross sections drawings.

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 Two Lane Manual (IRC : SP 73 -2007).

##### 2.2 Design speed

The design speed shall be the minimum design speed of 30 km per hour and ruling design speed of 50 km / per hour for hilly terrain.

##### 2.3 Improvement of the existing road geometrics

Improvement of the existing road geometrics shall be carried out as per section 2 of the Two Lane Manual (IRC : SP 73 -2007).

##### 2.4 Right of Way

Sl. No.	Design Chainage (m)		Proposed Length	Proposed Width (m)	Remarks
	From	To			
1	0	150	150	18	Khonsa
2	150	3200	3050	24	
3	3200	3350	150	18	Hayuliang
4	3350	4350	1000	24	
5	4350	4500	150	18	Army Camp
6	4500	5000	500	24	

Sl. No.	Design Chainage (m)		Proposed Length	Proposed Width (m)	Remarks
	From	To			
7	5000	6000	1000	18	Army Camp
8	6000	7550	1550	24	
9	7550	8100	550	18	Army Camp
10	8100	9100	1000	24	
11	9100	9300	200	18	GREF LAVER CALONY
12	9300	14650	5350	24	
13	14650	14850	200	18	-
14	14850	17000	2150	24	



**2.5 Type of shoulder**

The shoulder shall be hard granular shoulder (with locally available material) on both sides of the carriageway as per typical Cross Sections provided in para 2.11 of this Schedule B

**2.6 Lateral and vertical clearances at underpasses**

2.6.1 Lateral and vertical clearances at underpasses and provision of guardrails / crash barriers shall be as per paragraph 2.11 of the Two Lane Manual (IRC : SP 73 -2007).

2.6.2 Lateral clearance: The width of the opening at the Vehicle Underpasses shall be as follows.

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

**2.7 Lateral and vertical clearances at overpasses**

2.7.1 Lateral and vertical clearances at overpasses shall be as per paragraph 2.12 of the Two Lane Manual (IRC : SP 73 -2007).

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

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

**2.8 Service Roads**

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

Sl. No.	Existing Location of Service road (from km to km)	Proposed 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				

**2.9 Grade separated structures**

2.9.1 Grade separated structures shall be provided as per paragraph 2.14 of the Two Lane Manual (IRC: SP 73 -2007). The requisite particulars are given below and GADs are annexed at Annexure "D":

Sl. No.	Existing Chainage of the structure	Design Chainage of structure	Length (m)	Number and length of spans (m)	Approach gradient	Remarks, if any
Nil						

## 2.10 Cattle and Pedestrian Underpass /Overpass

Cattle and pedestrian underpass/ overpass shall be constructed as follows: [Refer to paragraphs 2.14.3 of the Two Lane Manual (IRC : SP 73 - 2007) and specify the requirements of cattle and pedestrian underpass/ overpass]

Sl. No.	Location	Span/opening (m)	Type of crossing
Nil			

## 2.11 Typical cross-sections of the Project Highway

Typical Cross-Sections of the Project Highway are tabulated below –

Sl. No.	Design Chainage (Km)		Length (in m, after structure length deduction)	TCS Type	Widening Details	Shoulder
	From	To				
1	0.000	0.150	148	TCS I	Two lane in Built-up areas	1.0 m RCC covered drain on both side.
2	0.150	3.200	3002	TCS II & III	Two lane in Open areas	1.5 m Hard Shoulder on hill side and 1.9 m on Valley side
3	3.200	3.350	148	TCS I	Two lane in Built-up areas	1.0 m RCC covered drain on both side.
4	3.350	4.350	854	TCS II & III	Two lane in Open areas	1.5 m Hard Shoulder on hill side and 1.9 m on Valley side
5	4.350	4.500	148	TCS I	Two lane in Built-up areas	1.0 m RCC covered drain on both side.
6	4.500	5.000	492	TCS II & III	Two lane in Open areas	1.5 m Hard Shoulder on hill side and 1.9 m on Valley side
7	5.000	6.000	984	TCS I	Two lane in Built-up areas	1.0 m RCC covered drain on both side.
8	6.000	7.550	1525	TCS II & III	Two lane in Open areas	1.5 m Hard Shoulder on hill side and 1.9 m on Valley side

Sl. No.	Design Chainage (Km)		Length (in m, after structure length deduction)	TCS Type	Widening Details	Shoulder
	From	To				
9	7.550	8.100	541	TCS I	Two lane in Built-up areas	1.0 m RCC covered drain on both side.
10	8.100	9.100	984	TCS II & III	Two lane in Open areas	1.5 m Hard Shoulder on hill side and 1.9 m on Valley side
11	9.100	9.300	197	TCS I	Two lane in Built-up areas	1.0 m RCC covered drain on both side.
12	9.300	14.650	5150	TCS II & III	Two lane in Open areas	1.5 m Hard Shoulder on hill side and 1.9 m on Valley side
13	14.650	14.850	197	TCS I	Two lane in Built-up areas	1.0 m RCC covered drain on both side.
14	14.850	17.000	2112	TCS II & III	Two lane in Open areas	1.5 m Hard Shoulder on hill side and 1.9 m on Valley side

### 3 INTERSECTIONS AND GRADE SEPARATORS

All intersections and grade separators shall be as per Section 3 of the Two Lane Manual (IRC : SP 73 -2007). 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:

(a) At-grade intersections

Sl. No.	Existing Chainage (Km)	Design Chainage (m)	Type of Junction	Side	Remarks
1	3+330	3+330	Y	LHS	
2	4+110	4+100	T	LHS	
3	4+550	4+560	Y	LHS	
4	6+930	7+030	Y	LHS	
5	7+500	7+610	Y	RHS	
6	7+570	7+680	Y	RHS	
7	7+800	7+910	Y	RHS	
8	7+810	7+920	T	RHS	
9	8+000	8+100	T	RHS	
10	8+675	8+780	Y	LHS	

(b) Grade separated intersection with/ *without* ramps

Sl. No.	Location	Salient Features	Minimum length of Viaduct to be Provided	Road to be carried over / under the structures
NIL				

#### 4 ROAD EMBANKMENT AND CUT SECTION

- 4.1 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 Two Lane Manual (IRC: SP 73 -2007) and the specified cross sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.
- 4.2 The existing road including raising shall be reconstructed as per FRL mentioned in Plan & Profile as attached in annex 3 of schedule A.

#### 5 PAVEMENT DESIGN

- 5.1 Pavement design shall be carried out in accordance with Section 5 of the Two Lane Manual (IRC: SP 73 -2007).

##### 5.2 Type of pavement

Flexible pavement shall be adopted for Project Highway in accordance with Clause 2.2 of IRC:37-2012 identifies four type of flexible pavements. The estimated cost of civil works is based on flexible pavements consisting of Granular base, Sub base, DBM and BC. Since, the successful bidders under EPC mode can use any type of four flexible pavements mentioned Clause 2.2 of IRC:37-2012, they may carry out their own diligence to arrive at project cost before submitting bids.

### 5.3 Design requirements

#### 5.3.1 Design Period and Strategy

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

#### 5.3.2 Design Traffic

Not with standing anything to the contrary contained in this Agreement or the Two Lane Manual (IRC : SP 73 -2007), the Contractor shall design the pavement for entire Project Highway for design traffic of not less than 20 million standards axles (msa).

### 5.4 Reconstruction / Realignment / Bypass of stretches

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

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

5.4.2 The existing road shall be reconstructed as per FRL mentioned in Plan & Profile (Annex III of Schedule A).

## 6 ROADSIDE DRAINAGE

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per Section 6 of the Two Lane Manual (IRC : SP 73 -2007). How above, Line drains shall be provided in the following stretches –

Sl. No.	Design Chainage (Km)		Length (in m, after structure length deduction)	TCS Type	Drain Type
	From	To			
1	0.000	0.150	148	TCS I	1.0 m RCC covered drain on both side.
2	0.150	3.200	3002	TCS II & III	KC Open drain on Hill Side
3	3.200	3.350	148	TCS I	1.0 m RCC covered drain on both side.
4	3.350	4.350	854	TCS II & III	KC Open drain on Hill Side

Sl. No.	Design Chainage (Km)		Length (in m, after structure length deduction)	TCS Type	Drain Type
	From	To			
5	4.350	4.500	148	TCS I	1.0 m RCC covered drain on both side.
6	4.500	5.000	492	TCS II & III	KC Open drain on Hill Side
7	5.000	6.000	984	TCS I	1.0 m RCC covered drain on both side.
8	6.000	7.550	1525	TCS II & III	KC Open drain on Hill Side
9	7.550	8.100	541	TCS I	1.0 m RCC covered drain on both side.
10	8.100	9.100	984	TCS II & III	KC Open drain on Hill Side
11	9.100	9.300	197	TCS I	1.0 m RCC covered drain on both side.
12	9.300	14.650	5150	TCS II & III	KC Open drain on Hill Side
13	14.650	14.850	197	TCS I	1.0 m RCC covered drain on both side.
14	14.850	17.000	2112	TCS II & III	KC Open drain on Hill Side
<b>Total Length of RCC Drain in Built-up Areas = 2 x 2363 = 4726 m (Both Side)</b>					
<b>Total Length of KC drain in Open areas = 14129 m</b>					

## 7 DESIGN OF STRUCTURES

### 7.1 General

7.1.1 All bridges, culverts and structures shall be designed and constructed in accordance with section 7 of the Two Lane Manual (IRC : SP 73 -2007) and shall conform to the cross- sectional features and other details specified therein.

7.1.2 Width of the carriageway of new bridges and structures shall be as per figure 7.2 and figure 7.3 of the Two Lane Manual (IRC : SP 73 -2007).

7.1.3 The following structures shall be provided with footpaths:

NIL

7.1.4 All bridges shall be high-level bridges.

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

Sl. No.	Bridge at Design km	Utility service to be carried	Remarks
1	<b><u>99.120 (Khupa – Hayuliang road)</u></b>	Water Pipe	New
2	<b><u>1.440 (Hayuliang – Hawai Road)</u></b>	Water Pipe	New
3	<b><u>3.66 (Hayuliang – Hawai Road)</u></b>	Water Pipe	New

7.1.6 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 Two Lane Manual (IRC : SP 73 -2007).

### 7.2 Culverts

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

7.2.2 Reconstruction of existing culverts:

Existing Culverts at the following locations shall be re-constructed as new culverts:

Sl. No.	Existing Chainage	Design Chainage	Type of Culvert	Span / Dia (m)	Width (m)
1	95850	50	Slab/Box	1	2
2	96145	345	Slab/Box	1	1.5

Sl. No.	Existing Chainage	Design Chainage	Type of Culvert	Span / Dia (m)	Width (m)
3	96360	560	Slab/Box	1	2
4	97235	1435	Slab/Box	1	2
5	97524	1724	Slab/Box	1	2
6	97700	1900	Slab/Box	1	2
7	97770	1970	Slab/Box	1	2
8	97970	2170	Slab/Box	1	2.5
9	98150	2350	Slab/Box	1	2
10	98215	2415	Slab/Box	1	2
11	98470	2670	Slab/Box	1	1.5
12	98790	2990	Slab/Box	1	2.5
13	99050	3250	Slab/Box	1	2.5
14	99140	3340	Slab/Box	1	2
15	99277	3477	Slab/Box	1	2
16	99352	3552	Slab/Box	1	2.5
17	99760	3960	Slab/Box	1	1.5
18	99885	4085	Slab/Box	1	1.5
19	99970	4170	Slab/Box	1	2.5
20	100133	4333	Slab/Box	1	2
21	100310	4510	Slab/Box	1	2
22	100450	4650	Slab/Box	1	2
23	100775	4975	Slab/Box	1	1.5
24	101050	5250	Slab/Box	1	3
25	101290	5490	Slab/Box	1	1.5
26	101765	5965	Slab/Box	1	1.5
27	101865	6065	Slab/Box	1	2
28	102290	6490	Slab/Box	1	1.5



Sl. No.	Existing Chainage	Design Chainage	Type of Culvert	Span / Dia (m)	Width (m)
29	102560	6760	Slab/Box	1	3
30	102800	7000	Slab/Box	1	2
31	103210	7410	Slab/Box	1	1.5
32	103275	7475	Slab/Box	1	3
33	103350	7550	Slab/Box	1	2.5
34	103525	7725	Slab/Box	1	4
35	103770	7970	Slab/Box	1	4
36	170	8170	Slab/Box	1	2
37	227	8227	Slab/Box	1	4
38	390	8390	Slab/Box	1	1.5
39	500	8500	Slab/Box	1	1.5
40	875	8875	Slab/Box	1	1.5
41	1275	9275	Slab/Box	1	2.5
42	1625	9625	Slab/Box	1	4
43	1785	9785	Slab/Box	1	4
44	1885	9885	Slab/Box	1	6
45	2065	10065	Slab/Box	1	3
46	2200	10200	Slab/Box	1	4
47	2370	10370	Slab/Box	1	4
48	2485	10485	Slab/Box	1	1.5
49	2575	10575	Slab/Box	1	1.5
50	2765	10765	Slab/Box	1	3
51	2920	10920	Slab/Box	1	3
52	3015	11015	Slab/Box	1	1.5
53	3150	11150	Slab/Box	1	1.5
54	3580	11580	Slab/Box	1	2.5

Sl. No.	Existing Chainage	Design Chainage	Type of Culvert	Span / Dia (m)	Width (m)
55	4250	12250	Slab/Box	1	1.5
56	4780	12780	Slab/Box	1	1.5
57	4850	12850	Slab/Box	1	1.5
58	4900	12900	Slab/Box	1	1.5
59	5115	13115	Slab/Box	1	1.5
60	5280	13280	Slab/Box	1	1.5
61	5370	13370	Slab/Box	1	1.5
62	5615	13615	Slab/Box	1	1.5
63	5800	13800	Slab/Box	1	3
64	6195	14195	Slab/Box	1	3
65	6275	14275	Slab/Box	1	1.5
66	6500	14500	Slab/Box	1	5
67	6880	14880	Slab/Box	1	6
68	6900	14900	Slab/Box	1	1.5
69	7630	15630	Slab/Box	1	2
70	7820	15820	Slab/Box	1	1.5
71	8000	16000	Slab/Box	1	4
72	8075	16075	Slab/Box	1	1.5
73	8160	16160	Slab/Box	1	1.5
74	8630	16630	Slab/Box	1	6
75	8745	16745	Slab/Box	1	1.5
76	8900	16900	Slab/Box	1	1.5
77	8965	16965	Slab/Box	1	1.5

## 7.2.3 Widening of existing culverts

NIL

7.2.4 Additional new culverts shall be constructed as per particulars given in the table below:

Sl. No.	Existing Chainage	Design Chainage	Type of Culvert	Span / Dia (m)	Width (m)
1	95935	135	Slab / Box	1	2
2	96510	710	Slab / Box	1	2
3	96620	820	Slab / Box	1	2
4	96725	925	Slab / Box	1	2
5	96850	1050	Slab / Box	1	2
6	97040	1240	Slab / Box	1	2
7	97380	1580	Slab / Box	1	2
8	98050	2250	Slab / Box	1	2
9	98320	2520	Slab / Box	1	2
10	98960	3160	Slab / Box	1	2
11	99538	3738	Slab / Box	1	2
12	99760	3960	Slab / Box	1	2
13	99885	4085	Slab / Box	1	2
14	100650	4850	Slab / Box	1	2
15	100850	5050	Slab / Box	1	2
16	101145	5345	Slab / Box	1	2
17	101400	5600	Slab / Box	1	2
18	101970	6170	Slab / Box	1	2
19	102430	6630	Slab / Box	1	2
20	102640	6840	Slab / Box	1	2
21	103100	7300	Slab / Box	1	2
22	600	8600	Slab / Box	1	2

Sl. No.	Existing Chainage	Design Chainage	Type of Culvert	Span / Dia (m)	Width (m)
23	965	8965	Slab / Box	1	2
24	1155	9155	Slab / Box	1	2
25	1390	9390	Slab / Box	1	2
26	3295	11295	Slab / Box	1	2
27	3412	11412	Slab / Box	1	2
28	3840	11840	Slab / Box	1	2
29	3955	11955	Slab / Box	1	2
30	4075	12075	Slab / Box	1	2
31	4555	12555	Slab / Box	1	2
32	4700	12700	Slab / Box	1	2
33	5040	13040	Slab / Box	1	2
34	5927	13927	Slab / Box	1	2
35	6100	14100	Slab / Box	1	2
36	6700	14700	Slab / Box	1	2
37	7025	15025	Slab / Box	1	2
38	7167	15167	Slab / Box	1	2
39	7267	15267	Slab / Box	1	2
40	7420	15420	Slab / Box	1	2
41	7540	15540	Slab / Box	1	2

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

NIL

7.2.6 Floor protection works shall be as specified in the relevant IRC Codes and Specifications.

### 7.3 Bridges

7.3.1 Existing bridges to be re- constructed/widened

- (i) The existing bridges at the following locations shall be reconstructed as new structures **(Minor Bridges)** –

Sl. No.	Existing Chainage (Km)	Design Chainage (m)	Proposed Span in mt	Proposed Width in mt	Remark
NiL					

Existing bridges along the proposed alignment are being constructed by BRO/planned to be constructed by BRO. However, after construction, maintenance shall be responsibility of the contractor along with the complete awarded stretch.

GAD is attached at Annex B of annex 1 of this Schedule.

- (ii) The following bridges shall be widened:

NIL

7.3.2 Additional New Minor Bridges

New minor bridges at the following locations on the Project Highway shall be constructed

Sl. No.	Existing Chainage (Km)	Design Chainage (m)	Proposed Span in mt	Proposed Width in mt	Proposed / Remark
NiL					

GAD is attached at Annex B of annex 1 of this Schedule.

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

Sl. No.	Location at km	Remarks
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Nil
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7.3.4 Repairs/replacement of railing/parapets of the existing bridges shall be undertaken as follows:

Sl. No.	Location at km	Remarks
Nil		

7.3.5 Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in paragraph 7.21 of the Two Lane Manual (IRC : SP 73 - 2007)

7.3.6 Structures in marine environment

NIL

#### 7.4. Rail-road bridges

7.4.1 Design, construction and detailing of ROB/RUB shall be as specified in section 7 of the Two Lane Manual (IRC : SP 73 -2007).

NIL

7.4.2 Road over-bridges

Road over-bridges (road over rail) shall be provided at the following level crossings, as per GAD drawings attached at Annexure – “C” to this schedule :

Sl. No.	Existing Location of Level crossing / Railway Track (Chainage km)	Proposed Location of Level crossing / Railway Track (Chainage km)	Length of bridge (m)
Nil			

**7.4.3 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 Crossing (Chainage km)	Number and length of span (m)
NIL		

**7.5 Grade separated structures**

NiL

**7.6 Repairs and strengthening of bridges and structures****A. Bridges**

The existing bridges and structures to be repaired/strengthened are given below:

NiL

**B. ROB / RUB**

Nil

**C. Overpasses/Underpasses and other structures**

Nil

**7.7 List of Major Bridges and Structures**

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

- (i) The existing bridges at the following locations shall be constructed as new structures (Major Bridges) -

Sl. No.	Existing Chainage (Km)	Design Chainage (m)	Proposed Span in mt	Proposed Width in mt	Proposed/Remark
NIL					

Existing bridges along the proposed alignment are being constructed by BRO/planned to be constructed by BRO.

However, after construction, maintenance shall be responsibility of the contractor along with the complete awarded stretch.

GAD is attached at Annex B of annex 1 of this Schedule.

### 7.3.2 Additional New Major Bridges

New major bridges at the following locations on the Project Highway shall be constructed

Sl. No.	Design Chainage (m)	Proposed Span in mt	Proposed Width in mt	Proposed/Remark
NiL				

## 8 TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

8.1 Traffic control devices and road safety works shall be provided in accordance with Section 9 of the Two Lane Manual (IRC : SP 73 - 2007). (Polymer rumble strips (min. 1700 RM) on hazardous locations specially on shoulders of valley side curves)

8.2 Specifications of the reflecting sheeting: As per the Clause 9.3 of the Two Lane Manual (IRC : SP 73 -2007) of Specification and Standards.

**The Tentative quantity of Traffic signages and pavement marking are as tabulated below –**

Traffic Signages, Road Marking and other appurtenances			
1	Road Marking: - Lane, Centre Line, Pedestrian crossing		
	Centre line on straight portion	Sqm	673
	Centre line on curve portion	Sqm	255
	Edge Line at Paved Shoulder	Sqm	3400
	Add 15% for Misc. including Pedestrian X-ings etc	Sqm	649
	<b>Total</b>	Sqm	4978
2	Directional Arrows, letter marking etc.	Nos.	55



<b>Traffic Signages, Road Marking and other appurtenances</b>			
3	Advance Direction signs size 1800X1200 mm	Nos.	30
4	Village name boards size 600X900 mm	Sqm	9.72
5	Place Identification signs size 1200X900 mm	Sqm	3.84
6	90 cm Triangle	Nos.	15
7	90 cm Octagon	Nos.	15
8	Hazard plate 300X900 mm	Sqm	252.45
9	800 x 600 mm Size	Nos.	20
10	60 Cm circular	Nos.	20
11	Supply and fixing of Micro Prismatic type Retro-Reflective sign plate which is to be fixed on Overhead/ Cantilever structures with the help of G.I. nut bolts	Sqm	51.36
12	Over Head Sign Truss	MT	5.5
13	Boundary Stone (taken 10% of Qty)	Nos.	9
14	5th Km Stone -New	Nos.	2
15	Ordinary Km Stone	Nos.	15
16	Hectometer Stone	Nos.	68
17	Delineator	Nos.	80
18	Bollards	Nos.	80
19	RCC Guard Post	Nos.	80
20	Enamel Paint	Sqm	40

## **9 ROADSIDE FURNITURE**

9.1 Roadside furniture shall be provided in accordance with the provisions of Section 11 of the Two Lane Manual (IRC : SP 73 - 2007).

9.2 The Overhead traffic signs: location and size

Full width overhead sign : 1 no.

Cantilever overhead signs : 2 nos. (Locations to be finalized in consultation with Authority's Engineer.)

## **10 COMPULSORY AFFORESTATION**

The number of trees which are required to be planted by the contractor as compulsory afforestation shall be as per Forest

Conservation Act and as per the Two Lane Manual (IRC : SP 73 - 2007). In addition Hydro seeding/plantation or similar on hill slopes as slope protection works for minimum 63000 Sqm)

## 11 HAZARDOUS LOCATIONS

The safety barriers, Protective works shall also be provided at the following hazardous locations / lengths:

Sl. No.	Type of Protection works	Minimum Length (m)	Height (range in m)	Remarks
1	Parapet Wall on Valley side	7064		As per IRC SP: 48- 1998
2	W-Beam Crash Barrier	4155		
3	Breast Wall	4239	2 – 6 m	
4	Retaining Wall	4946	2 - 4 m	
5	Gabion Wall	990	2 - 4 m	

## 12 SPECIAL REQUIREMENTS FOR HILL ROADS

All special features shall be provided as per Two Lane Manual (IRC : SP 73 -2007).

The side slope shall be protected by using suitable slope protection measures all along the highway on Hill side and Valley side. The details of the protection work are listed in “Annex B” and the typical sections for the protection works are given in “Annex A”.

## 13 Utilities

Provision of accommodating utilities shall be made both over as well as underground wherever required.

## **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.

# DRAWINGS FOLDER

**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[s];
- (b) road side furniture;
- (c) pedestrian facilities;
- (d) tree plantation;
- (e) truck lay-byes;
- (f) bus-bays and bus shelters;
- (g) rest areas; and
- (h) others to be specified

**2 Description of Project Facilities****(a) Toll Plaza**

NIL

**(b) Road side Furniture**

Roadside furniture shall be provided in accordance with the provisions of Section 11 of the Two Lane Manual (IRC : SP 73 -2007).

**(c) Pedestrian Facilities**

Pedestrians facilities in the form of guard rails, footpath, at grade pedestrian crossing etc. shall be provided wherever required as per section 13 of the Two Lane Manual (IRC : SP 73 -2007).

**(d) Tree Plantation:**

NIL

**(e) Truck lay-byes:**

The locations of proposed truck lay byes are as under -

Sl. No.	Existing Km	Design Km	Side	Remarks
NIL				

**(f) Bus-byes and Bus Shelter,**

The locations of proposed Bus bays are as under -

Sl. No.	Existing Chainage (Km)	Design Chainage (m)	Side	Remarks
1		4800	Right	
2		7550	Left	
3		11700	Both	

**(g) Rest areas:**

NIL

**(h) Others to be specified:**

NIL

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:

Two Lane Manual (IRC : SP 73 -2007) of Specifications and Standards for Two Laning Published by IRC SP: 73-2007.

SCHEDULE - E  
(See Clauses 2.1 and 14.2)

**MAINTENANCE REQUIREMENTS**

**1 Maintenance Requirements**

- 1.1 The Contractor shall, at all times 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 MORTH Specifications for Road and Bridge Works, and the relevant IRC publications. Where the specifications for a work are not given, Good Industry Practice shall be adopted.



## **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: SP35. 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

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawaii Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawaii Road)] in the state of Arunachal Pradesh under SARDP-NE**

Engineer.

**8. Repairs on account of natural calamities**

All damages occurring to the Project Highway on account of a Force Majeure Event or default or neglect of the Authority shall be undertaken by the Authority at its own cost. The Authority may instruct the Contractor to undertake the repairs at the rates agreed between the Parties.

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
<b>ROADS</b>		
<b>(a)</b>	<b>Carriageway and paved shoulders</b>	
(i)	Breach or blockade	Temporary restoration of traffic within 24 hours; permanent restoration within 15 (fifteen) days
(ii)	Roughness value exceeding 2,200 mm in a stretch of 1 km (as measured by a calibrated bump integrator)	120 (one hundred and twenty) days
(iii)	Pot holes	24 hours
(iv)	Any cracks in road surface	15 (fifteen) days
(v)	Any depressions, rutting exceeding 10 mm in road surface	30 (thirty) days
(vi)	Bleeding/skidding	7 (seven) days
(vii)	Any other defect/distress on the road	15 (fifteen) days
(viii)	Damage to pavement edges	15 (fifteen) days
(ix)	Removal of debris, dead animals	6 hours
<b>(b)</b>	<b>Granular earth shoulders, side slopes, drains and culverts</b>	
(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
Nature of Defect or deficiency		Time limit for

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		repair/rectification
(ii)	Edge drop at shoulders exceeding 40 mm	7 (seven) days
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	30 (thirty) days
(iv)	Rain cuts/gullies in slope	7 (seven) days
(v)	Damage to or silting of culverts and side drains	7 (seven) days
(vi)	Desilting of drains in urban/semi-urban areas	24 hours
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)
<b>(c)</b>	<b>Road side furniture including road sign and pavement marking</b>	
(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
<b>(d)</b>	<b>Road lighting</b>	
(i)	Any major failure of the system	24 hours
(ii)	Faults and minor failures	8 hours
<b>(e)</b>	<b>Trees and plantation</b>	
(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
<b>Nature of Defect or deficiency</b>		<b>Time limit for</b>

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawaii Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawaii Road)] in the state of Arunachal Pradesh under SARDP-NE**

		repair/rectification
(iv)	Trees and bushes requiring replacement	30 (thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
<b>(f)</b>	<b>Rest area</b>	
(i)	Cleaning of toilets	Every 4 hours
(ii)	Defects in electrical, water and sanitary installations	24 hours
<b>(g)</b>	<b>[Toll Plaza]</b>	
<b>(h)</b>	<b>Other Project Facilities and Approach roads</b>	
(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
<b>Bridges</b>		
<b>(a)</b>	<b>Superstructure</b>	
(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>(b)</b>	<b>Foundations</b>	
(i)	Scouring and/or cavitation	15 (fifteen) days
<b>(c)</b>	<b>Piers, abutments, return walls and wing walls</b>	
(i)	Cracks and damages including settlement and tilting, spalling, scaling	30 (thirty) days
<b>Nature of Defect or deficiency</b>		<b>Time limit for repair/rectification</b>

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawaii Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawaii Road)] in the state of Arunachal Pradesh under SARDP-NE**

<b>(d)</b>	<b>Bearings (metallic) of bridges</b>	
(i)	Deformation, damages, tilting or shifting of bearings	15 (fifteen) days Greasing of metallic bearings once in a year
<b>(e)</b>	<b>Joints</b>	
(i)	Malfunctioning of joints	15 (fifteen) days
<b>(f)</b>	<b>Other items</b>	
(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
<b>(g)</b>	<b>Hill Roads</b>	
(i)	Damage to retaining wall/breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours
(iii)	Snow requiring clearance	24 (twenty four) hours

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

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawaii Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawaii Road)] in the state of Arunachal Pradesh under SARDP-NE**

SCHEDULE - F  
(See Clause 3.1.7(a))

**APPLICABLE PERMITS**

**1 Applicable Permits**

- 1.1 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 Panchayats and Pollution Control Board for installation of crushers;
  - (c) Licence for use of explosives;
  - (d) Permission of the State Government for drawing water from river/reservoir;
  - (e) Licence 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 or clearances required under Applicable Laws.
- 1.2 Applicable Permits, as required, relating to environmental protection and conservation shall have been procured by the Authority in accordance with the provisions of this Agreement.
2. The agency need to ensure compliance of AIP and FC stated in Schedule 'A' Annexure-IV. The necessary certifications need to be obtained from competent local forest department.
3. Muck dumping locations in forest area to be freezed in consultation with the forest department, the necessary certifications from local competent forest department is to be submitted.

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawaii Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawaii Road)] in the state of Arunachal Pradesh under SARDP-NE**

## SCHEDULE – G

(See Clauses 7.1.1, 7.5.3 and 19.2)

### FORM OF BANK GUARANTEE

Annex-I

(See Clause 7.1.1)

#### [Performance Security/Additional Performance Security]

Managing Director,  
National Highways & Infrastructure  
Development Corporation Limited, New Delhi

WHEREAS:

- (A) \_\_\_\_\_ [name and address of contractor] (hereinafter called the “**Contractor**”) and [name and address of the authority], (hereinafter called the “**Authority**”) have entered into an agreement (hereinafter called the “**Agreement**”) for the “**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawai Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawai Road)] in the state of Arunachal Pradesh under SARDP-NE**” on Engineering, Procurement and Construction (the “**EPC**”) basis, subject to and in accordance with the provisions of the Agreement
- (B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the {Construction Period/ Defects Liability Period and Maintenance Period} (as defined in the Agreement) in a sum of 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**”*) by way of Performance Security.

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor’s obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the 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

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[General Manager in the National Highways Authority of India], that the Contractor has committed default in the due and faithful performance of all or any of its obligations 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 differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the 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.

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawaii Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawaii Road)] in the state of Arunachal Pradesh under SARDP-NE**

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

S.no.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank	Transport Bhawan, New Delhi

<sup>s</sup> Insert date being 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 7.2 of the Agreement).

	Branch Name	
5	Beneficiary Bank Address	Syndicate Bank transport Bhawan, 1st Parliament Street, New Delhi- 110001

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

- (i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
- (ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

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Annex – II  
(Schedule - G)  
(See Clause 7.5.3)

## Form for Guarantee for Withdrawal of Retention Money

Managing Director,  
National Highways & Infrastructure  
Development Corporation Limited, New Delhi

WHEREAS:

- 
- (A) [name and address of contractor] (hereinafter called the “**Contractor**”) has executed an agreement (hereinafter called the “**Agreement**”) with the [name and address of the authority], (hereinafter called the “**Authority**”) for the “**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawaii Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawaii Road)] in the state of Arunachal Pradesh under SARDP-NE**”, subject to and in accordance with the provisions of the Agreement.
- (B) In accordance with Clause 7.5.3 of the Agreement, the Contractor may withdraw the retention money (hereinafter called the “**Retention Money**”) after furnishing to the Authority a bank guarantee for an amount equal to the proposed withdrawal.
- (C) We, ..... through our branch at ..... (the “**Bank**”) have agreed to furnish this bank guarantee (hereinafter called the “**Guarantee**”) for the amount of Rs. ----- cr. (Rs.-----crore) (the “**Guarantee Amount**”).

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

1. The Bank hereby unconditionally and irrevocably undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways Authority of India], that the Contractor has committed default in the due and faithful performance of all or any of its obligations for 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 differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the

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discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Retention Money and any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Retention Money.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Guarantee shall cease to be in force and effect 90 (ninety) days after the date of the Completion Certificate specified in Clause 12.4 of the Agreement.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by

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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 up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.
12. This guarantee shall also be operatable at our..... Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.
13. Bank Guarantee has been sent to authority's bank through SFMS gateway as per the details below:-

S.no.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Syndicate Bank transport Bhawan, 1st Parliament Street, New Delhi-110001

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawaii Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawaii Road)] in the state of Arunachal Pradesh under SARDP-NE**

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**

Managing Director,  
National Highways & Infrastructure  
Development Corporation Limited, New Delhi

WHEREAS:

- 
- (A) [name and address of contractor] (hereinafter called the “**Contractor**”) has executed an agreement (hereinafter called the “**Agreement**”) with the [name and address of the authority], (hereinafter called the “**Authority**”) for the “**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawaii Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawaii Road)] in the state of Arunachal Pradesh under SARDP-NE**” subject to and in accordance with the provisions of the Agreement
- (B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing (@ Bank Rate) advance payment (herein after called “**Advance Payment**”) equal to 10% (ten per cent) of the Contract Price; and that the Advance Payment shall be made in two installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} installment of the Advance Payment is Rs. - ----- cr. (Rupees ----- crore) and the amount of this Guarantee is Rs. ----- cr. (Rupees ----- crore) (the “**Guarantee Amount**”).
- (C) We, ..... through our branch at ..... (the “**Bank**”) have agreed to furnish this bank guarantee (*hereinafter called the “**Guarantee**”*) for the Guarantee Amount.

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid instalment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to

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<sup>\$</sup> The Guarantee Amount should be equivalent to 110% of the value of the applicable instalment.

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an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

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

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writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

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

S.no.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi

<sup>\$</sup> Insert a date being 90 (ninety) days after the end of one year from the date of payment of the Advance payment to the Contractor (in accordance with Clause 19.2 of the Agreement).

5	Beneficiary Bank Address	Syndicate Bank transport Bhawan, 1st Parliament Street, New Delhi-110001
---	--------------------------	---

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

- (i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
- (ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

\_\_\_\_\_

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**SCHEDULE - H****(See Clauses 10.1.4 and 19.3)****Contract Price Weightages**

1.1 The Contract Price for this Agreement is Rs. ..../-

1.2 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	PERCENTAGE WEIGHTAGE vis a vis overall Project
1	2	3	4	5
Road works including culverts, minor bridges, underpasses, overpasses, approaches to ROB/RUB/ Major Bridges/ Structures (but excluding service roads/slip roads)	80.55%	<b>A-Widening and Strengthening</b>		
		(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock.	54.45%	43.87%
		(2) Granular work (sub- base, base, shoulders)	10.94%	8.81%
		(3) Bituminous work	0.00%	
		a) DBM	7.74%	6.24%
		b) BC	4.24%	3.42%
		(4) Concrete Pavement	0.00%	0.00%
		(5) Site Clearance	0.06%	0.05%
		(6) Widening and repair of culverts	0.00%	0.00%
		(7) Protection of existing works	0.00%	0.00%
		(8) Widening and repair of minor bridges	0.00%	0.00%
		<b>B- New 2-lane alignment</b>		
		(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock.	0.00%	0.00%
		(2) Granular work (sub- base, base, shoulders)	0.00%	0.00%

ITEM	WEIGHTAGE IN PERCENTAGE TO THE CONTRACT PRICE	STAGE FOR PAYMENT	PERCENTAGE WEIGHTAGE	PERCENTAGE WEIGHTAGE vis a vis overall Project
1	2	3	4	5
		(3) Bituminous work	0.00%	
		a) DBM	0.00%	0.00%
		b) BC	0.00%	0.00%
		(4) CC Pavement	0.00%	0.00%
		(5) Protection Works	0.00%	0.00%
		(6) RCC / Reinf. Earth ret wall in approaches of RoB	0.00%	0.00%
		(7) Drainage Works	0.00%	0.00%
		(8) Clearing & Grubbing	0.00%	0.00%
		(9) Protection works	0.00%	0.00%
		<b>C- New culverts, minor bridges, underpasses, overpasses on existing road, realignments, bypasses:</b>		
		(1) Box / Slab Culverts	22.56%	18.18%
		(2) HP Culverts	0.00%	0.00%
		(3) Embankment Protection (New Lane)	0.00%	0.00%
		(4) Grade Separated structures	0.00%	0.00%
		(5) Overpasses	0.00%	0.00%
		(6) Elephant underpass	0.00%	0.00%
		(7) Approaches to ROB and Viaduct	0.00%	0.00%
		(8) Minor bridges	0.00%	0.00%
		(9) Cattles/Pedestrian Underpasses	0.00%	0.00%
		(10) Vehicular Underpasses	0.00%	0.00%
<b>Major Bridge works and ROB/RUB</b>	<b>0.00%</b>	<b>A- Widening and repairs of Major Bridges</b>		
		(1) Foundation	0.00%	0.00%
		(2) Sub-structure	0.00%	0.00%
		(3) Super-structure (including wearing coat, crash barriers etc. complete in all respect )	0.00%	0.00%

ITEM	WEIGHTAGE IN PERCENTAGE TO THE CONTRACT PRICE	STAGE FOR PAYMENT	PERCENTAGE WEIGHTAGE	PERCENTAGE WEIGHTAGE vis a vis overall Project
1	2	3	4	5
		<b>B- Widening and repair of</b>		
		(a) ROB	0.00%	0.00%
		(b) RUB	0.00%	0.00%
		<b>C- New Major Bridges</b>		
		(1) Other Miscellaneous Items	0.00%	0.00%
		(2) Guide Bund	0.00%	0.00%
		(3) Foundation	0.00%	0.00%
		(4) Sub-structure	0.00%	0.00%
		(5) Super-structure (including wearing coat, crash barriers etc. complete in all respect )	0.00%	0.00%
		(6) Protection Works	0.00%	0.00%
		<b>D- New rail-road bridge including Viaduct</b>		
		(a) ROB	0.00%	0.00%
		(b) RUB	0.00%	0.00%
<b>Structures (elevated sections, reinforced earth)</b>	<b>0.00%</b>	<b>(1) Foundation</b>	0.00%	0.00%
		<b>(2) Sub-structure</b>	0.00%	0.00%
		<b>(3) Super-structure (including crash barriers etc. complete)</b>	0.00%	0.00%
		<b>(4) Reinforced Earth</b>	0.00%	0.00%
<b>Other Works</b>	<b>19.45%</b>	<b>Other Engineering Works</b>		
		Major Junction	0.00%	0.00%
		Road Marking	0.00%	0.00%
		Road Appurtenances	0.00%	0.00%
		Road Side plantation	0.00%	0.00%
		Protection works	0.00%	0.00%
		Service roads/slip road	0.00%	0.00%
		Toll Plaza	0.00%	0.00%
		Road side drains & toe wall	14.41%	2.80%
		Project facilities	0.07%	0.01%

ITEM	WEIGHTAGE IN PERCENTAGE TO THE CONTRACT PRICE	STAGE FOR PAYMENT	PERCENTAGE WEIGHTAGE	PERCENTAGE WEIGHTAGE vis a vis overall Project
1	2	3	4	5
		Safety & traffic mgmt. During construction	0.00%	0.00%
		Traffic Sign	0.28%	0.05%
		Pavement marking	1.11%	0.22%
		Crash barrier/ W metal crash barrier	4.53%	0.88%
		Boundary stone, km stone, 5th km stone, & hectometre stones	0.03%	0.01%
		Traffic blinker LED Delineator, stud, reflective payment marker, tree reflector	0.18%	0.03%
		Traffic Island	0.00%	0.00%
		Median Kerbs	0.00%	0.00%
		Bus Bays & Bus shelter	1.29%	0.25%
		Road side plantation & medium Plantation	0.00%	0.00%
		Protection works of guide bund including construction of flexible aprons, boulder pitching and filter media on slopes	0.00%	0.00%
		Minor junction	2.25%	0.44%
		Median filling shrub plantation & maintenance for 1 year	0.00%	0.00%
		Overhead signboard	0.31%	0.06%
		painting on kerb	0.00%	0.00%
		Footpath & Separator	0.00%	0.00%
		Vetiver Plantation	0.00%	0.00%
		Interlocking concrete block payment	0.00%	0.00%
		CC kerb	0.00%	0.00%
		Painting	0.00%	0.0001%
		Cable duct	0.00%	0.00%

ITEM	WEIGHTAGE IN PERCENTAGE TO THE CONTRACT PRICE	STAGE FOR PAYMENT	PERCENTAGE WEIGHTAGE	PERCENTAGE WEIGHTAGE vis a vis overall Project
1	2	3	4	5
		Solar stud & solar blinking LED	0.00%	0.00%
		Rest area with development of site including One no Bus bay and Bus shelter, landscaping and tree plantation	0.00%	0.00%
		For Plantation (Hydro seeding & plantation on hill slopes as slope protection measures)	4.99%	0.97%
		Traffic control devices and road safety works (Polymer rumble strips on hazardous locations specially valley side curves)	1.00%	0.19%
		Road furniture	0.00%	0.00%
		Roads side drains I/C Chute drain	0.00%	0.00%
		Repair of protections works	0.00%	0.00%
		Traffic diversion, Safety and traffic management during construction	0.00%	0.00%
		Retaining wall	0.00%	0.00%
		Miscellaneous items	0.00%	0.00%
		Breast wall and RCC retaining wall	0.00%	0.00%
		Site Clearance	0.00%	0.00%
		M-20 kerb with channel	0.00%	0.00%
		Prefabricated railing over kerb in median	0.00%	0.00%
		Safety Barrier	0.00%	0.00%
		<b>(v) Project facilities</b>		



ITEM	WEIGHTAGE IN PERCENTAGE TO THE CONTRACT PRICE	STAGE FOR PAYMENT	PERCENTAGE WEIGHTAGE	PERCENTAGE WEIGHTAGE vis a vis overall Project
1	2	3	4	5
		(a) Truck lay-byes	0.00%	0.00%
		(b) others	0.00%	0.00%
		<b>(vi) Repairs to bridges/structures</b>		
		Other items (Junctions)	0.00%	0.00%
		Providing wearing coat	0.00%	0.00%
		Replacement of bearing joints	0.00%	0.00%
		Providing crash barriers	0.00%	0.00%
		<b>(vii) Protection works</b>		
		Breast wall	25.85%	5.03%
		Retaining wall	31.26%	6.08%
		Gabion Wall	2.98%	0.58%
		Parapet	9.46%	1.84%
		Slope Protection at Land Slide locations.	0.00%	0.00%
		*		<b>100.00%</b>

### 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 vis a vis overall Project	PAYMENT PROCEDURE
<b>A-Widening and Strengthening</b>		
(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock.	43.87%	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)	8.81%	
(3) Bituminous work		
a) Prime & Tack Coat	0.00%	
b) DBM	6.24%	
c) BC	3.42%	
(4) Concrete Pavement	0.00%	
(5) Site Clearance	0.05%	
(6) Widening and repair of culverts	0.00%	Cost of ten completed culverts shall be determined pro rata with respect to the total number of culverts. Payment shall be made on the completion of ten culverts.
(7) Protection of existing works	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 the total length.
(8) 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>B- New 2-lane alignment</b>		
(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock.	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 2 (two) km length.
(2) Granular work (sub- base, base, shoulders)	0.00%	
(3) Bituminous work	0.00%	
a) Prime & Tack Coat	0.00%	
b) DBM	0.00%	
c) BC	0.00%	
(4) CC Pavement	0.00%	

STAGE OF PAYMENT	PERCENTAGE WEIGHTAGE vis a vis overall Project	PAYMENT PROCEDURE
(5) Protection Works	0.00%	
(6) RCC / Reinf. Earth ret wall in approaches of RoB	0.00%	
(7) Drainage Works	0.00%	
(8) Clearing & Grubbing	0.00%	
(9) Protection works	0.00%	
<b>C- New culverts, minor bridges, underpasses, overpasses on existing road, realignments, bypasses:</b>		
(1) Box / Slab Culverts	18.18%	Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of five culverts.
(2) HP Culverts	0.00%	
(3) Embankment Protection (New Lane)	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 the total length.
(4) Grade Separated structures	0.00%	Cost of each structure shall be determined on pro rata basis with respect to the total number of structures. Payment shall be made on the completion of each number of structures specified.
(5) Overpasses	0.00%	
(6) Elephant underpass	0.00%	
(7) Approaches to ROB and Viaduct	0.00%	
(8) Minor bridges	0.00%	Cost of each minor bridge/Culvert shall be determined on pro rata basis with respect to the total linear length of the minor bridges/culvert. Payment shall be made on the completion of a minor bridge/culvert.
(9) Cattles/Pedestrian Underpasses	0.00%	Cost of each structure shall be determined on pro rata basis with respect to the total number of structures. Payment shall be made on the completion of each number of structures specified.
(10) Vehicular Underpasses	0.00%	

@. 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 =  $P \times \text{weightage for bituminous work} \times (1/L)$

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 Procedure of estimating the value of work done

#### 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	PERCENTAGE WEIGHTAGE vis a vis overall Project	PAYMENT PROCEDURE
<b>A- Widening and repairs of Major Bridges</b>		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.
(1) Foundation	0.00%	
(2) Sub-structure	0.00%	
(3) Super-structure (including wearing coat, crash barriers etc. complete in all respect )	0.00%	
<b>B- Widening and repair of</b>		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 an ROB/RUB
(a) ROB	0.00%	
(b) RUB	0.00%	
<b>C- New Major Bridges</b>		Payment shall be made on pro rata basis on completion of 25 (twenty five) percent of each stage of a Major Bridge as per the weightage given in this table.
(1) Other Miscellaneous Items	0.00%	
(2) Guide Bund	0.00%	
(3) Foundation	0.00%	
(4) Sub-structure	0.00%	
(5) Super-structure (including wearing coat, crash barriers etc. complete in all respect )	0.00%	
(6) Protection Works	0.00%	
<b>D- New rail-road bridge</b>		Payment shall be made on pro rata basis on completion of 25 (twenty five) percent of each stage of a ROB/RUB as per the weightage given in this table.
(a) ROB	0.00%	
(b) RUB	0.00%	

**TABLE: 1.3.3**

STAGE OF PAYMENT	PERCENTAGE WEIGHTAGE vis a vis overall Project	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 20 (twenty) 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	PERCENTAGE WEIGHTAGE vis a vis overall Project	PAYMENT PROCEDURE
<b>Other Engineering Works</b>		
Major Junction	0.00%	Payment shall be made on pro rata basis for completed facilities.
Road Marking	0.00%	
Road Appurtenances	0.00%	
Road Side plantation	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/slip roads. Payment shall be made for completed service roads/slip roads in a length of not less than 20 (twenty) percent of the total length of service roads/slip roads.
Protection works	0.00%	
Service roads/slip road	0.00%	
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.
Road side drains & toe wall	2.80%	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) percent of the total length.
Project facilities	0.01%	Payment shall be made for completed items.
Safety & traffic mgmt. During construction	0.00%	
Traffic Sign	0.05%	
Pavement marking	0.22%	
Crash barrier/ W matel crash barrier	0.88%	

STAGE OF PAYMENT	PERCENTAGE WEIGFTAGE vis a vis overall Project	PAYMENT PROCEDURE
Boundary stone, km stone,5th km stone, & hectometre stones	0.01%	
Traffic blinker LED Delineator, stud, reflective payment marker, tree reflector	0.03%	
Traffic Island	0.00%	
Median Kerbs	0.00%	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) percent of the total length.
Bus Bays & Bus shelter	0.25%	Payment shall be made for completed items.
Road side plantation & medium Plantation	0.00%	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) percent of the total length.
Protection works of guide bund including construction of flexible aprons , boulder pitching and filter media on slopes	0.00%	
Minor junction	0.44%	Payment shall be made for completed items.
Median filling shrub plantation & maintenance for 1 year	0.00%	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) percent of the total length.
Overhead signboard	0.06%	
painting on kerb	0.00%	
Footpath & Separater	0.00%	
Vetiver Plantation	0.00%	
Interlocking concrete block payment	0.00%	
CC kerb	0.00%	
Painting	0.00%	
Cable duct	0.00%	
Solar stud & solar blinking LED	0.00%	



STAGE OF PAYMENT	PERCENTAGE WEIGHTAGE vis a vis overall Project	PAYMENT PROCEDURE
Rest area with development of site including One no Bus bay and Bus shelter, landscaping and tree plantation	0.00%	
For Plantation (Hydro seeding & plantation on hill slopes as slope protection measures)	0.97%	
Traffic control devices and road safety works (Polymer rumble strips on hazardous locations specially valley side curves)	0.19%	
Road furniture	0.00%	
Roads side drains I/C Chute drain	0.00%	
Repair of protections works	0.00%	
Traffic diversion, Safety and traffic management during construction	0.00%	
Retaining wall	0.00%	
Miscellaneous items	0.00%	
Breast wall and RCC retaining wall	0.00%	
Site Clearance	0.00%	
M-20 kerb with channel	0.00%	
Prefabricated railing over kerb in median	0.00%	
Safety Barrier	0.00%	
<b>(v) Project facilities</b>		
(a) Truck lay-byes	0.00%	Payment shall be made for completed items.
(b) others	0.00%	
<b>(vi) Repairs to bridges/structures</b>		
Other items (Junctions)	0.00%	Payment shall be made for completed items.
Providing wearing coat	0.00%	
Replacement of bearing joints	0.00%	

STAGE OF PAYMENT	PERCENTAGE WEIGHTAGE vis a vis overall Project	PAYMENT PROCEDURE
Providing crash barriers	0.00%	
<b>(vii) Protection works</b>		
Breast wall	5.03%	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) percent of the total length.
Retaining wall	6.08%	
Gabion Wall	0.58%	
Parapet	1.84%	

## 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 10.2.4)

**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 contractor is required to furnish all the Drawings as per the Manual and Clause 10.2*]

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawai Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawai Road)] in the state of Arunachal Pradesh under SARDP-NE**

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawai Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawai Road)] in the state of Arunachal Pradesh under SARDP-NE**

SCHEDULE - J  
(See Clause 10.3.2)

**PROJECT COMPLETION SCHEDULE**

**1 Project Completion Schedule**

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

**2 Project Milestone-I**

- 2.1 Project Milestone-I shall occur on the date falling on the 180th (one hundred and eightieth) day from the Appointed Date (the “**Project Milestone-I**”).
- 2.2 Prior to the occurrence of Project Milestone-I, the Contractor shall have commenced construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 10% (ten per cent) of the Contract Price.

**3 Project Milestone-II**

- 3.1 Project Milestone-II shall occur on the date falling on the *550th (Five hundred and fiftieth)* day from the Appointed Date (the “**Project Milestone-II**”).
- 3.2 Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 40% (forty per cent) of the Contract Price.

**4 Project Milestone-III**

- 4.1 Project Milestone-III shall occur on the date falling on the *915th (Nine hundred and fifteenth)* day from the Appointed Date (the “**Project Milestone-III**”).
- 4.2 Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 80% (eighty per cent) of the Contract Price.

**5 Scheduled Completion Date**

- 5.1 The Scheduled Completion Date shall occur on the [1095th (*one thousand ninety fifth*)] 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.

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawaii Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawaii Road)] in the state of Arunachal Pradesh under SARDP-NE**

## **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 [\*\*\*].
- 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 kilometre.
- 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) metres 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.

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawai Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawai Road)] in the state of Arunachal Pradesh under SARDP-NE**



**3 Agency for conducting Tests**

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

**4 Completion Certificate**

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

SCHEDULE - L  
(See Clause 12.2 and 12.4)

**PROVISIONAL CERTIFICATE**

- 1 I, ..... (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated ..... (the "Agreement"), for **"Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawai Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970(Hayuliang – Hawai Road)] in the state of Arunachal Pradesh under SARDP-NE"** (the **"Project Highway"**) on Engineering, Procurement and Construction (EPC) basis through ..... (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been undertaken to determine compliance of the Project Highway with the provisions of the Agreement.
- 2 Works that are incomplete on account of Time Extension have been specified in the Punch List appended hereto, and the Contractor has agreed and accepted that it shall complete all such works in the time and manner set forth in the Agreement. In addition, certain minor works are incomplete and these are not likely to cause material inconvenience to the Users of the Project Highway or affect their safety. The Contractor has agreed and accepted that as a condition of this Provisional Certificate, it shall complete such minor works within 30 (thirty) days hereof. These minor works have also been specified in the aforesaid Punch List.
- 3 In view of the foregoing, I am satisfied that the Project Highway from km \*\* to km \*\* can be safely 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

SIGNED, SEALED AND

AND DELIVERED

DELIVERED

For and on behalf of

For and on behalf of

CONTRACTOR by:

AUTHORITY's ENGINEER by:

(Signature)

(Signature)

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawai Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawai Road)] in the state of Arunachal Pradesh under SARDP-NE**

## COMPLETION CERTIFICATE

- 1 I, ..... (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated ..... (the "Agreement"), for ***"Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawai Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawai Road)] in the state of Arunachal Pradesh under SARDP-NE"*** (the "**Project Highway**") on Engineering, Procurement and Construction (EPC) basis through ..... (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.
- 2 It is certified that, in terms of the aforesaid Agreement, all works forming part of Project Highway have been completed, and the Project Highway is hereby declared fit for entry into operation on this the ..... day of ..... 20.....

SIGNED, SEALED AND DELIVERED

For and on behalf of

the Authority's Engineer by:

(Signature)

(Name)

(Designation)

(Address)

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawai Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawai Road)] in the state of Arunachal Pradesh under SARDP-NE**

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 deductions 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
<b>(a)</b>	<b>Carriageway/Pavement</b>	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
<b>(b)</b>	<b>Road, Embankment, Cuttings, Shoulders</b>	
(i)	Edge drop, inadequate crossfall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees	5%
<b>(c)</b>	<b>Bridges and Culverts</b>	
(i)	Desilting, cleaning, vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
S. No.	Item/Defect/Deficiency	Percentage

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawaii Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawaii Road)] in the state of Arunachal Pradesh under SARDP-NE**

(ii)	Any Defects in superstructures, bearings and sub-structures	10%
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
<b>(d)</b>	<b>Roadside Drains</b>	
(i)	Cleaning and repair of drains	5%
<b>(e)</b>	<b>Road Furniture</b>	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5 <sup>th</sup> km stones	5%
<b>(f)</b>	<b>Miscellaneous Items</b>	
(i)	Removal of dead animals, broken down/accident vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
<b>(g)</b>	<b>Defects in Other Project Facilities</b>	5%

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

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

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

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

L1 = Non-complying length

L = Total length of the road,

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

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

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

**Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawaii Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawaii Road)] in the state of Arunachal Pradesh under SARDP-NE**

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 [name and address of the Authority] (the “**Authority**”) and ..... (the “**Contractor**”) for “*Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawai Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawai Road)] in the state of Arunachal Pradesh under SARDP-NE*”, 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

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

#### **4 Construction Period**

- 4.1 During the Construction Period, the Authority's Engineer shall review the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1.6. The Authority's Engineer shall complete such review and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.
- 4.2 The Authority's Engineer shall review any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.
- 4.3 The Authority's Engineer shall review the Quality Assurance Plan submitted by the Contractor and shall convey its comments to the Contractor within a period of 21 (twenty-one) days stating the modifications, if any, required thereto.
- 4.4 The Authority's Engineer shall complete the review of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.

- 4.5 The Authority's Engineer shall grant written approval to the Contractor, where necessary, **Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawaii Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawaii Road)] in the state of Arunachal Pradesh under SARDP-NE**



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.

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- 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

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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 **Construction of Two-Lane with hard shoulders of Existing Khupa - Hayuliang – Hawai Road (NH-113) on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa – Hayuliang Road) to Km 8.970 (Hayuliang – Hawai Road)] in the state of Arunachal Pradesh under SARDP-NE**

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
  - (i) Total of (i) and (ii) above.
- (g) Net claim: (e) – (f) (iii);
- (h) The amounts received by the Contractor upto the last claim:
  - (i) For the Works executed (excluding Change of Scope orders);
  - (ii) For Change of Scope Orders, and
  - (iii) Taxes deducted

#### **2. Monthly Maintenance Payment Statement**

The monthly Statement for Maintenance Payment shall state:

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

#### **3. Contractor's claim for Damages**

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

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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 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 any 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 which arises from a cause occurring prior to the issue of the 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 its liability for any loss, damage, death or bodily injury, or damage to any property (except things insured under Paragraphs 1 and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences.
- The insurance cover shall be not less than the project cost.
- 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

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- (b) damage which is an 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.



Date: 13.10.2016


## As Modified

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Schedule B clause 11 i.e Hazardous locations	Sl No	Type of protection work	Minimum Length (m)	Height(range in M)	Remarks
	1	Parapet wall on valley side	7064		As per IRC SP:48- 1998
	2	W Beam Crash Barrier	4155		
	3.	Breast Wall	4239	2-6 m	
	4.	Retaining Wall	4946	2-4 m	
	5	Gabion wall	990	2-4m	
Annexure IV Schedule A	Environmental Clearances The project Highway does not required Environment Clearance as per MoEF corrigendum dated 22.08.2013				
Schedule F (New Clause to be added	<p>Environmental Clearances</p> <p>The project Highway does not required Environment Clearance as per MoEF corrigendum dated 22.08.2013.</p> <p>In addition, the ALP for the project has been received. The Final approval is yet to be received. Temporary working provision will be ensured before appointed date. All conditions imposed by MoEF while issuing the Approval in Principle(ALP) and final forest clearance(FC) to be adhered during construction stage and after construction stage are to be complied with.</p> <p>The muck dumping sites in forest area stand identified and freezed by Forest department to be abided by agency during dumping of muck as stated in Schedule 'F'</p> <p>2. The agency need to ensure compliance of ALP and FC stated in Schedule 'A' Annexure-IV. The necessary certifications need to be obtained from competent local forest department.</p> <p>3. Muck dumping locations in forest area to be freezed in consultation with the forest department, the necessary certifications from local competent forest department is to be submitted.</p>				

Sl No	Type of protection work	Minimum Length (m)	Height(range in M)	Remarks
1	Parapet wall on valley side	7064		
2	W Beam Crash Barrier	4155		
3.	Breast Wall	4239	2-6 m	
4.	Retaining Wall	4946	2-4 m	
5	Gabion wall	990	2-4m	As per manual and codes

  
Y.C Srivastava  
GM(T)

To, -

All the prospective bidders

Subject: - "Two-Laning of Existing Khupa - Hayuliang - Hawait Road on EPC basis from design Km. 0.000 (Khupa) to Km. 17.000 [Existing Km 95.800 of (Khupa - Hayuliang Road) to Km 8.970 (Hayuliang - Hawait Road)] in the state of Arunachal Pradesh under SARDP-NE, Project Highway-Corrigendum in Schedules

Sir,

Wherever applicable, the **IRC: SP: 73:2007** may be read as **IRC: SP: 73:2015**

2. Further, the following modifications have been made:

	As Existing	As Modified																																																						
Para 3 of Annexure-I of Schedule B	<b>INTERSECTION AND GRADE SEPERATOR</b>	<b>INTERSECTION/MINOR JUNCTION AND GRADE SEPERATOR</b>																																																						
Para 8.2 of Schedule B	<p>The Tentative quantity of Traffic Signages and Pavement markings are as tabulated below.</p> <table border="1"> <thead> <tr> <th colspan="3">Traffic Signages, Road Marking and other appurtenances</th></tr> </thead> <tbody> <tr> <td>1</td><td>Road Marking: - Lane, Centre Line, Pedestrian crossing</td><td></td></tr> <tr> <td></td><td>Centre line on straight portion</td><td>Sqm 673</td></tr> <tr> <td></td><td>Centre line on curve portion</td><td>Sqm 255</td></tr> <tr> <td></td><td>Edge Line at Paved Shoulder</td><td>Sqm 3400</td></tr> <tr> <td></td><td>Add 15% for Misc. including Pedestrian X-ings etc</td><td>Sqm 649</td></tr> <tr> <td></td><td>Total</td><td>Sqm 4978</td></tr> <tr> <td>2</td><td>Directional Arrows, letter marking etc.</td><td>Nos. 55</td></tr> <tr> <td>3</td><td>Advance Direction signs size 1800X1200 mm</td><td>Nos. 30</td></tr> </tbody> </table>	Traffic Signages, Road Marking and other appurtenances			1	Road Marking: - Lane, Centre Line, Pedestrian crossing			Centre line on straight portion	Sqm 673		Centre line on curve portion	Sqm 255		Edge Line at Paved Shoulder	Sqm 3400		Add 15% for Misc. including Pedestrian X-ings etc	Sqm 649		Total	Sqm 4978	2	Directional Arrows, letter marking etc.	Nos. 55	3	Advance Direction signs size 1800X1200 mm	Nos. 30	<p>The Tentative quantity of Traffic Signages and Pavement markings are as tabulated below.</p> <table border="1"> <thead> <tr> <th colspan="3">Traffic Signages, Road Marking and other appurtenances</th></tr> </thead> <tbody> <tr> <td>1</td><td>Road Marking: - Lane, Centre Line, Pedestrian crossing</td><td></td></tr> <tr> <td></td><td>Centre line on straight portion</td><td>Sqm 673</td></tr> <tr> <td></td><td>Centre line on curve portion</td><td>Sqm 255</td></tr> <tr> <td></td><td>Edge Line at Paved Shoulder</td><td>Sqm 3400</td></tr> <tr> <td></td><td>Add 15% for Misc. including Pedestrian X-ings etc</td><td>Sqm 649</td></tr> <tr> <td></td><td>Total</td><td>Sqm 4978</td></tr> <tr> <td>2</td><td>Directional Arrows, letter marking etc.</td><td>Nos. 55</td></tr> <tr> <td>3</td><td>Advance Direction signs size 1800X1200 mm</td><td>Nos. 30</td></tr> </tbody> </table>	Traffic Signages, Road Marking and other appurtenances			1	Road Marking: - Lane, Centre Line, Pedestrian crossing			Centre line on straight portion	Sqm 673		Centre line on curve portion	Sqm 255		Edge Line at Paved Shoulder	Sqm 3400		Add 15% for Misc. including Pedestrian X-ings etc	Sqm 649		Total	Sqm 4978	2	Directional Arrows, letter marking etc.	Nos. 55	3	Advance Direction signs size 1800X1200 mm	Nos. 30
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New clause may be added after Para 14 of Annexure-I of Schedule B	4	Village name boards size 600X900 mm	Sqm	9.72
	5	Place Identification signs size 1200X900 mm	Sqm	3.84
	6	90 cm Triangle	Nos.	15
	7	90 cm Octagon	Nos.	15
	8	Hazard plate 300X900 mm	Sqm	252.45
	9	800 x 600 mm Size	Nos.	20
	10	60 Cm circular	Nos.	20
	11	Supply and fixing of Micro Prismatic type Retro-Reflective sign plate which is to be fixed on Overhead/ Cantilever structures with the help of G.I. nut bolts	Sqm	51.36
	12	Over Head Sign Truss	MT	5.5
	13	Road side Boundary Stone (taken 10% of Qty)	Nos.	As per the IRC SP 73:2015
	14	5th Km Stone -New	Nos.	
	15	Ordinary Km Stone	Nos.	
	16	Hectometer Stone	Nos.	
	17	Delineator	Nos.	80
	18	Bollards	Nos.	As per the IRC SP 73:2015
	19	RCC Guard Post	Nos.	
	20	Enamel Paint	Sqm	

New clause may be added after Para 14 of Annexure-I of Schedule B

## 15.0 Slope Protection Measures

### 15.1.1 Breast Wall and Retaining Wall

#### Following measures shall be adopted:

Slope protection along hill slope side shall be with breast walls with PCC minimum M15 grade concrete. However, at the zones prone to sliding breast walls will be of sausage type (by stone-mesh gabions). Retaining wall has been considered at valley sides. The height of breast walls is varying from 1.5 m to 3m as per site requirement and to be finalized by consultation with Authority Engineers. The breast wall of height 3m has been considered if the height of hill cut is more than 9m and in this circumstances 3m berm with catch water drain is required to be provided. The maximum cut slope at hill side is 55° (0.7H to 1V).

**15.1.2** Embankment less than 3m in height shall be turfed as per MoRTH Specifications.

**15.1.3** Vetiver Plantation, Hydro Seeding and Hydro Mulching etc or similar works is to be done for slope protection and site mitigation measure upto a height of 12-15 m all along the slopes in each cutting locations except hard rock location which needs to be protected with appropriate applicable technologies, if required.



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