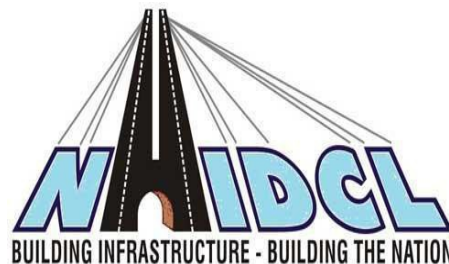


TECHNICAL SCHEDULES

FOR

Upgradation of Existing 2-lane Highway to 4 lane with Paved Shoulder configuration from Km 26.350 (Design Chainage 26+615) (Khati Chowk) to Km 30.097 (Design Chainage 30+359) (Hanuman Chowk) including bridge on Chenab river of Jammu - Akhnoor Section of NH 144A in the Union Territory of Jammu & Kashmir on EPC basis. "(Pkg-IIIB)



**NATIONAL HIGHWAYS & INFRASTRUCTURE
DEVELOPMENT CORPORATION LTD.**

(NHIDCL)

2022

SCHEDULES

Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

1. The Site

- i.** Upgradation of Existing 2-lane Highway to 4 lane with Paved Shoulder configuration from Km 26.350 (Design Chainage 26+615) (Khati Chowk) to Km 30.097 (Design Chainage 30+359) (Hanuman Chowk) including bridge on Chenab river of Jammu – Akhnoor Section of NH 144A in the Union Territory of Jammu & Kashmir on EPC basis. "(Pkg-IIIB). The site shall include the land, buildings, and structures and road works as described below.
- ii.** The dates of handing over the Right of Way to the Contractor are specified in Annex-II of this Schedule-A
- iii.** An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2.1 of this Agreement.
- iv.** The alignment plans of the Project Highway are specified in Annex-III. The proposed profile of the Project Highways shall be followed by the contractor with minimum FRL as indicated in the alignment plan. The Contractor, however, improve/upgrade the Road Profile as indicated in Annex-III based on site/design requirement.
- v.** The status of the environment clearances obtained or awaited is given in Annex-IV.

Annex - I
(Schedule-A)

Site

1. Site

The site of the of Upgradadtion of Existing 2-lane Highway to 4 lane with Paved Shoulder configuration from Km 26.350 (Design Chainage 26+615) (Khati Chowk) to Km 30.097 (Design Chainage 30+359) (Hanuman Chowk) including bridge on Chenab river of Jammu – Akhnoor Section of NH 144A in the Union Territory of Jammu & Kashmir on EPC basis. "(Pkg- IIIB). The site shall include the land, buildings, and structures and road works as described below.

2. Land

The Site of the Project Highway comprises the land (sum of land already in possession and land to be possessed) as described below:

Sr. No.	From Chainage (Km)	To Chainage (Km)	Proposed Right of Way (m)	Available Right of Way (m)
1	26+615	26+780	30	30
2	26+780	26+895	Varies from 34 to 62m	30
3	26+895	27+120	Varies 24 m to 30 m	00
4	27+120	27+190	24	00
5	27+190	27+420	24	24
6	27+420	27+630	24	00
7	27+630	27+900	24 m to 30 m	00
8	27+900	30+359	30	30

3. Carriageway

Existing carriageway is 7m wide for entire stretch.

4. Major Bridges

The Site includes the following Major Bridges:

Sr. No.	Ex Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-structure	Super-structure		
1	27+100	Open	Pier	PSC Super Structure	(96+160+96)	12

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

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

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

6. Grade Separators

The Site includes the following grade separators:

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

Nil

7. Minor bridges

The Site includes the following minor bridges:

S. No.	Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub- structure	Super- structure		
1	28+780	RAFT	Box	6 Cell Box Bridge	6 * 10	12

8. Railway Level Crossings

The Site includes the following railway level crossings:

S. No.	Location (km)	Remarks
Nil		

9. Underpasses (vehicular, non-vehicular)

The Site includes the following under passes:

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

10. Culverts

The Site has the following culverts:

S. No.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)
1	26+560	Box Culvert	1 m*3 m	12
2	26+580	Box Culvert	1m*3 m	12
3	27+757	Box Culvert	3 m*3 m	12
4	28+090	Box Culvert	6 m*3.5 m	12
5	28+315	Box Culvert	6 m*3.5 m	12
6	28+752	Box Culvert	6 m*3.5 m	12
7	29+055	Box Culvert	6 m*3.5 m	12
8	29+568	Box Culvert	6 m*3.5 m	12
9	29+955	Box Culvert	6 m*3.5 m	12

11. Bus bays

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

S. No.	Chainage (km)	Length (m)	Left Hand Side	Right Hand Side
Nil				

12. Truck Lay byes

The details of truck lay byes are as follows:

S. No.	Chainage (km)	Length (m)	Left Hand Side	Right Hand Side
Nil				

13. Roadside drains

The details of the roadside drains are as follows:

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

14. Major junctions

The details of major junctions are as follows:

S. No.	Location		At grade	Separated	Category of Cross Road			
	From km	to km			NH	SH	MDR	Others
1	Khatti Chowk		At grade				MDR	
2	Pamprana Chowk		At grade				MDR	
3	Hanuman Chowk		At grade				MDR	

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

15. Minor junctions

The details of the minor junctions are as follows:

S. No.	Location	Type	Remarks
1	Sapper Sthal	At Grade - T Type	

16. Bypasses

The details of the existing road sections proposed to be bypassed are as follows:

S. No.	Name of bypass (town)	Chainage (km) From km to km	Length (in Km)
		Nil	

17. Existing Utility

The details of existing utility services are shown along with Tender Drawings and utility to be shifted in Annx V

Annex – II
(Schedule-A)

Dates for providing Right of Way of Construction Zone

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

Sl. No.	From To (Km)	Length (Km)	Width (m)	Date of providing
				Right of Way*
1	2	3	4	5
(i) Full Right of Way (Full Width)	26+615 to 26+780	0.165	30 mtr	On Appointment Date
(ii) Full Right of Way (Full Width)	26+780to 26+895	0.115	Varies from 34 to 62m	90 (one hundred and fifty) days after the Appointed Date
(Iii) Full Right of Way (Full Width)	26+895 to 27+120	0.225	Varies 24 m to 30 m	90 (one hundred and fifty) days after the Appointed Date
(iv) Full Right of Way (Full Width)	27+120 to 27+190	0.070	24 m	90 (one hundred and fifty) days after the Appointed Date
(v) Full Right of Way (Full Width)	27+190 to 27+420	0.230	24 m	On Appointment Date
(vi) Full Right of Way (Full Width)	27+420 to 27+630	0.210	24 m	90 (one hundred and fifty) days after the Appointed Date
(vii) Full Right of Way (Full Width)	27+630 to 27+900	0.270	24 m to 30 m	90 (one hundred and fifty) days after the Appointed Date
(viii) Full Right of Way (Full Width)	27+900 to 30+359	2.459	30 m	On Appointment Date

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

Annex - III

(Schedule-A)

Alignment Plans

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

- (i) The alignment of the Project Highway is enclosed in alignment plan & tender drawings and indicated below. Finished road level indicated in the alignment plan shall be followed by the contractor as minimum FRL. In any case, the finished road level of the project highway shall not be less than those indicated in the alignment plan. The contractor shall, however, improve/upgrade the Road profile as indicated in Annex-III based on site/design requirement.



Annex – IV

(Schedule-A)

Environment Clearances

As per EIA notification 2006 and its amendment S.O.2559 (E) Dt 22nd August 2013, S.O 996(E) Dt 10th April 2015, S.O 382(E) Dt 3rd February 2015 Environmental Clearance Exempted from the purview of the Environmental Impact Assessment

[To be published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section(ii)]

MINISTRY OF ENVIRONMENT AND FORESTS NOTIFICATION

New Delhi, the 22nd August, 2013

S.O. 2559 (E).- Whereas by notification of the Government of India in the Ministry of Environment and Forests vide number S.O.1533(E), dated the 14th September, 2006 issued under sub-section (1) and clause (v) of sub-section (2) of section (3) of the Environment (Protection) Act, 1986 read with clause (d) of sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government directed that on and from the date of its publication, the required construction of new projects or activities or the expansion or modernization of existing projects or activities listed in the Schedule to the said notification entailing the capacity addition with change in process or technology and or product mix shall be undertaken in any part of India only after prior environmental clearance from the Central Government or as the case may be, by the State level Environmental Impact Assessment Authority, duly constituted by the Central Government under sub-section (3) of section 3 of the said Act, in accordance with the procedure specified therein;

And whereas the Government of India in the Ministry of Environment and Forests had constituted a High Level Committee under the Chairmanship of Member (Environment and Forests and Science and Technology), Planning Commission, vide OM No.21-270/2008-IA.III dated the 11th December, 2012 to review the provisions of Environmental Impact Assessment Notification, 2006 relating to granting Environmental Clearances for Roads, Buildings and Special Economic Zone projects and provisions under the OM dated the 7th February, 2012 issued by the Ministry of Environment and Forests regarding guidelines for High Rise Buildings;

And whereas one of the terms of reference (ToR) of the Committee was to review the requirement of Environmental Clearance for highway expansion projects upto the right of way of 60 meters and length of 200 kms under Environmental Impact Assessment notification;

And whereas the Committee has submitted its report to the Ministry and on this ToR, the Committee has recommended exempting highway expansion projects from the requirement of scoping and that Environmental Impact Assessment or Environment Management Plan for highway expansion projects may be prepared on the basis of model ToRs to be posted on Ministry's website and in respect of requirement of environmental clearance, the Committee has recommended that expansion of National Highway projects up to 100 kms involving additional right of way or land acquisition upto 40 mts on existing alignments and 60 mts on re-alignments or by-passes may be exempted from the preview of the notification;

Annex - V
(Schedule-A)
Existing Utilities

Electrical Utility

The site includes the following electrical utilities

Extra High Tension Lines(EHT Lines)

Sr. No	Chainage (Km)		Length (in Km)				Crossing			
	From	To	400 Kv	220 Kv	132 Kv	66 Kv	400 Kv	220 Kv	132 Kv	66 Kv
Nil										

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

Sr. No	Chainage (Km)		Length (in km)			Crossing			Transformer	
	From	To	33Kv	22/11 Kv	LT	33Kv	22/11 Kv	LT	No	Capacity
1	Ch 26+615	Ch 27+190		0.600			3		1	100 Kv
2	MES Utility			2.100 (OH) 0.900 (UG)			3		1	
3	Ch 27+400	Ch 30+359		4.500			5		2	

Public Health Utilities (Water / Sewage Pipe Lines)

Sr. No	Chainage (Km)		Length (in Km)				Crossing			
	From	To	Water Supply		Sewage Line		Water Supply		Sewage Line	
			With Pumping	With Gravity	With Pumping	With Gravity	With Pumping	With Gravity	With Pumping	With Gravity
1	Ch 26+615	Ch 30+359	6.500		Nil		6 Nos		Nil	
2	MES Utility		1.400				2 Nos			

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

Nil

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 the Project Development

Upgradation of Existing 2-lane Highway to 4 lane with Paved Shoulder configuration from Km 26.350 (Design Chainage 26+615) (Khathi Chowk) to Km 30.097 (Design Chainage 30+359) (Hanuman Chowk) of Jammu – Akhnoor Section of NH 144A in the Union Territory of Jammu & Kashmir on EPC basis. (Pkg - IIIB). in accordance with IRC-SP:84-2019. If any standards, specification or details are not given in the manual, the minimum design/ construction requirements shall be specified in the schedule.

1. Construction of the Highway

- (i) The Project Highway shall follow the existing alignment unless otherwise specified by the Authority and shown in the alignment plans specified in Annex-III of Schedule-A and tender drawings.

Sr. No.	Chainage From	Chainage To	Length (Km)	TCS Type	Remark
1	26.615	27.000	0.385	1A/1B	4 Lane Fill/Cut section till Khatti Chowk
2	27.000	27.020	0.020	4A/4B	2 Lane Fill/Cut Bridge Approach
3	27.020	27.115	0.095	5A	2 Lane Fill LHS Retaining Bridge Approach
4	27.115	27.120	0.005	5B	2 Lane Fill Retaining both sides Bridge Approach
5	27.120	27.570	0.450	GAD of Major Bridge	Major Bridge
6	27.570	27.720	0.150	GAD of VUP / 5B	2 Lane Fill Retaining both sides - VUP
7	27.720	27.840	0.120	8	2 Lane Fill/Cut section with Service road in LHS
8	27.840	27.960	0.120	1A/1B	4 Lane Fill/Cut section
9	27.960	28.310	0.350	3	4 Lane Fill/Cut section with Covered Drain on both sides
10	28.310	28.350	0.040	1A/1B	4 Lane Fill/Cut section
11	28.350	28.360	0.010	6A	4 Lane Fill Retaining LHS
12	28.360	28.370	0.010	1A/1B	4 Lane Fill/Cut section from Merger location
13	28.370	28.380	0.010	2	4 Lane Fill Retaining both sides
14	28.380	28.480	0.100	1A/1B	4 Lane Fill/Cut section
15	28.480	28.580	0.100	2	4 Lane Fill Retaining both sides
16	28.580	28.590	0.010	1A/1B	4 Lane Fill/Cut section
17	28.590	28.670	0.080	2	4 Lane Fill Retaining both sides
18	28.670	28.680	0.010	GAD of LVUP -1A/1B	4 Lane Fill/Cut section - LVUP
19	28.680	28.685	0.005	2	4 Lane Fill Retaining both sides
20	28.685	28.690	0.005	6B	4 Lane Fill/Cut section with Retaining Wall in RHS
21	28.690	28.990	0.300	1A/1B	4 Lane Fill/Cut section
22	28.990	29.020	0.030	2	4 Lane Fill Retaining both sides
23	29.020	29.030	0.010	1A/1B	4 Lane Fill/Cut section
24	29.030	29.120	0.090	2	4 Lane Fill Retaining both sides
25	29.120	29.190	0.070	GAD of Minor Bridge -1A/1B	4 Lane Fill/Cut section - Minor Bridge

26	29.190	29.210	0.020	2	4 Lane Fill Retaining both sides
27	29.210	29.290	0.080	6B	4 Lane Fill/Cut section with Retaining Wall in RHS
28	29.290	29.320	0.030	2	4 Lane Fill Retaining both sides
29	29.320	29.330	0.010	1A/1B	4 Lane Fill/Cut section
30	29.330	29.460	0.130	2	4 Lane Fill Retaining both sides
31	29.460	29.470	0.010	6B	4 Lane Fill/Cut section with Retaining Wall in RHS
32	29.470	29.650	0.180	1A/1B	4 Lane Fill/Cut section
33	29.650	30.359	0.719	7	4 Lane Fill/Cut section with Drain cum Duct in both sides
			3.744	Km.	

TWO LANE UPGRADE SECTION

34	27.000	27.180	0.180	4A/4B	2 Lane Fill/Cut
35	27.180	27.560	0.380		Existing Major Bridge
36	27.560	27.940	0.380	4A/4B	2 Lane Fill/Cut
			0.940	Km.	

(ii) Width of Carriageway

- (a) 4-Laning with paved shoulders shall be undertaken for main road. The paved carriageway shall be 8.5 x2 (17m) wide for main road section in accordance with the typical cross section's drawings attached in tender drawings.
- (b) Except as otherwise provided in this agreement, the width of the paved carriageway and cross-sectional features shall confirm to tender drawing and TCS.

(iii) Length of each TCS

Sr. No	Type	Road Length (In Kms.)
1	TCS 1A/1B	1.145
2	TCS 2	0.485
3	TCS 3	0.350
4	TCS 4A/4B	0.580
5	TCS 5A	0.095
6	TCS 5B	0.155
7	TCS 6A	0.010
8	TCS 6B	0.095
9	TCS 7	0.709
10	TCS 8	0.120
	Total	3.744

2. Geometric Design and General Features

(i) General

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

(ii) Design speed

The design speed shall be the maximum design speed of 100 Km/hr. and minimum design speed of 80 km/hr. for plain terrain as per IRC-SP:84-2019. It is to follow as per details provided in Plan and Profile along with curve details.

(iii) Improvement of the existing road geometrics

Since this project is of widening of existing highway from 2 lane to 4 lane all geometrics improvement are taken care in the design.

Sl. No.	Stretch (from km to km)	Type of deficiency	Remarks
Nil			

(iv) Right of Way

Details of the Right of Way are given in Annex II of Schedule-A. The proposed alignment is passes along existing road except for the realignment for approach of new major bridge where it is going in LHS side and becoming 2 lane road upto the merger point from where it follows 4 lane configuration. Proposed right of way is 30 m which is already acquired by BRO except for realignment portion. On realignment portion ROW is of 24 m. At junctions ROW varies.

(v) Type of shoulders

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

Sl.No.	Stretch(from km to km)	Fully paved shoulders/ footpaths	Reference to cross section
1	29+650 to 30+369	18m +(2.1 x 2) (FP)	TCS 7

(b) In rural sections, footpaths/fully paved shoulders shall be provided in the following stretches:

Sl. No.	Stretch (from km to km)	Fully paved shoulders/ footpaths (m)	Earthen shoulders/ footpaths (m)	Reference to cross section
Nil				

(a) In open country/plain areas, paved shoulders of 1.5m width and balance 2.0 m width earthen shoulder shall be provided on either side.

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

(vi) Lateral and vertical clearances at underpasses

(a) Lateral and vertical clearances at underpasses and provision of guardrails/crash barriers shall be as per the provision of relevant Manual.

(b) Lateral clearance: The width of the opening at the underpasses shall be as follows:

Sl. No.	Location (Chainage) (from km to km)	TYPE	Lateral Clearance (m)	Minimum Vertical Clearance	Remarks
1	Ch. 27+649	VUP	1*12	5.5 m	For Connectivity to Akhnoor Steel Bridge
2	Ch. 28+680	LVUP	1*10	4.5 m	To connect Army area at Sapper Sthal

(vii) Lateral and vertical clearances at over passes

(a) Lateral and vertical clearances at overpasses shall be as per the provision of relevant Manual.

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

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

(viii) Service Roads

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

Sl. No.	Location of service road (from km to km)	Right hand side (RHS)/Left hand side (LHS)/ or Both sides	Length (m) of service road	Remarks
1	Ch 27+649 to Ch 27+850	RHS(Single Lane Service Road)	201	

Temporary road for traffic diversion to be constructed at Minor Bridge location on RHS side for 100 mtr length during the construction of Minor Bridge for traffic movement including proper barricading (It is a onetime cost only and maintenance of the same shall be the obligation of the contractor during contract period).

(ix) Grade Separated Structures

(a) Grade separated structures shall be provided as per provision of the relevant Manual. The requisite particulars are given below:

Sl. No.	Location of structure	Type of Structure		Number and length of spans (m)	Approach Gradient	Width (m)	Remarks, if any
		Foundation	Super Structure				
Nil							

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

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

(x) Cattle and Pedestrian Underpass/Overpass

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

Sl. No.	Location	Type of crossing
1	Design Ch. 26+880	Pedestrian Over Pass (Foot Over Bridge) to connect both side of army area at Khatti Chowk

(xi) Typical cross-sections of the Project Highway

Following typical cross sections shall be provided for the Project Highway However to be designed as per manual.

Sr. No.	Chainage From	Chainage To	Length (Km)	TCS Type	Remark
1	26.615	27.000	0.385	1A/1B	4 Lane Fill/Cut section till Khatti Chowk
2	27.000	27.020	0.020	4A/4B	2 Lane Fill/Cut Bridge Approach
3	27.020	27.120	0.100	5A	2 Lane Fill LHS Retaining Bridge Approach
4	27.120	27.120	0.000	5B	2 Lane Fill Retaining both sides Bridge Approach
5	27.120	27.570	0.450	GAD of Major Bridge	Major Bridge
6	27.570	27.720	0.150	GAD of VUP / 5B	2 Lane Fill Retaining both sides - VUP

7	27.720	27.840	0.120	8	2 Lane Fill/Cut section with Service road in LHS
8	27.840	27.960	0.120	1A/1B	4 Lane Fill/Cut section
9	27.960	28.310	0.350	3	4 Lane Fill/Cut section with Covered Drain on both sides
10	28.310	28.350	0.040	1A/1B	4 Lane Fill/Cut section
11	28.350	28.360	0.010	6A	4 Lane Fill Retaining LHS
12	28.360	28.370	0.010	1A/1B	4 Lane Fill/Cut section from Merger location
13	28.370	28.380	0.010	2	4 Lane Fill Retaining both sides
14	28.380	28.480	0.100	1A/1B	4 Lane Fill/Cut section
15	28.480	28.580	0.100	2	4 Lane Fill Retaining both sides
16	28.580	28.590	0.010	1A/1B	4 Lane Fill/Cut section
17	28.590	28.670	0.080	2	4 Lane Fill Retaining both sides
18	28.670	28.680	0.010	GAD of LVUP -1A/1B	4 Lane Fill/Cut section - LVUP
19	28.680	28.685	0.005	2	4 Lane Fill Retaining both sides
20	28.685	28.690	0.005	6B	4 Lane Fill/Cut section with Retaining Wall in RHS
21	28.690	28.990	0.300	1A/1B	4 Lane Fill/Cut section
22	28.990	29.020	0.030	2	4 Lane Fill Retaining both sides
23	29.020	29.030	0.010	1A/1B	4 Lane Fill/Cut section
24	29.030	29.120	0.090	2	4 Lane Fill Retaining both sides
25	29.120	29.190	0.070	GAD of Minor Bridge -1A/1B	4 Lane Fill/Cut section - Minor Bridge
26	29.190	29.210	0.020	2	4 Lane Fill Retaining both sides
27	29.210	29.290	0.080	6B	4 Lane Fill/Cut section with Retaining Wall in RHS
28	29.290	29.320	0.030	2	4 Lane Fill Retaining both sides
29	29.320	29.330	0.010	1A/1B	4 Lane Fill/Cut section
30	29.330	29.460	0.130	2	4 Lane Fill Retaining both sides
31	29.460	29.470	0.010	6B	4 Lane Fill/Cut section with Retaining Wall in RHS
32	29.470	29.650	0.180	1A/1B	4 Lane Fill/Cut section
33	29.650	30.359	0.719	7	4 Lane Fill/Cut section with Drain cum Duct in both sides
			3.744	Km.	

TWO LANE UPGRADE SECTION

34	27.000	27.180	0.180	4A/4B	2 Lane Fill/Cut
35	27.180	27.560	0.380		Existing Major Bridge
36	27.560	27.940	0.380	4A/4B	2 Lane Fill/Cut
			0.940	Km.	

3. Intersections and Grade Separators

All intersections and grade separators shall be as per the provision of relevant Manual.

Properly designed intersections shall be provided at the locations and of the types and features given in the table as below:

(i) At-grade Inter sections

Sr. No.	Proposed Chainage	Type	Type	Link
	(Km)			
1	Design Chainage 26+830 (Khatti Chowk)	+	Major	LHS-Army Area

				RHS -Army Area
2	Existing Chainage 27+660 (Pamparna Chowk)	T	Minor	LHS - Akhnoor City
3	Design Chainage 28+900 (Sapper Sthal)	T	Minor	RHS -Army Area
4	Design Chainage 30+359 (Hanuman Chowk)	T	Major	LHS - Akhnoor City
				RHS - Poonch

- (ii) Grade separated intersection with/without ramps

Sl. No.	Location	Salient features	Minimum length of viaduct to be provided	Road to be carried over/under the structures
Nil				

4. Road Embankment and Cut Section

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

- (ii) Raising of the existing road

The existing road shall be raised in the following sections:

Sl.No.	Section(from km to km)	Length	Extent of raising [Top of finished road level]
As Per Tender Drawing (Ref. P&P and TCS)			

5. Pavement Design

- (i) Pavement design shall be carried out in accordance with the provision of relevant Manual.

- (ii) Type of Pavement

Flexible pavement is proposed for the project highway in accordance with IRC: 37-2018. Design CBR for the pavement design is 8%.

Layer	Thickness (mm)
BC	30
DBM	90
WMM (Upper layer)	125
WMM (Bottom layer)	125
GSB (Upper layer)	100
GSB (Bottom Layer)	100
Total Thickness	570

- (iii) Design Requirements

- (a) Design Period and Strategy

Flexible pavement for new pavement shall be designed for a period of 20 years and Rigid pavement shall be designed for a minimum design period of 30 years. Stage construction shall not be permitted.

- (b) Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for a minimum design traffic of 20(MSA) million standard axles.

6. Roadside Drainage -

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per the provision of relevant Manual. Minimum Length of Road Side Drainage is 2540 Mtr. (For Covered Drain)

Sr. No.	Design Chainage in km		Design Length in m	Drain Type	Side
	From	To			
1	27+960	28+130	170	RCC Covered Drain	LHS
2	27+960	28+130	170	RCC Covered Drain	RHS
3	29+650	29+830	180	RCC Covered Drain	LHS
4	29+650	29+830	180	RCC Covered Drain	RHS
5	29+840	30+210	370	RCC Covered Drain	LHS
6	29+840	30+210	370	RCC Covered Drain	RHS
7	29+650	29+830	180	RCC Drain + Utility Duct	LHS
8	29+650	29+830	180	RCC Drain + Utility Duct	RHS
9	29+840	30+210	370	RCC Drain + Utility Duct	LHS
10	29+840	30+210	370	RCC Drain + Utility Duct	RHS
Total Length in m			2540		

(i) Details of Earthen Drain

Sr. No.	Design Chainage in km		Design Length in m	Drain Type	Side
	From	To			
1	26615	27000	385	Earthen Drain	LHS
2	26615	27000	385	Earthen Drain	RHS
3	27000	27020	20	Earthen Drain	LHS
4	27000	27180	180	Earthen Drain	LHS
5	27000	27020	20	Earthen Drain	RHS
6	27000	27180	180	Earthen Drain	RHS
7	27560	27940	380	Earthen Drain	LHS
8	27560	27940	380	Earthen Drain	RHS
9	27720	27840	120	Earthen Drain	LHS
10	27720	27840	120	Earthen Drain	LHS
11	27720	27840	120	Earthen Drain	RHS
12	27840	27960	120	Earthen Drain	LHS
13	27840	27960	120	Earthen Drain	RHS
14	28310	28350	40	Earthen Drain	LHS
15	28310	28350	40	Earthen Drain	RHS
16	28350	28360	10	Earthen Drain	RHS
17	28360	28370	10	Earthen Drain	LHS
18	28360	28370	10	Earthen Drain	RHS
19	28380	28480	100	Earthen Drain	LHS
20	28380	28480	100	Earthen Drain	RHS
21	28580	28590	10	Earthen Drain	LHS
22	28580	28590	10	Earthen Drain	RHS
23	28670	28680	10	Earthen Drain	LHS
24	28670	28680	10	Earthen Drain	RHS
25	28685	28690	5	Earthen Drain	LHS

Sr. No.	Design Chainage in km		Design Length in m	Drain Type	Side
	From	To			
26	28690	28990	300	Earthen Drain	LHS
27	28690	28990	300	Earthen Drain	RHS
28	29020	29030	10	Earthen Drain	LHS
29	29020	29030	10	Earthen Drain	RHS
30	29120	29190	70	Earthen Drain	LHS
31	29120	29190	70	Earthen Drain	RHS
32	29210	29290	80	Earthen Drain	LHS
33	29320	29330	10	Earthen Drain	LHS
34	29320	29330	10	Earthen Drain	RHS
35	29460	29470	10	Earthen Drain	LHS
36	29470	29650	180	Earthen Drain	LHS
37	29470	29650	180	Earthen Drain	RHS
Total Length in m			4115		

7. Design of Structures

(i) General

(a) All bridges, culverts and structures shall be designed and constructed in accordance with the provision of relevant Manual and shall conform to the cross- sectional features and other details specified therein.

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

Sl. No.	Structure at Km	Width of Carriageway and Cross-Sectional features*
1	2 Lane Major Bridge FROM 27+120 to 27+570	Width of Carriageway (11.90 m)+ Footpath including railing(1.5m x 2)+ Crash Barrier (.55m x 2) -Total Width 16 mtrs.
2	4 Lane Minor Bridge @ Ch. 29+840	Width of Carriageway (8.5m x 2) + Median (2.5m/0.5m) and RCC Crash barrier 0.5m (both sides) - Total Width - 24.5m/26.5m
3	4 Lane Minor Bridge FROM 29+120 to 29+180	Width of Carriageway (7.5m x 2) + Median(0.5m) + RCC Crash barrier (0.5m x2) + Footpath (1.5m x 2) = Concrete Railing (0.5 x 2)- Total Width - 20.5 m
4	All 4 Lane Culverts	Width of Carriageway (8.5m x 2) + Median (2.5m/0.5m) and RCC Crash barrier 0.5m (both sides) - Total Width - 24.5m/26.5m

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

Sl. No.	Location at km	Span Arrangement No.x Length (m)	Remarks
1	Ch 27+120	(3*25)+95.4+160+95.4+25	Both side footpath
2	Ch 29+150	2 * 30 Mtr	Both side footpath

(d) All bridges shall be high-level bridges.

Refer to the provision of relevant Manual and state if there is any exception

(e) The following structures shall be designed to carry utility services specified in table below:

Sl. No.	Bridge at km	Utility Service to be carried	Remarks
1	MJB at Ch 27+120	Electricity cables, OFC cables etc.	
2	MNB at Ch 29+150	Electricity cables, OFC cables etc.	

(f) Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the typical cross-sections given in the provision of relevant Manual.

(ii) Culverts

(a) Overall width of all culverts shall be equal to roadway width of the approaches.

(b) Reconstruction of existing culverts:

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

Sl. No.	Culvert location	Span/Opening (m) No*Width*Height	Remarks, if any*
1	Design Ch 26+818	1 Cell * (2 m* 3 m)	FRL as per tender drawing
2	Design Ch 26+848	1 Cell * (2 m* 3 m)	FRL as per tender drawing
3	Design Ch 28+077	1 Cell * (3 m* 3 m)	FRL as per tender drawing
4	Design Ch 28+362	1 Cell * (6 m* 3.5 m)	FRL as per tender drawing
5	Design Ch 28+586	1 Cell * (6 m* 6 m)	FRL as per tender drawing
6	Design Ch 29+025	1 Cell * (6 m* 4 m)	FRL as per tender drawing
7	Design Ch 29+327	1 Cell * (6 m* 4 m)	FRL as per tender drawing
8	Design Ch 29+641	1 Cell * (3 m* 3 m)	FRL as per tender drawing
9	Design Ch 30+217	1 Cell * (6 m* 4 m)	FRL as per tender drawing

*Specify modifications, if any, required in the road level, etc.

(c) Widening of existing Culverts:

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

Sl. No.	Culvert location	Type, span, height and width of existing culvert (m)	Repairs to be carried out [specify]
Nil			

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

S. No.	Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)
1	Ch 27+649	VUP	1 Cell * (12m x 5.5 m)	12
2	Ch 28+670	LVUP	1 Cell * (10m x 4.5 m)	10

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

Sl. No.	Location at km	Type of repair required
Nil		

(f) Floor protection works shall be as specified in the relevant IRC Codes and Specifications.

(iii) Bridges

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

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

Sl. No.	Bridge location (km)	Salient details of existing bridge	Adequacy or otherwise of the existing waterway,	Remarks
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			vertical clearance, etc.*	
1	Design Ch - 29+150 (Near Fruit Mandi)	6 Cell Box Bridge	2.4 mtr clearance from water way	It is required to reconstruct as we are following existing alignment without any LA

*Attach GAD

(ii) The following narrow bridges shall be widened:

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

@ Attach cross-section

(b) Additional new bridges

New bridges at the following locations on the Project Highway shall be constructed. GADs for the new bridges are attached in the drawings folder.

Minor Bridge: -

Sr. No.	Design Chainage in km	Proposed Span in m	Span Arrangement (No. x length) m	Proposed Structure
1	Design Ch 29+840	7 mtr	1 Cell * (7 m* 4 m)	Box Culvert

Viaduct/Major Bridge: -

Sl. No.	Design Chainage	Type of Superstructure	Total Length (m)	Proposed Span Arrangement (no.xlength)	Proposed Overall Deck Width (m)	Remarks
1	Ch. 27+120	I Girder + Balance Cantilever	450.8	(3*25)+95.4+160+95.4+25	16	Type of structure to be adopted by the EPC contractor as per best engineering practice & IRC, MoRT&H specification by using Innovative technologies approve by the Authority's Engineer

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

Sl. No.	Location at km	Remarks
Nil		

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

Sl. No.	Location at km	Remarks
Nil		

(e) Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in the provision of relevant Manual

(f) Structures in Marine Environment

Refer to the provision of relevant Manual and specify the necessary measures/ treatments for protecting structures in marine environment, where applicable.

(iv) Rail-Road Bridges

(a) Design, construction and detailing of ROB/RUB shall be as specified in the provision of relevant Manual. [Refer to the provision of relevant Manual and specify modification, if any]

(b) Road Over-bridges

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

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

(c) Road Under-bridges

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

Sr. No.	Design Chainage in km	Proposed Span in m	Span Arrangement (No. x length x width) m	Proposed Structure	Remarks
NIL					

(v) Grade Separated Structures

The grade separated structures shall be provided at the locations and of the type and length specified in paragraphs 2 (ix) and 3 of this Annex-I.

(vi) Repairs and strengthening of bridges and Structures

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

(a) Bridges

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

(b) ROB /RUB

Sr. No.	Chainage	Proposed Span in m	Span Arrangement (No. x length) m	Proposed Structure	Remarks
Nil					

(c) Overpasses/Underpasses and other structures

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

(vii) Bridges and Structures

The following is the list of the Bridges and Structures:

S. No.	Type of Structure	Design Chainage in km
NIL		

8. Traffic Control Devices and Road Safety Works

- (i) Traffic control devices and road safety works shall be provided in accordance with the section 9 of the manual referred to in Schedule D.
- (ii) Specifications of the reflective sheeting as per IRC:67-2012 has been provided.

8.1 Crash Barrier

- (a) Min. length of 3 m of Thrie beam crash barrier shall be provided along the project highway as per section 9 of the manual. It shall be provided at Culvert approaches on both sides and at location of embankment with height greater than or equal to 3m.
- (b) The concrete crash barrier/ railing of bridge and culvert shall be painted in black and white stripes in general.

8.2 Transverse Rumble Strip

Transverse rumble strips in the form of thermoplastic bar marking shall be provided to warn the drivers to reduce the speed for safety. Stripes shall be in full width of pavement. The stripes shall be provided at sharp curves, village approaches, location approaching access road, intersections and any other hazardous locations on the project highway. Guidelines of IRC-35 shall be followed.

8.3 Road Marking and Signage

The following road marking, signage and safety devise shall be used on the project which is minimum. Further If any shall be in accordance with the section 9 of the manual referred to in Schedule D.

The minimum quantity of Traffic Signage and pavement marking as per IRC: 35-2015 are tabulated here:

Sl. No.	Traffic Signages, Road Marking and other appurtenances	Unit	Quantity
1	Road Marking: -Lines, dashes, arrows	Sq. m	1580
2	900 mm triangular	Nos.	12
3	60 cm equilateral triangle	Nos.	1
4	60 cm circular	Nos.	1
5	80cm x 60 cm rectangular	Nos.	122
6	60 cm x 45 cm rectangular	Nos.	1
7	60 cm x 60 cm square	Nos.	114
8	Direction and Place Identification Signs 0.9 sqm Size	Sq. m.	9
9	Overhead Gantry mounted signs	Nos.	5
10	Cantilever Sign board	Nos.	2
11	Project Display signboard 1800mm x 1600mm	Nos.	4
12	Ordinary Km Stone	Nos.	4
13	Hectometre Stone	Nos.	11
14	Boundary pillar	Nos.	37
15	Raised Road Marker (Studs)	Nos.	374
16	Cats eye	Nos.	970

9. Roadside Furniture

Roadside furniture shall be provided in accordance with the provision of relevant Manual for Main Road.

(i) Delineators = 150 Nos.

(ii) High Mast

Continuously tapered, polygonal cross section, with top height of mast and signage shall be at 17 m, with A/F dimensions of 200mm at the top and 540 mm at the bottom for wind speed 50m/sec AND 200mm at the top and 610mm at the bottom for wind speed 62.5m/sec. The plate thickness shall be 5 mm for bottom and 4 mm for top section for wind speed 50m/sec AND 6 mm for bottom and 4 mm for top section for wind speed 62.5m/sec. The mast flange shall have PCD 650 mm, outer diameter 730 mm and thickness 30 mm for 50m/sec AND PCD 730 mm, outer diameter 840 mm and thickness 30 mm for 62.5 m/sec

Numbers: 4

Chainage

1. 26+830 – Khatti Chowk
2. 27+980 – Merger location
3. 28+900 – Sapper Sthal tri-junction
4. 30+359 – Hanuman Chowk

(iii) Street Lighting

Providing and erecting street light mounted on a steel circular hollow pole of standard specifications for street lighting, 9 m high spaced 40 m apart, 1.8 m overhang on both sides if fixed in the median and on one side if fixed on the footpath, fitted with sodium vapour lamp and fixed firmly in concrete foundation.)

For Fixing in Median and edges

Numbers: 265

10. Compensatory Afforestation

Refer to the provision of relevant Manual no forest land is to be acquired for development of highways so it is not required.

11. Hazardous Locations

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

Sl. No.	Location stretch from (km) to (km)	LHS/RHS
Nil		

12. Special Requirement for Project Road

This shall be provided accordance with section 13 of the Manual.

The side slope shall be protected by using suitable slope protection measures all along the highway on both sides. The retaining wall/Toe wall, crash barriers shall be constructed as per requirement of site condition in accordance with manual requirement. However, minimum length of protection works shall be construction as per details given below and the typical section of protection work are given in tender drawings.

a) RCC Retaining Wall

Sl. No.	Chainage (Km)		Length (m)	Side
	From	To		
1	Ch. 27+020	Ch. 27+190	170.00	LHS
2	Ch. 27+570	Ch. 27+640	70.00	LHS
3	Ch. 27+650	Ch. 27+710	60.00	LHS
4	Ch. 28+350	Ch. 28+360	10.00	LHS
5	Ch. 28+370	Ch. 28+380	10.00	LHS
6	Ch. 28+490	Ch. 28+580	90.00	LHS
7	Ch. 28+590	Ch. 28+670	80.00	LHS

Sl. No.	Chainage (Km)		Length (m)	Side
	From	To		
8	Ch. 28+680	Ch. 28+685	5.00	LHS
9	Ch. 29+000	Ch. 29+020	20.00	LHS
10	Ch. 29+030	Ch. 29+120	90.00	LHS
11	Ch. 29+190	Ch. 29+210	20.00	LHS
12	Ch.29+300	Ch. 29+320	20.00	LHS
13	Ch. 29+330	Ch. 29+460	130.00	LHS
14	Ch. 27+170	Ch. 27+190	20.00	RHS
15	Ch. 27+570	Ch. 27+640	70.00	RHS
16	Ch. 27+650	Ch. 27+710	60.00	RHS
17	Ch. 28+360	Ch. 28+365	5.00	RHS
18	Ch. 28+370	Ch. 28+380	10.00	RHS
19	Ch. 28+490	Ch. 28+580	90.00	RHS
20	Ch. 28+590	Ch. 28+670	80.00	RHS
21	Ch. 28+680	Ch. 28+690	10.00	RHS
22	Ch. 29+000	Ch. 29+020	20.00	RHS
23	Ch. 29+030	Ch. 29+120	90.00	RHS
24	Ch. 29+190	Ch. 29+320	130.00	RHS
25	Ch. 29+330	Ch. 29+470	140.00	RHS

RCC Retaining wall & shall be constructed with minimum length is 1500 m on Main Road with 1.0m to 7.0m ht. or any other better material acceptable to the Authority Engineer. Contractor need to access the same and bid accordingly. Difference between FRL and OGL shall be review to decide the type of protection work along with its height.

b) Toe Wall

Sl. No.	Chainage (Km)		Length (m)	Side
	From	To		
1	Ch. 26+920	Ch. 26+930	10.00	LHS
2	Ch. 28+390	Ch. 28+480	90.00	LHS
3	Ch. 28+690	Ch. 28+730	40.00	LHS
4	Ch. 28+970	Ch. 28+990	20.00	LHS
5	Ch. 29+220	Ch. 29+290	70.00	LHS
6	Ch. 29+630	Ch. 29+640	10.00	LHS
7	Ch. 29+650	Ch. 29+650	0.00	LHS
8	Ch. 29+680	Ch. 29+680	0.00	LHS
9	Ch. 29+830	Ch. 29+830	0.00	LHS
10	Ch. 29+840	Ch. 29+930	90.00	LHS
11	Ch. 29+980	Ch. 29+985	5.00	LHS
12	Ch. 30+010	Ch. 30+020	10.00	LHS
13	Ch. 30+190	Ch. 30+210	20.00	LHS
14	Ch. 30+220	Ch. 30+240	20.00	LHS
15	Ch. 26+615	Ch. 26+620	5.00	RHS
16	Ch. 26+640	Ch. 26+645	5.00	RHS
17	Ch. 26+660	Ch. 26+665	5.00	RHS
18	Ch. 26+690	Ch. 26+695	5.00	RHS
19	Ch. 27+720	Ch. 27+840	120.00	RHS

Sl. No.	Chainage (Km)		Length (m)	Side
	From	To		
20	Ch. 28+390	Ch. 28+480	90.00	RHS
21	Ch. 28+700	Ch. 28+760	60.00	RHS
22	Ch. 28+970	Ch. 28+990	20.00	RHS
23	Ch. 29+480	Ch. 29+480	0.00	RHS
24	Ch. 29+510	Ch. 29+520	10.00	RHS
25	Ch. 29+810	Ch. 29+830	20.00	RHS
26	Ch. 29+840	Ch. 29+850	10.00	RHS
27	Ch. 30+140	Ch. 30+210	70.00	RHS
28	Ch. 30+220	Ch. 30+280	60.00	RHS

It is a small retaining wall structure at the foot of an earth slope. -Total Length 865 mtr

c) Metal Beam/ Thrie Beam Crash Barrier

Metal Beam / Thrie Beam Crash Barriers or Traffic Barriers keep vehicles within their roadway and prevent them from colliding with dangerous obstacles such as boulders, sign supports, trees, bridge abutments, buildings, walls, and large storm drains, or from traversing steep (non-recoverable) slopes or entering deep water. They are also installed within medians of divided highways to prevent errant vehicles from entering the opposing carriageway of traffic and help to reduce head-on collisions. Some of these barriers, designed to be struck from either side, are called median barriers. Traffic barriers can also be used to protect vulnerable areas like school yards, pedestrian zones, and fuel tanks from errant vehicles. The list of Metal beam/ Thrie Beam crash barriers provided on the project road are given below. Minimum quantity of Crash Barrier is 720 m.

Metal Beam/ Thrie Beam Crash Barrier					
Left Side			Right Side		
From	To	Length	From	To	Length
26+700	26+710	10	26+800	26+810	10
26+760	26+770	10	26+940	26+980	40
26+910	26+920	10	27+010	27+150	140
26+970	27+020	50	27+150	27+160	10
27+030	27+040	10	28+700	28+790	90
27+050	27+060	10	28+970	28+980	10
27+080	27+090	10	29+480	29+490	10
27+720	27+730	10	29+510	29+530	20
27+760	27+810	50	29+640	29+650	10
27+900	27+910	10			
28+690	28+750	60			
28+960	28+970	10			
28+980	28+990	10			
29+470	29+480	10			
27+810	27+900	90			
29+620	29+630	10			
29+640	29+650	10			
		380			340

13. Utility Shifting

The details of utilities are as follows:

Shifting of obstructing existing utilities indicated in Schedule A to an appropriate location in

accordance with the standards and Specification of concern Utility Owning Departments is a part of scope of work for the Contractor/Concessionaire. The bidder may visit the site and assess the quantum of shifting of utilities for the project before submission of the bid. The specifications of concerned Utility Owning Department shall be applicable and followed.

Note- The details are given in utility shifting plan as **Annex-V of Schedule - A**. The actual 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 specified in this Schedule B shall not constitute a Change of Scope.

(i) Any Other Line

- (a) The type/spacing/size/specifications of poles/towers/lines/cables to be used in shifting work are as per the guidelines of utility owning department and it is solely between the Contractor and the utility owning department. No change of scope shall be eligible or no cost shall be paid for using different type/spacing /size/specifications in shifted work in comparison to those in the existing or for making any overhead crossings to underground as per requirement of utility owning department/construction of project highway. The Contractor shall carry out joint inspection with utility owning department and get the estimates sanctioned from utility owning department. The assistance of the Authority is limited to giving forwarding letter on the proposal of Contractor to utility owning department whenever asked by the Contractor. The decision/approval of utility owning department shall be binding on the Contractor. No CoS or no cost shall, be eligible on any account.
- (b) The supervision charges at the rates/charges applicable between implementing agencies of MoRTH and utility owning department shall be paid directly by the Authority to the Utility Owning Entity as and when Contractor furnishing a demand of Utility Owning Department along with a copy of sanctioned estimate.
- (c) The credit of dismantled materials has been accounted for in the estimated cost. The dismantled material /scrap of existing Utility to be shifted/dismantled shall belong to the Contractor/Concessionaire who would be free to dispose-off the dismantled material as deemed fit by them. If the Contractor is forced to deposit the dismantled material to utility owning department then the amount of credit for dismantled material indicated in the sanctioned estimates of utility owning department will be reimbursed to the Contractor after submitting the duly authenticated receipt of the dismantled material from utility owning department to the Authority.
- (d) The utilities shall be handed over after shifting work is completed to Utility Owning Department up to their entire satisfaction. The maintenance liability shall rest with the Utility Owning Department after handing over process is complete as far as utility shifting works are concerned.
- (e) No change of scope shall be paid for any over-ground utilities. However, for any underground utilities not mentioned in Schedule B shall form change of scope, which shall be worked out as per the estimation of the concerned utility owning dept. and shall be payable to the contractor accordingly.

14. Change of Scope

The length of Structures and bridges specified herein above shall be treated as an approximate assessment. The actual lengths as required based on 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.

**Annex-
TCS**

Annex-III
Alignment Plan & Profile

Annex-III A
Utility Shifting Plan

Schedule - C

(See Clause 2.1)

Project Facilities

1. Project Facilities

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

- (a) Toll Plaza
- (b) Roadside furniture.
- (c) Pedestrian facilities.
- (d) Lighting
- (e) Environmental Management Plan
- (f) Tree plantation.
- (g) Advanced Traffic Management System(ATMS)
- (h) Utilities.
- (i) Rainwater harvesting; and
- (j) Others to be specified

2. Description of Project Facilities

Each of the Project Facilities is described below:

Project Facilities to be completed on or before project completion date have been described in Annex-I of this Schedule-C.

Annex - I
Schedule - C

1. Project Facilities

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

- (a) Toll Plaza
- (b) Roadside furniture.
- (c) Pedestrian facilities.
- (d) Lighting
- (e) Environmental Management Plan
- (f) Tree plantation.
- (g) Advanced Traffic Management System(ATMS)
- (h) Utilities.
- (i) Rainwater harvesting; and
- (j) Others to be specified

2. Description of Project Facilities

Each of the Project Facilities is described below:

2.1 Toll Plaza

There is no Toll Plaza Proposed on the road section.

2.2 Roadside Furniture

Kilometer and Hectometer Stones, Road Signs, Road Marking, Road Delineators, Reflective Pavement Markers shall be provided in accordance with Schedule - B.

2.3 Pedestrian Facilities

Pedestrian / Cattle Underpasses/SVUP/LVUP shall be provided at locations specified in Schedule - B. (Pedestrian FOB at Khatti Chowk to connect both army area.)

2.4 Lighting

The Contractor shall provide lighting as per Schedule - D at following locations of the Project.

- Major Junctions
- Major Bridge, Minor Bridge including Approaches
- Yellow Flashing Light to alert Drivers

Minimum level illumination on locations of the Project Highway where exterior lighting is provided shall be 40 lux. In general 'code of practice for lighting of public thoroughfare IS 1944 shall be followed.

The lighting fittings (with LED features) shall be powered by solar system with back up facilities (power and battery both) at all locations.

The solar system will be used for the entire highway. The solar panel at junction, and grade separator shall be battery backup. The electrical connection with all its infrastructures shall be done by the Contractor. Additional battery backup, if required, shall be provided

2.5 Environmental Management Plan

As per EIA notification 2006 and its amendment S.O.2559 (E) Dt 22nd August 2013, S.O 996(E) Dt 10th April 2015, S.O 382(E) Dt 3rd February 2015 Environmental Clearance Exempted from the purview of the Environmental Impact Assessment

The Contractor shall implement the Environmental Management plan & action Plan for undertaking possible mitigation measures in accordance with guidelines for Highway Projects of the Ministry of Environment and Forests and Wild life Department. The conditions & directions stipulated by the MOEF &CC shall be made available by the Authority.

2.6 Tree plantation.

The Contractor shall plant trees and shrubs of required numbers and types at the appropriate locations within Right of Way and in the land earmarked by the Authority for afforestation as per Schedule at the following areas.

Sr. No	Type of Plantation	Location (Km)	Remarks
1	Shrubs	In median except Structures	Ornamental type plantation shall be provided
2	Land Scaping	All interchanges/ Service Areas / Toll plazas / O & M Centers	Ornamental type plantation shall be provided
3	Plantations	Available open land within ROW	In addition to compensatory afforestation, additional trees of desired type near the edge of ROW on both sides shall be planted, preferably of local varieties.

2.7 Advanced Traffic Management System(ATMS)

It is not applicable for the project

2.8 Utilities.

Provision of accommodating utilities shall be made within utility corridor on either side of Project Highway. Box culverts proposed in Schedule B shall be used for crossing of underground utilities, wherever required. However, in location where the distance between two adjacent box culverts is more than 1 km, Utility ducts in form of NP-4 Hume Pipe 1.2m diameter shall be provided across the Project Highway and along with inspection chamber as per IRC:SP:99-2013 requirements. Location for such utility crossing shall be finalized in consultation with Authority Engineer.

2.9 Rainwater harvesting; and

It is not possible to provide/construct it as alignment is passing through Urban / Semi Urban Area with restricted RoW where width of Median is 0.5 mtr

2.10 Way Side Amenities near Archaeological Site at Ambaran including the following facilities :-

Sl. No.	Facility
A.	Mandatory Facility
1.	Food Court/Restaurant
2.	Convenience store/shops
3.	Toilet facility (separate for ladies, gents & Divyang with appropriate ramp and railing), dustbin and baby care room
4.	Drinking water
5.	Car/Bus Parking (Provision for wheel chair & other facilities for Divyang)
6.	First Aid Box

7.	Dedicated area for promoting location artisans in the form of Kiosk/stall/dedicated covered zone with a minimum of 1000 square foot or 1% of the area of wayside amenity whichever is more.
8.	Landscaping
9.	Children's play area & open gym
10.	Safety awareness corner
B.	Permissible Facility
1	Fuel stations (Petrol/Diesel pump, any other type of fuel station) and Electric Vehicle charging station with air filling stations, puncture repair and pollution check
2	Tourist information kiosk
3	Motel/rooms for short stay
4	Dormitory for drivers
5	Open gym, & Open rest area with benches and tables
6	Vehicle repair shop
7	Spare parts shop
8	Car washing facility
9	Medical clinic with ambulance
10	ATM
11	Convention centre
12	Telephone tower
13	Village Haat & MSME craft shop

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:

Annex – I

(Schedule-D)

Specifications and Standards for Construction

1. Specifications and Standards

All Materials works and construction operations shall conform to the Manual of Specifications and Standards for Four-Laning of Highways IRC-SP:84-2019, referred to as the Manual, and MORT&H Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2. Deviations from the Specifications and Standards

- (i) The terms "Concessionaire", "Independent Engineer" and "Concession Agreement" used in the Manual shall be deemed to be substituted by the terms "Contractor", "Authority's Engineer" and "Agreement" respectively.
- (ii) Notwithstanding anything to the contrary contained in Paragraph 1 above, the following Specifications and Standards shall apply to the Project Highway, and for purposes of this Agreement, the aforesaid Specifications and Standards shall be deemed to be amended to the extent set for the below:

Sr. No.	Item	Clause referred in Manual	Provision as per Manual	Modified Provision
1	Design Speed	2.2.1	Plain and Rolling terrain (cross slope of the ground up to 25%) Minimum design speed 80 kmph.	The design speed shall be the minimum design speed of 80 kmph except the locations given in alignment drawing (Annex-III, Schedule A).
2	Width of Shoulders	2.6.1		These clauses are deemed to be amended as shown in the typical cross section (refer Appendix – B1 of Schedule B).
3	Roadway Width	2.7		
4	Typical Cross section	2.16		
5	Typical Cross Section	2.6.1, 2.7 and 2.16		
6	Radii of Horizontal Curve	2.9.4		Plain and Rolling terrain, desirable minimum radii and absolute minimum shall be 400 m and 250 m, respectively except at the location given in alignment drawing (Annex-III, schedule A).
7	Radii of Horizontal Curves	2.9.4	Plain and Rolling terrain, desirable minimum radii and absolute minimum shall be 400 m and 250 m, respectively.	
8	Width of New Bridge	7.3		To be amended as shown in the typical Cross Section.

ATTACHMENT-DI
TECHNICAL SPECIFICATIONS FOR ROAD & BRIDGE

Table of Contents

1.1 Site Information General	
1.1.4 Seismic Zone	
2 GENERAL REQUIREMENTS	
2.1 Part-I: General Technical Specifications	
2.2 Part-II: Supplementary Technical Specifications	
2.3 PART-III Specifications for Miscellaneous Works	
CLAUSE 102 DEFINITIONS	
CLAUSE 106 CONSTRUCTION EQUIPMENT	
CLAUSE 108 SITE INFORMATION	
CLAUSE 109 SETTING OUT	
CLAUSE 111 PRECAUTIONS FOR SAFEGUARDING THE ENVIRONMENT	
Sub-Clause 111.1 General	
Sub-Clause 111.2 Borrow Pits for Embankment Construction	
Sub-Clause 111.3 Quarry Operations	
Sub-Clause 111.5 Pollution from Hot-Mix Plant and Batching Plants	
Sub-Clause 111.8.2 Air Quality	
Sub-Clause 111.8.3 Water Sources and Water Quality	
Sub-Clause 111.20 Control and Disposal of Wastes	
Sub-Clause 111.14 Equipment and Vehicles used for the Works	
Sub-Clause 111.15 Noise Control	
Sub-Clause 111.16 Vibration Control	
Sub-Clause 111.17 Measurement	
CLAUSE 112 ARRANGEMENT FOR TRAFFIC DURING CONSTRUCTION	
Sub-Clause 112.6 Measurement for Payment and Rates	
CLAUSE 114 SCOPE OF RATES FOR DIFFERENT ITEMS OF WORK	
CLAUSE 115 METHODOLOGY AND SEQUENCE OF WORK	
Sub-Clause 115.1 Submission of Method Statement	
Sub-Clause 115.2 Approval of Proprietary Product/Process/System	
CLAUSE 120 FIELD LABORATORY	
Sub-Clause 120.3 Ownership	
Sub-Clause 120.4 Maintenance	
Sub-Clause 120.5 Rate	
SECTION 200 Site Clearance	
CLAUSE 201 CLEARING AND GRUBBING	
CLAUSE 202 DISMANTLING CULVERTS, BRIDGES AND OTHER STRUCTURES/ PAVEMENTS	
SECTION 300 Earthwork, Erosion Control and Drainage	
CLAUSE 301 EXCAVATION FOR ROADWAY AND DRAINS	

CLAUSE 304 EXCAVATION FOR STRUCTURES

CLAUSE 305 EMBANKMENT CONSTRUCTION

Sub-Clause 305.2.2.2 Borrow Materials

Sub-Clause 305.2.2.4 Compaction Requirements

Sub-Clause 305.3 Construction Operations

Sub-Clause 305.8 Measurement for Payment

CLAUSE 306 SOIL EROSION AND SEDIMENTATION CONTROL

SECTION 400 Sub-Bases, Bases (Non-Bituminous) and Shoulders

CLAUSE 401 GRANULAR SUB -BASE

Sub-Clause 401.2.2 Physical Requirements

CLAUSE 406 WET MIX MACADAM SUB -BASE/BASE

Sub-Clause 406.4 Opening to Traffic

SECTION 500 Base and Surface Courses (Bituminous)

Sub-Clause 501.2 Materials

Sub clause 501.2.1 Binder

Binder of VG-40 grade shall be used or if available viscosity grade of bitumen shall be used in accordance with IS: 73

CLAUSE 505 DENSE BITUMINOUS MACADAM

CLAUSE 507 BITUMINOUS CONCRETE

Binder of CRMB-60 grade shall be used.

SECTION 800 Traffic Signs, Markings and Other Road Appurtenances

CLAUSE 803 ROAD MARKINGS

CLAUSE 806 ROAD DELINATORS

TECHNICAL SPECIFICATIONS

- 1 The Technical Specifications contained herein shall be read in conjunction with the other Bidding Documents as specified in DPR Volumes.

1.1 Site Information General

- 1.1.1 The information given hereunder and provided elsewhere in these documents is given in good faith by the Employer, but the Contractor shall satisfy himself regarding all aspects of site conditions and no claim will be entertained on the plea that the information supplied by the Employer is erroneous or insufficient.
- 1.1.2 The area in which the works are located is in plain terrain, the project road starts from 32.720833°N and 75.175487°E and ends at 32.731307°N and 74.844159°E in the union territory of Jammu & Kashmir.

1.1.3 Climatic Conditions

- 1.1.3.1 The temperature in this region is as under:
- i) During summer months, the temperature varies from mean minimum temperature 20°C to mean maximum temperature 35 °C
 - ii) During winter months, the temperature varies from mean minimum temperature 9°C to mean maximum temperature 18 °C

1.1.4 Seismic Zone

The stretch lies in Seismic Zone-IV as defined in Fig. 18 of IRC: 6-2017.

2 GENERAL REQUIREMENTS

The Technical Specifications in accordance with which the entire work described hereinafter shall be constructed and completed by the Contractor shall comprise of the following:

2.1 Part-I: General Technical Specifications

The General Technical Specifications shall be the "SPECIFICATIONS FOR ROAD AND BRIDGE WORKS" (Fifth Revision, April 2013), issued by the Ministry of Road Transport and Highways, Government of India and published by the Indian Roads Congress, henceforth called MORT&H Specifications and deemed to be bound into this document.

2.2 Part-II: Supplementary Technical Specifications

The Supplementary Technical Specifications shall comprise of various Amendments/Modifications/ Additions to the "SPECIFICATIONS FOR ROAD AND BRIDGE WORKS" referred to in Part-I above and Additional Specifications for item of works which are not covered in Part-I.

- 2.3 A clause or a part thereof in "SPECIFICATIONS FOR ROAD AND BRIDGE WORKS (Fifth Revision April 2013)", referred in Part-I above, where Amended/Modified/Added upon, and incorporated in Part-II, referred to above, such Amendment/Modification/ Addition supersedes the relevant Clause or part of the Clause.

- 2.3.1 The Additional Specifications shall comprise of specifications for item of works which not covered in Part-I.
- 2.3.2 When an Amended/Modified/Added Clause supersedes a Clause or part thereof in the said Specifications, then any reference to the superseded Clause shall be deemed to refer to the Amended/Modified/Added Clause or par thereof.
- 2.3.3 In so far as Amended/Modified/Added Clause may come in conflict or be inconsistent with any of the provisions of the said MORT&H Specifications under reference; the Amended/Modified/Added Clause shall always prevail.
- 2.3.4 The following Clauses in the "SPECIFICATIONS FOR ROAD AND BRIDGE WORKS (Fifth Revision

April 2013”), have been Amended/Modified/Added upon

Sr. No.	Section No.	Section Title	Clause No.
1.	100	General	102,106,108,109, 111,112,114,115 and 120
2.	200	Site Clearance	201 and 202
3.	300	Earthwork, Erosion Control and Drainage	301,304,305 and 306
4.	400	Sub-base, Bases (Non-Bituminous) and Shoulder	401and 406
4.	500	Bases and Surface Courses (Bituminous)	501,505 and 507
5.	800	Traffic signs, Markingsand other RoadAppurtenances	803 and 806
6.	2100	Open Foundations	2104

2.4 PART-III Specifications for Miscellaneous Works

Technical Specifications for Miscellaneous works shall be the latest “Specifications volume I to VI, 1996 for Civil Works and General Specifications for Electrical Works PART I – INTERNAL, PART – II, EXTERNAL for electric work 1994 as published by the Central Public Works Department (CPWD), Government of India” and deemed to be bound into this document.

- 2.5** The latest edition till 60 days before the final date of submission of the bid of all specifications / standard shall be applicable.

SCOPE OF WORKS

Road Works

Site clearance; setting-out and layout; widening of existing carriageway and strengthening including camber corrections; construction of new road/ parallel service road; bituminous pavements remodelling/construction of junctions, intersections, bus bays, lay bays; supplying and placing of drainage channels, flumes, guard posts, guard rails and other related items; construction/extension of cross drainage works, bridges, approaches and other related works; road markings, road signs and kilometer/ hectometre stones; protective works for roads/ bridges; all aspects of quality assurance of various components of works; rectification of the defects in the completed works during the Defect Liability Period; submission of "As built" drawings and any other related documents; and other items of work as may be required to be carried out for completing the works in accordance with the drawings and provisions of the Contractor insure safety.

Other Items

Execution of any other items of work for the construction and completion of the Works in accordance with the provisions of the Contract including all incidental items as well as preparation and submittal of reports, plans as may be required.

During the period of the Contract the right of way and all existing roads shall be kept open for traffic and maintained in a safe and usable condition. Residents along and adjacent to the works are always to be provided with safe and convenient access to their properties. Traffic control and traffic diversions shall be used as necessary to protect the works and maintenance will be carried out as directed by the Engineer and provided in the Contract.

Any other items as required to fulfil all contractual obligations as per the Bid Documents.

PART II
SUPPLEMENTARY TECHNICAL SPECIFICATION
AMENDMENTS/MODIFICATIONS/ADDITIONS TO EXISTING CLAUSES OF GENERAL
TECHNICAL SPECIFICATIONS

SECTION 100 General

CLAUSE 102 **DEFINITIONS**

The following abbreviations shall be added in this Clause: "MORT&H" :
Ministry of Road Transport & Highways

(Previously known as 'MOST', Ministry of Surface Transport)

"NHAI" : National Highways Authority of India

CLAUSE 106 **CONSTRUCTION EQUIPMENT**

Add the following sub para (g) and (h) after sub para (f)

- Adequate standby equipment including spare parts shall be available.
- All measuring devices and gauges shall be in good working condition. Measuring devices that can affect product quality shall be calibrated prior to use and at prescribed intervals against certified equipment. Calibration procedures shall be established, maintained and documented and corrective actions taken when results are unsatisfactory. Accuracy and fitness of measuring devices shall be ensured by proper maintenance.

CLAUSE 108 **SITE INFORMATION**

Sub-Clause 108.4 This clause shall be as follows:

"Identification of quarry sites and borrow areas shall be the responsibility of the Contractor. Materials procured from quarry sites and borrow areas identified by Contractor and to be used in Works must comply with the requirements of quality as stipulated in the Technical Specification for particular items of work."

CLAUSE 109 **SETTING OUT**

Sub-Clause 109.8 Delete the 2nd and 3rd sentences in Clause 109.8 and substitute the following:
"Setting out of the road alignment and measurement of angles shall be done by using Total Station."

CLAUSE 111 **PRECAUTIONS FOR SAFEGUARDING THE ENVIRONMENT**

Sub-Clause 111.1 **General**

Delete the text of Clause 111.1 in its entirety and substitute the following:

"The Contractor shall take all necessary measures and precautions and otherwise ensure that the execution of the Works and all associated operations on site or off-site are carried out in conformity with statutory and regulatory requirements including those prescribed elsewhere in this document.

The Contractor shall take all measures and precautions to avoid any nuisance or disturbance arising for the execution of the Works. This shall wherever possible be achieved by suppression of the nuisance at source rather than abatement of the nuisance once generated. All vehicles deployed for material haulage shall be spillageproof.

Haul roads shall be inspected at least once daily to clear any accidental spillage. In the event of any spoil, debris, wastes or any deleterious substance

from the Site being deposited on any adjacent land, the Contractor shall immediately remove all such material at no cost to the Contract and restore the affected area to its original state to the satisfaction of the Engineer."

Sub-Clause 111.2 Borrow Pits for Embankment Construction

Delete the text of Clause 111.2 and substitute the following:

"Prior approval shall be sought from the concerned State Authorities, and the Contractor shall comply with all local environmental regulations. For all borrow areas, the actual extent of area/zones to be excavated shall be demarcated with the signboards and the operational areas shall be access controlled.

In the case of borrow from tank beds, a regrade/improvement of the inlet channels (at least up to 100m stretch) shall be undertaken in consultation with the concerned state government departments (the Minor Irrigation department of the State PWD) and local bodies. The Contractor shall ensure that excavation of tank beds is uniform over the entire area and that the finished profile of the bed is smooth.

In the case of borrow from the dry highlands, all borrow areas shall be reinstated by the formation gentle side slopes, re-vegetated and connected to the nearest drainage channel to avoid the formation of pools during/after the rainy seasons.

Plant and machinery used in the borrow areas shall conform to State noise emission regulations. All operation areas shall be water sprinkled to contain dust levels to the National Ambient Air Quality Standards."

Sub-Clause 111.3 Quarry Operations

Delete the text of Clause 111.3 and substitute the following:

"Aggregates shall be sourced only from quarry sites that comply with the local/state environmental and other applicable regulations. Occupational safety procedures/practices for the work force in all quarries shall be in accordance with applicable laws. Quarry and crushing units shall have adequate dust suppression measures, such as sprinklers, in work areas and along all approach roads to the quarry sites. These shall preferably be located on the upwind side."

Sub-Clause 111.5 Pollution from Hot-Mix Plant and Batching Plants

Delete the 1st sentence of Clause 111.5 and substitute the following:

"Bituminous hot mix plant and concrete batching plants shall be located at least one(1)km away from the sensitive receptors(schools, hospitals, etc.)and atleast 500m from urban settlements, unless otherwise required by the statutory requirements."

Sub-Clause 111.8.1 Environmental Protection:

Add the following sentences in the first paragraph of Sub Clause 111.8.1:

Water tankers with suitable sprinkling system shall be deployed along the haulage roads and in the work sites. Water shall be sprinkled regularly all along the routes to suppress airborne dusts from truck/dumper movements particularly on unpaved roads. Actual frequency will be agreed with the Engineer to suit site conditions."

Sub-Clause 111.8.2 Air Quality

The Contractor shall devise and implement methods of working to minimize dust, gaseous and other air-borne emissions and carry out the Works in such a

manner as to minimize adverse impacts on the air quality. Construction camps shall have facilities for LPG fuel. The use of firewood shall not be permitted.

The Contractor shall utilize effective water sprays during delivery, manufacture, processing and handling of materials when dust is likely to be created, and to dampen stored materials during dry and windy weather. Stockpiles of friable materials shall be covered with clean tarpaulins, with applications of sprayed water during dry and windy weather. Stockpiles of materials or debris shall be dampened prior to their movement, except where this is contrary to the Specification.

Any vehicle with an open load-carrying area used for transporting potentially dust-producing material shall have properly fitting side and tail boards. Materials having the potential to produce dust shall not be loaded to a level higher than the side and tail boards and shall be covered with clean tarpaulins in good condition. The tarpaulin shall be properly secured and extend at least 300mm over the edges of the side of the side and tailboards.

The Contractor shall monitor air-quality once weekly in all operational areas under the project and take the necessary steps to comply with the specified requirements. Air quality parameters will include SPM, RPM, SO₂, NO_x, HC and CO. operational areas include work sites, haulage roads, hot mix plants, quarries, crushing plants, stockpiles, borrow sites and spoil disposal sites.

Sub-Clause 111.8.3 Water Sources and Water Quality

The Contractor shall provide independent sources of water supply, such as bore wells, for use in the Works and for associated storage, workshop and work force compounds. Prior approval shall be obtained from the relevant State Authorities and all installations shall follow local regulations. Bore wells installed and used for the project shall be left in good operating condition for the use of NHAI and local communities. The Contractor shall prevent any interference with the supply to or abstraction from and prevent any pollution of water resources (including underground percolating water) as a result of the execution of the Works.

Areas where water is regularly or repetitively used for dust suppression purposes shall be laid to fall to specially constructed settlement tanks to permit sedimentation of particulate matter. After settlement, the water may be re-used for dust suppression and rinsing. The Contractor shall protect all watercourses, waterways, ditches, canals, drains, lakes and the likes from pollution as a result of the execution of the Works.

All water and other liquid waste products arising on the Site shall be collected and disposed of at a location on or off the Site and in a manner that shall not cause either nuisance or pollution.

The Contractor shall at all times ensure that all existing stream courses and drains within, and adjacent to, the Site are kept safe and free from any debris and any materials arising from the Works. The Contractor shall not discharge or deposit any matter arising from the execution of the Works into any water except with the permission of the Engineer and the regulatory authority concerned.

Work force camps shall have septic tank and soak away pits. Operational areas like POL storage areas/hot mix plant areas shall comply with local/state environmental regulations and safety procedures. Storage and handling areas shall be impervious and surrounded by an impervious lined drain to catch any accidental spills. Storm water shall be stored in lined holding tanks with oil, grease-tapping facility prior to disposal in to nearby watercourses. The trappings and sludge of holding tanks shall be disposed off in accordance with

the procedures approved by the local regulatory authority.

Sub-Clause 111.20 Control and Disposal of Wastes

The Contractor shall control the disposal of all forms of waste generated by the construction operations and in all associated activities. No uncontrolled deposition or dumping shall be permitted. Wastes to be so controlled shall include, but shall not be limited to, all forms of fuels and engine oils, all types of bitumen, cement, and surplus aggregates, gravels, bituminous mixtures etc. The Contractor shall make specific provision for the proper disposal of these and any other waste products, conforming to local regulations and acceptable to the Engineer.

Spilling of oil and bituminous products during construction and transport shall be avoided to reduce the chances of contamination of surface as well as ground water.

Degraded materials shall be disposed of in a manner as approved by the Engineer and wastewater shall be disposed into septic tanks and soak pits etc. The Contractor shall make arrangements to clean-up spoil as soon as the work finishes in a stretch. If such sites are located outside the ROW, restoration of the site to a level acceptable to the land owner(s) will be carried out within a time period agreed between landowner(s) and the Contractor. Separators shall be used to separate POL materials from wastewater prior to discharging to the watercourses or as approved by the Engineer in conformance with directives and guidelines.

Disposal of solid waste materials shall be outlined in a plan for which environmental clearances shall be obtained from State environmental regulatory authorities. Potential locations for solid waste disposal are the natural depressions and borrow areas. The areas used for dumping of uncontaminated debris shall be covered with 300mm soil and shall be planted. Contaminated debris shall be dumped in depressions whose bed must be impervious e.g., stone quarry sites or depressions made impervious with 450mm thick impervious floor apron as per MORT&H Technical Specifications. Each successive 1.0m layers shall be covered with 500mm thick soil layer, and the area will be covered with 300mm thick layer and planted.

After Clause 111.12 add the following new Clauses 111.13 to 111.17

Sub-Clause 111.13 Haulage Roads

Existing roads used for hauling shall be strengthened and/ or widened by the Contractor in accordance with the requirements for normal and construction traffic.

Where such roads are not existing, the Contractor shall construct project specific single lane paved roads in settlement areas and gravel roads in open areas conforming to the Ministry of Road Transport and Highways (MORT&H) specifications.

The alignment of the haulage roads shall be fixed to avoid agricultural land to the extent possible. In unavoidable circumstances, suitable compensation shall be paid to the people whose land will be temporarily acquired for the duration of the operations. The compensation shall cover for loss of income for the duration of temporary acquisition and land restoration. Prior to the construction of the haul roads, topsoil shall be stripped and stockpiled for re-use.

Material dumping sites shall be access controlled to prevent the unauthorized

entry of the people, grazing cattle and stray animals.

Haulage roads shall be reinstated upon completion of hauling for the use of local communities.”

Sub-Clause 111.14

Equipment and Vehicles used for the Works

Equipments and vehicles deployed for the construction activities shall not be older than 5 years. Equipments used for road and bridge works shall be based on new technology and shall generate noise and pollutants not exceeding the limits specified by the relevant State Authorities. Vehicles and machineries used for road and bridge works are to be regularly maintained to conform to the National Air Quality Standards. Blasting, if any, will be carried out using small charges.

Sub-Clause 111.15

Noise Control

The Contractor shall consider noise as an environmental constrain in the planning and execution of the Works.

The Contractor shall take all necessary measures so that the operation of all mechanical equipment and construction processes on and off the site shall not cause any unnecessary or excessive noise, taking in to account applicable environmental requirements. The Contractor shall use all necessary measures and shall maintains all plant and silencing equipment in good conditions so as to minimize the noise emission during construction works.

Any member of the work force likely to be exposed to beyond their threshold noise levels shall be provided with protective equipment, such as earplugs, and shall be rotated every four hours.

Construction operations shall be limited to daytime hours only, particularly in the settlement areas.

Sub-Clause 111.16

Vibration Control

The Contractor shall take measures during construction activities to control the movement of the work force and construction machinery/equipment, and to avoid/ minimize activities, which produce vibrations.

Sub-Clause 111.17

Measurement

Monitoring of Air/Water/Noise and Soil quality shall be paid as per numbers of samples tested. For Compliance of all other provisions made in this Clause 111, it shall be deemed to be incidental to the work and no separate measurement shall be made. The Contractor shall be deemed to have made allowance for such compliance with these provisions in the preparations of his prices for items of work included in the Bills of Quantities and full compensation for such compliance shall be deemed to be covered by them.”

CLAUSE 112

ARRANGEMENT FOR TRAFFIC DURING CONSTRUCTION

Sub-Clause 112.4

Traffic Safety and Control

Last line of Para 5 shall be read as under:

“The signs shall be of approved design and of reflector type.” **Add the following paragraph at the end of the clause:**

“Before commencement of any construction, the Contractor shall prepare and submit details of the arrangements for passing traffic during construction, design of barricades, signs, markings, lights, flags etc. conforming and satisfying the requirements of the “Guidelines on Safety in Road Construction Zones” of IRC: SP 55-2001 and get the same approved by the Engineer.

- Sub-Clause 112.6 Measurement for Payment and Rates
- a) The provision of treated shoulder including construction of temporary cross drainage structures, if required, as described in Clause 112.2 including their maintenance, dismantling and clearing debris, where necessary, shall be considered as incidental to the works and shall be Contractor's responsibility.
 - b) The Construction of temporary diversion including temporary cross drainage structures as described in subclause 112.3, shall be measured in linear meter and the unit contract rate shall be inclusive of full compensation for construction (including supply of material, labor, tools, etc.), maintenance as per sub clause 112.5, final dismantling, and disposal.
 - c) All Traffic safety and control devices during construction as per sub clause 112.4 including providing, erecting and maintaining barrier, signs, markings, flags, lights and providing flag men etc. is included in item rate.

CLAUSE 114 SCOPE OF RATES FOR DIFFERENT ITEMS OF WORK

Sub-Clause 114.2 Item (ii) of Clause 114.2 shall read as follows:

A detailed resource-based construction programme including resources planning using computerized critical path network method/PERT in a form, which facilitates control of the progress of the works and consequences of any changes in terms of time. The programme shall also include detailed network, activities for the submission and approval of materials, procurement of critical materials and equipment, fabrication of special products/ equipment and their installation and testing and for all activities of the Contractor that are likely to affect the progress of work etc. including updating all such activities on the basis of decisions taken at the periodic site review meetings or as directed by the Engineer. The Contractor shall submit data via electronic media to the Engineer in a form readily compatible with Engineer's planning system.

The first issue of the detailed construction programme including the detailed description of the system and the procedures shall be submitted to the Engineer for acceptance not later than 28 days after the date of receipt of the letter of acceptance.

The contractor shall submit to the Engineer for approval & consent, the updated & revised programme at every three months interval or as such as directed by the Engineer. The updated & revised programme shall be submitted showing the actual progress achieved (physical & financial) and the effects of the progress achieved on the timing of the remaining work including any change to the sequence of the activities

CLAUSE 115 METHODOLOGY AND SEQUENCE OF WORK

The Clause shall be substituted as follows:

Sub-Clause 115.1 Submission of Method Statement

The Contractor shall submit methods statement within 28 days after the date of letter of acceptance. The methods statement shall be submitted in two parts.

The General part of the methods statement shall describe the Contractor's proposals regarding preliminary works, common facilities, and items that require consideration at the early stage of the Contract. The General part shall be furnished along with the first issue of the construction programme (refer clause 114.2) and shall include information on:

- a) Sources of materials like coarse aggregate and fine aggregate, quantity and quality of materials available in different sources;

- b) Sources of manufactured materials like cement, steel, bitumen reinforcement, pre stressing strands and bearings. Wherever possible the Contractor shall identify at least two sources for each of the items; he shall also submit test certificates of recently manufactured materials for the consideration of the Engineer.
- c) Locations of site facilities like batching plant, hot mix plant, aggregate processing plant, crushing plant etc.
- d) Details of facilities/approaches for transportation of men, equipment and materials for construction of pavements, foundations and substructure in riverbed, and plan for free traffic flow and safe drainage.
- e) Information on procedures to be adopted by the Contractor for prevention and mitigation of negative environmental impact due to construction activities.
- f) Any other information required by the Engineer subsequent to the scrutiny of method statement

The General part of the Q.A. Programme shall accompany the methods statement under sub-clause 105.3.

The Special part of the methods statement shall be submitted to the Engineer by the Contractor for each important item of work like construction of embankments and sub grade, pavements, pile/well foundations, concreting, pre stressing, repair and rehabilitation of existing structures, concrete superstructure, dismantling of structures and pavement and for any other item as directed by the Engineer.

These statements shall give information on

- i) Details of personnel both for execution and quality control of the work.
- ii) Equipment deployment with details of number of units, capacity, standby arrangements
- iii) Sequence of construction, details of temporary or enabling works like, diversions, cofferdams, formwork including specialized formwork for superstructure, details of borrow areas, method of construction of embankment and sub grade, pavements, piles, wells, concreting procedures, details of proprietary process and products (e.g. details of pre stressing systems, proprietary piling systems, bearings, expansion joints etc.) and details of equipment to be deployed. Wherever necessary, technical literature, design calculations and drawings shall be included in the methods statement.
- iv) Testing and acceptance procedures including documentation.
- v) Special part of the Q.A. Programme referred in clause 105.3 for the particular item of work shall be submitted along with the methods statement for the concerned activity.
- vi) Engineer shall examine and approve the methods statement or direct the Contractor to resubmit the statement with required modifications. The modified statement shall be submitted within 14 days of receipt of Engineer's comments.

The sole responsibility for the safety and adequacy of the methods adopted by the Contractor shall rest on the Contractor irrespective of any approval given by the Engineer.

Only proprietary products proven by International usage in comparable projects shall be permitted to be used. Fully authenticated details of licensing and collaboration arrangement shall be submitted by the manufacturer, where relevant.

Within 90 days of award of work the Contractor shall submit the following information for all proprietary products for approval by the Engineer.

i) Name of manufacturer and name of product/ process/system.

Complete details of the manufacturer of the product/ process/ system shall be furnished. Details of projects where similar product/process/system has been successfully used shall be furnished. Authenticated copies of license/collaboration agreement shall be furnished.

ii) General features of the product/product process/system.

Detailed write up with methods statements shall be furnished for each product/ process/ system. This shall include complete working drawings & installation drawings, technical specifications covering fabrication, materials, system of corrosion protection etc.

i) Details of product development and development testing.

ii) Acceptance test and criteria.

Manufacturer shall submit a quality assurance system document. Details of acceptance test and criteria of acceptance shall be furnished in this document.

i) Installation Procedure.

ii) Maintenance procedure and schedule.

iii) Warranty proposal.

The Engineer may instruct any additional tests for the purpose of accepting the product. The charges of these additional tests shall be borne by the Employer only in case the product satisfies the specifications.

CLAUSE 120

FIELD LABORATORY

Sub-Clause 120.2

Description

Replace the words "indicated in the drawings" in the first sentence of second paragraph of this Clause with the words "per provisions indicated in this Clause and at a location approved by the Engineer."

Replace "electric supply etc." to the second sentence of first paragraph by "including uninterrupted power supply etc."

Delete the first sentence of second paragraph "The floor space in the drawing" and substitute the following:

"The floor space required for the field laboratory shall be not less than 200 sq.m.

"The fourth sentence of second paragraphs "The furnishing In Table100-2"shall read as under.

"A good semi furnished office accommodation shall be provided to the Material Engineers of the Supervision Team as per the direction of the Engineer."

Add the following at the end of this Clause:

"There shall also be provided a concrete paved area, for storing samples adjacent to the laboratory, of about 100 sq.m and another 75 sq.m shall be suitably roofed with open sides giving protection against sun and rain.

Within 14 (fourteen) days of the commencement date, the Contractor shall prepare and submit a layout plan and details of the laboratory building and make/supplier of the equipment to the Engineer for his approval.

The field laboratory to be provided under the Contract shall be handed over to the Engineer in finished and fully equipped condition not later than 2 months after the receipt of Notice to Commence Work, and the field laboratory with all equipment/instrument shall be to the entire satisfaction of the Engineer. During the 2-month period starting from the Notice to Commence work, the laboratory tests shall be performed in another laboratory proposed by the Contractor and approved by the Engineer.

Laboratory Equipment

General

The items of laboratory equipment shall be provided in the field laboratory depending upon the items to be executed as per Table mentioned below instead of Table 100-2 shown in MORTH:

The following items of laboratory equipment shall be provided in the field laboratory:

The equipment and instruments shall be new and shall be quality certified by Bureau of Indian Standards (BIS).

Sr. No.	Sub No.	Item, Specifications	Nos. required
A: General			
(i)	Balance		
	(a)	7 kg to 10 kg capacity semi -self indicating Electronic Type –Accuracy 1 gm	2
	(b)	500 gm capacity semi-self-indicating Electronic Type – Accuracy 0.01 gm	2
	(c)	Chemical balance 100gm capacity - Accuracy 0.0001gm	1
	(d)	Pan balance 5 kg capacity - Accuracy 0.5 gm	2
	(e)	Platform Scale – 300 kg capacity	1
	(f)	Triple Beam balance-25kg capacity Accuracy 1gm	2
(ii)	Ovens – Electrically operated, thermostatically controlled		
	(a)	From 100°C to 220°C – Sensitivity	2
(iii)	Sieves, as per IS 460-1962		
	(a)	IS Sieves 450 mm internal dia. of sieve sets as per BIS of required sieve sizes complete with lid and pan	2 set
	(b)	IS sieve 200 mm internal dia. (brass frame and steel or brass wire cloth mesh) consisting of sieve sets of required sieve sizes complete with lid and pan	2 set
(iv)	Sieve shaker capable of taking 200 mm and 450 mm dia. Sieves electrically operated with time switch assembly (As per BIS)		1
(v)	200 tones compression testing machine		1
(vi)	Stop watches 1/5 sec. Accuracy		2
(vii)	Glassware comprising of Beakers, Pipettes, dishes, measuring cylinders (100 to 1000 cc capacity) glass rods and funnels, glass thermometers range 0°C to 100°C and metallic thermometers range 300°C		1 Dozen each
(viii)	Hot plates 200 mm dia (1500 watt)		6
(ix)	Enamel trays		

	(a)	600 mm x 450 mm x 50 mm	10
	(b)	450 mm x 300 mm x 40 mm	10
	(c)	300 mm x 250 mm x 40 mm	6
	(d)	Circular plates of 250 mm dia.	6
(x)	Water Testing Kit		1
(xi)	First Aid Box		1
(xii)	Spatula Set of 100 and 200 long		3
(xiii)	Digging Tools (pixels, shovel, fork etc.)		As reqd.
(xiv)	Miscellaneous tools (sledge hammer, lump hammer, wooden pegs etc.)		As reqd.
(xv)	Maximum and Minimum Thermometer		2 Set
(xvi)	Rain Gauge		1 Set
(xvii)	Timer 0-60 minutes with alarm & 1/5 sec accuracy.		3 Sets

B: For Soils and Aggregates			
(i)	Water still, 3 litre/hr with fittings and accessories		1
(ii)	Liquid limit device with Casagrande and ASTM grooving tools as per IS: 2720		1
(iii)	Sampling pipettes fitted with pressure and suction inlets, 10 ml Capacity		2 set
(iv)	Compaction apparatus (Proctor) as per IS: 2720 (Part 8) complete with collar, base plate and hammer		1 set
(v)	Modified AASHTO compaction apparatus as per IS. 2720 (Part 7) 1980 or Heavy Compaction Apparatus as per IS complete with collar, base plate and hammer		1 set
(vi)	Sand pouring cylinder with conical funnel and tap and complete as per IS 2720 (Part 28) 1980 including modified equipment		4
(vii)	Sampling tins with lids 100 mm dia x 75 mm ht ½ kg capacity and miscellaneous items like moisture, tins with lid (50 grams) etc.		12
(viii)	Lab CBR testing equipment for conducting CBR testing, load frame with 5 Ton capacity, electrically operated with speed control as per IS: 2720 (Part 16), and consisting of following:		1 set
	(a)	CBR moulds 150-mm dia – 175-mm ht complete with collar, base plate etc.	24
	(b)	Tripod stands for holding dial gauge holder	24
	(c)	CBR plunger with settlement dial gauge holder	1
	(d)	Surcharge weight 147-mm dia 2.5 kg weight with central hole	48
	(e)	Spacer disc 148-mm dia, 47.7-mm ht. With handle	3
	(f)	Perforated plate (Brass)	24
	(g)	Soaking tank for accommodating 24 CBR moulds	
	(h)	Proving rings of 1000kg, 2500kg and 5000kg capacity	1 each
	(i)	Dial gauges, 25 mm travel- 0.01 mm/division	10
	(j)	Aluminium Tis	
		50x30m	36 nos
		55x35m	36 nos
		70x45m	36 nos
		70x50m	36 nos
		80x50m	36 nos
(ix)	Standard Penetration test equipment		1
(x)	Nuclear Moisture Density Meter or equivalent		2
(xi)	Speedy moisture meter complete with chemicals		2
(xii)	Unconfined compression test apparatus		1 set
(xiii)	Aggregate Impact Test Apparatus		1
(xiv)	Aggregate Impact Test Apparatus as per IS 2386 (Part 4) 1963		1

(xv)	Los Angeles abrasion Test Apparatus as per IS 2386 (Part 4)1963	1
(xvi)	Riffle Box of Slot size of 50mm as per ASTM C-136	1

C: For Bitumen and Bituminous Mixes		
(i)	Constant temperature bath for accommodating bitumen	2
	Test specimen electrically operated and thermostatically controlled, 50-liter capacity temp. range ambient 80o C	
(ii)	Penetrometer automatic type, adjustable weight arrangement and needles as per IS. 1203 – 1978	2
(iii)	Solvent extraction or centrifuge type apparatus complete (AASHTO, T-164) with extraction thimbles with stocks of solvent and filter paper	1
(iv)	Laboratory mixer including required accessories about .02 cum capacity electrically operated fitted with heating jacket	1
(v)	Marshall compaction apparatus automatically operated as per ASTM 1559-62 T and complete with electrically operated loading unit, compaction pedestal heating head assembly, dial micrometre and bracket for flow measurement, load transfer bar, specimen mould 100 mm dia. (4 in) with base plate, collars, specimen extractor, compaction hammer 4.53 kg (10 lb.) x457 mm (18 in) fall	1 set
(vi)	Distant Reading Digital Thermometer for Measuring Temperatures in Asphaltic Mixes	As required
(vii)	Riffle Box	1
(viii)	Automatic Asphalt Content Gauge [Nuclear are equivalent]	1
(ix)	Thin film Oven test apparatus to the requirement of AASHTO T 179, including accessories	1
(x)	Ring Ball Apparatus as per IS 1205- 1978	1
(xi)	Asphalt Institute Vacuum Viscometer as per IS 1206(part II) – 1978	1
(xii)	BS U- Tube Modified Reverse Floro Viscometer IS 1206(Part III) – 1978	1
(xiii)	Apparatus for Determination of Ductility Test as per IS 1208 – 1978	1
(xiv)	Pen Sky – Martars closed Tester for testing flashandfire point as per IS 1209 – 1978.	1
(xv)	Apparatus for Float Test – IS – 1210 – 1978	1
(xvi)	Apparatus for Determination of water content (Deanand Shark Method) IS – 1211 – 1978	1
(xvii)	Apparatus for Determination of Loss on Heading IS– 1212-1978.	1
(xviii)	Apparatus of Determination of specified Gravity IS- 1202-1978	1
(xix)	Core cutting machine with 100mm dia. Diamond cutting Edge	1
(xx)	Apparatus for Elastic Recovery test for Modified Bitumen	1
(xxi)	Apparatus for Storage Stability test for Modified Bitumen	1
(xxii)	Apparatus for Separation test for modified bitumen	1

D: For Cement, Cement Concrete and Materials		
(i)	Water still	1
(ii)	Vicat needle apparatus for setting time with plungers, as per IS. 269-1967	1
(iii)	Moulds	

	(a)	150 mm x 300 mm ht cylinder with capping component	As required
	(b)	150mmx150 mm x150mm cubical for compressive strength	As required
	(c)	150mmx100 mm x600mm beam for flexural strength	As required
(iv)		Concrete permeability apparatus	1
(v)		High frequency mortar cube vibrator for cement testing	1
(vi)		Concrete mixer power driven, 1 cu ft. capacity	1
(vii)		Variable frequency and amplitude vibrating table size 1 metre x 1 metre, as per the relevant British Standard	1
(viii)		Flakiness & Elongation test apparatus	2each
(ix)		Aggregate impact test apparatus as per IS 2386 (Part 4) 1963	2
(x)		Los Angeles abrasion apparatus as per IS. 2386 (Part 4) 1963	1
(xi)		Flow table as per IS 712-1973	1
(xii)	(a)	Equipment for slump test	2
	(b)	Compaction factor test equipment	1
(xiii)		Equipment for determination of specific gravity for fine and coarse aggregate as per IS 2386 (Part 3) 1963	2
(xiv)		Flexural attachment to compression testing machine	1
(xv)		Core cutting machine with 150 mm dia. Diamond cutting edge	1
(xvi)		Needle vibrator	1
(xvii)		Vibrating hammer as per BS specification	1
(xviii)		Air entrainment meter ASTM C – 231	1
(xix)		0.5 Cft, 1 Cft cylinder for checking bulk density of aggregate with tamping rod	1
(xx)		Soundness testing apparatus for cement	1
(xxi)		Flexural Beam testing machine with accessories	1
(xxii)		Chemicals solutions and consumable	As reqd.
(xxiii)		Chloride Testing kit for chemical analysis of chloride content.	1
(xxiv)		ION Exchange kit for rapid determination of sulphate content.	1

E: For Control of Profile and Surface Evenness			
(i)		Digital Level complete with all accessories	2 sets
(ii)		Distomat or equivalent	2 Nos.
(iii)		Theodolite – Electronically operated with computerized output attachment	2 sets
(iv)		Total Station with all accessories	2 sets
(v)		Towed Fifth Wheel Bump Indicator	1 set
(vi)		3meter straight edge and measuring wedge	2 sets
		Camber templates 2 lane	
(vii)		String line Arrangement with paver and sensor powers	1
	(a)	Crown type cross-section	2 sets
	(b)	Straight run cross-section	2 sets
(viii)		Steel tape	
	(a)	5 m long	as reqd
	(b)	10 m long	as reqd
	(c)	20 m long	as reqd

	(d)	30 m long	as reqd
	(e)	50 m long	As reqd
	(e)	50 m long	As reqd
(ix)	Precision Staff		3 Sets

Note: The laboratory set-up must be complete including a set of reference standards, adequately staffed and operational to the satisfaction of the Engineer not later than 2 months from the date of receipt of Notice to commence the works.

Sub-Clause 120.3 Ownership

This Clause shall read as under:

“Land for the laboratory shall be provided by the Contractor.”

Sub-Clause 120.4 Maintenance

This Clause shall read as under:

“The Contractor shall arrange to maintain the field laboratory including sample store yards in a satisfactory manner until the issue of Taking over Certificate for the whole work. Maintenance includes all activities described in Clause 120.4 and maintenance of equipment and running of the same including chemicals and consumables.”

Sub-Clause 120.5 Rate

The construction, supply, installation, maintenance, and operation including all consumables like chemicals & reagents etc., and all other expenses involved in connection thereto for the field laboratory shall be incidental to the work, and shall not be paid for separately.

SECTION 200 Site Clearance

CLAUSE 201 CLEARING AND GRUBBING

Sub-Clause 201.1 Scope

Replace with following Para:

This work shall consist of cutting, excavating, removing, and disposing of all materials such as trees of girth up to 300 mm, bushes, shrubs, stumps, roots, grass weeds, rubbish etc. and top soil up to 150 mm, which in the opinion of Engineer is unsuitable for incorporation in the work including draining out stagnant water if any from the area of road land, drain, cross drainage structure and other area as specified in the drawing or instructed by Engineer. It shall include necessary excavation by harrow discs or any other suitable equipment, backfilling of the pits by suitable soil, resulting from uprooting of trees & stumps and making the surface in proper grade by suitable equipment and compacted by power roller to required compaction as per Clause 305.3.4. The work also includes handling, salvaging and disposal of cleared material. Clearing and grubbing shall be performed less than one month in advance of earthwork operation and in accordance with requirement of the specifications.

CLAUSE 202 DISMANTLING CULVERTS, BRIDGES AND OTHER STRUCTURES/ PAVEMENTS

Sub-Clause 202.5 Disposal of Materials

The first paragraph of the sub clause shall read as below:

All materials obtained of dismantling/milling shall be the property of the Contractor for which he shall quote a rate for rebate in BOQ Bill No. 1, and the Contractor shall be free to use this material in work, or he may sell/dispose the material to as desired / deemed fit by him.

The existing pavement crust shall be reused as indicated below:

Contractor shall be free to use dismantled / milled material, as is where basis is, or by suitably modifying the material, or by crushing the material, or by breaking the material, and screening the same, provided it meets the specifications and is approved by the Engineer.

SECTION 300 Earthwork, Erosion Control and Drainage

CLAUSE 301 EXCAVATION FOR ROADWAY AND DRAINS

Sub-Clause 301.1 Scope

Add the following as second paragraph under this clause:

“The work shall also include excavation for channel training at culverts/bridges, excavation of existing shoulders and medians for purposes of widening the pavement and excavation of existing embankment for reconstruction to specification.”

CLAUSE 304 EXCAVATION FOR STRUCTURES

Sub-Clause 304.3.2 Excavation

At the end of 1st paragraph of Clause 304.3.2 inserts the following additional sentences:

“The Contractor shall ensure the stability and structural integrity of adjacent existing foundations and structures and if necessary shall, at his own expense, install temporary or permanent sheet piles, coffer dams, shoring or similar as support or protection to the satisfaction of the Engineer.”

CLAUSE 305 EMBANKMENT CONSTRUCTION

Sub-Clause 305.2 Material and General Requirements

Sub-Clause 305.2.1 Physical Requirements:

Sub-Clause 305.2.1.2 Add the following after second paragraph:

“Soils having medium and high swelling potential shall be defined based on Liquid Limit, Plastic Limit, Shrinkage Limit, Gradation, Free swelling Index, Field dry Density and Field Moisture Content and types of Clay minerals present in the soil and as directed by the Engineer. The location and the extent of these soils with medium to high swelling potential should be defined as directed by the Engineer.”

Sub-Clause 305.2.2.2 Borrow Materials

Para 1 of this Clause shall read as under:

“ No borrow area shall be made available by the Employer for this work. The arrangement for the source of supply of the material for embankment and sub-grade as well as compliance to the different environmental requirements in respect of excavation and borrow areas as stipulated, from time to time, by the Ministry of Environmental and Forest, Government of India and the local bodies, as applicable, shall be the sole responsibility of the Contractor.”

Sub-Clause 305.2.2.4 Compaction Requirements

In Clause 305.2.2.4 delete Table 300-2 and substitute the following:

Table 300-2

Compaction Requirements of Embankment and Subgrade

Sr. No.	Type of Work/Material	Relative Compaction as %age of maximum laboratory dry density as per IS 2720 (Part 8)
1	Subgrade and earthen shoulders	Not less than 97%
2	Embankment	Not less than 95%
3	Expansive clays	Not allowed
4	Design CBR of Subgrade & Shoulder has been taken 8. The borrow earth used for sub grade material must satisfied the requirement of the design CBR of 8 %	

Para 2 of this Clause given below Table 300-2 shall read as under:

The contractor shall at least 21 working days before commencement of construction of embankment and the sub grade; submit the following to the Engineer for approval:

- (i) The values of maximum dry density and optimum moisture content obtained in accordance with IS: 2720 (Part 8) for each fill material proposed to be used in the construction of embankment and sub grade.
- (ii) The graphs of Density plotted against moisture content from which each of the values in (i) above of maximum dry density and optimum moisture content were determined.
- (iii) The dry density-moisture content-CBR relationships, heavy comp active efforts conforming to the IS 2770 (part 8) for each of the fill material proposed to be used in the subgrade.

The above information shall form the basis for compaction only upon its approval by the Engineer."

Sub-Clause 305.3 Construction Operations

Sub-Clause 305.3.4 Compacting Ground Supporting Embankment/Subgrade

Para 1 of this clause shall be read as

"Where necessary the original ground shall be levelled, scarified, mixed with water and then compacted by rolling to facilitate placement of first layer of embankment so as to achieve minimum dry density as given in Table 300-2.

Sub-Clause 305.8 Measurement for Payment

Substitute Clause 305.8.1 shall be read as

"Earth embankment/sub-grade construction shall be measured separately by taking cross sections at intervals after clearing and grubbing and if necessary compaction of original ground before the embankment work starts and after its completion and computing the volumes of earthwork in cubic metres by the method of average and areas."

CLAUSE 306 SOIL EROSION AND SEDIMENTATION CONTROL

Sub-Clause 306.4 Measurements for Payment

Substitute Clause 306.4 as follows:

"All temporary sedimentation and pollution control works shall be deemed as incidental to the earthwork and other items of work and as such no separate payment shall be made for the same."

SECTION 400 Sub-Bases, Bases (Non-Bituminous) and Shoulders

CLAUSE 401 GRANULAR SUB BASE

Sub-Clause 401.1 Scope

	Add the following at the end of this Clause: "A site trial shall be performed in accordance with Clause 901.16."
Sub-Clause 401.2.2	Physical Requirements Add at the end of this clause as under: The Contractor shall, at least 21 working days before the commencement of the construction of the sub-base course, submit to the Engineer, the results for approval of the laboratory testing on the physical properties defined above. The construction of the sub-base course shall be taken up only upon the Engineer's approval of the material. Grading-I of table 400-1 shall be adopted at site.
CLAUSE 406	WET MIX MACADAM SUB BASE/BASE
Sub-Clause 406.4	Opening to Traffic The Clause shall be read as follows: No vehicular traffic of any kind shall be allowed on the finished wet mix macadam surface.
SECTION 500	Base and Surface Courses (Bituminous)
Sub-Clause 501.2	Materials
Sub clause 501.2.1	Binder Binder of VG-40 grade shall be used or if available viscosity grade of bitumen shall be used in accordance with IS: 73
Sub-Clause 501.2.2	Delete "Crushed gravel or other hard material" from first Line of Para 1." Para 3 is deleted.
CLAUSE 505	DENSE BITUMINOUS MACADAM
Sub-Clause 505.2.1	Bitumen Binder of VG-40 grade shall be used or if available viscosity grade of bitumen shall be used in accordance with IS: 73.
CLAUSE 507	BITUMINOUS CONCRETE
Sub-Clause 507.2.1	Bitumen Binder of CRMB-60 grade shall be used.
SECTION 800	Traffic Signs, Markings and Other Road Appurtenances
CLAUSE 803	ROAD MARKINGS
Sub-Clause 803.2	Materials This clause shall read as under: "Road markings shall be hot applied thermoplastic compound and the materials shall meet the requirements as specified in Clause 803.4. The road markings shall be laid in one layer with appropriate road marking machine approved by the Engineer. Before the road-marking machine is used on the permanent works, the satisfactory working of the machine shall be demonstrated on a suitable site, which is not part of the permanent works. The rate of application shall be checked and adjusted as necessary before application on a large scale is commenced, and the reafterdaily."
CLAUSE 806	ROAD DELINATORS

Sub-Clause 806.2

This clause shall read as follows:

- a) Triangular Object Marker shall be 300mm side with four red reflectors, made out of 2mm thick aluminium sheet, face to be fully covered by high intensity grade white retro reflective sheeting of encapsulated lens type as per clause 801. The background/border/symbols shall be made by screen-printing of desired colour as per sign details. The sign plate shall be fixed with 6mm dia. aluminium rivets on MS angle iron frame. The angle iron frame shall be made with angle of size 40mmx40mmx5mm. The sign shall be fixed with nut-bolts & welding on MS pipe 50mm dia (NB-MW) and 500mm high.
- b) Rectangular hazard marker 600mm x 300mm made out of 2mm thick aluminium sheet, face to be fully covered by high intensity grade white retro reflective sheeting of encapsulated lens type. The background/ border/ symbols shall be made by screen-printing of desired colour as per sign details. The sign plate shall be fixed with 6mm dia aluminium rivets on MS angle iron frame. The angle iron frame shall be made with angle of size 40mmx40mmx5mm. The sign shall be fixed to 80mm dia (NB-MW) MS pipe.
- c) Roadway Indicators shall be 1000mm high made with 100 mm dia. NB medium weight MS pipe. One reflector of high intensity grade retro reflective sheeting with encapsulated lens shall be provided on top of the reflector. The white & red reflector shall be provided alternatively of 40mm width, so that total width of reflector shall be 120mm. A wire mesh cover of 150mm height shall be provided on top.
- d) All components of signs & supports shall be thoroughly de scaled, cleaned, primed and painted with two coats of epoxy paint. The sign backside shall be with grey colour and post shall be white colour/ alternate white & black bands. The post below ground shall be painted with three coats of red lead.

Clause 2100

Open Foundation

Sub-Clause 2104.1

Preparation of Foundation

Please add the following as a last para-

Considering the soil SBC as per Geotechnical report, 1 m of depth below the founding level of bridges shall be removed and replaced with granular sand. The cost of the excavation and sand shall be made from respective items.

Schedule - E

(See Clauses 2.1 and 14.2)

Maintenance Requirements

1. Maintenance Requirements

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

[Specify all the relevant documents]

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 Engineer.

8. Repairs on account of natural calamities

- (a) All damages occurring to the Project Highway on account of a Force Majeure Event or wilful 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.

Table -1: Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, Approaches of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm in depth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA2003(http://www.tfhr.com/pavement/ltp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2
	Cracking	Nil	< 5 % subject to limit of 0.5 sq.m for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15 -30 days	MORT&H Specification 3004.2
	Corrugations and Shoving	Nil	< 0.1% of area	Daily	Length Measurement Unit like		2-7 days	IRC:82- 2015
	Bleeding	Nil	< 1 % of area	Daily			3-7 days	MORT&H Specification 3004.4
	Ravelling/Stripping	Nil	< 1 % of area	Daily			7-15 days	IRC:82- 2015 read with IRC SP 81
	Edge Deformation/ Breaking	Nil	< 1 m for any 100 m section and width <0.1 m at any location, restricted to 30 cm from the edge	Daily	Scale, Tape, odometer etc.		7- 15 days	IRC:82- 2015
	Roughness BI	2000mm/km	2400mm/km	Bi- Annually	Class I Profile meter	Class I Profile meter: ASTM E950 (98)	180 days	IRC:82- 2015
	Skid Number	60SN	50SN	Bi- Annually	SCRIM (Sideway- force Co efficient Routine Investigation Machine or equivalent)	:2004 –Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement	180 days	BS: 7941-1: 2006
	Pavement Condition Index	3	2.1	Bi- Annually			180 days	IRC:82- 2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	Acceptable					
						Condition Survey Equipment		
	Other Pavement Distresses			Bi- Annually			2-7 days	IRC:82- 2015
	Deflection/ Remaining Life			Annually	Falling Weight Deflectometer	IRC 115: 2014	180 days	IRC:115- 2014
	Roughness BI	2200m m/km	2400mm /km	Bi- Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656 - 94: 2000	180 days	IRC:SP:83- 2008
Rigid Pavement (Pavement of MCW, Service Road, Grade structure, approaches of connecting road, slip roads, lay byes etc. as applicable)	Skid	Skid Resistance no. at different speed of vehicles		Bi- Annually	SCRIM (Sideway- force	IRC:SP:83-2008	180 days	IRC:SP:83- 2008
		Minimum SN		traffic Speed (Km/h)				
		36		50	Coefficient Routine Investigation Machine or equivalent)			
		33		65				
Embankment/ Slope		32		80				
		31		95				
		31		110				
	Edge drop at shoulders	Nil	40m m	Daily			7-15 days	MORT&H Specification 408.4
	Slope of camber/cross fall	Nil	<2%variation inprescribedslope of camber/cross fall	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC	7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15 %variation inprescribe side slope	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification
	Rain Cuts/ Gullies in slope	Nil	Nil	DailySpecialy During Rainy Season	NA		7-15 days	MORT&H Specification

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

Table -2:Maintenance Criteria for Rigid Pavements:

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
CRACKING						
1	Single Discrete Cracks Not intersecting with any joint	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	Not applicable
			1	$w < 0.2$ mm. hair cracks		
			2	$w = 0.2 - 0.5$ mm, discernible from slow-moving car	Seal without delay	Seal, and stitch if $L > 1$ m. Within 7 days
			3	$w = 0.5 - 1.5$ mm, discernible from fast-moving car		
			4	$w = 1.5 - 3.0$ mm	Seal, and stitch if $L > 1$ m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15 days
			5	$w > 3$ mm.		
2	Single Transverse (or Diagonal) Crack intersecting with one or more joints	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	$w < 0.2$ mm, hair cracks	Route and seal with epoxy. Within 7 days	Staple or Dowel Bar Retrofit. Within 15 days
			2	$w = 0.2 - 0.5$ mm, discernible from slow vehicle		
			3	$w = 0.5 - 3.0$ mm, discernible from fast vehicle	Route, seal and stitch, if $L > 1$ m. Within 7 days	
			4	$w = 3.0 - 6.0$ mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected.
			5	$w > 6$ mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	Portion with norms and specifications - See Para 5.5 & 9.2 Within 15 days
3	Single Longitudinal Crack intersecting with one or more joints	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	$w < 0.5$ mm, discernible from slow moving vehicle	Seal with epoxy, if $L > 1$ m. Within 7 days	Staple or dowel bar retrofit. Within 15 days
			2	$w = 0.5 - 3.0$ mm, discernible from fast vehicle	Route seal and stitch, if $L > 1$ m. Within 15 days	-
			3	$w = 3.0 - 6.0$ mm	Staple, if $L > 1$ m. Within 15 days	Partial Depth Repair with stapling. Within 15 days
			4	$w = 6.0 - 12.0$ mm, usually associated with spalling	Not Applicable, as it may be full depth	
			5	$w > 12$ mm, usually associated with spalling, and/or slab rocking under traffic		Full Depth Repair Dismantle and reconstruct affected portion as per norms And specifications - See Para 5.6.4 Within 15 days

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
4	MultipleCracks intersecting with one or morejoints	w = width of crack	0	Nil, not discernible	No Action	Dismantle, Reinstatement subbase, Reconstruct whole slab as per specifications within 30 days
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > 1 m. Within 15 days	
			2	w = 0.2 - 0.5 mm. discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	
			4	w = 3.0 - 6.0 mm panel broken into 2 or 3pieces		
			5	w > 6 mm and/or panelbroken into more than 4 pieces		
5	Corner Break	w = width of crack L = length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to secure broken parts Within 7 days	Seal with epoxy seal withepoxy Within 7days
			2	w < 1.5 mm; L < 0.6 m, only one cornerbroken	Partial Depth (Refer Figure 8.3 of IRC: SP: 83-2008) Within 15 days	Full depth repair Reinstatement sub-base, and reconstructthe slab as per norms and specifications within 30days
			3	w < 1.5 mm; L < 0.6 m, two corners broken		
			4	w > 1.5 mm; L > 0.6 m or three corners broken		
			5	three or four corners broken		
6	Punch out (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)	w = width of crack L = length(m/m2)	0	Nil, not discernible	Applicable, as it may be fulldepth	No Action
			1	w < 0.5 mm; L < 3 m/m ²		Seal with low viscosity epoxy to secure broken parts. Within 15days
			2	either w > 0.5 mm or L < 3 m/m ²		
			3	w > 1.5 mm and L < 3 m/m ²		Full depth repair - Cut out and replace damaged area taking care not to damage reinforcement. Within30days
			4	w > 3 mm, L < 3 m/m ² and deformation		
			5	w > 3 mm, L > 3 m/m ² and deformation		
7	RavellingorHoneycombttype surface	r = area damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	Short Term No action.	Not Applicable
			1	r < 2 %	Local repair of areas damaged and liable to be damaged. Within 15 days	
			2	r = 2 - 10 %		
			3	r = 10-25%	Bonded Inlay, 2 or 3 slabs if affecting. Within 30 days	
			4	r = 25 - 50 %		
			5	r > 50% and h > 25 mm	Reconstruct slabs, 4 or more slabs ifaffecting.	

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
					Within 30 days	
8	Scaling	r = damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	Short Term	Long Term
			1	r <2 %	No action.	Not Applicable
			2	r = 2 - 10 %	Local repair of areas damaged and liable to be damaged. Within 7 days	
			3	r = 10 - 20%	Bonded Inlay within 15 days	
			4	r = 20 - 30 %		
			5	r > 30 % and h > 25 mm	Reconstruct slab within 30 days	
9	Polished Surface/Glazing	t = texture depth, sand patch test	0		No action.	Not Applicable
			1	t > 1 mm	Monitor rate of deterioration	
			2	t = 1 - 0.6 mm		
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		
			5	t < 0.1 mm	Diamond Grinding if affecting 50% or more slabs in a continuous stretch of minimum 5 km. Within 30 days	
10	Pop out (Small Hole), Pothole Refer Para 8.4	n = number/m ² d = diameter h = maximum depth	0	d < 50 mm; h < 25 mm; n < 1 per 5 m ²	No action.	Not Applicable
			1	d=50-100mm;h<50mm;n<1 per 5 m ²	Partial depth repair 65 mm deep. Within 15 days	
			2	d=50-100mm;h>50mm;n<1 per 5 m ²		
			3	d = 100 - 300 mm; h < 100 mm n < 1 per 5m ²		
			4	d = 100 - 300 mm; h > 100 mm; n < 1 per 5m ²		
			5	d > 300 mm; h > 100 mm: n > 1 per 5 m ²		
Joint Defects						
11	Joint Seal Defects	loss or damage L = Length as % total joint length	0	Difficult to discern.	Short Term	Long Term
					No action.	Not Applicable
			1	Discernible, L< 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
			3	Notable. $L > 25\%$ insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days	
			5	Severe; $w > 3$ mm negligible protection against ingress of water and trapping incompressible material.	Clean, widen and reseal the joint. Within 7 days	
12	Spalling of Joints	w = width on either side of the joint L = length of spalled portion (as % joint length)	0	Nil, not discernible	No action.	
			1	$w < 10$ mm	Apply low viscosity epoxy resin/ mortar in cracked portion. Within 7 days	
			2	$w = 10 - 20$ mm, $L < 25\%$	Partial Depth Repair. Within 15 days	
			3	$w = 20 - 40$ mm, $L > 25\%$	30 - 50 mm deep, $h = w + 20\%$ of w , within 30 days	
			4	$w = 40 - 80$ mm, $L > 25\%$	50 - 100 mm deep repair. $H = w + 20\%$ of w . Within 30 days	
			5	$w > 80$ mm, and $L > 25\%$		
13	Faulting (or Stepping) in Cracks or Joints	f = difference of level	0	not discernible, < 1 mm	No action.	No action.
			1	$f < 3$ mm		
			2	$f = 3 - 6$ mm	Determine cause and observe, take action for diamond grinding	Replace the slab as appropriate.
			3	$f = 6 - 12$ mm	Diamond Grinding	Within 30 days
			4	$f = 12 - 18$ mm	Raise sunken slab.	Replace the slab as appropriate.
			5	$f > 18$ mm	Strengthen subgrade and sub-base by grouting and raising sunken slab	Within 30 days
14	Blow-up or Buckling	H = vertical displacement from normal profile	0	Nil, not discernible	Short Term	Long Term
			1	$h < 6$ mm	No Action	
			2	$h = 6 - 12$ mm	Install Signs to Warn Traffic	
			3	$h = 12 - 25$ mm	within 7 days	
			4	$h > 25$ mm	Full Depth Repair. Within 30 days	
			5	shattered slabs, i.e. 4 or more pieces	Replace broken slabs. Within 30 days	
15	Depression	H = negative vertical displacement from normal profile L = length	0	Not discernible, $h < 5$ mm	No action.	Not Applicable
			1	$h = 5 - 15$ mm		
			2	$h = 15 - 30$ mm, $Nos < 20\%$ joints	Install Signs to Warn Traffic within 7 days	

Sr.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Strengthen subgrade. Reinstate pavement at normal level	
			5	h > 100 mm	If L < 20 m. Within 30 days	
16	Heave	h = positive vertical displacement from normal profile. L = length	0	Not discernible. h < 5 mm	Short Term No action.	Long Term
			1	h = 5 - 15 mm	Follow up.	
			2	h = 15 - 30 mm, Nos <20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Stabilise subgrade.	
			5	h > 100 mm	Reinstate pavement at normal level if length < 20 m. Within 30 days	
					scrabble	
17	Bump	H =vertical displacement from normal profile	0	h < 4 mm	No action	
			1	h = 4 - 7 mm	Grind, in case of new construction within 7 days	Construction Limit for New Construction.
			3	h = 7 - 15 mm	Grind, in case of ongoing Maintenance within 15 days	Replace in case of new construction. Within 30days
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	Lane to Shoulder Drop-off	f = difference of level	0	Nil, not discernible < 3mm	Short Term No action.	Long Term
			1	f = 3 - 10 mm	Spot repair of shoulder within 7 days	
			2	f = 10 - 25 mm		
			3	f = 25 - 50 mm	Fill up shoulder within 7 days	For any 100 m stretch Reconstruct shoulder, if affecting 25% or more of stretch. Within 30days
			4	f = 50 - 75 mm		
			5	f > 75 mm		
Drainage						
19	Pumping	quantity of fines and water expelled through open joints and cracks Nos Nos/100 m stretch	0	not discernible	No Action	
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints Without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	appreciable/ Frequent 10 -25%	Lift or jack slab within 30 days.	
			5	abundant,crack development >25%	Repair distressed pavement	

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

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

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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Time Visibility	<u>Performance for Dry Retro reflectivity during nighttime:</u> <u>Design (RL) Retro Reflectivity Speed (mcd/m²/lux)</u> <div> <div>Initial (7 days)</div> <div>Minimum Threshold level (TL) & warranty period required up to 2 years</div> </div> <div> <div>Up to 65</div> <div>200</div> <div>80</div> </div> <div> <div>65 - 100</div> <div>250</div> <div>120</div> </div> <div> <div>Above 100</div> <div>350</div> <div>150</div> </div> <u>Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):</u>		per Annexure-E		24 hours Cat-2 Defect – within 2 months	
		Initial 7 days Retro reflectivity: 100 mcd/m ² /lux Minimum Threshold Level: 50 mcd/m ² /lux					
	Skid Resistance	Initial and Minimum performance for Skid Resistance: Initial (7 days): 55BPN Min. Threshold: 44BPN *Note: shall be considered under urban/city traffic condition encompassing the	Bi-Annually	As per Annexure-G of IRC:35-2015		Within 24 hours	IRC:35-2015

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended measures	Remedial Time limit for Rectification	Specifications and Standards
		locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc.					
Road Signs	Shape Position and	Shape and Position as per IRC: 67- 2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is Damaged. Relocation as per requirement change of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/Cantilever Sign boards 48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/Cantilever Sign boards	IRC:67-2012
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of each Signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.			RC:67-2012
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance measuring tape	Raising Kerb Height	Within 1 Month	RC 86:1983
	Kerb Painting	<u>Functionality:</u> Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	RC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2014 and IRC: 35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:84-2014,IRC:35-2015
	Pedestrian Guardrail	<u>Functionality:</u> Functioning of	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		ning of guardrail asintended		backup			
	Traffic Safety Barriers	<u>Functionality:</u> Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014, IRC:119-2015
	End Treatment	<u>Functionality:</u> Functioning of End Treatment as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014,
	Traffic Safety Barriers			backup			IRC:119- 2015
	Attenuators	<u>Functionality:</u> Functioning of Attenuators asintended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP-2014, IRC:119- 2015
	Guard Posts and Delineators	<u>Functionality:</u> Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: 79 - 1981
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67-2012
	Traffic Blinkers	<u>Functionality:</u> Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014
Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84-2014
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84-2014
	Toll	Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be	Improvement in Lighting System	24 hours	IRC:SP:84-2014

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Plaza Canopy Lights			measured with luxmeter			
		No major/minor failure in the lighting system	Daily	-	Rectification of failure	8 hours	IRC:SP:84-2014
Trees and Plantation including median plantation	Obstruction in a minimum head-room of 5.5 m above carriageway or obstruction in visibility of road signs	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC:SP:84-2014
	Deterioration in health of trees and bushes	Health of plantation shall be as per requirement of specifications & instructions issued by Authority from time to time	Daily	Visual with video/image backup	Timely watering and treatment. Or Replacement of Trees and Bushes.	Within 90 days	IRC:SP:84-2014
	Vegetation affecting sight line and road structures	Sight line shall be free from obstruction by vegetation	Daily	Visual with video/image backup	Removal of Trees	Immediate	IRC:SP 84-2014
Rest Areas	Cleaning toilets	-	Daily	-	-	Every 4 hours	
	Defects in electrical, water and sanitary installations	-	Daily	-	Rectification	24 hours	
Other Project Facilities and	Damage or deterioration in Approach Roads,		Daily	-	Rectification	15 days	IRC:SP 84-2014

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended measures	Remedial Time limit for Rectification	Specifications and Standards
Approach roads		pedestrian facilities, truck lay-bys, bus-bays, bus-shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works					
Pipe/box/slab culverts	Free waterway/unobstructed flow section	85% of culvert normal flow area to available.	2 times in a year (before and after rainy season)	Inspection by Bridge Engineer as per IRC SP: 35-1990 and recording of depth of silting and area of vegetation.	Cleaning silt up soils and debris in culvert barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrel before rainy season.	15 days before onset of monsoon and within 30 days after end of rainy season.	IRC 5-2015, IRC SP:40-1993 and IRC SP:13-2004
	Leak-proof expansion joints if any	No leakage through expansion joints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35-1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-1993 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25 sqm Delamination of concrete not more than 0.25 sq.m. Cracks wider than 0.3 mm not more than 1m aggregate length	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording	Repairs to spalling, cracking, delamination, rusting shall be followed as per IRC:SP:40-1993.	15 days	IRC SP 40-1993 and MORTH Specification s clause 2800
		Damaged of rough stone apron or bank revetment not	2 times in a year (before	Condition survey as per	Repairs to damaged aprons and pitching	30 days after defect observation or 2	IRC: SP 40-

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Protection works in good condition	more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	and after rainy season)	IRC SP:35-1990		weeks before onset of rainy season whichever is earlier.	1993and IRC:SP:13-2004.
Bridges including ROB's Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811
Bridge - Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORT&H Specification 3004 & 2811.
	User safety (condition of crash barrier and guardrail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed condition survey as per IRC SP: 35-1990.	Repairs and replacement of safety barriers as the case may be	3 days	IRC: 5-1998, IRC SP: 84-2014 and IRC SP: 40-1993.
	Rusted reinforcement Spalling of concrete Delamination	Not more than 0.25 sq.m Not more than 0.50 sq.m Not more than 0.50 sq.m	Bi- Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out the repairs to affected concrete portion with epoxy mortar / concrete.	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
	Cracks wider than 0.30 mm	Not more than 1m total length	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile	Grouting with epoxy mortar, investigating causes for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP: 40-1993 and MORTH Specification 2800.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
				Bridge Inspection Unit			
	Rainwater seepage through deck slab	Leakage - nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting of deck slab at leakage areas, waterproofing, repairs to drainage spouts	1 months	MORTH specifications 2600 & 2700.
	Deflection due to permanent loads and live loads	Within design limits.	Once in every 10 years for spans more than 40 m	Load test method	Carry out major rehabilitation works on bridge to retain original design load capacity	6 months	IRC SP: 51-1999.
	Vibrations in bridge deck due to moving trucks	Frequency of vibrations shall not be more than 5 Hz	Once in every 5 years for spans more than 30m and every 1 year for spans between 15 to 30 m	Laser displacement sensors or laser vibro-meters	Strengthening structure of super	4 months	AASHTO LRFD specifications
		No damage to elastomeric sealant compound in		Detailed condition survey as per	Replace of expansion joint seal		MORTH specifications

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Leakage in expansion joints	strip seal expansion joint, no leakage of rain water through expansion joint in case of buried and asphalt plug and copper strip joint.	Bi-Annually	IRC SP:35-1990 using Mobile		15 days	2600 and IRC SP: 40-1993.
	Debris and dust in strip seal expansion joint	No dust debris expansion or in joint gap.	Monthly	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Cleaning of expansion joint gap thoroughly	3 days	MORTH specification s 2600 and IRC SP: 40-1993.
	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No silt, debris, clogging of drainage spout collection chamber.	Monthly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainagespout if any leakages observed.	3 days	MORTH specification 2700.
Bridge-substructure	Cracks/spalling of concrete/rusted steel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting/guniting and micro concreting expending on type of defect noticed	30 days	IRC SP: 40-1993 and MORTH specification 2800.
	Bearings	Delamination of bearing reinforcement not more than 5%, cracking	Bi-Annually	Detailed condition survey as per	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment	3 months	MORTH specification 2810 and IRC

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

Table 4: Maintenance Criteria for Hill Roads

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

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

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

A. Flexible Pavement

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

(i)	Damage in approach roads, pedestrian facilities, truck lay- byes, bus-bays, bus-shelters, cattle crossings, [Traffic Aid Posts, Medical Aid Posts] and service roads	15 (fifteen) days
(ii)	Damaged vehicles or debris on the road	4 (four) hours
(iii)	Malfunctioning of the mobile crane	4 (four) hours
Bridges		
(a) Superstructure		
(i)	Any damage, cracks, spalling/ scaling Temporary measures Permanent measures	within 48 (forty-eight) hours within 15 (fifteen) days or as specified by the Authority's Engineer
(b) Foundations		
(i)	Scouring and/or cavitation	15 (fifteen) days
(c) Piers, abutments, return walls and wing walls		
(i)	Cracks and damages including settlement and tilting, spalling, scaling	30 (thirty) days
(d) Bearings (metallic) of bridges		
(i)	Deformation, damages, tilting or shifting of bearings	15 (fifteen) days Greasing of metallic bearings once in a year
(e) Joints		
(i)	Malfunctioning of joints	15 (fifteen) days
(f) Other items		
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3 (three) days
(iii)	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g) Hill Roads		
(i)	Damage to retaining wall/breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12 (twelve) hours
(iii)	Snow requiring clearance	24 (twenty-four) hours

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

Schedule - F

(See Clause 4.1 (vii) (a))

Applicable Permits

1. Applicable Permits

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

Schedule – G

(See Clauses 7.1 and 19.2)

Annex-I

(See Clause 7.1)

Form of Bank Guarantee

[Performance Security/Additional Performance Security]

[To

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

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

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

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

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor’s obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Contract, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

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

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

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

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

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

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

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

7. The Guarantee shall cease to be in force and effect on ****\$. 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.

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

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

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

10. This Guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

11. 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.

12. The guarantor/bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of [MoRT&H/NHAI/NHIDCL/State PWD/BRO], details of which is as under:

S.No.	Particulars	Details
1	Name of Beneficiary	National Highways & Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	CNRB0019062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Canara Bank (erstwhile Syndicate Bank) transport Bhawan, 1st Parliament Street, New Delhi-110001

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

SIGNED, SEALED AND DELIVERED
For and on behalf of the Bank by:
(Signature)
(Name)
(Designation)
(Code Number)
(Address)

Annex – II

(Schedule - G)

(See Clause 19.2)

Form for Guarantee for Advance Payment

[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 “**EPC**”) basis, subject to and in accordance with the provisions of the Agreement
- (B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing @Bank Rate + 3% advance payment (herein after called “ **Advance Payment**”) equal to 10%(ten percent)of the Contract Price; and that the Advance Payment shall be made in two instalments 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 instalment to remain effective till the complete and full repayment of the instalment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} instalment 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:

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

1. 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.
2. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
3. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

^{\$} The Guarantee Amount should be equivalent to 110% of the value of the applicable instalment.

4. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
5. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Advance Payment.
6. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
7. The Guarantee shall cease to be in force and effect on ****\$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.
8. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
9. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.
10. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

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

\$ 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).

- (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.

Schedule - H

See Clauses 10.1 (iv) and 19.3

Contract Price Weightages

- 1.1 The Contract Price for this Agreement is
- 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 of Payment	Percentage Weightage
1	2	3	4
Road works including culverts, widening and repair of culverts.	28.74%	A - Widening and Strengthening of existing road	
		(1) Earthwork up to top of sub-grade* (includes Clearing & Dismantaling)	15.22%
		(2) Earthwork in Shoulder	00.46%
		(3) Sub-Base Course	09.22%
		(4) Non-Bituminous Base Course	06.56%
		(5) Bituminous Base Course	14.92%
		(6) Wearing Coat	00.58%
		(7) Widening and repair of culverts	00.00%
		B.1 - Reconstruction/New 2-lane realignment/Bypass (Flexible pavement)	
		(1) Earthwork up to top of sub-grade* (includes Clearing & Dismantaling)	02.11%
		(2) Earthwork in Shoulder	00.11%
		(3) Sub-Base Course	00.14%
		(4) Non-Bituminous Base Course	00.09%
		(5) Bituminous Base Course	00.15%
		(6) Wearing Coat	00.15%
		C..1- Reconstruction / New Service Road/Slip Road (Flexible Pavement)	
		(1) Earthwork up to top of sub-grade* (includes Clearing & Dismantaling)	01.20%
		(2) Earthwork in Shoulder	00.00%
		(3) Sub-Base Course	00.02%
		(4) Non-Bituminous Base Course	00.02%
		(5) Bituminous Base Course	00.03%
		(6) Wearing Coat	00.03%
		D - Re-Construction and New culverts on existing road, realignments, bypasses:	
		(1) Culverts (length < 6m)	48.99%
Minor Bridges/ Underpasses/Over passes/Viaducts	6.38%	A.1-Widening and repair of minor bridges (length > 6m and < 60m)	
		Minor Bridges	0.00%
		A.2- New minor bridges/ Viaduct	
		(i) Foundation +Sub- Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers up to	28.00%

Item	Weightage in percentage to the Contract Price	Stage of Payment	Percentage Weightage
1	2	3	4
		the abutment/pier cap.	
		(ii) Super-structure: On completion of the superstructure in all respects including wearing coat, bearings, expansion joints, handrails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	49.60%
		(iii) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	22.40%
Major Bridge (length >60 m) works and ROB/ RUB/ elevated sections/flyovers including viaducts, if any	39.29%	A.2- New Major Bridges	
		1) Foundation	09.46%
		2) Sub-structure	13.31%
		3) Super-structure (including bearings)	72.50%
		(a) casting of girders/fabrications of girders (steel)/Casting of segments	40% of 72.50%
		(b) Erection of girders, deck slab and bearing / Erection of segments	60% of 72.50%
		4) Wearing Coat including expansion joints	01.93%
		5) Miscellaneous Items like handrails, crash barriers, road markings etc.)	02.24%
		6) Wing walls/return walls	00.35%
		7) Guide Bunds, River Training works etc.	0.00%
		8) Approaches (including Retaining walls, stone pitching and protection works)	0.21%
		C.2-New Elevated Section / Flyovers/Grade Separators /Rotary/Viaduct/RUB	
		1) Foundation	00.00%
		2) Sub-structure	00.00%
		3) Super-structure (including bearings)	00.00%
		4) Wearing Coat (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	00.00%
		5) Miscellaneous Items like handrails, crash barriers, road markings etc.	00.00%
		6) Wing walls/return walls	00.00%
		7) Approaches Retaining walls/ Reinforced Earth wall, stone pitching and protection works)	00.00%
Other Works	22.61%	i) Toll Plaza	00.00%

Item	Weightage in percentage to the Contract Price	Stage of Payment	Percentage Weightage
1	2	3	4
		ii) Roadside drains + duct	09.49%
		iii) Road signs, markings, km stones safety devices,, delinators etc.	01.77%
		iv) Project Facilities	
		a) Bus bye /Bus Stop & Rainwater Harvesting	00.30%
		b) Truck lay-byes	00.00%
		c) Others - FOB/Temp. Road+barricading	10.44%
		v) Junctions	07.64%
		vi) High Mast Lighting & Electric Pole	07.23%
		vii) Roadside plantation & Miscellaneous	0.00%
		viii) Protection works including structure locations	
		a) Retaining Wall	56.01%
		b) Metal Beam / Thrie Beam Crash barrier	00.90%
		c) Kerb & Median	02.79%
		d) Toe wall , Stone pitching.	03.43%
		ix) Safety and traffic management during construction	00.00%
Electrical Utilities and Public Health Utilities (Water and Sewerage Lines)	2.98%	i) EHT Line	00.00%
		ii) HT/LT Line	65.00%
		iii) HT/LT Crossing	
		iv) Water Pipeline	35.00%

1.3 Procedure of estimating the value of work done

1.3.1 Road works

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

Table 1.3.1

Stage of Payment	Percentage - Weightage	Payment Procedure
A - Widening and Strengthening of existing road		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 20% of total length in 2-lane , whichever is less.
(1) Earthwork up to top of sub-grade* (includes Clearing & Dismantaling)	15.22%	
(2) Earthwork in Shoulder	00.46%	
(3) Sub-Base Course	09.22%	
(4) Non-Bituminous Base Course	06.56%	
(5) Bituminous Base Course	14.92%	
(6) Wearing Coat	00.58%	
(7) Widening and repair of culverts	00.00%	
B.1 - Reconstruction/New 4-lane realignment/bypass (Flexible pavement)		Unit of measurement is linear length. Payment of each stage

Stage of Payment	Percentage - Weightage	Payment Procedure
(1) Earthwork up to top of the sub-grade	02.11%	shall be made on pro rata basis on completion of a stage in full length or 20% of total length in 2-lane, whichever is less.
(2) Sub-base Course	00.11%	
(3) Non-Bituminous Course	00.14%	
(4) Bituminous Base Course	00.09%	
(5) Wearing Coat	00.15%	
6) Widening and repair of culverts	00.15%	
C..1- Reconstruction / New Service Road/Slip Road (Flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 10% of total length.
(1) Earthwork up to top of sub-grade* (includes Clearing & Dismantaling)	01.20%	
(2) Earthwork in Shoulder	00.00%	
(3) Sub-Base Course	00.02%	
(4) Non-Bituminous Base Course	00.02%	
(5) Bituminous Base Course	00.03%	
(6) Wearing Coat	00.03%	
D - Re-Construction and New culverts on existing road, realignments, bypasses:		
(1) Culverts (length < 6m)	48.99%	Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of at least nine culverts in 2-lane.

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

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

Where P= Contract Price

L = Total length in km

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

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

1.3.2 Minor Bridges and Underpasses/Overpasses.

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

Table 1.3.2

<u>Stage of Payment</u>	<u>Weightage</u>	<u>Payment Procedure</u>
1	2	3
A.1-Widening and repair of minor bridges	0.000%	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 widening & repair works of a minor bridge.
(length > 6m and < 60m)		
A.2- New minor bridges		

<u>Stage of Payment</u>	<u>Weightage</u>	<u>Payment Procedure</u>
1	2	3
(i) Foundation +Sub- Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers up to the abutment/pier cap.	28.00%	(i) Foundation +Sub- Structure: Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. Payment against foundation + sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation +substructure of each bridge subject to completion of at least two foundations along with sub-structure up to abutment/pier cap level of each bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Super-structure: On completion of the superstructure in all respects including wearing coat, bearings, expansion joints, handrails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	49.60%	(ii) Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure of at least one span in all respects as specified in the column of "Stage of Payment" in this sub-clause.
(iii) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	22.40%	(iii) Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of "Stage of Payment" in this sub-clause.

1.3.3 Major Bridge works, ROB/RUB and Structures.

Procedure for estimating the value of Major Bridge works, ROB/RUB and Structures shall be as stated in table 1.3.3:

Table 1.3.3

<u>Stage of Payment</u>	<u>Weightage</u>	<u>Payment Procedure</u>
1	2	3
A.2- New Major Bridges		
(i) Foundation	09.46%	(i) Foundation: Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the major Bridge subject to completion of at least two foundations of the major Bridge.
(ii) Sub-structure	13.31%	(ii) Sub-Structure: Payment against Substructure shall be made on pro-rata basis on

<u>Stage of Payment</u> 1	<u>Weightage</u> 2	<u>Payment Procedure</u> 3
		completion of a stage i.e. not less than 25% of the scope of substructure of the major bridge subject to completion of at least two sub-structures of abutments/piers up to abutment/pier cap level of the major bridge.
(iii) Wing walls/return walls	00.35%	(iii) Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(iv) Super-structure: (including bearings)	72.50%	(iv) Super-structure: (iv)(a) - Super-Structure (casting of girder/):- Unit of measurement is numbers. Payment against casting of girders shall be made on pro rata basis with respect of total numbers of girders required in the structure on completion of a stage i.e. not less than completion of casting of at least five girders of the structure. (iv)(b) - Super-Structure (casting of segments):- Unit of measurement is numbers. Payment against casting of segments shall be made on pro rata basis with respect of total numbers of segments required in the structure on completion of a stage i.e. not less than completion of casting of at least 50 (fifty) segments of the structure. (iv) (c) - Super-structure (Erection of girders, deck slab and bearing/Erection of segments): Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of at least one span in all respects as specified.
(v) Wearing Coat including expansion joints	01.93%	(v) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous Items like handrails, crash barriers, road markings etc.	02.24%	(vi) Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc. complete in all respects as specified.

<u>Stage of Payment</u> 1	<u>Weightage</u> 2	<u>Payment Procedure</u> 3
(vi) Guide Bunds, River Training works etc.	00.00%	(vii) Guide Bunds, River Training works: Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(viii) Approaches (including Retaining walls, stone pitching and protection works)	00.21%	(viii) Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
B.2- New Elevated Section / Flyovers/Grade Separators /Rotary/Viaduct/RUB		
1) Foundation	00.00%	(i) Foundation: Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROB/RUBs. Payment shall be made on prorated basis on completion of a stage i.e. not less than 25% of the scope of foundation of the ROB/RUB subject to completion of at least two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
2) Sub-structure	00.00%	(ii)Sub- Structure: Payment against Substructure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of substructure of the ROB/RUB subject to completion of at least two sub-structures of abutments/piers up to abutment/pier cap level of the ROB/RUB.
3)Super-structure (including bearings)	00.00%	(iii) Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of at least one span in all respects as specified.
4) Wearing Coat including expansion joints in case of ROB. In case of RUB, rigid pavement under RUB including drainage facility as specified.	00.00%	(iv) Wearing Coat: Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB- rigidpavement under RUB including drainage facility complete in all respects as specified as specified.
5) Miscellaneous Items like handrails, crash barriers, road markings etc.	00.00%	(v) Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc.

<u>Stage of Payment</u>	<u>Weightage</u>	<u>Payment Procedure</u>
1	2	3
		complete in all respects as specified.
6) Wing walls/return walls	00.00%	(vi) Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
7) Approaches (Retaining walls, stone pitching & protection works)	00.00%	(vii) Approaches: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.

1.3.4 Other works.

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

Table 1.3.4

<u>Stage of Payment</u>	<u>Weightage</u>	<u>Payment Procedure</u>
(i) Toll plaza	00.00%	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.
(ii) Road-side drains+duct	09.49%	Unit of measurement is linear length in km./Nos./sqm Payment shall be made on prorate basis on completion of a stage in a length of not less than 10 % (ten per cent) of the scope of work.
(iii) Road signs, markings, km stones, safety devices, delineators etc...	01.77%	
iv) Project Facilities		
a) Bus bye /Bus Stop & Rainwater Harvesting, etc.	00.30%	
b) Truck lay-byes	00.00%	
c) Others (Pedestrian FOB/ Temp. Road+ Barricading)	10.44%	
v) Junctions	07.64%	
vi) High Mast Lighting & Electric Pole	07.23%	
vii) Roadside plantation & Miscellaneous	00.00%	Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
viii) Protection works including structures		
a) Retaining Wall,	56.01%	
b) Metal beam /Thrie Beam crash barrier,	00.90%	
c) Kerb&Median	02.79%	
d) Toe wall , Stone pitching.	03.43%	
ix) Slope Protection (Hill Side) (Breast Wall & Wire Mesh)	00.00%	
10) Safety and traffic	00.00%	Every six monthly

Stage of Payment	Weightage	Payment Procedure
management during construction		

Temporary Road at Minor Bridge for Traffic Diversion is one time cost only and maintenance of the same shall be the obligation of the contractor during construction period)

1.3.5 Electrical Utilities and public health utilities

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

Table 1.3.5

Stage of payment	Weightage	Payment procedure
i) EHT line	0.00%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of EHT line. Payment shall be made for completed activity, (The average weightage of major activities (only for payment purpose) in shifting work is (i) Erection of Poles-20%, (ii) Conductor stringing including Laying of cable-30%, (iii) DTR erection (if involved)-15% and (iv) Charging of line including dismantling and siteclearance-35% (with DTR)and50% without DTR)
ii) EHT crossings	00.00%	Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 4 crossings.
iii) HT/LT line (including Transformers if any)	65.00%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of LT/HT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is (i) Erection of Poles-20%, (ii) Conductor stringing including laying of cable-30%, (iii) DTR erection (if involved)-10% and (iv) Charging of line including dismantling and siteclearance-40% (with DTR) and 50% without DTR)
Iv) HT/LT crossings		Cost of each crossing shall be determined on pro-rata basis with reference to total no, of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 10 crossings.

V) Water Pipeline	35.00%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipeline. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous works and dismantling and site clearance-50%)
v) Water Pipeline crossing		Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings. Payment shall be made for not less than 25% of the crossings subject to a minimum of 8 crossings.

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 instalments in accordance with the provisions of Clause 19.7.

Schedule - I
(See Clause 10.2 (iv))

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

1. The Project drawings, as defined in Clause 1.1, Definitions, Article 1, Definitions and Interpretation, Part-I: Preliminary, of the Contract Agreement shall consist:
 - (a) Working Drawings of all the components/elements of the Project as determined by Authority Engineer/Authority, and
 - (b) As-built drawings for the Project components/elements as determined by AE/Authority. As-built drawings shall be duly certified by Authority Engineer.
2. A minimum list of the drawings of the various components/elements of the Project and project facilities required to be submitted by the Contractor is given below:

A. BRIDGE

General Arrangement Drawing
Detailed Drawings of Structures/Bridges

B. ROAD (PLAN & PROFILE)

Plan & Profile
Cross Sections
Drawings of horizontal alignment, vertical profile and cross sections
Drawings of cross drainage works
Drawings of traffic diversion plans and traffic control measures
Drawings of road drainage measures
Drawings of typical details slope protection measures
Drawings of landscaping and horticulture
Drawings of street lighting

C. STANDARD DRAWINGS

Detail of Mandatory Regulatory Signs
Detail of Mandatory Regulatory Signs & Compulsory Direction Control and Other Signs
Detail of Informatroy Signs
Detail of Cautionary Signs-TS
Detail of cautionary warning signs
Detail of cautionary warning signs
Details of route marking (chevron marking)
Details of road marking
Details of directional signs
Details Toe drain
Details of pitching, filter material, chute drain and energy dissipation basin-std
Details of double head metal beam crash barrier
Details for 200 meter 1 km & km post
Detail for boundary stone & guard post
Drain retaining wall & kerb
Gabion wall

Schedule - J

(See Clause 10.3 (ii))

Project Completion Schedule

1. Project Completion Schedule

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

2. Project Milestone-I

- (i) Project Milestone-I shall occur on the date falling on the **256th** (Two Hundred and Fifty Six) day from the Appointed Date (the “**Project Milestone-I**”).
- (ii) Prior to the occurrence of Project Milestone-I, the Contractor shall have commenced construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 10% (ten per cent) of the Contract Price.

3. Project Milestone-II

- (i) Project Milestone-II shall occur on the date falling on the **438th** (Four Hundred and Thirty Eight) day from the Appointed Date (the “**Project Milestone- II**”).
- (ii) Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 30% (thirty-five per cent) of the Contract Price and should have started construction of all bridges.

4. Project Milestone-III

- (i) Project Milestone-III shall occur on the date falling on the **620th** (Six Hundred & Twenty) day from the Appointed Date (the “**Project Milestone- III**”).
- (ii) Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 60% (seventy per cent) of the Contract Price and should have started construction of all project facilities.

5. Scheduled Completion Date

- (i) The Scheduled Completion Date shall occur on the **730th** (Seven Hundred and Thirty) day from the Appointed Date.
- (ii) On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

6. Extension of time

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

Schedule - K

(See Clause 12.1 (ii))

Tests on Completion

1. Schedule for Tests

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

2. Tests

A. Road and Bridge

- (i) Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include [***].
- (ii) Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a Network Survey Vehicle (NSV) fitted with latest equipments and the maximum permissible roughness for purposes of this Test shall be [2,000 (two thousand)] mm for each kilometre.
- (iii) Tests for bridges: All major and minor bridges shall be subjected to the rebound hammer and ultrasonic pulse velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on Non destructive 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.
- (iv) Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and Standards, except tests as specified in clause 5, but shall include measuring the reflectivity of road markings and road signs; and measuring the illumination level (lux) of lighting using requisite testing equipment.

B. Other Tests

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

3. Agency for Conducting Tests

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

4. **Completion Certificate**

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

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

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

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

Schedule - L

(See Clause 12.2)

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**"), Upgradation of Existing 2-lane Highway to 4 lane with Paved Shoulder configuration from Km 26.350 (Design Chainage 26+615) (Khali Chowk) to Km 30.097 (Design Chainage 30+359) (Hanuman Chowk) of Jammu – Akhnoor Section of NH 144A in the Union Territory of Jammu & Kashmir on EPC basis. (Pkg - IIIB). (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 afore said 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..., Scheduled Completed date for which was the day of20.....

SIGNED, SEALED AND DELIVERED

For and on behalf of the Authority's Engineer by:

(Signature)

(Name) (Designation)(Address)

Schedule - M

(See Clauses 14.6, 15.2 and 19.7)

Payment Reduction for Non-Compliance

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

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

2. Percentage reductions in lump sum payments on monthly basis

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

S. No.	Item/Defect/Deficiency	Percentage
(a)	Carriageway/Pavement	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	Road, Embankment, Cuttings, Shoulders	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, rain cuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	Bridges and Culverts	
(i)	Desilting, cleaning, vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%
(iii)	Painting, repairs/replacement kerb, railings, parapets, guideposts/crash barriers	5%
(d)	Roadside Drains	
(i)	Cleaning and repair of drains	5%
(e)	Road Furniture	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5 th km stones	5%
(f)	Miscellaneous Items	
(i)	Removal of dead animals, broken down/accidental vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	Defects in Other Project Facilities	5%

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

$$R = \frac{P}{100} \times (M1 \text{ or } M2) \times \frac{L1}{L}$$

Where,

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

M1= Monthly lump-sum payment in accordance para 1.2 above of this Schedule M2= Monthly lump-sum payment in accordance para 1.2 above of this Schedule 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.

Schedule - N

(See Clause 18.1 (i))

Selection of Authority's Engineer

1. Selection of Authority's Engineer

- (i) The provisions of the Model Request for Proposal for Selection of Technical Consultants, issued by the Ministry of Finance in May 2009, or any substitute thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority's Engineer.
- (ii) In the event of termination of the Technical Consultants appointed in accordance with the provisions of 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

- (i) These Terms of Reference (the "**TOR**") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated (the "**Agreement**"), which has been entered into between the [name and address of the Authority] (the "**Authority**") and (the "**Contractor**")[#] for Upgradation of Existing 2-lane Highway to 4 lane with Paved Shoulder configuration from Km 26.350 (Design Chainage 26+615) (Khati Chowk) to Km 30.097 (Design Chainage 30+359) (Hanuman Chowk) of Jammu – Akhnoor Section of NH 144A in the Union Territory of Jammu & Kashmir on EPC basis. (Pkg - IIIB). (EPC) basis, and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

- In case the bid of Authority's Engineer is invited simultaneously with the bid of EPC project, then the status of bidding of EPC project only to be indicated

- (ii) The TOR shall apply to construction and maintenance of the Project Highway.

2. Definitions and interpretation

- (i) The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Agreement.
- (ii) References to Articles, Clauses and Schedules in this TOR shall, except where the context otherwise requires, be deemed to be references to the Articles, Clauses and Schedules of the Agreement, and references to Paragraphs shall be deemed to be references to Paragraphs of this TOR.
- (iii) The rules of interpretation stated in Article 1 of the Agreement shall apply, mutatis mutandis, to this TOR.

3. General

- (i) The Authority's Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.
- (ii) The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement, but subject to obtaining prior written approval of the Authority before determining:
- (a) any Time Extension;
 - (b) any additional cost to be paid by the Authority to the Contractor;
 - (c) the Termination Payment; or
 - (d) issuance of Completion Certificate or
 - (e) any other matter which is not specified in (a), (b), (c) or (d) above and which creates a financial liability on either Party.
- (iii) The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.
- (iv) The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2.

- (v) The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.
- (vi) In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

4. Construction Period

- (i) During the Construction Period, the Authority's Engineer shall review and approve 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 (vi). The Authority's Engineer shall complete such review and approval and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.
- (ii) The Authority's Engineer shall review and approve any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.
- (iii) The Authority's Engineer shall review and approve the Quality Assurance Plan submitted by the Contractor and shall convey its comments to the Contractor within a period of 21 (twenty one) days stating the modifications, if any, required thereto.
- (iv) The Authority's Engineer shall complete the review and approve of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.
- (v) The Authority's Engineer shall grant written approval to the Contractor, where necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Project Highway for purposes of maintenance during the Construction Period in accordance with the provisions of Clause 10.4.
- (vi) The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.
- (vii) The Authority's Engineer shall inspect the Construction Works and the Project Highway and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular, the Authority's Engineer shall include in its Inspection Report, the compliance of the recommendations made by the Safety Consultant.
- (viii) The Authority's Engineer shall conduct the pre-construction review of manufacturer's test reports and standard samples of manufactured Materials, and such other Materials as the Authority's Engineer may require.
- (ix) For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4 (ix), the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any

modification/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

- (x) The Authority's Engineer shall test check at least 50 (fifty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.
- (xi) The timing of tests referred to in Paragraph 4 (ix), and the criteria for acceptance/rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.
- (xii) In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works, the Authority's Engineer shall require the Contractor to carry out remedial measures.
- (xiii) The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project Highway, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 shall apply.
- (xiv) In the event that the Contractor fails to achieve any of the Project Milestones, the Authority's Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Authority's Engineer shall determine that completion of the Project Highway is not feasible within the time specified in the Agreement, it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority's Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.
- (xv) The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.2.
- (xvi) Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measure, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.
- (xvii) In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.
- (xviii) The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate, as the case may be. For carrying out its functions under this Paragraph 4 (xviii) and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

5. Maintenance Period

- (i) The Authority's Engineer shall aid and advise the Contractor in the preparation of its monthly Maintenance Programme and for this purpose carry out a joint monthly inspection with the Contractor.
- (ii) The Authority's Engineer shall undertake regular inspections, at least once every month, to evaluate compliance with the Maintenance Requirements and submit a Maintenance

Inspection Report to the Authority and the Contractor.

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

6. Determination of costs and time

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

7. Payments

- (i) The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2 (iv)(d).
- (ii) Authority's Engineer shall-
 - (a) within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment, pending issue of the Interim Payment Certificate; and
 - (b) within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor, after adjustments in accordance with the provisions of Clause 19.10.
- (iii) The Authority's Engineer shall, within 15 (fifteen) days of receipt of the Monthly Maintenance Statement from the Contractor pursuant to Clause 19.6, verify the Contractor's monthly statement and certify the amount to be paid to the Contractor in accordance with the provisions of the Agreement.
- (iv) The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provisions of Clause 19.16.

8. Other duties and functions

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

9. Miscellaneous

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

Schedule - O

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

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

- (a) the estimated amount for the Works executed in accordance with Clause 19.3
- (i) subsequent to the last claim;
- (b) amounts reflecting adjustments in price for the afore said 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 (iii)(a);
- (e) total of (a), (b), (c) and (d) above;
- (f) Deductions:
 - i. Any amount to be deducted in accordance with the provisions of the Agreement except taxes;
 - ii. Any amount towards deduction of taxes; and
 - iii. Total of (i) and (ii) above.
- (g) Net claim: (e) – (f)(iii);
- (h) The amounts received by the Contractor up to the last claim:
 - i. For the Works executed (excluding Change of Scope orders);
 - ii. For Change of Scope Orders, and
 - iii. Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

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

3. Contractor's claim for Damages

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

Schedule - P

(See Clause 20.1)

Insurance

1. Insurance during Construction Period

- (i) The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the Completion Certificate, the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:
 - (a) insurance of Works, Plant and Materials and an additional sum of [15 (fifteen)] per cent of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and
 - (b) insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.
- (ii) The insurance under sub para (a) and (b) of paragraph 1(i) 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 of not less than 15% of the Contract Price 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

- (i) 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: Rs. 2,00,00,000/- (Two Crore only)

- (ii) The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor's performance of this Agreement excluding:
 - (a) the Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and
 - (b) damage which is 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.

Schedule-Q

(See Clause 14.10)

Tests on Completion of Maintenance Period

1. Riding Quality Test

Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator and the maximum permissible roughness for purposes of this Test shall be [2,200 (two thousand and two hundred only)] mm for each kilometer.

2. Visual and physical test

The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include measurement of cracking, rutting, stripping and potholes and shall be as per the requirement of maintenance mentioned in Schedule-E.

Schedule-R

(See Clause 14.10)

Taking Over Certificate

I, (Name and designation of the Authority's Representative) under and in accordance with the Agreement dated (the "**Agreement**"), for Upgradation of Existing 2-lane Highway to 4 lane with Paved Shoulder configuration from Km 26.350 (Design Chainage 26+615) (Khati Chowk) to Km 30.097 (Design Chainage 30+359) (Hanuman Chowk) of Jammu – Akhnoor Section of NH 144A in the Union Territory of Jammu & Kashmir on EPC basis. (Pkg - IIIB). (the "**Project Highway**") on Engineering, Procurement and Construction (EPC) basis through (Name of Contractor), hereby certify that the Tests on completion of Maintenance Period in accordance with Article 14 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement and I hereby certify that the Authority has taken over the Project highway from the Contractor on this day.....

SIGNED, SEALED AND DELIVERED

(Signature)

(Name and designation of Authority's Representative)

(Address)

SCHEDULE [S]
(See Clause 26.1(iii))
Procedure for Dispute Resolution Board

The parties to the Contract Agreement mutually agree as follows:

- (1) The Board shall comprise of three Members having experience in the field of construction or have been involved in the Works related to construction and with the interpretation of contractual documents. One Member shall be selected by each of the Employer and the Contractor from the list maintained by NHAI hosted on its website (www.nhai.gov.in). In the event the parties fail to select the member within 28 days of the date of the signing of Contract Agreement, in that eventuality, upon the request of either or both parties such Member shall be selected by SAROD within 14 days. The third Member shall be selected by the other two members from the same list. If the two Members selected by or on behalf of the parties fail to select the third Member within 14 days after the later of their selections, then upon the request of either or both parties such third Member shall be selected by SAROD within 14 days. The third Member shall serve as Chairman of the Board.
- (2) The Board shall be constituted when each of the three Board Members has signed a Board Member's declaration of Acceptance as required by the DRB's rules and procedures (which, along with the declaration of acceptance form, are attached as Annexure herewith).
- (3) In the event of death, disability, or resignation of any Member, such Member shall be replaced in the same manner as the Member being replaced was selected. If for any other reason, a Member fails or is unable to serve, the Chairman (or failing the action of the Chairman then either of the other Members) shall inform the Parties and such non-serving Member shall be replaced in the same manner as the Member being replaced was selected. Any replacement made by the parties shall be completed within 28 days after the event giving rise to the vacancy on the Board, failing which the replacement shall be made by SAROD in the same manner as described above. Replacement shall be considered complete when the new Member signs the Board Member's Declaration of Acceptance. Throughout any replacement process, the Members not being replaced shall continue to serve and the Board shall continue to function and its activities shall have the same force and effect as if the vacancy had not occurred, provided, however, that the Board shall not conduct a hearing nor issue a decision until the replacement is completed.
- (4) If either the Employer or the Contractor is dissatisfied with any decision of the Board, and/or if the Board fails to issue its decision within 56 days after receipt of all the pleadings (along with the supporting documents) of the parties by the Chairman of the Board or any extension mutually agreed upon by the Employer and the Contractor, in such a case, either the Employer or the Contractor may, within 28 days after his receipt of the decision, or within 28 days after the expiry of the said period, as the case may be, give notice to the other party, with a copy for information to the Authority engineer, of his intention to refer the matter to the Conciliation Committee of Independent Experts (CCIE) of the Authority for Conciliation/amicable settlement.
- (5) It is mandatory to refer all the disputes to DRB before issuance of completion certificate and satisfactory completion of punch list items. No dispute shall be entertained after completion of aforementioned date.
- (6) If the Board has issued a decision to the employer and the Contractor within the said 56 days or any extension mutually agreed upon by the Employer and the Contractor and no notice of intention to commence Conciliation by the Conciliation Committee of Independent Experts (CCIE) of the Authority for Conciliation/amicable settlement as to such dispute has been given by either the Employer or the Contractor within 28 days after the parties received such decision from the Board, the decision shall become final and binding upon the employer and Contractor.
- (7) Whether or not it has become final and binding upon the Employer and the Contractor, a decision shall be admissible as evidence in any subsequent dispute resolution procedure, including any arbitration or litigation having any relation to the dispute to which the decision relates.
- (8) All decision of DRB which have become final and binding or till they have been reversed in subsequent conciliation/Arbitration process shall be implemented by the parties forthwith. Such implementation shall also include any relevant action of the Authority engineer.

- (9) If during the Contract Period, the Employer and the Contractor are of the opinion that the Disputes Resolution Board is not performing its functions properly, the Employer and the Contractor may together disband the Disputes Resolution Board and reconstitute it. In that case, a new board shall be selected in accordance with the provisions applying to the selection of the original Board as specified above, except that words "within 28 days after the signing of this Contract Agreement" shall be replaced by the words "within 28 days after the date on which the notice disbanding the original Board became effective".
- (10) The Employer and the Contractor shall jointly sign a notice specifying that the Board shall stand disbanded with effect from the date specified in the notice. The notice shall be posted by email to each Member of the Board. A Member shall be deemed to have received the e mail even if he refuses to have received the same.
- (11) All other terms and conditions of the original Contract Agreement shall remain unaltered/unaffected and the parties shall remain bound by terms and conditions as contained therein.

Disputes Resolution Board's Rules and Procedures

1. Except for providing the services required hereunder, the Board Members shall not give any advice to either party or to the Authority engineer concerning conduct of the Works. The Board Members:
 - (a) Shall have no financial interest in any party to the 'Contract, or the Authority engineer, or a financial interest in the contract, except for payment for services on the Board.
 - (b) Shall have had no previous employment by, or financial ties to, any party to the Contract Agreement, or the Authority engineer, except for fee based consulting services/advisers on other projects, and/or be Retired Government Officers (not connected in whole or part with the project), all of which must be disclosed in writing to both parties prior to appointment to the Board.
 - (c) Shall have disclosed in writing to both parties prior to appointment to the Board any and all recent or close professional or personal relationships with any director, officer, or employee of any party to the Contract, or the Authority engineer, and any and all prior involvement in the project to which the Contract relates;
 - (d) Shall not, while Board member, be employed whether as a consultant or adviser or otherwise by either party to the Contract, or the Authority engineer, except as a Board Member, without the prior consent of the parties and the other Board Members;
 - (e) Shall not, while a Board Member, engage in discussion or make any agreement with any party to the Contract, or with the Authority engineer, regarding employment whether as a consultant or otherwise whether after the Contract is completed or after service as a Board Member is completed.
 - (f) Shall remain and be impartial and independent of the parties and shall disclose in writing to the Employer, the Contractor and one another any fact or circumstance which might be such as to cause either the Employer or the Contractor to question the continued existence of the impartiality and independence required of Board Members; and
 - (g) Shall be fluent in the language of the Contract.
2. Except for its participation in the Board's activities as provided in the Contract Agreement and in this Agreement none of the Employer, the Contractor, and or the Authority engineer shall solicit advice or consultation from the Board or the Board Members on matters dealing with the conduct of the Works.
3. The Contractor shall :
 - (a) Furnish to each Board member one copy of all documents which the Board may request including Contract Agreement, progress reports and other documents pertinent to the performance of the Contract Agreement.
 - (b) In cooperation with the Employer, coordinate the site visits of the Board, including conference facilities, and secretarial and copying service.
4. The Board shall begin its activities following the signing of a Board Member's Declaration of Acceptance by all three Board Members, and it shall terminate these activities as set forth below
 - (a) The Board shall terminate its regular activities when either (i) issuance of completion certificate and completion of punch list items or (ii) the parties have terminated the contract and when, in either case, the Board has communicated to the parties and the Authority engineer its decision on all disputes previously referred to it.
 - (b) Once the Board has terminated its regular activities as provided by the previous paragraph, the Board shall remain available to process any dispute referred to it by either party. In case of such a referral, Board Members shall receive payments as provided in paragraphs 7(a)(ii), (iii) and (iv).

Board Members shall not assign or subcontract any of their work under these Rules and Procedures.

The Board Members are Independent and not employees or agents of either the Employer or the Contractor.

Payments to the Board Members for their services shall be governed by the following provisions

(a) Each Board Member will receive payments as follows :

i. A retainer fee per calendar month as specified in the schedule of fee made part of his Schedule and its revision from time to time. This retainer fee shall be considered as payment in full for :

- (A) Being available, on 7 days' notice, for all hearings, Site Visits, and other meetings of the Board.
- (B) Being conversant with all project developments and maintaining relevant files.
- (C) All offices and overhead expenses such as secretarial services, photocopying and office supplies (but not include telephone calls, faxes and telexes) incurred in connection with the duties as a Board Member.

ii A daily fee as specified in the schedule of fee in respect of fee for site visit & meeting, fee for meeting/hearing not at site and extra charges for days (max. of 02 days for travel on each occasion) other than hearing / meeting days.

iii Expenses, in addition to the above, all reasonable and necessary travel expenses (including economy class air fare, subsistence, and other direct travel expenses). Receipts for all expenses in excess of Rs. 2000/- (Rupees Two Thousand only) shall be provided.

iv Reimbursement of any taxes that may be levied on payments made to the Board Member pursuant to this paragraph 7.

(b) The retainer fee and other fees shall remain fixed for the period of each Board Member's term until revised by NHAI.

(c) Phasing out of monthly retainer fee. Beginning with the next month after the completion certificate (or, if there are more than one, the one issued last) has been issued, the Board members shall receive only one-third of the monthly retainer fee till next one year. Beginning with the next month after the Board has terminated its regular activities pursuant to paragraph 4(a) above, the Board members shall no longer receive any monthly retainer fee.

(d) Payments to the Board Members shall be shared equally by the Employer and the Contractor. The concerned Project Implementation Unit (PIU) of Employer shall pay members' invoices within 30 calendar days after receipt of such invoices and shall invoice the Contractor for one-half of the amounts of such invoices. The Contractor shall pay such invoices within 30 days" time period after receipt of such invoices.

8. Board Site Visits:

(a) The Board shall visit the Site and meet the representatives of the Employer, the Contractor and the Authority engineer at regular intervals, at times of critical construction events, at the written request of either party, and in any case not less than 6 times in any period of 12 months. The timing of Site visits shall be as agreed among the Employer, the Contractor and the Board, but failing agreement shall be fixed by the Board.

(b) Site visits shall include an informal discussion of the status of the construction of the Works. Site visits shall be attended by personnel from the Employer, the Contractor and the Authority engineer.

(c) At the conclusion of each Site visit, the Board shall prepare a report covering its activities during the visit and shall send copies to the parties and to the Authority engineer.

9. Procedure for Dispute Referral to the Board :

(a) If either party objects to any action or inaction of the other party or the Authority engineer, the objecting party may file a written Notice of Dispute to the other party with a copy to the Authority engineer stating that it is given pursuant to the Agreement and state clearly and in details the basis of the dispute.

(b) The party receiving the Notice of Dispute will consider it and respond to it in writing within 14 days after receipt.

(c) This response shall be final and conclusive on the subject, unless a written appeal to the response is filed with the responding party within 10 days after receiving the response and call upon Authority engineer to mediate and assist the parties in arriving an amicable settlement thereof. Both parties are encouraged to pursue the matter further to attempt to settle the dispute.

- (d) If the Authority engineer receiving the Notice of Dispute fails to provide a written response within 14 days after receipt of such Notice or failing mediation by Authority engineer, either party may require such dispute to be referred to the Board, either party may refer the dispute to the Board by written Request to the Board. The Request for decision shall state clearly and in full detail the specific issues of the dispute (s) to be considered by Board and shall be addressed to the Chairman of the Board, with copies to the other Board Members, the other party, and the Authority engineer, and it shall state that it is made pursuant to this Agreement.
- (e) When a dispute is referred to the Board, and the Board is satisfied that the dispute requires the Board's assistance, the Board decide when to conduct a hearing on the dispute. The Board may request that written documentation and arguments from both parties be submitted to each Board Member before the hearing begins. The parties shall submit insofar as possible agreed statements of the relevant facts.
- (f) During the hearing, the Contractor, the Employer, and the Authority engineer shall each have ample opportunity to be heard and to offer evidence. The Board's decision for resolution of the dispute will be given in writing to the Employer, the Contractor and the Authority engineer as soon as possible, and in any event not more than 56 days or any mutually extended period between the Employer and the Contractor. The time period of 56 days of issuance of DRB decision will reckon/start from the day of first hearing that begins after submission of complete pleadings (including supporting documents, if any) by the parties.

10. Conduct of Hearings :

- (a) Normally hearings will be conducted at the Site, but any location that would be more convenient and still provide all required facilities and access to necessary documentation may be utilized by the Board. Private session of the Board may be held at any cost effective location convenient to the Board. Video recordings of all hearings shall invariably be made. The Employer, the Authority engineer and the Contractor shall be given opportunity to have representatives at all hearings. Parties should restrain to bring any Advocate/Law Firm during DRB hearings.
- (b) During the hearings, no Board Member shall express any opinion concerning the merit of the respective arguments of the parties.
- (c) After the hearings are concluded, the Board shall meet privately to formulate its decision. The private meeting (s) of the Board shall not exceed 3 sittings. All Board deliberations shall be conducted in private, with all Members' individual views kept strictly confidential. The Board's decisions, together with an explanation of its reasoning shall be submitted in writing to both parties and to the Authority engineer. The decision shall be based on the pertinent contract provisions, applicable laws and regulations and the facts and circumstances involved in the dispute.
- (d) The Board shall make every effort to reach a unanimous decision. If this proves impossible the majority shall decide and the dissenting Member may prepare a written minority report together with an explanation of its reasoning for submission to both parties and to the Authority engineer.

11. In all procedural matters, including the furnishing of written documents and arguments relating to disputes, site visits and conduct of hearings, the Board shall have full and the final authority. If a unanimous decision on any such matter proves impossible, the majority shall prevail.

12. After having been selected and where necessary approved each Board Member shall sign two copies of the following declaration and make one copy available each to the Employer and to the Contractor.

"BOARD MEMBER'S DECLARATION OF ACCEPTANCE"

WHEREAS

- (a) A Contract agreement (the Contract) for the _____ project [fill in the name of project] has been signed on _____ [fill in date] between _____ [name of Employer] and _____ [name of Contractor] (the Contractor).;
- (b) The provisions of Agreement and Dispute Resolution Board's rules and procedure provided for establishment and operation of Dispute Resolution Board (DRB).
- (c) The undersigned has been selected to serve as a Board Member on said Board; NOW

THEREFORE, the undersigned Board Member hereby declares as follows :

- 1. I accept the selection as a Board Member and agree to serve on the Board and to be bound by the provisions of Contract agreement and rules and procedure provided for establishment and operation of Dispute Resolution Board (DRB),
- 2. With respect to paragraph 1 of Dispute Resolution Board's Rules and Procedure, said Annex A, I declare
 - (a) that I have no financial interest of the kind referred to in subparagraph (a):
 - (b) that I have had no previous employment nor financial ties of the kind referred to in subparagraph (b); and
 - (c) that I have made to both parties any disclosures that may be required by sub-paragraphs (b) and (c).
- 3. I declare that I have _____ no. of Arbitrations (list enclosed) and _____ no. of DRBs (list enclosed) in progress and that I will give sufficient time for the current assignment.

BOARD MEMBER

_____ *[insert name of Board Member]*

Date _____

Schedule of expenses and fees payable to the
Member (s) of Dispute Resolution Board (DRB)

The fee and other expenses payable to the members of DRB shall be as under :-

S.No.	PARTICULAR	AMOUNT PAYBLE
1.	Retainer-ship fee, secretarial assistance and incidental charges (telephone, fax, postage etc.)	Rs. 50,000/- per month for one package and maximum of Rs. 75,000/- per month for 2 or more packages
2(i)	Fee for site visit or meetings at site	Rs. 25,000/- per day
(ii)	Fee for meetings/hearings not at site	Rs. 10,000/- per day
3	Travelling expenses	Economy class by air, AC first class by train and AC taxi by road
4	Lodging & Boarding	Rs. 15,000/- per day (Metro Cities); or Rs. 10,000/- per day (in other cities); or Rs. 5,000/- per day (own arrangement)
5	Extra charges for days other than hearing/meeting days (travel days maximum of 2 days on each occasion)	Rs. 5,000/-
6	Local conveyance	Rs. 2,000/-

- i. Lodging, boarding and travelling expenses will be allowed only for those members who are residing 100 kms away from the place of meeting.
- ii. Delhi, Mumbai, Chennai, Kolkata, Bangalore and Hyderabad shall be considered as Metro Cities.
- iii. The above schedule of fee and expenses shall be applicable on or after the date of issue of this circular.
- iv. The expenses are to be shared equally by the parties i.e. Employer and Contractor

Appendix-III: Arbitration Rules of the Society for Affordable Redressal of
Disputes
(SAROD) SAROD' ARBITRATION RULES)
Under Clause 44.3.1

1. Scope of Application
2. Definitions
3. Notice, Calculation of Periods of Time
4. Commencement of Arbitration
5. Response by Respondent
6. Filing of Case Statements
7. Contents of Case Statements
8. Default in Filing and Serving Case Statements
9. Further Written Statements
10. SAROD to Provide Assistance
11. Appointment of Tribunal
12. Multi-party Appointment of the Tribunal
13. Appointment of Substitute Arbitrator
14. Independence and Impartiality of the 'tribunal
15. Code of Ethics for Arbitrators.
16. Challenge of Arbitrators
17. Decision on Challenge
18. Removal of the Tribunal
19. Re-hearing in the Event of Replacement of the Tribunal
20. Jurisdiction of the Tribunal
21. Fees of SA ROD and Arbitral Tribunal
22. Transmission of File of the Tribunal
23. Juridical Seat of Arbitration
24. Language of Arbitration
25. Conduct of the Proceeding
26. Communications between Parties and the Tribunal
27. Party Representatives
28. Hearings
29. Documents - only Arbitration
30. Witnesses
31. Experts Appointed by the Tribunal
32. Rules applicable to substance of dispute
33. Closure of Hearings
34. Additional Powers of the Tribunal
35. Deposits to Costs and Expenses
36. Decision Making by the Tribunal
37. The Award.
38. Additional Award
39. Correction of Awards
40. Settlement
41. Interest
42. Costs
43. Waiver
44. Exclusion of Liability
45. General Provisions
46. Amendment to Rules

PREAMBLE

In order to seek speedy, affordable, just and reasonable Redressal OR Dispute/ Differences between NHAI and Concessionaire/Contractor arising out of and during the course of execution of various contracts, a Society for Affordable Redressal of Disputes (SAROD) has been formed as a Society under Societies Registration Act, 1860 with registration No.S/RS/SW/10441/2013. It has been formed by National Highways Authority of India (NHAI) and National Highways Builders Federation (NHBF) with founding members as mentioned in the Memorandum of Association of SAROD.

SAROD ARBITRATION RULES

Rule I -Scope of Application

Where any agreement, submission or reference provides for arbitration at the Society for Affordable Redressal of Disputes ("SAROD"), or under the Arbitration Rules of the SAROD and where the case is a domestic arbitration shall be conducted in accordance with the following Rules, or such Rules as amended by the SAROD where the amendments take effect before the commencement of the Arbitration. Parties may adopt following clause for inclusion in the contract:-

"Any dispute or difference whatsoever arising between the parties and of or relating to the construction, interpretation, application, meaning, scope, operation or effect of this contract or the validity or the breach thereof, shall be settled by arbitration in accordance with the rules of arbitration of the "SAR.OD" and the award made in pursuance thereof shall be final and binding on the parties subject to Provisions of The Arbitration and Conciliation Act, 1996".

1.2 These rules shall come into effect from the day of approval by Governing Body of SAROD.

Rule 2 - Definitions

2.1 These Rules shall be referred to as "the SAROD Arbitration Rules".

2.2 In these Rules:

"Act" means the 'Arbitration and Conciliation Act 1996' of India and any statutory modifications or re-enactments thereof.

"SAROD" means the Society for Affordable Redressal of Disputes.

"SAROD Arbitrator Panel" means the list of persons admitted to serve as arbitrators under these Rules.

"NHAI" means National Highways Authority of India.

"NHBF" means the National Highways Builders Federation.

"GOVERNING BODY" means Governing Body of SAROD as defined in Article 9 of Memorandum of Association.

"PRESIDENT" means President of Governing Body of SAROD as defined in Rules & Regulation of SAROD,

"SECRETARY" means Secretary of SAROD as defined in Rules & Regulation of SAROD.

"TRIBUNAL" means either a Sole Arbitrator or all arbitrators when more than one is appointed.

"PARTY" means a party to an arbitration.

"E-Arbitration" means submission of pleadings, defence statement etc by E-mail and holding of proceedings via video conferencing.

Rule 3 - Notice, Calculation of periods of Time

3.1 For the purposes of these Rules, any notice, including a notification, communication or proposal, is deemed to have been received if it is physically delivered to the addressee or if it is

delivered at his habitual residence, place of business or mailing address, or, if none of these can be found after making reasonable inquiry, then at the addressee's last-known residence or place of business. Notice shall be deemed to have been received on the day it is so delivered.

- 32 For the purposes of calculating a period of time under these Rules, such period shall begin to run on the day following the day when a notice, notification, communication or proposal is received. If the last day of such period is an official holiday or a non-business day at the residence or place or business of the addressee, the period is extended until the first business day which follows. Gazetted public holidays or non-business days occurring during the running of the period of time are included in calculating the period.
- 3.3 Without prejudice to the effectiveness of any other form of written communication, written communication may be made by fax, email or any other means of electronic transmission effected to a number, address or site of a party,
- 3.4 The transmission is deemed to have been received on the day OF transmission. Rule 4 - Commencement of Arbitration

Rule 4 – Commencement of Arbitration

- 4.1 Any party wishing to commence an arbitration under these Rules ("the Claimant") shall file with the Secretary and serve on the other party ("the Respondent"), a written Notice of Arbitration ("the Notice of Arbitration") which shall include the following:
- a) a request that the dispute be referred to arbitration;
 - b) the names, addresses, telephone numbers, fax numbers and email addresses of the parties to the dispute;
 - c) a reference to the arbitration clause or any separate arbitration agreement that is invoked and provide a copy of the arbitration clause or arbitration agreement
 - d) a reference to the contract out of which the dispute arises and provide a copy of the contract where possible;
 - e) a brief statement describing the nature and circumstances of the dispute;
 - f) the relief or remedy sought, including the amount of claim unquantifiable at the time the Notice of Arbitration is filed;
 - g) a proposal as to the number of arbitrators (i.e. one or three), if the parties have not previously agreed on the number: and
 - h) the name of the claimant's nominated arbitrator.

4.2 A filing fee of Rs. 10,000/- (Ten thousand) or any amount decided by Governing body from time to time is payable at the time of filing the Notice of arbitration.

4.3 The date of filing of the Notice of Arbitration with the Secretary is the date of commencement of the arbitration for the purpose of these Rules.

Rule 5 - Response by Respondent

- 5.1 Within 11 days of receipt of the Notice of Arbitration, the Respondent shall file with the Secretary and serve upon the Claimant, a Response including
- a. A confirmation or denial of all or part of the claims;
 - b. Brief statement of the nature and circumstances of any envisaged counterclaims;
 - c. A comment in response to any proposals contained in the Notice of Arbitration; and
 - d. The name of the respondent's nominated arbitrator.

5.2 A filing fee of Rs. 10,000/- or any amount decided by Governing Body from time to time is payable at the time of filing the Response.

5.3 In case parties have objection to the jurisdiction of Arbitral Tribunal, such objection shall be raised not later than 15 days of the commencement of Arbitration proceedings failing which it will be deemed that parties have waived their right to objection.

Rule 6 Filing of Case Statements

6.1 Within 30 days after the filing of the Notice of Arbitration, the claimant must file with the Secretary and serve on the Respondent, a Statement or Claimant's Case alongwith all documents to be relied upon by the Claimant.

6.2 Within 30 days after the service of the statement of Claimant's Case, the Respondent must file with the Secretary and serve on the Claimant, a statement of respondent's defence and counterclaim (if any) alongwith all documents to be relied upon by the Respondent.

6.3 Within 30 days after the service of the statement of Respondent's defence, if the Claimant intends to challenge anything in the statement of Respondent's defence and/or counterclaim, the Claimant must then file with the Secretary and serve on the Respondent, a statement of claimant's reply and if necessary, defence to counterclaim.

6.4 No further case statements may be filed without the leave of the Tribunal or if a Tribunal has not been appointed, the Secretary.

6.5 The Tribunal or if a Tribunal has not been appointed, the Secretary, may upon the written application of a party, extend the time limits provided under this Rule,

6.6 The party required to file a case statement must at the same time deposit with the Secretary for eventual transmission to the Tribunal an additional copy or additional copies of the case statement, according to the number of arbitrators constituting or who will constitute the Tribunal.

Rule 7 - Contents of Case Statements

7.1 The case statements must contain the detailed particulars of the party's claim, defence or counterclaim and must thus contain a comprehensive statement of the facts and contentions of law supporting the party's position.

7.2 It must:

- a) Set out all items of relief Of other remedies sought together with the amount of all quantifiable claims and detailed calculations.
- b) State fully its reasons for denying any allegation or statement of the other party.
- c) State fully its own version of events if a party intends to put forward a version of events different from that given by the other party.

7.3 A case statement must be signed by or on behalf of the party making it.

Rule 8 - Default in Filing and Serving Case Statements

8.1 If the Claimant fails within the time specified under these Rules or as may be fixed by the Tribunal or by the Secretary, to submit its Statement of Case, the Tribunal or if a Tribunal has not been appointed, the Governing Body may issue an order for the termination of the arbitral proceedings or make such other directions as may be appropriate in the circumstances.

8.2 If the Respondent fails to submit a Statement of Respondent's Defence, the Tribunal may nevertheless proceed with the arbitration and make the award.

Rule 9 - Further Written Statements

9.1 The Tribunal will decide which further written statements, in addition to the case statement(s) already filed, are required from the parties and shall fix the periods of time for giving, filing and serving such statements.

9.2 All such further statements must be given to the Tribunal, filed with the Secretary and served on the Claimant or Respondent, whichever is applicable.

Rule 10 - SAROD to Provide Assistance

10.1 At the request of the Tribunal or either party, the Secretary will render such assistance as is required for the conduct of the arbitration, including arranging for facilities, suitable accommodation for sittings of the Tribunal, secretarial assistance or interpretation of these rules.

10.2 Any additional expenses incurred or to be incurred for any such arrangements shall be borne by the parties.

Rule 11 - Appointment of Tribunal

11.1 The disputes shall be decided by a Sole Arbitrator when the total claim of dispute is Rs. 3 Crores Or less.

11.2 In all cases of disputes claimed for more than Rs. 3 Crores, the tribunal shall consist of odd number of Arbitrators to be nominated by the parties. The Presiding Arbitrator shall be appointed by the Arbitrators nominated by the parties from amongst the panel maintained by SAROD. For deciding the Presiding Arbitrator, a draw of lots can be carried out from amongst the names suggested by the Arbitrators nominated by the Parties. The eligibility criteria the empanelment of Arbitrators will be decided by the Governing Body.

11.3 If a Sole Arbitrator is to be appointed, the Governing Body will appoint the Arbitrator within 21 days from the date the Respondent's Statement of Defence and Counterclaim (if any) is filed or falls due, whichever is earlier. The Governing Body will appoint the Arbitrator from the panel of Arbitrators by draw of lots,

11.4 An Arbitrator/Presiding Arbitrator to be appointed under these Rules shall be a person on the SAROD Arbitration Panel as at the date of the appointment.

11.5 In the event of any party failing to appoint Arbitrator within 30 days of receipt of the notice of Arbitration, the Governing Body shall appoint the Arbitrator or Presiding Arbitrator as the case may be by a draw of lots.

Rule 12 - Multiparty appointment of the Tribunal

12.1 If there are more than 2 parties in the arbitration, the parties shall agree on the procedure for appointing the Tribunal Within 21 days of the receipt of the Notice of Arbitration.

12.2 If the parties are unable to do so, upon the lapse of the 21 day time period mentioned herein, the Tribunal shall be appointed by the Governing Body as soon as practicable.

Rule 13- Appointment of substitute Arbitrator

In the event of the death or resignation of any of the arbitrators, a substitute arbitrator must be appointed by the Same procedure as in Rule 11 by which the arbitrator concerned was appointed, failing which, the Governing Body will make the appointment.

Rule 14 - Independence and Impartiality of the Tribunal

14.1 The Tribunal conducting arbitration under these Rules shall be and remain at all times independent and impartial, and shall not act as advocate for any party.

14.2 A prospective arbitrator shall disclose to those who approach him in connection with his possible appointment, any circumstances likely to give rise to justifiable doubts as to his impartiality or independence.

14.3 An arbitrator, once nominated or appointed, shall disclose any such circumstance referred to in Rule 14.2 to the Secretary and or to all parties.

Rule 15 - Code of Ethics for Arbitrators

An Arbitrator is a fountain of justice and emblem of equity, fairness and good conscience. Therefore he/she is expected to exhibit a noble conduct. The code of conduct prescribed by the Governing Body has to be adopted.

Appointment

15.1 A prospective arbitrator shall accept an appointment only if he is fully satisfied that he is able to discharge his duties without bias, he has an adequate knowledge of the language of the arbitration, and he is able to give to the arbitration the time and attention which the parties are reasonably entitled to expect,

15.2 In this code, the masculine includes the feminine.

Disclosure

15.3 A prospective arbitrator shall disclose all facts or circumstances that may give rise to justifiable doubts as to his impartiality or independence. such duty to continue thorough out

the arbitral proceedings with regard to new facts and circumstances,

15.4 A prospective arbitrator shall disclose to the Secretary and any party who approaches him for a possible appointment:

(a) Any past or present close personal relationship or business relationship, whether direct or indirect, with any party to the dispute, or any representative of a party, or any person known to be a potentially important witness in the arbitration;

(b) The extent of any prior knowledge he may have of the dispute.

15.5 The criteria for assessing questions relating to bias are impartiality and independence. Partiality arises when an arbitrator favours one of the parties or where he is prejudiced in relation to the subject matter of the dispute. Dependence arises from relationships between an arbitrator and one or the parties, or with someone closely connected with one of the parties.

15.6 Any close personal relationship or current direct or indirect business relationship between an arbitrator and a party, or any representative of a party, or with a person who is known to be a potentially important witness, will normally give rise to justifiable doubts as to a prospective arbitrator's impartiality or independence. Past business relationships will only give rise to justifiable doubts if they are of such magnitude or nature as to be likely to affect a prospective arbitrator's judgment. He should decline to accept an appointment in such circumstances unless the parties agree in writing that he may proceed.

Communications

15.7 Before accepting an appointment, an arbitrator may only enquire as to the general nature of the dispute, the names of the parties and the expected time period required for the arbitration.

15.8 No arbitrator shall confer with any of the parties or their Counsel until after the Secretary gives notice of the formation of the Tribunal to the parties.

15.9 Throughout the arbitral proceedings, an arbitrator shall avoid any unilateral communications regarding the case with any party, or its representatives.

Fees

15.10 In accepting an appointment, an arbitrator agrees to the remuneration as prescribed in the rules of SAROD, and he shall make no unilateral arrangements with any of the parties or their Counsel for any additional fees or expenses without the agreement of all the parties and the consent of the Secretary of SAROD.

Conduct

15.11 Once the arbitration proceedings commence, the arbitrator shall acquaint himself with all the facts and arguments presented and all discussions relative to the proceedings so that he may properly understand the dispute

Confidentiality

15.12 The arbitration proceedings shall remain confidential. An arbitrator is in a relationship of trust to the parties and should not, at any time, use confidential information acquired during the course of the proceedings to gain personal advantage or advantage for others, or to affect adversely the interest of another.

15.13 This Code is not intended to provide grounds for the setting aside of an award.

Rule 16 - Challenge of Arbitrators

16.1 An arbitrator May be challenged if there are circumstances that give rise to justifiable doubts as to his impartiality or independence and also if he or she has committed any misconduct,

16.2 An arbitrator may also be challenged if he does not possess the qualifications required by the agreement of the parties,

16.3 A party may challenge an arbitrator appointed on its nomination or with its agreement only for reasons of which it becomes aware after the appointment has been made.

16.4 A party who intends to challenge an arbitrator shall file with the Secretary and serve on the other party or all other parties, whichever is applicable, a Notice of Challenge.

16.5- The Notice of challenge must be filed and served within 14 days from the appointment of the arbitrator or within 14 days after the circumstances mentioned in Rule 15.1 became known to that party.

16.6 The Notice of Challenge must state the reasons for the challenge.

16.7 The arbitration shall be suspended until the challenge is resolved or decided upon.

16.8 When an arbitrator has been challenged by one party, the other party may agree to the challenge. The arbitrator may also, after the challenge, withdraw from his office. However, it is not implied in either case that there has been an acceptance of the validity of the grounds for the challenge. In both cases, the procedure provided in Rule 11 read with Rule. 13, shall be used for the appointment or a substitute arbitrator.

Rule 17 - Decision on Challenge

17.1 If the other party does not agree to the challenge and the arbitrator does not withdraw, the decision on the challenge will be made by the Governing Body.

17.2 If the Governing Body sustains the challenge, a substitute arbitrator shall be appointed or chosen pursuant to the procedure applicable to the appointment of an arbitrator as provided in Rule 11 read with Rule 13. If the Governing Body dismisses the challenge, the arbitrator shall continue with the

arbitration.

Rule 18. Removal of the Tribunal

18.1 The Governing Body may on the application of a party remove an arbitrator

- a. Who is physically or mentally incapable of conducting the proceedings or where there are justifiable doubts as to his ability to do so; or
- b. Who has refused or failed to use all reasonable dispatch in conducting the arbitration or making an award.
- c. Who has continuously absented from attending the proceedings for more than 3 sittings without prior permission of Presiding Arbitrator/Governing Body or SAROD.

18.2 The arbitrator(s) concerned is entitled to appear and be heard at the hearing of the application to remove him.

18.3 Upon the removal of the arbitrator, a substitute arbitrator shall be appointed in accordance with Rule 18 read with Rule 13.

18.4 The Governing Body's decision on the application is final and is not subject to appeal or review.

Rule 19 - Re-hearing in the Event of Replacement of the Tribunal

If the sole or presiding Arbitrator is replaced, there shall be a re-hearing. If any other arbitrator is replaced, such re-hearing may take place at the discretion of the Tribunal.

Rule 20 -Jurisdiction of the Tribunal

20.1 The Tribunal shall have the power to rule on its own jurisdiction, including any objection with respect to the existence, termination or validity of the arbitration agreement. For that purpose, an arbitration agreement which forms part of a contract shall be treated as an agreement independent of the other terms of the contract. A decision by the Tribunal that the contract is null and void shall not entail ipso jure the invalidity of the arbitration agreement.

20.1 The plea that the Tribunal does not have jurisdiction shall be raised not later than in the Statement of Defense. A plea that the Tribunal is exceeding the scope of its authority shall be raised promptly after the Tribunal has indicated its intention to decide on the matter alleged to be beyond the scope of its authority. In either case the Tribunal may nevertheless admit a late plea under this Rule if it considers the delay justified. A party is not precluded from raising such a plea by the fact that he has nominated, or participated in the appointment of an arbitrator.

20.3 The Tribunal must rule on an objection that it lacks jurisdiction as a preliminary question upon the objection being raised. It may rule on an objection that it exceeds the scope of its authority either as a preliminary question or in an award on the merits, as it deems just and convenient.

20.4 In addition to the jurisdiction to exercise the powers defined elsewhere in these Rules, the Tribunal shall have jurisdiction to determine any question of law arising in the arbitration; proceed with the arbitration not withstanding the failure or refusal of any party to comply with these Rules or with the Tribunal's orders or directions, or to attend any meeting or hearing, but only after giving that party written notice that it intends to do so; and to receive and take into account such written or oral evidence as it shall determine to be relevant, whether or not strictly admissible in law.

Rule 21 - Fees of SAROD and Arbitral Tribunal Fee Schedule

Registration Fee (Non - Refundable): Rs. 10000/- or any amount fixed by Governing Body from time to time. The Schedule of Fees and allied expenditure shall be decided by Governing Body.

Rule 22- Transmission of File to the Tribunal

22.1 The Secretary shall, as soon as practicable transmit to the Tribunal, a file containing the Notice of Arbitration, the Response and all case statements.

22.2 The Tribunal shall as soon as practicable, after consultation with the parties, issue such orders and/or directions as are necessary for the conduct of the arbitration to conclusion, including a timetable for steps to be taken in the arbitration and for the hearing of the arbitration.

Rule 23 - Judicial Seat of Arbitration

23.1 Unless otherwise agreed by the parties, the judicial seat of arbitration shall be New Delhi.

23.2 Notwithstanding Rule 22.1 and 22.2, the Tribunal may, unless otherwise agreed by the parties, hold hearings and meetings anywhere convenient, subject to the provisions of Rule 28.2.

Rule 24 - Language of Arbitration

The language of arbitrators shall be English. In case of material existing in any other language, other than English the same has to be translated to English language.

Rule 25- Conduct of the proceedings

The Tribunal shall have the widest discretion allowed by the Act to ensure the just, expeditious, economical and final determination of the dispute. The proceedings shall be conducted from 10.AM to 5PM with a recess of one hour.

Rule 26 - Communication between Parties and the Tribunal

26.1 Where the Tribunal sends any written communication to one party, it shall send a copy to the other party or parties as the case may be.

26.2 Where a party sends any written communication (including Statements, expert reports or evidentiary documents) to the Tribunal, the same shall be copied to the other party or all other parties, whichever is applicable, and show to the Tribunal that the same has been so copied.

26.3 The address of the parties for the purpose of all communications during the proceedings shall be those set out in the Notice of Arbitration, or as either party may at any time notify the Tribunal and the other party or parties, whichever is applicable.

26.4 A copy of correspondence between the parties and the Tribunal shall be sent to the Secretary.

Rule 27 - Party Representatives

Any party may be represented by legal practitioners or any other representatives, subject to such requirements of authority as the Tribunal may require. The names and addresses of such representatives must be notified to the other party or parties. In case one party is represented by non-legal person, another party will also be represented by non-legal person so as to maintain natural justice.

Rule 28- Hearings

28.1 Unless the parties have agreed on documents-only arbitration, the tribunal shall hold a hearing for the presentation of evidence by witnesses, including expert witnesses, or for oral submissions.

28.2 The Tribunal shall fix the date, time and place of any meetings and hearings in the

arbitrations on the first hearing, and complete time table pertaining to all the activities of the Arbitration e. g. submission of statement of claim, reply, counter claim, reply therein, admission and denial of documents, visit/inspection of site if any. The tribunal shall stick to the time table with without any deviations unless there are unavoidable circumstances warranting such deviation which will be with the prior permission of the tribunal.

28.3 Prior to the hearing, the Tribunal may provide the Parties with matters or questions to which it wishes them to give special consideration.

28.4 In the event that a party to the proceedings without sufficient cause, fails to appear at a hearing of which the notice has been given, the Tribunal may proceed with the arbitration and may make the Award after the party present has submitted evidence to prove its case.

28.5 All meetings and hearing shall be in private unless the parties agree otherwise.

Rule 29 - Documents Only Arbitration

29.1 The Disputes may be decided without an oral hearing if it is so agreed by the parties.

29.2.1 Where the parties agree to dispense with oral hearing, the Tribunal must be promptly informed by either of the parties, as soon as is practicable. The Tribunal must also be promptly informed if, at a later stage, the parties or either of them intends to apply for an oral hearing.

29.21 Parties may seek discovery of documents if they are not satisfied with existence of documents annexed with statement or claim, reply and counter claim by giving self contained request to the Tribunal justifying the necessity for such documents. Decision of tribunal shall be final and binding upon the parties.

Rule 39 – Witnesses

30.1 The Tribunal may require each party to give notice of the names and designations of the witnesses it intends to call and reasons for legal necessity of such witness.

30.2 No party shall call any expert witness without the leave of the Tribunal.

30.3 Any witness who gives evidence may be questioned by each party or its representative subject to any rulings made by the Tribunal,

30.4 A Witness may be required by the Tribunal to testify under oath or affirmation.

30.5 Subject to such order or direction which the Tribunal may make, the testimony of witness may be presented in written form, either as signed statements or by duly sworn or affirmed affidavits,

30.6 Any party may require a witness to attend an oral examination at a hearing. If the witness fails to attend, the Tribunal may place such weight on the written testimony as it thinks fit, or may exclude it altogether,

30.7 The Tribunal shall determine the admissibility, relevance, materiality and weight of the evidence given by any witness.

Rule 31 - Experts Appointed by the Tribunal

31.1 Unless otherwise agreed by the parties, the Tribunal may:

- a. appoint one or more experts to report to the Tribunal on specific issues;
- b. require a party to give any such expert any relevant information or to produce, or to provide access to, any relevant documents, goods or property for inspection by the expert.

31.2 Unless otherwise agreed by the parties, if a party so requests or if the Tribunal deem it fit, the expert shall, after delivery of his written or oral report, participate in an oral hearing, at which the parties may question him and present expert witnesses in order to testify on the points at issue.

31.3 Rule 30.2 shall not apply to an assessor appointed by agreement of the parties ; or to an expert appointed by the Tribunal to advise solely in relation to procedural matters.

Rule 32 - Rules applicable to substance of dispute- (1) Where the place of arbitration is situated in India,

32.1 In an arbitration, the arbitral tribunal shall decide the dispute submitted to arbitration in accordance with the substantive law for the time being in force in India;

Rule 33- Closure of Hearing

33.1. The Tribunal may inquire of the parties if they have any further proof to offer or witnesses to be heard or submission to make and, if there are none, declare the hearing closed.

33.2 The Tribunal may also, in view of exceptional circumstance, reopen the hearings at any time before the award is made.

Rule 34 - Additional Powers of the Tribunal

34.1 In addition to the powers conferred by the Act, the Tribunal shall also have the power to:-

- a. Allow any party, upon such terms as to costs and otherwise) as it shall determine, to amend claims or counterclaims;
- b. Extend or abbreviate any time limits provided by these Rules;
- c. Conduct such enquires as may appear to the Tribunal to be necessary or expedient;
- d. Order the parties to make any property or thing available for inspection
- e. Order any parties to produce to the Tribunal, and to the other parties for inspection, and to supply copies of any documents or classes of documents in their possession, custody or power which the Tribunal determines to be relevant.
- g. Make orders or give directions to any party for interrogatories;
- h. Make such order or give directions to any party for an interim injunction or any other interim measure;
- i. Make such orders or give such directions as it deems fit in so far as they are not inconsistent with the Act or any statutory re-enactment thereof or such law which is applicable or these Rules.

34.2 If the parties so agree, the Tribunal shall also have the power to add other parties (with their consent) to be joined in the arbitration and make a single Final Award determining all disputes between them.

Rule 35 - Deposits to Costs and Expenses

35.1 The Tribunal's fees and SAROD administration fees shall be ascertained in accordance with the Schedule of Fees in Force at the time of commencement of the arbitration.

35.2 The Claimant shall deposit with the SAROD half of the fees payable at the time of filing of the Statement of Case. The Respondent shall deposit with the SAROD one-half of the fees payable at the time of filing the Statement of Respondent's Defence and Counterclaim (if any). The balance of fees payable shall be paid 60 days before the date of the final hearing or on such other date that the Secretary may direct.

35.3 Where the amount of the claim or the counterclaim is not quantifiable at the time payment is due, the

Secretary will make a provisional estimate. The fees will be adjusted in the light of such information as may subsequently become available. If the arbitration is settled or disposed of without a hearing, the amount of the Tribunal's fees and SAROD administration fees shall be finally determined by the Secretary who will have regard to all the circumstances of the case, including the stage of proceedings at which the arbitration is settled or otherwise disposed of.

35.4 The Secretary may from time to time direct parties to make one or more deposit(s) towards any farther expenses incurred or to be incurred on behalf of or for the benefit of the parties.

35.5 All deposit(s) shall be made to and held by the SAROD. Any interest which may accrue on such deposit(s) shall be retained by the SAROD.

35.6 If a party fails to make the payments or deposits required or directed, the Tribunal may refuse to hear the claims or counterclaims, whichever is applicable, by the noncomplying party, although it may proceed to determine claims or counterclaims by any party who has complied with orders.

35.7 The parties shall remain jointly and severally liable to the SAROD for payment of all such fees and expenses until they have been paid in full even if the arbitration is abandoned, suspended or concluded, by agreement or otherwise, before the final Award is made.

Rule 36 - Decision Making by the Tribunal

36.1 Where a Tribunal has been appointed, any direction, order, decision or award of the Tribunal must be made by the whole Tribunal or a majority. If an arbitrator refuses or fails to sign the Award, the signatures of the majority shall be sufficient, provided that the reason for the omitted signature is stated.

36.2 if there is no unanimity, the same shall be made by the majority arbitrators as well as by the dissenting Arbitrator alone as if acting as a sole arbitrator.

36.3 However in the case of a three member Tribunal the presiding arbitrator may after consulting the other arbitrators make procedural rulings alone.

Rule 37 - The Award

37.1 It will be mandatory for the parties to submit written synopsis of their arguments respectively which will form part of the arbitral proceedings.

37.2 The Tribunal shall assemble at the assigned place in SAROD and shall exercise utmost secrecy and confidentiality in writing the award,

37.3 Unless the Secretary extends the time or the parties agree otherwise, the Tribunal shall make its Award in writing within 30 days from the date on which the hearings are closed and shall state the reasons upon which its award is based. The award shall contain the date and shall be signed by the arbitrator or arbitrators.

37.4 The Tribunal may make interim awards or separate awards on different issues at different times.

37.5 All Awards must be submitted by the Tribunal to the Secretary and they shall be issued through the Secretary.

37.6 The Tribunal must deliver to the Secretary number of originals of the award sufficient for the parties and for filing with the Secretary.

37.7 The Secretary shall release the award to the parties only upon receipt of sufficient deposits to cover the fees and expenses due to the Tribunal and to the SAROD.

37.8 By agreeing to have arbitration under these Rules, the parties undertake to carry out the award without delay.

37.9 Stamp duty on award shall be payable by the party in whose favor the award has been pronounced.

Rule 38 _ - Additional Award

38.1 Within 30 days after the receipt of the award, either party, with notice to the Secretary and the other party may request the Tribunal to make an additional award as to claims presented in the arbitral proceedings but omitted from the award.

38.2 If the Tribunal considers the request for an additional award to be justified and considers that the omission can be rectified without any further hearings or evidence, it shall notify all the parties within 7 days of the receipt of the request, that it will make an additional award, and complete the additional award within 30 days after the receipt of the request.

Rule 39 _ Correction of Awards

39.1 Within 30 days of receiving an Award, unless another period of time has been agreed upon by the parties, a party may by notice to the Secretary and the other party request the Tribunal to correct in the Award, any errors in computation, any clerical or typographical errors or any errors of similar nature.

39.2 If the Tribunal considers the request to be justified, it shall make the corrections within 30 days of receiving the request. Any correction shall be notified in writing to the parties and shall become part of the Award,

39.3 The Tribunal may correct any error or type referred to in Rule 37.1 on its own initiative within 30 days of the date of the Award,

Rule 40 - Settlement

40.1 If, the parties arrived at amicable settlement of the dispute during the currency proceedings, the parties shall file memo of settlement before the tribunal who shall either issue an order for the termination of the arbitral proceedings or, if requested by both parties and accepted by the Tribunal, record the settlement in the form of an arbitral award on agreed terms. The Tribunal is not obliged to give reasons for such an award,

40.2 The Parties shall:

- a) Notify the Tribunal and the Secretary immediately if the arbitration is settled or otherwise terminated!
- b) Make provision in any settlement for payment of all the costs of the arbitration and fees and expenses due to the SAROD and the Tribunal.

40.3 If the continuation of the arbitral proceedings becomes unnecessary or impossible for any reason not mentioned in Rule 38.1, before the award is made, the Tribunal shall inform the parties of its intention to issue an order for the termination of the proceedings. The Tribunal shall have the power to issue such an order unless a party raises justifiable grounds for objection.

40.4 Copies of the order for termination of the arbitral proceedings or of the arbitral award on agreed terms, signed by the Tribunal, shall be communicated by the Tribunal to the parties through the Secretary.

Rule 41 - Interest

The Tribunal may award interest on any sum awarded at such rate as applicable in fixed deposits of State Bank of India in respect of such periods ending not later than the date of the award as the Tribunal considers just.

Rule 42 - Costs

42.1 The Tribunal shall specify in the final award, the costs of the arbitrations and decide which party shall bear them and in what proportion they shall be borne.

42.2 In this Rule, "costs of the arbitration" shall include:

- a) The fees and expenses of the Tribunal and the administration fees of the SAROD as determined by the Secretary in accordance with the Schedule of Fees;
- b) The costs of tribunal appointed experts or of other assistance rendered: and
- c) All expenses which are reasonably incurred by the SAROD in connection with the arbitration.

42.3 The Tribunal has power to order in its Award, that all or part of the legal or other costs (such as legal fees and expenses, costs incurred in respect of party appointed experts etc) of one party shall be paid by the other party.

Rule 43 - Waiver

A party which is aware of non-compliance with these Rules and yet proceeds with the arbitration without promptly stating its objection in writing to such non-compliance shall be deemed to have waived its right to object

Rule 44 - Exclusion of Liability

44.1 The Tribunal, the President, the SAROD and any or its officers, employees or agents shall not be liable to any party for any act or omission in connection with any arbitration conducted under these Rules,

44.2 After the Award as been made and the possibilities of corrections and additional Awards have lapsed or been exhausted, neither the Tribunal nor the President shall be under any obligation to make any statement to any person about any matter concerning the arbitration, and no party shall seek to make any arbitrator or the President or the SAROD and any of its officers a witness in any legal proceedings arising out of the arbitration.

Rule 45 - General Provisions

45.1 In all matters not expressly provided for in these Rules, the President, the Secretary and the Tribunal shall act in the spirit of these Rules and shall make every reasonable effort to ensure the just, expeditious and economical conclusion of the arbitration.

45.2 The Secretary may from time to time issue Practice Notes on the implementation of these Rules.

Rule 46 - Amendment to Rules

These Rules may from time to time be amended by the Governing Body of SAROD

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