Schedules

Schedule A

(See Clause 2.1 and 8.1)

SITE OF THE PROJECT

1. The Site

(i) Site of the Project Highway shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.

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

(iii) An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2 (i) of this Agreement.

(iv) The alignment plans of the Project Highway are specified in Annex-III. In the case of sections where no modification in the existing alignment of the Project Highway is contemplated, the alignment plan has not been provided. Alignment plans have only been given for sections where the existing alignment is proposed to be upgraded. The proposed profile of the Project Highways shall be followed by the contractor with minimum FRL as indicated in the alignment plan. The Contractor, shall 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

Note: Through suitable drawings and description in words, the land, buildings, structures and road works comprising the Site shall be specified briefly but precisely in this Annex-I. All the chainages/ location referred to in Annex-I to Schedule-A shall be existing chainages.

1. Site

The Site of the 2-Lane Project Highway with hard shoulder starts from Ch – 65+080 km existing chainage at Ram Mandir Square, Arrowa and ends after the Tidding Bridge, Ch – 68+110 km brought up by BRO. The land, carriageway and structures comprising the Site are described below.

2. Land

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

SL NO.	EXISTING CHAINAGE (km)		DESIGN CHAINAGE (km)		Existing ROW	Remarks
	From	To	From	To		
1	65+080	68+110	65+080	67+990	Nil	

3. Carriageway

The present carriageway of the Project Highway is Single Lane. The type of the existing pavement is flexible.

4. Major Bridges

The Site includes the following Major Bridges:

S. No	Existing Chainage (km)	Span Arrangement	Type of Super-Structure	Total Length (m)	Remark
1	65+970	1x71	Steel Girder	71	Arrowa Bridge
2	66+900	1x44,1x110.725	RCC with Steel Girder	154.725	Tidding Bridge

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	66+620			Steel Girder	1x30	

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location (km)	Remarks
Nil		

9. Underpasses (vehicular, non-vehicular)

The Site includes the following underpasses:

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

10. Culverts

The Site has the following culverts:

Sl No	Design Chainage	Existing Type of Structures	Existing Span Arrangement (m)
1.	65+205	slab	1 X 1.0
2.	65+273	slab	1 X 0.9
3.	65+310	slab	1 X 1.2
4.	65+390	slab	1 X 1.0
5.	65+510	slab	1 X 1.0
6.	65+730	slab	1 X 1.0
7.	66+320	slab	1 X 1.5
8.	66+425	slab	1 X 1.1
9.	66+505	slab	1 X 1.5
10.	67+126	slab	1 X 6.7
11.	67+205	slab	1 X 6.0
12.	67+270	slab	1 X 3.0
13.	67+307	Slab	1 X 3.0
14.	67+366	Slab	1 X 5.8

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. Road side 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
Nil								

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

15. Minor junctions

The details of the minor junctions are as follows:

	DESIGN CHAINAGE (km)	TYPE	SIDE	CONNECTING PLACES
1	**65+080**	Y	L	To Tezu
2	**65+575**	Y	R	

16. Bypasses

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

S. No.	Name of bypass(town)	Chainage (km) Fromkm to km	Length (inKm)
Nil			

17. Existing Utilities

(i) Electrical

The site includes the following electrical utilities:

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

S No.	Design Chainage (Km)		Length (in Km) (Existing Length Between Crossing Locations)					Crossings					No of Towers obstructing/infringing ROW
	From	To	400 KV	220 KV	132 KV	110 KV	66 KV	400 KV	220 KV	132 KV	110 KV	66 KV	
1	NIL												

(b) High Tension/Low tension (HT/LT) lines

S. NO	Design Chainage (in Km)		Length of Conductor (in km)				Crossings				Transformer		Mandal
	From	To	33 KV LINE	11 KV LINE	LT LINE	AB CABLE	33 KV LINE	11 KV LINE	LT LINE	AB CABLE	No.	Capacity	
1	As per Site Conditions										1	Single phase 16 KVA	

(ii) PHE

Sr. No.	Chainage		Length (in Km)		Crossing	
	From	To	Water Supply line		Water Supply line	
			With Pumping	With Gravity Flow	With Pumping	With Gravity Flow
Nil						

18. OTHER STRUCTURES

The project location has no structures.

Annex – II

(As per Clause 8.3 (i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

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

Sl. No	Chainage From	Chainage To	Length (Km)	Proposed ROW Width (m)	Date of Providing proposed ROW
i)	65+080	67+990	2.91.0	24 m	90% of ROW At Appointment Date. Balance Right of way Within 150 days after the Appointed Date

Annex - III

(Schedule-A)

Alignment Plans

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

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

(ii) Traffic Signage plan of the Project Highway showing numbers & location of traffic signs is enclosed. The contractor shall, however, imp

(iii) Rove/upgrade upon the traffic signage plan as indicated in Annex-III based on site/design requirement as per the relevant specifications/IRC Codes/Manual.

Annex – IV

(Schedule-A)

Environment Clearances

As per notification of MOEF F.O. 2559(E) dated 22/08/2013, the project will not attract Environmental Clearance

Schedule - B

(See Clause 2.1)

Development of the Project Highway

1. Development of the Project Highway

Development of the Project Stretch from Km 65+080 to Km 67+990 of Arrowa - Tidding Highway shall include design and construction of the Project Highway as described in this Schedule-B and in Schedule-C.

2. Rehabilitation and augmentation

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

3. Specifications and Standards

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

Annex – I

(Schedule-B)

Description of Two-Laning and Strengthening

[Note: Description of the Project Highway shall be given by the Authority in detail together with explanatory drawings (where necessary) to explain the Authority's requirements precisely in order to avoid subsequent changes in the Scope of the Project. The particulars that must be specified in this Schedule-B are listed below as per the requirements of the Manual of Specifications and Standards for [Two Laning of Highways (IRC: SP:73)], referred to as the Manual. If any standards, specifications or details are not given in the Manual, the minimum design/construction requirements shall be specified in this Schedule. In addition to these particulars, all other essential project specific details, as required, should be provided in order to define the Scope of the Project clearly and precisely.]

1. Widening of the Existing Highway

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

(ii) Width of Carriageway

(a) The paved carriageway shall be two lanes with hard shoulder in accordance with IRC: SP: 73-2018. The paved carriageway shall be 7.00 m wide having 1.5 m hard shoulder on hill side and 2.5 m hard shoulder on valley side. As per Typical cross section drawing.

Sr. No.	**Built-up Stretch**	**Location / Design Chainage (Km)**	**Paved Width (m)**	**Typical Cross Section**
Nil				

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

2. Geometric Design and General Features

(i) General

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the IRC: SP: 73 – 2018.

(ii) Design speed

The design speed is 30-40 kmph

(iii) Improvement of the existing road geometrics

In the following sections, where improvement of the existing road geometrics to the prescribed standards is not possible, the existing road geometrics shall be improved to the extent possible within the given right of way and proper road signs and safety measures shall be provided as per IRC: SP:73-2018:

Sr. 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.

(v) Type of shoulders

The type of shoulders to be provided for the project road shall be as follows:

Sl.No.	**Design km**		**Length in m**	**Type of shoulder**		**Remarks**
	From	**To**		**Width**		
				Hill Side	Valley Side	
1	65+080	67+990	2910	1.5 m	2.5 m	Hard Shoulder

(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)**	**Span/ opening (m)**	**Remarks**
Nil			

(vii) Lateral and vertical clearances at overpasses

(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: [Refer to the provision of relevant Manual and provide details]

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

(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	Length (m)	Number and length of spans(m)	Approach gradient	Remarks, ifany
Nil					

(b) 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: [Refer to the Provision of relevant Manual and specify the type of vehicular under pass/ overpass structure and whether the cross road is to be carried at the existing level, raised or lowered.

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: [Refer to the provision of relevant Manual and specify the requirements of cattle and pedestrian underpass/ overpass]

Sl. No.	Location	Type of crossing
Nil		

(xi) Typical cross-sections of the Project Highway (Fig. attached at appendix-I)

From	To	Length	TCS
65+080	65+170	90 mtr	TCS- 1
65+200	65+300	100 mtr	
65+355	65525	170 mtr	
65+545	65+740	195 mtr	
65+940	66+080	140 mtr	
66+275	66+305	30 mtr	
66+345	66+400	55 mtr	
66+835	67+080	245 mtr	
67+920	67+990	70 mtr	
65+170	65+200	30 mtr	TCS-2
65+300	65+355	55 mtr	
65+525	65+545	20 mtr	
65+740	65+940	200 mtr	
66+080	66+275	195 mtr	
66+305	66+345	40 mtr	
66+400	66+835	435 mtr	
67+570	67+920	350 mtr	
67+080	67+570	490 mtr	TCS-3

3. Intersections and Grade Separators

All intersections and grade separators shall be as per the provision of relevant Manual. Existing intersections which are deficient shall be improved to the prescribed standards.

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

(i) At-grade intersections

Sl. No	CHAINAGE	TYPE	SIDE	CONNECTING PLACES
1	65+575	Y	Right	Towards Hawa Camp

(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 IRC: SP: 73-2018 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 [Refer to the provision of relevant Manual and specify sections to be raised]

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]**
Nil			

5. Pavement Design

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

(ii) Type of pavement

Flexible pavement shall be adopted for Project Highway.

(iii) Design requirements

Notwithstanding anything to the contrary contained in this agreement, the contractor shall design the pavement of main carriageway for design traffic of 10 MSA with a minimum design period of 20 years. CBR taken for the road is 8%.

(a) Design Period and strategy

Flexible pavement for new pavement or for widening and strengthening of the existing pavement shall be designed for a minimum design period of 20 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 design traffic of 10 million standard axles.

(iv) Realignment of stretches

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

S. No.	Chainage From	Chainage To	Length (m)	Proposal
1.	65+170	65+200	30	New Construction
2.	65+300	65+355	55	New Construction
3.	65+525	65+545	20	New Construction
4.	65+740	65+940	200	New Construction
5.	66+080	66+275	195	New Construction
6.	66+305	66+345	40	New Construction
7.	66+400	66+835	435	New Construction
8.	67+080	67+920	840	New Construction

6. Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per Section 6 of the Manual (IRC: SP: 73-2018).
Trapezoidal Lined of following length shall be provided:

S. No	From	To	length	Remarks
1.	65+080	65+170	90	On Hill Side
2.	65+200	65+300	100	On Hill Side
3.	65+355	65+525	170	On Hill Side
4.	65+545	65+740	195	On Hill Side
5.	65+940	66+080	140	On Hill Side
6.	66+275	66+305	30	On Hill Side
7.	66+345	66+400	55	On Hill Side
8.	66+835	67+080	245	On Hill Side
9.	67+920	67+990	70	On Hill Side
10.	65+170	65+200	30	On Hill Side
11.	65+300	65+355	55	On Hill Side
12.	65+525	65+545	20	On Hill Side
13.	65+740	65+940	200	On Hill Side
14.	66+080	66+275	195	On Hill Side
15.	66+305	66+345	40	On Hill Side
16.	66+400	66+835	435	On Hill Side
17.	67+570	67+920	350	On Hill Side
18.	67+080	67+570	980	On both Side
19.	Total		**3400**	

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 new bridges and structures shall be as follows:

All new structures shall have minimum carriageway as per Manual.

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

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

Sl. No.	Design Chainage	Proposed Span Arrangement (No x l)	Width (m)	Remarks
1.	65+590	1 x 2.0	11	RCC BOX Culvert
2.	67+910	1 x 2.0	11	RCC BOX Culvert

* Attach typical cross-section, if necessary.

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

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

S. No.	**Bridge at km**	**Utility service to be carried**	**Remarks**
1	66+620	OFC, telephone and Electricity cables	

(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 section 7 of the Manual.

(ii) Culverts

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

(b) Reconstruction of existing culverts:

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

S. No	**Design Chainage**	**Proposed Type of Structure**	**Proposed Span (m)**	**Over all Width in m**	**Proposal**
1.	65+205	RCC BOX	1 X 2.0	11	RECONSTRUCTION
2.	65+273	RCC BOX	1 X 2.0	11	RECONSTRUCTION
3.	65+310	RCC BOX	1 X 2.0	11	RECONSTRUCTION
4.	65+390	RCC BOX	1 X 2.0	11	RECONSTRUCTION
5.	65+510	RCC BOX	1 X 2.0	11	RECONSTRUCTION
6.	65+730	RCC BOX	1 X 2.0	11	RECONSTRUCTION

S. No	Design Chainage	Proposed Type of Structure	Proposed Span (m)	Over all Width in m	Proposal
7.	66+320	RCC BOX	1 X 2.0	11	RECONSTRUCTION
8.	66+425	RCC BOX	1 X 2.0	11	RECONSTRUCTION
9.	66+505	RCC BOX	1 X 2.0	11	RECONSTRUCTION
10	67+126	RCC BOX	1 X 6.0	14	RECONSTRUCTION
11	67+205	RCC BOX	1 X 6.0	14	RECONSTRUCTION
12	67+270	RCC BOX	1 X 3.0	11	RECONSTRUCTION
13.	67+307	RCC BOX	1 X 3.0	11	RECONSTRUCTION
14.	67+366	RCC BOX	1 X 6.0	14	RECONSTRUCTION

(c) Widening of existing culverts:

All existing culverts which are not to be reconstructed shall be widened tothe 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.	Design Chainage	Proposed Type of Structure	Proposed Span (m)	Over all Width in m	Proposal
1.	65+590	RCC BOX	1 X 2.0	11	NEW CONSTRUCTION
2.	67+910	RCC BOX	1 X 2.0	11	NEW CONSTRUCTION

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

[Refer to the provision of relevant Manual and provide details]

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

S. No.	Design Chainage	Proposed span arrangement (No. x l)	Remarks
1	66+620	1x30	Reconstruction

(ii) The following narrow bridges shall be widened:

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

(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.

Sl. No.	**Location (km)**	**Total length (m)**	**Remarks, if any**
Nil			

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

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

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

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

(d) Drainage system for bridge decks

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

(e) 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:

Sl. No.	Location of Level crossing (Chainage km)	Number and length of span (m)
Nil		

(v) Grade separated structures

Nil

(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 /strengtheningto be carried out
Nil		

(b) ROB / RUB

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

(c) Overpasses/Underpasses and other structures

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

(vii) List of Major Bridges and Structures

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

Sl. No.	Location
Nil	

8. Traffic Control Devices and Road Safety Works

(i) Traffic control devices and road safety works shall be provided in accordance with section 9 of IRC: SP:73-2018.

(ii) Specifications of the reflective sheeting.

9. Roadside Furniture

(i) Roadside furniture shall be provided in accordance with the provision of IRC: SP: 73-2018.

a) Road Boundary Stone: For the entire Project Highway
b) Pedestrian crossings: Provide Pedestrian crossing facilities on junctions.

(ii) Overhead traffic signs: location and size

Sl. No.	Design Chainage	Remarks
1	65+080	

10. Compulsory Afforestation

The number of trees which are to be planted by the Contractor as compulsory afforestation shall be as per Forest conservation Act and as per the Two Lane Manual (IRC: SP 73-2015).

11. Hazardous Locations

Metal Beam crash barrier of minimum length of 2573.35 m (single runner, heavy duty and W-shape) shall be provided at the locations of bridge approaches and high embankments (3.0m and more), at sharp curves on the project at the locations finalized in consultation with AE. Increase in length if any as per site requirement will not constitute change of scope.

12. Special Requirement for Hill Roads

Refer to section 13 of IRC: SP: 73-2018.

The following minimum length of protection works shall be provided tabulated below:

- Breast wall (1.5 m height)

S.No	From	TO	Length	Side
1.	65+080	65+140	60.000	LHS
2.	65+210	65+270	60.000	LHS
3.	65+845	65+940	95.000	LHS
4.	65+865	65+930	65.000	RHS
5.	66+100	66+195	95.000	RHS
6.	66+360	66+660	300.000	LHS
7.	66+540	66+595	55.000	RHS
8.	66+710	66+830	120.000	LHS
9.	67+575	67+680	105.000	LHS
10.	67+710	67+760	50.000	RHS
11.		**Total Length =**	**1005.000**	-

- Retaining wall (average 5 m high)

S. No.	From	To	Length	m	Remarks
1.	67+260	67+430	170.00	m	LHS
2.	67+450	67+575	250.00	m	BS
3.	67+760	67+830	70.00	m	RHS
4.	67+890	67+970	160.00	m	BS
	Total Length		**650.00**	**m**	-

- Retaining wall (average 3 m high)

S. No.	From	To	Length	m	Side
1.	66+050	66+100	50.00	m	RHS
2.	66+195	66+520	325.00	m	RHS
3.	66+240	66+330	90.00	m	LHS
4.	66+680	66+710	30.00	m	RHS
5.	66+710	66+830	120.00	m	RHS
6.	66+830	66+875	90.00	m	BS
7.	66+995	67+110	230.00	m	BS
8.	67+110	67+190	80.00	m	LHS
9.	67+260	67+430	170.00	m	RHS
	Total Length =		**1185.00**		

- Shore erosion control

S. No.	From	To	Length	m	Side
1.	66+000	66+175	175.00	m	RHS
2.	66+480	66+680	200.00	m	RHS

- Guard Wall

S. No	From	To	Length	Unit
1.	65+080	65+170	90	m
2.	65+200	65+300	100	m
3.	65+355	65+525	170	m
4.	65+545	65+740	195	m
5.	65+940	66+080	140	m
6.	66+275	66+305	30	m
7.	66+345	66+400	55	m
8.	66+835	67+080	245	m
9.	67+920	67+990	70	m
10.	65+170	65+200	30	m
11.	65+300	65+355	55	m
12.	65+525	65+545	20	m
13.	65+740	65+940	200	m
14.	66+080	66+275	195	m
15.	66+305	66+345	40	m
16.	66+400	66+835	435	m
17.	67+570	67+920	350	m
	Total Length =		**2420**	**m**

Note 1- *The Contractor shall be responsible for accurate assessment of the actual requirement as per site situation & prepare designs for slope protection & stabilization as per the specifications & standards stipulated in schedule 'D' and submit the same to the AE for review through the proof consultant and implement it accordingly thereafter.*

Note 2- **Any increase in quantity over and above the minimum qty.** ***as mentioned in above table or change in specifications will not be considered as change of scope****. Therefore, contractor shall make thorough investigation at site and assess the requirement of slope protection and slide prone zone and other safety features at his own before submission of bid.*

Note 3- *The length of Retaining wall shown above is minimum, to be constructed at site for proper geometrics & will not be converted to Breast wall. Any reduction in the length of Retaining wall constituted of negative change of scope.*

13. Change of Scope

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

arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

14. Utility Shifting

Shifting of obstructing existing utilities indicated in Schedule-A to an appropriate location in accordance with the standards and specifications of concerned utility Owning Department is part of the scope of work of the Concessionaire. The Bidders may visit the site and assess the quantum of shifting of utilities for the project before submission of their bid. Copy of utility relocation plan is enclosed. The specifications of the concerned Utility Owning Department shall be applicable and followed.

Note I:

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

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

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

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

(Schedule B-1)

i.The shifting of utilities and felling of trees shall be carried out by the Contractor. The cost of the same shall be borne by the Authority. The details of utilities are as follows:

Sr. No	Type of Utility	Unit	Quantity	Location/stretch (LHS/RHS)
A	Electrical Utilities			
A1	Electrical Poles	Nos.	21	As per site Condition
A2	Electrical cables	meters	1470	
A3	Transformers	Nos.	1	
-	------	--		
-	-------	--		
B	Water/Sewagepipeline			
B1	Sewage	meters	Nil	
B2	Water supply	meters	Nil	
-	-------	--		
-	-------	--		
C	Felling of Tress	Nos.	As per Site Condition	

a. Typical Cross Section

Figure 1: Typical Cross Section I on Existing Section

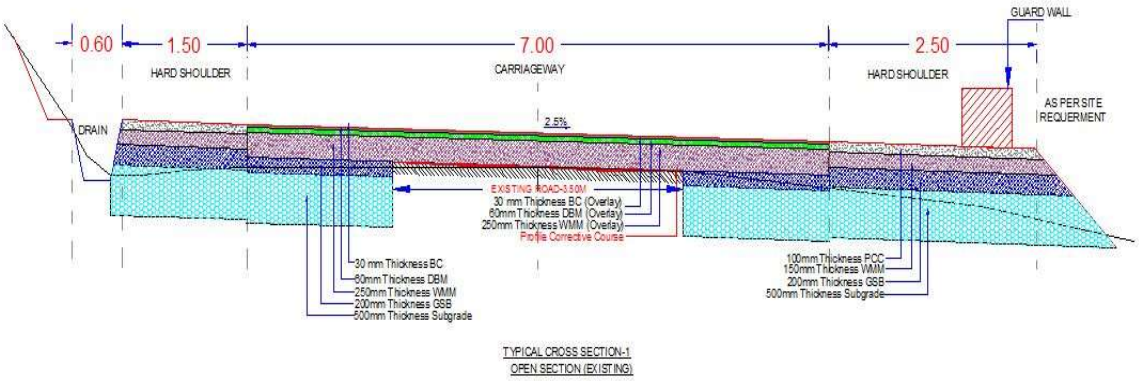


Figure 2: Typical Cross Section II in Realignment Section

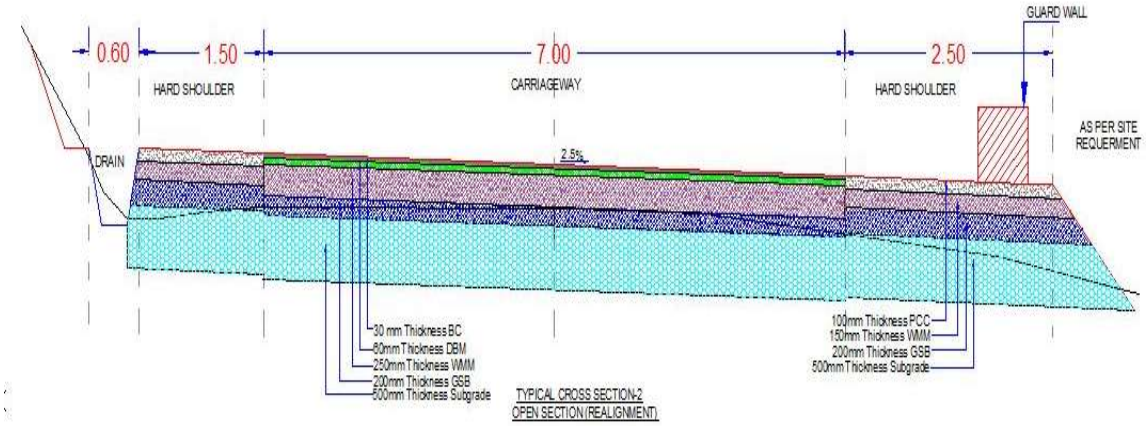
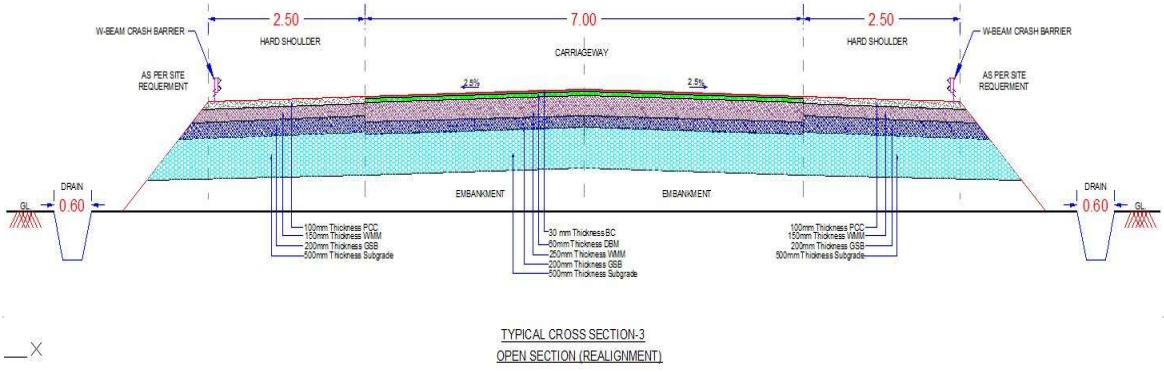


Figure 3: Typical Cross Section III in Open Section



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) Roadside Furniture;
b) Tree Plantation;
c) Others to be specified

2. Description of Project Facilities

a) Road side Furniture

(i) Traffic Signs and Pavement Markings:

Traffic signs and pavement markings shall include road side signs, overhead signs, curve mounted signs and road marking along the project highway. The locations for these provisions shall be finalized as per manual.

(ii) Concrete Crash Barrier wherever required as per manual.

(iii) Traffic Safety Devices wherever required

(iv) Boundary Stones

(v) Hectometre / Kilometre Stones

(vi) Traffic Blinker Signal (L.E.D) shall be provided at all At-grade junctions, schools, hospitals, police station, places of worship and institutional buildings etc.

(vii) Overhead signs: To be provided at one location i.e., at 65/080 as per IRC 67

(viii) Delineators and Studs: Delineators for the entire Project Highway at the locations as per section 9.4 of IRC SP 73:2018.

b) Toll Plazas

Sl. No.	Design Chainage (Km)	Remarks
Nil		

c) Pedestrian Facilities

Pedestrian facilities shall be provided at the locations of urban sections in order to ensure safety

of pedestrians while crossing in consultation with AE. This should include (a) minimum Zebra Crossing with flashing Beacon or (b) Zebra Crossing with separate pedestrian phase or (c) any other provision as approved by AE.

d) Landscaping and Tree Plantation

Landscaping & Tree Plantation shall be as per the Manual of Specification & IRC Standards.

e) Truck lay byes:

Sl No	Location	Remarks
NIL		

f) Bus-bays and Bus Shelter:

Bus-bays and Bus-shelter shall be provided at the following location conforming to clause 12.6 of the Two-Lane Manual of Standards and Specifications.

Sl No	Location	Side
NIL		

**The final locations of Bus shelters shall be finalized by Authority Engineer.*

Schedule - D

(See Clause 2.1)

Specifications and Standards

1. Construction

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

2. Design Standards

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

Manual of specification and standards for two laning of Highways with paved shoulder (Second revision) IRC: SP:73-2018, Hill Road manual IRC: SP:48-1998 and Specification of roads and bridges work (fifth revision), MoRTH.

Annex – I

(Schedule-D)

Specifications and Standards for Construction

1. Specifications and Standards

All materials, works and construction operations shall confirm to the Manual of Specifications and Standards for Two Laning of Highways (IRC: SP: 73 – 2018), referred as the Manual, MORTH Specifications for Road and Bridge Works, and IRC: SP: 48-1998. 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, aforesaid Specifications and Standards of following clauses shall be deemed to be amended to the extent set forth below:

S. No.	Clause	Provision as per Manual (IRC: SP:73-2018)	Modified Provision
1	2.2	**Design Speed:** Ruling or minimum Design speed shall be followed	Design speed shall be 30 km/h for project highway excepting hair pin bend locations wherein design speed shall be 20 km/h. The same is mentioned in the Plan &Profile drawings given in **Annexure-III** of **Schedule A.**
2	2.7.2	**Roadway Width:** On horizontal curves with radius up to 300 m width of pavement and roadway shall be increased as per Table 2.4	On horizontal Curves with radius up to 300 m width of pavement and roadway shall be increased as per Plan & Profile drawings given in **Annexure – III of Schedule A**
3	2.9.4	**Radius of Horizontal Curves:**	Radius of Horizontal curves and Vertical gradient shall be as per the alignment plan shown in Plan & Profile drawings given in **Annexure-III** of **Schedule A.**
4	2.9.7	**Vertical Gradient:**	As per the alignment plan shown in Plan & Profile drawings given in **Annexure-III** of **Schedule A.**
5	2.6.1	**Width of Hard Shoulder:**	The width of Hard shoulder in valley side is 2.5 m whereas the width of shoulder in hill side is 1.5 m given in Annexure – III of Schedule A.

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-fulfillment of the Maintenance obligations by the Contractor. Upon occurrence of any breach hereunder, the Authority shall be entitled to effect reduction in monthly lump sum payment as set forth in Clause 14.6 of this Agreement, without prejudice to the rights of the Authority under this Agreement, including Termination thereof.

(iii) All Materials, works and construction operations shall conform to the 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

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)

Annex -I Repair/rectification of Defects and deficiencies

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

Table -1: Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/ Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, approaches of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm in depth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA 2003 (http://www.tfhrc.com/pavement/lttp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2
	Cracking	Nil	< 5 % subject to limit of 0.5sqm for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15 -30 days	MORT&H Specification 3004.2
	Corrugations and Shoving	Nil	< 0.1 % of area	Daily	Length Measurement Unit like Scale, Tape, odometer etc.		2-7 days	IRC:82-2015
	Bleeding	Nil	< 1 % of area	Daily			3-7 days	MORT&H Specification 3004.4
	Ravelling/ Stripping	Nil	< 1 % of area	Daily			7-15 days	IRC:82-2015 read with IRC SP 81
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM (Sideway-force	Class I Profilometer: ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of	180 days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-Annually			180 days	BS: 7941-1: 2006

	Pavement	3	2.1	Bi-Annually	Coefficient	Travelled Surfaces with	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**					
	Other Pavement Distresses			Bi-Annually	Routine Investigation Machine or equivalent)	Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	2-7 days	IRC:82-2015
	Deflection/ Remaining Life			Annually	Falling Weight Deflectometer	IRC 115: 2014	180 days	IRC:115-2014
Rigid Pavement (Pavement of MCW, Service Road, Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Roughness BI	2200mm/ km	2400mm/km	Bi-Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656 -94: 2000	180 days	IRC: SP:83-2008
	Skid	Skid Resistance no. at different speed of vehicles		Bi-Annually	SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)	IRC: SP:83-2008	180 days	IRC: SP:83-2008
	Edge drop at shoulders	Nil	40mm	Daily	Length Measurement		7-15 days	MORT&H Specification 408.4

Embankment / Slope	Slope of camber/cross fall	Nil	<2% variation in prescribed slope of camber /cross fall	Daily	Unit like Scale, Tape, odometeretc.	IRC	7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15 % variation in prescribe side slope	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification

Asset Type	**Performance Parameter**	**Level of Service (LOS)**		**Frequencyof Inspection**	**Tools/ Equipment**	**Standards and References forInspection and Data Analysis**	**Time limit for Rectification/Repair**	**Maintenance Specifications**
		Desirable	**Acceptable**					
	Rain Cuts/ Gullies in slope	Nil	Nil	Daily Specially During Rainy Season	NA		7-15 days	MORT&H Specification

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

Table -2: **Maintenance Criteria for Rigid Pavements:**

Sr. No.	**Type of Distress**	**Measured Parameter**	**Degree of Severity**	**Assessment Rating**	**Repair Action**	
					For the case d < D/2	**For the case d > D/2**
			CRACKING			
1	**Single Discrete Cracks Not intersecting with anyjoint**	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 > l m. Within 7days
			3	w = 0.5 - 1.5 mm, discernible from fast-moving car		
			4	w = 1.5 - 3.0 mm	Seal, and stitch if L > l m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15days
			5	w > 3 mm.		
	Single Transverse (or	w = width of crack L = length of	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Route and seal with	Staple or Dowel Bar
			2	w = 0.2 - 0.5 mm, discernible from slow		

2	**Diagonal) Crack intersecting with one ormore joints**	crack d = depth of crack D = depth of slab		vehicle	epoxy. Within 7 days	Retrofit. Within 15days
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L >1 m. 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**
			4	w = 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected. Portion with norms and specifications - See Para 5.5 &9.2 Within 15days
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may befull depth	
3	**Single Longitudinal Crack intersecting with one or more joints**	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	w < 0.5 mm, discernable from slow moving vehicle	Seal with epoxy, if L > 1 m. Within 7 days	Staple or dowel bar retrofit. Within 15days
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > Im. 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 befull depth	
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic		Full Depth Repair Dismantle and reconstruct affected portion as per norms and specifications - See Para 5.6.4 Within 15 days
4	**Multiple Cracks intersecting with one ormore joints**	**w = width of crack**	0	Nil, not discernible	No Action	-
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > I 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	Dismantle, Reinstate
			4	w = 3.0 - 6.0 mm panel broken into 2 or 3 pieces		

			5	w > 6 mm and/or panel broken into more than 4 pieces	days	subbase, Reconstruct whole slab as per specifications within 30 days
5	**Corner Break**	w = width of crack L = length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to secure broken parts Within 7 days	Seal with epoxy seal with epoxy Within 7 days
			2	w < 1.5 mm; L < 0.6 m, only one corner broken		
			3	w < 1.5 mm; L < 0.6 m, two corners broken	Partial Depth (Refer Figure	Full depth repair
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	w > 1.5 mm; L > 0.6 m or three corners broken	8.3 of IRC: SP: 83-2008) Within 15 days	
			5	three or four corners broken		Reinstate sub-base, and reconstruct the slab as per norms and specifications within 30days
6	**Punchout (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)**	w = width of crack L = length (m/m2)	0	Nil, not discernible		No Action
			1	w < 0.5 mm; L < 3 m/m^2	Not Applicable, as it may be full depth	Seal with low viscosity epoxy to secure broken parts. Within 15days
			2	either w > 0.5 mm or L < 3 m/m^2		
			3	w > 1.5 mm and L < 3 m/m^2		
			4	w > 3 mm, L < 3 m/m^2 and deformation		Full depth repair - Cut out and replace damaged area taking care not to damage reinforcement. Within 30days
			5	w > 3 mm, L > 3 m/m^2 and deformation		
Surface Defects						
7	Raveling or Honeycomb type	r = area damaged surface/total surface of slab (%) h =	0	Nil, not discernible	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	r < 2 %	Local repair of areas damaged and liable to be damaged. Within 15 days	
			2	r = 2 - 10 %		
			3	r = 10-25%	Bonded Inlay, 2 or 3 slabs	

	surface	maximum depth of damage	4	r = 25 - 50 %	ifaffecting. Within 30 days	
			5	r > 50% and h > 25 mm	Reconstruct slabs, 4 or moreslabs if affecting. Within 30 days	
8	**Scaling**	r = damaged surface/total surface of slab (%)	0	Nil, not discernible	**Short Term**	**Long Term**
					No action.	Not Applicable
					Local repair of areas	
		h = maximum depth ofdamage				
			2	r = 2 - 10 %	damaged and liable to be damaged. Within 7days	
			3	r = 10 - 20%	Bonded Inlay within 15 days	
			4	r = 20 - 30 %		
			5	r > 30 % and h > 25 mm	Reconstruct slab within 30days	
9	**Polished Surface/Glazing**	t = texture depth, sandpatch test	0		No action.	Not Applicable
			1	t > 1 mm		
			2 '	t = 1 - 0.6 mm	Monitor rate of deterioration	
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		
			5	t < 0.1 mm	Diamond Grinding if affecting 50% or more slabsin 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 - 100 mm; h < 50 mm; n < 1 per 5 m^2	Partial depth repair 65 mmdeep. Within 15 days	
			2	d = 50 - 100 mm; h > 50 mm; n < 1 per 5 m^2		
			3	d = 100 - 300 mm; h < 100 mm n < 1 per 5 m^2	Partial depth repair 110mm i.e.10 mm more than the depth of the hole. Within 30 days	
			4	d = 100 - 300 mm; h > 100 mm; n < 1 per 5 m^2		

			5	d > 300 mm; h > 100 mm: n > 1 per 5 m^2	Full depth repair. Within 30 days	
Joint Defects						
11	**Joint Seal Defects**	loss or damage L = Length as % total	0	Difficult to discern.	**Short Term** No action.	**Long Term** Not Applicable

Sr. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
		joint length	1	Discernible, L< 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	
			3	Notable. L > 25% insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days	
			5	Severe; w > 3 mm negligible protection against ingress of water and trapping incompressible material.	Clean, widen and reseal the joint. Within 7 days	
12	**Spalling of Joints**	w = width on either side of the joint L = length of spalled portion (as % joint length)	0	Nil, not discernible	No action.	Not Applicable
			1	w < 10 mm	Apply low viscosity epoxy resin/ mortar in cracked portion. Within 7 days	
			2	w = 10 - 20 mm, L < 25%		
			3	w = 20 - 40 mm, L > 25%	Partial Depth Repair. Within 15 days	
			4	w = 40 - 80 mm, L > 25%	30 - 50 mm deep, h = w + 20% of w, within 30 days	
			5	w > 80 mm, and L > 25%	50 - 100 mm deep repair. H = w + 20% of w. Within 30 days	
13	**Faulting (or Stepping)**	f = difference of level	0	no discernible, < 1 mm	No action.	No action.
			1	f < 3 mm		
			2	f = 3 - 6 mm	Determine cause and observe, take action for diamond grinding	Replace the slab as appropriate. Within 30 days
			3	f = 6 - 12 mm	Diamond Grinding	

	inCracks or Joints		4	f= 12 - 18 mm	Raise sunken slab.	Replace the slab as appropriate.Within 30days
			5	f> 18 mm	Strengthen subgrade and sub-base by grouting and raising sunken slab	
14	**Blowup or buckling**	h = vertical	0	Nil, not discernible	**Short Term**	**Long Term**

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**
		displacement from normal profile			No Action	
			1	h < 6 mm		
			2	h = 6 - 12 mm	Install Signs to Warn Trafficwithin 7 days	
			3	h = 12 - 25 mm		
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shattered slabs, ie 4 or more pieces	Replace broken slabs. Within 30 days	
15	**Depression**	h = negative vertical displacement from normal profile L =length	0	No 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 Trafficwithin 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Strengthen sub-grade. Reinstate pavement at normal level if L < 20 m. Within 30 days	
			5	h > 100 mm		
					Short Term	**Long Term**
16	**Heave**	h = positive vertical displacement from normal profile. L = length	0	No discernible. h < 5 mm	No action.	scrabble
			1	h = 5 - 15 mm	Follow up.	
			2	h = 15 - 30 mm, Nos <20% joints	Install Signs to Warn Trafficwithin 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Stabilise subgrade. Reinstatepavement at normal level if length < 20	
			5	h > 100 mm		

					m. Within 30 days	
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

Sr. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	**Lane to Shoulder Dropoff**	f = difference of level	0	Nil, not discernible < 3mm	**Short Term**	**Long Term**
					No action.	
			1	f = 3 - 10 mm	Spot repair of shoulder within 7 days	
			2	f = 10 - 25 mm		
			3	f = 25 - 50 mm	Fill up shoulder within 7 days	
			4	f = 50 - 75 mm		For any 100 m stretch Reconstruct shoulder, if affecting 25% or more of stretch. Within 30days
			5	f > 75 mm		
Drainage						
19	**Pumping**	quantity of fines and water expelled through open joints and cracks Nos	0	not discernible	No Action	
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints Without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	appreciable/ Frequent 10 - 25%	Lift or jack slab within 30 days.	

		Nos/100 m stretch	5	abundant, crack development > 25%	Repair distressed pavement sections. Strengthen subgrade andsubbase. Replace slab. Within 30 days	
20	**Ponding**	Ponding on slabs due to blockage ofdrains	0-2	No discernible problem	No action.	
			3 to 4	Blockages observed in drains, but water flowing	Clean drains etc within 7 days, Follow up	Action required to stop water damaging foundation within 30 days.
			5	Ponding, accumulation of water observed	-do-	

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 ofsafe stopping sight distance shall be available throughout. **Design Speed ,kmph** / **Desirable Minimum Sight Distance (m)** / **Safe Stopping Sight Distance (m)** 100 / 360 / 180 80 / 260 / 130	Monthly	Manual Measurement swith Odometer along with video/ image backup	Removal of obstruction within 24 hours, in case of sight line affected by temporaryobjects such as trees, temporary encroachments. In case of permanent structure or designdeficiency: Removal of obstruction/improvement ofdeficiency 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
Pavement Marking	Wear	<70% of marking remaining	Bi-Annually	Visual Assessment as perAnnexure-F of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect - within2 months	IRC:35-2015

	Day time Visibility	During expected life Service Time Cement Road - 130mcd/m^2/lux Bituminous Road - 100mcd/m^2/lux	Monthly	As per Annexure-D of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months	IRC:35-2015

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Night Time Visibility	<u>Initial and Minimum Performance for Dry Retro reflectivity during night time:</u>	Bi-Annually	As per Annexure-E of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months	IRC:35-2015
		Design Speed: (RL) Retro Reflectivity (mcd/m^2/lux) — Initial (7 days); Minimum Threshold level (TL) & warranty period required up to 2 years Up to 65: 200; 80 65 - 100: 250; 120 Above 100: 350; 150					
		<u>Initial and Minimum Performance for Night Visibility under wet condition (Retro reflectivity):</u> 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 (7days): 55BPN Min. Threshold: 44BPN *Note: shall be considered under urban/city traffic condition encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc.	Bi-Annually	As per Annexure-G of IRC:35-2015		Within 24 hours	IRC:35-2015
Asset Type	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
Road Signs	Shape and Position	Shape and Position as per IRC:67-2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is damaged. Relocation as per requirement	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/Cantilever Sign boards	IRC:67-2012
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of each signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.	hange of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/Cantilever	RC:67-2012

						Sign boards	
Kerb	Kerb Height	As per IRC 86:1983 depending upon typeof Kerb	Bi-Annually	Use of distance measuring tape	Raising Kerb Height	Within 1 Month	RC 86:1983
	Kerb Painting	Functionality: Functioning of Kerbpainting 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	Functionality: Functioning of guardrail asintended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014

AssetType	**Performance Parameter**	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	**Time limit for Rectification**	**Specifications and Standards**
	Traffic Safety Barriers	Functionality: Functioning of Safety Barriersas intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014,IRC:119-2015
	End Treatment of Traffic Safety Barriers	Functionality: Functioning of End Treatmentas intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014,IRC:119-2015
	Attenuators	Functionality: Functioning of Attenuators asintended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP-2014, IRC:119-2015
	Guard Posts and Delineators	Functionality: Functioning of Guard Postsand Delineators as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: 79 - 1981

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

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

roads						

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
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	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording the defects	Repairs to spalling, cracking, delamination, rusting shall be followed as per IRC: SP: 40-1993.	15 days	IRC SP 40-1993 and MORTH Specifications clause 2800
		Delamination of concrete not more than 0.25 sqm.					
		Cracks wider than 0.3 mm not more than 1m aggregate length					

	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35- 1990	Repairs to damaged aprons and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Bridges including ROBs Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35- 1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
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 3004.2 & 2811.
	User safety (condition of crash barrier and guard rail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed condition survey as per IRC SP: 35-1990.	Repairs and replacement of safety barriers as the case may be	3days	IRC: 5-1998, IRC SP: 84-2014 and IRC SP: 40-1993.

	Rusted reinforcement	Not more than 0.25 sqm	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out the repairs to affected concrete portion with epoxy mortar / concrete.	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
	Spalling of concrete	Not more than 0.50 sqm					
	Delamination	Not more than 0.50 sq.m					
	Cracks wider than 0.30 mm	Not more than 1m total length	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting with epoxy mortar, investigating causes for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP: 40-1993 and MORTH Specification 2800.
	Performance Parameter	**Level of Service (LOS)**	**Frequency of Measurement**	**Testing Method**	**Recommended Remedial measures**	Time limit for Rectification	**Specifications and Standards**
	Rainwater seepage through deck slab	**Leakage - nil**	**Quarterly**	**Detailed condition survey as per IRC SP: 35- 1990 using Mobile Bridge Inspection Unit**	**Grouting of deck slab at leakage areas, waterproofing, repairs to drainage spouts**	1 months	**MORTH specifications 2600 & 2700.**

	Deflection due to permanent loads and live loads	**Within design limits.**	**Once in every 10 years for spans more than 40 m**	**Load test method**	**Carry out major rehabilitation works on bridge to retain original design loads capacity**	6 months	**IRC SP: 51-1999.**
	Vibrations in bridge deck due to moving trucks	**Frequency of vibrations shall not be more than 5 Hz**	**Once in every 5 years for spans more than 30m and every 10 years for spans between 15 to 30 m**	**Laser displacement sensors or laser vibro-meters**	**Strengthening of super structure**	4 months	**AASHTO LRFD specifications**
	Leakage in Expansion joints	**No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rain water through expansion joint in case of buried and asphalt plug and copper strip joint.**	**Bi-Annually**	**Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit**	**Replace of seal in expansion joint**	15 days	**MORTH specifications 2600 and IRC SP: 40-1993.**
	Debris and dust in strip seal expansion joint	**No dust or debris in expansion joint gap.**	**Monthly**	**Detailed condition survey as per IRC SP:35- 1990 using Mobile Bridge Inspection Unit**	**Cleaning of expansion joint gaps thoroughly**	3 days	**MORTH specifications 2600 and IRC SP: 40-1993.**

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No silt, debris, clogging of drainage spout collection chamber.	Monthly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainage spout if any leakages observed.	3 days	MORTH specification 2700.
Bridge-substructure	Cracks/ spalling of concrete/rusted steel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting/guniting and micro concreting depending on type of defect noticed	30 days	IRC SP: 40-1993 and MORTH specification 2800.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Bearings	Delamination of bearing reinforcement notmore than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture of reinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	In case of failure of even one bearing onany pier/abutment,all the bearings on that pier/abutment shall be replaced, inorder to get uniform load transfer on to bearings.	3 months	MORTH specification 2810 and IRC SP: 40-199.
Bridge Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection as per IRC SP:35-1990 using Mobile Bridge Inspection Unit.In case of doubt, use Underwater camera for inspection of deep wells in major Rivers.	Suitable protection works around pier/abutment	1 month	IRC SP: 40-1993, IRC 83-2014, MORTH specification 2500

	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sq.m, damage to solid apron (concrete apron) not more than 1 sq.m	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching.	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC: SP:13-2004.
Note: Any Structure during the entire contract period which is found that does not 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 Structures and Culverts:

Table 5: Maintenance Criteria for Hill Roads

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

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

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

A. Flexible Pavement

Nature of Defect or deficiency		**Time limit for repair/ rectification**
(b)	**Granular earth shoulders, side slopes, drains and culverts**	
(i)	Variation by more than 1 % in the prescribed slope of camber/cross fall (shall not be less than the camber on the main carriageway)	7 (seven) days
(ii)	Edge drop at shoulders exceeding 40 mm	7 (seven) days
(iii)	Variation by more than 15% in theprescribed side (embankment) slopes	30 (thirty) days
(iv)	Rain cuts/gullies in slope	7 (seven) days
(v)	Damage to or silting of culverts and side	7 (seven) days
(vi)	Desilting o f drains in urban/semi- urban	24 (twenty-four) hours
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)
(c)	**Road side furniture including road sign and pavement marking**	
(i)	Damage to shape or position, poor visibility orloss of retro- reflectivity	48 (forty-eight) hours
(ii)	Painting of km stone, railing, parapets, crashbarriers	As and when required/ Once everyyear
(iii)	Damaged/missing signs road requiringreplacement	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 ofroad 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 androad structures	15 (fifteen) days
(f)	**Rest area**	
(i)	Cleaning of toilets	Every 4 (four) hours
(ii)	Defects in electrical, water and sanitaryinstallations	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	within 48 (forty-eight) hours
	Permanent measures	within15 (fifteen) days or as specifiedby 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 andtilting, spalling, scaling	30 (thirty) days
(d)	**Bearings (metallic) of bridges**	
(i)	Deformation, damages, tilting or shifting of bearings	15 (fifteen) days Greasing ofmetallic 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 within24 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. License 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: Form of Bank Guarantee

(See Clause 7.1)

[Performance Security /Additional Performance Security]

To

_____[name of Authority]

_____ [address of Authority]

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

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

crore) (the **"Guarantee Amount"**[1]).

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

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

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

2. A letter from the Authority, under the hand of an officer not below the rank of [General Manager of National Highways & Infrastructure Development Corporation Limited], that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Contract shall be conclusive, final and binding on the Bank. The Bank further

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

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

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

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

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

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

Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect on ****$. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.

9. The Bank undertakes not to revoke this Guarantee during its currency,

except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

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

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

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

13. This guarantee shall also be operatable at our .... Branch at New Delhi, from whom,

confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

14. The guarantor/bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of NHIDCL, details of which is as under:

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

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

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

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

NOTES:

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

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

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

Annex – II: Form for Guarantee for Advance Payment

To

_____ [name of Authority]

_____ [address of Authority]

WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the authority], (hereinafter called the "**Authority**") for the construction of the ***** section of [National Highway No. **] on Engineering, Procurement and Construction (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement.

(B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing @Bank Rate + 3% advance payment (herein after called "**Advance Payment**") equal to 10% (ten per cent) of the Contract Price; and that the Advance Payment shall be made in two installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} installment of the Advance Payment is Rs. _____cr. (Rupees _____ crore) and the amount of this Guarantee is Rs._____cr. (Rupees_____crore) (the "**Guarantee Amount**")[2].

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

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

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

   A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways Authority of India], that the Contractor has committed default in the due and faithful performance

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

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

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

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

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

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

7. The Guarantee shall cease to be in force and effect on ****3 Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.

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

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

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

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

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

13. The guarantor/bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of NHIDCL, details of which is as under:

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

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

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

NOTES:

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

(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 Clauses10.1 (iv) and 19.3)

Contract Price Weightages

1. The Contract Price for this Agreement is …….

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

Bill No	Weightage in percentage to the contract price	Description of Items		Percentage weightage
1		**WIDENING AND STRENGTHENING OF EXISTING ROAD**		
	50.79%	*A1.1*	*Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock including Cleaning & grubbing with required site clearance etc.*	**0.00%**
		A1.2	*Sub-Base Course*	**0.00%**
		A1.3	*Non-Bituminous Base Course (WMM)*	**0.00%**
		A1.4	*Bituminous Base Course*	**0.00%**
		A1.5	*Wearing Coarse (BC)*	**0.00%**
		A1.6	*Rigid Pavement*	**0.00%**
		A1.7	*Hard Shoulder*	**0.00%**
2		**RECONSTRUCTION/NEW 2-LANE ALIGNMENT/BYPASS (FLEXIBLE PAVEMENT)**		
		A2.1	*Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock including Cleaning & grubbing with required site clearance etc.*	**10.76%**
		A2.2	*Sub-Base Course*	**5.61%**
		A2.3	*Non Bituminous Base Course*	**7.32%**
		A2.4	*Bituminous Base Course*	**4.33%**
		A2.5	*Wearing Coat*	**2.65%**
		A2.6	*Hard Shoulder*	**3.51%**
3		**RECONSTRUCTION/NEW 2-LANE ALIGNMENT/BYPASS(RIGID PAVEMENT)**		
		A3.1	*Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock including Cleaning & grubbing with required site clearance etc.*	**0.00%**
		A3.2	*Sub-Base Course*	**0.00%**
		A3.3	*Dry Lean Concrete(DLC) Course*	**0.00%**
		A3.4	*Pavemennt Quality Control(PQC) Course*	**0.00%**
4		**RECONSTRUCTION/NEW SERVICE ROAD (FLEXIBLE PAVEMENT)**		**0.00%**
		A4.1	*Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock including Cleaning & grubbing with required site clearance etc.*	**0.00%**
		A4.2	*Sub-Base Course*	**0.00%**
		A4.3	*Non-Bituminous Base Course*	**0.00%**

		A4.4	*Bituminous Base Course*	**0.00%**
		A4.5	*Wearing Coat*	**0.00%**
5		**RECONSTRUCTION/NEW SERVICE ROAD (RIGID PAVEMENT)**		**0.00%**
		A5.1	*Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock including Cleaning & grubbing with required site clearance etc.*	**0.00%**
		A5.2	*Sub-Base Course*	**0.00%**
		A5.3	*Dry Lean Concrete (DLC) Course*	**0.00%**
		A5.4	*Pavement Quality Control (PQC) Course*	**0.00%**
6		**RECONSTRUCTION AND NEW BOX CULVERTS, SLAB CULVERTS & HUMEPIPE CULVERTS ON EXISTING ROAD, REALIGNMENTS, BYPASSES**		**0.00%**
		A6.1	*Culverts and associated Protection Works (Length< 6m)*	**16.61%**
7	**7.53%**	**WIDENING AND REPAIR OF MINOR BRIDGES (Length > 6 m and < 60 m)**		**0.00%**
		A7.1	*Repair of Minor Bridges*	**0.00%**
8		**NEW MINOR BRIDGES (Length > 6 m and < 60 m) Reconstruction**		**0.00%**
		A8.1	***Foundation + Sub Structures:*** *On completion of the foundation work including foundations for wing wall and return walls, abutments, piers upto the abutment/pier cap.*	**2.38%**
		A8.2	***Super-structure:*** *On completion of the super structure in all respect including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.*	**4.69%**
		A8.3	***Approaches:*** *On completion of approaches including retaining wall, stone pitching, protection works complete in all respect and fit for use.*	**0.46%**
		A8.4	***Guide Bunds and River Training Works:*** *On completion of Guide bunds and river training works complete in all respects.*	**0.00%**
9		**WIDENING AND REPAIRS OF UNDERPASSES/ OVERPASSES**		**0.00%**
		A9.1	*Underpasses/ Overpasses*	**0.00%**
10		**NEW UNDERPASSES/ OVERPASSES**		**0.00%**
		A10.1	***Foundation + Sub Structures:*** *On completion of the foundation work including foundations for wing wall and return walls, abutments, piers upto the abutment/pier cap.*	**0.00%**
		A10.2	***Super-structure:*** *On completion of the super structure in all respect including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.* *Wearing Coat (a) in case of overpass- wearing coat including expansion joint complete in all respects as specified and (b) in case of underpass- Rigid pavement including drainage facility complete in all respects as specified.*	**0.00%**
		A10.3	***Approaches:*** *On completion of approaches including retaining walls/ Reinforced earth walls, stone pitching, protection works complete in all respect and fit for use.*	**0.00%**
11	**0.00%**	**WIDENING AND REPAIRS OF MAJOR BRIDGES**		**0.00%**

		A11.1		*Foundation*	**0.00%**
		A11.2		*Sub-structure*	**0.00%**
		A11.3		*Super-structure (including bearings)*	**0.00%**
		A11.4		*Wearing Coat including expansion joints*	**0.00%**
		A11.5		*Miscellaneous items like handrails, crash barriers, road markings etc.*	**0.00%**
		A11.6		*Wing walls/ Return walls*	**0.00%**
		A11.7		*Guide Bunds, River Training Works etc*	**0.00%**
		A11.8		*Approaches (including Retaining walls, stone pitching and protection works)*	**0.00%**
12		**NEW MAJOR BRIDGES (RECONSTRUCTION)**			**0.00%**
		A12.1		*Foundation*	**0.00%**
		A12.2		*Sub-structure*	**0.00%**
		A12.3		*Super-structure (including bearings)*	**0.00%**
		A12.4		*Wearing Coat including expansion joints*	**0.00%**
		A12.5		*Miscellaneous items like handrails, crash barriers, road markings etc.*	**0.00%**
		A12.6		*Wing walls/ Return walls*	**0.00%**
		A12.7		*Guide Bunds, River Training Works etc*	**0.00%**
		A12.8		*Approaches (including Retaining walls, stone pitching and protection works)*	**0.00%**
13		**WIDENING AND REPAIR OF ROB/RUB**			**0.00%**
		A13.1	***(a)***	***ROB***	**0.00%**
			(i)	*Foundation*	**0.00%**
			(ii)	*Sub-structure*	**0.00%**
			(iii)	*Super-structure (including bearings)*	**0.00%**
			(iv)	*Wearing Coat in case of ROB- wearing coat including expansion joint complete in all respects as specified.*	**0.00%**
			(v)	*Miscellaneous items like handrails, crash barriers, road markings etc.*	**0.00%**
			(vi)	*Wing walls/ Return walls*	**0.00%**
			(vii)	*Approaches (including Retaining walls, stone pitching and protection works)*	**0.00%**
		A13.2	***(b)***	***RUB***	**0.00%**
			(i)	*Foundation*	**0.00%**
			(ii)	*Sub-structure*	**0.00%**
			(iii)	*Super-structure (including bearings)*	**0.00%**
			(iv)	*Wearing Coat in case of RUB- Rigid pavement under RUB including drainage facility complete in all respects as specified.*	**0.00%**
			(v)	*Miscellaneous items like handrails, crash barriers, road markings etc.*	**0.00%**
			(vi)	*Wing walls/ Return walls*	**0.00%**

			(vii)	*Approaches (including Retaining walls, stone pitching and protection works)*	**0.00%**
14		**NEW ROB/RUB**			**0.00%**
		A14.1	***(a)***	***ROB***	**0.00%**
			(i)	*Foundation*	**0.00%**
			(ii)	*Sub-structure*	**0.00%**
			(iii)	*Super-structure (including bearings)*	**0.00%**
			(iv)	*Wearing Coat in case of ROB- wearing coat including expansion joint complete in all respects as specified.*	**0.00%**
			(v)	*Miscellaneous items like handrails, crash barriers, road markings etc.*	**0.00%**
			(vi)	*Wing walls/ Return walls*	**0.00%**
			(vii)	*Approaches (including Retaining walls/ Reinforced earth walls, stone pitching and protection works)*	**0.00%**
		A14.2	***(b)***	***RUB***	**0.00%**
			(i)	*Foundation*	**0.00%**
			(ii)	*Sub-structure*	**0.00%**
			(iii)	*Super-structure (including bearings)*	**0.00%**
			(iv)	*Wearing Coat in case of RUB- Rigid pavement under RUB including drainage facility complete in all respects as specified.*	**0.00%**
			(v)	*Miscellaneous items like handrails, crash barriers, road markings etc.*	**0.00%**
			(vi)	*Wing walls/ Return walls*	**0.00%**
			(vii)	*Approaches (including Retaining walls/ Reinforced earth walls, stone pitching and protection works)*	**0.00%**
15		**WIDENING AND REPAIR OF ELEVATED SECTION/ FLYOVERS/ GRADE SEPARATORS**			**0.00%**
		A.15.1	*(i)*	*Foundation*	**0.00%**
			(ii)	*Sub-structure*	**0.00%**
			(iii)	*Super-structure (including bearings)*	**0.00%**
			(iv)	*Wearing Coat including expansion joint.*	**0.00%**
			(v)	*Miscellaneous items like handrails, crash barriers, road markings etc.*	**0.00%**
			(vi)	*Wing walls/ Return walls*	**0.00%**
			(vii)	*Approaches (including Retaining walls/ Reinforced earth walls, stone pitching and protection works)*	**0.00%**
16		**NEW ELEVATED SECTION/ FLYOVERS/ GRADE SEPARATORS**			**0.00%**
		A.16.1	*(i)*	*Foundation*	**0.00%**
			(ii)	*Sub-structure*	**0.00%**
			(iii)	*Super-structure (including bearings)*	**0.00%**
			(iv)	*Wearing Coat including expansion joint.*	**0.00%**

			(v)	*Miscellaneous items like handrails, crash barriers, road markings etc.*	**0.00%**
			(vi)	*Wing walls/ Return walls*	**0.00%**
			(vii)	*Approaches (including Retaining walls/ Reinforced earth walls, stone pitching and protection works)*	**0.00%**
17	**41.68%**	**OTHER WORKS**			**0.00%**
		A17.1	*Toll Plaza*		**0.00%**
		A17.2	*Road side drain*		**1.83%**
		A17.3	*Road signs, marking, Km stones, Safety devices etc.*		**0.00%**
			(a)	*Pavement Marking*	**0.48%**
			(b)	*Crash barrier/W metal crash barrier*	**3.63%**
			(c)	*Traffic Sign*	**0.21%**
			(d)	*Road Boundary stone, km Stone,5th km stone and hectometer stone*	**0.01%**
			(e)	*Parking facility*	**0.00%**
			(f)	*Traffic impact Attenuators at Abutments and Piers traffic island*	**0.00%**
			(g)	*Road furniture (overhead signboard etc.)*	**0.42%**
			(h)	*Others including construction of median & median kerb with channel & paint and rumble strip*	**0.00%**
		A17.4	*Project facilities*		**0.00%**
			(a)	*Truck lay-byes*	**0.00%**
			(b)	*Bus bays and Bus Shelter*	**0.00%**
			(c)	*Junctions (Major & Minor)*	**0.18%**
			(d)	*Road side Footpath*	**0.00%**
			(e)	*Overtaking Zone*	**0.00%**
			(f)	*Utility Corridor*	**0.00%**
		A17.5	*Road Side Plantation, Median plantation & Turfing of the embankment slope*		**0.00%**
		A17.6	*Repair of protection works other than approaches to the bridges, elevated sections/ fly-overs/ grade separator and ROBs/ RUBs.*		**0.00%**
		A17.7	*Shore Protection Works*		**5.87%**
		A17.8	*Traffic diversion, Safety and traffic management during construction*		**0.00%**
		A17.9	*Slope Protection Works as special requirement for hill road*		**0.00%**
			(a)	*Hydro Seeding of Cut Slopes in Soil*	**0.00%**
			(b)	*Seeding and Mulching with Jute net all along the perpetual slide locations*	**0.00%**
			(c)	*Catchwater Drain*	**0.00%**
			(d)	*Retaining Wall*	**14.46%**
			(e)	*Reinforced earth wall*	**0.00%**
			(f)	*Breast wall*	**5.49%**
			(g)	*Gabion wall*	**6.63%**

			(h)	*Slip zones protections*	**0.00%**
			(i)	*Parapet Wall*	**0.00%**
			(j)	*Guard wall*	**1.58%**
		A17.10	*Utility Shifting Works*		**0.89%**
Total Civil Works Cost i/c Utility Shifting (In Rs.)					**100.00%**

Procedure of estimating the value of work done

(i) 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
1	**2**	**3**
A-Widening and strengthening of Existing Road		
(1) Earthwork up to top of the sub-grade	0.00%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 5 (five) percent of the total length.
(3) Sub-Base Course	0.00%	
(4) Non-Bituminous Base course	0.00%	

Stage of Payment	Percentage -Weightage	Payment Procedure
1	2	3
(5) Bituminous Base course	0.00%	
(5) Wearing Coat	0.00%	
(6) Hard Shoulder	0.00%	
B.1- Reconstruction/New 8-lane realignment/bypass (Flexible Pavement)		
(1) Earthwork up to top of the sub-grade	10.76%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5 (five) percent of the total length, whichever is less
(2) Sub-Base Course	5.61%	
(3) Non-Bituminous Base course	7.32%	
(4) Bituminous Base course	4.33%	
(5) Wearing Coat	2.65%	
(6) Hard Shoulder	3.51%	
B.2- Reconstruction/New 8-lane realignment/bypass (Rigid Pavement)		
(1) Earthwork up to top of the sub-grade	0.00%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5 (five) percent of the total length, whichever is less
(2) Sub-Base Course	0.00%	
(3) Dry Lean Concrete (DLC) Course	0.00%	
(4) Pavement Quality Concrete (PQC) Course	0.00%	
C.1- Reconstruction/New Service Road (Flexible Pavement)		
(1) Earthwork up to top of the sub-grade	0.00%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5 (five) percent of the total length, whichever is less
(2) Earthwork in shoulders	0.00%	
(3) Sub-Base Course	0.00%	
(4) Non-Bituminous Base Course	0.00%	
(5) Bituminous Base Course	0.00%	
(6) Wearing Coat	0.00%	
C.2- Reconstruction/New Service Road (Rigid Pavement)		
(1) Earthwork up to top of the sub-grade	0.00%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5 (five) percent of the total length, whichever is less
(2) Sub-Base Course	0.00%	
(3) Dry Lean Concrete (DLC) Course	0.00%	
(4) Pavement Quality Concrete (PQC) Course	0.00%	
D- Reconstruction and New Culverts on existing road, realignments, bypasses:		

Stage of Payment	Percentage -Weightage	Payment Procedure
1	2	3
(1) Culverts (Length < 6m)	16.61%	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 five culverts.

@ For calculation of payment stage for main-carriageway the project length shall be converted into equivalent 2 lane length. For example, if the total length of 4 lane main carriageway is 100 km, then the equivalent length for calculation of payment stage will be 2 x 100 km. Now, 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 equivalent 2-Lane length in km as defined above

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 including the length not handed over to the Contractor under clause 8.3 of this Contract Agreement 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

(ii) 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

Stage of Payment	Percentage - Weightage	Payment Procedure
1	2	3
A.1. Widening and Repair of minor bridges (length >6m and < 60m)	0.00%	Cost of each minor bridge shall be determined on pro- rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of widening and repair works of a minor bridge.
A.2.- New Minor bridges		

Stage of Payment	Percentage - Weightage	Payment Procedure
1	2	3
1) **Foundation** + **Sub Structures**: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	2.38%	**Foundation:** Cost of each Minor bridge shall be determined on pro- rata basis with respect to the total linear length (m) of the minor bridges. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e., not less than 25% of the scope of foundation of each bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified. **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 sub- structure shall be made on pro-rata basis on completion of a stage i.e., not less than 25% of the scope of sub-structure of each bridge.
(2) Super-structure: On completion of the super-structure in all respects including Girder, Deck slab, bearings	4.69%	**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.
(3) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use	0.46%	**Approaches**: Payment shall be made on pro-rata basis on completion of one approach including Stone pitching and protection works etc complete in all respects as specified.
(4) Guide Bunds and River Training Works: On completion of Guide Bunds and river training works complete in all respects	0.00%	**Guide Bunds and River Training Works:** Payment shall be made on pro-rata basis on completion of a stage i.e., completion of Guide Bunds and River training Works in all respects as specified
(5) Other Ancillary Works: On completion of wearing coat, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion in all respect.	0.00%	**Other Ancillary Works**: Payment shall be made on pro-rata basis on completion of a stage in all respects as specified

Stage of Payment	Percentage - Weightage	Payment Procedure
1	2	3
B.1. Widening and repair of underpasses/overpasses	0.00%	Cost of each underpass/overpass shall be determined on pro- rata basis with respect to the total linear length of the underpasses/overpasses. Payment shall be made on the completion of widening and repair works of a underpass/overpass.
B.2. New Underpasses/Overpasses		
(1) Foundation: On completion of the foundation work including foundations for wing and return walls, abutments, piers.	0.00%	**Foundation:** Cost of each Underpass/ Overpass shall be determined on pro- rata basis with respect to the total linear length (m) of the Underpasses/Overpasses. 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 each Underpasses/ Overpasses. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-structure: On completion of abutments, piers up to the abutment/ pier cap including wing/ return/ retaining wall up to top	0.00%	**Sub-structure:** Cost of each Underpass/ Overpass shall be determined on pro- rata basis with respect to the total linear length (m) of the Underpasses/ Overpasses. Payment against sub-structure shall be made on pro-rata basis on completion of a stage i.e., not less than 25% of the scope of sub-structure of each Underpasses/Overpasses.
(3) Super-structure: On completion of the super-structure in all respects including Girder, Deck slab, bearings	0.00%	**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. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above.
(4) On completion of Retaining / Reinforced earth walls complete in all respect and fit for use	0.00%	Payments shall be made on pro rata basis on completion of 20% of the total area.
(5) Approaches and Other Ancillary Works: On completion of wearing coat, expansion joints, hand rails, crash barriers, road signs & markings, stone pitching, protection works, tests on completion in all respect.	0.00%	Payment shall be made on pro-rata basis on completion of a stage in all respects as specified

Stage of Payment	Percentage - Weightage	Payment Procedure
1	2	3
Wearing Coat (a) in case of Overpass-wearing coat including expansion joints complete in all respects as specified and (b) in case of underpass-rigid pavement including drainage facility complete in all respects as specified	0.00%	Payment shall be made on pro-rata basis on completion of a stage in all respects as specified.

(iii) Major Bridge works, ROB/RUB and Structures

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

Table 1.3.3

Stage of Payment	Percentage - Weightage	Payment Procedure
1	2	3
A.1.- Widening and Repairs of Major Bridges		
(1) Foundation: On completion of the foundation work including foundations for return walls, abutments, piers.	0.00%	**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. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-structure: On completion of abutments, piers up to the abutment/ pier cap	0.00%	**Sub-structure:** Payment against sub-structure shall be made on pro-rata basis on completion of a stage i.e., not less than 25% of the scope of sub-structure of major bridge.

Stage of Payment	Percentage - Weightage	Payment Procedure
1	2	3
(3) Super-structure: On completion of the super-structure in all respects including Girder, Deck slab, Bearings	0.00%	**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. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above.
(4). Wearing Coat including expansion joints	0.00%	**Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%	**Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/return walls up to top	0.00%	**Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7) Guide bunds, River Training works etc.	0.00%	**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.
(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	**Approaches:** Payments shall be made on pro rata basis on completion of 10% of the scope of each stage.
A.2. New Major Bridges		
(1) Foundation: On completion of the foundation work including foundations for return walls, abutments, piers.	0.00%	**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. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-structure: On completion of abutments, piers up to the abutment/ pier cap	0.00%	**Sub-structure:** Payment against sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of major bridge.

Stage of Payment	Percentage - Weightage	Payment Procedure
1	2	3
(3) Super-structure: On completion of the super-structure in all respects including Girder, Deck slab, Bearings	0.00%	**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. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4). Wearing Coat including expansion joints	0.00%	**Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%	**Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/return walls up to top	0.00%	**Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7) Guide bunds, River Training works etc.	0.00%	**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.
(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	**Approaches:** Payments shall be made on pro rata basis on completion of 10% of the scope of each stage.
B.1.- Widening and repairs of		
(a) ROB		
(b) RUB		
(1) Foundation	0.00%	**Foundation:** Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length(m) of the ROB/RUB. Payment 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 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	0.00%	**Sub-structure:** Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of ROB/RUB.

Stage of Payment	Percentage - Weightage	Payment Procedure
1	2	3
(3) Super-structure (including bearings)	0.00%	**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. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4) **Wearing coat (a) in case of ROB –** wearing coat including expansion joints complete in all respects as specified and **(b) in case of RUB –** rigid pavement under RUB including drainage facility complete in all respects as specified	0.00%	**Wearing Coat:** Payment shall be made on completion (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified.
(5) Miscellaneous Items (like hand rails, crash barriers road marking etc.)	0.00%	**Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/return walls up to top	0.00%	**Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7) On completion of Retaining/Reinforced earth walls complete in all respect and fit for use	0.00%	Payments shall be made on pro rata basis on completion of 20% of the total area.
(8) Approaches and Other Ancillary Works: On completion of wearing coat, expansion joints, hand rails, crash barriers, road signs & markings, stone pitching, protection works, tests on completion in all respect.	0.00%	Payment shall be made on pro-rata basis on completion of a stage in all respects as specified
B.2.- New		
(a) ROB		
(b) RUB		

Stage of Payment	Percentage - Weightage	Payment Procedure
1	2	3
(1) Foundation	0.00%	**Foundation:** Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROB/RUB. Payment 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 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	0.00%	**Sub-structure:** Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e., not less than 25% of the scope of sub-structure of ROB/RUB.
(3) Super-structure (including bearing)	0.00%	**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. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4) Wearing Coat including expansion joints in case of ROB. In case of RUB-rigid pavement under RUB including drainage facility as specified	0.00%	**Wearing Coat:** Payment shall be made on completion (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified.
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%	**Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/return walls	0.00%	**Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7) On completion of Retaining / Reinforced earth walls complete in all respect and fit for use	0.00%	Payments shall be made on pro rata basis on completion of 20% of the total area.

Stage of Payment	Percentage - Weightage	Payment Procedure
1	2	3
(8) Approaches and Other Ancillary Works: On completion of wearing coat, expansion joints, hand rails, crash barriers, road signs & markings, stone pitching, protection works, tests on completion in all respect.	0.00%	Payment shall be made on pro-rata basis on completion of a stage in all respects as specified
C.1- Widening and repairs of Elevated Section/Flyovers/Grade Separators		
(1) Foundation	0.00%	**Foundation:** Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structure. 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 structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-structure:	0.00%	**Sub-structure:** Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e., not less than 25% of the scope of sub-structure of structure.
(3) Super-structure: On completion of the super-structure in all respects including Girder, Deck slab, bearings	0.00%	**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. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above.
(4) Wearing Coat including expansion joints.	0.00%	**Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5). Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%	**Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/return walls	0.00%	**Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.

Stage of Payment	Percentage - Weightage	Payment Procedure
1	2	3
(7) On completion of Retaining / Reinforced earth walls complete in all respect and fit for use	0.00%	Payments shall be made on pro rata basis on completion of 20% of the total area.
(8) Approaches and Other Ancillary Works: On completion of wearing coat, expansion joints, hand rails, crash barriers, road signs & markings, stone pitching, protection works, tests on completion in all respect.	0.00%	Payment shall be made on pro-rata basis on completion of a stage in all respects as specified
C.2- New Elevated Section/Flyovers/Grade Separators		
(1) Foundation	0.00%	**Foundation:** Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structure. 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 structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-structure:	0.00%	**Sub-structure:** Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e., not less than 25% of the scope of sub-structure of structure.
(3) Super-structure: On completion of the super-structure in all respects including Girder, Deck slab, bearings	0.00%	**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. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4) Wearing Coat including expansion joints.	0.00%	**Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5). Miscellaneous items like hand rails, crash barriers, road markings etc	0.00%	**Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/return walls	0.00%	**Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.

Stage of Payment	Percentage - Weightage	Payment Procedure
1	2	3
(7) On completion of Retaining / Reinforced earth walls complete in all respect and fit for use	0.00%	Payments shall be made on pro rata basis on completion of 20% of the total area.
(8) Approaches and Other Ancillary Works: On completion of wearing coat, expansion joints, hand rails, crash barriers, road signs & markings, stone pitching, protection works, tests on completion in all respect.	0.00%	Payment shall be made on pro-rata basis on completion of a stage in all respects as specified

Note:

(1) In case of innovative Major Bridge projects like cable suspension/cable stayed/ Extra Dozed and exceptionally long span bridges, the schedule may be modified as per site requirements before bidding with due approval of DG (RD) &SS, MoRT&H.

(2) The Schedule for exclusive tunnel projects may be prepared as per sit requirements before bidding with due approval of DG (RD) &SS, MoRT&H.

(iv) Other Works.

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

Table 1.3.4

Stage of Payment	Percentage -Weightage	Payment Procedure
1	2	3
(i) Toll Plaza	0.00%	Unit of measurement is each completed toll plaza. Payment of each toll plaza shall be made on pro rata basis with respect to the total of all toll plaza.
(ii) Road side drains	1.83%	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five per cent) of the total length.
(a) Lined Drain		
(b) Unlined Drain		
© Covered Drain		
(iii) Road signs, safety Devices, Road Furniture etc.	0.64%	
(iv) Road markings & Studs	0.48%	
(v) Crash Barrier	3.63%	
(vi) Project facilities	0.00%	Payment shall be made on pro rata basis for completed facilities.
(a) Bus Bays	0.00%	
(b) Truck Lay-Byes	0.00%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five per cent) of the total length or 10% (ten percent) of the area for

Stage of Payment	Percentage -Weightage	Payment Procedure
1	2	3
(c) Toe wall	0.00%	seeding and mulching
(vii) Retaining Wall	14.46%	
(viii) Breast Wall	5.49%	
(ix) Gabion wall	6.63%	
(x) Guard wall	1.58%	
(xi) Protection Works other than approaches to the bridges, elevated sections/ flyover/ grade separators and ROBs/ RUBs		
Utility Shifting	0.89%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rate basis as per its weightage with reference to total cost of EHT line. Payment shall be made for completed activity. (The average weightage of major activities (only for payment purpose) in shifting work is (i)Erection of Ples-20%, (ii)Conductor stringing including laying of cable-30%, (iii)DTR erection (if involved)-15% and (iv)Charging of line including dismantling and site clearace-35% (with DTR) and 50%without DTR)
Hydro Seeding & Mulching	0.00%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 5% (five per cent) of the total length or 10% (ten percent) of the area for seeding and mulching
Shore Protection works	5.88%	
(xii) Safety & Traffic Management during const.	0.00%	Payment shall be made on prorate basis every six months.
(xiii) Other miscellaneous works including Connecting Road & Junction under Grade separator	0.00%	Payment shall be made on Prorate basis on completion of each stage
(a) Connecting Road etc.	0.00%	
(b) Junction	0.18%	
(Xiv) Site clearance and Dismantling	0.00%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(xv) Maintenance of Road	0.00%	

2. Procedure for payment for Maintenance

(a) The cost for maintenance shall be as stated in Clause 14.1 (v).

(b) Payment for Maintenance shall be made in accordance with the provisions of Article 14 and Article 19

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

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

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 192th days **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 329th **days from the Appointed Date (the "Project Milestone- II")** (the **"Project Milestone- II"**).

(ii) Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 35% (thirty-five per cent) of the Contract Price **and should have started construction of all bridges**

4. Project Milestone-III

(i) Project Milestone-III shall occur on the date falling on the 466th **day from the Appointed Date (the "Project Milestone- III").**

(ii) Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 70% (seventy per cent) of the Contract Price and **should have** started construction of all project facilities.

5. Scheduled Completion Date

(i) The Scheduled Completion Date shall occur on the 548th 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

(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 Nondestructive Testing Techniques, at two spots in every span, to be chosen at random by the Authority's Engineer. Bridges with a span of 15 (fifteen) metres or more shall also be subjected to load testing.

(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.

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

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

3. Agency for conducting Tests

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

4. Completion Certificate

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

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

Sr. No.	Key metrics of Asset	Equipment to be used	Frequency of condition survey
1	Surface defects of pavement	Network Survey Vehicle (NSV)	At least twice a year (As per surveymonths defined for the state basis rainy season)
2	Roughness of pavement	Network Survey Vehicle (NSV)	At least twice a year (As per surveymonths 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 surveymonths 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**"), for **Improvement and Widening to Two Lane with paved shoulder of road from Km 101.300 to km 127.319 (Total Length 26.019 Km) i.e. the Khowai –Teliamura section of NH 208 (Package I) in the state of Tripura on EPC under JICA ODA Loan Phase –VI** (the "**Project Highway**") on Engineering, Procurement and Construction (EPC) basis through(Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

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

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, raincuts, disturbed pitching, vegetationgrowth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage tofoundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%
S. No.	**Item/Defect/Deficiency**	**Percentage**
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%

(d)	**Roadside Drains**	
(i)	Cleaning and repair of drains	5%
(e)	**Road Furniture**	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th km stones	5%
(f)	**Miscellaneous Items**	
(i)	Removal of dead animals, broken down/accidented vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	**Defects in Other Project Facilities**	5%

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

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

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 **National Highways & Infrastructure Development Corporation Ltd. , Third Floor, PTI Building, 4 Sansad Marg, New Delhi-110001** (the "**Authority**") and (the "**Contractor**") for **Improvement and Widening to Two Lane with paved shoulder of road from Km 101.300 to km 127.319 (Total Length 26.019 Km) i.e. the Khowai –Teliamura section of NH 208 (Package I) in the state of Tripura on EPC under JICA ODA Loan Phase –VI** , and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

2. Definitions and interpretation

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

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

(iii) The rules of interpretation stated in 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 aforesaid claim;

(c) the estimated amount of each Change of Scope Order executed subsequent to the last claim;

(d) amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2 (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 upto the last claim:

   i. For the Works executed (excluding Change of Scope orders);

   ii. For Change of Scope Orders, and

   iii. Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

(a) the monthly payment admissible in accordance with the provisions of the Agreement;

(b) the deductions for maintenance work not done;

(c) net payment for maintenance due, (a) minus (b);

(d) amounts reflecting adjustments in price under Clause 19.12; and

(e) amount towards deduction of taxes

3. Contractor's claim for Damages

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

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 underparagraph 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 the value of the contract price

(ii) The insurance shall be extended to cover liability for all loss and damage to the

Authority's property arising out of the Contractor's performance of this Agreement excluding:

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

(b) damage which is 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 kilometre.

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 " **Improvement and Widening to Two Lane with paved shoulder of road from Km 101.300 to km 127.319 (Total Length 26.019 Km) i.e. the Khowai – Teliamura section of NH 208 (Package I) in the state of Tripura on EPC under JICA ODA Loan Phase –VI"** 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)

***** End of the Document *****