Schedules

Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

1 The Site

(i) Site of the [Single -Lane] 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.

(i) 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.

(ii) 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, 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,theland,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 Project Road starts from Srirampur on NH-27(old NH-31C) and ends at immediate approach of proposed bridge over river Brahmaputra near Dhubri. The total length of the existing road stretch is 55.060 km .The project road is divided into 5(Five) packages. The PKG-I of the project road starts from Srirampur (near Bhairiguri village)at Ex.Ch.0.000 and ends to Grehempur at Ex.Ch.10.912 The entire package falls under Kokrajhar district of Assam.

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) (As per Survey,Starting Chainage of Srirampur 0.000 KM)		Design Chainage (KM)		Existing Right of Way (m)
	From	To	From	To	
1	0.000	0.250	0.000	0.255	25
2	0.250	0.500	0.255	0.505	27
3	0.500	0.750	0.505	0.755	31
4	0.750	1.000	0.755	1.005	30
5	1.000	1.250	1.005	1.255	30
6	1.250	1.500	1.255	1.504	31
7	1.500	1.750	1.504	1.754	31
8	1.750	2.000	1.754	2.004	30
9	2.000	2.250	2.004	2.254	28
10	2.250	2.500	2.254	2.504	28
11	2.500	2.750	2.504	2.753	30
12	2.750	3.000	2.753	2.998	27
13	3.000	3.250	2.998	3.246	32
14	3.250	3.500	3.246	3.494	32
15	3.500	3.750	3.494	3.744	30
16	3.750	4.000	3.744	3.996	32
17	4.000	4.250	3.996	4.244	30
18	4.250	4.500	4.244	4.492	30

SL No.	Existing Chainage (KM) (As per Survey,Starting Chainage of Srirampur 0.000 KM)		Design Chainage (KM)		Existing Right of Way (m)
	From	To	From	To	
19	4.500	4.750	4.492	4.741	31
20	4.750	5.000	4.741	4.995	30
21	5.000	5.250	4.995	5.242	28
22	5.250	5.500	5.242	5.492	26
23	5.500	5.750	5.492	5.742	27
24	5.750	6.000	5.742	5.992	25
25	6.000	6.250	5.992	6.242	27
26	6.250	6.500	6.242	6.492	28
27	6.500	6.750	6.492	6.742	28
28	6.750	7.000	6.742	6.992	30
29	7.000	7.250	6.992	7.242	30
30	7.250	7.500	7.242	7.492	24
31	7.500	7.750	7.492	7.742	24
32	7.750	8.000	7.742	7.992	29
33	8.000	8.250	7.992	8.242	30
34	8.250	8.500	8.242	8.492	30
35	8.500	8.750	8.492	8.742	28
36	8.750	9.000	8.742	8.992	26
37	9.000	9.250	8.992	9.242	25
38	9.250	9.500	9.242	9.492	24
39	9.500	9.750	9.492	9.742	24
40	9.750	10.000	9.742	9.992	26
41	10.000	10.250	9.992	10.242	26
42	10.250	10.500	10.242	10.492	25
43	10.500	10.750	10.492	10.742	27
44	10.750	10.912	10.742	10.900	30

3. Carriageway

The present carriageway of the Project Highway consists single lane carriageway with earthen shoulder configuration from Ex.Ch.0.000Km to Ex.Ch.10.912km.The type of the existing pavement of the section is flexible.

4. Major Bridges

The Site includes the following Major Bridge: -

Sl. No.	Survey Chainage (km)	Type of Structures			No. of Spans with Span Length (m)
		Foundation	Sub-Structure	Super Structure	
Nil					

5. Roadover-bridges (ROB)/Roadunder-bridges (RUB)

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

S. No.	Chainage (km)	TypeofStructure		No.ofSpanswith spanlength(m)	Width (m)	ROB/ RUB
		Foundation	Superstructure			
Nil						

6. Gradeseparators

The Site includes the following grade separators:

S. No.	Chainage (km)	TypeofStructure		No.ofSpanswithspanlength(m)	Width (m)
		Foundation	Superstructure		
Nil					

7. Minor bridges

The Site includes the following minor bridges:

S. No.	Existing Chainage (km)	DesignChainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
			Foundation	Sub-structure	Super-structure		
1	7.251	7.241	-	RCC Box	RCC	4.0mX4.0mX4 cell	8.5

8. Railway level crossings

The Site includes the following railway level crossings:

Sl. No.	Existing Chainage (km)	Design Chainage (km)	Location	Remarks
1	1.058	-	Srirampur	Between Srirampur and Jorai Railway Station

9. Under passes (vehicular, non-vehicular)

The Site includes the followingunderpasses:

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.	Existing Chainage (km)	Design Chainage (km)	Type of Culvert	Span/Opening with Span Length (m)	Width of Culvert (m)
1	1.943	1.946	SC	1 X 2.0m	5.60
2	2.997	2.992	HP	3 X1m(Dia)	12.900
3	3.384	3.378	SC	1X3.0m	5.60
4	4.325	4.322	SC	1X3.0m	5.700
5	4.328	Removed	HP	2X1(Dia)	10.000
6	5.768	5.760	HP	2X1m(Dia)	9.700
7	6.080	6.059	HP	2X1m(Dia)	9.900
8	6.231	6.221	HP	2X1m(Dia)	7.700
9	6.731	6.723	HP	2X1m(Dia)	10.000
10	6.735	Removed	HP	2X1(Dia)	7.200
11	7.860	7.850	SC	1 X 1.7m	6.800
12	8.068	8.058	HP	2X1m(Dia)	7.200

11. Bus bays

The details of bus bays onthe 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:

Sl. No.	Location		Type	
	From km	To km	Masonry/cc (Pucca)	Earthen (Kutcha)
Nil				

14. Major junctions

The details of major junctions are as follows:

Sl. No.	Location				At Grade	Separated	Category of Cross Road			
	Existing Ch.		Design Ch.				NH	SH	MDR	Others
	From (km)	To (km)	From (km)	To (km)						
1	0		0		√	-	NH-31C	-	-	-

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

15. Minor junctions

The details of the minor junctions are as follows:

Sl. No.	Location				Type	
	Existing Ch.		Design Ch.			
	From km	To km	From km	To km	Type of Junction	Cross Road
1	0.004		0.005		4-legged	COOCHBEHAR - GUWAHATI
2	0.070		0.075		3-legged	DAMRAPARA
3	0.246		0.241		3-legged	VAIRAGURI
4	0.435		0.439		3-legged	VAIRAGURI
5	0.747		0.750		3-legged	ST. MARY SCHOOL
6	0.746		0.750		3-legged	SRIRAMPUR HIGH SCHOOL
7	0.840		-		3-legged	BENGALI CAMP
8	0.938		-		3-legged	SRIRAMPUR RLY STATION
9	1.029		-		3-legged	SRIRAMPUR RLY STATION
10	1.081		-		3-legged	SRIRAMPUR RLY STATION
11	1.085		-		3-legged	SRIMANTAPUR
12	1.139		-		3-legged	SRIRAMPUR RLY STATION
13	1.238		1.241		4-legged	HARAPOTA RIVER - SAMAGURI
14	1.434		1.438		3-legged	VILLAGE
15	1.755		1.759		3-legged	SAMAGURI
16	1.772		1.776		3-legged	SRIRAMPUR VILLAGE
17	2.111		2.114		3-legged	SCHOOL
18	2.928		2.928		3-legged	RIVER SIDE
19	3.112		3.106		3-legged	BASANTAPUR
20	3.491		3.485		3-legged	MAJHEDUBRI
21	3.979		3.973		3-legged	MAJADABRI
22	4.631		4.623		3-legged	PHALAGURI
23	4.638		4.630		3-legged	CHIRKUT
24	4.988		4.980		3-legged	DINGDINGA
25	6.097		6.087		3-legged	PHALAGURI
26	6.197		6.187		3-legged	VILLAGE
27	6.750		6.740		3-legged	HORPUR
28	6.769		6.760		3-legged	PHALAGURI
29	7.850		7.840		3-legged	MALKAPUR
30	8.145		8.136		3-legged	KARAKPUR
31	8.249		8.240		3-legged	MALLIKAPUR
32	8.557		8.848		3-legged	KERAPUR
33	8.994		8.984		3-legged	SCHOOL
34	9.046		9.039		4-legged	ANANDAPUR - JAIPUR VILLAGE
35	9.046		9.039		3-legged	JAIPUR VILLAGE
36	9.454		9.443		3-legged	KATHALGUDI SCHOOL
37	10.141		10.139		4-legged	POLASHKANDI- GRAHMPUR VILLAGE
38	10.285		10.274		4-legged	HINGDINGA BAZAR

Sl. No.	Location				Type	
	Existing Ch.		Design Ch.			
	From km	To km	From km	To km	Type of Junction	Cross Road
39	10.910		10.885		3-legged	VILLAGE

16. Bypasses

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

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

17. Other structures

[Provide details of other structures, if any.]

Nil

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:

Sr. No.	From km To km	Length (Km)	Proposed ROW (m)	Date of providing ROW*
1	**2**	**3**	**4**	**5**
Full Right of Way (full width)	Excluding Bypass & Realignment, Bus bays, Truck Lay Bye	10.56	Rural Area :30m &45m Built-up Area: 45m ROB Location :60m	At appointed date
Balance Right of Way (Width)	Realignment	-	-	Within 150 days of declaration of appointed date
	Bypass	-	-	
	Bus bays	0.340	45	
	Truck Lay Bye	-		

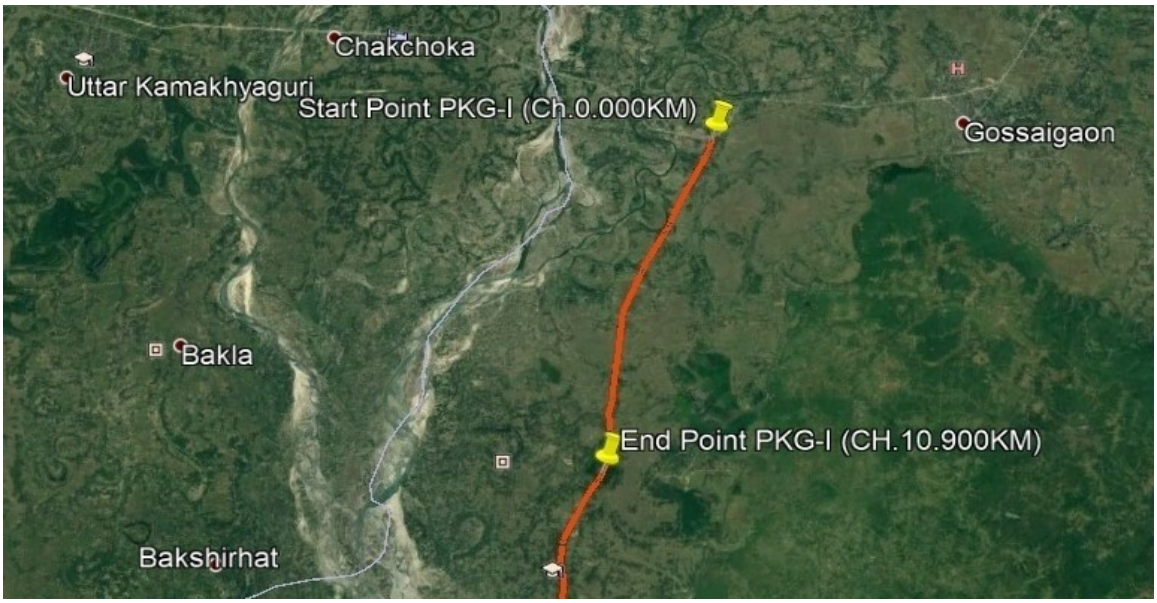
*The dates specified herein shall in no case be beyond 150 (one hundred and fifty) days after the Appointed Date.

`Annex-III

(Schedule-A)

Alignment Plans

The 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,he 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 &locationof traffic signs is enclosed.The contractor shall,however,

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

Annex – IV

(Schedule-A)

Environment Clearances

The following environment clearances have been obtained: [***]

The following environment clearances are awaited: [***]

Sr. No.	Clearances	Present Status
1	Environment clearance	Not Required
2	Forest Clearance	Not Required
3	Wildlife Approval	Not Required

Schedule - B

(See Clause 2.1)

Development of the Project Highway

1. Development of the Project Highway

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

2. [Rehabilitation and augmentation]

[Rehabilitation and augmentation] shall include [Four-Laning and Strengthening] 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 [Four-Laning]

[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 [Four Laning of Highways (IRC: SP:84-2014)], 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 andprecisely.]

1. Widening of the Existing Highway

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

(ii) Width of Carriageway

(a) Four-Lanning [with] paved shoulders shall be undertaken. The paved carriageway shall be [2x7m] wide in accordance with the typical cross sections drawings in theManual.

Provided that in the built-up areas [refer to paragraphs 2.1 (ii) (a) of the Manual and provide necessary details]: the width of the carriageway shall be as specified in the following table:

Sl. No.	Built-up stretch (Township)	Location	Width (m)	Typical Cross Section (Refer to Manual)	Remarks
1	0.000 Km to 0.420 Km	Simultapu-III	30	TCS - 1B	As per Plan & Profile Drawing.

(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 theProjectHighway shall be in accordance with Section 2 of the Manual.

(ii) Design speed

The design speed shall be the minimum design speed of [80 km per hr for plain/ rolling terrain] and Rulling design speed of [100 km per hr for plain/ rolling terrain

(iii) Improvement of the existing road geometrics

[Refer to paragraph 2.1 (v) of the Manual and provide details]

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:

Sl. No.	Stretch (from km to km)	Type of deficiency	Remarks
1	2.750km to 2.865km	Existing Curve Radius=150m	Proposed Curve Radius=600m
2	2.900km to 3.065km	Existing Curve Radius=150m	Proposed Curve Radius=500m
3	4.130km to 4.327km	Existing Curve Radius=200m	Proposed Curve Radius=500m
4	4.365km to 4.463km	Existing Curve Radius=150m	Proposed Curve Radius=500m
5	5.917km to 6.050km	Existing Curve Radius=200m	Proposed Curve Radius=500m
6	9.000km to 9.100km	Existing Curve Radius=150m	Proposed Curve Radius=450m

(iv) Right of Way

[Refer to provision of relevant Manual]. Details of the Right of Way are given in Annex-II of Schedule-A.

v) Type of shoulders

[Refer to paragraph 2.5.2 of the Manual and specify]

(a) In ROB locations. Drain cum footpaths/fully paved shoulders shall be provided in the following stretches:

Sl. No.	Stretch (from Km to Km)	Fully Paved shoulders/ footpaths	Reference to cross section
1	0.420Km to 0.897km & 1.201km to 1.780km	2 X 1.5 m Paved Shoulder/ 2 X 1.0m width Drain Cum Footpath	TCS - 5A

(b) In open country, [paved shoulders of 1.5 m width shall be provided and balance 2.0m width shall be covered with 150 mm thick compacted layer of granular material].

(c) Design and specifications of paved shoulders and granular material shall conform to the requirements specified in the relevantManual.

Design and specifications of paved shoulders and granular material shall

conform to the requirements specified in the relevant Manual.

(vi) Lateral and vertical clearances at underpasses

(a) Lateral and vertical clearance at underpasses and provision of guard rails/crash barriers shall be as per requirements specified in the relevant Manual.

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

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

(vii) Lateral and vertical clearances at overpasses

(a) Lateral and vertical clearances at overpassesshallbe as per requirements specified in the relevant Manual.

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

Sl. No.	Location (Chainage) (fromkmtokm)	Span/Opening (m)	Remarks
Nil			

(viii) Service roads

Service roads shall be constructed at the locations and for the lengths indicated below: [Refer requirements specified in the relevant Manual]

Sl. No.	Location of service road(from km to km)	Right hand side(RHS)/Left hand side(LHS)/or Both sides	Length (km)of service road
1	0.420Km to 0.897km & 1.201km to 1.780km	Both sides	2x 1.056

'' The length of service road indicated in this location is minimum''

(ix) Grade separated structures

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

[Refer to requirements specified in the relevant Manual]

Sl. No.	Location of Structure (VUP)	Length(m)	Number and length of spans (m)	Approach gradient	Remarks
NIL					

(b) In the case of grade separated structures the type of structure and the level of the Project Highway and the crossroads shall be as follows: [Refer to provision of the Manual and specify the type of vehicular underpass/ 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.ifany
			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 provisionofthe 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

[Give typical cross-sections of the Project Highway by reference to the Manual]
As per attached Drawings

Sl. No.	Description	Length (m)
TCS -1B	Re-Construction of 4-Lane Carriageway for flexible pavement with Both side drain (With New Sub-Grade)	420
TCS - 5A	4-Lane Carriageway for flexible pavement with Both side RE Wall & Service Road	1360
TCS - 2B	Re-Construction of 4-Lane Carriageway for flexible pavement with New Sub-Grade	9120
	Total Length =	**10,900**

Chainage (m)		Length	TCS no.	Remarks
From	To.	(m)		
0	420	420	TCS -1B	
420	1780	1360	TCS - 5A	
1780	10900	9120	TCS - 2B	Turfing on both side of embankment to be provided.
Total Length =		**10,900**		

3. Intersections and Grade Separators

All intersections and grade separators shall be as per Section 3 of the Manual.Existing intersections which are deficient shall be improved to the prescribed standards.

[Refer to provision of the relevant Manual and specify the requirements. Explain where necessary with drawings/sketches/general arrangement]

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

(i) At-grade intersections

Major Intersections

Sl. No.	Location of intersection (Km)	Type of intersection	Other features
1	Start Point (Ch.0.000 km)	4-legged	Junction with NH-31C

Minor Intersections

Sl. No.	Location		Type	
	From km	To km	T-Junction	Cross Road
1	0.005		4-legged	COOCHBEHAR - GUWAHATI
2	0.075		3-legged	DAMRAPARA
3	0.241		3-legged	VAIRAGURI
4	0.439		3-legged	VAIRAGURI
5	0.750		3-legged	ST. MARY SCHOOL
6	0.750		3-legged	SRIRAMPUR HIGH SCHOOL
7	0.844		3-legged	BENGALI CAMP
8	1.241		4-legged	HARAPOTA RIVER - SAMAGURI
9	1.438		3-legged	VILLAGE
10	1.759		3-legged	SAMAGURI
11	1.776		3-legged	SRIRAMPUR VILLAGE
12	2.114		3-legged	SCHOOL
13	2.928		3-legged	RIVER SIDE
14	3.106		3-legged	BASANTAPUR
15	3.485		3-legged	MAJHEDUBRI
16	3.973		3-legged	MAJADABRI
17	4.623		3-legged	PHALAGURI
18	4.630		3-legged	CHIRKUT
19	4.980		3-legged	DINGDINGA
20	6.087		3-legged	PHALAGURI
21	6.187		3-legged	VILLAGE
22	6.740		3-legged	HORPUR
23	6.760		3-legged	PHALAGURI
24	7.840		3-legged	MALKAPUR
25	8.136		3-legged	KARAKPUR
26	8.240		3-legged	MALLIKAPUR
27	8.848		3-legged	KERAPUR
28	8.984		3-legged	SCHOOL

Sl. No.	Location		Type	
	From km	To km	T-Junction	Cross Road
29	9.039		4-legged	ANANDAPUR - JAIPUR VILLAGE
30	9.039		3-legged	JAIPUR VILLAGE
31	9.443		3-legged	KATHALGUDI SCHOOL
32	10.139		4-legged	POLASHKANDI- GRAHMPUR VILLAGE
33	10.274		4-legged	HINGDINGA BAZAR
34	10.885		3-legged	VILLAGE

*In case any other deficient junction with cross roads is identified during the Construction Period in addition to those mentioned above, shall be improved as per Manual and will not qualify for Change of Scope

(ii) Grade separated intersection with/without ramps

Sl. No.	Location	Salient features	Minimum length of viaduct tobe 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 givenin Section 4 of the Manual and the specified cross-sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

(ii) Raising of the existing road [Refer to provision of the 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 (km)	Extent of raising [Top of finished road level]
1	From 0.000km to 10.900km	10.900	Road is raised on an avg of 1m from the HFL level.

5. Pavement Design

(i) Pavement design shall be carried out for a design life of 15 years considering20 MSA.

(ii) Type of pavement

[Refer to the provision of relevant Manual and state specific requirement, if any, of providing cement concrete pavement.]

Flexible pavement shall be designed as per IRC : 37-2012(Third Revision)and the details given below

For New Construction/Widening/Re Wall portion (Main carriageway) (Km 0.000 to Km 10.900 Km)
BC-40mm
DBM-85mm
WMM-I -125mm
WMM-II -125mm
GSB- 200mm
Total -575 mm

For Service Road :
PQC= 250 mm
DLC= 150 mm
GSB= 150 mm
Total = 550 mm

The above details are minimum stipulations to be followed

(iii) Design requirements

[Refer to the provision of relevant Manual and specify design requirements and strategy]

(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 15 years. Stage construction shall not be permitted.

(b) Design Traffic

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

(iv) Reconstruction of stretches

[Refer to the provision of relevant Manual and specify the stretches, if any, to be reconstructed.]

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

SL NO.	Stretch from Km to Km	TCS Type	Remarks
1	0.000km to 0.420km	TCS -1B	Existing road single lane
2	1.780km to 10.900km	TCS - 2B	

6. Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per the provision of relevant Manual.

RCC Cover drain has been proposed in Built -up & ROB Location for the Project Highway.

The details are given below:

RCC Covered Drain

- **Main Carriageway**

Chainage (m)		Side	Length(m)
From	**To**		
0	420	Both	840
Total=			**840**

- **Service Road**

Chainage(m)		Side	Length(m)
From	**To**		
420	897	Both	954
1201	1780	Both	1158
Total=			**2112**

"The EPC Contractor shall ensure proper functioning of the road side drains by designing them as per site conditions and considering the outfall locations."

7. Design of Structures

(i) General

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

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

[Refer to provision of the relevant Manual and specify the width of carriageway of new bridges and structures of more than 60(sixty) meter length. If the carriageway width is different from7.5 (seven point five) meters in the table below.]

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

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

[Refer to provision of the relevant Manual and provide details of new Structures with footpath]

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

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

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

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

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

S. No.	Bridge at km	Utility service to be carried	Remarks
Nil			

(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 provision of the relevant Manual.

(iii) 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:

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

Sl No.	Design Chainage (km)	Existing Type of Structures (Pipe/ Slab/ Box/ Arch)	Type of Proposed	Span of proposed culvert (m)	Repairs to be carried out [specify]
1	1.946	Slab Culvert	RCC Box	1 X 2.0M X 2.0M	Reconstruction
2	2.992	HP Culvert	RCC Box	1 X 3.0M X 3.0M	Reconstruction
3	3.378	Slab Culvert	RCC Box	1 X 3.0M X 3.0M	Reconstruction
4	4.322	Slab Culvert	RCC Box	1 X 3.0M X 3.0M	Reconstruction
5	5.760	HP Culvert	RCC Box	1 X 2.0M X 3.0M	Reconstruction
6	6.059	HP Culvert	RCC Box	1 X 2.0M X 2.0M	Reconstruction
7	6.221	HP Culvert	RCC Box	1 X 2.0M X 3.0M	Reconstruction
8	6.723	HP Culvert	RCC Box	1 X 2.0M X 3.0M	Reconstruction
9	7.850	Slab Culvert	RCC Box	1 X 2.0M X 2.0M	Reconstruction
10	8.058	HP Culvert	RCC Box	1 X 2.0M X 2.0M	Reconstruction

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

(c) Widening of existing culverts:

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

Sl. No.	Culvert location	Type, span, height & width of existing culvert(m)	Repair to be carried out[specify]
NIL			

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

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
1	0.350	1 X 2.0M X 2.0M	Single Cell
2	2.300	1 X 2.0M X 3.0M	Single Cell
3	2.550	1 X 2.0M X 3.0M	Single Cell
4	2.800	1 X 2.0M X 2.0M	Single Cell
5	3.530	1 X 2.0M X 3.0M	Single Cell
6	3.835	1 X 2.0M X 3.0M	Single Cell
7	4.475	1 X 2.0M X 2.0M	Single Cell
8	4.800	1 X 2.0M X 2.0M	Single Cell
9	4.950	1 X 2.0M X 2.0M	Single Cell
10	5.400	1 X 2.0M X 2.0M	Single Cell
11	6.450	1 X 2.0M X 2.0M	Single Cell
12	6.940	1 X 2.0M X 2.0M	Single Cell
13	7.600	1 X 2.0M X 2.0M	Single Cell
14	8.450	1 X 2.0M X 2.0M	Single Cell
15	8.700	1 X 2.0M X 2.0M	Single Cell
16	8.950	1 X 2.0M X 2.0M	Single Cell
17	9.229	1 X 2.0M X 2.0M	Single Cell
18	9.850	1 X 2.0M X 2.0M	Single Cell
19	10.250	1 X 2.0M X 2.0M	Single Cell
20	10.500	1 X 2.0M X 2.0M	Single Cell

**** The span and opening of these culverts as specified are indicative. The design of waterway has to be done as per site requirement, considering the site requirements. Any change in this configuration shall not attract provisions of Article 13 of this Agreement".***

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

[Refer provision of the relevant Manual and provide details]

S. 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]

[Refer provision of the relevant Manual and provide details]

Sl. No.	Bridge location	Salient details of existing bridge		Adequacy or otherwise of the existing waterway, vertical clearance etc.*	Remarks
	(km)	Type of Structures	Span Arrangement and Total Vent way (No. x Length) (m)		
Nil					

*Attach GAD

* The span and opening of these bridges as specified are indicative. The design of waterway has to be done as per site requirement, considering the site requirements. Any change in this configuration shall not attract provisions of Article 13 of this Agreement

(iii) The following narrow bridges shall be widened:

Sl. No.	Bridge location	Salient details of existing bridge		Adequacy or otherwise of the existing waterway, vertical clearance etc.*	Remarks
	(km)	Type of Structures	Span Arrangement and Total Vent way (No. x Length) (m)		
1	7.241	Box Bridge	4.0mX4.0mX4 cell	-	Retained & widened as per structure drawings.

@ Attach cross-section

(b) Additional new bridges

[Specify additional new bridges if required. And attach GAD]

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
1	7.241	4mx4.066m x 4cell	Additional 2-Lane

*The span and opening of these bridges as specified are indicative. The design of waterway has to be done as per site requirement, considering the site requirements. Any change in this configuration shall not attract provisions of Article 13 of this Agreement

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

locations:

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

Sl.No.	Location at km	Remarks
Nil		

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

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

Sl.No.	Location at km	Remarks
1	7.241	Dismantling of kerb below Railing, Dismantling of RCC Railing

(e) Drainage system for bridge decks

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

(f) Structures in marine environment

[Refer to provision of the 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 provision of the relevant Manual [Refer to provision of the relevant Manual and specify modification, if any]

(b) Road over-bridges

Road over-bridges (roadoverrail) 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)
1	1.044	3 x 36m Composite Girder + 1 x 72m Bowstring Girder + 3 x 36m Composite Girder

(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	Number and length of span(m)
Nil		

(v) Grade separated structures

[Refer provision of the relevant Manual]

The grade separated structures shall be provided at the locations and of the type and length specified in paragraphs 2(ix) and3 of this Annex-I.

(vi) Repairs and strengthening of bridges and structures

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

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

(a) Bridges

Sl. No.	Location of bridge (km)	Nature and extent of repairs /strengthening to be carried out
1	7.241	Dismanteling of existing bituminous concrete wearing coat, Laying of wearing Course (Bituminous Concrete),Laying of wearing Course (Mastic Asphalt),Laying of wearing Course (Tack Coat).

(b) ROB / RUB

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

(c) Overpasses/Underpasses and other structures

Sl. No.	Location of Structure(km)	Natureandextentofrepairs/strengtheningtobecarriedout
Nil		

(vii) List of Major Bridges and Structures

The following is the list ofthe Major Bridges and Structures:

Sl.	Location (Km)	Total Length (m)	Remarks
NIL			

8. Traffic Control Devices and Road Safety Works

(i) Traffic control devices and road safety works shall be provided in accordance with provisions of relevant Manual.

Sl No	Traffic Signages, Road Marking and other appurtenances	unit	Quantity
1	Right Hand Side Curve (900 mm Triangular)	Nos.	9
2	Left Hand Side Curve(900 mm Triangular)	Nos.	9
3	Built-up area(900 mm Tringular)	Nos.	8
4	School (900 mm Tringular)	Nos.	8
5	Side road left(900 mm Tringular)	Nos.	33
6	Y Intersection(900 mm Tringular)	Nos.	0
7	Cross Road(900 mm Tringular)	Nos.	5
8	Gap in Median(900 mm Tringular)	Nos.	21
9	Petrol pump/ Filling facility(800x600 rectangular)	Nos.	2
10	Bus Stop/ Built up area (800x600 rectangular)	Nos.	20
11	Direction Sign(<0.9 sqm)	Nos.	38
12	Direction Sign(>0.9 sqm)	Nos.	6
13	Stop Sign(900 mm Octagonal)	Nos.	38
14	Horn prohibited(600mm Cicular)	Nos.	8
15	Compulsory Keep Left(600mm Cicular)	Nos.	0
16	Rumble Strip	Nos.	39
17	Road marking	Sqm	8734
18	Painting on Kerb	Sqm	8772
19	Road Delineator	Nos.	200
20	Road Studs	Nos.	7500
21	Harzad Marker	Nos.	8

*All above quantities are minimum to be installed/executed

(ii) Specifications of the reflective sheeting. [Refer to provision of relevant Manual and specify]

9. Road side Furniture

(i) Roadside furniture shall be provided in accordance with the provision of relevant Manual.

(ii) Overhead traffic signs: location and size

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

Sl No.	Chainage (km)	Location
1	0.000	Srirampur

10. Compulsory Afforestation

[Refer to provision of relevant Manual and specify the number of trees which are required to be planted by the concerned department as compensatory afforestation.]

11. Hazard Location

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

W-Metal beam crash barrier of 200 m length has been provided at Bridge location

a) Toe wall

Location		Side	Length (km)
From(km)	To(km)		
8.700	8.800	RHS	0.100
8.700	8.725	LHS	0.025
8.908	8.925	RHS	0.017
8.950	9.000	RHS	0.050
9.111	9.201	RHS	0.090
9.100	9.125	LHS	0.025
Total Length=			**0.307**

*The specified length of Toe wall is the minimum requirement

b) Reinforced Earth wall

Location		Length (km)
From(km)	To(km)	
0.420	0.897	0.477
1.201	1.780	0.579
Total Length=		**1.056**

*The specified length of RE wall is the minimum requirement

c) Retaining wall

Location			Side	Length (km)
From(km)	To(km)	Height(m)		
NIL				

*The specified length of Retaining wall is the minimum requirement

12. Special Requirement for Hill Roads

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

13. Change of Scope

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

(Schedule B-1)

1. 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 asfollows:

S.No	Description	Unit	Quantity
1	LT Post	Nos.	284
2	Lamp post	Nos.	3
3	11kv Post	Nos.	136
5	Transformer	Nos.	13
8	Water Supply Scheme	Nos	5
9	OFC	mtr	9,227

** The quantity given above is indicative, the contractor has to finalize the actual requirement of shifting of various utilities in due consultation with Authority's Engineer and Authority, duly verified by the concerned utility authorities and approved by authority".

Schedule - C

(See Clause 2.1)

Project Facilities

1. Project Facilities

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

(a) Toll plaza[s]

(b) Roadside furniture;

(c) Pedestrian facilities;

(d) Tree plantation;

(e) Truck Lay byes;

(f) Bus-bays and passenger shelters;

(g) Rest areas; and

(h) Others to be specified

2. Description of Project Facilities

Each of the Project Facilities is described below:

a) Toll Plaza :-

Sl. No.	Design Chainage (km)	Name of the Place
Nil		

Note: Provide adequate details of each Project Facility to ensure their design and completion in accordance with the project-specific requirements and the provisions of theManual.

b) Road side furniture:-

Sl. No.	Description	Location	Design Standard
1	Traffic sign & pavement marking	Entire Length (As per Schedule B)	As per Manual
2	Km Stone, 5th kilometre stone	Entire Length	As per Manual
3	Boundary Stone	Entire Length	As per Manual
4	Road side Delineator, marker & Road Stud	As per Schedule B	As per Manual
5	Metal beam crash barrier	As per Schedule B	As per Manual

C) Pedestrian Facility:-

Pedestrian facilities in the form of foot path shall be provided in the built up area (refer typical cross – section drawing). Pedestrian facilities shall be provided at the locations of Built up sections in order to ensure safety of pedestrians while crossing in consultation with NHIDCL.

d) Truck Lay bye: -

Sl. No.	Truck lay bye Chainage (Both Side)	Name of the Place
NIL		

e) Bus Bay with Passenger shelter: -

Sl. No.	Project Facility	Location (km)	Side	Name of the Place
1	Bus bay with Passenger shelter	9.300	Both	Anandapur

f) Rest Areas

Sl. No.	Rest Area Chainage	Name of the Place
Nil		

g) Roadside Amenities

Nil

h) Others to be specified

Street Lighting:

i) Minimum 134 Nos. Street lighting shall be provided in junction, Bus Bay,ROB locations. or any other location as per the satisfaction of Authority's Engineer

ii) The EPC Contractor will obtain all permissions/load sanctions/power supply, etc. from the Electricity Authorities. The Contractor shall be solely responsible for submission of application along with all necessary documents to supply authority. Further the Contractor shall be responsible for follow up of the application and getting the release of the supply to lighting. All statutory approvals/permissions have to be obtained by the Contractor for energizing/operating the lights.

Utility Duct:

Nil

Note: Provide adequate details of each Project Facility to ensure their design and completion in accordance with the project-specific requirements and the provisions of the Manual.

Schedule - D

(See Clause 2.1)

Specifications and Standards

1. Construction

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

2. Design Standards

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

[Manual of Specifications and Standards for Four Lanning of Highways (IRC: SP: 84-2014) referred to herein as the Manual]

[Note: Specify the relevant Manual, Specifications and Standards]

Annex – I

(Schedule-D)

Specifications and Standards for Construction

1. Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for [Four-Lanning of Highways (IRC:SP:84-2014)], referred to as the Manual, and MORTH Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2. Deviations from the Specifications and Standards

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

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

SCHEDULE - E

(See Clauses 2.1 and 14.2)

MAINTENANCE REQUIREMENTS

1 Maintenance Requirements

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

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

1.3 All Materials, works and construction operations shall conform to the MORTH Specifications for Road and Bridge Works, and the relevant IRC publications. Where the specifications for a work are not given, Good Industry Practice shall be adopted.

2 Repair/rectification of Defects and deficiencies

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

3 Other Defects and deficiencies

In respect of any Defect or deficiency not specified in Annex - I of this Schedule-E, the Authority's Engineer may, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards, and any deviation or deterioration beyond the permissible limit shall be repaired or rectified by the Contractor within the time limit specified by the Authority's Engineer.

4 Extension of time limit

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

5 Emergency repairs/restoration

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

6 Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

The Contractor shall carry out a detailed pre-monsoon inspection of all bridges, culverts and drainage system before [1st June] every year in accordance with the guidelines contained in IRC: SP35. Report of this inspection together with details of proposed maintenance works as required on the basis of this inspection shall be sent to the Authority's Engineer before the [10th June] every year. The Contractor shall complete the required repairs before the onset of the monsoon and send to the Authority's Engineer a compliance report. Post monsoon inspection shall be done by the [30th September] and the inspection report together with details of any damages observed and proposed action to remedy the same shall be sent to the Authority's Engineer.

8. Repairs on account of natural calamities

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

Annex - I
(Schedule-E)

Repair/rectification of Defects and deficiencies

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

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	MaintenanceSpecifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, approache	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

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					
s of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Cracking	Nil	< 5 % subject to limitof 0.5 sqm for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15 -30 days	MORT&H Specification 3004.2
	Corrugations and Shoving	Nil	< 0.1% ofarea	Daily	Length Measurement Unit like		2-7 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					
	Bleeding	Nil	< 1 % of area	Daily	Scale, Tape, odometer etc.		3-7 days	MORT&H Specification 3004.4
	Ravelling / Stripping	Nil	< 1 % of area	Daily			7-15 days	IRC:82-2015 read with IRC SP 81
	Edge Deformation/ Breaking	Nil	< 1 m for any 100 m section and width < 0.1 m at any location, restricte	Daily			7- 15 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					
			d to 30 cm from the edge					
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)	Class I Profilometer : ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	180 days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-Annually			180 days	BS: 7941-1: 2006
	Pavement Condition Index	3	2.1	Bi-Annually			180 days	IRC:82-2015

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	MaintenanceSpecifications
		Desirable	**Acceptable**					
	Other Pavement Distresses			Bi-Annually			2-7 days	IRC:82-2015
	Deflection/ Remaining Life			Annually	Falling Weight Deflectometer	IRC 115: 2014	180 days	IRC:115-2014
Rigid Pavement (Pavement of MCW, Service Road, Grade structure,	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	IRC:SP:83-2008	180 days	IRC:SP:83-2008

AssetType	PerformanceParamet er	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	MaintenanceSpecifications
		Desirable	Acceptable					
approaches of connecting roads, slip roads, lay byes etc. as applicable)		**Minimum SN**	**Traffic Speed (Km/h)**		Coefficient Routine Investigation Machine or equivalent)			
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					

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	MaintenanceSpecifications
		Desirable	Acceptable					
Embankment/ Slope	Edge drop at shoulders	Nil	40mm	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC	7-15 days	MORT&H Specification 408.4
	Slope of camber/cross fall	Nil	<2% variation in prescribed slope of camber /cross fall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15 % variation in prescribe	Daily			7-15 days	MORT&H Specification 408.4

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**					
			side slope					
	Embankment Protection	Nil	Nil	Daily	NA		7-15 days	MORT&H Specification
	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:**

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
CRACKING						
1	**Single Discrete Cracks Not intersecting with any joint**	w = width of crack L = length of crack d = depth of crack D = depth ofslab	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-movingcar	Seal without delay	Seal, and stitch if L >lm.
			3	w = 0.5 - 1.5 mm, discernible from fast-movingcar		Within 7days

S.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 - 3.0 mm	Seal, and stitch if L > l m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15days
			5	w > 3 mm.		
2	**Single Transverse (or Diagonal) Crack intersecting with one or morejoints**	w = width of crack L = length of crack d = depth of crack D = depth ofslab	0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Route and seal with epoxy. Within 7 days	Staple or Dowel Bar Retrofit. Within 15days
			2	w = 0.2 - 0.5 mm, discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1m. Within 7 days	

S.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 reconstructaffected. 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 ofslab	0	Nil, not discernible	No Action	
			1	w < 0.5 mm, discernable from slow movingvehicle	Seal with epoxy, if L > 1 m. Within 7 days	Staple or dowel bar retrofit. Within 15days

S.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
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, ifL >l m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair withstapling. Within 15 days
			4	w = 6.0 - 12.0 mm, usually associated withspalling	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 pernorms and specifications -

S.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**
						See Para 5.6.4 Within 15 days
4	**Multiple Cracks intersecting with one or morejoints**	**w = width of crack**	0	Nil, not discernible	No Action	-
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > l m. Within 15 days	
			2	w = 0.2 - 0.5 mm. discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, Reinstate subbase, Reconstruct whole slab as per specifications within 30 days
			4	w = 3.0 - 6.0 mm panel broken into 2 or 3pieces		
			5	w > 6 mm and/or panelbroken		

S.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**
				into more than 4 pieces		
5	**Corner Break**	w = width of crack L = length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to secure broken parts Within 7 days	Seal with epoxy seal withepoxy Within 7days
			2	w < 1.5 mm; L < 0.6 m, only one cornerbroken		
			3	w < 1.5 mm; L < 0.6 m, two corners broken	Partial Depth (Refer Figure 8.3 of IRC:SP: 83-2008) Within 15 days	Full depth repair
			4	w > 1.5 mm; L > 0.6 m or three corners broken		
			5	ree or four corners broken		Reinstate sub-base, and reconstructthe

S.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**
						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 fulldepth	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. Within30days
			5	w > 3 mm, L > 3 m/m^2 and deformation		

S.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
Surface Defects						
7	Ravelling or Honeycomb type surface	r = area damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term** No action.	**Long Term** Not Applicable
			1	r < 2 %	Local repair of areas damaged and liable to be damaged. Within 15 days	
			2	r = 2 - 10 %		
			3	r = 10-25%	Bonded Inlay, 2 or 3 slabs if affecting.	
			4	r = 25 - 50 %		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
					Within 30 days	
			5	r > 50% and h > 25 mm	Reconstruct slabs, 4 or more slabs ifaffecting. Within 30 days	
8	**Scaling**	r = damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	r <**2 %**	Local repair of areas damaged and liable to be damaged. Within 7days	
			2	r = 2 - 10 %		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			3	r = 10 - 20%	Bonded Inlay within 15 days	
			4	r = 20 - 30 %		
			5	r > 30 % and h > 25 mm	Reconstruct slab within 30 days	
9	**Polished Surface/Glazing**	t = texture depth, sand patchtest	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		

S.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	t < 0.1 mm	Diamond Grinding if affecting 50% or more slabs ina continuous stretch of minimum 5 km. Within 30 days	
10	**Popout (Small Hole), Pothole Refer Para 8.4**	n = number/m^2 d = diameter h = maximumdepth	0	d < 50 mm; h < 25 mm; n < 1 per 5 m^2	No action.	Not Applicable
			1	d=50-100mm;h<50mm;n<1 per 5 m^2	Partial depth repair 65 mm deep. Within 15 days	
			2	d=50-100mm;h>50mm;n<1 per 5 m^2		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			3	d = 100 - 300 mm; h < 100 mm n < 1 per 5m^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 5m^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 jointlength	0	Difficult to discern.	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	Discernible, L< 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	
			3	Notable. L > 25% insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days	
			5	Severe; w > 3 mm negligible protection against ingress ofwater	Clean, widen and reseal the joint. Within 7 days	

				and trapping incompressible material.		
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 crackedportion.	
			2	w = 10 - 20 mm, L < 25%	Within 7 days	
			3	w = 20 - 40 mm, L > 25%	Partial Depth Repair. Within 15 days	
			4	w = 40 - 80 mm, L > 25%	30 - 50 mm deep, h = w . 20% of w, within 30 days	
			5	w > 80 mm, and L > 25%	50 - 100 mm deep repair. H = w . 20% of w. Within 30 days	
13	**Faulting (orStepping)**	f = difference of level	0	not discernible, < 1 mm	No action.	No action.

	in Cracks or Joints		1	f < 3 mm		
			2	f = 3 - 6 mm	Determine cause and observe, take action for diamondgrinding	Replace the slab as appropriate.
			3	f = 6 - 12 mm	Diamond Grinding	Within 30days
			4	f= 12 - 18 mm	Raise sunken slab.	Replace the slab as appropriate.
			5	f> 18 mm	Strengthen subgrade and sub-base by groutingand raising sunken slab	Within 30days
14	**Blowup or Buckling**	h = vertical displacement from normalprofile	0	Nil, not discernible	**Short Term**	**Long Term**
			1	h < 6 mm	No Action	
			2	h = 6 - 12 mm	Install Signs to Warn Traffic	

			3	h = 12 - 25 mm	within 7 days	
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shattered slabs, ie 4 or morepieces	Replace broken slabs. Within 30 days	
15	**Depression**	h = negative vertical displacement from normal profile L =length	0	Not discernible, h < 5 mm	No action.	Not Applicable
			1	h = 5 - 15 mm		
			2	h = 15-30 mm, Nos<20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Strengthen subgrade. Reinstate pavement at normal level	

			5	h > 100 mm	if L < 20 m. Within 30 days	
16	**Heave**	h = positive vertical displacement from normal profile. L = length	0	Not discernible. h < 5 mm	**Short Term**	**Long Term**
					No action.	scrabble
			1	h = 5 - 15 mm	Follow up.	
			2	h = 15 - 30 mm, Nos <20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h >50 mm or > 20% joints	Stabilise subgrade. Reinstate pavement at normal level if length < 20 m. Within 30 days	
			5	h > 100 mm		
17	**Bump**	h = vertical	0	h < 4 mm	No action	

		displacement from normalprofile	1	h = 4 - 7 mm	Grind, in case of new construction within 7 days	Construction Limit for New Construction.
			3	h = 7 - 15 mm	Grind, in case of ongoing Maintenance within 15 days	Replace in case of new construction. Within 30days
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	**Lane to Shoulder Dropoff**	f = difference of level	0	Nil, not discernible < 3mm	**Short Term**	**Long Term**
					No action.	
			1	f = 3 - 10 mm	Spot repair of shoulder within 7 days	
			2	f = 10 - 25 mm		
			3	f = 25 - 50 mm	Fill up shoulder	

			4	f = 50 - 75 mm	within 7 dayss	For any 100 m stretch Reconstruct shoulder, if affecting 25% or more ofstretch. Within 30days
			5	f > 75 mm		
Drainage						
19	**Pumping**	quantity of fines and water expelled through open joints and cracks Nos	0	not discernible	No Action	
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints Without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	appreciable/ Frequent 10 -25%	Lift or jack slab within 30 days.	
		Nos/100 m stretch	5	abundant, crack development >25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab. Within 30 days	

20	**Ponding**	Ponding on slabs due to blockage of drains	0-2	No discernible problem	No action.	
			3 to 4	Blockages observed in drains, but water flowing	Clean drains etc within 7 days, Follow up	Action required to stop water damaging foundation within 30 days.
			5	Ponding, accumulation of water observed	-do-	

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

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th colspan="3">Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td rowspan="5">Highway</td><td rowspan="5">Availability of Safe Sight Distance</td><td colspan="3">As per IRC SP :84-2014, a minimum of safe stopping sight distance shall be available throughout.</td><td rowspan="5">Monthly</td><td rowspan="5">Manual Measurements with Odometer along with video/ image backup</td><td colspan="2" rowspan="5">Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments.

In case of permanent structure or design deficiency:
Removal of obstruction/improvement of deficiency at theearliest
Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.</td><td rowspan="5">IRC:SP 84-2014</td></tr>
<tr><td>Design Speed, kmph</td><td>Desirable Minimum Sight Distance (m)</td><td>Safe Stopping Sight Distance (m)</td></tr>
<tr><td>100</td><td>360</td><td>180</td></tr>
<tr><td>80</td><td>260</td><td>130</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td>Pavement Marking</td><td>Wear</td><td colspan="3"><70% of marking remaining</td><td>Bi-Annually</td><td>Visual Assessment as per Annexure-F of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect - within 2months</td><td>IRC:35-2015</td></tr>
</table>

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th colspan="4">Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td rowspan="13"></td><td>Day time Visibility</td><td colspan="4">During expected life Service Time
Cement Road - 130mcd/m²/lux
Bituminous Road - 100mcd/m²/lux</td><td>Monthly</td><td>As per Annexure-D of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td>IRC:35-2015</td></tr>
<tr><td rowspan="12"></td><td colspan="4"><u>Initial and Minimum Performancefor Dry Retro reflectivity during night time:</u></td><td rowspan="12">Bi-Annually</td><td rowspan="12">As per Annexure-E of IRC:35-2015</td><td rowspan="12">Re - painting</td><td rowspan="12">Cat-1 Defect – within 24 hours
Cat-2 Defect – within 2 months</td><td rowspan="12">IRC:35-2015</td></tr>
<tr><td>Design Speed</td><td colspan="3" rowspan="2">(RL) Retro Reflectivity (mcd/m²/lux)</td></tr>
<tr><td></td></tr>
<tr><td></td><td rowspan="4"></td><td rowspan="4">Initial (7 days)</td><td rowspan="4">Minimum Threshold level (TL) & warranty period required up to 2 years</td></tr>
<tr><td></td></tr>
<tr><td></td></tr>
<tr><td>Night Time Visibility</td></tr>
<tr><td></td><td>Up to 65</td><td>200</td><td>80</td></tr>
<tr><td></td><td>65 - 100</td><td>250</td><td>120</td></tr>
<tr><td></td><td>Above 100</td><td>350</td><td>150</td></tr>
<tr><td></td><td colspan="4"><u>Initial and Minimum Performance for Night Visibility under wet condition(Retro reflectivity):</u></td></tr>
</table>

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		Initial 7 days Retro reflectivity: 100 mcd/m²/lux Minimum Threshold Level: 50 mcd/m²/lux					
	Skid Resistance	Initial and Minimum performance for SkidResistance: Initial (7days): 55BPN Min. Threshold: 44BPN *Note: shall be considered under urban/city traffic condition encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc	Bi-Annually	As per Annexure-G of IRC:35-2015		Within 24 hours	IRC:35-2015
Road Signs	Shape and Position	Shape and Position as per IRC:67-2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is damaged. Relocation as per requirement	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/Cantilever Sign boards	IRC:67-2012
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of each	hange of ignboard	48 hours in case of Mandatory	RC:67-2012

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	TestingMethod	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
				signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.		Signs, Cautionary and Informatory Signs (Single and Dual postsigns) 1 Month in case of Gantry/Cantilever Sign boards	
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance measuring tape	Raising Kerb Height	Within 1 Month	RC 86:1983
	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	RC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2014 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:84-2014,IRC:35-2015
	Pedestrian Guardrail	Functionality: Functioning of guardrail asintended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014
	Traffic Safety Barriers	Functionality: Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014, IRC:119-2015
	End Treatment of	Functionality: Functioning of End Treatment as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2014,

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measuremen t	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specification s and Standards
	Traffic Safety Barriers			backup			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 Posts and Delineators as intended	Daily	Visual with video/image backup	Rectificatio n	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 Measuremen t	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specification s and Standards
Trees and Plantatio n including median plantatio n	Obstruction in a minimum head-roomof 5.5 m above carriageway or obstruction in visibility of road signs	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC:SP:84-2014
	Deterioration in health of trees and bushes	Health of plantation shall be as per requirement of specifications & instructions issued by Authority from time to time	Daily	Visual with video/image backup	Timely watering and treatment. Or Replacement of Trees and Bushes.	Within 90 days	IRC:SP:84-2014
	Vegetation affecting sight line and road structures	Sight line shall be free from obstruction byvegetation	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	

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Other Project Facilities and Approach roads	Damage or deterioration in Approach Roads, pedestrian facilities, truck lay-bys, bus-bays,bus-shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works		Daily	-	Rectification	15 days	IRC:SP 84-2014

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 barrelbefore rainy season.	15 days before onset of monsoon and within 30 days after end ofrainy season.	IRC 5-2015, IRC SP:40-1993 and IRC SP:13-2004
	Leak-proof expansion joints if any	No leakage through expansionjoints	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	Repairs to spalling, cracking, delamination, rusting shall be followed as perIRC:SP:40-1993.	15 days	IRC SP 40-1993 and MORTH Specifications clause
		Delamination of concrete not more than 0.25 sq.m.					

		Cracks wider than 0.3 mm not more than 1m aggregatelength		defects			2800

	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons andpitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Bridges including ROBs Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811
Bridge -Super Structure	Bumps	No bump at expansionjoint	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 andguard 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 sq.m	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	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 portionwith epoxy mortar / concrete.	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
	Spalling of concrete	Not more than 0.50 sq.m					
	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 InspectionUnit	Grouting with epoxy mortar, investigating causes for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP: 40-1993 and MORTH Specification 2800.
	Rainwater seepage through deck slab	Leakage - nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	Grouting of deck slab at leakage areas, waterproofing, repairs to drainage spouts	1 months	MORTH specifications 2600 & 2700.
	Deflection due to permanent loads and	Within design limits.	Once in every 10 years for spans more	Load test method	Carry out major rehabilitation works on bridge to retain original design loadscapacity	6 months	IRC SP: 51-1999.

	live loads		than 40 m						
	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 structure	of	super	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 stripjoint.	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge InspectionUnit	Replace of expansionjoint	sea l	in	15 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Debris and dust in strip seal	No dust or debris in expansion joint	Monthly	Detailed condition survey as per IRC SP:35-1990 using	Cleaning of expansion joint gapsthoroughly			3 days	MORTH specifications 2600 and

	expansion joint	gap.		Mobile Bridge InspectionUnit			IRC SP: 40-1993.
	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No silt, debris, clogging of drainage spout collection chamber.	Monthly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainagespout if any leakages observed.	3 days	MORTH specification 2700.
Bridge-substructure	Cracks/spalling of concrete/ rusted steel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	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.

	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture ofreinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment shall be replaced, in order togetuniform load transfer on tobearings.	3 months	MORTH specification 2810and 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 inmajor Rivers.	Suitable protection works around pier/abutment	1 month	IRC SP: 40-1993, IRC 83-2014, MORTH specification 2500
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons andpitching.	30 days after defect observation or 2	IRC: SP 40-1993 and IRC:SP:13-2004.

		sq.m, damage to solid apron (concrete apron) not more than 1 sq.m				weeks before onset of rainy season whichever is earlier.	
Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of thecontractor.							

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 indicated herewith) along with MoRTH specifications shall be binding for all maintenance activities.

A. Flexible Pavement

Nature of Defect or deficiency		Time limit for repair/ rectification
(b)	**Granular earth shoulders, side slopes, drains and culverts**	
(i)	Variation by more than 1 % in the prescribed slope of camber/cross fall (shall not be less than the camber on the main carriageway)	7 (seven) days
(ii)	Edge drop at shoulders exceeding 40 mm	7 (seven) days
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	30 (thirty) days
(iv)	Rain cuts/gullies in slope	7 (seven) days
(v)	Damage to or silting of culverts and side drains	7 (seven) days
(vi)	Desilting of drains in urban/semi- urban areas	24 (twenty four) hours
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)
(c)	**Road side furniture including road sign and pavement marking**	
(i)	Damage to shape or position, poor visibility or loss of retro- reflectivity	48 (forty eight) hours
(ii)	Painting of km stone, railing, parapets, crash barriers	As and when required/ Once every year
(iii)	Damaged/missing signs road requiring replacement	7 (seven) days
(iv)	Damage to road mark ups	7 (seven) days
(d)	**Road lighting**	
(i)	Any major failure of the system	24 (twenty four) hours
(ii)	Faults and minor failures	8 (eight) hours
(e)	**Trees and plantation**	

Nature of Defect or deficiency		Time limit for repair/ rectification
(i)	Obstruction in a minimum head- room of 5 m above carriageway or obstruction in visibility of road signs	24 (twenty four)hours
(ii)	Removal of fallen trees from carriageway	4 (four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiring replacement	30 (thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
(f)	**Rest area**	
(i)	Cleaning of toilets	Every 4 (four) hours
(ii)	Defects in electrical, water and sanitary installations	24 (twenty four) hours
(g)	**[Toll Plaza]**	
(h)	**Other Project Facilities and Approach roads**	
(i)	Damage in approach roads, pedestrian facilities, truck lay- byes, bus-bays, bus-shelters, cattle crossings, [Traffic Aid Posts, Medical Aid Posts] and service roads	15 (fifteen) days
(ii)	Damaged vehicles or debris on the road	4 (four) hours
(iii)	Malfunctioning of the mobile crane	4 (four) hours
Bridges		
(a)	**Superstructure**	
(i)	Any damage, cracks, spalling/ scaling Temporary measures Permanent measures	within 48 (forty eight) hours within 15 (fifteen) days or as specified by the Authority's Engineer
(b)	**Foundations**	

	Nature of Defect or deficiency	Time limit for repair/ rectification
(i)	Scouring and/or cavitation	15 (fifteen) days
(c)	**Piers, abutments, return walls and wingwalls**	
(i)	Cracks and damages including settlement and tilting, spalling, scaling	30 (thirty) days
(d)	**Bearings (metallic) of bridges**	
(i)	Deformation, damages, tilting or shifting of bearings	15 (fifteen) days Greasing of metallic bearings once in a year
(e)	**Joints**	
(i)	Malfunctioning of joints	15 (fifteen) days
(f)	**Other items**	
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3 (three) days
(iii)	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guidebunds	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

Nature of Defect or deficiency		Time limit for repair/ rectification
(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) License from inspector of factories or other competent Authority for setting up batching plant;

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

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

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

(i) Any other permits 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 ASgreement.

SCHEDULE - G

(See Clauses 7.1.and 19.2)

FORM OF BANK GUARANTEE

Annexure-I

(See Clause 7.1)

[Performance Security/Additional Performance Security]

The Managing Director,
National Highways & Infrastructure Development Corporation Ltd.
PTI Building, 3rd Floor,
4, Parliament Street
New Delhi - 110001

WHEREAS:

(A) _____ [name and address of contractor] (hereinafter called the "Contractor") and National Highways and Infrastructure Development Corporation Ltd. , (hereinafter called the "Authority") have entered into an agreement (hereinafter called the "Agreement") for **"Widening/Improvement to 4 (Four) Lane with Paved Shoulder configuration of existing single lane road from Srirampur (near Bhairiguri Village) to Grehempur Section (Package-I) of Srirampur - Dhubri Section of NH-127B from existing Km 0.000 to Km 10.912 (Design Km 0.000 to Km 10.900), (Design Length=10.900 Km) on EPC Mode in the State of Assam under JICA-ODA loan assistance."** subject to and in accordance with the provisions of the Agreement

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

(C) We, ……..through our branch at …….. (the "Bank") have agreed to furnish this bank guarantee (hereinafter called the "Guarantee") by way of Performance Security.

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

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

2. A letter from the Authority, under the hand of an officer not below the rank of General Manager in the 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 Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in

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

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

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

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

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

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

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 authorised to receive such notice and to effect payment thereof

forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

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

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

13. Bank Guarantee has been sent to authority's bank through SFMS gateway as per the details below:-

Sl.	Particulars	Details
1	Name of the Beneficiary	National Highways and 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	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.

Annexure – II

(Schedule - G)

(See Clause 19.2)

Form for Guarantee for Advance Payment

The Managing Director,
National Highways & Infrastructure Development Corporation Ltd.
PTI Building, 3rd Floor,
4, Parliament Street
New Delhi - 110001

WHEREAS:

(A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the National Highways and Infrastructure Corporation Ltd., (hereinafter called the "**Authority**") for the **"Widening/Improvement to 4 (Four) Lane with Paved Shoulder configuration of existing single lane road from Srirampur (near Bhairiguri Village) to Grehempur Section (Package-I) of Srirampur - Dhubri Section of NH-127B from existing Km 0.000 to Km 10.912 (Design Km 0.000 to Km 10.900), (Design Length=10.900 Km) on EPC Mode in the State of Assam under JICA-ODA loan assistance."** 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 free 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 three 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/third} installment of the Advance Payment is Rs. --- --- cr. (Rupees ------ crore) and the amount of this Guarantee is Rs. ------- cr. (Rupees ------ crore) (the "**Guarantee Amount**")$.

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

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

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

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

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

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

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

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

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

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

12. Bank Guarantee has been sent to authority's bank through SFMS gateway as per the details below:-

Sl.	Particulars	Details
1	Name of the Beneficiary	National Highways and 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	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) and19.3)

Contract Price Weightages

1.1 The Contract Price for this Agreement is Rs. ****

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

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
Road Works including Culverts, widening and repair of culverts	43.84 %	**A- Widening and strengthening of existing road**	
		(1) Earthwork up to top of the sub- grade	17.38%
		(2) Sub-base Course	16.64%
		(3) Non bituminous Base course	15.11%
		(4) Bituminous Base course	18.13%
		(5) Wearing Coat	10.76%
		(6) Widening and repair of culverts	[Nil]
		B.1-Reconstruction/New 2-Lane Realignment /Bypass(Flexible Pavement)	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) Non bituminous Base course	[Nil]
		(4) Bituminous Base course	[Nil]
		(5) Wearing Coat	[Nil]
		B.2-Reconstruction/New 8-Lane Realignment/ Bypass(Rigid Pavement)	
		(1) Earthwork up to top of the sub- grade	[Nil]
		(2) Sub-base Course	[Nil]
		(3) Dry Lean Concrete (DLC) Course	[Nil]
		(4) Pavement Quality Control (PQC) Course	[Nil]
		C.1-Reconstruction/ New Service Road(Flexible Pavement)	
		(1) Earthwork up to top of the sub- grade	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		(2) Sub-base Course	[Nil]
		(3) Non bituminous Base course	[Nil]
		(4) Bituminous Base course	[Nil]
		(5) Wearing Coat	[Nil]
		C.2- Reconstruction/New Service road(Rigid Pavement)	
		(1) Earthwork up to top of the sub- grade	0.93%
		(2) Sub-base Course	0.85%
		(3) Dry Lean Concrete (DLC) Course	1.28%
		(4) Pavement Quality Control (PQC) Course	3.74%
		D- Reconstruction & New Culverts on existing road, realignments, bypasses Culverts (length <6m)	15.18%
Minor bridge/ Underpasses/ Overpasses	0.85 %	**A.1-Widening and repairing of Minor Bridges (length >6 m&<60m)**	
		Minor Bridges	0.36%
		A.2- New Minor bridges (length >6 m and<60m)	
		(1) Foundation: On completion of the foundation work.	3.53%
		(2)Sub-Structure: On completion of the Sub structure work	55.34%
		(3) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road, signs & markings, tests on completion etc. complete in all respect.	30.26%
		(4)Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all and fit for use	[Nil]
		(5) Guide Bunds and River Training Works: On completion of Guide Bunds and river training works complete in all respects	10.51%
		B.1- Widening and repairs of underpasses/overpasses	
		Underpasses/ Overpasses	[Nil]
		B.2-New Underpasses/Overpasses	
		(1)Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	[Nil]
		(2)Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		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 joints complete in all respects as specified and (b) in case of underpass- rigid pavement including drainage facility complete in all respects as specified.	
		(3) Approaches: On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	[Nil]
Major bridge(length>60 m) works and ROB/RUB/elevated sections/ flyovers including viaducts, if any	30.42 %	**A.1- Widening and repairs of Major Bridges**	
		(1)Foundation	[Nil]
		(2)Sub-structure	[Nil]
		(3)Super-structure(including bearings)	[Nil]
		(4)Wearing Coat including expansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7)Guidebunds, River Training works etc.	[Nil]
		(8)Approaches(including Retaining walls, stone pitching and protection works)	[Nil]
		A.2-New Major Bridges	
		(1)Foundation	[Nil]
		(2)Sub-structure	[Nil]
		(3)Super-structure(including bearings)	[Nil]
		(4)WearingCoatincludingexpansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7)Guide bunds, River Training works etc.	[Nil]
		(8)Approaches(including Retaining walls, stone pitching and protection works)	[Nil]
		B.1-Wideningandrepairsof (a) ROB (b) RUB	
		(1) Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3) Super-Structure (Including bearings)	[Nil]
		(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	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/Return walls	[Nil]
		(7) Approaches (Including Retaining walls, Stone Pitching and protection works)	[Nil]
		B.2-New ROB/RUB	
		(1)Foundations	9.7%
		(2) Sub-Structure	12.55%
		(3) Super-Structure (Including bearings)	74.6%
		(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	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	3.15%
		(6) Wing walls/Return walls	[Nil]
		(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]
		C.1- Widening and repair of Elevated Section/Flyovers/Grade Separators	
		(1) Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3)Super-Structure(Including bearings)	[Nil]
		(4)Wearing Coat including expansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/Return walls	[Nil]
		(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]
		C.2- New Elevated Section/Flyovers/Grade Separators	
		(1) Foundations	[Nil]
		(2) Sub-Structure	[Nil]
		(3)Super-Structure(Including bearings)	[Nil]
		(4)Wearing Coat including expansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/Return walls	[Nil]
		(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]
Other Works	24.89 %	(i) Toll Plaza	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		(ii) Road side drains	14.85%
		(iii) Road signs, markings, km stones, safety devices etc	6.5%
		(iv) Project facilities	
		a) Bus Bays	1.43%
		b) Truck Lay-byes	[Nil]
		c) Passenger Shelter	0.1%
		d) Rest Area	[Nil]
		e) Road Side Amenities	[Nil]
		f) Street Light	0.85%
		g) Utility Duct	[Nil]
		(v) Road side Plantation	[Nil]
		(vi)Repair of Protection Works other than approaches to the bridges, elevated sections/flyover/grade separators and ROBs/ RUBs	[Nil]
		(vii) Safety &Traffic Management during const.	[Nil]
		(viii) Junction	
		(ix) Toe Wall	0.8%
		(x) Retaining Wall	[Nil]
		(xi) Boundary wall	[Nil]
		(xii) Site Clearance & Dismantling	2.4%
		(xiii) Reinforced Earth Wall	44.27%
		(xiv) Junction	13.7%
		(xv) Turfing	0.2%
		(xvi) Breast Wall	[Nil]
		(xvii) Chute Drain	[Nil]
		(xvii) Ground Improvement Works (Sand Pile)	[Nil]
		(xvii) Protection Work (Stone Pitching)	[Nil]
		(xviii) Diversion Road & Approach Road	[Nil]
		(xvix) Shifting of Utility	14.9%

1.3 Procedure of estimating the value of work done

1.3.1 Road works

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

Table 1.3.1

Stage of Payment	Percentage weightage	Payment Procedure

Stage of Payment	Percentage weightage	Payment Procedure
A- Widening & Strengthening of road		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.
(1)Earthwork up to top of the sub-grade	17.38%	
(2) Sub-base Course	16.64%	
(3) Non bituminous Base course	15.11%	
(4) Bituminous Base course	18.13%	
(5) Wearing Coat	10.76%	
(6) Widening and repair of culverts	[Nil]	Cost of ten completed culverts shall be determined on pro rata basis with respect to the total number of culverts.
B.1- Reconstruction/ New 2-Lane Realignment/ Bypass (Flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 0.5 (half) km length, whichever is less.
(1) Earthwork up to top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Non bituminous Base course	[Nil]	
(4) Bituminous Base course	[Nil]	
(5) Wearing Coat	[Nil]	
B.2- Reconstruction/New 8-Lane Realignment/Bypass(Rigid Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 0.5 (half) km length, whichever is less.
(1)Earthwork upto top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Dry Lean Concrete (DLC) Course	[Nil]	
(4) Pavement Quality Control (PQC) Course	[Nil]	
C.1- Reconstruction/New Service Road/ Slip Road(Flexible Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 0.5 (half) km length, whichever is less.
(1)Earthwork upto top of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Non bituminous Base course	[Nil]	
(4) Bituminous Base course	[Nil]	
(5) Wearing Coat	[Nil]	
C.2- Reconstruction/New Service road (Rigid Pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 0.5 (half) km length, whichever is less.
(1)Earthwork upto top of the sub-grade	0.93%	
(2) Sub-base Course	0.85%	
(3) Dry Lean Concrete (DLC)Course	1.28%	
(4) Pavement Quality Control (PQC) Course	3.74%	
D- Reconstruction & New Culverts on existing road, realignments, bypasses		Cost of each culverts shall be determined on pro rata basis with respect to the total number of culverts.
Culverts (length <6m)	15.18%	

Stage of Payment	Percentage weightage	Payment Procedure
		Payment shall be made on the completion of at least one culvert.

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

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

Where,

P = Contract Price

L = Total length in km

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

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

1.3.2 Minor Bridges and Underpasses/Overpasses.

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

Table 1.3.2

Stage of Payment	Weightage	Payment Procedure
1	2	3
A.1-Widening and repairs of Minor Bridges (length>6m&<60m)	0.36%	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of widening & repair works of at least one minor bridge
A.2- New Minor Bridges (length > 6m & < 60m)		
(1)Foundation: On completion of the foundation work.	3.53%	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

Stage of Payment	Weightage	Payment Procedure
		foundation, the trigger of first payment shall include load testing also where specified.
(2)Sub-Structure: On completion of the Sub structure work	55.34%	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 wearing coat, bearings, expansion joints, hand rails, crash barriers, road, signs & markings, tests on completion etc. complete in all respect.	30.26%	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
(3)Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all and fit for use	[Nil]	Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of "Stage of Payment" in this sub-clause.
(4) Guide Bund sand River Training Works: On completion of Guide Bunds and river training works complete in all respects	10.51%	Payment shall be made on pro-rata basis on completion of a stage i.e. completion of Guide Bund sand River training Works in all respects as specified
B.1- Widening and repairs of underpasses/overpasses	[Nil]	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 & repair works of a underpass/overpass.
B.2- New Underpasses/Overpasses		
(1)Foundation + Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	[Nil]	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.

Stage of Payment	Weightage	Payment Procedure
(2)Super-structure: On completion of the super-structure in all respects 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 joints complete in all respects as specified and (b) in case of underpass- rigid pavement including drainage facility complete in all respects as specified.	[Nil]	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
(3) Approaches: On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	[Nil]	Payment shall be made on pro-rata basis on completion of a stage in all respects as specified

1.3.3 Major Bridge works, ROB/RUB and Structures.

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

Table 1.3.3

Stage of Payment	Weightage	Payment Procedure
A.1-Wideningand repairs of Major Bridges		
(1)Foundation	[Nil]	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	[Nil]	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

Stage of Payment	Weightage	Payment Procedure
		bridge.
(3)Super-structure(including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super- structure including bearings of atleast 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	[Nil]	Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	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	[Nil]	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.	[Nil]	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)	[Nil]	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	[Nil]	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.

Stage of Payment	Weightage	Payment Procedure
(2)Sub-structure	[Nil]	Sub-structure: Payment against sub-structure shall be made on pro-rata basis on completion of a stage i.e. not lessthan25% of the scope of sub- structure of major bridge.
(3)Super-structure(including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e.completion of super- structure including bearings of atleast 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	[Nil]	Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/return walls	[Nil]	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.	[Nil]	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)	[Nil]	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		

Stage of Payment	Weightage	Payment Procedure
(1) Foundations	[Nil]	Foundation: Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m)of theROB/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. Incasewhereloadtestingisrequired forfoundation,thetrigger offirst payment shallincludeloadtestingalso where specified.
(2) Sub-Structure	[Nil]	Sub-structure:Payment against sub-structure shallbe made on pro-rata basis on completion of a stage i.e.not lessthan 25% of the scope of sub- structure of ROB/RUB.
(3) Super-Structure (Including bearings)	[Nil]	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%ofthe 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 respectsas specified and (b) incase of RUB-rigid pavement under RUB including drainagefacility completein all respects as specified	[Nil]	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 handrails, crash barrier, road markings etc.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/Return walls	[Nil]	Wing walls/return walls: Payments shall be made on completion of all wing walls/ return walls complete in all respects as specified.
(7) Approaches (Including Retaining walls, Stone Pitching and protection works)	[Nil]	Payments shall be made on pro rata basis on completion of 20% of the total area.
B.2-NewROB/RUB		

Stage of Payment	Weightage	Payment Procedure
(1) Foundation	9.7%	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.
(2) Sub-structure	12.55%	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)	74.6%	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 respectsas specified and (b) incase of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	[Nil]	Wearing Coat: Payment shall be made on completion(a) in case of ROB-wearing coat including expansion joints complete in all respects as specifiedand(b) In case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	3.15%	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc. complete in all respects as specified.
(6) Wing walls/Return walls	[Nil]	Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]	Payment shall be made on pro-rata basis on completion of a stage in all respects as specified
C.1-Wideningandrepairs of Elevated Section/ Flyovers/ Grade Separators		

Stage of Payment	Weightage	Payment Procedure
(1) Foundations	[Nil]	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	[Nil]	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 (Including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super- structure including bearings of atleast one span in all respects a sspecified. 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	[Nil]	Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings etc. Complete in all respects as specified.
(6) Wing walls/Return walls	[Nil]	Wing walls/return walls: Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]	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		

Stage of Payment	Weightage	Payment Procedure
(1) Foundations	[Nil]	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. Incase where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-Structure	[Nil]	Sub-structure:Payment against sub-structure shallbe 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(Including bearings)	[Nil]	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e.completion ofsuper- structure including bearings of atleast 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 foreach span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)WearingCoatincludingexpansion joints	[Nil]	WearingCoat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crashbarriers,road markings etc. complete in all respects as specified.
(6) Wing walls/Return walls	[Nil]	Wingwalls/return walls:Payments shall be made on completion of all wing walls/returnwalls complete in all respects as specified.
(7)Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	[Nil]	Payments shall be made on pro rata basis on completion of 20% of the total area.

Note: (1) In case of innovate 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 the Competent Authority.

(2) The Schedule for exclusive tunnel projects may be prepared as per site requirements before bidding with due approval of Competent Authority.

1.3.4 Other works.

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

Table1.3.4

Stage of Payment	Weightage	Payment Procedure
1	2	3
(1) Toll Plaza	[Nil]	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.
(2) Road side drains	14.85%	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 percent) of the total length.
(3) Road signs, markings, km stones, safety devices etc	6.5%	
(4) Project Facilities		Payment shall be made on pro rata basis for completed facilities.
a) Bus Bays	1.43%	
b) Truck Lay-byes	[Nil]	
c) Passenger Shelter	0.1%	
d) Rest Area	[Nil]	
e) Road Side Aminities	[Nil]	
f) Street Light	0.85%	
g) Utility Duct	[Nil]	
(5) Retaining Wall	[Nil]	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 percent)of the total length.
(6) Road side Plantation including Horticulture in Wayside Amenities	[Nil]	
(7) Repair of Protection Works other than approaches to the bridges, elevated sections/flyover/grade separators and ROBs/ RUBs	[Nil]	
(8) Boundary wall	[Nil]	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 percent)of the total length
(9) Safety and traffic management during construction	[Nil]	Payment shall be made on prorate basis every six months.
(10) Breast Wall	[Nil]	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 percent)of the total length.
(11) Toe Wall	0.8%	
(12) Site Clearance & Dismantling	2.4%	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 percent) of the total length.

Stage of Payment	Weightage	Payment Procedure
(13) Reinforced Earth Wall	44.27%	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 percent)of the total length.
(14) Junction	13.7%	Cost of each Junction shall be determined on pro rata basis with respect to the total number of junctions. Payment shall be made on the completion of at least five junctions.
(15) Turfing	0.2%	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 percent)of the total length.
(16) Ground Improvement Works (Sand Pile)	[Nil]	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 percent)of the total length.
(17) Protection Work (Stone Pitching)	[Nil]	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 percent) of the total length.
(18) Diversion Road & Approach Road	[Nil]	
(19) Shifting of Utility	14.9%	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 percent) of the total length.

2. Procedure for payment for Maintenance

2.1 The cost for maintenance shall be as stated in Clause14.1.1.

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

Schedule - I

(See Clause 10.2 (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 is required 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 256th day from the Appointed Date (the "**Project Milestone-I**").

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

3. Project Milestone-II

(i) Project Milestone-II shall occur on the date falling on the 438th day from the Appointed Date (the "**Project Milestone-II**").

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

4. Project Milestone-III

(i) Project Milestone-III shall occur on the date falling on the 621st 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 **730th** 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 forTests

(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 ApplicablePermits.

(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 IndustryPractice.

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 survey months defined for the state basis rainy season)
2	Roughness of pavement	Network Survey Vehicle (NSV)	At least twice a year (As per survey months defined for the state basis rainy season)
3	Strength of pavement	Falling Weight Deflectometer(FWD)	At least once a year
4	Bridges	Mobile Bridge Inspection Unit(MBU)	At least twice a year (As per survey months defined for the state basis rainy season)
5	Road signs	Retro-reflectometer	At least twice a year (As per survey months defined for the state basis rainy season)

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

Schedule - L

(See Clause 12.2)

Completion Certificate

1 I, …….. (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated ..... (the "**Agreement**"), for **"Widening/Improvement to 4 (Four) Lane with Paved Shoulder configuration of existing single lane road from Srirampur (near Bhairiguri Village) to Grehempur Section (Package-I) of Srirampur - Dhubri Section of NH-127B from existing Km 0.000 to Km 10.912 (Design Km 0.000 to Km 10.900), (Design Length=10.900 Km) on EPC Mode in the State of Assam under JICA-ODA loan assistance."**through (Name of Contractor),herebycertify 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 forentryintooperationonthisthe……dayof……20…,ScheduledCompleted Date for which was the ……. day of ……20…..

SIGNED, SEALED ANDDELIVERED

For and on behalf of the Authority's Engineerby:

(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 inSchedule-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 isdone.

(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 Paragraph2.

2. Percentage reductions in lump sum payments on monthlybasis

(i) The following percentages shall govern the paymentreduction:

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, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%

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/5thkmstones	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:

$$R = \frac{P}{100} \times M \times \frac{L1}{L}$$

Where,
P=Percentage of particular item/Defect/deficiency for deduction
M=Monthly lump-sum payment in accordance with the Bid
L1=Non-complying length
L = Total length of the road,
R=Reduction (the amount to be deducted for non-compliance for a particular item/Defect/deficiency)

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

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

Schedule - N

(See Clause 18.1 (i))

Selection of Authority's Engineer

1. Selection of Authority'sEngineer

(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'sEngineer.

(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 thisSchedule-N.

2. Terms ofReference

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'sEngineer

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) TheseTermsofReference (the"**TOR**")for the Authority'sEngineerarebeingspecified pursuant to the EPC Agreement dated ..... (the "**Agreement**), which has been enteredintobetweenthe[nameandaddressoftheAuthority](the"**Authority**")and ..... (the "**Contractor**")[#]for **"Widening/Improvement to 4 (Four) Lane with Paved Shoulder configuration of existing single lane road from Srirampur (near Bhairiguri Village) to Grehempur Section (Package-I) of Srirampur - Dhubri Section of NH-127B from existing Km 0.000 to Km 10.912 (Design Km 0.000 to Km 10.900), (Design Length=10.900 Km) on EPC Mode in the State of Assam under JICA-ODA loan assistance."** and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

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

2. Definitions andinterpretation

(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 theAgreement.

(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 thisTOR.

(iii) The rules of interpretation stated in Article 1 of the Agreement shall apply, mutatis mutandis, to thisTOR.

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 IndustryPractice.

(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 Certificateor

(e) Any other matter which is not specified in (a), (b), (c) or (d) above and which creates a financial liability on eitherParty.

(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 everymonth.

(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 Clause18.2.

(v) The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article13.

(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. ConstructionPeriod

(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 andStandards.

(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 there to.

(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 Clause10.4.

(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 suchreport.

(vii) TheAuthority'sEngineershallinspecttheConstructionWorksandtheProjectHighway 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 mayrequire.

(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 qualityassurance.

(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 IndustryPractice.

(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 remedialmeasures.

(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,unforeseeableeventorotherwise;providedthatincaseofanyworkrequired on account of a Force Majeure Event, the provisions of Clause 21.6 shallapply.

(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 Contractororthwith.

(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 Clause12.2.

(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 berevoked.

(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 andSchedule-K.

5. MaintenancePeriod

(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 theContractor.

(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 theContractor.

(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 Clause14.5.

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) TheAuthority'sEngineershalldeterminetheperiodofTimeExtensionthatisrequired 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 Clause18.5.

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 tothe

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 Clause19.16.

8. Other duties andfunctions

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-builtsurveyillustratingthelayoutoftheProjectHighwayandsetbacklines,ifany,ofthe buildings and structures forming partofProjectFacilitiesand shall hand themoverto the Authority against receiptthereof.

(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 theParties.

(v) TheAuthority'sEngineershallinformtheAuthorityandtheContractorofanyeventof Contractor's Default within one week of itsoccurrence.

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) TheestimatedamountfortheWorksexecutedinaccordancewithClause19.3 (i) subsequent to the lastclaim;

(b) amounts reflecting adjustments in price for the aforesaidclaim;

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

(d) amountsreflectingadjustmentinprice,ifany,for(c)aboveinaccordancewith 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 excepttaxes;

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 lastclaim:

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

ii. For Change of Scope Orders,and

iii. Taxesdeducted

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 theSite.

(ii) The insurance under sub para (a) and (b) of paragraph 1(i) above shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

2. Insurance for Contractor's Defects Liability

The Contractor shall effect and maintain insurance cover of not less than 15% of the Contract Price for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and which arises from a cause occurring prior to the issue of the Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage toproperty

(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 ofoccurrences.

The insurance cover shall be not less than: Rs. 1.5 Crore (Rupees One Crore Fifty Lakhs)

(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 [construction of the ****section (km ** to km **) of

****] (the "**Project Highway**") on Engineering, Procurement and Construction (EPC) basis through..... (Name of Contractor), here by 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 ANDDELIVERED

(Signature)

(Name and designation of Authority's Representative)

(Address)