

Schedules

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

1 The Site

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

Schedule-A
(See Clauses 2.1 and 8.1)
Site of the Project

1 The Site

- (ii) Site of the [Two-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.
- (iii) An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor ,and such inventory shall form part of the memorandum referred to in Clause8.2 (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.

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

**Annex -I
(Schedule-A)
Site**

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

1. Site

The Site starts at Beltoli (junction with SH-5) near Bilasipara and ends at Jalukbari interchange in Guwahati. The total length of the existing road stretch is 215.578 km. The project road is divided into 16(sixteen) packages. The PKG-7 of the project road starts from the Sagunbashi forest (near Nichinta) and ends at the starting of Krishnai Bypass (Ex. Ch. 88.00km to Ex. Ch.99.930km).The Design length of the PKG-7 comes out as 11.900 km (Design Ch. 84.100km to Ch. 96.000km).The entire package falls under Goalpara 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 Bilasipura KM 0.000		Design Chainage (KM)		Existing Right of Way Width (m)		Total Width (m)
	From	To	From	To	Right	Left	
1	88.000	88.250	84.100	84.340	8.4	26.3	34.6
2	88.250	88.500	84.340	84.590	11.2	26.1	37.3
3	88.500	88.750	84.590	84.840	7.0	16.0	23.0
4	88.750	89.000	84.840	85.090	4.7	19.7	24.4
5	89.000	89.250	85.090	85.340	5.3	9.3	14.6
6	89.250	89.500	85.340	85.580	21.8	7.6	29.3
7	89.500	89.750	85.580	85.830	12.4	8.7	21.2
8	89.750	90.000	85.830	86.080	8.1	7.7	15.9
9	90.000	90.250	86.080	86.330	6.8	8.6	15.4
10	90.250	90.500	86.330	86.580	6.0	9.2	15.3
11	90.500	90.750	86.580	86.830	17.3	6.9	24.2
12	90.750	91.000	86.830	87.080	5.9	10.5	16.3
13	91.000	91.250	87.080	87.330	8.6	6.4	15.0
14	91.250	91.500	87.330	87.580	5.0	7.3	12.2
15	91.500	91.750	87.580	87.830	7.3	8.4	15.7
16	91.750	92.000	87.830	88.080	18.8	24.1	42.9
17	92.000	92.250	88.080	88.330	14.0	21.3	35.3
18	92.250	92.500	88.330	88.580	17.3	19.6	36.9
19	92.500	92.750	88.580	88.830	18.3	21.1	39.3
20	92.750	93.000	88.830	89.080	14.5	10.8	25.3

SL No.	Existing Chainage (KM),As per Survey, Starting Chainage of Bilaspura KM 0.000		Design Chainage (KM)		Existing Right of Way Width (m)		Total Width (m)
	From	To	From	To	Right	Left	
21	93.000	93.250	89.080	89.330	10.8	6.9	17.7
22	93.250	93.500	89.330	89.575	24.7	6.3	31.0
23	93.500	93.750	89.575	89.825	32.6	5.2	37.8
24	93.750	94.000	89.825	90.075	22.7	11.9	34.6
25	94.000	94.250	90.075	90.325	11.8	14.0	25.8
26	94.250	94.500	90.325	90.575	16.1	20.6	36.7
27	94.500	94.750	90.575	90.825	17.4	6.8	24.2
28	94.750	95.000	90.825	91.075	16.6	12.3	28.8
29	95.000	95.250	91.075	91.325	6.8	7.9	14.7
30	95.250	95.500	91.325	91.575	8.4	6.8	15.1
31	95.500	95.750	91.575	91.825	10.0	8.0	18.0
32	95.750	96.000	91.825	92.080	15.2	4.0	19.2
33	96.000	96.250	92.080	92.330	13.7	0.2	14.0
34	96.250	96.500	92.330	92.580	23.9	12.4	36.3
35	96.500	96.750	92.580	92.830	12.4	13.9	26.3
36	96.750	97.000	92.830	93.080	11.7	6.1	17.8
37	97.000	97.250	93.080	93.330	6.0	7.1	13.1
38	97.250	97.500	93.330	93.580	9.3	5.9	15.2
39	97.500	97.750	93.580	93.825	6.1	10.2	16.3
40	97.750	98.000	93.825	94.075	5.7	5.8	11.4
41	98.000	98.250	94.075	94.325	6.0	8.2	14.1
42	98.250	98.500	94.325	94.575	7.1	8.7	15.8
43	98.500	98.750	94.575	94.825	6.0	6.5	12.5
44	98.750	99.000	94.825	95.075	5.8	5.5	11.4
45	99.000	99.250	95.075	95.325	9.8	7.0	16.9
46	99.250	99.500	95.325	95.575	6.3	8.0	14.3
47	99.500	99.750	95.575	95.825	7.2	6.8	14.0
48	99.750	99.930	95.825	96.000	5.9	6.2	12.0

3. Carriageway

The present carriageway of the Project Highway consists two Lane with bituminous/earthen shoulder configuration from Ex. Ch. 88.000km to Ex. Ch. 99.930km. The type of the existing pavement of the section is flexible.

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilaspura- Guwahati road (NH 17) in the state of Assam on EPC mode.

4. Major Bridges

The Site includes the following Major Bridge: -

SL. No.	Survey Chainage (km)	Existing Chainage as per NH-37 (km)	Design Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
				Foundation	Sub-structure	Super-structure		
1	91.071	22.940	87.153	RCC Pile	RCC Wall	PSC BOX-GIRDER	2 x 33.80	8.6
2	93.745	25.547	89.816	Pile	RCC Wall	PSC BOX-GIRDER	2 x 31.00	8.3

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

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

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

6. Grade separators

The Site includes the following grade separators:

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

7. Minor bridges

The Site includes the following minor bridges:

SL. No.	Survey Chainage (km)	Existing Chainage as per NH-37 (km)	Design Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
				Foundation	Sub-structure	Super-structure		
1	91.602	23.470	87.681	RCC Pile	RCC Wall	RCC T Girder	2 x 19.1	11.1
2	91.958	23.800	88.035	Open	RCC Wall	PSC T Girder	1 x 25.4	10.5
3	92.8	24.604	88.878	Open	RCC Wall	RCC Slab	2 x 8.2	8.7
4	93.012	24.813	89.09	Open	RCC Wall	RCC Slab	3 X 6.00	8.5
5	97.851	29.653	93.926	Pile	RCC Wall	RCC Slab	2 X 6.00	8.9

8. Railway level crossings

The Site includes the following railway level crossings:

Sl. No.	Chainage (km)	Location	Remarks
Nil			

9. Under-passes (vehicular, on-vehicular)

The Site includes the following under-passes:

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

10. Culverts

The Site has the following culverts:

Sl No	Survey Chainage (km)	Existing Chainage as per NH-37 (km)	Design Chainage (km)	Type of Structures (Pipe/Slab/Box/Arch)	Span Arrangement (no x length) (m)	Width of culvert (m)
1	88.204	19.980	84.290	Slab	1X2.5 M	11.2
2	89.167	20.992	85.254	Slab	1X2.5 M	11.5
3	89.403	20.772	85.486	Slab	1X2.5 M	9.8
4	94.252	25.904	90.325	Slab	1X2.5 M	8.3
5	94.528	25.631	90.600	Box	1X2.0 M	7.9
6	95.089	26.898	91.164	Box	1X2.0 M	8.6
7	95.243	26.948	91.317	Box	1X2.0 M	8.9
8	96.105	27.914	92.182	Box	1X1.5M	8.7
9	96.390	28.192	92.467	Slab	1X1.3M	9.3
10	96.947	28.751	93.026	Box	1X2.0 M	10.9
11	97.278	29.080	93.355	Box	1X2.5 M	10.9
12	98.177	29.980	94.252	Slab	1X0.8M	12.5
13	98.663	30.465	94.736	Box	1X1.5M	12.5
14	99.577	31.456	95.652	Box	1X2.0M	10.8

11. Bus bays

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

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

12. Truck Lay byes

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

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 (Kutchra)
NIL				

14. Major junctions

The details of major junctions are as follows:

S. No.	Location					At grade	Separated	Category of Cross Road			
	Survey Ch.		Existing Chainage as per NH-37 (km)	Design Ch.				NH	SH	MDR	Others
	From km	to km		From km	To km						
1	89.600		21.344	85.600		✓		SH-12			
2	99.300		31.111	95.388		✓	NH-217				

(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	
	Survey Ch.		Existing Chainage as per NH-37 (km)	Design Ch.		T-Junction	Cross Road
	From km	To km		From km	To km		
1	88.830		20.652	84.916		3 Legged	Alley Academic School
2	88.845		20.669	84.934		3 Legged	Kulpara
3	89.104		20.928	85.192		3 Legged	Rangsapara
4	89.900		21.725	85.983		3 Legged	Agia pt II
5	90.000		21.866	86.080		3 Legged	Petrol Pump
6	90.450		22.301	86.520		3 Legged	Agia Gaon
7	92.050		23.882	88.120		3 Legged	kushmari
8	93.430		25.223	89.500		3 Legged	Chandramari
9	94.840		26.680	90.914		3 Legged	Fafanga
10	95.370		27.173	91.445		4 Legged	Godhabari(LHS),Fafanga Pt II(RHS)
11	95.448		27.259	91.530		3 Legged	Godhabari
12	97.352		29.149	93.430		3 Legged	Garopara

Sl. No.	Location					Type	
	Survey Ch.		Existing Chainage as per NH-37 (km)	Design Ch.		T-Junction	Cross Road
	From km	To km		From km	To km		
13	97.800		29.594	93.870		3 Legged	Tukurapara
14	98.000		29.784	94.060		3 Legged	Tukurapara
15	98.700		30.526	94.800		3 Legged	Lohar Kharmor
16	99.530		31.319	95.600		3 Legged	Paikan

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 Km)
	(town)	From (km)	to (km)	
Nil				

17. Other structures

[Provide details of other structures, if any.]

Nil

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

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	11.900	Rural Area :30m - 40m VUP Location :45m	At appointed date
Balance Right of Way (Width)	Realignment	-	-	Within 150 days of declaration of appointed date
	Bypass			
	Bus bays			
	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, the finished road level of the project highway shall not be less than those indicated in the alignment plan. The contractor shall, however, improve/upgrade the Road profile as indicated in Annex-III based on site/design requirement.
- (iii) Traffic Signage plan of the Project Highway showing numbers & location of traffic signs is enclosed. The contractor shall, however,
- (iv) 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.

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

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	<p>Required forest clearance. The project stretch passes through Phofanga Proposed Reserved Forest.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">As per Existing NH 37 Chainage (Km)</th> <th colspan="2" style="text-align: center;">Existing Survey chainage (Km)</th> <th style="text-align: center;">Length(Km)</th> </tr> <tr> <th style="text-align: center;">From</th> <th style="text-align: center;">To</th> <th style="text-align: center;">From</th> <th style="text-align: center;">To</th> <th></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">26.152</td> <td style="text-align: center;">26.366</td> <td style="text-align: center;">94.311</td> <td style="text-align: center;">94.525</td> <td style="text-align: center;">0.214</td> </tr> <tr> <td style="text-align: center;">27.285</td> <td style="text-align: center;">27.585</td> <td style="text-align: center;">95.475</td> <td style="text-align: center;">95.775</td> <td style="text-align: center;">0.300</td> </tr> <tr> <td style="text-align: center;">28.010</td> <td style="text-align: center;">28.121</td> <td style="text-align: center;">96.200</td> <td style="text-align: center;">96.311</td> <td style="text-align: center;">0.111</td> </tr> </tbody> </table>	As per Existing NH 37 Chainage (Km)		Existing Survey chainage (Km)		Length(Km)	From	To	From	To		26.152	26.366	94.311	94.525	0.214	27.285	27.585	95.475	95.775	0.300	28.010	28.121	96.200	96.311	0.111
As per Existing NH 37 Chainage (Km)		Existing Survey chainage (Km)		Length(Km)																							
From	To	From	To																								
26.152	26.366	94.311	94.525	0.214																							
27.285	27.585	95.475	95.775	0.300																							
28.010	28.121	96.200	96.311	0.111																							
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.

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

**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 & 2019)], referred to as the Manual. If any standards, specifications or details are not given in the Manual, the minimum design/construction requirements shall be specified in this Schedule. In addition to these particulars, all other essential project specific details, as required, should be provided in order to define the Scope of the Project clearly and precisely.]

1. Widening of the Existing Highway

(i) The Project Highway 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 is available.

(ii) Width of Carriageway

(a) Four-Lanning [with] paved shoulders shall be undertaken. The paved carriageway shall be [7(seven) x2m] wide in accordance with the typical cross sections drawings in the Manual.

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)
Nil				

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

2. Geometric Design and General Features

(i) General

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

(ii) Design speed

The design speed shall be the minimum design speed of [80 km per hr. for plain/rolling terrain] and Ruling 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	85.400km to 85.550km	Existing Curve Radius=250m	Proposed Curve Radius=500m
2	86.650km to 86.800km	Existing Curve Radius=250m	Proposed Curve Radius=500m
3	86.900km to 87.100km	Existing Curve Radius=150m	Proposed Curve Radius=250m

(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 VUP 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	Km 95.000 to km 95.730	2 X 1.5 m Paved Shoulder/ 2 X 1.5m width Drain Cum Footpath	TCS-6A

In EUP location 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	Km 87.250 to km 87.600	2 X 1.5 m Paved Shoulder/ 2 X 0.5m width Drain Cum Footpath	TCS-6D

- (b) In open country, [paved shoulders of 2.5 m width and balanced 1m width earthen shoulder shall be provided and balance 1.5m 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 relevant Manual.

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 guardrails/crash barriers shall be as per requirements specified in the relevant Manual.
- (b) Lateral clearance: The width of the opening at the underpasses shall be as follows:

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilaspura- Guwahati road (NH 17) in the state of Assam on EPC mode.

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

(vii) Lateral and vertical clearances at overpasses

- (a) Lateral and vertical clearances at overpasses shall be 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) (from km to km)	Span/Opening (m)	Remarks
Nil			

(viii) Service roads

Service roads shall be constructed at the locations and for the lengths indicated below:
[Refer 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	Remarks
1	Km 87.250 to km 87.600	Both sides	2X0.350=0.700	EUP Location
2	Km 95.000 to km 95.730 km	Both sides	2X0.730=1.46	VUP Location

(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
1	95.388	30	1 x 30m	2.50%	PSC T Girder

- (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 crossroad is to be carried at the existing Level. Raised or lowered]

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

(x) Cattle and pedestrian underpass /overpass

Cattle and pedestrian underpass/overpass shall be constructed as follows:
[Refer to provision of the relevant Manual and specify the requirements of cattle and pedestrian underpass/overpass]

Sl.No.	Location	Type of crossing
Nil		

The details of Elephant Under passes is given below.

Sl.No.	Location(km)	Remarks
1	87.425	Elephant Underpass

(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 1A	TYPICAL CROSS SECTION OF 4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA (OVERLAY OVER EXISTING PAVEMENT)	625
TCS 1E	TYPICAL CROSS SECTION OF 4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA AT HIGH EMBANKMENT AT BRIDGE APPROACH	975
TCS 1F	TYPICAL CROSS SECTION OF 4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA (RECONSTRUCTION OVER EXISTING PAVEMENT WITH FULL EXISTING GRANULAR LAYER SCARIFICATION WITH NEW SUBGRADE BELOW EXISTING PAVEMENT)	4290
TCS 1G	TYPICAL CROSS SECTION OF 4 LANE CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA (RECONSTRUCTION OVER EXISTING PAVEMENT WITH PARTIAL GRANULAR LAYER SCRAIFICATION)	1700
TCS 1H	TYPICAL CROSS SECTION OF 4 LANE CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA (RECONSTRUCTION OVER EXISTING PAVEMENT WITH FULL GRANULAR LAYER SCRAIFICATION)	270
TCS 1K	TYPICAL CROSS SECTION OF 4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN RURAL AREA (RECONSTRUCTION OVER EXISTING PAVEMENT WITH FULL BITUMINOUS LAYER SCARIFICATION)	2960
TCS 6A	TYPICAL CROSS SECTION OF 4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN VUP/ROB APPROACHES WITH BOTH SIDE SERVICE ROAD IN BUILT UP/ RURAL AREA FOLLOWS EXISTING 2-LANE ROAD	730
TCS 6D	TYPICAL CROSS SECTION OF 4 LANE DIVIDED CARRIAGEWAY WITH PAVED SHOULDER IN VUP/ROB APPROACHES IN EUP LOCATION	350
Total Length=		11900

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Chainage (m)		Length (m)	TCS no.
From	To.		
84100	86150	2050	TCS 1K
86150	86350	200	TCS 1A
86350	87050	700	TCS 1K
87050	87250	200	TCS 1A
87250	87600	350	TCS 6D
87600	88500	900	TCS 1G
88500	88725	225	TCS 1A
88725	89050	325	TCS 1E
89050	89550	500	TCS 1F
89550	89925	375	TCS 1G
89925	90125	200	TCS 1E
90125	90550	425	TCS 1G
90550	90760	210	TCS 1K
90760	90910	150	TCS 1E
90910	93750	2840	TCS 1F
93750	94050	300	TCS 1E
94050	95000	950	TCS 1F
95000	95730	730	TCS 6A
95730	96000	270	TCS 1H
Total=		11900	

4. Intersections and Grade Separators

All intersections and grade separators shall be as per Section3 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	Agia (Ch.85.600km)	3-legged	Junction with SH-12

Minor Intersections

Sl. No.	Location		Type	
	From km	To km	3/4 Legged	Cross Road
1	84.916		3 Legged	Alley Academic School
2	84.934		3 Legged	Kulpara
3	85.192		3 Legged	Rangsapara
4	85.983		3 Legged	Agia pt II
5	86.080		3 Legged	Petrol Pump
6	86.520		3 Legged	Agia Gaon
7	88.120		3 Legged	kushmari
8	89.500		3 Legged	Chandramari
9	90.914		3 Legged	Fafangax
10	91.445		4 Legged	Godhabari(LHS),Fafanga Pt II(RHS)
11	91.530		3 Legged	Godhabari
12	93.430		3 Legged	Garopara
13	93.870		3 Legged	Tukurapara
14	94.060		3 Legged	Tukurapara
15	94.800		3 Legged	Lohar Kharmor
16	95.600		3 Legged	Paikan

*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 to be provided	Road to be carried over/under the structures

4. Road Embankment and Cut Section

(i) Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/cuttings shall conform to the Specifications and Standards given in Section4 of the Manual and the specified cross-sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

(iii) 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]
Nil			

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilaspura- Guwahati road (NH 17) in the state of Assam on EPC mode.

5. Pavement Design

(i) Pavement design shall be carried out for a design life of 20 years considering 33 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: 37-2018(Fourth Revision) and the details given below

<p><u>For Overlay</u> BC-40mm DBM-50mm DBM(Profile Corrective Course)-50mm Total -140 mm</p>	<p><u>For New Construction/Widening/RE Wall portion</u> BC -40 mm DBM -60 mm WMM - 100 mm CT Base-100 mm CT Sub-Base- 200 mm Total -500 mm</p>
<p><u>For Existing Reconstruction</u> BC -40 mm DBM -60 mm RAP-110 mm GSB-300mm Total -510 mm</p>	<p><u>For Existing Reconstruction</u> BC -40 mm DBM -100 mm WMM I - 125 mm WMM II - 125 mm GSB- 200 mm Total - 590 mm</p>

*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 20 years. Stage construction shall not be permitted.

(b) Design Traffic

Not with standing anything to the contrary contained in this Agreement or the Manual. The Contractor shall design the pavement for a minimum design traffic of 33 million 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	Chainage (km)		Length (km)	TCS Type	TCS No
	From	To.			
1	84.100	86.150	2.050	Rural	TCS 1K
2	86.350	87.050	0.700	Rural	TCS 1K
3	87.600	88.500	0.900	Rural	TCS 1G
4	89.050	89.550	0.500	Rural	TCS 1F
5	89.550	89.925	0.375	Rural	TCS 1G
6	90.125	90.550	0.425	Rural	TCS 1G
7	90.550	90.760	0.210	Rural	TCS 1K
8	90.910	93.750	2.840	Rural	TCS 1F
9	94.050	95.000	0.950	Rural	TCS 1F
10	95.730	96.000	0.270	Rural	TCS 1H

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 VUP location for the Project Highway has been provided in the table given below:

RCC Covered Drain

Chainage (m)		Side	Length (m)	Remarks
From	To			
87250	87600	Both	2X350= 700	EUP Location
95000	95730	Both	2X730= 1460	VUP Location
Total length=			2160m	

* 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 from 7.5 (seven point five) meters in the table below.]

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Sl. No.	Bridge/Structure at km	Width of carriageway and cross-sectional features
1	87.153	Carriageway Width = 9.5 m
2	89.816	

(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]

Sl.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.

(iv) 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.	Culvert location (Design Ch.) (Km)	Span of existing culvert (m)	Span of proposed culvert (m)	Repairs to be carried out [specify]
1	85.486	1X2.5	1 X 3.0 X 3.0	Reconstruction
2	90.600	1X2.0 M	1 X 2.0 X 3.0	Reconstruction
3	91.317	1X2.0 M	1 X 2.0 X 3.0	Reconstruction
4	92.182	1X1.5M	1 X 2.0 X 3.0	Reconstruction

Sl. No.	Culvert location (Design Ch.) (Km)	Span of existing culvert (m)	Span of proposed culvert (m)	Repairs to be carried out [specify]
5	92.467	1X1.3M	1 X 2.0 X 3.0	Reconstruction
6	93.026	1X2.0 M	1 X 2.0 X 3.0	Reconstruction
7	94.252	1X0.8M	1 X 2.0 X 2.0	Reconstruction
8	94.736	1X1.5M	1 X 2.0 X 2.0	Reconstruction
9	95.652	1X2.0 M	1 X 2.0 X 2.0_EC	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 (Design Ch.) (Km)	Span of existing culvert (m)	Span of proposed culvert (m)	Repairs to be carried out [specify]
1	84.290	1X2.5	1 X 3.0 X 3.0	Both side Widening existing Slab culvert
2	85.254	1X2.5	1 X 3.0 X 2.0	Left side Widening existing Slab culvert
3	90.325	1X2.5	1 X 3.0 X 2.5	Left side Widening existing Slab culvert
4	91.164	1X2.0 M	1 X 2.0 X 2.0	Both side Widening existing Slab culvert
5	93.355	1X2.5	1 X 3.0 X 2.0	Right side Widening of existing Slab culvert

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

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
1	84.550	1 X 2.0 X 2.0	Single Cell
2	85.048	1 X 2.0 X 2.0	Single Cell
3	85.700	1 X 2.0 X 3.0	Single Cell
4	85.936	1 X 2.0 X 2.0	Single Cell
5	86.218	1 X 2.0 X 2.0	Single Cell
6	86.611	1 X 2.0 X 2.0	Single Cell
7	88.314	1 X 2.0 X 2.0	Single Cell
8	88.485	1 X 2.0 X 2.0	Single Cell
9	88.687	1 X 2.0 X 3.0	Single Cell
10	89.245	1 X 2.0 X 2.0	Single Cell
11	89.517	1 X 2.0 X 3.0	Single Cell
12	90.160	1 X 2.0 X 3.0	Single Cell
13	90.810	1 X 2.0 X 2.0	Single Cell
14	91.661	1 X 2.0 X 2.0	Single Cell
15	91.936	1 X 2.0 X 2.0	Single Cell

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Sl. No.	Culvert Location	Span /Opening (m)	Remarks*
16	93.657	1 X 2.0 X 2.0	Single Cell
17	95.000	1 X 2.0 X 2.0	Single Cell
18	95.730	1 X 2.0 X 2.0	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/replacement so railing/parapets, flooring and protection work of the existing culverts shall be undertaken as follows:

[Refer provision of the relevant Manual and provide details]

Sl.No.	Location at km	Type of repair required
1	84.29	Dismantling of deck slab for providing stiffening beam, Patching of damaged concrete surface of Deck Slab
2	85.254	Dismantling of existing Wing Wall, Dismantling of deck slab for providing stiffening beam
3	90.325	Dismantling of existing Wing Wall, Dismantling of deck slab for providing stiffening beam, Patching of damaged concrete surface of Deck Slab
4	91.164	Dismantling of existing Wing Wall, Dismantling of deck slab for providing stiffening beam, Patching of damaged concrete surface of Deck Slab
5	93.355	Dismantling of existing Wing Wall, Dismantling of deck slab for providing stiffening beam

- (e) Floor protection works shall be as specified in the relevant IRC Code and Specifications.

- (iii) Bridges

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

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

[Refer provision of the relevant Manual and provide details]

Sl. No.	Salient details of existing bridge			Salient details of proposed bridge			Adequacy or otherwise of the existing waterway, vertical clearance etc.*	Remarks
	Bridge location (km)	Type of Structures	Span Arrangement and Total Vent way (No. x Length) (m)	Bridge location (km)	Type of Structures	Span Arrangement and Total Vent way (No. x Length) (m)		
1	93.012	RCC Slab	3 x 6	89.090	RCC Box	3 x 6 x 5.5	-	Reconstructed in location of existing bridge

*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

(ii) The following narrow bridges shall be widened:

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

@ 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	87.153	2 x 35m	Additional 2 lane
2	87.681	2 x 18m	Additional 2 lane
3	88.035	1 x 24m	Additional 2 lane
4	88.878	1 x 21m	Additional 2 lane
5	89.816	2 x 35m	Additional 2 lane
6	93.926	1 x 12m	Additional 2 lane

(c) The railings of existing bridges shall be replaced by crash barrier sat 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:

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilaspura- Guwahati road (NH 17) in the state of Assam on EPC mode.

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

Sl.No.	Location at	Remarks
1	88.035	Painting on concrete surface
2	88.878	Patching of Concrete Surface, Repairing of railing, Painting on concrete surface
3	89.816	Repairing of railing, Dismantelling of Well Cap Skin Wall (PCC-M20), Reconstruction of Well Cap Skin Wall (PCC-M20)
4	93.926	Patching of Concrete Surface, Painting on concrete surface

- (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 (road over rail) shall be provided at the following level crossings. As per GAD drawings attached:

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

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

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

- (v) Grade separated structures

[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) and 3 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
NIL		

(b) ROB / RUB

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

(c) Overpasses/Underpasses and other structures

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

1. 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
Main Road			
1	Right Hand Side Curve	Nos.	12
2	Left Hand Side Curve	Nos.	16
3	School	Nos.	8
4	Side road left	Nos.	16
5	Side road right	Nos.	12
6	Cross Road	Nos.	2
7	Petrol pump/ Filling facility	Nos.	6
8	Bus Stop	Nos.	2
9	Direction Sign	Nos.	16
10	Stop Sign	Nos.	30
11	Horn prohibited	Nos.	8
12	Hazard Marker (one way)	Nos.	164
13	Object Marker (one way)	Nos.	2
Junction			
1	Right Hand Side Curve	Nos.	2
2	Left Hand Side Curve	Nos.	2
3	Side Road	Nos.	4
4	T Intersection	Nos.	2
5	Pedestaling Crossing	Nos.	6
6	Stop Sign	Nos.	6

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilaspura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Sl No	Traffic Signages, Road Marking and other appurtenances	unit	Quantity
7	Speed limit	Nos.	2
8	U-Turn prohibited	Nos.	10
9	Rumble strip	Nos.	6
10	Object Marker (one way)	Nos.	10
11	Object Marker (Two way)	Nos.	2
12	Direction Sign	Nos.	6
13	Direction Sign	Nos.	10
14	W-Metal Beam Crash Barrier	Nos.	7
15	Lane marking, edge marking	Sqm	6734
16	Delineator	Nos.	338

*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.	Location (Km)	Size
NIL		

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:

- a) Breast wall

Location		Side	Length (km)
From(km)	To(km)		
86.775	86.950	LHS	0.175
Total Length			0.175

*The specified length of Breast wall is the minimum requirement

- b) Toe wall

Location		Side	Length (km)
From(km)	To(km)		
87.650	87.950	LHS	0.450
88.550	89.000	RHS	0.300
Total length=			0.750

*The specified length of Toe wall is the minimum requirement

c) Retaining wall

Location		Side	Length (km)
From(km)	To(km)		
86.550	86.700	RHS	0.150
87.100	87.250	BOTH	0.300
89.650	90.000	LHS	0.350
Total length=			0.800

*The specified length of Retaining wall is the minimum requirement

d) Reinforced wall

Location		Length (km)
From(km)	To(km)	
87.250	87.600	0.350
95.000	95.730	0.730
Total length=		1.080

*The specified length of Reinforced wall is the minimum requirement

e) Stone pitching

Location		Side	Length (km)
From(km)	To(km)		
85.400	85.770	LHS	0.370
88.250	88.350	LHS	0.100
88.850	89.000	LHS	0.150
89.000	89.270	BOTH	0.540
89.270	89.440	RHS	0.170
89.570	89.750	LHS	0.180
89.910	90.010	LHS	0.100
90.300	90.350	RHS	0.050
90.620	90.710	RHS	0.090
94.660	94.800	BOTH	0.280
94.900	94.970	LHS	0.070
Total length=			2.100

*The specified length stone pitching is the minimum requirement

f) Seeding and Mulching

Location		Side	Length (km)
From(km)	To(km)		
84.100	86.150	BOTH	4100
86.150	86.350	BOTH	400
86.350	87.050	BOTH	1400
87.050	87.250	BOTH	400
87.600	88.500	BOTH	1800
88.500	88.725	BOTH	450
88.725	89.050	BOTH	650
89.050	89.550	BOTH	1000
89.550	89.925	BOTH	750

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Location		Side	Length (km)
From(km)	To(km)		
89.925	90.125	BOTH	400
90.125	90.550	BOTH	850
90.550	90.760	BOTH	420
90.760	90.910	BOTH	300
90.910	93.750	BOTH	5680
93.750	94.050	BOTH	600
94.050	95.000	BOTH	1900
95.730	96.000	BOTH	540
Total length=			21.640

*The specified length stone pitching is the minimum requirement

2. 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 constitute Change of Scope save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

(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 as follows:

S.No	Description	Unit	Nos.
1	Electric Post	Nos.	90
2	Lamp post	Nos.	2
3	11kv Post	Nos.	391
4	Telephone Post	Nos.	1
5	Transformer	Nos.	10
6	Tube Wall	Nos.	3
7	Water Tap	Nos	4
6	OFC	mtr	22802

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Schedule - C

(See Clause 2.1)

Project Facilities

1. Project Facilities

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

- (a) Toll plaza[s]
- (b) Road side furniture;
- (c) Pedestrian facilities;
- (d) Tree plantation;
- (e) Truck Lay byes;
- (f) Bus-bays and 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 the Manual.

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)	Name of the Place
Nil			

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 93 Nos. Street lights shall be provided in Built up & VUP 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:

Utility duct has been proposed at Median center and both edge of the carriageway.

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.

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

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 and IRC: SP: 84-2019), 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	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, approaches)	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/ltp/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 limit of 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% of area	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, restricted	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	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	SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)		180 days	BS: 7941-1:2006
	Pavement Condition Index	3	2.1	Bi-Annually			180 days	IRC:82-2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	Acceptable					
	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	2200m m/km	2400mm /km	Bi-Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656 -94: 2000	180 days
	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	Perform ance Paramet er	Level of Service (LOS)		Freque ncy of Inspect ion	Tools/Equip ment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintena nce Specificati ons
		Desirable	Accepta ble					
approach es of connectin g roads, slip roads, lay byes etc. as applicabl e)		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	Maintenance Specifications
		Desirable	Acceptable					
Embankment/ Slope	Edge drop at shoulders	Nil	40m m	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 of slab	0	Nil, not discernible	No Action	Not applicable
			1	w < 0.2 mm. hair cracks		
			2	w = 0.2 - 0.5 mm, discernible from slow-moving car	Seal without delay	Seal, and stitch if L > 1m.
			3	w = 0.5 - 1.5 mm, discernible from fast-moving car		

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	Single Transverse (or Diagonal) Crack intersecting with one or more joints	w = width of crack L = length of crack d = depth of crack D = depth of slab	4	w = 1.5 - 3.0 mm	Seal, and stitch if L > 1 m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15 days
			5	w > 3 mm.		
			0	Nil, not discernible	No Action	
			1	w < 0.2 mm, hair cracks	Route and seal with epoxy. Within 7 days	Staple or Dowel Bar Retrofit. Within 15 days
2	w = 0.2 - 0.5 mm, discernible from slow vehicle					
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 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	$w = 3.0 - 6.0 \text{ mm}$	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected. Portion with norms and specifications - See Para 5.5 & 9.2
			5	$w > 6 \text{ mm}$, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	Within 15 days
3	Single Longitudinal Crack intersecting with one or more joints	$w = \text{width of crack}$ $L = \text{length of crack}$ $d = \text{depth of crack}$ $D = \text{depth of slab}$	0	Nil, not discernible	No Action	
			1	$w < 0.5 \text{ mm}$, discernible from slow moving vehicle	Seal with epoxy, if $L > 1 \text{ m}$. Within 7 days	Staple or dowel bar retrofit. Within 15 days

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > 1 m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair with stapling.
			4	w = 6.0 - 12.0 mm, usually associated with spalling	Not Applicable, as it may be full depth	Within 15 days
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic		Full Depth Repair Dismantle and reconstruct affected portion as per norms and specifications -

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 more joints	w = width of crack	0	Nil, not discernible	No Action	-
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > 1 m.	
			2	w = 0.2 - 0.5 mm. discernible from slow vehicle	Within 15 days	
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, Reinststate subbase, Reconstruct whole slab as per specifications within 30 days
			4	w = 3.0 - 6.0 mm panel broken into 2 or 3 pieces		
			5	w > 6 mm and/or panel broken		

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 with epoxy Within 7 days
			2	w < 1.5 mm; L < 0.6 m, only one corner broken		
			3	w < 1.5 mm; L < 0.6 m, two corners broken	Partial Depth (Refer Figure 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	three or four corners broken		

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/m ²)	0	Nil, not discernible		No Action
			1	$w < 0.5 \text{ mm}; L < 3 \text{ m/m}^2$	Not Applicable, as it may be fulldepth	Seal with low viscosity epoxy to secure broken parts. Within 15days
			2	either $w > 0.5 \text{ mm}$ or $L < 3 \text{ m/m}^2$		
			3	$w > 1.5 \text{ mm}$ and $L < 3 \text{ m/m}^2$		
			4	$w > 3 \text{ mm}, L < 3 \text{ m/m}^2$ and deformation		
					Full depth repair - Cut out and replace	

			5	w > 3 mm, L > 3 m/m ² and deformation		damaged area taking care not to damage reinforcement. Within 30 days
--	--	--	---	--	--	---

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
Surface Defects						
7	Ravelling or Honeycomb surface type	r = area 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 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 if affecting. Within 30 days	
8	Scaling	r = damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	Short Term No action.	Long Term
			1	$r < 2\%$	Local repair of areas damaged and liable to be damaged. Within 7 days	Not Applicable
			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 $h > 25 \text{ mm}$		
9	Polished Surface/Glazing	t = texture depth, sand patchtest	0		No action.	Not Applicable
			1	$t > 1 \text{ mm}$		
			2	$t = 1 - 0.6 \text{ mm}$	Monitor rate of deterioration	
			3	$t = 0.6 - 0.3 \text{ mm}$		
			4	$t = 0.3 - 0.1 \text{ mm}$		

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	$t < 0.1 \text{ mm}$	Diamond Grinding if affecting 50% or more slabs in a 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 = maximum depth	0	$d < 50 \text{ mm}; h < 25 \text{ mm}; n < 1 \text{ per } 5 \text{ m}^2$	No action.	Not Applicable
			1	$d=50-100\text{mm}; h<50\text{mm}; n<1 \text{ per } 5 \text{ m}^2$	Partial depth repair 65 mm deep.	
			2	$d=50-100\text{mm}; h>50\text{mm}; n<1 \text{ per } 5 \text{ m}^2$	Within 15 days	

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
			3	$d = 100 - 300 \text{ mm}; h < 100 \text{ mm}; n < 1 \text{ per } 5\text{m}^2$	Partial depth repair 110mm	
			4	$d = 100 - 300 \text{ mm}; h > 100 \text{ mm}; n < 1 \text{ per } 5\text{m}^2$	i.e.10 mm more than the depth of the hole. Within 30 days	
			5	$d > 300 \text{ mm}; h > 100 \text{ mm}; n > 1 \text{ per } 5\text{m}^2$	Full depth repair. Within 30 days	

Joint Defects							
11	Joint Seal Defects	loss or damage L = Length as % total joint length	0	Difficult to discern.	Short Term	Long Term	
						No action.	Not Applicable
			1	Discernible, L < 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.		
			3	Notable. L > 25% insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days		
5	Severe; w > 3 mm negligible protection against ingress of water	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 cracked portion.	
			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 (or Stepping)	f = difference of level	0	not discernible, < 1 mm	No action.	No action.

	in Cracks or Joints		1	$f < 3 \text{ mm}$		
			2	$f = 3 - 6 \text{ mm}$	Determine cause and observe, take action for diamond grinding	Replace the slab as appropriate. Within 30days
			3	$f = 6 - 12 \text{ mm}$	Diamond Grinding	
			4	$f = 12 - 18 \text{ mm}$	Raise sunken slab.	Replace the slab as appropriate. Within 30days
			5	$f > 18 \text{ mm}$	Strengthen subgrade and sub-base by grouting and raising sunken slab	
14	Blowup or Buckling	h = vertical displacement from normal profile	0	Nil, not discernible	Short Term	Long Term
			1	$h < 6 \text{ mm}$	No Action	
			2	$h = 6 - 12 \text{ mm}$		

			3	h = 12 - 25 mm	within 7 days	
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shattered slabs, ie 4 or more pieces	Replace broken slabs. Within 30 days	
15	Depression	h = negative vertical displacement from normal profile L = length	0	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	$h > 100 \text{ mm}$	if $L < 20 \text{ m}$. Within 30 days	
16	Heave	h = positive vertical displacement from normal profile. L = length	0	Not discernible. $h < 5 \text{ mm}$	Short Term	scrabble
					No action.	
			1	$h = 5 - 15 \text{ mm}$	Follow up.	
			2	$h = 15 - 30 \text{ mm}$, Nos $< 20\%$ joints	Install Signs to Warn Traffic within 7 days	
			3	$h = 30 - 50 \text{ mm}$		
			4	$h > 50 \text{ mm}$ or $> 20\%$ joints	Stabilise subgrade. Reinstate pavement at normal level if length $< 20 \text{ m}$. Within 30 days	
			5	$h > 100 \text{ mm}$		
17	Bump	h = vertical	0	$h < 4 \text{ mm}$	No action	

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

			4	f = 50 - 75 mm	within 7 dayss	For any 100 m stretch Reconstruct shoulder, if affecting 25% or more of stretch. Within 30days
			5	f > 75 mm		

Drainage

19	Pumping	quantity of fines and water expelled through open joints and cracks Nos	0	not discernible	No Action	
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints Without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	appreciable/ Frequent 10 -25%	Lift or jack slab within 30 days.	
		Nos/100 m stretch	5	abundant, crack development >25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab. Within 30 days	

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

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

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

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

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/m ² /lux Minimum Threshold Level: 50 mcd/m ² /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	change of signboard	48 hours in case of Mandatory	IRC:67-2012

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	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 post-signs) 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	<u>Functionality:</u> Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	RC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2014 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:84-2014,IRC:35-2015
	Pedestrian Guardrail	<u>Functionality:</u> Functioning of guardrail asintended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014
	Traffic Safety Barriers	<u>Functionality:</u> Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014, IRC:119-2015
	End Treatment of	<u>Functionality:</u> 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 Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Traffic Safety Barriers			backup			IRC:119-2015
	Attenuators	Functionality: Functioning of Attenuators as intended	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	Rectification	Within 15 days	IRC: 79 - 1981
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67-2012
	Traffic Blinkers	Functionality: Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014
Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84-2014
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84-2014
	Toll Plaza Canopy Lights	Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major/minor failure in the lighting system	Daily	-	Rectification of failure	8 hours	IRC:SP:84-2014

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Trees and Plantation including median plantation	Obstruction in a minimum head-room of 5.5 m above carriageway or obstruction in visibility of road signs	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC:SP:84-2014
	Deterioration in health of trees and bushes	Health of plantation shall be as per requirement of specifications & instructions issued by Authority from time to time	Daily	Visual with video/image backup	Timely watering and treatment. Or Replacement of Trees and Bushes.	Within 90 days	IRC:SP:84-2014
	Vegetation affecting sight line and road structures	Sight line shall be free from obstruction by vegetation	Daily	Visual with video/image backup	Removal of Trees	Immediate	IRC:SP 84-2014
Rest Areas	Cleaning 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 barrel before rainy season.	15 days before onset of monsoon and within 30 days after end of rainy season.	IRC 5-2015, IRC SP:40-1993 and IRC SP:13-2004
	Leak-proof expansion joints if any	No leakage through expansion joints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35-1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-1993 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25 sqm Delamination of concrete not more than 0.25 sq.m.	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 per IRC: SP: 40-1993.	15 days	IRC SP 40-1993 and MORTH Specifications clause

		Cracks wider than 0.3 mm not more than 1m aggregate length		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 and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Bridges including ROB's Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811
Bridge -Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORT&H Specification 3004.2 & 2811.
	User safety (condition of crash barrier and guard rail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed condition survey as per IRC SP: 35-1990.	Repairs and replacement of safety barriers as the case may be	3 days	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 Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out the repairs to affected concrete portion with epoxy mortar / concrete.	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
Spalling of concrete	Not more than 0.50 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 Inspection Unit	Grouting with epoxy mortar, investigating causes for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP: 40-1993 and MORTH Specification 2800.
Rainwater seepage through deck slab	Leakage - nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting of deck slab at leakage areas, waterproofing, repairs to drainage spouts	1 months	MORTH Specifications 2600 & 2700.
Deflection due to permanent loads and	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 loads capacity	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 15m 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 strip joint.	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Replace	of seal	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 gaps thoroughly			3 days	MORTH specifications 2600 and

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

	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture of reinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment shall be replaced, in order to get uniform load transfer on to bearings.	3 months	MORTH specification 2810 and IRC SP: 40-199.
Bridge Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection as per IRC SP:35-1990 using Mobile Bridge Inspection Unit. In case of doubt, use Underwater camera for inspection of deep wells in major Rivers.	Suitable protection works around pier/abutment	1 month	IRC SP: 40-1993, IRC 83-2014, MORTH specification 2500
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching.	30 days after defect observation or 2	IRC: SP 40-1993 and IRC:SP:13-2004.

		sq.m, damage to solid apron (concrete apron) not more than 1 sq.m				weeks before onset of rainy season whichever is earlier.	
<p>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 the contractor.</p>							

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 requiringreplacement	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) [TollPlaza]		
(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 mobilecrane	4 (four) hours
Bridges		
(a) Superstructure		
(i)	Any damage, cracks, spalling/ scaling Temporarymeasures Permanentmeasures	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) Licence for use of explosives;
 - (d) Permission of the State Government for drawing water from river/reservoir;
 - (e) Licence from inspector of factories or other competent Authority for setting up batching plant;
 - (f) Clearance of Pollution Control Board for setting up batching plant;
 - (g) Clearance of Village Panchayats and Pollution Control Board for setting up asphalt plant;
 - (h) Permission of Village Panchayats and State Government for borrow earth; and
 - (i) Any other permits or clearances required under Applicable Laws.
- (ii) Applicable Permits, as required, relating to environmental protection and conservation shall have been procured by the Authority in accordance with the provisions of this Agreement.

SCHEDULE - G

(See Clauses 7.1.and 19.2)

FORM OF BANK GUARANTEE

Annexure-I

(See Clause 7.1)

[Performance Security/Additional Performance Security]

The Managing Director,
National Highways & Infrastructural 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. , (here in after called the "Authority") have entered into an agreement (here in after called the "Agreement") for "Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch. 84.100km to Ch.96.00km) of the Sagunbashi forest end (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam " 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,

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilaspura- Guwahati road (NH 17) in the state of Assam on EPC mode.

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. 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 SYNB0009062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Syndicate Bank, Transport Bhawan, 1 st 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.

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Annexure - II
(Schedule - G)

(See Clause 19.2)

Form for Guarantee for Advance Payment

The Managing Director,
National Highways & Infrastructural 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 from Ch. 88.000km to Ch.99.930 km (Design Ch. 84.100km to Ch. 96.000km) of the Sagunbashi forest end (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam 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 instalment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its

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

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

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

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

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 Clauses 10.1 (iv) and 19.3)

Contract Price Weightages

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

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

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
Road Works including Culverts, widening and repair of culverts	53.37 %	A- Widening and strengthening of existing road	
		(1) Earthwork up to top of the sub- grade	10.62%
		(2) Sub-base Course	21.37%
		(3) Non bituminous Base course	14.82%
		(4) Bituminous Basecourse	18.74%
		(5) Wearing Coat	11.7%
		(6) Widening and repair of culverts	1.92%
		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	0.27%
		(2) Sub-base Course	1.34%
		(3) Non bituminous Base course	1.07%
		(4) Bituminous Base course	1.075%
		(5) Wearing Coat	0.72%
		C.2- Reconstruction/New Service road(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]		

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		D- Reconstruction & New Culverts on existing road, realignments, bypasses Culverts (length <6m)	16.35%
Minor bridge/ Underpasses/ Overpasses	15.76 %	A.1-widening and repairing of Minor Bridges (length >6 m<60m)	
		Minor Bridges	10.12%
		A.2- New Minor bridges (length >6 mand<60m)	
		(1) Foundation : On completion of the foundation work .	29.48%
		(2)Sub-Structure: On completion of the Sub structure work	19.19%
		(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.	12.38%
		(4)Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all and fit for use	3.15%
		(5) Guide Bunds and River Training Works: On completion of Guide Bunds and river training works complete in all respects	[Nil]
		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.	15.75%
		(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.	9.93%
		(3) Approaches: On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete	[Nil]

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		in all respect and fit for use.	
Major bridge(length>60 m) works and ROB/RUB/elevated sections/flyovers including viaducts, if any	10.23 %	A.1- Wideningand repairs of Major Bridges	
		(1)Foundation	[Nil]
		(2)Sub-structure	[Nil]
		(3)Super-structure(including bearings)	[Nil]
		(4)Wearing Coat in cluding expansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	[Nil]
		(6) Wing walls/return walls	[Nil]
		(7)Guidebunds, River Trainingworks etc.	[Nil]
		(8)Approaches(including Retaining walls, stone pitchingandprotection works)	[Nil]
		A.2-New Major Bridges	
		(1)Foundation	38.966%
		(2)Sub-structure	17.86%
		(3)Super-structure(including bearings)	39.92%
		(4)Wearing Coat including expansion joints	[Nil]
		(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	0.166%
		(6) Wing walls/return walls	[Nil]
		(7)Guidebunds, RiverTrainingworks etc.	[Nil]
		(8)Approaches(including Retaining walls, stone pitching and protection works)	3.09%
		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) incase 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.	[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	[Nil]		
(2) Sub-Structure	[Nil]		

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage		
		(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]		
		(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.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	20.64 %	(i) Toll Plaza	[Nil]
				(ii) Road side drains	9.41%
				(iii) Road signs, markings, km stones, safety devices etc	7.58%
				(iv) Project facilities	
				a) Bus Bays	[Nil]
				b) Truck Lay-byes	[Nil]
		c) Passenger Shelter	[Nil]		
		d) Rest Area	[Nil]		
		e) Road Side Amenities	[Nil]		

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
		f) Street Light	0.84%
		g) Utility Duct	9.22%
		(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	2.31%
		(x) Retaining Wall	5.36%
		(xi) Boundary wall	[Nil]
		(xii) Site Clearance & Dismanteling	4.91%
		(xiii) Reinforced Earth Wall	46.25%
		(xiv) Junction	5.91%
		(xv) Seeding & Mulching	1.8%
		(xvi) Breast Wall	1.47%
		(xvii) Chute Drain	[Nil]
		(xvii) Ground Improvement Works (Sand Pile)	[Nil]
		(xvii) Protection Work (Stone Pitching)	4.935%
		(xviii) Diversion Road & Approach Road	[Nil]

1.3 Procedure of estimating the value of work done

1.3.1 Roadworks

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

Table 1.3.1

Stage of Payment	Percentage weightage	Payment Procedure
A- Widening & 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	10.62%	
(2) Sub-base Course	21.37%	
(3) Non bituminous Base course	14.82%	
(4) Bituminous Base course	18.74%	
(5) Wearing Coat	11.7%	
(6) Widening and repair of culverts	1.92%	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 prorata basis

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Stage of Payment	Percentage weightage	Payment Procedure
(1) Earthwork up to top of the sub-grade	[Nil]	on completion of a stage in full length or 5(five) km length, whichever is less.
(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 5(five) 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 1(one) km length, whichever is less.
(1)Earthwork upto top of the sub-grade	0.27%	
(2) Sub-base Course	1.34%	
(3) Non bituminous Base course	1.07%	
(4) Bituminous Base course	1.075%	
(5) Wearing Coat	0.72%	
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 1(one) km length, whichever is less.
(1)Earthwork upto tp of the sub-grade	[Nil]	
(2) Sub-base Course	[Nil]	
(3) Dry Lean Concrete (DLC)Course	[Nil]	
(4) Pavement Quality Control (PQC) Course	[Nil]	
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. Payment shall be made on the completion of at least one culvert.
Culverts (length <6m)	16.35%	

@ 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:

$$\text{Cost per km} = P \times \text{weightage for road work} \times \text{weightage for bituminous work} \times (1/L)$$

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)	10.12%	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of widening & repair works of a minor bridge
A.2- New Minor Bridges (length>6m<60m)		
(1) Foundation : On completion of the foundation work .	29.48%	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. Incase where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2)Sub-Structure: On completion of the Sub structure work	19.19%	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.	12.38%	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	3.15%	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.

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Stage of Payment	Weightage	Payment Procedure
(4) Guide Bund sand River Training Works: On completion of Guide Bunds and river training works complete in all respects	[Nil]	Guide Bunds and River Training Works: 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.	15.75%	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. Incase where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(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.	9.93%	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- Widening and 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. 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 shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub- structure of major bridge.
(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 marking setc. 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)Guidebunds, 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 MajorBridges		

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Stage of Payment	Weightage	Payment Procedure
(1)Foundation	38.966%	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-ratabasis 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	17.86%	Sub- structure: Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub- structure of major bridge.
(3)Super-structure(including bearings)	39.92%	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super- structure including bearings of at least one span in all respects as specified. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)Wearing Coat including expansion joints	[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.	0.166%	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road marking setc. 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)Guidebunds, 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)	3.09%	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]	<p>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.</p> <p>In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.</p>
(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 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 respects as specified and (b) incase of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	[Nil]	<p>Wearing Coat: Payment shall be made on completion</p> <p>(a) in case of ROB-wearing coat including expansion joints complete in all respects as specified</p> <p>and</p> <p>(b) in case of RUB-rigid pavement underRUB including drainage facility complete in all respects as specified.</p>
(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 marking setc. 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 prorata basis on completion of 20% of the total area.
B. 2- NewROB/RUB		

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Stage of Payment	Weightage	Payment Procedure
(1) Foundation	[Nil]	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	[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 ROB/RUB.
(3) Super-structure (including bearing)	[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% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)Wearing Coat (a) in case of ROB-wearing coat including expansion joints complete in all respects as specified and (b) 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) incase 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.	[Nil]	Miscellaneous: Payments shall be made on completion of all miscellaneous works like handrails, crash barriers ,road marking setc. 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/return walls complete in all respects asspecified.
(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]	<p>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.</p> <p>Incase where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.</p>
(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 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)WearingCoatincl udingexpansion joints	[Nil]	Wearing Coat: Payment shall be made on completion of wearingcoat 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]	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		

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

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 of super- structure including bearings of at least one span in all respects as specified. In case of structures where pre-cast girders have been proposed by the Contractor,50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4)Wearing Coat including expansion joints	[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]	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 Competen 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	9.41%	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	7.58%	
(4) Project Facilities		Payment shall be made on pro rata basis for completed facilities.
a) Bus Bays	[Nil]	
b) Truck Lay-byes	[Nil]	
c) Passenger Shelter	[Nil]	
d) Rest Area	[Nil]	
e) Road Side Amenities	[Nil]	
f) Street Light	0.84%	
g) Utility Duct	9.22%	
(5) Retaining Wall	5.36%	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 prorated basis every six months.
(10) Breast Wall	1.47%	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	2.31%	
(12) Site Clearance & Dismanteling	4.91%	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.
(13) Reinforced Earth Wall	46.25%	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.

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Stage of Payment	Weightage	Payment Procedure
(14) Junction	5.91%	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) Seeding & Mulching	1.8%	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)	4.935%	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]	

2. Procedure for payment for Maintenance

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

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

Schedule - I

(See Clause 10.2 (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.

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

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 **319th** 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 **548th** 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 **776th** 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 **913th** day from the Appointed Date.
- (ii) On or before the Scheduled Completion Date, the Contractor shall have completed

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

construction in accordance with this Agreement.

6. Extension of time

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

Schedule - K

(See Clause 12.1 (ii))

Tests on Completion

1. Schedule for Tests

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

2. Tests

- (i) Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include [***].
- (ii) Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a Network Survey Vehicle (NSV) fitted with latest equipment's 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.

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

- (v) Environmental audit: The Authority’s Engineer shall carry out a check to determine conformity of the Project Highway with the environmental requirements set forth in Applicable Laws and Applicable Permits.
- (vi) Safety Audit: The Authority’s Engineer shall carry out, or cause to be carried out, a safety audit to determine conformity of the Project Highway with the safety requirements and Good Industry Practice.

3. Agency for conducting Tests

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

4. Completion Certificate

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

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

Sr. No.	Key metrics of Asset	Equipment to be used	Frequency of condition survey
1	Surface defects of pavement	Network Survey Vehicle (NSV)	At least twice a year (As per 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 from Ch. 88.000km to Ch.99.930 km (DesignCh.84.100km to Ch.96.00km) of the Sagunbashi forest end (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode "through (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.
- 2 It is certified that, in terms of the aforesaid Agreement, all works forming part of Project Highway have been completed, and the Project Highway is hereby declared fit for entry into operation on this the.....day of.....20..., Scheduled Completed Date for which was the day of20.....

SIGNED, SEALED AND DELIVERED

For and on behalf of the Authority's Engineerby:

(Signature)

(Name)

(Designation)(Address)

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Schedule - M

(See Clauses 14.6, 15.2 and 19.7)

Payment Reduction for Non-Compliance

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

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

2. Percentage reductions in lump sum payments on monthly basis

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

S. No.	Item/Defect/Deficiency	Percentage
(a)	Carriageway/Pavement	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	Road, Embankment, Cuttings, Shoulders	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, raincuts, disturbed pitching, 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/5 th kmstones	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 asunder:

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

Where,

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

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

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

L1= Non-complying length L = Total length of the road,

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

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

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

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

Schedule - N

(See Clause 18.1 (I))

Selection of Authority's Engineer

1. Selection of Authority's Engineer

- (i) The provisions of the Model Request for Proposal for Selection of Technical Consultants, issued by the Ministry of Finance in May 2009, or any substitute thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority's Engineer.
- (ii) In the event of termination of the Technical Consultants appointed in accordance with the provisions of Paragraph 1.1, the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of this Schedule-N.

2. Terms of Reference

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

3. Appointment of Government entity as Authority's Engineer

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

Annex – I

(Schedule - N)

Terms of Reference for Authority's Engineer

1. Scope

- (i) These Terms of Reference (the “**TOR**”) for the Authority's Engineer are being specified pursuant to the EPC Agreement dated (the “**Agreement**”), which has been entered into between the [name and address of the Authority] (the “**Authority**”) and (the “**Contractor**”) # for “Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest end (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode ” and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

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

2. Definitions and interpretation

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

3. General

- (i) The Authority's Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.
- (ii) The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement, but subject to obtaining prior written approval of the Authority before determining:
- (a) any Time Extension;
- (b) any additional cost to be paid by the Authority to the Contractor;

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

- (c) the Termination Payment; or
 - (d) issuance of Completion Certificate or
 - (e) Any other matter which is not specified in (a), (b), (c) or (d) above and which creates a financial liability on either Party.
- (iii) The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.
- (iv) The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2.
- (v) The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.
- (vi) In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

4. Construction Period

- (i) During the Construction Period, the Authority's Engineer shall review and approve the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1 (VI). The Authority's Engineer shall complete such review and approval and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended up to 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.
- (ii) The Authority's Engineer shall review and approve any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.
- (iii) The Authority's Engineer shall review and approve the Quality Assurance Plan submitted by the Contractor and shall convey its comments to the Contractor within a period of 21 (twenty one) days stating the modifications, if any, required thereto.

- (iv) The Authority's Engineer shall complete the review and approve of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.
- (v) The Authority's Engineer shall grant written approval to the Contractor, where necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Project Highway for purposes of maintenance during the Construction Period in accordance with the provisions of Clause 10.4.
- (vi) The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.
- (vii) The Authority's Engineer shall inspect the Construction Works and the Project Highway and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular, the Authority's Engineer shall include in its Inspection Report, the compliance of the recommendations made by the Safety Consultant.
- (viii) The Authority's Engineer shall conduct the pre-construction review of manufacturer's test reports and standard samples of manufactured Materials, and such other Materials as the Authority's Engineer may require.
- (ix) For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4 (ix), the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any modification/substitution there of shall be deemed to be tests conforming to Good Industry Practice for quality assurance.
- (x) The Authority's Engineer shall test check at least 50 (fifty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.
- (xi) The timing of tests referred to in Paragraph 4 (ix), and the criteria for acceptance/rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.
- (xii) In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works, the Authority's Engineer shall require the Contractor to carry out remedial measures.

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

- (xiii) The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project Highway, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 shall apply.
- (xiv) In the event that the Contractor fails to achieve any of the Project Milestones, the Authority's Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Authority's Engineer shall determine that completion of the Project Highway is not feasible within the time specified in the Agreement, it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority's Engineer shall review the same and send its comments to the Authority and the Contractor or thwith.
- (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 be revoked.
- (xvii) In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.
- (xviii) The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate, as the case may be. For carrying out its functions under this Paragraph 4 (xviii) and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

5. Maintenance Period

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

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

6. Determination of costs and time

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

7. Payments

- (i) The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2 (IV) (d).
- (ii) Authority's Engineer shall-
 - (a) within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment, pending issue of the Interim Payment Certificate; and
 - (b) within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable title

Contractor , after adjustments in accordance with the provisions of Clause 19.10.

- (iii) The Authority's Engineer shall, within 15 (fifteen) days of receipt of the Monthly Maintenance Statement from the Contractor pursuant to Clause 19.6, verify the Contractor's monthly statement and certify the amount to be paid to the Contractor in accordance with the provisions of the Agreement.
- (iv) The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provisions of Clause 19.16.

8. Other duties and functions

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

9. Miscellaneous

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

Schedule - 0

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

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

- (a) The estimated amount for the Works executed in accordance with Clause 19.3 (i) subsequent to the last claim;
- (b) amounts reflecting adjustments in price for the aforesaid claim;
- (c) the estimated amount of each Change of Scope Order executed subsequent to the last claim;
- (d) amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2 (iii)(a);
- (e) total of (a), (b), (c) and (d) above;
- (f) Deductions:
 - i. Any amount to be deducted in accordance with the provisions of the Agreement except taxes;
 - ii. Any amount towards deduction of taxes; and
 - iii. Total of (i) and (ii) above.
- (g) Net claim: (e) – (f)(iii);
- (h) The amounts received by the Contractor up to the last claim:
 - i. For the Works executed (excluding Change of Scope orders);
 - ii. For Change of Scope Orders, and
 - iii. Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

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

3. Contractor's claim for Damages

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

Schedule - P

(See Clause 20.1)

Insurance

1. Insurance during Construction Period

- (i) The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the Completion Certificate, the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:
 - (a) insurance of Works, Plant and Materials and an additional sum of [15 (fifteen)] per cent of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and
 - (b) Insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.
- (ii) The insurance under sub para (a) and (b) of paragraph 1(i) above shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

2. Insurance for Contractor's Defects Liability

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

3. Insurance against injury to persons and damage to property

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

The insurance cover shall be not less than: Rs. [*****]

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

- (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), hereby certify that the Tests on completion of Maintenance Period in accordance with Article 14 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement and I hereby certify that the Authority has taken over the Project highway from the Contractor on this day.....

SIGNED, SEALED AND DELIVERED

(Signature)

(Name and designation of Authority's Representative)

(Address)

Widening/Improvement to 4 (Four) Lane with Paved Shoulder from Ch. 88.000km to Ch.99.930 km (Design Ch.84.100km to Ch.96.000km) of the Sagunbashi forest (near Nichinta) Bypass to the starting of Krishnai Bypass Section (Package-7) of Bilasipura- Guwahati road (NH 17) in the state of Assam on EPC mode.

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