National Highway Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Engineering Procurement and Construction (EPC)

Agreement

For

Construction of Four Lane Panchgram Bypass from Design Chainage km 15+500 on NH-37 (Old NH-53) at Kalinagar Pt.-II Village to Design Chainage km 27+300 at crossing with NH-6 (Old NH-44) Near Siddeswar Pt.-I Village in the State of Assam on EPC Mode under Bharatmala Pariyojana in Economic Corridors (Project Length – 11.8 km). (3rd Call)

Schedule A, B, C, D

March, 2023

Schedule

Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

0 **The Site**

(i) Site of the Four-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.

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

(v) The status of the environment clearances obtained or awaited is given in Annex-IV.

Annex – I

(Schedule-A)

Site

1. Site

The Site of the Four-Lane Project Highway comprises the section of National Highway 37 (Old NH-53) commencing from Design Chainage km 15+500 near Kalinagar Pt.-II Village at Existing Chainage Km 21+850 of NH-37 (Old NH-53) to Design Chainage km 27+300 at crossing with NH-6 (Old NH-44) near Siddeswar Pt.-I Village i.e. **Panchgram Bypass** in the State of Assam.

The project site of 0.830 km length from Existing Chainage Km 21+850 (Design Chainage Km 15+500) to Existing Chainage km 22+680 (Design Chainage Km 16+330) of NH-37 (Old NH-53) is the brownfield section for main alignment and balance 10.970 km length of main alignment from Design Chainage Km 16+330 to Design Chainage Km 27+300 is the greenfield section. Existing Chainage from Km 22+680 to Km 23+800 of NH-37 (Old NH-53) is the brownfield section for the alignment of ramp for traffic interchange between NH-37 (Old NH-53) and approach of under construction ROB for NH-154 (Hailakandi Road). The approach (Length-420 m) of under construction ROB for NH-154 (Hailakandi Road) towards NH-37 is also the part of the project as brownfield section for ramps to traffic interchange between NH-154 (Hailakandi Road) and NH-37 (Old NH-53). Centreline coordinates of main alignment are provided in Annex-V. 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:

S. No.	Existing Chainage (Km)		Right of Way (m)	Remarks
	From	To		
Land details are provided in Annexure II of Schedule A				

3. Carriageway

The present carriageway of the Project Highway including type of pavement is described below:

S. No.	Existing Chainage of NH-37 (Km)		Carriageway Width (m)	Type of Pavement	Remarks
	From	To			
1	21+850	23+800	7.0	Flexible	

4. Major Bridges

The Site includes the following Major Bridges:

S. No.	Existing Chainage (km)	Design Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
			Foundation	Sub-structure	Super-structure		
NIL							

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.	Existing Chainage (km)	Design 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.	Existing Chainage (km)	Design Chainage (km)	Type of Structure		No. of Spans with span length (m)	Width (m)	Flyover/Underpass
			Foundation	Superstructure			
NIL							

7. Minor bridges

The Site includes the following minor bridges:

S. No.	Existing Chainage of NH-37 (km)	Design Chainage of Ramp-5 (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
			Foundation	Sub- structure	Super-structure		
1	22+873	0+825	Not Visible	RCC Abutment	Steel Truss	1x48.6	7.5 (Carriageway)

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Existing Chainage (km)	Remarks
Nil		

9. Underpasses (vehicular, non-vehicular)

The Site includes the following underpasses:

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

10. Culverts

The Site has the following culverts:

S. No.	Existing Chainage of NH-37 (km)	Design Chainage (km)	Type of Culvert	Span /Opening with span length (m)	Width (m)
1	22+575	16+274	Pipe	1x1.0 m Dia	15

11. Bus bays/Bus Shelters

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

S. No.	Existing Chainage (Km)	Design Chainage (km)	Left Hand Side	Right Hand Side	Road Section
-	-	-	-	-	-
Bus Shelters					
-	-	-	-	-	-

12. Truck Lay byes

The details of truck lay byes are as follows:

S. No.	Existing Chainage (km)	Design Chainage (km)	Left Hand Side	Right Hand Side	Road Section
-	-	-	-	-	-

13. Roadside drains

The details of the roadside drains are as follows:

S. No.	Existing Chainage (Km)		Type	
	From	To	Masonry/cc (Pucca)	Earthen (Kutcha)
-				

14. Major junctions

The project highway divided into brownfield and greenfield sections.
The details of major junctions in brownfield section and major crossroad in greenfield section are as follows:

S. No.	Existing Chainage of NH-37 (Km)	Design Chainage (Km)	At Grade	Separated	Category of Cross Road			
					NH	SH	MDR	Others
1	Greenfield	17+300	NA	NA	NH-154	-	-	-
2	23+630	17+430	NA	NA	NH-37	-	-	-
3	Greenfield	20+060	NA	NA	-	-	MDR	-
4	Greenfield	26+740	NA	NA	NH-6	-	-	-

(NH: National Highway, SH: State Highway, MDR: Major District Road, NA: Not Applicable)

15. Minor junctions

The project highway divided into two sections Brownfield and Greenfield sections. The details of the minor junctions in the brownfield section and minor crossroad in greenfield section are as follows:

S. No.	Existing Chainage of NH-37 (Km)	Design Chainage (Km)	Type	
			Junction	Cross road
1	23+260	0+440 of Ramp-5	Y-Type	Village Road
2	23+115	0+580 of Ramp-5	Y-Type	Village Road
3	23+045	0+650 of Ramp-5	Y-Type	Village Road
4	22+915	0+780 of Ramp-5	Y-Type	Village Road
5	22+735	0+960 of Ramp-5	Y-Type	Village Road
6	Greenfield	16+950 of MCW	X-Type	Cart Track
7	Greenfield	17+050 of MCW	X-Type	Cart Track
9	Greenfield	18+580 of MCW	X-Type	Village Road
10	Greenfield	19+760 of MCW	X-Type	Village Road
11	Greenfield	21+650 of MCW	X-Type	Village Road
12	Greenfield	22+325 of MCW	X-Type	Cart Track
13	Greenfield	22+415 of MCW	X-Type	Cart Track
14	Greenfield	23+730 of MCW	X-Type	Village Road

16. Bypasses

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

S. No.	Name of Bypass (Town)	Existing Chainage (km) From km to km	Design Chainage (km) From km to km	Length (in Km)
1	Panchgram Bypass	From Km 22+680 of NH-37 to NH-6 (Old NH-44) near Siddeswar Pt.-I Village.	Km 16+330 to Km 27+300	10.970

17. Other structures]

(vi) Nil

Annex – II

(As per Clause 8.3 (i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

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

Sl. No	From km to km	Length (km)	Width (m)	Date of providing Right of Way*
(1)	(2)	(3)	(4)	(5)
(i) Full Right of Way (full width) (a) Stretch (b) Stretch (c) Stretch (d) Stretch (e) Stretch	 16+300 to 16+960 16+960 to 17+050 17+050 to 17+450 17+450 to 18+580 18+580 to 27+300	 0+660 0+090 0+400 1+130 8+720	 60 50 60 35 60	90% ROW of Construction Zone to be handed over on Appointed Date and balance within 150 days from Appointed date
(ii) Part Right of Way (part width) (a) Stretch (b) Stretch	 15+500 to 15+700 15+700 to 16+300	 0+200 0+600	 30 30 (Average)	On appointed date
(iii) Balance Right of Way (width) (a) Stretch (b) Stretch	 15+500 to 15+700 15+700 to 16+300	 0+200 0+600	 15 30 (Average)	90% ROW of Construction Zone to be handed over on Appointed Date and balance within 150 days from Appointed date

Annex – III

(Schedule-A)

Alignment Plans

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

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

(ii) Traffic Signage plan of the Project Highway showing numbers & location of traffic signs is enclosed. The contractor shall, however, improve/upgrade upon the traffic signage plan as indicated in Annex-III based on site/design requirement as per the relevant specifications/IRC Codes/Manual.

Annex – IV

(Schedule-A)

Environment Clearances

Not Required

Schedule – B

(See Clause 2.1)

Development of the Project Highway

1. Development of the Project Highway

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

2. Rehabilitation and augmentation

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

3. Specifications and Standards

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

Annex – I

(Schedule-B)

Description of Four-Laning

Construction of Four Lane Panchgram Bypass from Design Chainage km 15+500 on NH-37 (Old NH-53) at Kalinagar Pt.-II Village to Design Chainage km 27+300 at crossing with NH-6 (Old NH-44) Near Siddeswar Pt.-I Village in the State of Assam on EPC Mode under Bharatmala Pariyojana in Economic Corridors (Project Length – 11.8 km).

1. Construction of the Project 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

Four-Laning with paved shoulders shall be undertaken. The paved carriageway shall be 20.0 m (2x7.0 carriageway+2x2.5 Paved shoulders+2x0.50 Shyness) wide in accordance with the typical cross section's drawings in the Manual.

Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1(ii)(a).

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 100 km per hr for plain/ rolling terrain except given below locations where minimum design speed of 80 km per hr.

Sl. No.	Location (Centre Chainage of Curve)	Radius of Curvature in m	Remarks
1	15+863	250	
2	16+212	300	
3	16+714	375	
4	17+161	250	

(iii) Improvement of the existing road geometrics

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

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

(iv) Right of Way

Details of the Right of Way are given in Annex II of Schedule-A.

(v) Type of shoulders

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

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

In open country, paved shoulders of 2.5 m width shall be provided for main highway and balance 1.50m width earthen shoulders shall be covered with 150 mm thick compacted layer of granular material for main highway, slip road, loops and ramps.

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

Lateral and vertical clearances at underpasses and provision of guard rails/crash barriers shall be as per the provision of relevant Manual.

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

Sl. No.	Design Chainage (in Km)	Lateral Clearance (m)	Remarks
1	19+760	12.00	LVUP
2	20+060	20.00	VUP
3	21+650	12.00	LVUP
4	23+729	12.00	LVUP

Vertical clearance: The height of the opening at the underpasses shall be as follows:

Sl. No.	Design Chainage (in Km)	Vertical Clearance (m)	Remarks
1	19+760	4.0	LVUP
2	20+060	5.5	VUP
3	21+650	4.0	LVUP
4	23+729	4.0	LVUP

(vii) Lateral and vertical clearances at overpasses

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

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

Sl. No.	Design Chainage (From km to km)	Span/ opening (m)	Remarks
Nil			

(viii) Service Roads and Slip Roads

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

Sl. No.	Design Chainage (From km to km)	Right hand side (RHS)/Left hand side (LHS)/ or Both sides	Length (m) of service road
-	-	-	-

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

Sl. No.	Design Chainage of Slip Road (from km to km)	Right hand side (RHS)/Left hand side (LHS)/ or Both sides	Length (m) of service road
1	15+800 to 16+700	Both sides	900.00
2	16+700 to 17+000	LHS	300.00
3	26+180 to 27+200	Both sides	1020.00

Loops & Ramps:

Loop and ramps shall be constructed at the Interchange location near km 16+300. The length of loops and ramps indicated below:

Sl. No.	Design Chainage of Loop / Ramps (From km to Km)	Name of Loop/Ramps	Length of Loop and Ramps (m)
1	0+000 to 0+420	Ramp-1 (ROB approach of NH-154)	420.00
2	0+000 to 0+200	Ramp-2	200.00
3	0+000 to 0+406	Ramp-3	406.0
4	1+200 to 2+042	Ramp-4 (U-Turn under ROB of NH-154)	842.00
5	0+000 to 1+095	Ramp-5 (Existing Road Section of NH-37)	1095.00

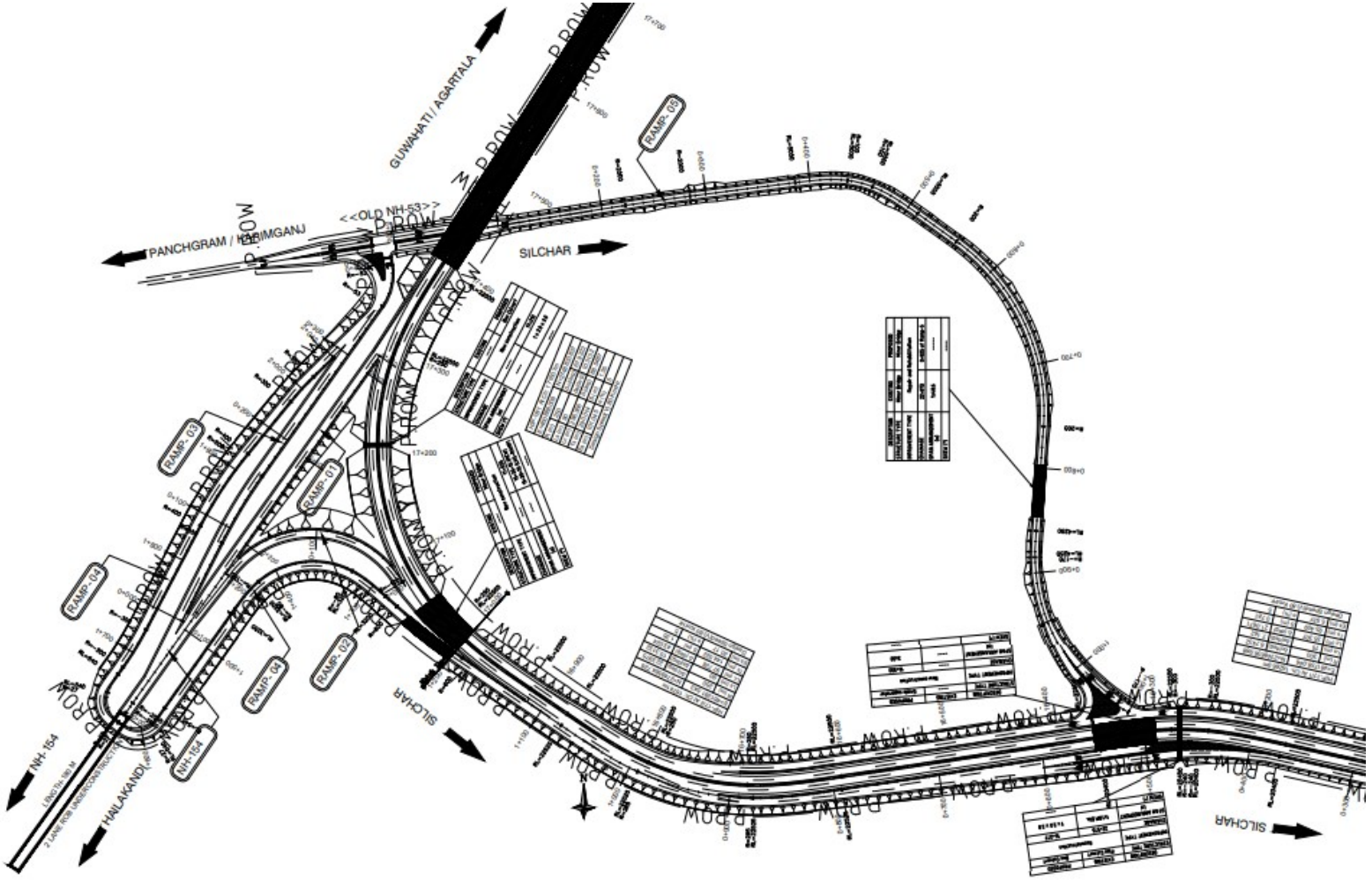
Note: -

1. The length of Slip Road, Loops and Ramps are minimum and likely to get changed as per site requirement. Any change as per site requirement may not constitute change of scope.

2. The above lengths are tentative and minimum specified without acceleration / deceleration lane and taper length. The acceleration / deceleration lane and taper shall be constructed as per Schedule D.

3. During detailed design stage by EPC Contractor, any portion of structure shall be considered out side Railway ROW

Layout Plan of Interchange near Km 16+284: -



(ix) Grade separated structures

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

Sl. No.	Design Chainage of Grade Separated Structure (Km)	Type of Grade Separated structure	Remarks
1	16+284	Grade Separator	
2	19+760	LVUP	
3	20+060	VUP	
4	21+650	LVUP	
5	23+729	LVUP	
6	26+740	Grade Separator	

(x) Cattle and pedestrian underpass /overpass

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

(xi) Typical cross-sections of the Project Highway

Typical cross-sections schedule of the Main Highway: -

Sl. No.	Design Chainage (Km)		Length (Km)	TCS Type	TCS Description
	From	To			
1	15+500	15+800	300	TCS-1	4 Lane Divided Carriageway for New Construction/Raising of Existing Road in Open Country for Plain/Rolling Terrain
2	15+800	16+255	455	TCS-3A	4 Lane Divided Carriageway with Both Side Slip Road in Brown Field Section for Plain/Rolling Terrain (Approach of Grade Separated Structure)
3	16+255	16+315	60	Grade Seperator	4 Lane Divided Carriageway Grade Separated Structure
4	16+315	16+700	385	TCS-3	4 Lane Divided Carriageway with Both Side Slip Road for New Construction of Bypass/Realignment in Open Country for Plain/Rolling Terrain (Approach of Grade Separated Structure)
5	16+700	17+000	300	TCS-4	4 Lane Divided Carriageway with Left Side Ramp for New Construction of Bypass in Rural section
6	17+000	17+050	50	Minor Bridge	4 Lane Divided Carriageway Minor Bridge
7	17+050	17+394	344	TCS-2	4 Lane Divided Carriageway for New Construction of Bypass/Realignment in Open Country for Plain/Rolling Terrain
8	17+394	19+056	1662	Major Bridge	4 Lane Divided Carriageway Major Bridge
9	19+056	19+754	698	TCS-2	4 Lane Divided Carriageway for New Construction of Bypass/Realignment in Open Country for Plain/Rolling Terrain

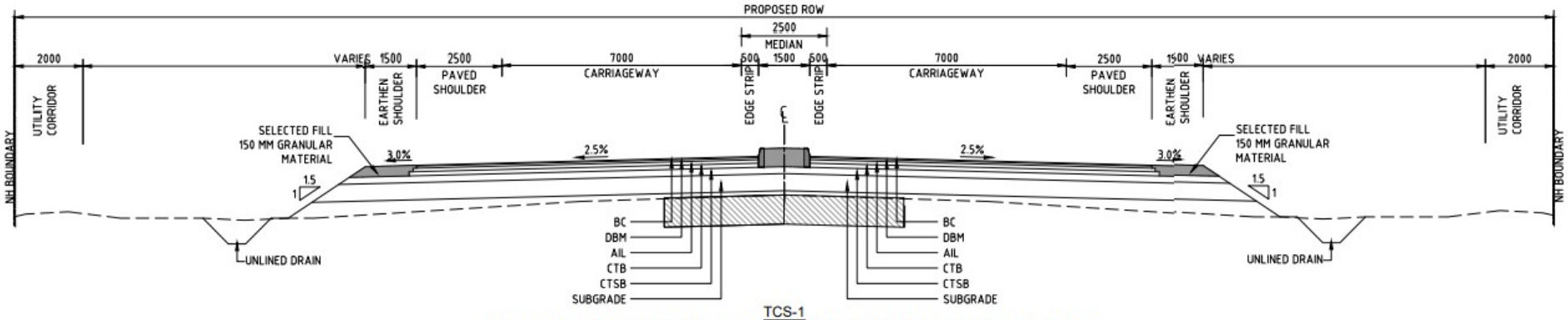
Sl. No.	Design Chainage (Km)		Length (Km)	TCS Type	TCS Description
	From	To			
10	19+754	19+766	12	LVUP	4 Lane Divided Carriageway Grade Separated Structure
11	19+766	20+050	284	TCS-2	4 Lane Divided Carriageway for New Construction of Bypass/Realignment in Open Country for Plain/Rolling Terrain
12	20+050	20+070	20	VUP	4 Lane Divided Carriageway Grade Separated Structure
13	20+070	21+644	1574	TCS-2	4 Lane Divided Carriageway for New Construction of Bypass/Realignment in Open Country for Plain/Rolling Terrain
14	21+644	21+656	12	LVUP	4 Lane Divided Carriageway Grade Separated Structure
15	21+656	22+315	659	TCS-2	4 Lane Divided Carriageway for New Construction of Bypass/Realignment in Open Country for Plain/Rolling Terrain
16	22+315	22+435	120	Major Bridge	4 Lane Divided Carriageway Major Bridge
17	22+435	23+724	1289	TCS-2	4 Lane Divided Carriageway for New Construction of Bypass/Realignment in Open Country for Plain/Rolling Terrain
18	23+724	23+736	12	LVUP	4 Lane Divided Carriageway Grade Separated Structure
19	23+736	25+550	1814	TCS-2	4 Lane Divided Carriageway for New Construction of Bypass/Realignment in Open Country for Plain/Rolling Terrain
20	25+550	25+560	10	Minor Bridge	4 Lane Divided Carriageway Major Bridge
21	25+560	26+180	620	TCS-2	4 Lane Divided Carriageway for New Construction of Bypass/Realignment in Open Country for Plain/Rolling Terrain
22	26+180	26+700	520	TCS-3	4 Lane Divided Carriageway with Both Side Slip Road for New Construction of Bypass/Realignment in Open Country for Plain/Rolling Terrain (Approach of Grade Separated Structure)
23	26+700	26+780	80	Grade Separator cum MNB	4 Lane Divided Carriageway Grade Separated Structure cum Minor Bridge
24	26+780	27+200	420	TCS-3	4 Lane Divided Carriageway with Both Side Slip Road for New Construction of Bypass/Realignment in Open Country for Plain/Rolling Terrain (Approach of Grade Separated Structure)
25	27+200	27+300	100	TCS-2	4 Lane Divided Carriageway for New Construction of Bypass/Realignment in Open Country for Plain/Rolling Terrain
Total Length (Km)			**11.800**		

Typical cross-sections schedule of the Ramps of Interchange: -

Sl. No.	Design Chainage (Km)		Length (Km)	TCS Type	TCS Description
	From	To			
1	0+000	0+420	420	TCS-5A	2-Lane Ramp - 1 (ROB approach of NH-154).
2	0+000	0+200	200	TCS-5	2-Lane Ramp-2 (Project Road NH-37 to NH-154).
3	0+000	0+406	406	TCS-5B	2-Lane Ramp-3 (NH-154 to Existing Road NH-37).
4	1+200	1+250	50	Minor Bridge	2-Lane Ramp-4 (U-Turn under ROB of NH-154).
5	1+250	1+600	350	TCS-5B	
6	1+600	1+640	40	TCS-5	
7	1+640	2+042	402	TCS-5B	
8	0+000	0+800	800	TCS-5A	2-Lane Ramp-5 (Existing Road Section of NH-37).
9	0+800	0+850	50	Minor Bridge	
10	0+850	1+095	245	TCS-5A	

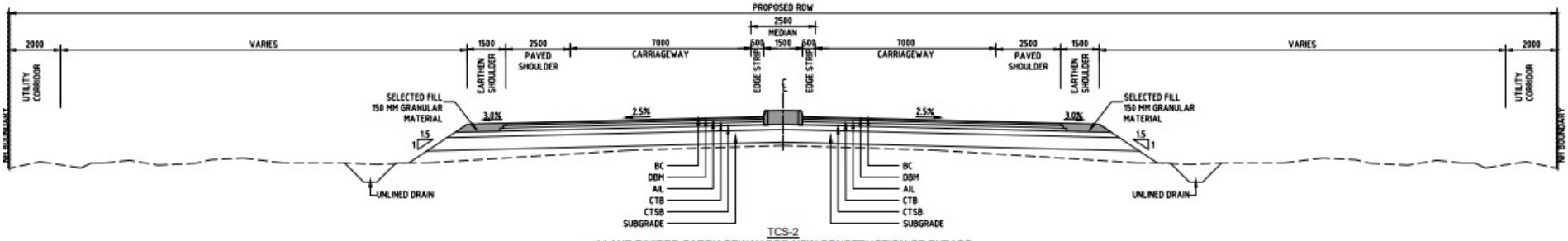
Note: TCS schedule as given above shall be treated as an approximate assessment. Actual length of the TCS schedule shall be prepared by the contractor based on detailed investigations and site requirements. Any variation in length of respective TCS specified in Schedule B shall not constitute a change of scope.

Figure of Typical Cross Section: -



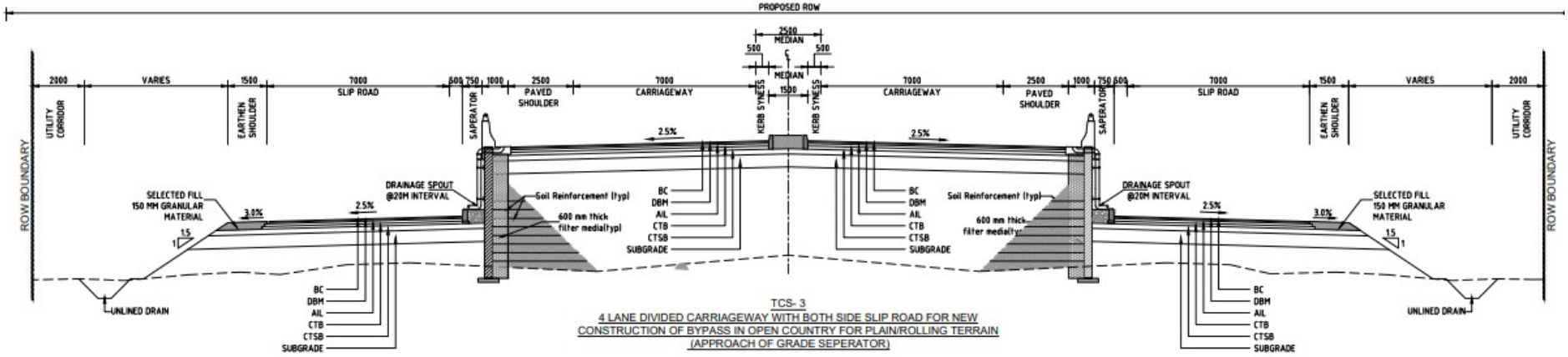
TCS-1

4 LANE DIVIDED CARRIAGEWAY FOR NEW CONSTRUCTION/RAISING OF EXISTING ROAD IN OPEN COUNTRY FOR PLAIN/ROLLING TERRAIN

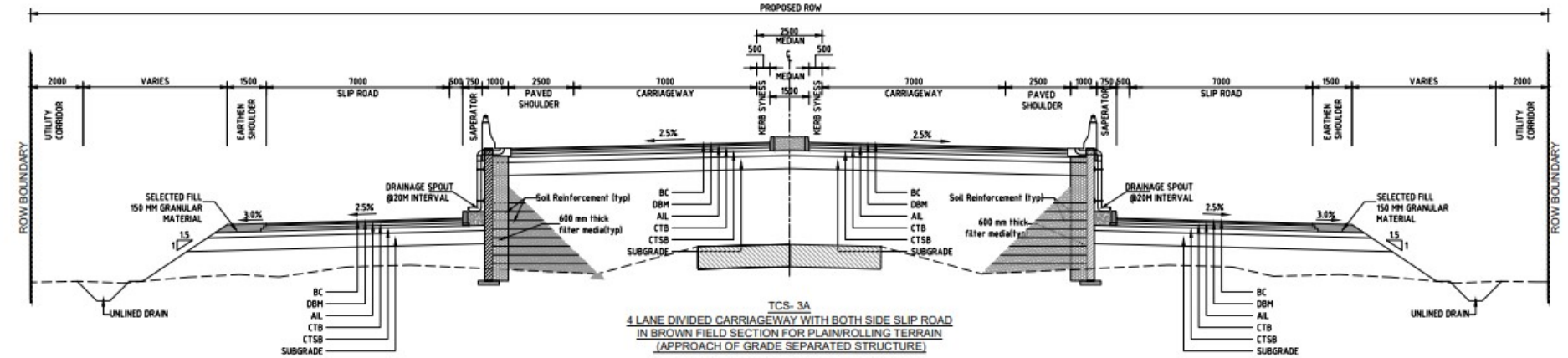


TCS-2

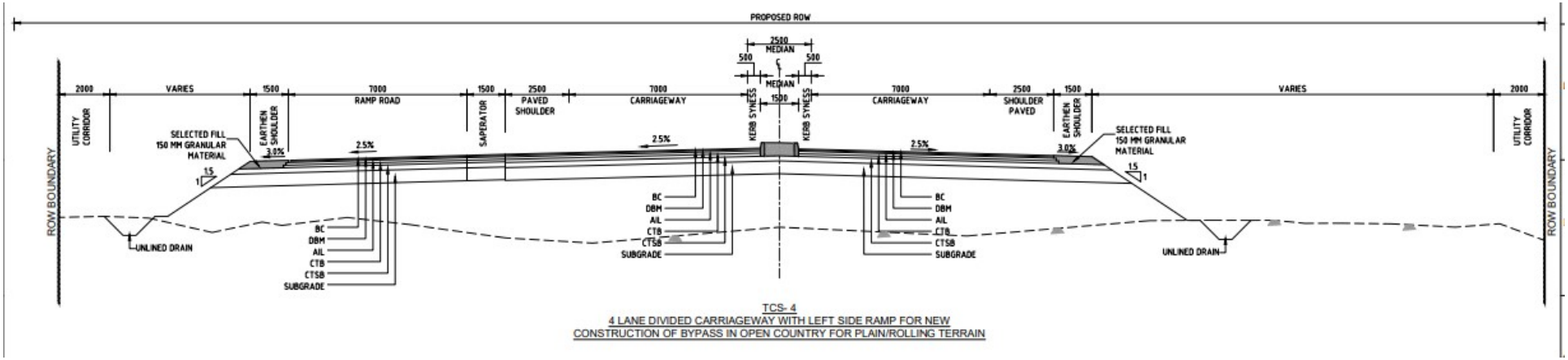
4 LANE DIVIDED CARRIAGEWAY FOR NEW CONSTRUCTION OF BYPASS IN OPEN COUNTRY FOR PLAIN/ROLLING TERRAIN



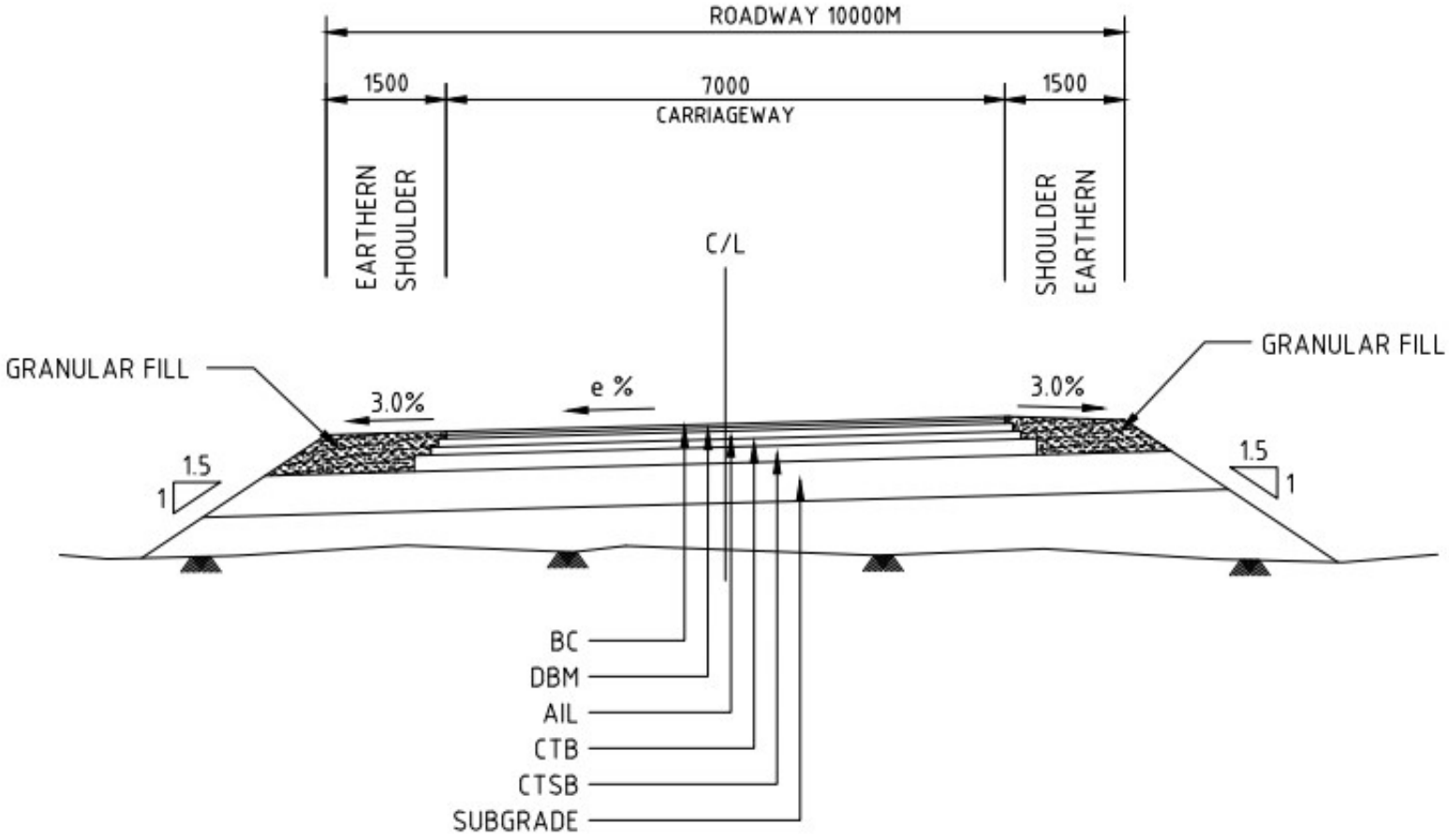
TCS- 3
4 LANE DIVIDED CARRIAGEWAY WITH BOTH SIDE SLIP ROAD FOR NEW CONSTRUCTION OF BYPASS IN OPEN COUNTRY FOR PLAIN/ROLLING TERRAIN (APPROACH OF GRADE SEPERATOR)



TCS- 3A
4 LANE DIVIDED CARRIAGEWAY WITH BOTH SIDE SLIP ROAD IN BROWN FIELD SECTION FOR PLAIN/ROLLING TERRAIN (APPROACH OF GRADE SEPARATED STRUCTURE)

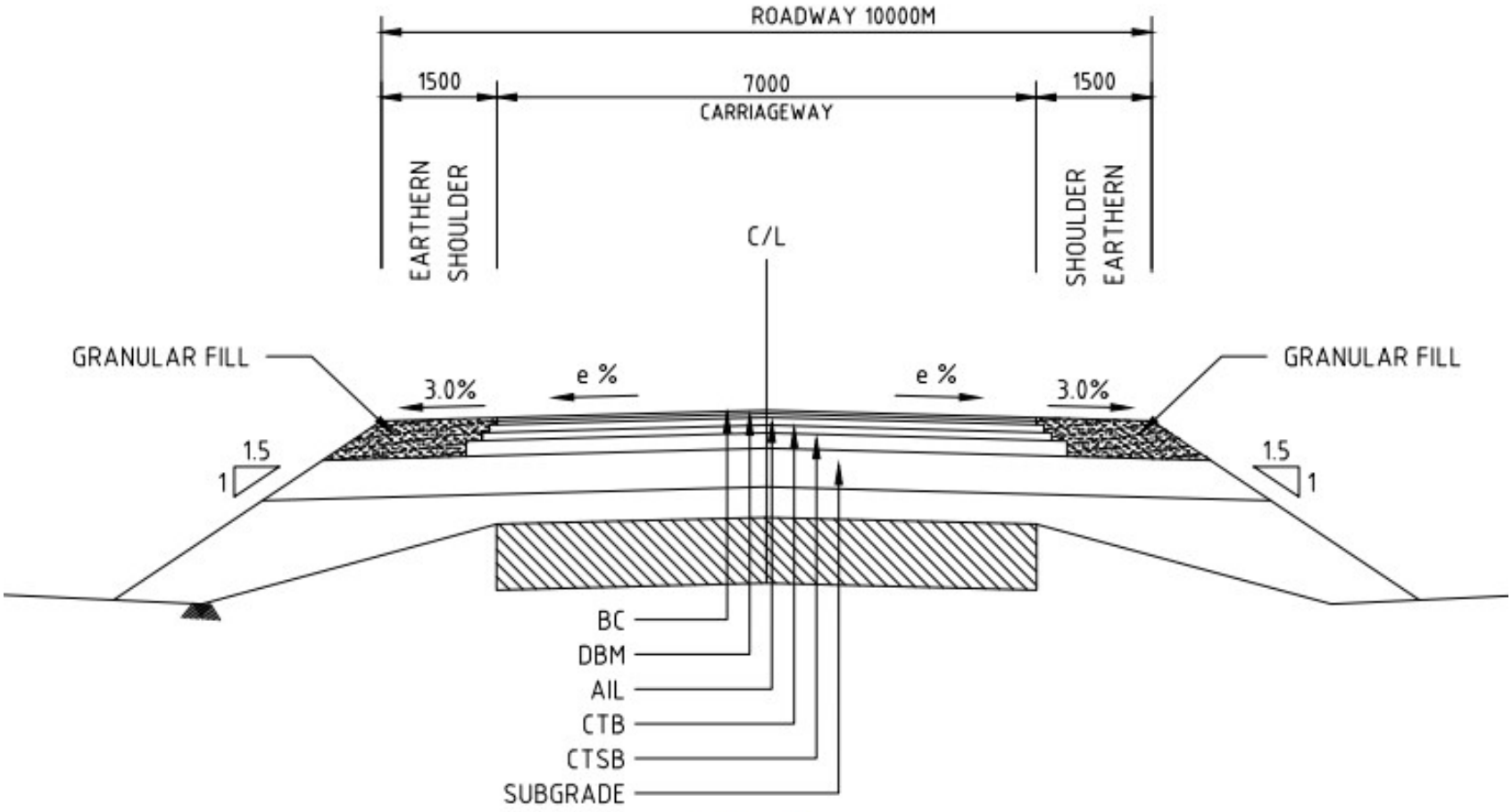


TCS- 4
4 LANE DIVIDED CARRIAGEWAY WITH LEFT SIDE RAMP FOR NEW CONSTRUCTION OF BYPASS IN OPEN COUNTRY FOR PLAIN/ROLLING TERRAIN



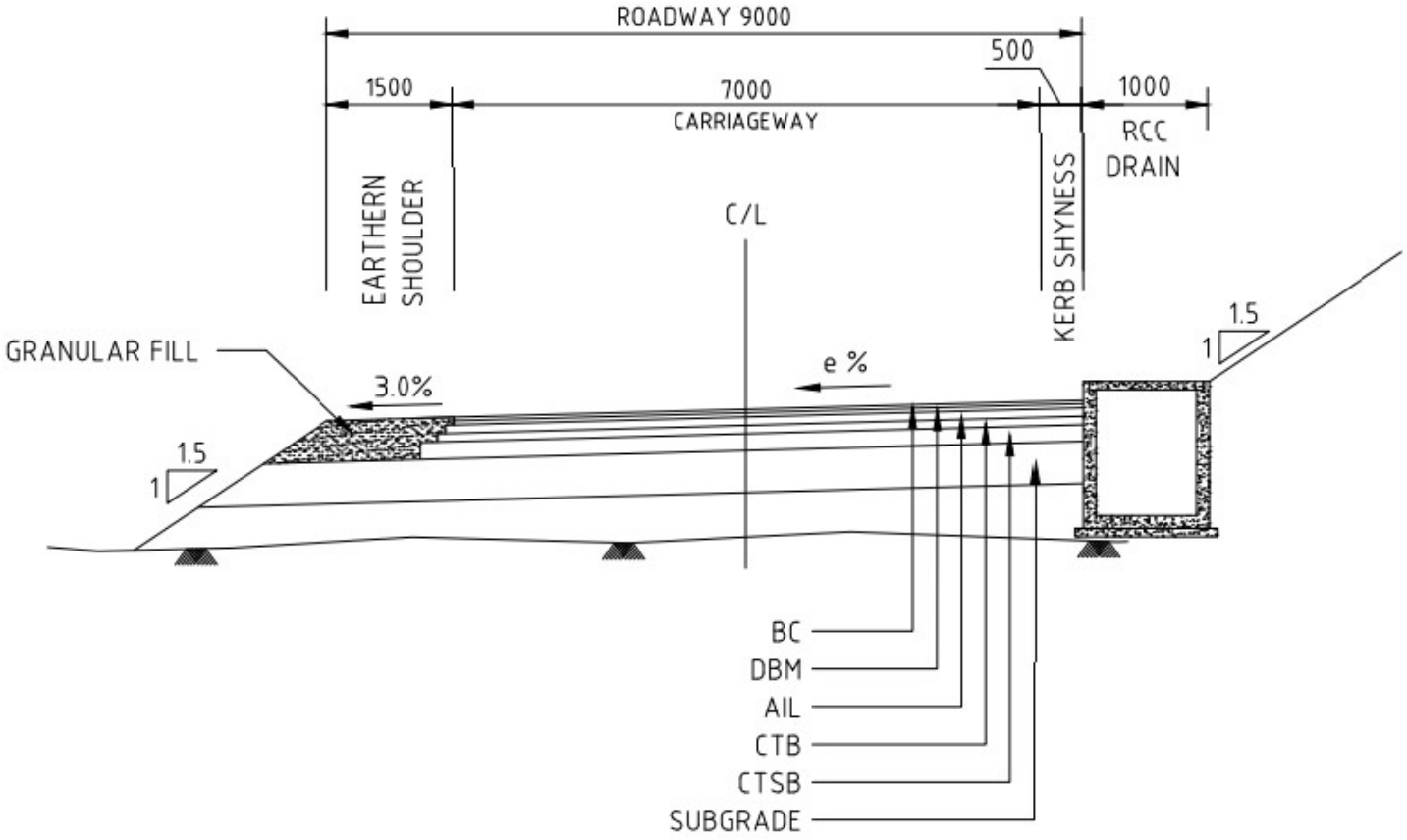
TCS - 5

TWO LANE RAMP IN OPEN COUNTRY FOR PLAIN/ROLLING TERRAIN



TCS - 5A

TWO LANE RAMP IN OPEN COUNTRY FOR PLAIN/ROLLING TERRAIN



TCS - 5B

TWO LANE RAMP IN OPEN COUNTRY FOR PLAIN/ROLLING TERRAIN

3. Intersections and Grade Separators

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

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

(xii) At-grade intersections

Major Junction: -

Sl. No.	Design Chainage (Km)	Type of intersection	Other features
1	16+284	At Grade-Y Junction	Junction with Slip Road and Existing Road/Ramp-5 (New NH-37/Old NH-53)
2	Near 17+430	At Grade-Y Junction	Junction with End Point of Ramp -3 and Existing Road/Ramp-5 (New NH-37/Old NH-53)
3	26+740	At Grade-X Junction	Junction with Slip Road and Cross Road (New NH-6/Old NH-44)

Minor Junction: -

Sl. No.	Design Chainage of Ramp-5 (Km)	Type of intersection	Other features
1	0+440	Y-LHS	Village Road
2	0+580	Y-RHS	Village Road
3	0+650	Y-LHS	Village Road
4	0+780	Y-LHS	Village Road
5	0+960	Y-RHS	Village Road

Note: Any other junction not mentioned above but observed during the construction of the project shall be improved as per schedule D requirements. The same shall not constitute a Change of Scope.

(xiii) Grade separated intersection with/without ramps

Sl. No.	Design Chainage (Km)	Salient features	Minimum length of viaduct to be provided (m)	Road to be carried over/under the structures
1	16+284	Grade separator with both side Slip Road to interchange the traffic	60.00	Project Road Over the Structure and Cross Road under the structure
2	26+740	Grade separator with both side Slip Road to interchange the traffic	80.00	Project Road Over the Structure and Cross Road under the structure

Note: Location and span arrangement of grade-separated structures are indicative. Exact location may be decided in consultation with Authority Engineer. Any Change in span arrangement shall not be treated as change of scope.

4. Road Embankment and Cut Section

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

(ii) Raising of the existing road

The existing road shall be raised in the following sections:

Sl. No.	Design Chainage (From km to km)	Length (Km)	Extent of raising [Top of finished road level]	Remarks
1	15+500 to 16+300	0.800	Raising with the reference of Clause no 4.2.1 Para (i) of IRC: SP:84-2019 (HFL for this location is 17.19 m/ As per Plan & Profile Drawings.	Submergence Area
2	0+000 to 0+800 of Ramp-5	0.800		
3	0+850 to 1+095 of Ramp-5	0.245		

5. Pavement Design

(i) Pavement design shall be carried out in accordance with section 5 of the Manual.

(ii) **Type of Pavement**

Main carriageway including loops & ramps, raising of existing road, bypasses, realignment, reconstruction, Truck Lay Byes, Rest Areas, Bus Bays, Service Road, Slip Road sections are proposed to be constructed with flexible pavement with Cement Treated Base (CTB) and Cement Treated Sub-base (CTSB). However, the design is in the scope of EPC Contractor who may propose any other alternate design which shall conform to the specification and standards and any modification shall not qualify for Change of Scope (CoS).

(iii) **Design requirements**

Pavement design shall be carried out in accordance with IRC: 37-2018.

Design Period and strategy

Flexible pavement for new pavement, raising of existing road, reconstruction of existing road, widening, and strengthening of the existing road, Slip Road, Ramps and Loops shall be designed for a minimum design period of 20 years. Stage construction shall not be permitted.

Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall carry out Traffic Survey, Axle load survey and calculate design traffic for pavement design but design traffic shall not be less than 70 million standard axles (MSA) for main carriageway and 20 million standard axles (MSA) for Slip Road, Loops and Ramps of Interchanges/Grade separator.

Minimum specified crust composition for flexible pavement with Cement Treated Base (CTB) and Cement Treated Sub-base (CTSB) are presented below. However, the EPC contractor proposing alternate design shall be maintain minimum total thickness mentioned in the tables below.

Bypass, Realignments, Reconstruction of Existing Road, Raising of Existing Road for Main Carriageway including paved shoulders: -

Design Chainage (km)	Proposed Flexible Pavement Thickness (mm)					Total (mm)
	BC	DBM	AIL	CTB	CTSB	
Km 15+500 to 27+300	40	60	100	140	200	540

Slip Roads, Loops and Ramps:

Design Chainage (km)	Proposed Flexible Pavement Thickness (mm)					Total (mm)
	BC	DBM	AIL	CTB	CTSB	
Km 15+500 to 27+300	40	50	100	100	200	490

(iv) **Reconstruction of stretches**

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

Sl. No.	From (Km)	To (Km)	Length (Km)	Remarks
Nil				

6. Roadside Drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per the provision of relevant Manual, however minimum 11082.0 RM chute drain shall be provided at slope of high embankment area and RCC lined drain shall be provided as given below.

Sl. No.	Design Chainage (From km to Km)	Side (LHS/RHS/Both Side)	Length (m)
1	0+050 to 0+405 of Ramp-3	RHS	355
2	1+200 to 2+040 of Ramp-4	RHS	840
Total Length (M)			1195

7. Design of Structures

(i) General

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

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

Sl. No.	Bridge at km	Minimum Width of carriageway and cross-sectional features*
1	Minor Bridge at Km 17+025	2X12.5 (MCW) and 1x11.0 (Ramp-4 on LHS of MCW)
2	Major Bridge at Km 18+225	2x12.5
3	Major Bridge at Km 22+375	2x12.5
4	Minor Bridge at Km 25+554	2x12.5
5	Minor Bridge at Km 26+712	2x11.0 (Slip Road)

Note: MCW – Main Carriageway, SR – Slip Road

The following structures shall be provided with footpaths:

Sl. No.	Location at km	Remarks
All Bridges to be Designed with footpaths.		

All bridges shall be high-level bridges.

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

Sl. No.	Bridge at km	Utility service to be carried	Remarks
All Bridges to be Designed to carry Utility Services.			

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

(ii) Culverts

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

Reconstruction of existing culverts:

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

Sr. No.	Existing Chainage of NH-37 (KM)	Design Chainage (Km)	Proposed Type of Structure	Minimum Span Arrangement (m)	Remarks
1	22+575	16+274	RCC Box	1x2.0x2.0	Reconstruction to RCC Box Culvert

Widening of existing culverts:

All existing culverts which are not to be reconstructed shall be widened to the roadway width of the Project Highway as per the typical cross section given in the

provision of relevant Manual. Repairs and strengthening of existing structures where required shall be carried out.

Sr. No.	Design Chainage (Km)	Minimum Span Arrangement (m)	Proposed Type of Structure	Remarks
NIL				

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

Sr. No.	Design Chainage (Km)	Minimum Span Arrangement (m)	Type of Structure	Remarks
1	15+730	1 x 2.0 x 2.0	RCC Box	-
2	17+210	1 x 2.0 x 2.0	RCC Box	-
3	19+380	1 x 2.0 x 2.0	RCC Box	-
4	20+330	1 x 2.0 x 2.0	RCC Box	-
5	20+650	1 x 2.0 x 2.0	RCC Box	-
6	20+930	1 x 2.0 x 2.0	RCC Box	-
7	21+370	1 x 2.0 x 2.0	RCC Box	-
8	21+550	1 x 2.0 x 2.0	RCC Box	-
9	21+906	1 x 2.0 x 2.0	RCC Box	-
10	22+189	1 x 2.0 x 2.0	RCC Box	-
11	22+670	1 x 2.0 x 2.0	RCC Box	-
12	23+029	1 x 2.0 x 2.0	RCC Box	-
13	23+879	1 x 2.0 x 2.0	RCC Box	-
14	24+624	1 x 2.0 x 2.0	RCC Box	-
15	24+879	1 x 2.0 x 2.0	RCC Box	-
16	25+099	1 x 2.0 x 2.0	RCC Box	-
17	25+959	1 x 2.0 x 2.0	RCC Box	-
18	26+354	1 x 2.0 x 2.0	RCC Box	-

Note: Location of the above culverts are indicative and span arrangement is minimum specified. Exact location of these culverts shall be decided in consultation with Authority Engineer. The actual vent way/span arrangements of culverts shall be determined based on detailed investigations by the Contractor in accordance with the Specifications and Standards. Any variations in vent way/span arrangements specified in this Schedule-B shall not constitute a Change of Scope.

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

Sr. No.	Design Chainage (Km)	Proposed Type of Structure	Minimum Span Arrangement (m)	Remarks
NIL				

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

(iii) Bridges

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

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

Major Bridge to be Reconstructed:

Sl. No	Existing Location (km)	Design Chainage (km)	Existing Span (m)	Existing Width (m)	Minimum Span (m)	Mimimum Total Width (m)	Salient details of existing bridge	Adequacy or otherwise of the existing waterway, vertical clearance, etc*	Remarks
NIL									

Minor Bridge to be Re-constructed:

Sr. No.	Existing Chainage (Km)	Design Chainage	Existing Span Arrangement (m)	Existing Total Width (m)	Minimum Span Arrangement (m)	Proposed Type of Structure	Minimum Total Width (m)	Adequacy or otherwise of the existing waterway, vertical clearance, etc*	Remarks
NIL									

(ii) The following narrow bridges shall be widened:

Sl. No.	Existing Chainage	Design Chainage	Existing Span Arrangement (m)	Existing width (m)	Minimum Span Arrangement (m)	Proposed Type of Structure	Cross-section at deck level for widening @	Remarks

Sl. No.	Existing Chainage	Design Chainage	Existing Span Arrangement (m)	Existing width (m)	Minimum Span Arrangement (m)	Proposed Type of Structure	Cross-section at deck level for widening @	Remarks
NIL								

Additional New Bridges

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

Additional New Major Bridge parallel to the existing Major Bridge

Sr. No.	Design Chainage	Proposed Span (m)	Proposed Type of Structure	Minimum Span Arrangement (m)	Remarks
NIL					

Additional New Minor Bridges parallel to the existing Minor Bridge

Sr. No.	Design Chainage	Existing Span Arrangement (m)	Existing Total Width (m)	Minimum Span Arrangement (m)	Proposed Type of Structure	Proposed Total Width (m)	Remarks
NIL							

Additional New Major Bridges:

Sr. No.	Design Chainage (Km)	Minimum Span Arrangement (Exp. To Exp.) (m)	Proposed Type of Super Structure	Minimum Total Width (m)	Remarks
1	18+225	11x106.5 + 14x35.0	Pre-Cast Concrete Girder / UHPC U-girder	2x12.5	Bridge across Barak River.
2	22+375	3x40.0	PSC I-Girder	2x12.5	MJB across Banarmola Garg.

Additional New Minor Bridges:

Sr. No.	Design Chainage (Km)	Minimum Span Arrangement (Exp. To Exp.) (m)	Proposed Type of Super Structure	Minimum Total Width (m)	Skew Angle	Remarks
1	17+025	15.0+20.0+15.0	RCC I-Girder	2x12.5	-	For MCW
		15.0+20.0+15.0	RCC I-Girder	1x11.0	-	For Ramp-4 on LHS of MCW
2	25+554	1x10.0	RCC Box	2x12.5	20^0	For MCW
3	26+712	3x5.0	RCC Box	2x11.0	-	For Both Side Slip Road

*For RCC Box case Span Arrangement considered as clear span.

Note:

(i) Location of the above bridges (Major and Minor) are indicative and span arrangement is minimum specified. Exact location of these bridges shall be decided as per detailed design, in consultation with Authority Engineer and as per site requirement. The actual span arrangements of the bridges shall be determined based on detailed investigations by the Contractor in accordance with the Specifications and Standards. Any variations in span arrangements specified in this Schedule-B shall not constitute a Change of Scope.

(ii) Minimum 8.0 m vertical clearance shall be required from HFL of Barak River for Major Bridge at Chainage Km 18+000 for navigation as per specifications for NW-16 by Inland Waterway Authority of India.

(iii) Minimum 50.0 m horizontal clearance shall be required for Major Bridge across Barak River at Chainage Km 18+000 for navigation as per classification of NW-16 of Inland Waterway Authority of India.

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

Sl. No.	Location at km	Remarks
NIL		

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

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

Sl. No.	Design Chainage of Ramp-5 (km)	Remarks

1	0+825	1x48.6 m (Steel Truss Bridge) Repairs and Rehabilitation shall be carried out as per site conditions of bridge during construction of Project.

Drainage system for bridge decks

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

(iv) Not Applicable Rail-road bridges

Design, construction and detailing of ROB/RUB shall be as specified in the provision of relevant Manual.

Road over-bridges

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

Sr. No.	Existing Chainage	Design Chainage	Existing Span Arrangement (m)	Proposed Type of Structure	Minimum Span Arrangement (SK)(m)	Minimum Total Width (m)	Remarks
NIL							

Road under-bridges

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

Sr. No.	Design Chainage	Name of Bridge	Proposed Type of Structure	Minimum Span Arrangement (SK)(m)	Minimum Total Width (m)	Remarks
NIL						

(v) Grade separated structures

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

Additional New Flyover/Grade Separator:

Sr. No.	Design Chainage	Proposed Type of Super Structure	Minimum Span Arrangement	Minimum Total Width (m)	Remarks
1	16+284	PSC I Girder	2x30.0 (Clear Span)	2x11.0	Grade separator at Start point of Bypass
2	26+740	RCC I Girder + PSC I Girder	1x20.0 (Exp. To Exp.) +1x30.625 (Clear Span) + 1x30.0 (Clear Span)	2x11.0	MNB cum Grade separator over New NH-6/Old NH-44.

Additional New VUP:

Sr. No.	Design Chainage (Km)	Proposed Type of Super Structure	Minimum Clear Span Arrangement (m)	Minimum Total Width (m)	Skew Angle	Remarks
1	20+060	RCC I Girder	1x20.0	2x11	9^0	For MCW

Additional New LVUP:

Sr. No.	Design Chainage	Proposed Type of Super Structure	Minimum Clear Span (m)	Minimum Total Width (m)	Skew Angle	Remarks
1	19+760	RCC Box	1x12.0	26.5	26^0	For MCW
2	21+650	RCC Box	1x12.0	26.5	-	For MCW
3	23+729	RCC Box	1x12.0	26.5	16^0	For MCW

Note: Location of the above structures (Flyover/Grade Separator, VUP and LVUP) are indicative and span arrangement is minimum specified. Exact location of these structures shall be decided as per detailed design, in consultation with Authority Engineer and as per site requirement. The actual span arrangements of the structures shall be determined based on detailed investigations by the Contractor in accordance with the Specifications and Standards. Any variations in span arrangements specified in this Schedule-B shall not constitute a Change of Scope.

(vi) Repairs and strengthening of bridges and structures

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

Bridges

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

NIL

ROB / RUB

Sl. No.	Existing Chainage	Proposed Chainage	Name of Bridge	Nature and extent of repairs /strengthening to be carried out
NIL				

Overpasses/Underpasses and other structures

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

(vii) List of Major Bridges and Structures

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

Major Bridges

Sl. No.	Location
1	16+284 (Grade Separated Structure)
2	18+225 (Major Bridge across Barak River)
3	22+375 (Major Bridge across Banarmola Garg.)
4	26+740 (Grade Separated Structure)

ROB

Sl. No.	Location
NIL	

8. Traffic Control Devices and Road Safety Works

Traffic control devices and road safety works shall be provided in accordance with the provision of relevant Manual.

Specifications of the reflective sheeting. specifications of the reflective sheeting shall be as specified in the manual.

(a) Traffic Signs:

Traffic signs include roadside signs, overhead signs and curb mounted signs along the entire Project Highway.

(b) Pavement Marking:

Pavement markings shall cover road marking for the entire Project Highway.

(c) Safety Barrier:

W- beam metal crash barriers shall be provided in entire project length as per schedule D, however minimum 12390.00 Rm shall be provided.

9. Roadside Furniture

(i) Roadside furniture like km / Hectometer Stones, Railings, Traffic Impact Attenuators, Delineator shall be provided in accordance with the provision of relevant Manual and Traffic Signage plan as indicated in Annexure-III of Schedule-A and deemed to be part of this Schedule-B.

(ii) RCC boundary pillar shall be provided along the entire length on either side of the project highway.

(iii) Traffic Signs boards shall be provided as per the road signage plan indicated in Annexure-III of Schedule-A which shall be deemed to be part of this Schedule-B.

(iv) Overhead traffic signs: Overhead signs shall be provided as per Section 9 of IRC: SP:84-2019.

Note: The type, numbers and location of Traffic Signages shown in Traffic Signage plan as indicated in Annexure-III of Schedule-A are tentative and minimum specified. The actual numbers and location of Traffic Signages shall be determined by the Contractor in accordance with the requirement of the manual with approval from the Authority's Engineer. Any variation in the number and type of road sign boards specified in this Clause of Schedule-B shall not constitute a Change of Scope.

10. Compulsory Afforestation

Minimum 2500 no. of trees are required to be planted by the contractor as compensatory afforestation in accordance with IRC: SP:84-2019 keeping in view IRC: SP: 21-2009 or as per norms of Govt. of Assam. Any increase in no. of trees shall not be treated as change of scope, save and except any variations arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

11. Hazardous Locations

The safety barriers shall also be provided at the following hazardous locations as per site requirement in consultation with the NHIDCL/Authority Engineer and in accordance with the provisions of manual.

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

Sl. No.	Location from Km 15+500 to km 27+300	LHS and RHS
Safety Barriers shall be provided as per manual.		

12. Retaining Wall/Toe Wall/RE Wall/Embankment Protection

Retaining Wall: Retaining Wall shall be provided as per the requirement of site conditions to restrict the right of way. however minimum 40 m length shall be provided.

Toe Wall: Toe Wall shall be provided as per the requirement of site conditions to restrict the right of way; however minimum 400 m length shall be provided.

Reinforced Earth Wall: Reinforced Earth Wall shall be provided as per the requirement of site conditions; however minimum 3600 m length shall be provided between Main carriageway and Slip Road/Ramp.

Embankment Protection: High embankment slop protection shall be provided as per the requirement of the site as per manual, however minimum 10980.00 cum stone boulder pitching shall be provided in embankment slope.

Note:

1. Above length and height of Retaining wall, Toe wall, Reinforced Earth Wall is tentative and minimum specified. The actual length and height of Retaining wall/ Toe wall / Reinforced Earth Wall shall be determined by the Contractor in accordance with the requirements of the manual with approval from the Authority's Engineer. Any variation in the length and height specified in this Clause of Schedule-B shall not constitute a Change of Scope.
2. Above quantity of protection measure for embankment protection is tentative and minimum specified. The actual length of boulder pitching shall be determined by the Contractor in accordance with the requirements of manual based on site investigations with approval from the Authority's Engineer. Any variation in the quantity specified in this Clause of Schedule-B shall not constitute a Change of Scope.

13. Special Requirement for Hill Roads: Project Road passing through plain and rolling terrain therefore special requirement for Hill Roads is not applicable.

14. Change of Scope

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

(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:

Sr. No	Type of Utility	Unit	Quantity	Location/stretch (LHS/RHS)
A	Electrical Utilities			
A1	Electrical Poles	Nos.	206	95/111
A2	Transformers	Nos.	03	01/02
A3	HT lines	Nos.	02	02/00
B	Water/Sewage pipeline			
B1	Hand pumps	Nos.	2	01/01
B2	Water supply	meters	2230	2230
C	Telephones & OFC			
C1	Telephones	Nos.	0	00/00
C2	OFC	Nos	2	01/01
D	Felling of Tress	Nos.	195 – Govt. 250 - Private	445

SCHEDULE – C

(See Clause 2.1)

PROJECT FACILITIES

1 Project Facilities

This schedule indicates the minimum spatial and functional requirements of the facilities to be provided on the Project Highway (Total length of 11.90 km) with an aim to cater to the envisaged demand till the end of the concession period.

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

(a) Roadside furniture

(b) Pedestrian facilities

(c) Bus shelters

(d) Passing Places

(e) Truck lay byes and

(f) Tree plantation and landscaping

(g) Others to be specified

2 Description of Project Facilities

Each of the Project Facilities is described below:

a) Toll plaza

Sl. No.	Toll Plaza Location		Remarks
	Existing Chainage (Km)	Design Chainage (Km)	
Nil			

b) Roadside furniture,

The roadside furniture shall include the provision of:

a) Traffic Signs:

Traffic signs include roadside signs, overhead signs, kerb mounted signs, etc. shall be provided for the entire project highway as per the manual.

b) Pavement Markings:

Pavement markings shall be provided for the entire project highway as per the manual.

c) LED Traffic Blinkers:

LED Traffic Blinkers shall be provided for the entire project highway as per at the Manual.

d) Crash barrier

Crash Barrier shall be provided as per the manual.

e) Delineators

Delineators shall be provided for the entire project highway as per the Manual.

f) Hectometre / Kilometre Stones,

Hectometre/ Kilometre Stones shall be provided for the entire project highway as per the Manual.

c) Pedestrian facilities,

Pedestrian facilities shall be provided at the locations of urban sections in order to ensure safety of pedestrians while crossing in consultation with NHIDCL. This should include (a) minimum Zebra Crossing with flashing Beacon or (b) Zebra Crossing with separate pedestrian phase or (c) any other provision as approved by NHIDCL.

d) Bus shelters,

To ensure orderly movement of the through traffic, bus shelters have been proposed outside the residential area, away from bridges, and high embankments and not too close to the road intersections.

Bus shelters shall be provided on the Project Highway at 3 locations (Total 6 No) as mentioned herein under. Bus shelters shall be constructed as per Manual on both sides (staggered arranged) of the Project Highway. These bus shelters will also have passenger's facility.

Location of Bus shelters

S. No.	Design Chainage (Km)	SIDE
1	16+200	Both side
2	21+100	Both Side
3	26+100	Both Side

e) Truck lay-byes,

Truck lay-byes shall be provided at given below locations.

Sl. No.	Truck lay-byes Location		Remarks
	Existing Chainage (Km)	Design Chainage (Km)	
Nil			

f) Tree Plantation and Landscaping,

Landscape treatment of the Project Highway shall be undertaken through planting of trees and ground cover of appropriate varieties and landscaping on surplus land in the ROW. The Construction Contractor should plant at least 2250 nos. of trees of minimum 6 ft. height with tree guard made up of MS sections.

Plantation scheme shall be prepared in consultation with the Forest Department of the Government of Arunachal Pradesh, and the Independent Consultant/ NHIDCL.

Environment

The Project Highway during design, construction and maintenance during implementation period shall conform to the environmental rules and regulations in force. The Construction Contractor shall be responsible for the same.

g) Others,

Highway Lighting

Lighting shall be provided at the following locations:

(i) Lighting shall be provided at Built up areas, Toll Plaza, Bus Bays, Bus Shelters, Truck lay-byes, LVUP, VUP, Grade Separator, Interchange locations as per manual recommended in Schedule D. High Mast Lighting shall be provided at all Major Junctions, Grade Separator / Interchange locations, Toll Plaza locations, Truck lay-byes locations Bus Shelter locations.

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 confirm to design requirements set out in the following documents:

Manual of Specifications and Standards for Four Laning of highways (IRC: SP:84 – 2019) referred to herein as the manual.

Annex – I

(Schedule – D)

Specifications and Standards for Construction

1 Specifications and Standards

All materials, works and construction operations shall confirm to the Four Lane Manual (IRC:SP:84–2019) of Specifications and Standards for Four Laning (IRC:SP: 84–2019), referred as the Two Lane Manual (IRC:SP: 84–2019), and MORTH Specifications for Road and Bridge Works, IRC: SP: 48-1998 and IRC 56-2011. 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

2.1 The terms 'Concessionaire', 'Independent Engineer' and 'Concession Agreement' used in the Four Lane Manual (IRC:SP: 84-2019) shall be deemed to be substituted by the terms **'Contractor', 'Authority's Engineer' and 'Agreement'** respectively.

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

S. No.	Clause No	Item	Provision as per Manual (IRC: SP: 84-2019)	Modified Provision
1	2.2	Design Speed	Minimum Design Speed 80 km per hr. for plane and rolling terrain	Minimum Design speed shall be 100 km per hr. for plane and rolling terrain except at locations as mentioned in Schedule B section 2(ii) of this document.
2	2.3	Right of Way	A minimum Right of Way (ROW) of 60 m should be available for development of a 4-lane highway.	Right of Way (ROW) shall be available as per Annex-II of Schedule-A.
3	2.5.1	Width of Raised Median in Open country with isolated built-up area and Approach to grade separated structures for Plain and Rolling Terrain	5.0 m including Kerb shyness of 0.5 m on either side.	2.5 m including Kerb shyness of 0.5 m on either side.
4	7.3	Width of Structure	-	Width of structure shall be as per width specified in Schedule B of Annex-I.
5	-	Carriageway Width of Slip Road, Loops and Ramps	-	Carriageway Width of Slip Road, Loops and Ramps shall be 7.0 m width excluding kerb shyness.
6	-	Earthen Shoulders of Slip Road, Loops and Ramps	-	Earthen Shoulders of Slip Road, Loops and Ramps shall be 1.5 m width.
7	5.4.1(i)	Flexible Pavement Design Period	Flexible Pavement Shall be design for a minimum design period of 15 years.	Flexible Pavement shall be design for a minimum design period of 20 years.

Schedules E to G

Schedule - E

(See Clauses 2.1 and 14.2)

Maintenance Requirements

1. Maintenance Requirements

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

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

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

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

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

4. Extension of time limit

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

5. Emergency repairs/restoration

Notwithstanding anything to the contrary contained in this Schedule-E, if any Defect,

deficiency or deterioration in the Project Highway poses a hazard to safety or risk of damage to property, the Contractor shall promptly take all reasonable measures for eliminating or minimizing such danger.

6. Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

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

8. Repairs on account of natural calamities

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

Annex – I

(Schedule-E) 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, approache	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm in depth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA 2003 (http://www.tfhrc.com/pavement/lttp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	MaintenanceSpecifications
		Desirable	**Acceptable**					
s of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Cracking	Nil	< 5 % subject to limitof 0.5 sqm for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15 -30 days	MORT&H Specification 3004.2
	Corrugations and Shoving	Nil	< 0.1% ofarea	Daily	Length Measurement Unit like		2-7 days	IRC:82-2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
	Bleeding	Nil	< 1 % of area	Daily	Scale, Tape, odometer etc.		3-7 days	MORT&H Specification 3004.4
	Ravelling / Stripping	Nil	< 1 % of area	Daily			7-15 days	IRC:82-2015 read with IRC SP 81
	Edge Deformation/ Breaking	Nil	< 1 m for any 100 m section and width < 0.1 m at any location, restricte	Daily			7- 15 days	IRC:82-2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	MaintenanceSpecifications
		Desirable	**Acceptable**					
			d to 30 cm from the edge					
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)	Class I Profilometer : ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	180 days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-Annually			180 days	BS: 7941-1: 2006
	Pavement Condition Index	3	2.1	Bi-Annually			180 days	IRC:82-2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	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	2200mm/km	2400mm/km	Bi-Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656 - 94: 2000	180 days	IRC:SP:83-2008
	Skid	Skid Resistance no. at different speed of vehicles		Bi-Annually	SCRIM (Sideway-force	IRC:SP:83-2008	180 days	IRC:SP:83-2008

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

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Embankment/ Slope	Edge drop at shoulders	Nil	40mm	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC	7-15 days	MORT&H Specification 408.4
	Slope of camber/cross fall	Nil	<2% variation in prescribed slope of camber/cross fall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15 % variation in prescribe	Daily			7-15 days	MORT&H Specification 408.4

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

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

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

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
CRACKING						
1	**Single Discrete Cracks Not intersecting with any joint**	w = width of crack L = length of crack d = depth of crack D = depth ofslab	0	Nil, not discernible	No Action	Not applicable
			1	w < 0.2 mm. hair cracks		
			2	w = 0.2 - 0.5 mm, discernible from slow-movingcar	Seal without delay	Seal, and stitch if L >lm.
			3	w = 0.5 - 1.5 mm, discernible from fast-movingcar		Within 7days

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

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
			4	w = 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstructaffected. Portion with norms and specifications - See Para 5.5 & 9.2 Within 15days
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may befull depth	
3	**Single Longitudinal Crack intersecting with one or more joints**	w = width of crack L = length of crack d = depth of crack D = depth ofslab	0	Nil, not discernible	No Action	
			1	w < 0.5 mm, discernable from slow movingvehicle	Seal with epoxy, if L > 1 m. Within 7 days	Staple or dowel bar retrofit. Within 15days

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

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

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

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
						slab as per norms and specifications within 30days
6	**Punchout (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)**	w = width of crack L = length(m/m2)	0	Nil, not discernible		No Action
			1	w < 0.5 mm; L < 3 m/m^2	Not Applicable, as it may be fulldepth	Seal with low viscosity epoxy to secure broken parts. Within 15days
			2	either w > 0.5 mm or L < 3 m/m^2		
			3	w > 1.5 mm and L < 3 m/m^2		
			4	w > 3 mm, L < 3 m/m^2 and deformation		Full depth repair - Cut out and replace damaged area taking care not to damage reinforcement. Within30days
			5	w > 3 mm, L > 3 m/m^2 and deformation		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
Surface Defects						
7	Ravelling or Honeycomb type surface	r = area damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term** No action.	**Long Term** Not Applicable
			1	r < 2 %	Local repair of areas damaged and liable to be damaged. Within 15 days	
			2	r = 2 - 10 %		
			3	r = 10-25%	Bonded Inlay, 2 or 3 slabs if affecting.	
			4	r = 25 - 50 %		

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

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			3	r = 10 - 20%	Bonded Inlay within 15 days	
			4	r = 20 - 30 %		
			5	r > 30 % and h > 25 mm	Reconstruct slab within 30 days	
9	**Polished Surface/Glazing**	t = texture depth, sand patchtest	0		No action.	Not Applicable
			1	t > 1 mm		
			2 '	t = 1 - 0.6 mm	Monitor rate of deterioration	
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		

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

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

Joint Defects						
11	**Joint Seal Defects**	loss or damage L = Length as % total jointlength	0	Difficult to discern.	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	Discernible, L< 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	
			3	Notable. L > 25% insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days	
			5	Severe; w > 3 mm negligible protection against ingress ofwater	Clean, widen and reseal the joint. Within 7 days	

				and trapping incompressible material.		
12	**Spalling of Joints**	w = width on either side of the joint L = length of spalled portion (as % joint length)	0	Nil, not discernible	No action.	Not Applicable
			1	w < 10 mm	Apply low viscosity epoxy resin/ mortar in crackedportion. Within 7 days	
			2	w = 10 - 20 mm, L < 25%		
			3	w = 20 - 40 mm, L > 25%	Partial Depth Repair. Within 15 days	
			4	w = 40 - 80 mm, L > 25%	30 - 50 mm deep, h = w + 20% of w, within 30 days	
			5	w > 80 mm, and L > 25%	50 - 100 mm deep repair. H = w + 20% of w. Within 30 days	
13	**Faulting (orStepping)**	f = difference of level	0	not discernible, < 1 mm	No action.	No action.

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

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

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

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

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

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

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

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th colspan="4">Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td rowspan="5">Highway</td><td rowspan="5">Availability of Safe Sight Distance</td><td colspan="4">As per IRC SP :84-2014, a minimum of safe stopping sight distance shall be available throughout.</td><td rowspan="5">Monthly</td><td rowspan="5">Manual Measurements with Odometer along with video/ image backup</td><td colspan="2" rowspan="5">Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments.

In case of permanent structure or design deficiency:
Removal of obstruction/improvement of deficiency at theearliest
Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.</td><td rowspan="5">IRC:SP 84-2014</td></tr>
<tr><td>Design Speed, kmph</td><td>Desirable Minimum Sight Distance (m)</td><td>Safe Stopping Sight Distance (m)</td></tr>
<tr><td>100</td><td>360</td><td>180</td></tr>
<tr><td>80</td><td>260</td><td>130</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>Pavement Marking</td><td>Wear</td><td colspan="4"><70% of marking remaining</td><td>Bi-Annually</td><td>Visual Assessment as per Annexure-F of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect - within 2months</td><td>IRC:35-2015</td></tr>
</table>

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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		Initial 7 days Retro reflectivity: 100 mcd/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	hange of ignboard	48 hours in case of Mandatory	RC:67-2012

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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of 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 asintended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP-2014, IRC:119-2015
	Guard Posts and Delineators	Functionality: Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/image backup	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 byvegetation	Daily	Visual with video/image backup	Removal of Trees	Immediate	IRC:SP 84-2014
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every 4 hours	
	Defects in electrical, water and sanitary installations	-	Daily	-	Rectification	24 hours	

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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Pipe/ box/slab culverts	Free waterway/ unobstructed flow section	85% of culvert normal flow area to available.	2 times in a year (before and after rainy season)	Inspection by Bridge Engineer as per IRC SP: 35-1990 and recording of depth of silting and area of vegetation.	Cleaning silt up soils and debris in culvert barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrelbefore rainy season.	15 days before onset of monsoon and within 30 days after end ofrainy season.	IRC 5-2015, IRC SP:40-1993 and IRC SP:13-2004
	Leak-proof expansion joints if any	No leakage through expansionjoints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35-1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-1993 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25 sqm Delamination of concrete not more than 0.25 sq.m. Cracks wider than 0.3 mm not more than 1m aggregatelength	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording the defects	Repairs to spalling, cracking, delamination, rusting shall be followed as perIRC:SP:40-1993.	15 days	IRC SP 40-1993 and MORTH Specification s clause 2800

	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons andpitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Bridges including ROBs Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811
Bridge -Super Structure	Bumps	No bump at expansionjoint	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORT&H Specification 3004.2 & 2811.
	User safety (condition of crash barrier andguard rail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed condition survey as per IRC SP: 35-1990.	Repairs and replacement of safety barriers as the case may be	3days	IRC: 5-1998, IRC SP: 84-2014 and IRC SP: 40-1993.

	Rusted reinforcement	Not more than 0.25 sq.m	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out the repairs to affected concrete portionwith epoxy mortar / concrete.	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
	Spalling of concrete	Not more than 0.50 sq.m					
	Delamination	Not more than 0.50 sq.m					
	Cracks wider than 0.30 mm	Not more than 1m total length	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	Grouting with epoxy mortar, investigating causes for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP: 40-1993 and MORTH Specification 2800.
	Rainwater seepage through deck slab	Leakage - nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge InspectionUnit	Grouting of deck slab at leakage areas, waterproofing, repairs to drainage spouts	1 months	MORTH specifications 2600 & 2700.
	Deflection due to permanent loads and	Within design limits.	Once in every 10 years for spans more	Load test method	Carry out major rehabilitation works on bridge to retain original design loadscapacity	6 months	IRC SP: 51-1999.

	live loads		than 40 m				
	Vibrations in bridge deck due to moving trucks	Frequency of vibrations shall not be more than 5 Hz	Once in every 5 years for spans more than 30m and every 10 years for spans between 15 to 30 m	Laser displacement sensors or laser vibro-meters	Strengthening of super structure	4 months	AASHTO LRFD specifications
	Leakage in Expansion joints	No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rain water through expansion joint in case of buried and asphalt plug and copper stripjoint.	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge InspectionUnit	Replace of seal in expansionjoint	15 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Debris and dust in strip seal	No dust or debris in expansion joint	Monthly	Detailed condition survey as per IRC SP:35-1990 using	Cleaning of expansion joint gapsthoroughly	3 days	MORTH specification s 2600 and

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

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

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

Table 4: Maintenance Criteria for Structures and Culverts:

Table 5: Maintenance Criteria for Hill Roads

In addition to above, for hill roads the following provision 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 andculverts**	
(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 pavementmarking**	
(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)	**Roadlighting**	
(i)	Any major failure of the system	24 (twenty four) hours
(ii)	Faults and minor failures	8 (eight) hours
(e)	**Trees andplantation**	

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) ofbridges**	
(i)	Deformation, damages, tilting or shifting of bearings	15 (fifteen) days Greasingof metallic bearings once in a year
(e)	**Joints**	
(i)	Malfunctioning of joints	15 (fifteen) days
(f)	**Otheritems**	
(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)	**HillRoads**	
(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 beforeissuing the bidding document, with the approval of the competent authority.]

Schedule - F

(See Clause 4.1 (vii)(a))

Applicable Permits

1. Applicable Permits

(i) The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:

(a) Permission of the State Government for extraction of boulders from quarry;

(b) Permission of Village Panchayats and Pollution Control Board for installation of crushers;

(c) Licence for use of explosives;

(d) Permission of the State Government for drawing water from river/reservoir;

(e) Licence from inspector of factories or other competent Authority for setting up batching plant;

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

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

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

(i) Any other permits or clearances required under Applicable Laws.

(ii) Applicable Permits, as required, relating to environmental protection and conservation shall have been procured by the Authority in accordance with the provisions of this Agreement.

Schedule – G

(See Clauses 7.1 and 19.2)

Annex-I

(See Clause 7.1)

Form of Bank Guarantee
[Performance Security/Additional Performance Security]

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 [name and address of the authority], (hereinafter called the "Authority") have entered into an agreement (hereinafter called the "Agreement") for the Construction of Four Lane Panchgram Bypass from Design Chainage km 15+500 on NH-37 (Old NH-53) at Kalinagar Pt.-II Village to Design Chainage km 27+300 at crossing with NH-6 (Old NH-44) Near Siddeswar Pt.-I Village in the State of Assam under Bharatmala Pariyojana in Economic Corridors (Project Length – 11.8 km) on Engineering, Procurement and Construction (the "EPC") basis, subject to and in accordance with the provisions of the Agreement

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

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

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

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

2. A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways & Infrastructure Development Corporation

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

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

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

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

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

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

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

be discharged from its liabilities hereunder.

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

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

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

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

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

S. No.	Particulars	..... Details
1	Name of the Beneficiary	National Highways and Infrastructure Development Corporation Limited
2	Beneficiary Bank Account No.	90621010002659
3	Beneficiary Bank Branch	IFSC CNRB0019062
4	Beneficiary Bank Branch Name	Transport Bhawan, New Delhi
5	Beneficiary Bank Address	Syndicate Bank, Transport Bhawan, 1st Parliament street, New Delhi-110001

Signed and sealed this ..... day of ....., 20 ..... at
SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:
(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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

Annex – II

(Schedule - G)

(See Clause 19.2)

Form for Guarantee for Advance Payment

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 [name and address of the authority], (hereinafter called the "**Authority**") for the Construction of Four Lane Panchgram Bypass from Design Chainage km 15+500 on NH-37 (Old NH-53) at Kalinagar Pt.-II Village to Design Chainage km 27+300 at crossing with NH-6 (Old NH-44) Near Siddeswar Pt.-I Village in the State of Assam under Bharatmala Pariyojana in Economic Corridors (Project Length – 11.8 km) on Engineering, Procurement and Construction (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement

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

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

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

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

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

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

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

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

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

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

6. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in

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

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

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

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

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

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

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

S. No.	Particulars	Details
1	Name of the Beneficiary	RO NHIDCL PROJECTS
2	Beneficiary Bank Account No.	73653210000013
3	Beneficiary Bank Branch	Canara Bank [IFSC : CNRB0017365]
4	Beneficiary Bank Branch Name	Dispur, Guwahati
5	Beneficiary Bank Address	Upasana Complex, Dr. R. P. Road, Ganeshguri, Dispur, Guwahati

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:
(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

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

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

SCHEDULE-H

(See Clauses 10.1.4 and 19.3)

CONTRACTPRICEWEIGHTAGES

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	37.38%	**A- Widening and strengthening of existing road**	
		(1) Earthwork up to top of the sub-grade	0.00%
		(2) Sub-base Course	0.00%
		(3) Non bituminous Base course	0.00%
		(4) Bituminous Base course	0.00%
		(5) Wearing Coat	0.00%
		(6) Widening and Repair of Culverts	0.00%
		B.1- Reconstruction/New Intermediate 4-Lane Realignment / Bypass (Flexible Pavement)	
		(1) Earthwork up to top of the sub-grade	46.17%
		(2) Cement treated Crushed Rock for Sub Base (CSTB)	14.56%
		(3) Cement treated Crushed Rock for Base (CTB)	7.10%
		(4) Aggregate Inter layer	5.11%
		(5) Bituminous Base course	10.75%
		(6) Wearing Coat	5.76%
		B.2- Reconstruction/New Intermediate 4-Lane Realignment / Bypass (Rigid Pavement)	
		(1) Earthwork up to top of the sub-grade	0.00%
		(2) Sub-base Course	0.00%
		(3) Dry Lean Concrete (DLC) Course	0.00%
		(4) Pavement Quality Control (PQC) Course	0.00%
		C.1- Reconstruction/ New Service Road/ Slip Road (Flexible Pavement)	
		(1) Earthwork up to top of the sub-grade	0.90%
		(2) Cement treated Crushed Rock for Sub Base (CSTB)	2.18%
		(3) Cement treated Crushed Rock for Base (CTB)	0.78%
		(4) Aggregate Inter layer	0.78%
		(5) Bituminous Base course	1.35%
		(6) Wearing Coat	0.87%
		C.2- Reconstruction/New Service road (Rigid Pavement)	

Item	Weightage in Percentage to the Contract Price	Stage for Payment	Percentage Weightage
		(1) Earthwork up to top of the sub-grade	0.00%
		(2) Sub-base Course	0.00%
		(3) Dry Lean Concrete (DLC) Course	0.00%
		(4) Pavement Quality Control (PQC) Course	0.00%
		D- Reconstruction & New Culverts on existing road, realignments, bypasses	
		(1) Hume pipe Culverts (Length <6m)	
		(2) Box Culverts (length <6m)	3.69%
Total of "Road Works including Culverts, widening and repair of culverts"			**100.00%**
Minor bridge/Underpasses/ Overpasses	**6.11%**	**A.1- Widening and repairs of Minor Bridges (length>6m & <60m)**	
		Minor Bridges (Repair)	0.00%
		A.2- New Minor bridges (length >6 m and < 60 m)	
		(1) Foundation: On completion of the foundation work including foundations for wing and return walls.	42.74%
		(2) Sub-Structure: On completion of the abutments, piers up to the abutment/pier cap.	8.13%
		(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.	14.04%
		(4) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	5.93%
		(5) Guide Bunds, Gabion Protection and River Training Works: On completion of Guide Bunds and river Training Works complete in all respects	0.00%
		B.1- Widening and repairs of underpasses/Overpasses	
		Underpasses/ Overpasses	0.00%
		B.2- New Underpasses /Overpasses	
		(1) Foundation: On completion of the foundation work including foundations for wing and return walls.	13.83%
		(2) Sub-Structure: On completion of the abutments, piers up to the abutment/pier cap.	4.36%
		(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. 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	9.82%

Item	Weightage in Percentage to the Contract Price	Stage for Payment	Percentage Weightage
		including drainage facility complete in all respects as specified	
		(4) Approaches: On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	1.15%
Total of "Minor bridge/Underpasses/Overpasses "			**100.00%**
Major bridge(length>60m) works and ROB/RUB /elevated sections/flyovers including viaducts, if any	**42.45%**	**A.1- Widening and repairs of Major Bridges**	
		(1) Foundation	0.00%
		(2) Sub-structure	0.00%
		(3) Super-structure (including bearings)	0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	0.00%
		(6) Wing walls/return walls up to top	0.00%
		(7) Guide bunds, River Training works etc.	0.00%
		(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
		A.2- New Major Bridges	
		(1) Foundation	19.00%
		(2) Sub-structure	4.29%
		(3) Super-structure : including girder, deck slab, bearings (Excluding wearing coat and expansion joints)	61.72%
		a) Super Structure : Casting of girder/fabrication of girders (Steel)/ Casting of Segments	
		b) Super Structure : Erection of girders, deck slab and bearings	
		(4A) Wearing Coat including expansion joints	1.50%
		(4B) Other Ancillary Work Items like hand rails, crash barriers, road markings etc.)	2.58%
		(5) Miscellaneous Works stone pitching and protection works, exculding Retaining walls/RE Walls etc.	0.80%
		(6) Wing walls/return walls up to top	
		(7) Guide bunds, Gabion Works, River Training works etc.	
		(8) Retaining walls, Reinforced Earth wall etc.	
		a) Panel Casting	
		b) Erection of panel/Construction of retaining wall	

Item	Weightage in Percentage to the Contract Price	Stage for Payment	Percentage Weightage
		B.1- Widening and repairs of	0.00%
		(a) ROB	0.00%
		(b) RUB	0.00%
		(1) Foundations	0.00%
		(2) Sub-Structure	0.00%
		(3) Super-Structure (Including bearings)	0.00%
		(4) Wearing Coat (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	0.00%
		(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%
		(6) Wing walls/Return walls	0.00%
		(7) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
		B.2- New ROB/RUB	0.00%
		(1) Foundations	0.00%
		(2) Sub-Structure	0.00%
		(3) Super-structure : including girder, deck slab, bearings (Excluding wearing coat and expansion joints)	0.00%
		a) Super Structure : Casting of girder/fabrication of girders (Steel)	0.00%
		b) Super-Structure : Casting of Segments	0.00%
		c) Super Structure : Erection of girders,deck slab and bearings	0.00%
		(4A) Wearing Coat including expansion joints	0.00%
		(4B) Other Ancillary Work Items like hand rails, crash barriers, road markings etc.)	0.00%
		(5) Miscellaneous Works stone pitching and protection works, Exculding Retaining walls/RE Walls etc.	0.00%
		(6) Wing walls/return walls up to top	0.00%
		(7) Guide bunds, Gabion Works, River Training works etc.	0.00%
		(8) Retaining walls, Reinforced Earth wall etc.	0.00%
		a) Panel Casting	0.00%

Item	Weightage in Percentage to the Contract Price	Stage for Payment	Percentage Weightage
		b) Erection of panel/Construction of retaining wall	0.00%
		C.1- Widening and repair of Elevated Section/Flyovers/Grade Separators	
		(1) Foundations	0.00%
		(2) Sub-Structure	0.00%
		(3) Super-Structure (Including bearings)	0.00%
		(4) Wearing Coat (including expansion joints)	0.00%
		(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%
		(6) Wing walls/Return walls	0.00%
		(7) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
		C.2- New Elevated Section/Flyovers/Grade Separators	
		(1) Foundations	4.83%
		(2) Sub-Structure	1.04%
		(3) Super-structure : including girder, deck slab, bearings (Excluding wearing coat and expansion joints)	
		a) Super Structure : Casting of girder/fabrication of girders (Steel)/ Casting of Segments	1.24%
		b) Super Structure : Erection of girders,deck slab and bearings	1.86%
		(4A) Wearing Coat including expansion joints	0.38%
		(4B) Other Ancillary Work Items like hand rails, crash barriers, road markings etc.)	0.30%
		(5) Miscellaneous Works stone pitching and protection works, Exculding Retaining walls/RE Walls etc.	
		(6) Wing walls/return walls up to top	0.00%
		(7) Guide bunds, Gabion Works, River Training works etc.	0.00%
		(8) Retaining walls, Reinforced Earth wall etc.	
		a) Panel Casting	0.46%
		b) Erection of panel/Construction of retaining wall	
Total of "Major bridge(length>60m) works and ROB/RUB/elevated sections/flyovers including viaducts"			**100.00%**
Other Works	**12.32%**	(i) Toll Plaza	0.00%
		(ii) Road side drains	0.00%

Item	Weightage in Percentage to the Contract Price	Stage for Payment	Percentage Weightage
		(a) Unlined Drain	0.34%
		(b) Covered Drain	0.00%
		(iii) Road signs, markings, km stones, safety devices etc.	4.54%
		(iv) Crash Barrier/Pedestrian guard Rails	11.91%
		(v) Project facilities	
		a) Bus Bays	1.51%
		b) Truck Lay-Byes	0.00%
		c) Rest Areas	0.00%
		d) Others	
		i) ATMS	0.00%
		ii) Lighting	0.86%
		e) Miscellaneous	
		i) Utility Ducts	0.26%
		ii) Chequered Tiles	0.00%
		f) Rain Water Harvesting	0.00%
		(g) Road side Plantation	0.82%
		(vi) Protection works other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs/RUBs.	
		(a) Retaining Wall	0.58%
		(b) Toe Wall	1.37%
		(c) Stone pitching work	9.95%
		(d) Breast Wall	0.00%
		(e) RE Wall	
		e.1) Panel Casting	10.45%
		e.2) Erection of panel/Construction of retaining wall	15.67%
		(f) Hydroseeding	0.01%
		(g) Mulching	0.05%
		(h) Chute Drain	3.09%
		(vii) Safety and traffic management during construction	0.44%
		(viii) Junctions	5.82%
		(ix) Other miscellaneous works including loop& Ramps, site clearances, repair & rehabilitation	32.33%
Total of "Other Works"			**100.00%**
Utility Works	**1.74%**	(i) EHT line	0.00%
		(ii) EHT Line crossings	0.00%
		(iii) Shifting of existing Electrical LT/11 KV/ 33 KV Lines	40.71%
		(iv) HT/LT Crossings	0.00%
		(v) UG Cable / Crossings	43.62%
		(vi) Shifting of existing Water Supply pipelines	6.37%

Item	Weightage in Percentage to the Contract Price	Stage for Payment	Percentage Weightage
		(vii) Water pipeline crossings	9.30%
		(viii) Sewage pipeline	0.00%
		(ix) Sewage pipeline crossings	0.00%
		Total of "Utility Works"	**100.00%**

1.3 Procedure of estimating the value of work done.

1.3.1 Road works

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

Table 1.3.1

Stage of Payment	Percentage Weightage	Payment Procedure
1	**2**	**3**
A- Widening & Strengthening of road		
(1) Earthwork up to top of the sub-grade	-	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 500m.
(2) Sub-base Course	-	
(3) Non bituminous Base course	-	
(4) Bituminous Base course	-	
(5) Wearing Coat	-	
(6) Widening and Repair of Culverts	-	Cost of completed culverts shall be determined pro rata basis with respect to the total no. of culverts. The payment shall be made on the completion of atleast five culverts.
B.1- Reconstruction/New Intermediate 4-Lane Realignment / Bypass (Flexible Pavement)		
(1) Earthwork up to top of the sub-grade	46.17%	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 500m.
(2) Cement treated Crushed Rock for Subbase (CSTB)	14.56%	
(3) Cement treated Crushed Rock for Base (CTB)	7.10%	
(4) Aggregate Inter layer	5.11%	
(5) Bituminous Base course	10.75%	
(6) Wearing Coat	5.76%	
B.2- Reconstruction/New Intermediate 4-Lane Realignment / Bypass (Rigid Pavement)		
(1) Earthwork up to top of the sub-grade	-	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 500m.
(2) Sub-base Course	-	
(3) Dry Lean Concrete (DLC) Course	-	

Stage of Payment	Percentage Weightage	Payment Procedure
1	2	3
(4) Pavement Quality Control (PQC) Course	-	
C.1- Reconstruction/ New Service Road/ Slip Road (Flexible Pavement)		
(1) Earthwork up to top of the sub-grade	0.90%	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.
(2) Cement treated Crushed Rock for Subbase (CSTB)	2.18%	
(3) Cement treated Crushed Rock for Base (CTB)	0.78%	
(4) Aggregate Inter layer	0.78%	
(5) Bituminous Base course	1.35%	
(6) Wearing Coat	0.87%	
C.2- Reconstruction/New Service Road (Rigid Pavement)		
(1) Earthwork up to top of the sub-grade	-	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 500m.
(2) Sub-base Course	-	
(3) Dry Lean Concrete (DLC) Course	-	
(4) Pavement Quality Control (PQC) Course	-	
D- Reconstruction & New Culverts on existing road, realignments, bypasses		
Culverts (length <6m)	3.69%	Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of atleast 01 (one) culvert.

@ For calculation of payment stage for main-carriageway the project length shall be converted into equivalent 2 lane length. For example, if the total length of 4 lane main carriageway is 100 km, then the equivalent length for calculation of payment stage will be 2 x 100 km. Now, ifthetotallengthofbituminousworktobedoneis100km, the cost per km of bituminous work shall be determined as follows:

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

Where P = Contract Price

L=Totalequivalent 2-Lane length in km as defined above

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

Note: The length affected due to law-and-order problems or litigation during execution including the length not handed over to the Contractor under clause 8.3 of this Contract Agreement due to which the Contractor is unable to execute the work, may be deducted from the total project length for payment purposes. The total length calculated here is only for payment purposes and will not affect and referred in other clauses of the Contract Agreement

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)	-	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 including foundations for wing and return walls.	42.74%	Payment against Foundation shall be made on pro rata basis completion of atleast two Foundations. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-Structure: On completion of the abutments, piers up to the abutment/pier cap.	8.13%	Payment against Sub-Structue shall be made on pro rata basis completion of atleast two Sub-Structue upto abutment/pier cap level of each bridge.
(3) Super-structure: On completion of the superstructure in all respects including wearing coat, bearings, expansion joints, handrails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	14.04%	Payment shall be made on pro rata basis completion of a stage ie. completion of Super-Structue of atleast one span in all respect as specified in the column of "Stage of payment" in this sub-clause.
(4) Approaches: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	5.93%	Payment shall be made on pro rata basis completion of a stage ie. completion of Approaches in all respect as specified in the column of "Stage of payment" in this sub-clause.
(5) Guide Bunds, gabion Protection and River Training Works: On completion of Guide Bunds and river training works complete in all respects	-	Payment shall be made on pro rata basis completion of a stage ie. completion of Guide Bunds and River Training Works in all respect as specified.
B.1- Widening and repairs of underpasses/overpasses		
Underpasses/ Overpasses	-	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 an underpass/overpass.
B.2- New Underpasses/Overpasses		

Stage of Payment	Weightage	Payment Procedure
1	2	3
(1) Foundation: On completion of the foundation work including foundations for wing and return walls.	13.83%	Payment against Foundation shall be made on pro rata basis completion of atleast two Foundations. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-Structure: On completion of the abutments, piers up to the abutment/pier cap.	4.36%	Payment against Sub-Structure shall be made on pro rata basis completion of atleast two Sub-Structure upto abutment/pier cap level of each bridge.
(3) Super-structure: On completion of the superstructure 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 as specified.	9.82%	Payment shall be made on pro rata basis completion of a stage ie. Completion of Super-Structure of atleast one span in all respect as specified in the column of "Stage of payment" in this sub-clause.
(4) Approaches: On completion of approaches including Retaining walls/ Reinforced Earth walls, stone pitching, protection works complete in all respect and fit for use.	1.15%	Payment shall be made on pro rata basis completion of a stage ie. completion of Approaches in all respect as specified in the column of "Stage of payment" in this sub-clause.

1.3.3 Major Bridge works, ROB/RUB, and Structures

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

Table1.3.3

Stage of Payment	Weightage	Payment Procedure
1	2	3
A.1- **Widening and repairs of Major Bridges**		
(1) Foundation	0.00%	(1) Foundation : Cost of each major bridge shall be determined on pro rata basis with respect to the total linear length (m) of the major 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 the major bridge subject to completion of atleast two foundations 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	0.00%	(2) 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 the major bridge subject to completion of atleast two foundations along with sub-structure upto abutment/pier cap level of the major bridge
(3) Super-structure(including bearings)	0.00%	(3) Super-Structure: Payment shall be made on pro rata basis completion of a stage ie. completion of Super-Structure of atleast one span in all respect as specified.
(4) Wearing Coat including expansion joints	0.00%	(4) Wearing coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(5) Miscellaneous Items like hand rails, crash barriers, road markings etc.)	0.00%	(5) Miscellaneous: Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road marking etc. Complete in all respects as specified.
(6) Wing walls/return walls up to top	0.00%	(6) Wing wall/return walls: Payments shall be made on completion of all wing wall/return walls complete in all respects as specified.
(7) Guide bunds, River Training works etc.	0.00%	(7) 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.

Stage of Payment	Weightage	Payment Procedure
1	2	3
(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	(8) Approaches: Payment shall be made on completion of both approaches including stone pitching, protection works, etc. Complete in all respects as specified.
A.2- New Major Bridges		
(1) Foundation: On completion of the foundation work including foundations for return walls, abutments, piers.	19.00%	(1) Foundation : 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 bridge subject to completion of atleast two foundations 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:	4.29%	(2) 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 the bridge subject to completion of atleast two foundations along with sub-structure upto abutment/pier cap level of the bridge
(3) Super-structure: (including bearings) a) Super Structure : Casting of girder/fabrication of girders (Steel)/Casting of segments b) Super Structure : Erection of girders, deck slab and bearings	61.72%	**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.
(4A) Wearing Coat including expansion joints	1.50%	Payments shall be made on completion of the stage in all respect as specified, for each structure.
(4B) Other Ancillary Work Items like hand rails, crash barriers, road markings etc.)	2.58%	Payments shall be made on completion of the stage in all respect as specified, for each structure.
(5) Miscellaneous Items like stone pitching and protection works, excluding Retaining Wall/RE Wall etc.	0.80%	
(6) Wing walls/Return walls		
(7) Guide bunds, River Training works etc.		
(8) Retaining walls, Reinforced Earth wall etc.		

Stage of Payment	Weightage	Payment Procedure
1	2	3
B.1- Widening and repairs of **(a) ROB** **(b) RUB**		
(1) Foundation:	-	(i) Foundation: Cost of each Major Bridge 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 prorata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the ROB/RUB subject to completion of at least two foundations of the ROB/RUB . In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-structure:	-	(ii) Sub-Structure: Payment against Substructure shall be made on pro-rata basis on completion of a stage i.e., not less than 25% of the scope of substructure of the ROB/RUB subject to completion of at least two sub-structures of abutments/piers up to abutment/pier cap level of the ROB/RUB.
(3) Super-structure: (including bearings)	-	**Super-structure**: Payment shall be made on pro-rata basis on completion of a stage i.e., completion of super-structure including bearings of at least one span in all respects as specified.
(4) Wearing Coat including expansion joints	-	**Wearing Coat**: Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	-	**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	-	**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)	-	**Approaches**: Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
B.2- New ROB/ RUB		

Stage of Payment	Weightage	Payment Procedure
1	2	3
(1) Foundation:	-	(i) Foundation: Cost of each Major Bridge 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 prorata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the ROB/RUB subject to completion of at least two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-structure:	-	(ii) Sub-Structure: Payment against Substructure shall be made on pro-rata basis on completion of a stage i.e., not less than 25% of the scope of substructure of the ROB/RUB subject to completion of at least two sub-structures of abutments/piers up to abutment/pier cap level of the ROB/RUB.
(3) Super-structure: (including bearings)	-	**Super-structure**: Payment shall be made on pro-rata basis on completion of a stage i.e., completion of super-structure including bearings of at least one span in all respects as specified.
(4) Wearing Coat including expansion joints	-	**Wearing Coat:** Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified as specified.
(5) Miscellaneous Items like handrails, crash barrier, road markings etc.	-	**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	-	**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)	-	**Approaches**: Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
C.1- Widening and repairs of Elevated Section/ Flyovers/ Grade Separators		

Stage of Payment	Weightage	Payment Procedure
1	2	3
(1) Foundation	-	(i) Foundation: Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures. Payment against foundation shall be made on prorata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the structure subject to completion of at least two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-structure	-	Sub-structure: Payment against Substructure shall be made on pro-rata basis on completion of a stage i.e., not less than 25% of the scope of substructure of the structure subject to completion of at least two sub-structures of abutments/piers up to abutment/pier cap level of the structure.
(3) Super-structure: (including bearings)	-	Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of at least one span in all respects as specified.
(4) Wearing Coat including expansion joints	-	**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.	-	**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	-	**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)	-	**Approaches**: Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
C.2- New Elevated Section/ Flyovers/ Grade Separators		

Stage of Payment	Weightage	Payment Procedure
1	2	3
(1) Foundations	4.83%	(1) Foundation: Cost of each structure 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 structure subject to completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(2) Sub-Structure	1.04%	(2) 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 the RoB/RuB subject to completion of atleast two foundations along with sub-structure upto abutment/pier cap level of the structure.
(3) Super-structure : including girder, deck slab, bearings (Excluding wearing coat and expansion joints)		
a) Super Structure : Casting of girder/fabrication of girders (Steel)/Casting of segment	1.24%	a) Super-Structure (Casting of girder): Unit of measurement is numbers. Payment against Casting of girder shall be made on pro rata with respect to total numbers of girders required n the structure on completion of a stage i.e. not less than completion of casting of atleast five (5) girders of the structure.
b) Super Structure : Erection of girders,deck slab and bearings	1.86%	c) Super-Structue (Erection of girders,deck slab and bearings) : Payment segment shall be made on pro rata on completion of a stage i.e. completion of Super structure including bearings of atleast one span in all respects as specified.
(4A) Wearing Coat including expansion joints	0.38%	Payments shall be made on completion of the stage in all respect as specified, for each structure.
(4B) Other Ancillary Work Items like hand rails, crash barriers, road markings etc.)	0.30%	
(5) Miscellaneous Works stone pitching and protection works, Exculding Retaining walls/RE Walls etc.	0.00%	

Stage of Payment	Weightage	Payment Procedure
1	2	3
(6) Wing walls/return walls up to top	0.00%	Payments shall be made on completion of all wing walls/return walls for a bridges as per weightage given in this table, completion in all respects as specified.
(7) Guide bunds, Gabion Works, River Training works etc.	0.00%	Payments shall be made on completion of the stage in all respect as specified, for each structure.
(8) Retaining walls, Reinforced Earth wall etc.		
a) Panel Casting	0.46%	a) Panel Casting : Unit of measurement is area Sqm. Payment against casting of panels shall be made on pro rata basis with respect to total area panels required for the structure on completion of a stage i.e. not less than completion of casting of 25% of scope of the RE Wall panel of each bridge.
b) Erection of panel/Construction of retaining wall		b) Erection of panel/Construction of retaining wall : Unit of measurement is area Sqm. Payment shall be made on pro rata basis with on completion of erection of panel/Construction of retaining wall complete in all respect for atleast 25% of scope of work for each Structure.

1.3.4 OtherWorks

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
(i) Toll Plaza	-	Payment of toll plaza shall be made on pro rata basis as per following completed stages.. (i) Rigid pavement upto DLC (LHS) - 12.5% (ii) Rigid pavement upto DLC (RHS) - 12.5% (iii) PQC (LHS) - 25 % (iv) PQC (RHS) - 25 % (v) Admin Building, Maintenance Building & Misc. Works-10% (vi) Canopy, Toll Booth, Safety Items & Miscellaneous Works-12.5% (vii) Toll Plaza Tunnel-2.5%
(ii) Roadside drains		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
(a) Unlined Drain	0.34%	
(b) Covered Drain	-	

Stage of Payment	Weightage	Payment Procedure
1	2	3
(iii) Road signs, markings, km stones, safety devices,	4.54%	the total length.
(iv) Crash Barrier/Pedestrian guard Rails	11.91%	
(v) Project facilities		Payment shall be made on pro rata basis for completed facilities.
a) Bus Bays	1.51%	
b) Truck Lay-Byes	0.00%	
c) Rest Areas	0.00%	
d) Others		
i) ATMS	0.00%	
ii) Lighting	0.86%	
e) Miscellaneous		
i) Utility Ducts	0.26%	
ii) Chequered Tiles	0.00%	
f) Rain Water Harvesting	0.00%	
(g) Road side Plantation	0.82%	
(vi) Protection works other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs/RUBs.		
(a) Retaining Wall	0.58%	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.
(b) Toe Wall	1.37%	
(c) Stone pitching work	9.95%	
(d) Breast Wall	0.00%	
(e) RE Wall		
e.1) Panel Casting	10.45%	a) Panel Casting : Unit of measurment is area Sqm. Payment against casting of panels shall be made on pro rata basis with respect to total area panels requried for the structure on completion of a stage i.e. not less than completion of casting of 25% of scope of the RE Wall panel of each bridge.
e.2) Erection of panel/Construction of retaining wall	15.67%	b) Erection of panel/Construction of retaining wall : Unit of measurment is area Sqm. Payment shall be made on pro rata basis with on completion of erection of panel/Construction of retaining wall complete in all respect for atleast 25% of scope of work for each Structure.
(f) Hydroseeding	0.01%	Payment shall be made on pro rata basis for completed facilities.
(g) Mulching	0.05%	
(h) Chute Drain	3.09%	
(vii)Safety and traffic management during construction	0.44%	Payment shall be made on prorate basis every six months.

Stage of Payment	Weightage	Payment Procedure
1	2	3
(viii) Junctions	5.82%	Payment shall be made on pro rata basis for completed facilities.
(ix) Maintenance of Road during Construction Period	-	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 10% (ten per cent) of the total length.
(viii) Other miscellaneous works including loop & Ramps, site clearances, repair & rehabilitation etc.	32.33%	Payment shall be made on pro rata basis for completed facilities.

1.3.5 Utility Shifting

Stage of Payment	Weightage	Payment Procedure
1	2	3
(i) EHT line	0.00%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage. With reference to total cost of EHT line. Payment shall be made for completed activity .(The average weightage of major activities(only for payment purpose) in shifting work is (i) Erection of Poles-20%,(ii) Conductor stringing including laying of cable-30%,(iii) DTR erection (if involved) -15% and (iv) Charging of line including dismantling and site clearance-35% (with DTR) and 50% without DTR)
(ii) EHT Line crossings	0.00%	Cost of each crossing shall be determined on pro-rata basis with reference to total no.of crossing. Payment shall be made for not less than 25% of the crossing subject to a minimum of 4 crossing.
(iii) Shifting of existing Electrical LT/11 KV/ 33 KV Lines	40.71%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage. With reference to total cost of LT/HT line. Payment shall be made for completed activity .(The average weightage of major activities (only for payment purpose) in shifting work is (i) Erection of Poles-20%,(ii) Conductor stringing including laying of cable-30%,(iii) DTR erection (if involved) - 10% and (iv) Charging of line including dismantling and site clearance-40% (with DTR) and 50% without DTR)
(iv) HT/LT Crossings	0.00%	Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossing. Payment shall be made for not less than 25% of the crossing subject to a minimum of 10 crossing.
(v) UG Cable / Crossings	43.62%	

Stage of Payment	Weightage	Payment Procedure
1	2	3
(vi) Shifting of existing Water Supply pipelines	6.37%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage. With reference to total cost of pipe line. Payment shall be made for completed activity .(The average weightage of major activities (only for payment purpose) in shifting work is laying of pipe-50%, Charging of line including all miscellaneous work and dismantling and site clearances-50%)
(vii) Water pipeline crossings	9.30%	Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings- payment shall be made for not less than 25% of the crossings subject to a minimum of 8 crossings.
(viii) Sewage pipeline	0.00%	Unit of measurement is as per completed activities. Cost per activity shall be determined on pro-rata basis as per its weightage with reference to total cost of pipe line -payment shall be made for completed activity. (The average weightage of major activities (Only for payment purpose) in shifting work is laying of pipe -50%,charging of line including all miscellaneous works and dismantling and site clearance-50%)
(ix) Sewage pipeline crossings	0.00%	Cost of each crossing shall be determined on pro-rata basis with reference to total no. of crossings- payment shall be made for completed activity. (The average weightage of major activities in shifting work is laying pipe-50%, charging of line including all miscellaneous works and dismantling and site clearance-50%)

2. Procedure for payment for Maintenance

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

2.2. Payment for Maintenance shall be made in quarterly instalments in accordance with the provisions of Clause19.7.

Schedule - I

(See Clause 10.2 (iv))

Drawings

1 . Drawings

In compliance of the obligations set forth in Clause 10.2 of this Agreement, the Contractor shall furnish to the Authority's Engineer, free of cost, all Drawings listed in Annex-I of this Schedule-I.

2 . Additional Drawings

If the Authority's Engineer determines that for discharging its duties and functions under this Agreement, it requires any drawings other than those listed in Annex-I, it may by notice require the Contractor to prepare and furnish such drawings forthwith. Upon receiving a requisition to this effect, the Contractor shall promptly prepare and furnish such drawings to the Authority's Engineer, as if such drawings formed part of Annex-I of this Schedule-I.

Annex – I

(Schedule - I)

List of Drawings

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

A minimum list of the drawings of the various components / elements of the Project Highway and project facilities required to be submitted by the Contractors given below:

a) Drawings of horizontal alignment, vertical profile and detailed cross sections.
b) Drawings of all Major and Minor Bridges.
c) Drawings of cross-drainage works.
d) Drawings of Major intersections.
e) Drawing of Toll Plaza layout and building.
f) Drawing of bus-bay and bus shelters.
g) Drawing of road furniture including traffic signage, marking, safety barriers etc.
h) Drawing of traffic diversion plan.
i) Drawing as per instruction of Authority's Engineer.
j) General arrangement showing area of base camp and administrative block

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 **320th** 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 construction in accordance with this Agreement.

2. Extension of time

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

Schedule - K

(See Clause 12.1 (ii))

Tests on Completion

1. Schedule for Tests

(i) The Contractor shall, no later than 30 (thirty) days prior to the likely completion of construction, notify the Authority's Engineer and the Authority of its intent to subject the Project Highway to Tests, and no later than 10 (ten) days prior to the actual date of Tests, furnish to the Authority's Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Works.

(ii) The Contractor shall notify the Authority's Engineer of its readiness to subject the Project Highway to Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the Authority's Engineer shall, in consultation with the Contractor, determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority's Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule-K.

2. Tests

(i) Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include [***].

(ii) Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a Network Survey Vehicle (NSV) fitted with latest equipments and the maximum permissible roughness for purposes of this Test shall be [2,000 (two thousand)] mm for each kilometre.

(iii) Tests for bridges: All major and minor bridges shall be subjected to the rebound hammer and ultrasonic pulse velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on Nondestructive Testing Techniques, at two spots in every span, to be chosen at random by the Authority's Engineer. Bridges with a span of 15 (fifteen) metres or more shall also be subjected to load testing.

(iv) Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and Standards, except tests as specified in clause 5,but shall include measuring the reflectivity of road markings and road signs; and measuring the illumination level (lux) of lighting using requisite testing equipment.

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

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

3. Agency for conducting Tests

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

4. Completion Certificate

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

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

Sr. No.	Key metrics of Asset	Equipment to be used	Frequency of condition survey
1	Surface defects of pavement	Network Survey Vehicle (NSV)	At least twice a year (As per 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 [construction of the ****section (km ** to km **) of National Highway No. ***] (the "Project Highway") on Engineering, ...Procurement and Construction (EPC) basis through (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

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

SIGNED, SEALED AND DELIVERED

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

(Signature)

(Name)

(Designation) (Address)

Schedule - M

(See Clauses 14.6, 15.2 and 19.7)

Payment Reduction for Non-Compliance

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

(i) Monthly lump sum payments for maintenance shall be reduced in the case of non-compliance with the Maintenance Requirements set forth in Schedule-E.

(ii) Any deduction made on account of non-compliance with the Maintenance Requirements shall not be paid even after compliance subsequently. The deductions shall continue to be made every month until compliance is done.

(iii) The Authority's Engineer shall calculate the amount of payment reduction on the basis of weightage in percentage assigned to non-conforming items as given in Paragraph 2.

2. Percentage reductions in lump sum payments on monthly basis

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

S. No.	Item/Defect/Deficiency	Percentage
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, raincuts, disturbed pitching, 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/5th km stones	5%
(f)	**Miscellaneous Items**	
(i)	Removal of dead animals, broken down/accidented vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	**Defects in Other Project Facilities**	5%

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

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

Where,

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

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

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

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

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

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

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

Schedule - N

(See Clause 18.1 (i))

Selection of Authority's Engineer

1. Selection of Authority's Engineer

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

(ii) In the event of termination of the Technical Consultants appointed in accordance with the provisions of Paragraph 1.1, the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of this Schedule-N.

2. Terms of Reference

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

3. Appointment of Government entity as Authority's Engineer

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

Annex – I

(Schedule - N)

Terms of Reference for Authority's Engineer

1. Scope

(i) These Terms of Reference (the "**TOR**") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "**Agreement**), which has been entered into between the [name and address of the Authority] (the "**Authority**") and ..... (the "**Contractor**")# for [Two-Laning] of the **** section (km ** to km **) of National Highway No. ** in the State of *** on Engineering, Procurement, Construction (EPC) basis, and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

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

2. Definitions and interpretation

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

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

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

3. General

(i) The Authority's Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.

(ii) The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement, but subject to obtaining prior written approval of the Authority before determining:

(a) any Time Extension;

(b) any additional cost to be paid by the Authority to the Contractor;

(c) the Termination Payment; or

(d) issuance of Completion Certificate or

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

(iii) The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.

(iv) The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2.

(v) The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.

(vi) In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

4. Construction Period

(i) During the Construction Period, the Authority's Engineer shall review and approve the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1 (vi). The Authority's Engineer shall complete such review and approval and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

(ii) The Authority's Engineer shall review and approve any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.

(iii) The Authority's Engineer shall review and approve the Quality Assurance Plan submitted by the Contractor and shall convey its comments to the Contractor within a period of 21 (twenty one) days stating the modifications, if any, required thereto.

(iv) The Authority's Engineer shall complete the review and approve of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.

(v) The Authority's Engineer shall grant written approval to the Contractor, where necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Project Highway for purposes of maintenance during the Construction Period in accordance with the provisions of Clause 10.4.

(vi) The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.

(vii) The Authority's Engineer shall inspect the Construction Works and the Project Highway and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular, the Authority's Engineer shall include in its Inspection Report, the compliance of the recommendations made by the Safety Consultant.

(viii) The Authority's Engineer shall conduct the pre-construction review of manufacturer's test reports and standard samples of manufactured Materials, and such other Materials as the Authority's Engineer may require.

(ix) For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4 (ix), the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any modification/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

(x) The Authority's Engineer shall test check at least 50 (fifty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

(xi) The timing of tests referred to in Paragraph 4 (ix), and the criteria for acceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.

(xii) In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works, the Authority's Engineer shall require the Contractor to carry out remedial measures.

(xiii) The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project Highway, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 shall apply.

(xiv) In the event that the Contractor fails to achieve any of the Project Milestones, the Authority's Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Authority's Engineer shall determine that completion of the Project Highway is not feasible within the time specified in the Agreement, it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority's Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.

(xv) The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.2.

(xvi) Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measure, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.

(xvii) In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.

(xviii) The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate, as the case may be. For carrying out its functions under this Paragraph 4 (xviii) and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

5. Maintenance Period

(i) The Authority's Engineer shall aid and advise the Contractor in the preparation of its monthly Maintenance Programme and for this purpose carry out a joint monthly inspection with the Contractor.

(ii) The Authority's Engineer shall undertake regular inspections, at least once every month, to evaluate compliance with the Maintenance Requirements and submit a Maintenance Inspection Report to the Authority and the Contractor.

(iii) The Authority's Engineer shall specify the tests, if any, that the Contractor shall carry out, or cause to be carried out, for the purpose of determining that the Project Highway is in conformity with the Maintenance Requirements. It shall monitor and review the results of such tests and the remedial measures, if any, taken by the Contractor in this behalf.

(iv) In respect of any defect or deficiency referred to in Paragraph 3 of Schedule- E, the Authority's Engineer shall, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards and shall also specify the time limit for repair or rectification of any deviation or deterioration beyond the permissible limit.

(v) The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of the Project Highway for undertaking maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure, the Authority's Engineer shall monitor the reopening of such lane(s), and in case of delay, determine the Damages payable by the Contractor to the Authority under Clause 14.5.

6. Determination of costs and time

(i) The Authority's Engineer shall determine the costs, and/or their reasonableness, that are required to be determined by it under the Agreement.

(ii) The Authority's Engineer shall determine the period of Time Extension that is required to be determined by it under the Agreement.

(iii) The Authority's Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause 18.5.

7. Payments

(i) The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2 (iv) (d).

(ii) Authority's Engineer shall -

(a) within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment, pending issue of the Interim Payment Certificate; and

(b) within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the

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

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

(iv) The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provisions of Clause 19.16.

8. Other duties and functions

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

9. Miscellaneous

(i) A copy of all communications, comments, instructions, Drawings or Documents sent by the Authority's Engineer to the Contractor pursuant to this TOR, and a copy of all the test results with comments of the Authority's Engineer thereon, shall be furnished by the Authority's Engineer to the Authority forthwith.

(ii) The Authority's Engineer shall retain at least one copy each of all Drawings and Documents received by it, including 'as-built' Drawings, and keep them in its safe custody.

(iii) Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as-built Drawings, in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Project Highway as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project Highway and setback lines, if any, of the buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.

(iv) The Authority's Engineer, if called upon by the Authority or the Contractor or both, shall mediate and assist the Parties in arriving at an amicable settlement of any Dispute between the Parties.

(v) The Authority's Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.

Schedule - O

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

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

(a) the estimated amount for the Works executed in accordance with Clause 19.3 (i) subsequent to the last claim;

(b) amounts reflecting adjustments in price for the aforesaid claim;

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

(d) amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2 (iii) (a);

(e) total of (a), (b), (c) and (d) above;

(f) Deductions:

i. Any amount to be deducted in accordance with the provisions of the Agreement except taxes;

ii. Any amount towards deduction of taxes; and

iii. Total of (i) and (ii) above.

(g) Net claim: (e) – (f) (iii);

(h) The amounts received by the Contractor upto the last claim:

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

ii. For Change of Scope Orders, and

iii. Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

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

(b) the deductions for maintenance work not done;

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

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

(e) amount towards deduction of taxes

3. Contractor's claim for Damages

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

Schedule - P

(See Clause 20.1)

Insurance

1. Insurance during Construction Period

(i) The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the Completion Certificate, the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:

(a) insurance of Works, Plant and Materials and an additional sum of [15 (fifteen)] per cent of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and

(b) insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.

(ii) The insurance under sub para (a) and (b) of paragraph 1(i) above shall cover the Authority and the Contractor against all loss or damage from any cause arising 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. [*****]

(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)

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