

DEENDAYAL PORT AUTHORITY



EPC

(Engineering, Procurement and Construction)

AGREEMENT

For

**Construction of Road Over Bridge (ROB) including
Roads and allied facilities at Tuna - Tekra**

EXECUTIVE ENGINEER (C-I)

CONSTRUCTION-DIVISION

DEENDAYAL PORT AUTHORITY

ROOM NO. 303, 2nd FLOOR,

NEW ANNEX BUILDING

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EPC Schedules

SCHEDULE – A

(SEE CLAUSES 2.1 AND 8.1)

SITE OF THE PROJECT

a) The Site

- (i) The Site of the Project ROB 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, structures, roadworks, 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 ROB are specified in **Annex-III**.

In the case of sections where no modification in the existing alignment of the Project ROB 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 ROB shall be proposed to be upgraded. The proposed profile of the Project ROB shall be followed by the contractor with minimum FRL as indicated in the alignment plan. The Contractor, however, can improve/upgrade the Road Profile as indicated in Annex – III based on site /design requirement.
- (v) The status of the environment clearances is given in **Annex IV**.

ANNEXURE- I
SCHEDULE – A
SITE

1. Site

The site of the Project ROB comprises of Construction of Road Over Bridge (ROB) including Roads and allied facilities at Tuna – Tekra on Engineering, Procurement and Construction (EPC) Mode. The land, carriageway and structures comprising the Site are described below.

2. Land

The Site of the Project ROB comprises the land as described below:

Sr. No.	Chainage (m) left		Chainage (m) right		Proposed ROW
	From	To	From	To	
	Main Carriageway Approach Road		Main Carriageway Approach Road		
1	2500.00	3318.00	2500.00	3318.00	60
	Major Creek Bridge		Major Creek Bridge		
2	3318.00	3418.00	3318.00	3418.00	60
	Main Carriageway Approach Road		Main Carriageway Approach Road		
3	3418.00	4270.00	3418.00	4270.00	60
	Reinforced Earth Wall (RE Wall)		Reinforced Earth Wall (RE Wall)		
4	4270.00	4460.00	4270.00	4460.00	60
	Viaduct Elevated Road		Viaduct Elevated Road		
5	4460.00	4782.00	4460.00	4782.	60
	RoB Crossing Over Rail		RoB Crossing Over Rail		
6	4782.00	4918.8	4782.00	4906.83	60
	Viaduct Elevated Road		Viaduct Elevated Road		
7	4917.74	5586.80	4906.22	5574.87	60
	Reinforced Earth Wall (RE Wall)		Reinforced Earth Wall (RE Wall)		
8	5586.80	5776.80	5574.87	5764.80	60
	Main Carriageway Approach Road Junction		Main Carriageway Approach Road Junction		
9	5776.80	5930	5764.80	5930.00	60
	Merging 4 lane to 6 lanes		Merging 4 lane to 6 lanes		
10	5930		6230		
	Two-lane service Road				
11	4100.00		5190.00		40

Note: - Zero chainage is started from the Tuna Junction.(E 612054.6685& N 2540939.780)

3. Carriageway

The existing road from Tuna point (zero chainage) up to the creek bridge is a 6-lane bituminous carriageway. Beyond the creek bridge, the existing bridge and road towards AKBTPPL comprise a 2-lane bituminous carriageway. The connectivity road leading to the container terminal from railway line chainage of 16/900 is presently under construction as a 4-lane divided carriageway.

The proposed ROB crosses the railway alignment at an approximate skew angle of 20°.Right of way for approach portion is 60 m wide along the existing road.

4. Structures

The details of existing structures are shown in the following table;

Type	HPC/ Slab/Arch / Box Nos.	Minor Bridge s Nos.	Major Bridges Nos.	ROB / RUB Nos.	Level Crossing
Existing Structures			From Chainage 3318.00 to 3418.00		Between 16/9 to 17/0 of Existing DBTK (E 612444.6984& N2537407.5403) Railway Track

5. Major Bridges

The Site includes the following Major Bridges:

Sr. No.	Location	Type of Structure			No. of Span with Span Length (m)	Width (m)
		Foundation	Sub Structure	Super Structure		
1.	Existing 2 lane Bridge over creek from chainage 3318.00 to 3418.00	Pile foundation	Pile caps	Pre-cast RC Girders	7 x 14.1m Span	9.3

6. Road over-bridges (ROB)

The Site includes the following ROB (Road over Bridge):**NIL**

Sr. No.	Existing Chainage (km)	Type of Structure			No. of Span with Span Length (m)	Total Width (m)
		Foundation	Sub Structure	Super Structure		
----- Nil -----						

7. Grade Separators

The Site includes the following grade separators: **NIL**

Sr. No.	Existing Chainage (km)	Type of Structure		No. of Span with Span Length (m)	Total Width (m)
		Foundation	Sub Structure		
----- Nil -----					

8. Minor Bridges

The Site structure includes the following minor bridges: **NIL**

9. Railway Level Crossings

The Site includes the following railway level crossings:

Sr. No.	Location (km)	Remarks
1	L.C between chainages 16.90 & 17.00 of the existing DBTK-Tuna line of DPA at Tuna – Tekra	

10. Underpasses (vehicular, non-vehicular)

The Site includes the following underpasses: **NIL**

11. Culverts:

The Site has the following culverts: **Nil**

12. Bus Bays

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

13. Truck Lay byes

The details of truck lay byes on the Site are as follows: **NIL**

14. Major Junction

The details of major junctions are as follows: Nil

Sr. No.	Location (km)	Remarks
-NIL-		

15. Minor Junction

The details of minor junctions are as follows: Near existing LC 16/900

Sr. No.	Location (km)	Remarks
1	L.C between chainages 16.90 & 17.00 of existing DBTK-Tuna line of DPA at Tuna - Tekra	

16. Bypasses

The details of the bypasses are as follows: **NIL**

Sr. No.	Location (km)	Remarks
-NIL-		

17. Other Structures: NIL

ANNEX - II
SCHEDULE – A
DATES OF PROVIDING RIGHT OF WAY

The date, on which the agreement will be executed, the Authority shall provide Right of Way to the Contractor on different stretches of site is stated below:

Sr. No.	Design Chainage (m)		Length (m)	Pro. Row	Date of Providing ROW
	From	To			
1.	Main Carriageway Approach Road				
RCW	2500	3000	500	60	Within 150 days from appointed date.
LCW	2500	300	500	60	
RCW	3000	3318	318	60	100 % ROW can be provided within 15 days after appointed date.
LCW	3000	3318	318	60	
2.	Major Creek Bridge				
RCW	3318	3418	100	60	100 % ROW can be provided within 15 days after appointed date.
LCW	3318	3418	100	60	
3.	Main Carriageway Approach Road				
RCW	3418	4270	852	60	100 % ROW can be provided within 15 days after appointed date.
LCW	3418	4270	852	60	
4.	Reinforced Earth Wall (RE Wall)				
RCW	4270	4460	190	60	100 % ROW can be provided within 15 days after appointed date.
LCW	4270	4460	190	60	
5.	Viaduct Elevated Road				
RCW	4460	4782	322	60	100 % ROW can be provided within 15 days after appointed date.
LCW	4460	4782	322	60	
6.	RoB Crossing Over the Rail				
RCW	4782	4812	30	60	100% Row will be provided within 150 days from appointed Date
LCW	4782	4812	30	60	
RCW	4812	4906.83	994.8	60	100% Row will be provided within 60 days from appointed date.
LCW	4812	4918..8	106.8	60	
7.	Viaduct Elevated Road				
RCW	4906.83	5100	1193.2	60	100 % ROW can be provided within 15 days after the Appointed Date.
LCW	4918.8	5100	181.2	60	
RCW	5100	5574.8	474.18	60	100 % within 150 days from appointed date.
LCW	5100	5586.8.	486.8	60	
8.	Reinforced Earth Wall (Re Wall)				
RCW	5574.8	5764.8	190	60	100 % within 150 days from appointed date or after construction of diversion Road
LCW	5586.8	5776.80	190	60	
9.	Main Carriageway Approach Road Junction				
RCW	5764.8	5930	165.2	60	100 % within 150 days from appointed date. Or after construction of diversion Road.
LCW	5776.80	5930	153.2	60	
10	Merging 4 lane to 6 lanes				
RCW	5930	6230	300	60	100 % within 150 days from appointed date. or after construction of diversion Road.
LCW	5930	6230	300	60	
11.	Two-lane service road				
	4100	5190	1090	40	100 % ROW van be provided within 15 days after the Appointed Date.

ANNEX – III
SCHEDULE – A
ALIGNMENT PLANS

The existing alignment of the subject project shall be modified as per the alignment plan indicated separately.

The alignment of the subject project 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 subject project 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 requirements.

The contractor shall improve/upgrade upon the traffic signage plan based on site/design requirement as per the relevant specifications / ITC Codes / Manual (IRC: SP: 55 & IRC: 67) or as applicable laws & regulations.

ANNEX – IV
SCHEDULE - A
ENVIRONMENTAL CLEARANCE

Sr. No.	Clearances	Present Status
1	Environment Clearances	Not required
2	Forest Clearances	Not required since no Forest Land involved

SCHEDULE- B

(See Clause 2.1)

DEVELOPMENT OF PROJECT ROB

1. Development of the Project ROB

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

Construction of Road Over Bridge (ROB) including Roads and allied facilities at Tuna – Tekra on Engineering, Procurement and Construction (EPC) Mode as described in Schedule-B and Schedule-C.

2. Rehabilitation and Augmentation

The construction of new ROB having Six-lane as described in this Schedule – B and Schedule – C.

3. Specifications and Standards

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

The particulars that must be specified in this Schedule-B are listed below as per the requirements of the Manual of Specifications and Standards for Six Lanning of Highways (IRC: SP:87-2019), referred to as the Manual or as applicable Indian standards codes, laws and regulations.

(SCHEDULE B)
DESCRIPTION OF PROJECT ROB

1. Preamble and Scope of the Contractor

This Schedule-B sets out the broad description, technical features, minimum requirements, and special conditions for the Construction of Road Over Bridge (ROB) including Roads and allied facilities at Tuna – Tekra on Engineering, Procurement and Construction (EPC) Mode.

The scope of the Contractor shall include, but not be limited to, the survey, investigation, design, engineering, approvals, construction, testing, commissioning, and maintenance during the Contract Period of all components necessary for completion of the Project ROB in accordance with this Agreement, the applicable Manual, IRC/MoRTH/Railway guidelines, approved GADs, and directions of the Authority / Authority's Engineer.

The Project broadly comprises the following:

- Construction of the ROB over the road & railway, including railway spans;
- Piled viaduct approaches on both sides of the ROB;
- RE wall approaches, retaining walls, and associated friction slabs on both sides between viaduct and approach road;
- Approach roads, service roads, and temporary diversion roads;
- Development and beautification of traffic island / rotary at Zero Chainage, including architectural monument features, landscaping, hardscape works, illumination, urban design elements, plantation, irrigation systems, signage integration and associated aesthetic development works, complete in all respects as approved by the Authority / Authority's Engineer
- Preparation, fabrication, submission and installation of a detailed three-dimensional physical model of the Project depicting the ROB, viaducts, RE walls, creek bridge, approaches, service roads, traffic circulation arrangements, landscaping features and associated project components, in a scale and level of detailing approved by the Authority / Authority's Engineer;
- Bridge over creek and associated approach integration works;
- Highway geometric improvements, embankments, pavements, culverts, separators, toe walls, median and stone pitching;
- Drainage works, utility provisions, road safety works, traffic control devices, street lightning, electrification, roadside furniture, project facilities, necessary utility facilities and all ancillary works;
- All temporary works, traffic management arrangements, liaison, approvals, and coordination with DPA, Railway Authorities, police, and other concerned agencies;
- Maintenance of existing traffic and road connectivity during execution;
- All such items as are required for safe, complete, and functional commissioning of the Project, whether specifically listed herein or reasonably inferable from the intent

of the Contract.

- The scope of the Contractor shall also include shifting, relocation, protection, reinstatement, and restoration of all affected utilities, all in accordance with Schedule B-1.

Unless expressly stated otherwise, the requirements stated in this Schedule-B shall be treated as minimum requirements. The Contractor shall develop the detailed design based on site conditions, investigations, design standards, approved drawings, and statutory / regulatory approvals. No claim shall lie on account of design development, increase in quantities, or modifications required for compliance with the Contract requirements, except as otherwise provided under Article 13 relating to Change of Scope.

2. General Description of Project

The work consists of the Construction of Road Over Bridge (ROB) including Roads and allied facilities at Tuna – Tekra on Engineering, Procurement and Construction (EPC) Mode.

The work includes construction of bridge with railway spans, including piled viaduct approaches, reinforced earth wall, retaining wall, approach roads, service road, temporary diversion road, creek bridge, highway geometric improvement, provision of drainage works, project facilities, etc., as described in this Agreement.

The scope shall additionally include development of an architectural traffic island / rotary feature at Zero Chainage as part of the overall urban and visual integration of the Project corridor. The Contractor shall prepare and submit architectural concepts, landscaping layouts, lighting arrangements and related aesthetic proposals for approval of the Authority prior to execution.

The Contractor shall also prepare and submit a detailed three-dimensional physical model of the Project for presentation and display purposes of the Authority. The scale, material specifications, level of detailing and presentation requirements of the physical model shall be finalised in consultation with and subject to approval of the Authority / Authority's Engineer.

Sr. No.	Design Chainage		Length (Metre)	Configuration	C/s Type
	From	To			
1.	Main Carriageway Approach Road		818	Main Carriageway 6-Lane Approach Road	1
	2500	3318			
2.	Major Creek Bridge		100	Main Creek Bridge 6-Lane Approach Road	2
	3318	3418			
3.	Main Carriageway Approach Road		852	Main Carriageway 6-Lane Approach Road	1
	3418	4270			
4.	Reinforced Earth Wall (RE Wall)		190	RE Wall Main Carriageway 6-lane Approach Road	3
	4270	4460			
5.	Viaduct Elevated Road		322	Viaduct Elevated Road Main Carriageway 6-lane Approach	4
	4460	4782			
6.	RoB Portion				
RCW	4782	4906.83	124.83	RoB Is Crossing Over AKBTPPL rail, DPW rails, existing road to AKBTPPL. Main Carriageway 6-lane	5
LCW	4782	4918.8	136.80		
7.	Viaduct Elevated Road		667.97	Viaduct Elevated Road Main Carriageway	4
	RCW	4906.83	5574.8		

Sr. No.	Design Chainage		Length (Metre)	Configuration	C/s Type
	From	To			
LCW	4918.8	5586.8.	668	6-lane Approach	
8.	Reinforced Earth Wall (RE Wall)				
RCW	5574.8	5764.8	190	RE Wall Main Carriageway 6-lane Approach Road	3
LCW	5586.8.	5776.80	190		
9.	Main Carriageway Approach Road Junction				
RCW	5764.8	5930	165.2	Main Carriageway 6-lane Approach Road	1
LCW	5776.80	5930	153.2		
10.	Merging 4 lane to 6 lanes				
RCW	5930	6230	300	Merging 4 lane to 6 lanes	-
LCW	5930	6230	300		
11.	Two-lane service road				
	4100	5190	1090	Service Carriageway 2-lane Approach Road	6
12.	Diversion Road		2100	Temporary Diversion 2-lane Road	7

3. Geometric Design and General Features

i. **General:** The geometric design and general features of the Project shall be in accordance with Section 2 of the applicable Manual.

ii. **Design Speed:** The design speed shall be 65 km/h.

iii. **Improvement of Existing Road Geometry:** The geometric design shall be improved for a design speed of 65 km/h and Intermediate Sight Distance (ISD) standard.

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

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

v. **Shoulders:** Type of shoulder shall be as per TCS.

Sr. No.	Design Chainage		Meter	Fully paved shoulders / footpaths	Reference to cross section
	From	To			
1.	Main Carriageway Approach Road				
	2500	3318	818	Earthen & Paved Shoulders	(TCS:1)
2.	Major Creek Bridge				
	3318	3418	100	Paved Shoulders with Footpaths	(TCS:2)
3.	Main Carriageway Approach Road				
	3418	4270	852	Earthen & Paved Shoulders	(TCS:1)
4.	Reinforced Earth Wall (RE Wall)				
	4270	4460	190	Paved Shoulders with Footpaths	(TCS:3)
5.	Viaduct Elevated Road				
	4460	4782	322	Paved Shoulders with Footpaths	(TCS:4)

Sr. No.	Design Chainage		Meter	Fully paved shoulders / footpaths	Reference to cross section
	From	To			
6.	RoB portion				
RCW	4782	4906.83	124.83	Paved Shoulders with Footpaths	(TCS:5)
LCW	4782	4918.8	136.8		
7.	Viaduct Elevated Road				
RCW	4906.83	5574.8	667.97	Paved Shoulders with Footpaths	(TCS:4)
LCW	4918.8	5586.8.	668.00		
8.	Reinforced Earth Wall (RE Wall)				
RCW	5574.8	5764.8	190	Paved Shoulders with Footpaths	(TCS:3)
LCW	5586.8.	5776.80	190		
9.	Main Carriageway Approach Road Junction				
RCW	5764.8	5930	165.2	Earthen & Paved Shoulders	(TCS:1)
LCW	5776.80	5930	153.2		
	Merging 4 lane to 6 lanes				
RCW	5930	6230	300	Earthen & Paved Shoulders	(TCS:1)
LCW	5930	6230	300		
10.	Two-lane service road				
	4100	5190	1090	Earthen Shoulders	(TCS:6)

vi. Underpasses / Overpasses

- Lateral and vertical clearances at underpasses: **NIL**
- Lateral and vertical clearances at overpasses: **NIL**
- Grade separated structures: **NIL**
- Cattle / Pedestrian underpass / overpass: **NIL**

Sr. No.	Design Chainage	Name of Intersecting Roads	Proposed span arrangement	Total width of the structure (m)	Remarks
----- Nil -----					

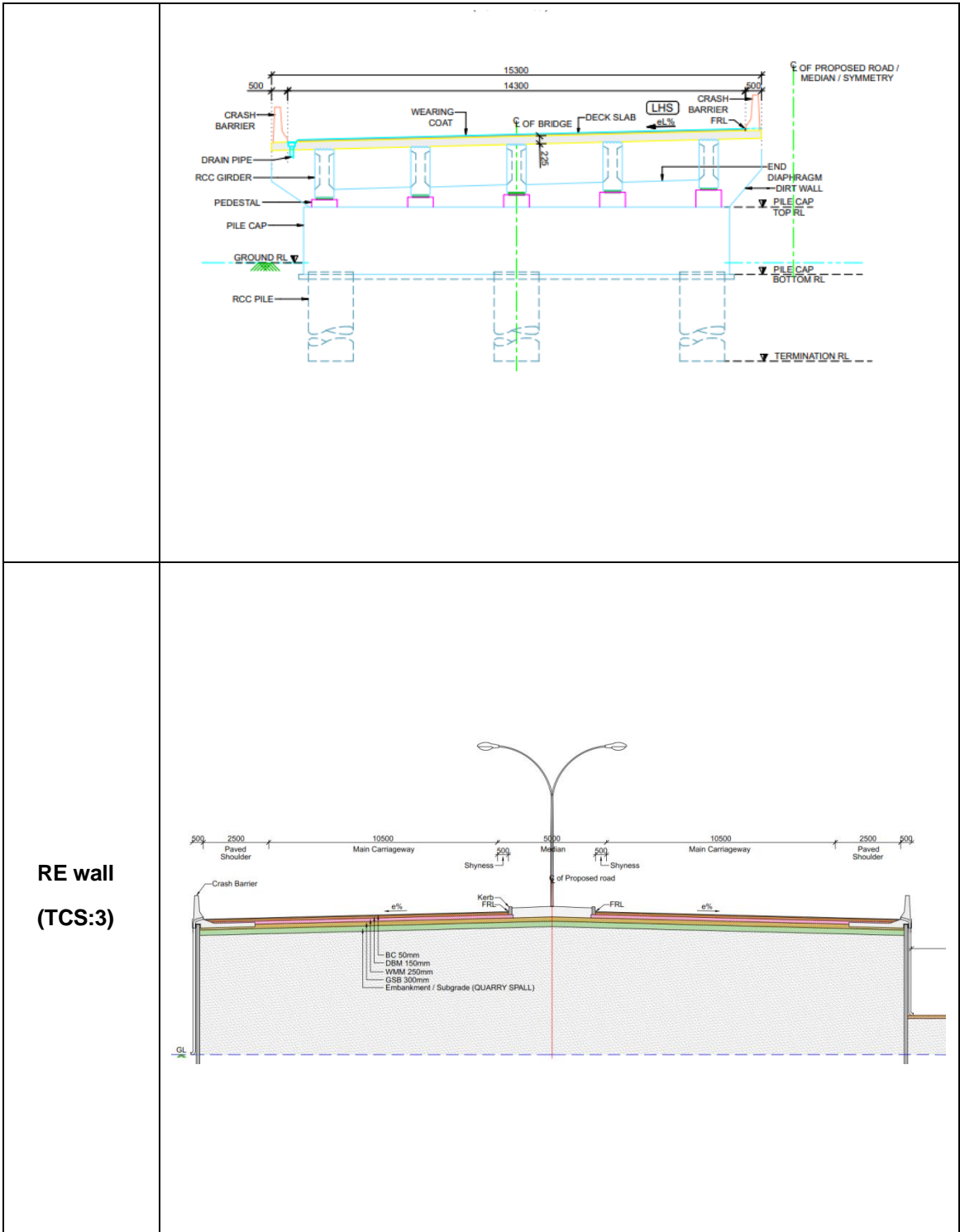
vii. Service Roads: Service roads shall be designed for 65 km/h and constructed at the locations and for the lengths indicated in the alignment plan. The Contractor shall consider all factors including permissible gradients, ISD requirements, acceleration and deceleration lanes, and all applicable IRC provisions. No positive Change of Scope shall be given for any increase in total length of service road; however, any decrease in service road length shall be treated as negative Change of Scope, as applicable.

Sr. No.	Location of Service Road(from m to m)	Right hand side (RHS)/Lefthand side (LHS) /or Both sides	Length(m) ofservice road
1.	4100-5190	One side only for connectivity to the AKBTP to the proposed main 6-lane carriageway road	1090

viii. Typical Cross Sections (TCS): Typical cross sections for the Road Over Bridge and solid approaches shall be as shown below and in the attached drawings, including:

- Approach road
- Service road
- RE wall
- Composite girder over rail crossing
- Viaduct
- Bridge over creek

Description	Typical Cross Section
Approach road (TCS:1)	
Bridge over creek (TCS:2)	



[illegible]

ii. Grade Separated Intersections: Grade separated intersections with / without ramps: **NIL**

Sr. No.	Location	Design Chainage	Location of Intersecting Roads	Proposed Span Arrangement of Viaduct	Total Width of the Viaduct	Remarks, if any
----- Nil -----						

- iii. Rotary circle development:** A suitably designed traffic island / rotary shall be developed at the Zero Chainage area of the Project corridor as part of the permanent works.

The development shall include architectural monument features, landscaping, plantation, hardscape treatment, lighting, drainage integration, traffic safety integration and all associated civil and electrical works required for complete execution.

The conceptual design, architectural treatment, dimensions, materials, landscaping philosophy, illumination features and associated aesthetic components shall be submitted by the Contractor for approval of the Authority / Authority's Engineer prior to execution.

The Contractor shall coordinate the development with the overall traffic circulation and road geometry requirements of the Project.

5. Road Embankment and Cut Section

- i. General:** 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 Existing Road: NIL

Sr. No.	Section (km)		Length (km)	Extent of raising (Top of finished road level)
	From	To		
----- Nil -----				

- iii. Maintenance during construction:** Existing Road / service road / diversions shall be maintained during the construction period of ROB / flyover / bridges.

6. Pavement Design

- i. General:** Pavement design shall be carried out in accordance with Section 5 of the applicable Manual. Existing carriageway and railway portion below road over bridges is to be maintained by the Contractor.
- ii. Type of Pavement:** The pavement type shall be Flexible Pavement.
- iii. Design Requirements:** Pavement shall be designed in accordance with Section 5 of the Manual and IRC SP:87-2019. Proposed crust compositions shown in the typical cross

sections shall be treated as minimum requirements.

- (a) **Design Period and Strategy:** Flexible pavement for new pavement, bituminous overlay, widening, and strengthening of existing pavement shall be designed for a minimum design period of 20 years. Stage construction shall not be permitted.

Minimum crust in mm given below shall be considered for design of pavement with maximum effective CBR = 6.9%.

Minimum Crust Composition for Solid Approaches and Service Road

- BC = 50 mm
- DBM = 150 mm
- WMM = 250 mm
- GSB = 300 mm / as per design
- Quarry Spall = 2000 mm / as per design
- Sub Grade / Boulder filling = 1000 / as per design

Modified bitumen or PMB-76E bitumen shall be used for the surface course, along with anti-stripping agent for bituminous works, as per the latest guidelines of the Ministry of Road Transport & Highways. For base course i.e. DBM layer shall be made up of VG-40 bitumen or modified bitumen.

- (b) **Design Traffic:** Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for minimum design traffic of 100 MSA (Million Standard Axles) or as per design, whichever is more critical.

- (c) **Reconstruction of Stretches: NIL**

Sr. No.	Design Chainage		Length	Configuration	C/s Type	Proposed Roadway	Remarks
	From	To	Km				
----- Nil -----							

- (d) **New Construction of Bypasses and Re-alignments: -**

- (ii) Realignment: Nil**

Sr. No.	Existing Chainage		Design Chainage		Length (km)	Payment Type	Remarks
	From	To	From	To			
----- Nil -----							

- (iii) Bypasses:**

Sr. No.	Existing Chainage		Design Chainage		Length (km)	Remarks
	From	To	From	To		
----- Nil -----						

7. Road Side Drainage

Suitable road drainage shall be designed as per IRC:SP:42 and constructed on either side of the approach road and service road.

The drainage system, including surface and subsurface drains for the Project ROB, shall be provided as per the Manual or IRC:SP:42.

Suitable crossings shall be provided at approaches to the properties. Invert levels of drains shall be decided on the basis of ground slope of adjacent properties and open ground, as per the Manual or IRC:SP:42.

The actual length of drains shall be determined by the Contractor considering the drainage locations and in accordance with Manual or IRC:SP:42 requirements, with approval of the Authority's Engineer.

8. Design of Structures

i. General:

- (a) All bridges, culverts, and structures shall be designed and constructed in accordance with IRC SP:87-2019 or applicable Indian standard code provisions and shall conform to the cross-sectional features and other details specified therein. However, the overall deck width of bridges shall be as per the approved GAD.
- (b) All structures shall be designed to carry utilities over the structures.
- (c) All structures shall be treated as being in marine environment, and all relevant and applicable codal provisions for marine exposure shall be complied.
- (d) All bridges shall be high-level bridges.
- (e) Cross-sections of new culverts and bridges at deck level shall conform to the typical cross-sections given in Section 7 of the Manual, except where otherwise specified in the GAD.
- (f) Footpaths and crash barriers shall be provided as per GAD.
- (g) Tender Document consists of Railway GAD.
- (h) The work shall be executed as per final approved/uploaded GAD.
- (i) Any change in the GAD, shall not be treated as change in scope.

ii. Structure-wise Requirements

(a) ROB Section with Composite Girders (TCS:5)

- Chainage: RCW 4782 to 4906.83 and LCW 4782 to 4918.8
- LCW length 124.83 M and RCW length 136.8 M
- AVG. 131 m length piled ROB with composite girders
- 6 lane configuration (15.3 m wide both side), 3 lane for up and 3 lanes for down
- Four spans: Right hand side: 37.2m x 2 nos. and 31.2m x 2 nos.
Left hand side: 31.2m x 2, 25.2m and 37.2m
- At ROB crossing DBTK 02 lane road, DBTK rail (2 existing + 1 future) and CT rail (1 proposed + 1 future)

- Minimum vertical clearance: 8.71 m from rail top level
- Skew: 20 degrees

(b) Piled Viaduct Approaches on Both Sides of the ROB (TCS:4)

- Chainage:
 - LCW 4460 to 4782 and RCW 4460 to 4782 4940 m to 5540 m LCW 44918.8 to 5586.8 and RCW 4906.83 to 5574.8
- Total length: Approx 990 m
- 31 spans of 30 m each, and some short span area 12.72m, 23.82m, 15.33m, 12.0m and 11.44m
- 6 lane configuration (15.3 m wide both side), 3 lanes for up and 3 lanes for down

(c) Bridge over Creek (TCS:2)

- Chainage: 3318 m to 3418 m
- 100 m length bridge on pile foundation
- As indicating in layout plan (Adjacent to existing 2-lane bridge on creek)
- 6 lane configuration (15.3 m wide both side), 3 lanes for up and 3 lanes for down

(d) Approach with RE Wall (TCS:3)

- Chainage: RE wall
 - LCW 4270 to 4460 and RCW 4270 to 4460, 5590 m to 5780 m, LCW 5586.8 to 5776.8 and RCW 5574.8 to 5764.8
- Reinforced Earth Wall
- 190 m x 2 RE wall approach ramps on both of the ends
- 6 lane (32.00 m wide), 3 lane for up and 3 lanes for down
- Ground improvement as per design requirement

(e) Approach Road (TCS:1)

- Chainage:
 - 2500 m to 3318 m
 - 3418 m to 4270 m
 - LCW 5776.8 to 5930 and RCW 5764.8 to 5930
 - Road Merging, exiting 4 lanes to 6 lanes from 5930 to 6230
- Includes engineered earth filling/quarry spall in embankments, 1 nos. of Geo grid layer over the sand layer, ground improvement (if required), pavement construction, toe-wall construction, culverts, stone pitching, highway separator development, etc.
- Total length: 1.86 km
- 6 lane (34.00 m wide incl. shoulders) 15.3 m wide both side), 3 lanes for up and 3 lanes for down

(f) Service Road (TCS:6)

- Chainage: 4100 m to 5192 m

- Includes engineered earth filling/quarry spall in embankments, 1nos. of Geo grid layer over the sand layer, ground improvement (if required), pavement construction, toe-wall construction, culverts, stone pitching, highway separator development, etc.
- Total length: approx. 1100 m
- Two-lane service road
- Width: 10.5 m incl. shoulders

(g) RC-Retaining Wall

- Location - ROB structure
- Towards Tuna point side – minimum 200 m
- Towards HGCTKPL side – minimum 200 m

(h) Culverts

- Overall length of all culverts shall be equal to the roadway width of the approaches.
- Existing culverts to be modified & reconstructed (if required). Widened to the roadway width of the Project ROB as per the typical cross section given in Section 7 of the Manual.
- Repairs and strengthening of existing structures, where required, shall be carried out.
- Additional new culverts shall be constructed as per site requirements and final alignment.
- Floor protection works shall be as specified in relevant IRC Codes and Specifications.

(i) Temporary Diversion Road (TCS:7)

- 2 Lane temporary diversion road connecting DPW container terminal and existing LC to keep container traffic running during construction

iii. Structural Design Parameters

- Approach road gradient: **Minimum 1 in 40**
- Foundation type: **Pile foundation as per GAD**
- Minimum pile diameter: **1400 mm**
- Concrete grade: **M50 for PSC girders & M40 for pier, abutment, pier cap, abutment cap, pedestal, approach slab, and other RCC structural members unless otherwise specified**
- Bearing: **POT-cum-PTFE type**
- Expansion joint: **Strip seal type**
- Wearing coat: **50 mm bituminous concrete, minimum 65 mm thick on RCC slab**
- Steel reinforcement: **TMT Fe-550D**
- Sulphate-resistant cement shall be used
- Seismic Zone: **V**

iv. Mandatory GAD / Span Arrangement Requirements

- Tender document consists of the Railway GAD as well.
- The work shall be executed as per the final approved/uploaded GAD.
- Design, construction, and detailing of ROB shall be as specified in Section 7 of the applicable Manual and relevant Railway design guidelines. Minimum 8.71 m vertical clearance from track level shall be maintained in the railway span as per approved Railway GAD.
- The EPC Contractor shall obtain approvals of all designs and drawings (RoB crossing over railway portion i.e. Composite girder) from concerned Railway Authorities and / or any other agencies appointed by Railways.
- For the supervision of execution of RoB crossing over railway portion i.e. Composite girder, EPC contractor has to appoint the agency as approved by Railway authority and cost for the same shall be borne by EPC contractor.
- Staircases shall be provided on both sides of the railway span.
- Any change in GAD shall not be treated as Change of Scope.
- The minimum bridge gradient shall be 1 in 40; however, it may be adjusted as per site constraints.
- Mentioned lengths are bare minimum.
- No positive Change of Scope shall be given for any increase in length of RE wall, retaining wall, or approach spans; however, any decrease in such lengths shall be treated as negative Change of Scope, as applicable.
- No deviation shall be allowed in span arrangement.
- Number of piles and minimum 1400 mm diameter piles shall be considered as per GAD for abutments/piers while carrying out detailed design of the ROB and both-side approach viaduct portions.
- If the Contractor proposes any change in span arrangement in RoB over railway portion i.e. Composite girder, the revised GAD shall be got approved from the Competent Authority of DPA by the Contractor at his own cost, and no extension of time shall be granted for time consumed in such approval.
- An effective drainage system for bridge decks shall be provided in accordance with the Manual.

v. Miscellaneous Structural Provisions

- Existing bridges to be reconstructed / widened: **NIL**
- Widening of existing bridges: **NIL**
- Additional new bridge: **Bridge over creek at chainage 3318, 100m long**
- Replacement of railings by crash barriers: **NIL**
- Repairs / replacements of railing / parapets: **NIL**
- Road under bridges (road under railway line): **NIL**
- Grade separated structures: **NIL**
- Repairs and Strengthening of Structures: **NIL**

9. Traffic Control Devices and Road Safety Works

- (i) Traffic control devices and road safety works shall be provided in accordance with Section 9 of the applicable Manual.
- (ii) The specification of reflective sheeting shall be in accordance with Section 9 of the Manual.
- (iii) Reflective traffic safety products / round tree reflectors shall be provided on trees for visibility at night.
- (iv) Traffic Management During Construction: During construction, all diversions including LC shifting and its approval from Railway shall be in the Contractor's scope and shall not be treated as Change of Scope. Permission or land acquisition for diversion, if required, shall be taken by the Authority.

Any portion of road damaged during construction and required to be repaired shall be repaired by the EPC Contractor at his own cost, after approval of repair methodology from the road owning Authority or as per instructions of the Authority / Authority's Engineer.

The Contractor shall:

- a) Maintain, at all times during construction, the minimum lane configuration as presently existing to ensure safe and smooth traffic flow. For avoidance of doubt, wherever 4 lanes exist, the Contractor shall maintain a minimum of 4 lanes at all times during construction.
- b) Deploy minimum 4 personnel, 24x7, for traffic management during construction to ensure free flow of traffic, safe movement, and minimum congestion.
- c) During festive seasons, social functions, political functions, and all other occasions affecting traffic, deploy minimum 8 personnel per km length of road in addition to other requirements.
- d) Liaise with all concerned authorities and take all actions related to safety and traffic management during construction. Obtain approval of traffic diversion plans, in consultation with DPA, Railways, police, and other concerned authorities, wherever required.
- e) Deploy a Safety Engineer having minimum 5 years' experience in handling traffic during construction of similar projects. CVs and contact details of such personnel shall be submitted to all concerned authorities along with the traffic management plan.
- f) Install all traffic control devices including solar blinkers, LED lights, standard barricades Type III, fixed barricades Type IV, sign boards, Digital screens & traffic control devices, portable variable message signs, water-filled barricades, New Jersey barriers, direction indicator barricades, and delineators, as required under the specific traffic management plan approved by the Authority's Engineer / Authority and as per IRC SP:55-2014.
- g) Engage a separate maintenance gang consisting of 4 labourers, painters, and

supervisors for maintenance of installed traffic control devices. They shall be provided with vehicles for transport of materials and labour, and shall periodically inspect and maintain such devices.

- h) Follow all prescribed traffic management practices in accordance with IRC SP:55-2014.

10. Change of Scope

The lengths 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 variation specified in this Schedule-B shall not constitute a Change of Scope, save and except variation arising out of a Change of Scope expressly undertaken in accordance with Article 13.

11. Project Supervision and Coordination

- (i) **Project Supervision:** The construction of the ROB will be funded and executed by Deendayal Port Authority (DPA) under the overall supervision of the Executive Engineer, Construction-I Division-Gandhidham/Authority Engineer. The ROB portion will also be subject to additional supervision by the Railway Department/Agency appointed by EPC contractor.
- (ii) **Bidder's Responsibilities:** To ensure smooth project execution and compliance with all relevant regulations, the successful bidder shall comply with the directions, requirements, and approvals of all the following entities:
- **Deendayal Port Authority (DPA):** As the funding agency, DPA will provide specific guidelines and requirements related to project financing and overall project goals.
 - **Executive Engineer, Construction-I Division, Gandhidham:** This office will oversee the overall execution of the project, including construction quality, adherence to timelines, and compliance with relevant highway construction standards
 - **Railway Department:** The Railway Department will provide specific guidance and approvals related to the design, construction, and safety aspects of the ROB portion of the Project.
- (iii) **Communication and Coordination:** The successful bidder shall be responsible for maintaining clear communication and effective coordination among all the above entities. This shall include attending regular meetings, submitting reports to each department as required, and promptly addressing concerns raised by the Authority, Authority's Engineer, Executive Engineer, Construction-I Division, Gandhidham, and Railway Authorities.

- (iv) **Submission of Physical Model** - The Contractor shall prepare and submit a detailed three-dimensional physical model of the Project for review, presentation and display purposes of the Authority.

The physical model shall depict all major Project components including ROB spans, viaducts, RE wall approaches, creek bridge, roads, junctions, traffic island / rotary development and associated infrastructure.

The scale, dimensions, materials, level of detailing, sectional representation, illumination features (if required) and presentation requirements shall be submitted by the Contractor for approval prior to fabrication.

The scope shall include preparation, fabrication, transportation, installation and handing over of the physical model complete in all respects.

(Schedule B-1)
Utility Shifting and Related Responsibilities

1. General

Notwithstanding anything contained elsewhere in this Agreement, and in accordance with the provisions of Schedule B-1, the identification, protection, coordination, shifting, relocation, removal, reinstatement, restoration, and making good of all existing and proposed utilities affected by the Project shall form part of the scope of the Contractor.

The Contractor shall be fully responsible for all works and actions required in relation to utilities, including but not limited to:

- (i) Carrying out detailed identification, verification, survey, and mapping of all existing utilities falling within or affecting the Project corridor, work sites, diversions, service roads, approach roads, structures, and temporary works.
- (ii) Coordinating with all concerned utility owning agencies / departments / authorities for shifting, relocation, disconnection, reconnection, protection, restoration, approvals, and execution of utility-related works.
- (iii) Preparing utility shifting drawings, schemes, method statements, traffic management arrangements, and all other documents required for obtaining approvals from the concerned authorities.
- (iv) Executing all utility shifting / relocation / protection works, whether temporary or permanent, including but not limited to:
 - Electric lines, HT Towers, poles, cables, transformers, feeder lines and associated infrastructure.
 - Water supply lines, valves, chambers, pumps and appurtenances.
 - Sewer lines, storm water drains and associated appurtenances.
 - Telecommunication / Optical Fiber Cable (OFC), ducts, poles and related systems.
 - Pipelines, crossings, service connections, and any other underground or overhead utilities.
 - Lighting, signalling, traffic systems, and other roadside or project-related services.
- (v) Providing all temporary arrangements, diversions, supports, sleeves, crossings, protective works, and safety measures required to ensure uninterrupted functioning of utilities, wherever necessary.
- (vi) Ensuring that utility shifting works are properly integrated with the construction methodology, traffic management plan, project phasing, and sequence of execution, so that the progress of the Project is not hindered.
- (vii) Restoring all affected utility corridors, surfaces, pavements, drains, structures, and adjoining areas to a condition equal to or better than that existing prior to commencement of the works.

- (viii) Liaising with DPA, Railway Authorities, local bodies, utility agencies, and all other concerned authorities for permissions, shutdown approvals, block requirements, restoration clearances, and completion certification, as applicable.
- (ix) Making do allowance in the Contract Price and construction programme for all costs, lead time, coordination effort, temporary works, protection works, approvals, shutdowns, and execution requirements associated with utility shifting / relocation works.

For avoidance of doubt, no separate payment or Change of Scope shall be admissible on account of utility shifting / relocation / protection / restoration works, except to the extent specifically provided in the Contract. The Contractor shall be deemed to have examined the site conditions and to have taken into account all utility-related obligations in its bid.

The Contractor shall ensure that no damage is caused to existing utilities. Any damage caused during execution shall be immediately attended to and rectified by the Contractor at its own cost and risk, to the satisfaction of the concerned authority and the Authority's Engineer.

Note: All the due payment/statutory charges related to shifting of utilities to the concerned authorities will be borne by EPC contractor.

2. Indicative List of Utilities for Shifting / Relocation

The following list is indicative and not exhaustive and is provided for guidance only. The Contractor shall be responsible for verifying the exact extent, location, quantity, and nature of utilities at site.

(i) Electrical Utilities

- Electrical tower shifting (dismantling and reinstallation) – 2 Nos.
- Electrical tower shifting with increased height (~30.92 m) – 1 No.
- Electrical tower installation (proposed height ~30.92 m) – 1 No.
- Electrical towers installation (220 kV, proposed height 51–54 m) – 2 Nos.
- Electrical cables (HT/LT/OFC associated with electrical systems) – as per site conditions

(ii) Railway Overhead Electrification (OHE)

- Dismantling of existing portal frames – 2 Nos.
- Installation of cantilever masts – 4 Nos.
- Transformers and associated railway electrical infrastructure – as per site conditions

Note: EPC contractor has to appoint the agency which is approved by railway dept. for the execution of railway OHE works & the cost for the same will be borne by the EPC contractor.

(iii) Water Supply / Sewerage / Pipelines

- Water supply pipelines – as per site conditions

- Sewer / sewage lines and associated appurtenances – as per site conditions
- Other pipelines (including industrial / utility pipelines) – as per site conditions

(iv) Tree Cutting / Clearance

- Felling / transplantation of trees – as per site conditions, including compliance with applicable forest and environmental regulations

(v) General Provisions

- The above quantities are indicative only and may vary based on actual site conditions, detailed survey, and requirements of concerned authorities.
- The Contractor shall carry out detailed utility mapping and verification prior to execution.
- All coordination, approvals, shutdowns, and permissions from utility agencies, Railway authorities, local bodies, and statutory authorities shall be within the scope of the Contractor.
- The Contractor shall ensure uninterrupted functioning of critical utilities, wherever required, through temporary arrangements.
- All utility shifting works shall be completed in a manner that does not adversely impact the project schedule.
- Restoration of all affected areas to original or better condition shall be the responsibility of the Contractor.
- No separate payment or Change of Scope shall be admissible for utility shifting works, and the Contractor shall be deemed to have included all such costs in the Contract Price.

(Schedule C)

See Clause 2.1

PROJECT FACILITIES

1. General

The Contractor shall design, provide, construct, install, test, commission, operate (where applicable), maintain during the Contract Period and Defect Liability Period, and hand over all Project Facilities forming part of the Project ROB in accordance with this Agreement, Schedule-B, Schedule-D, applicable Manuals, approved drawings, GAD, and directions of the Authority / Authority's Engineer.

The Project Facilities shall include all permanent and temporary facilities necessary for safe operation of the Project ROB, traffic management, user safety, illumination, guidance, environmental compliance, inspection, and supervision.

Unless expressly stated otherwise, all Project Facilities specified herein shall be deemed to be included in the Contract Price.

2. Scope of Project Facilities

Project Facilities shall include, but not be limited to, the following:

- (i) Roadside furniture and traffic safety appurtenances
- (ii) Traffic signs, pavement markings, delineators, cat eyes and hazard markers
- (iii) Pedestrian facilities including footpaths, railings, handrails and staircase provisions
- (iv) Crash barriers, parapets, median separators and edge protection systems
- (v) Highway / bridge / viaduct / service road lighting system
- (vi) Drainage interface elements (gratings, covers, inlet protection)
- (vii) Plantation / landscaping / compensatory plantation, where applicable
- (viii) Development and beautification of traffic island / rotary at Zero Chainage, including architectural monument, landscaping, hardscaping, illumination and associated aesthetic works;
- (ix) Project display boards and identification signage
- (x) Parking area, if included in approved design
- (xi) Concrete pier protection / anti-collision protection
- (xii) Facilities for Authority / Authority's Engineer (office setup, equipment, etc.)
- (xiii) Vehicle(s) for Authority
- (xiv) 2 Lane temporary diversion road connecting DPW container terminal and existing LC to keep container traffic running during construction or any additional diversion road is required to be considered by EPC contractor for maintaining the traffic flow.
- (xv) Any other facility required for safe, complete and functional operation of the Project

3. Roadside Furniture and Traffic Safety Appurtenances

The Contractor shall provide roadside furniture in accordance with Sections 9, 10 and 12 of the applicable Manual and approved drawings.

This shall include:

- (i) Regulatory, cautionary, informative, and destination signs
- (ii) Overhead and ground-mounted retro-reflective signage
- (iii) Pavement markings (lane lines, arrows, chevrons, stop lines, object markings, etc.)
- (iv) Cat eyes/road studs / reflective markers
- (v) Delineators, hazard markers, object markers and curve indicators
- (vi) Kerb markers, median separators and reflective safety devices
- (vii) Boundary stones, kilometre stones, chainage markers, where required
- (viii) Any other traffic safety device required under IRC / MoRTH / Railway standards
- (ix) All facilities shall be provided across the entire project stretch or as per approved drawings.

4. Safety Facilities on Structures and Approaches

- (i) **Crash Barriers / Parapets / Railings:** The Contractor shall provide:
 - W-beam metal beam crash barriers on approaches and ramps
 - RCC parapets with MS / galvanized handrails on ROB, viaduct and creek bridge
 - Median barriers and separators
 - Transition sections between road and bridge barriers
 - Edge protection at embankments for approach road and service road
- (ii) **Pedestrian Facilities:** The Contractor shall provide:
 - Footpaths on ROB / viaduct / bridge portions, as per GAD
 - Handrails / parapets along footpaths
 - Staircases on both sides of railway span with complete safety fittings
 - Anti-skid treatment, where required
 - Maintenance access provisions

5. Lighting and Electrical Facilities

- (i) **Scope:** The Contractor shall design, supply, install, test, commission and maintain complete lighting systems for:
 - ROB structure
 - Viaduct and creek bridge
 - Approach roads and service roads
 - Intersections and critical locations

- Staircases and pedestrian areas

The scope includes:

- Foundations and civil works
- LED luminaries, poles, brackets and panels
- Cables, conduits, ducts, earthing and lightning protection
- Control systems, feeders and metering
- All approvals from concerned electrical authorities

(ii) **Minimum Requirements**

- Luminaire type: Outdoor LED, minimum IP66
- Colour temperature: ~ 5500 K
- Pole height: Minimum 9.0 m
- Pole spacing: Typically, ≤ 25 m (subject to design)
- Illumination level: Minimum 25 lux average
- Uniformity: As per IRC / MoRTH standards
- Alternate circuiting: Wherever required
- The Contractor shall submit detailed lighting design for approval prior to execution.

6. Drainage Interface and Utility Corridor Elements

The Contractor shall provide:

- Drain gratings, covers, inlet protection systems
- Utility corridor covers and protection elements
- Access provisions and markers for utility corridors
- Safety provisions associated with drainage and utilities

7. Plantation and Environmental Works

The Contractor shall undertake:

- Avenue plantation where required
- Median / separator plantation, if applicable
- Turfing / Sweet Earth/ slope stabilization
- Compensatory afforestation, if required
- All works shall comply with statutory environmental and forest requirements.

8. Traffic Island / Rotary, Architectural Monument and Beautification Works

The Contractor shall design, develop, construct and maintain the traffic island / rotary at Zero Chainage, including architectural monument features, landscaping, hardscape elements, lighting, plantation, irrigation / watering arrangements, drainage integration, signage integration and all associated civil, architectural and electrical works.

The Contractor shall prepare and submit the conceptual design, architectural treatment, landscaping layout, monument details, material specifications, illumination arrangement and execution drawings for approval of the Authority / Authority's Engineer prior to

commencement of work.

The development shall be aesthetically integrated with the Project ROB corridor and shall not compromise traffic circulation, visibility, sight distance, road safety or future maintenance access.

Unless specifically provided otherwise, the cost of the above works shall be deemed included in the Contract Price.

9. Parking Area and Ancillary Facilities

Parking / Truck lay-by areas, if included in approved design, shall be provided complete with:

- Pavement
- Markings
- Drainage
- Lighting
- Signage

10. Project Display Boards

Project display boards shall be installed at both ends of the Project and other locations as directed by the Authority.

11. Concrete Pier Protection

Concrete pier protection of minimum 1.50 m height shall be provided in viaduct portions and other locations as directed.

Stone pitching around the pier for bridge over creek as directed by Authority Engineer.

12. Facilities for Authority / Authority's Engineer

(i) **Vehicle:** The Contractor shall provide:

- The Contractor shall provide within one month from the date of order by the Authority, 2 nos. of vehicle –latest model of Bolero/ Tata sumo / Innova or equivalent make.
- The vehicle shall be provided and maintained till the successful completion of Defect Liability Period for the complete work. Initially, new vehicle shall be provided. The vehicle shall be replaced with a new vehicle after a maximum run of 90,000 km or two years whichever is earlier. All necessary taxes for operating the vehicle shall be fully paid and all necessary papers shall be provided as required by prevailing Motor Vehicle Act with comprehensive insurance cover for the vehicle.
- The vehicle shall be provided day and night full time to the Authority. The Contractor shall also make available full-time driver having valid license at such times and for such duration as instructed by the Authority.
- The vehicle shall be maintained in a smooth-running condition. All expenses required for keeping the vehicle in smooth running condition such as fuel, lubrication oil and other consumables, necessary service and maintenance, driver, repairs and replacement etc. are to be met by the Contractor.

- In the event of any vehicle being off the road for maintenance or on account of breakdown, the Contractor shall provide substitute vehicle immediately.
- If the Contractor at any time fails to provide above vehicle (that the Contractor failed to provide) shall be debited Rs. 3000/- per day per vehicle to the Contractor's IPC as penalty.

(ii) **Office Setup:** The Contractor shall provide two offices for Authority and Authority's Engineer each having a minimum of the following facilities:

- 5 no. CCTV night vision HD camera for site office with facility of 30 days back up.
- Executive Chair – 1 no.,
- Medium Back leather Officers chairs of min. Size 655 W x 660D x 970 H mm – 3 nos., Mesh Back Visitors chairs of min. size 600W x 660D x 925H– 10 nos.,
- Door Godrej Steel Almirah of min. size 91.6W cm x 198 H cm x 48.6D cm– 4 no.
- 2 (Two) nos. of All in one Computer System with core i5 4th Gen/8GB/500 GB Tiny CPU + 250gb SSD RAM /19" Monitor + Keyboard + Mouse + FHD Webcam + Mic + Speakers + Wi-Fi/Warranty/Windows 10/MS Office 360 Along with High speed internet connections in all along and with 1 (One) A3 Inkjet colour printer of min. capacity 22 ppm, 1 (one) Scanner of min. capacity 35 ppm + Licence AutoCAD Software
- The complete office setup shall be approved by the Authority prior to procurement by the contractor.
- All the 2 nos. of office setup (incl. AC facility) supplies & Maintenance requirement shall be fulfilled by the Contractor up to completion DLP period.
- If the Contractor at any time fails to provide office setup (that the Contractor failed to provide) shall be debited Rs. 10,000/- per day to the Contractor's IPC as a penalty.

13. Temporary Project Facilities

The Contractor shall provide during construction:

- Temporary lighting
- Traffic signages and barricades
- Public information boards
- Temporary drainage arrangements
- Safety arrangements for road users

14. General

- All facilities deemed included in Contract Price
- Designs to be approved prior to execution
- Maintenance responsibility with Contractor
- Any missing but necessary facility deemed included
- The Contractor shall construct the Project Facilities in accordance with the provisions of this Agreement.

SCHEDULE D
(See Clause 2.1)
SPECIFICATIONS AND STANDARDS

1. General

- (i) **Applicable Specifications and Standards:** All materials, design, construction and workmanship shall conform to:
- MoRTH Specifications for Road and Bridge Works (latest revision) - Called the Manual.
 - IRC:SP:87-2019 – Manual of Specifications and Standards for Six-Laning of Highways
 - Relevant IRC / IS Codes
 - Railway standards (RDSO) and approved General Arrangement Drawings (GAD)
 - Applicable Government of Gujarat circulars
 - The Contractor shall comply with the Specifications and Standards set forth in Annex I of this
 - Schedule-D
 - Good Industry Practice, where not specified, subject to approval of Authority's Engineer

In case of any conflict between the provisions of the Manual, IRC/MoRTH Specifications and these Special Conditions, the provisions of these Special Conditions shall prevail. In case of conflict between Schedule B and Schedule D, Schedule B shall govern design intent and Schedule D shall govern specifications and execution.

(ii) **Interpretation and deviations: For the purposes of this Agreement:**

- The terms "Concessionaire" "Independent Engineer" and "Concession Agreement" used in the Manual shall be deemed to be substituted by the terms "EPC Contractor", "Authority's Engineer" and "Agreement" respectively.
- Notwithstanding anything to the contrary contained in Paragraph above, the following Specifications and Standards shall apply to the Project ROB, and for purposes of this Agreement, the aforesaid Specifications and Standards shall be deemed to be amended to the extent set forth below:
- TCS, Road / ROB Geometry, etc. to be as per approved GAD and requirements set forth in Schedule B.

2. Special Conditions:

The following special conditions shall apply:

- (i) All materials and works shall be subject to inspection, testing and approval by the Authority's Engineer.
- (ii) Photography / Videography of the works shall be undertaken before, during, and after

execution for proper record, and digital copies shall be submitted to the Competent Authority.

- (iii) Project display boards shall be erected at both ends of the project reach.
- (iv) Guidelines for road safety vide Ministry's letter no. RW/NH-33072/04/2004-S&R(R), dated 27.04.2010, shall be followed.
- (v) Guidelines for implementation of SCADA System vide Government of Gujarat Road and Building Department circular no. MCN/102015/20/H dated 19.02.2021 shall be followed.
- (vi) 10% testing shall be done in DPA laboratory & remaining testing will be performed in NABL approved laboratory.
- (vii) Bitumen shall be procured only from Indian refineries or approved sources conforming to MoRTH specifications.
- (viii) Bitumen shall be heated in boilers only; heating in drums on open fire shall not be permitted. Spraying shall be done only with mechanical sprayer and premixing of bitumen and aggregates shall be done only in proper mechanical mixer / hot mix plant.
- (ix) For BC, PMB 76E / modified bitumen (polymer / crumb rubber / natural rubber) shall be used. Anti-stripping agent shall be used PMB 76E / modified bitumen for BC works.
- (x) For DBM, VG-40 / modified bitumen (polymer / crumb rubber / natural rubber) shall be used. Anti-stripping agent shall be used VG-40 / modified bitumen for DBM works.
- (xi) The Pile Integrity Test for all piles shall be carried out as per Government circular.
- (xii) Where geo-grid is specified in Schedule B or approved drawings, the same shall be provided in accordance with applicable MoRTH circulars and specifications
- (xiii) Ten (10) hardbound copies of the executed agreement shall be submitted by the Contractor.
- (xiv) For concrete works, the Contractor shall use only stationary (central) concrete batching and mixing plant with PLC connected with computer and SCADA software.
- (xv) Protective coating of concrete surfaces shall be provided as per relevant IRC/MoRTH provisions and approved specifications, including epoxy-based systems for substructure and exposed surfaces, wherever applicable.
- (xvi) The Contractor shall submit, at the time of each IPC and at the time of final bill, original invoice / gate pass of approved bitumen, emulsion, cement, steel, aggregates, sand, soil, GSB material, admixtures, etc. used in the Project ROB, along with test results, material consumption statements, and royalty payment details for the construction materials with respect to the work done under that IPC.
- (xvii) The Contractor shall maintain day-to-day raw and manufactured material consumption registers, plant site registers, and paver site work register of bitumen mix quantity (MT) as per IRC:SP:112 and MoRTH & good industrial practice.
- (xviii) Surveying with the help of Network Survey Vehicle (NSV) shall be conducted:
 - Before commencement of work,
 - After completion of work, and
 - Every six months after completion of work, in accordance with circular no. RW/NH-34066/32/2019/S&R(P&B) dated 13.11.2019.

General Technical Specification

General:

These specifications cover the items of work in both structural and non-structural components falling under the scope of this document. All work shall be carried out in conformity with these specifications.

In general, the provisions of relevant Indian Standards, Indian Roads Congress (IRC) codes, MORT&H Specifications (5th Revision), standard specifications of the Government of Gujarat, and other applicable national standards shall be followed unless otherwise specified.

These specifications are not intended to cover minor details. The work shall be executed in accordance with best modern practices and all latest codes and standards referred to in these specifications. Revisions issued up to 30 days prior to the submission of tenders shall be considered.

This document shall be read in conjunction with other contract documents, including tender specifications, the price bid, contract drawings, and other related documents.

Order of precedence

For this document, in case of errors, omissions and/or disagreement between written and scaled dimensions on the drawings or between the drawings and specifications etc. the following order of precedence shall apply:

- a) Between scaled dimensions and written dimensions / description on a drawing, the later shall be accepted.
- b) Between the written or shown description/or dimensions in the drawing, and the corresponding one in the specification, the later shall apply.
- c) For execution stage, the following order of precedence shall apply.
 - (i) Specific provisions of specifications and conditions of this contract document.
 - (ii) Execution drawings/ notes/modifications specifically approved for construction.
 - (iii) In the absence of above, standard specifications of MORTH (5th Revision) /R&B and Good engineering practices in that order.

In case of conflicting provisions of IRC specifications and IS specifications, former shall prevail, i.e. IRC specifications would have precedence over IS specifications unless tender provisions are specific for the particular item of work.

However, notwithstanding anything said above, the interpretation/ decision of the Port Authority /Engineer-in-charge shall be final and binding.

1. Inclusive documents:

The provisions of all conditions of contract, those specified in this tender as well as execution drawings, and notes or other specifications issued in writing by the Engineer-in charge shall form part of these specifications.

2. Order of precedence, clarifications and interpretations:

When the various specifications and codes referred to in preceding portion are at variance with these specifications and or with each other, the order of precedence will generally be

as under;

The attention of the contractor is drawn to those clauses of the relevant IS Codes that require either supplementary specifications from the Engineer-in-Charge or mutual agreement on such specifications between the supplier and the purchaser.

In such cases, it shall be the responsibility of the contractor to seek clarification on any uncertainty or ambiguity and to obtain prior approval from the Engineer-in-Charge before undertaking any supply, construction, etc.

3. Measurement and Payments:

- a) The methods of measurement and payment shall be as given in Price Bid–Payment Terms. Should there be any detail of construction of materials which has not been referred to in the specifications or in the drawings but the necessity for which may be implied or inferred there from, or which are usual or essential for the completion of the work in the trades, the same shall be deemed to be included in the rates quoted by the contractor in the Price Bid.
- b) Unacceptable work
All defective works are liable to be demolished, rebuilt and defective materials replaced by the contractor at his own cost. In the event of such works being accepted by carrying out repairs etc.as specified by the Engineer-in-charge, the cost of repairs will be borne by the contractor and will be paid for the works actually carried out by him at reduced rates of the tendered rates, as may be considered reasonable by the Engineer-in-charge, in the preparation off in aileron account bills.

Annex-I
SCHEDULE D
(See Clause 2.1)
SPECIFICATIONS AND STANDARDS

- Item wise Technical Specifications and Codes to be followed
- List of Approved Makes of Materials for Civil Works
- Schedule of testing of materials

SCHEDULE - E
(See Clauses 2.1 and 14.2)
MAINTENANCE REQUIREMENTS

1. Maintenance Requirements

- (i) The Contractor shall, at all times maintain the Project ROB 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 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 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 corrected 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 ROB 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 in the section of all bridges, culverts, and drainage systems before [1stJune] 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 [10thJune] every year. The Contractor shall complete the required repairs before the onset of the Authority's Engineer's compliance report. Post monsoon in the section shall be done by the [30thSeptember] 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

Deleted.

(Schedule-E)
Repair/rectification of Defects and deficiencies

Table 1: Maintenance criteria for Pavements

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/ Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, Service Road, approaches of Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm in depth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA 2003 (http://www.tfhr.com/pavement/ttp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2
	Cracking	Nil	< 5 % subject to the limit of 0.5 sqm for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15 -30 days	MORT&H Specification 3004.2
	Corrugation and Shoving	Nil	< 0.1% of area	Daily	Length Measurement Unit like		2-7 days	IRC:82-2015
	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			7-15days	IRC:82-2015 read with IRC SP 81

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					
	Edge Deformation / Breaking	Nil	< 1 m for any 100 m section and width < 0.1 m at any location, restricted to 30 cm from the edge	Daily			7- 15 days	IRC:82-2015
	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	60 SN	50 SN	Bi- Annually			180 days	BS: 7941-1: 2006
	Pavement Condition Index	3	2.1	Bi- Annually			180 days	IRC:82-2015
	Other Pavement Distresses			Bi- Annually			2-7 days	IRC:82-2015
	Deflection/ Remaining Life			Annually	Falling Weight Deflector-meter	IRC 115:2014	180 days	IRC:115-2014

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					
Rigid Pavement (Pavement of MCW, Service Road, Grade structure, Approaches of connecting roads, slip roads, lay byes etc. as applicable)	Roughness BI	2200mm/km	2400mm	Bi- Annually	Class I	ASTM E950 (98) :2004 and ASTM	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, 180 days	IRC:SP:83-2008 180 days
		Minimum SN	Traffic speed (km/h)	Coefficient Routine Investigation Machine or equivalent)				
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					
Embankment / Slope	Edge drop at shoulders	Nil	40mm	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC	7-15days	MORT&H Specification 408.4
	Slope of camber/cross fall	Nil	<2% variation in prescribed slope of camber /cross fall	Daily			7-15days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15% variation in prescribe side slope	Daily			7-15days	MORT&H Specification 408.4
	Embankment Protection	Nil	Nil	Daily			7-15days	MORT&H Specification

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					
	Rain Cuts/Gullies in slope	Nil	Nil	Daily Specially During Rainy Season			7-15days	MORT&H Specification

Table 2 : Maintenance criteria for Rigid Pavements

Sr. No	Type of Distress	MeasuredParameter	Degree ofSeverity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
Cracking						
1	Single Discrete Cracks	w=width of crack L= length of crack d=depth of crack D = depth of slab	0	Nil, not discernible	No Action	Not Applicable
			1	w < 0.2 mm. hair cracks		
			2	w = 0.2 - 0.5 mm, discernible from slow-moving car	Seal without delay	Seal and stitch if L >lm. Within 7days
			3	w = 0.5 - 1.5 mm, discernible from fast-moving car		
			4	w = 1.5 - 3.0 mm	Seal, and stitch if L > l m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15days
			5	w > 3 mm.		
2	Single Transverse	w = width of crack	0	Nil, not discernible	No Action	

Sr. No	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
	(or Diagonal) Crack intersecting With one or more joints	L = length of crack d = depth of crack D = depth of slab	1	w < 0.2 mm, hair cracks	Route and seal with epoxy.	Staple or Dowel Bar Retrofit.
			2	w = 0.2 - 0.5 mm, discernible from slow vehicle	Within 7 days	Within 15 days
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1m. Within 7 days	Full Depth Repair: Dismantle and reconstruct affected.
			4	w = 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days Not Applicable, as it may be full depth	Portion with norms and specifications - See Para 5.5 & 9.2 Within 15 days
			5	W > 6mm, usually associated with spalling, and/or slab rocking under traffic		
3.	Single Longitudinal Crack intersecting with one or more joints	w = width of crack L = length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	w < 0.5 mm, discernible from slow moving vehicle	Seal with epoxy, if L > 1 m. Within 7 days	Staple or dowel bar retrofit. Within 15 days
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > 1 m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair with stapling. Within 15 days
			4	w = 6.0 - 12.0 mm, usually associated with palling	Not Applicable, as it may be full depth	
			5	w > 12mm, usually associated with spalling, and/or slab rocking under traffic		Full Depth Repair Dismantle and reconstruct the affected portion as per norms and specifications- See Para 5.6.4 Within 15 days
4	Multiple Cracks	w = width of crack	0	Nil, not discernible	No Action	

Sr. No	Type of Distress	MeasuredParameter	Degree ofSeverity	Assessment Rating	Repair Action		
					For the case d < D/2	For the case d > D/2	
	intersecting with one or more joints		1	w < 0.2 mm, hair cracks	Seal, and stitch if L > l m.		
			2	w = 0.2 - 0.5 mm. discernible from slow vehicle	Within 15 days		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days		
			4	w = 3.0 - 6.0 mm panel broken into 2 or 3pieces			
			5	w > 6 mm and/or panel broken into more than 4 pieces			
5	Corner Break	w = width of crack L = length of crack	0	Nil, not discernible	No Action		
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to secure broken parts. Within 7 days		Seal with epoxy seal with epoxy Within 7days
			2	w < 1.5 mm; L < 0.6 m, only one corner broken	Partial Depth (Refer Figure 8.3 of IRC:SP: 83-2008 Within 15 days		Full depth repair
			3	w < 1.5 mm; L < 0.6 m, two corners broken			
			4	w > 1.5 mm; L > 0.6 m or three corners broken			Reinstate sub-base, and reconstruct the slab as per norms and specifications within 30days
			5	Three or four corners broken			
6	Full depth repair	w = width of crack L =length(m/m²)	0	Nil, not discernible		No Action	
			1	w < 0.5 mm; L < 3 m/m²	Not Applicable, as it may be full depth	Seal with low-viscosity epoxy to secure broken parts. Within 15days	
			2	either w > 0.5 mm or L < 3 m/m2			
			3	w > 1.5 mm and L < 3 m/m²			

Sr. No	Type of Distress	MeasuredParameter	Degree ofSeverity	Assessment Rating	Repair Action		
					For the case d < D/2	For the case d > D/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						
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	Long Term	
					No action.	Not Applicable	
			1	r < 2 %	Local repair of areas damaged and liable to be damaged. Within 15 days		
			2	r = 2 - 10 %			
			3	r = 10-25%	Bonded Inlay, 2 or 3 slabs if affected. Within 30 days		
			4	r = 25 - 50 %			
			5	r > 50% and h > 25 mm	Reconstruct slabs, 4 or more slabs if affected. 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 %			

Sr. No	Type of Distress	MeasuredParameter	Degree ofSeverity	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	Bonded Inlay within 30 days				
9	Polished Surface/Glazing	t = texture depth, sand patch test	0		No Action	Not Applicable
			1	t > 1 mm		
			2	t = 1 - 0.6 mm	Monitor rate of deterioration	
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		
			5	t < 0.1 mm	Diamond Grinding if affecting 50% or more slabs in a continuous stretch of minimum 5 km. Within 30 days	
10	Pop out (Small Hole), Pothole Refer Para 8.4	n = number/m ² d =diameter h=maximum depth	0	d < 50 mm; h < 25 mm; n < 1 per 5 m ²	No action.	Not Applicable
			1	d=50-100mm; h<50mm; n<1per 5 m ²	Partial depth repair 65 mm deep. Within 15 days	
			2	d=50-100mm; h>50mm;		

Sr. No	Type of Distress	MeasuredParameter	Degree ofSeverity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
				n<1per 5 m ²		
			3	d = 100- 300mm; h < 100mm n < 1 per 5m ²	Partialdepthrepair110mmi.e .10 mm more than the depth of the hole. Within 30 days	
			4	d = 100- 300mm; h > 100mm;n< 1 per 5m ²		
			5	d > 300mm; h > 100mm: n > 1 per5 m ²	Full depth repair. Within 30 days	
			11	Joint Seal Defects	Loss or damage L = Length as % total joint length	
			1	Discernible < 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 in compressible material.	Clean and reapply sealant in selected locations. Within 7 days	
			5	Severe; w > 3 mm negligible protection against ingress of water and trapping incompressible material	Clean, widen and reseal the joint. Within 7 days	
Joint Defects						

Sr. No	Type of Distress	MeasuredParameter	Degree ofSeverity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
12	Spalling of Joints	w=width on either side of the joint L=length of spalled portion (as % joint length)	0	Nil, not discernible	No action.	Not Applicable
			1	w < 10 mm	Apply low viscosity epoxy resin/ mortar in cracked portion. Within 7 days	
			2	w = 10 - 20 mm, L < 25%		
			3	w = 20 - 40 mm, L > 25%	Partial Depth Repair. Within 15 days	
			4	w = 40 - 80 mm, L > 25%	30 - 50 mm deep, h = w + 20% of w, within 30 days	
			5	w > 80 mm, and L > 25%	50 - 100mm deep repair. H = w + 20% of w. Within 30 days	
13	Faulting(or Stepping) in Cracks or Joints	f = difference of level	0	not discernible, < 1 mm	No action	No action
			1	f < 3 mm		
			2	f = 3 - 6 mm	Determine cause and observe, take action for diamond grinding	Replace the slab as appropriate.
			3	f = 6 - 12 mm	Diamond Grinding	Within 30days
			4	f = 12 - 18 mm	Raise sunken slab.	Replace the slab as appropriate. Within 30days
			5	f > 18 mm	Strengthen sub-grade and sub- base by grouting and raising sunken slab	
14	Blowup or Buckling	h =vertical displacement from normal profile	0	Nil, not discernible	No Action	Not Applicable
			1	h < 6 mm		

Sr. No	Type of Distress	MeasuredParameter	Degree ofSeverity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			2	h = 6 - 12 mm	Install Signs to Warn Traffic within 7 days	
			3	h = 12 - 25 mm		
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shattered slabs, i.e. 4 or more pieces	Replace broken slabs. Within 30 days	
15	Depression	h = negative vertical displacement from normal profile L = length	0	No discernible, h < 5 mm	No action.	Not Applicable
			1	h = 5 - 15 mm		
			2	h = 15-30 mm, Nos <20%joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Strengthen sub-grade. Reinstall pavement at normal level	
			5	h > 100mm	if L < 20 m. Within 30 days	
16	Heave	h = positive vertical displacement from normal profile. L = length	0	Not discernible. h < 5 mm	No action.	Scrabble
			1	h = 5 - 15 mm	Follow up.	
			2	h = 15 - 30 mm, Nos <20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Stabilize sub-grade.	

Sr. No	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
			5	$h > 100\text{mm}$	Reinstate pavement at normal level if length < 20 within 30 days	
17	Bump	h = vertical displacement from normal profile	0	$h < 4\text{ mm}$	No action	
			1	$h = 4 - 7\text{ mm}$	Grind, in case of new construction within 7 days	Construction Limit for New Construction.
			3	$h = 7 - 15\text{ mm}$	Grandnieces of ongoing Maintenance within 15 days	Replace in case of new construction. Within 30days
			5	$h > 15\text{ mm}$	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	Lane to Shoulder Drop off	f = difference of level	0	Nil, not discernible < 3mm	No action.	
			1	$f = 3 - 10\text{ mm}$	Spot repair of shoulder within 7 days	
			2	$f = 10 - 25\text{ mm}$		
			3	$f = 25 - 50\text{ mm}$	Fill up shoulder within 7 days	
			4	$f = 50 - 75\text{ mm}$		$f = 50 - 75\text{ mm}$
			5	$f > 75\text{ mm}$		For any 100m stretch Reconstruct shoulder, if affecting 25% or more of stretch.

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

Table 3 : Maintenance criteria for Safety Related Items and Other Furniture Items

Asset Name	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial Measures	Time limit for Rectification	Specifications and Standards
Highway	Availability of Safe Sight Distance	ISD shall be not less than 200 m and may be rounded up suitably during detailed design.	Monthly	Manual Measurement with Odometer along with video/ image backup	Removal of obstruction within 24 hours, in case of sightline affected by temporary objects such as trees, temporary encroachments. In case of permanent structure or design deficiency: Removal of obstruction/improvement of deficiency at the earliest Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.		IRC: SP 84-2014
		Design Speed, 65 kmph					
Pavement Marking	Wear	<70% of marking remaining	Bi- Annually	Visual Assessment as per Annexure-F of IRC:35-2015	Re-painting	Cat-1 Defect – within 24 hours Cat-2 Defect - within 2 months	IRC:35-2015
	Daytime Visibility	During expected life Service Time Cement Road 130mcd/m ² /lux Bituminous Road- 100mcd/m ² /lux	Monthly	As per Annexure-D of IRC:35-2015	Re-painting	Cat-1 Defect – within 24 hours Cat-2 Defect –	IRC:35-2015

Asset Name	Performance Parameter	Level of Service (LOS)			Frequency of Measurement	Testing Method	Recommended Remedial Measures	Time limit for Rectification	Specifications and Standards
								within 2 months	
	Night Time Visibility	Initial and Minimum Performance for Dry Retro reflectivity during night time:			Bi-Annually	Asper Annexure-E of IRC:35-2015	Re-painting	Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months	IRC:35-2015
		Design Speed	(RL) Retro Reflectivity (mcd/m ² /lux)						
			Initial (7 days)	Minimum Threshold level (TL) & warranty period required up to 2 years					
		Up to 65	200	80					
		65 - 100	250	120					

Asset Name	Performance Parameter	Level of Service (LOS)			Frequency of Measurement	Testing Method	Recommended Remedial Measures	Time limit for Rectification	Specifications and Standards
		Above 100	350	150					
		Initial and Minimum Performance for Night Visibility under wet conditions (Retro reflectivity): Initial 7 days Retro reflectivity: 100 mcd/m²/lux Minimum Threshold Level: 50 mcd/m²/lux							
	Skid Resistance	Initial and Minimum Performance for Skid Resistance: Initial (7days): 55BPN Min. Threshold: 44BPN *Note: shall be considered under urban/city traffic conditions encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar marking, 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. The signboard should be clearly visible for the design speed of the section.			Daily	Visual With video/image backup	Improvement Otherwise, in case the shape is damaged.	48hoursin case of Mandatory Signs, Cautionary	IRC:67-2012

Asset Name	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial Measures	Time limit for Rectification	Specifications and Standards
					Relocation as per the requirement	and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/ Cantilever Sign boards	
	Retro reflectivity	As per specifications in IRC:67-2012	Bi-Annually	Testing of each signboard using the Retro Reflectivity Measuring Device. In accordance with ASTM D 4956-09.	Change of sign board	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual-post signs) 1 Month in case of Gantry/Cantilever Sign boards	IRC:67-2012
Kerb	Kerb Height	As per IRC 86:1983, depending upon the type of	Bi-Annually	Use of distance	Raising Kerb Height	Within 1 Month	IRC 86:1983

Asset Name	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial Measures	Time limit for Rectification	Specifications and Standards
		Kerb		measuring tape			
	Kerb Painting	Functionality: Functioning of the Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	IRC 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 the guardrail as intended	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,
	Traffic Safety Barriers			backup			IRC:119-2015
	Attenuators	Functionality: Functioning of Attenuators as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP-2014, IRC:119-2015
	GuardPosts and Delineators	Functionality: Functioning of GuardPosts and Delineators as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:79-1981
	Overhead Sign	The overhead sign structure	Daily	Visual with video/image	Rectification	Within 15 days	IRC:67-2012

Asset Name	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial Measures	Time limit for Rectification	Specifications and Standards
	Structure	shall be structurally adequate		backup			
	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 a lux meter	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 a lux meter	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
Trees and Plantation, including median plantation	Obstruction in a minimum headroom of 5.5m above carriage way	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC: SP:84-2014

Asset Name	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial Measures	Time limit for Rectification	Specifications and Standards
	or obstruction in the visibility of road signs						
	Deterioration in the health of trees and bushes	Health of the plantation shall be as per the requirements of specifications & instructions issued by the 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 the sight line and the road structures	Sightlines shall be free from obstruction by vegetation	Daily	Visual with video/image backup	Removal of Trees	Immediate	IRC: SP:84-2014
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every 4 hours	
	Defects in electrical, water and sanitary installations	-	Daily	-	Rectification	24 hours	
Other Project Facilities and Approach 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

Table 4 : Maintenance criteria for Structures and Culverts

Asset Name	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 is available.	2 times 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, underbarrel and D/so barrel before rainy season.	15 days before onset of monsoon And within 30 days after end of rainy season.	IRC 5- 2015 IRCSP:40-1993and IRCSP:13-2004
	Leak-proof expansion joints, if any	Mo leakage through expansion joints	Bi Annually	Physical inspection of expansion joints as per IRC SP:35 – 1990, if any, for leakage strains on walls at joints	Fixing with sealant suitably	30 days or before the onset of rains, whichever comes earlier	IRC SP:40 - 1993 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25sqm	Bi Annually	Detailed inspection of the culvert as per IRC SP:35-1990 and recording the defects	Repair to spalling, cracking, delaminating, and rusting shall be followed as perIRC:SP:40-	15 days	IRCSP40-1993 and MORTH Specifications clause 2800
		Delamination of concrete not morethan0.25sq.m.					
		Cracks wider than 0.3 mm not more than 1m aggregate length					

Asset Name	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
					1993.		
	Protection works in good condition	Damaged of rough stone apron or nak revetment more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Bridges including ROBs Flyover etc.as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORTH Specification 2811
Bridge-Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspection as per IRC SP:35-1990	Repairs to be done either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORTH Specification 3004.2& 2811.
	User safety (condition of crash barrier and	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed conditions	Repairs and replacement of safety barriers, as the case	3days	IRC: 5-1998, IRCSP: 84-2014and IRCSP: 40-

Asset Name	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	guardrail)			survey as per IRC SP:35-1990.	may be		1993.
	Rusted reinforcement	Not more than 0.25 sq.m	Bi Annually	Detailed condition survey, as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcements will need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out the repair to the repairs to affected concrete portion with epoxy mortar/concrete.	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
	Spalling of concrete	Not more than 0.50 sq.m					
	Delimitation	Not more than 0.50 sq.m					
	Cracks wider than 0.30mm	Not more than 1m total length	Bi-Annually	Detailed condition survey, as per IRC SP: 35-1990, using Mobile Bridge Inspection Unit	Grouting with epoxy mortar, investigating Causes for cracks development and carry out necessary Rehabilitation.	48 Hours	IRC SP: 40-1993 and MORTH Specification 2800.

Asset Name	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Rainwater seepage through the deck slab	Leakage - nil	Quarterly	Detailed condition survey, as per IRC SP: 35-1990, using Mobile Bridge Inspection Unit	Grouting of deck slab at leakage areas, waterproofing, and repairs to drainage spouts	1 months	MORTH specifications 2600&2700.
	Deflection due to permanent loads and live loads	Within design limits.	Once every 10 years for spans more than 40 m	Load test method	Carry out major rehabilitation works on the bridge to retain the original design load capacity	6 months	IRC SP: 51-1999.
	Vibrations in the bridge deck due to moving trucks	Frequency of vibrations shall not be more than 5 Hz	Once every 5 years for spans more than 30 m and every 10 years for spans between 15 and 30 m	Laser displacement sensors or laser vibrometers	Strengthening of the superstructure	4 months	AASHTO LRFD specifications
	Leakage in Expansion Joints	No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rainwater through expansion joint in case of buried and asphalt plug and copper strip joint.	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Replacement of the seal in the expansion joint	15 days	MORTH specifications 2600and IRC SP: 40-1993.

Asset Name	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Debris and dust in the strip seal expansion joint	No dust or debris in the joint expansion gap.	Monthly	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Cleaning of the expansion joint gaps thoroughly	3 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Drainage spouts	No down take pipe missing/broken below the soffit of the deck slab. No silt, debris, or clogging of the drainage spout collection chamber.	Monthly	Detailed condition survey, as per IRC SP: 35-1990, using Mobile Bridge Inspection Unit	Cleaning of drainage spouts thoroughly. Replacement of missing/broken take pipes with a minimum pipe extension of 500mm below the soffit of slab. Providing sealant around the drainage spout if any leakages are observed.	3 days	MORTH specification 2700.
Bridge-substructure	Cracks/spalling of concrete/rusted steel	No cracks, spalling of concrete, and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcements will need to be thoroughly cleaned of rust and applied with anti-corrosive coating before	30 days	IRC SP: 40-1993 and MORTH specification 2800.

Asset Name	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
					carrying out repairs to the substructure by grouting/guniting and micro-concreting, depending on the type of defect noticed		
	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture of reinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment shall be replaced to get a uniform load transfer onto the bearings.	3 months	MORTH specification 2810 and IRCSP:40-1993.
Bridge Foundations	Scouring around foundations	Scouring shall not be lower than the maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection as per IRCSP:35-1990 using Mobile Bridge Inspection Unit. In case of doubt, use	Suitable protection works around pier/abutment	1 month	IRCSP: 40-1993, IRC 83-2014, MORTH specification 2500

Asset Name	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
				an underwater camera for inspection of deep wells in major rivers.			
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3sqm, damage to solid apron(concrete apron) not more than 1 sqm	2 times a year (before And after the rainy season)	Condition survey as per IRCSP:35-1990	Repair damaged aprons and pitching.	30 days after defect observation or 2 weeks Before the onset of the rainy season Whichever is earlier.	IRC: SP 40-1993 and IRC: SP:13-2004.

Note: Any Structure during the entire contract period that is found not to comply with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of the contractor.

Note: For all tables 1 to 4 above, latest BIS & IRC standards (even those not indicated herewith), along with MoRTH specifications shall be binding for all maintenance activities.

A. Flexible Pavement (Approach Road)

Nature of Defect or deficiency		Time limit for repair/rectification
(b) Granular earth shoulders, side slopes, drains and culverts		
(i)	Variation by more than 1% in the prescribed slope of camber/cross fall (shall not be less than the camber on the main carriageway)	7 (seven) days
(ii)	Edge drop at shoulders exceeding 40mm	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)	De-silting of drains in urban/semi-Urban areas	24 hours
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)
(c) Roadside furniture including road sign and pavement marking		
(i)	Damage to shape or position, poor Visibility or loss of retro-reflectivity	48 hours
(ii)	Painting of the km. stone, railing, Parapets, crash barriers	As and when required/ Once every year
(iii)	Damaged/missing road signs requiring replacement	7 (seven) days
(iv)	Damage to road markings	7 (seven) days
(d) Road Lighting		
(i)	Any major failure of the system	24 hours
(ii)	Faults and minor failures	8 hours
(e) Trees and plantations		
(i)	Obstruction in the minimum headroom- Room of 5 m above the carriageway or obstruction in the visibility of road signs	24 hours
(ii)	Removal of fallen trees from the carriageway	4 hours
(iii)	Deterioration in the health of trees	Timely watering and treatment

	and bushes	
(iv)	Trees and bushes requiring replacement	30 (Thirty) days
(v)	Removal of vegetation affecting the sight line and road structures	15 (Fifteen) days
(f) Rest Area		
(i)	Cleaning of toilets	Every 4 hours
(ii)	Effects on electrical, water and sanitary installations	24 hours
(g) Toll Plaza		
(h) Other Project facilities and Approach roads		
(i)	Damage in pedestrian facilities, truck lay-byes, bus-bays, bus-shelters, cattle crossings,[Traffic Aid Posts, Medical Aid Posts] and service roads	5 (fifteen) days
(ii)	Damaged vehicles on the road	4 (four) hours
(iii)	Malfunctioning of the mobile Crane	4 (four) hours
Bridges		
(a) Superstructure		
	Any damage, cracks, or spalling /scaling	Within 48hours
	Temporary measures	Within 15(fifteen) days or as specified by the Authority's Engineer
	Permanent measures	
(b) Foundations		
	Scouring and/or cavitations	15 (fifteen) days
(c) Piers, abutments, return walls and wing walls		
	Cracks and damages, including settlement and tilting, spalling, and scaling	30 (thirty) days
(d) Bearings (metallic) of bridges		
	Deformation, damage, tilting, or shifting of bearings	15(fifteen) days Greasing of metallic bearing once a year
(e) Joints		
	Malfunctioning of joints	15 (fifteen) days
(f) Other Items		
	Deformation of pads in elastomeric bearings	7 (seven) days

	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3 (three) days
	Damage or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)
	Rain, cuts, or erosion of the banks of the side slopes of approaches	7 (seven) days
	Damage to the coat	15 (fifteen) days
	Damage or deterioration in approaches, slabs, pitching, apron, toes, floor or guide bunds	30 (thirty) days
	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g) Hill Roads		
i	Damage to retaining wall/breast wall	7 (seven) days
ii	Landslides requiring clearance	12 (twelve) hours
iii	Snow requiring clearance	24 (twenty-four) hours

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

SCHEDULE - F
(See Clause 4.1.7(a))
APPLICABLE PERMITS

1. Applicable Permits

- (i) The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:
 - a. Permission from the Railway Concerned Authority for NOC.
 - b. Permission of the State Government for the extraction of boulders from the quarry.
 - c. Permission of Village Panchayats and Pollution Control Board for installation of crushers.
 - d. License for use of explosives.
 - e. Permission from the State Government for drawing water from the river/reservoir.
 - f. License from the inspector of factories or other competent Authority for setting up a batching plant.
 - g. Clearance of Pollution Control Board for setting up the batching plant.
 - h. Clearance of Village Panchayats and Pollution Control Board for setting up an asphalt plant.
 - i. Permission of the Village Panchayats and the State Government for borrowing earth; and
 - j. Any other permits, including utility shifting clearances or approvals 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 Clause 19.2)
Form for Guarantee for Advance Payment

To
The Executive Engineer,
Construction Division,
Gandhidham

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 Road Over Bridge (ROB) including Roads and allied facilities at Tuna – Tekra on Engineering, Procurement and Construction (EPC) Mode, subject to and in accordance with the provisions of the Agreement.

(B)In accordance with Clause 19.2of the Agreement, the Authority shall make to the Contractor an interest bearing@ Bankrate+3% advance payment (herein after called "Advance Payment") equal to10%(ten percent)of the Contract Price; and that the Advance Payment shall be made in two instalments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalentto110%(one hundred and ten percent) of such instalment to remain effective till the complete and full repayment of the instalment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of the first/second instalment of the Advance Payment is Rs.----- cr. (Rupees ----- crore) and the amount of this Guarantee is Rs. -----cr. (Rupees ----- crore) (the "Guarantee Amount")\$

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

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

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

specified therein.

A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways Authority of India], that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the instalment of the Advance Payment under and in accordance with the Agreements 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 difference 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.

- (ii) 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.
- (iii) 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.
- (iv) 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 for bear 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 for bearance, 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.
- (v) 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.
- (vi) 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 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.

- (vii) 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.
- (viii) 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.
- (ix) 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 improving 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.
- (x) 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.
- (xi) This guarantee shall also be operable at our..... Branch at Gandhidham, 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 an invocation letter and make payment of amounts so demanded under the said invocation.
- (xii) Information regarding issuance of this Bank Guarantee shall be sent to the Authority's Bank through the SFMS Gateway as per the details below :
- Name of Beneficiary _" Punjab National Bank, Gandhidham
 - Beneficiary Bank Account Number: 0190002100031883
 - Beneficiary Bank IFSC Code PUNB0019000
 - Beneficiary Bank Branch _Gandhidham
 - Beneficiary Bank Address _Gandhidham
- (xiii) This Guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication no. 758, except that the supporting statement under Article 15 (a) is hereby excluded.

Signed and sealed this day of 2026..... at

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.

(j) The address, telephone number, 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.

\$ date being 90 (ninety) days after the end of one year from the date of payment of the Advance payment to the contractor (in accordance with Clause 19.2 of the Agreement).

SCHEDULE - H
(See Clauses 10.1.4 & 19.3)

1. **Contract Price Weightages**
2. The Contract Price for this Agreement is Rs.
3. Proportions of the Contract Price for different stages of Construction of the Project shall be as specified below:

Item	Weightage in percentage to the Contract Price	Stage of Payment	Payment Weightage	Remarks	Mode of Measurement / Payment Procedure
A. ROB	11.925%	Pilling	3.485%	Includes, boring for piles in soil and hard rock, MS liner plates Min 8mm, pile reinforcement, M40 pile concrete and. pile head dressing etc.	Unit of Measurement shall be each completed pile. Payment on pro-rata basis for each pile completed up to cut-off level including boring, concreting, reinforcement, liner, pile integrity / specified tests.
		Pile cap	0.870%	Includes excavation in all types of soil up to 1.5 m, extra lift beyond 1.5 m, PCC 1:2:4, M40 RCC pile cap, formwork, shuttering, reinforcement, embedment, finishing, curing and associated works.	Unit shall be each completed pile cap. Payment on pro-rata basis after RCC, curing, dimensions and accepted quality results.
		Pier & Abutment	1.244%	Includes M40 RCC for piers, abutments, abutment caps, pier caps, dirt walls, pedestals, seismic arrestors, reinforcement, bearings, tar paper bearings and associated works.	Unit shall be each completed substructure unit. Payment after completion up to cap level including pedestals / bearings seats.
		Composite Girders	4.978%	Includes fabrication and supply of composite steel girders, stiffeners, bracings, splices, studs, metalizing / aluminium spray, painting, transportation, assembly, erection and launching of steel girders.	Unit shall be MT / each girder / span. Up to 75% interim payment after approved fabrication and delivery; balance after erection, alignment, connections and acceptance.

		Deck slab	0.949%	Includes M40 RCC deck slab, reinforcement, formwork, strip seal expansion joints, crash barriers, footpath, utility provisions, drainage spouts, wearing coat and associated finishing works.	Unit shall be each completed span. Payment after slab, crash barrier, joints, utilities and finishing are complete.
		RCC staircase	0.088%	Includes cast-in-situ M40 RCC staircase, reinforcement, shuttering, waterproofing / protective treatment, plaster finish, scaffolding, curing and all associated staircase works.	Unit shall be each completed staircase ready for use.
		Testing	0.238%	Includes geotechnical investigation in soil and hard rock, initial vertical and lateral pile load tests, high-strain dynamic load tests, pile integrity tests, and bridge span load testing.	Payment on actual completion of specified tests and submission of accepted reports.
		Other miscellaneous works	0.073%	Includes steel railing, protective safety screens, painting to concrete surfaces, PVC utility pipes, galvanised drainage spouts,	Payment after completion of measurable incidental works certified by the Authority's Engineer.
		3D Physical Model	Included in Other miscellaneous works	Preparation and submission of detailed three-dimensional physical model of the Project and other incidental miscellaneous works. The physical model shall be submitted within 90 days from Appointed Date or prior to commencement of major structural works, whichever is earlier.	Payment related to the three-dimensional physical model shall be admissible after submission, installation and acceptance of the approved model by the Authority.
B. VIADUCT	52.750%	Pilling	22.047%	Includes boring of piles in soil and hard rock, pile head dressing, MS liner plates, M40 pile concrete, pile reinforcement and associated pile works for LCW and RCW viaduct.	Unit shall be each completed pile. Payment on a pro-rata basis for each pile completed to the cut-off level, including testing where specified.
		Pile cap	6.172%	Includes excavation in all types of soil up to 1.5 m, extra lift beyond 1.5 m, PCC 1:2:4 below pile caps and approach slab M40 RCC pile caps below ground level, formwork, shuttering, reinforcement, finishing, curing and associated pile cap works for abutment and pier pile caps.	Unit shall be each completed cap.

		Pier & Abutment	7.423%	Includes M40 RCC abutments, piers, abutment caps, pier caps, dirt walls, approach slab brackets, pedestals, seismic arrestors, transverse girders, reinforcement, POT-PTFE bearings, tar paper bearings and associated works.	Unit shall be each completed pier/abutment unit up to the cap level.
		PSC Girders	8.869%	Includes precast / cast-in-situ M50 PSC girders, end portions, mid portions, transition portions, diaphragms / cross girders, reinforcement, high tensile prestressing strands, stressing, grouting, launching/shifting and associated PSC girder works.	Unit shall be each girder/span. Up to 75% interim payment after casting, stressing and yard acceptance; balance after erection.
		Deck slab	7.184%	Includes M40 deck slab, solid slab, approach slab and gap slab, reinforcement, formwork, strip seal expansion joints, crash barriers, footpath, wearing coat and associated finishing works.	Unit shall be each completed span/deck segment, including slab, barriers, footpath, and joints.
		Testing	0.905%	Includes geotechnical investigations in soil, soft rock and hard rock, initial vertical and lateral pile load tests, high-strain dynamic pile load tests, low-strain pile integrity tests, and bridge span load testing.	Payment against completed and approved testing.
		Other miscellaneous works	0.150%	Includes painting to new concrete surfaces, pre-moulded bituminous pad type expansion joints, galvanised drainage spouts, PVC utility pipes for electrical / telecommunication services and other incidental miscellaneous works..	Payment after completion of measurable incidental works certified by the Authority's Engineer.
C. CREEK BRIDGE	5.427%	Pilling	3.357%	Includes shifting and setting up of piling plant and equipment, empty boring of piles in soil and hard rock, M40 pile concrete, pile head dressing, MS liner plates, pile reinforcement and associated offshore pile works.	Unit shall be each. Payment after completion of pile to cut-off level, including marine boring, liners and tests.
		Pile Cap & Girders	1.146%	Includes excavation, including additional lift below 1.5 m, PCC 1:2:4, M40 RCC pile caps, side walls, retaining wall, median wall, dirt wall, approach slab bracket, pedestals, seismic arrestors, M50 PSC / RCC girders, reinforcement, POT-PTFE bearings, tar paper bearings, casting, placing/launching and associated works.	Unit shall be each completed foundation cap/girder/span element on a pro-rata basis.
		Deck slab	0.688%	Includes M40 RCC deck slab, solid deck slab reinforcement, strip seal expansion joint, crash barrier, footpath, PVC utility pipes, galvanised drainage spouts, bituminous wearing coat	Unit shall be each completed span, including slab, wearing coat, joints, and barriers.

				and associated finishing works.	
		Testing	0.178%	Includes geotechnical investigation in soil, soft rock and hard rock, initial vertical and lateral pile load tests, high-strain dynamic pile load tests, low-strain pile integrity tests and bridge span load testing.	Payment on successful completion of specified tests.
		Abutment filling and stone pitching	0.023%	Includes geosynthetic drainage composite behind return wall/abutment/side wall / median wall, stone/boulder pitching, precast hexagonal cement concrete blocks/stone pitching, filter media with granular materials / crushed aggregates and associated slope/backfill protection works.	Unit shall be cum / sqm / rm as applicable. Payment after completion of protection reaches not less than 25% of each side.
		Other miscellaneous works	.035%	Includes painting to new concrete surfaces, pre-moulded bituminous pad type expansion joints, galvanised drainage spouts, PVC utility pipes for electrical / telecommunication services and other	Payment after completion of measurable incidental works certified by the Authority's Engineer.
D. RE WALL	6.615 %	RE Wall Ground Improvement	1.629%	Includes 500 mm sand layer after removal of unsuitable soil, excavation in all types of soil up to 1.5 m, ground improvement using rock columns/stone columns, primary rock of 0.1 to 0.5 T for ground improvement, setting out, compaction, testing, disposal of spoil and associated preparatory works.	Unit shall be sqm/rm / each column as applicable. Payment on a pro-rata basis for the completed treated zone of not less than 25% of each wall block.
		Geogrid, Geotextile and M-Sand Works	1.915%	Includes high-strength flexible geogrid, biaxial extruded geogrid, non-woven geotextile membrane, M-sand layer, laying, overlaps, cutting, securing, compaction and associated soil reinforcement/separation works.	Unit shall be sqm. Payment for completed accepted layer with overlaps and compaction.
		Fascia Panel	0.669%	Includes reinforced soil wall system with concrete fascia panels, uniaxial geogrid connection, levelling pad, coping beam, panel casting, erection, alignment and associated RE wall facing works.	Unit shall be sqm face area/rm. Payment after erection, alignment and connection is complete.
		filling	1.338%	Includes filling behind the RE wall with approved materials, selected backfill, retained fill, quarry spall filling, embankment filling, spreading in layers, watering, compaction to specified density, dressing and associated filling works.	Unit shall be cum based on approved cross-sections. Payment after completed compacted lifts with test results.

		Bituminous Pavement	1.064%	Includes GSB, WMM, tack coat, dense bituminous macadam, bituminous concrete wearing course, M40 RCC crash barrier, crash barrier reinforcement and associated pavement works.	Unit shall be linear length. Payment by layer for a completed stretch of 250 m or 25% of the reach, whichever is less.
E. APPROACH ROAD	13.124%	Approach Road Boulder Filling	2.421%	Includes primary rock of 0.1 to 0.5 T for road embankment/ground improvement, quarrying, royalty, loading, unloading, transportation, spreading in layers, levelling, dressing of side slopes and associated boulder filling works for main carriageway and junction development.	Unit shall be cum. Payment is based on approved sections for a completed continuous reach of 250 m minimum.
		Geogrid, Geotextile and M-Sand Works	0.673%	Includes biaxial geogrid, non-woven geotextile membrane, M-sand layer, laying, overlaps, cutting, securing, compaction and associated separation/reinforcement works for approach roads and junction areas.	Unit shall be sqm. Payment after the completed layer is accepted.
		Filling	3.838%	Includes quarry spall filling, embankment filling, additional provision for settlement, spreading in layers, compaction with rollers, watering, levelling, dressing and associated filling works for carriageway and junction roads.	Unit shall be cum. Payment after the completed embankment reaches the compaction tests.
		Bituminous Pavement	4.781%	Includes GSB, WMM, tack coat on granular/bituminous surface, DBM, BC wearing course and associated pavement works for main carriageway and junction development.	Unit shall be linear length. Payment by pavement layer on completed stretch of 500 m or 25% reach, whichever is less.
		Road protection works	1.411%	Includes metal beam crash barrier, rough stone pitching in cement mortar, toe wall including excavation, PCC, RCC, shuttering and associated road edge/slope protection works.	Unit shall be rm/sqm / cum. Payment for completed continuous reach of 250 m minimum.
F. SERVICE ROAD	3.299 %	Service Road Boulder Filling	0.473%	Includes primary rock of 0.1 to 0.5 T for road embankment/ground formation, quarrying, royalty, loading, unloading, transportation, spreading in layers, levelling, dressing of side slopes and associated boulder filling works for service road reaches.	Unit shall be cum. Payment is based on approved sections for a completed continuous reach of 250 m minimum.
		Geogrid, Geotextile and M-Sand Works	0.210%	Includes biaxial geogrid, non-woven geotextile membrane, M-sand layer, laying, overlaps, cutting, securing, watering, compaction, and associated reinforcement/separation works for service road and road separator areas.	Unit shall be sqm. Payment after the completed layer.

		Filling	0.862%	Includes quarry spall filling, filling for service road embankment and road separator, spreading in layers, compaction with rollers, watering, settlement allowance, levelling and associated filling works.	Unit shall be cum. Payment after the completed embankment reaches with compaction tests.
		Bituminous Pavement	0.701%	Includes GSB, WMM, tack coat on granular/bituminous surfaces, DBM, BC wearing course, and associated pavement works for service road stretches.	Unit shall be linear length. Payment by pavement layer on completed stretch of 500 m or 25% reach, whichever is less.
		Road protection works	1.053%	Includes metal beam crash barrier, rough stone pitching in cement mortar, toe wall including excavation, PCC, RCC (M30), shuttering, PCC for road separator and associated roadside/slope protection works.	Unit shall be m^2/sqm / cum. Payment for completed continuous reach of 250 m minimum.
G. DIVERSION	2.766%	Diversion Road Boulder Filling	0.808%	Includes primary rock of 0.1 to 0.5 T for temporary diversion road formation, quarrying, royalty, loading, unloading, transportation, spreading in layers, levelling, dressing of side slopes and associated boulder filling works.	Unit shall be cum. Payment is based on approved sections for a completed continuous reach of 250 m minimum.
		Filling	1.005%	Includes quarry spall filling for diversion road embankment, spreading in layers, compaction with rollers, watering, settlement allowance, levelling, dressing and associated filling works.	Unit shall be cum. Payment after the completed embankment reaches with compaction tests.
		Bituminous Pavement	0.953%	Includes GSB, WMM, tack coat on granular/bituminous surfaces, DBM, BC wearing course and associated pavement works for diversion road.	Unit shall be linear length. Payment by pavement layer on completed stretch of 500 m or 25% reach, whichever is less.
H. ROAD FURNITURE	0.902 %	Road Furniture – Main Road (Ch. 2500 to 6230)	0.698%	Includes complete road furniture and corridor beautification works for each 250 m completed length comprising kilometre stones, indicator stones, cautionary/regulatory / hazard / chevron / junction sign boards, cat eyes, thermoplastic road markings, kerbs, median plantation, construction stage diversion/safety signage, median soil filling, development and beautification of traffic island / rotary at Zero Chainage including architectural monument, landscaping, hardscape elements, plantation, irrigation arrangements, illumination interface provisions and all associated traffic safety, guidance and aesthetic development works.	Unit shall be linear m. Payment on a pro-rata basis for completed corridor length not less than 250m, including signs, markings, studs, kerbs, etc. Payment shall include traffic island / rotary beautification and architectural development works complete in all respects as approved by the Authority's Engineer.

		Road Furniture – Service Road (Ch. 4100 to 5192.78)	0.204%	Includes complete road furniture works for each 250 m completed length, comprising sign boards, hazard markers, junction signs, cat eyes, thermoplastic road markings, kerbs, traffic control signage, median / separator works and all associated service road safety furniture works.	Unit shall be linear m. Payment on a pro-rata basis for completed corridor length not less than 250m, including signs, markings, studs, kerbs, etc.
I. ELECTRIC WORKS	3.192%	Road electric works	1.117%	Includes street lighting, galvanized (min 120 microns) octagonal street poles with LED luminaires, 9 m poles at design spacing, median overhang lighting arrangements, cable ducts ,Wiring: Internal wiring with 1.5 sq. mm / 2.5 sq. mm PVC insulated copper flexible cable from junction box to luminaire., in crash barriers, concrete pedestals/foundations, base plates, anchor bolts, reinforcement, cabling accessories, installation, testing and commissioning of the complete roadway lighting system 40 Lux minimum, IP66 with IOT, Dashboard, Software, Network & Cloud services for ILM & CCMS for 5 years .SITC of Outdoor Distribution Pillar (DP) Description: design ,Supply and installation of a weatherproof IP65-rated Distribution Pillar fabricated from 2.0mm CRCA sheet steel. IOT basia Internal Gear: Includes 1 No. MCCB incomer (63A-125A), multiple MCB outgoings, and insulated bus-bars. Installation: Includes concrete foundation plinth, earthing, and cable glands. Spacing: One unit required every 200m of road length. Supply, Installation, Testing and Commissioning of Double Pole Structure with 11KV A.B Switch & H.G Fuse on 9 mtr. RSJ pole of 200KG complete with Labour and Material SITC at site 4 Core, LT armoured aluminium conductor XLPE cable of various sizes, 1.1KV grade	Unit shall be each pole / completed lighting circuit. 60% after pole, foundation, luminaire erection; 40% after cabling, energisation and lux compliance.
		OHE shifting and new installation	0.415%	Includes shifting, dismantling and re-erection of existing 25 kV Overhead Equipment. Equipment including masts, cantilevers, conductors, insulators, foundations/foundation modifications, replacement of damaged components, traffic/power block coordination, testing and commissioning as per Railway standards. Shifting, dismantling, and re-erection of existing 25kV OHE Replacing a existing 2-portal frame with a single mast.	Unit shall be completed in a block section/activity. Payment after dismantling, shifting, re-erection and commissioning as certified by the Railway authorities.
		HT Tower shifting and	1.660%	Includes shifting of HT line utilities, dismantling of existing HT towers, supply and installation of new HT towers, foundations,	Unit shall be completed utility activity/crossing / tower section. Indicative

		new installation		<p>conductor stringing, insulators, earthing, accessories, safety measures, testing and commissioning of complete HT line diversion/relocation works. installation of HT tower(s) and associated line shifting, including dismantling existing structures,</p> <p>Dismantling two towers and constructing realigned towers two tower with modified span lengths. Additional towers Pro-two tower are introduced as auxiliary structures with increased heights (~30.92 m) to facilitate safe vertical clearance. Replacing two tower with new two new towers upgraded to 220 kV-class designs with greater height (51–54 m)..</p>	split: foundations & towers 30%, conductor stringing 35%, charging & dismantling old line 35%.
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General Clauses

1. All payments shall be pro-rata to the accepted completed quantity/work stage.
2. No payment shall be due for partially completed items not fit for intended use unless specifically provided.
3. Measurements shall be jointly recorded by Contractor and Authority's Engineer.
4. Quality control tests, approvals and statutory clearances wherever applicable shall be a precondition to payment.
5. Interim payments for precast / fabricated structural elements shall follow EPC provisions and may be capped at 75% before erection.
6. The above list is illustrative and may require modification as per the scope of the work.
7. Lengths affected due to law-and-order problems or litigation during execution, due to which the Contractor is unable to execute the work, may be deducted from the total project length for payment purposes. The total length calculated here is only for payment purposes and will not affect and referred to in other clauses of the Contract Agreement.

4. Procedure for payment for Maintenance

- The cost for maintenance shall be as stated in Clause 14.1.1.
- Payment for Maintenance shall be made in quarterly instalments in accordance with the provisions of Clause 19.7.

- Maintenance Charge @3.75% of contract price with 10-year maintenance period.
- Maintenance charges shall be paid for Year 1 to Year 5 @ 0.25% of the contract price each year.
- Maintenance charges shall be paid for Year 6 to Year 10 @ 0.50% of the contract price each year.

SCHEDULE - I
(See Clause 10.2.4)
DRAWINGS

1. Drawings

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

The Contractor shall also prepare and submit all architectural, presentation, landscaping and physical model related drawings required for approval of the Authority in relation to project beautification works and preparation of the detailed three-dimensional physical model of the Project

2. Additional Drawings

If the Authority's Engineer determines that for discharging its duties and functions under this Agreement, it requires any drawing 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 this Schedule-I.

(Schedule - I)
List of Drawings

A minimum list of the drawings of the various components/elements of the project and project facility required to be submitted by the EPC Contractor is given below:

All the Drawings that the EPC contractor is required to furnish under Clause 10.2, specifying the Drawings as per the indicative cross section and as under.

- Detailed Topography Survey
- Detailed Geotechnical report
- Drawing of full alignment plan & profile / Geometric design
- General Arrangement drawings
 - Arrangement for the Approach portion
 - Arrangement for the Bridge portion
 - Arrangement for Creek Bridge
- Horizontal and Vertical Alignment with details of reference pillars, Horizontal Intersection Points, Vertical Intersection Points, elements of curves, and sight distances.
- Drawing & Details of Foundations, substructures and superstructures
- Cross section for approaches, connecting roads and such other component with details of pavement structures
- Details of intersections with details of pavement structures
- Traffic management drawings for safety in construction zones & layout drawings for traffic circulation for service roads and intersection
- Drawing showing location & details of crash barrier, railing and other safety arrangement
- Detailed drawings for Road side furniture (Road signs, Road marking etc).
- Drawing & details of lighting and decorative lighting
- Architectural and landscaping drawings for the proposed traffic island / rotary development at Zero Chainage, including monument layout, hardscape elements, plantation layout, illumination arrangement, material specifications, street furniture and associated aesthetic development components.
- Three-dimensional visualisations, rendered views and presentation drawings of the Project corridor, including ROB, viaducts, RE walls, creek bridge, approaches, traffic island / rotary development and associated facilities.
- Drawings, fabrication details, layout plans and presentation details for the detailed three-dimensional physical model of the Project, including proposed scale, sectional representation, material specifications and illumination / display features, wherever applicable

SCHEDULE – J
(See Clause 10.3.2)
PROJECT COMPLETION SCHEDULE

1. Preamble and Intent

This Schedule-J sets out the Project Completion Schedule, including defined Project Milestones and the Scheduled Completion Date.

In view of the anticipated commencement of operations of the upcoming container terminal, the Authority has identified certain critical components of the Project as “**Advance Works**”, which are required to be prioritized and completed on an expedited basis to ensure uninterrupted traffic movement and operational readiness.

The balanced scope of the Project shall be executed in parallel (“**Balance Works**”); however, achievement of milestones related to Advance Works shall take precedence and shall be binding on the Contractor.

The Contractor shall plan, sequence, and execute the works accordingly.

Within 15 (fifteen) days of achievement of each Project Milestone, the Contractor shall notify the Authority with the necessary supporting particulars.

2. Definition of Advance Works

The following components shall constitute Advance Works:

- I. (Construction of one carriageway (3-lane) of the creek bridge, sufficient for traffic movement, with the balance carriageway to be completed subsequently as directed by Authority Engineer.
- II. Construction and operationalisation of a temporary 2-lane diversion road, connecting the existing Level Crossing (LC), and the DPW terminal connectivity road beyond the ROB interface point, to ensure uninterrupted traffic flow during construction.
- III. Construction of Service Road.
- IV. Shifting / relocation of HT transmission line towers and associated utilities, as required for enabling construction.

3. Definition of Balance Works

All remaining components of the Project, including but not limited to:

- ROB structure and railway spans
- Remaining carriageway of creek bridge
- Viaducts, RE walls, retaining walls
- Approach roads
- Project facilities and finishing works
- Traffic island / rotary architectural development, landscaping and beautification works;

shall constitute Balance Works, to be executed in parallel with Advance Works.

4. Project Milestones

I. Project Milestone-I (Mobilisation and Initiation)

- a) Project Milestone-I shall occur on the date falling on the 30th (Thirtieth) day from the Appointed Date (the "Project Milestone-I").
- b) Prior to the occurrence of Project Milestone-I, the Contractor shall have mobilised key resources, established site offices and construction facilities, commenced preliminary and enabling works including surveys, utility identification and initial shifting activities, and submitted to the Authority:
 - i. preliminary construction programme and methodology;
 - ii. traffic management and diversion proposals;
 - iii. conceptual architectural and landscaping proposal for the traffic island / rotary at Zero Chainage; and
 - iv. detailed proposal, drawings, scale and presentation concept for the three-dimensional physical model of the Project.
- c) The Contractor shall also submit and install the approved three-dimensional physical model of the Project within 90 (Ninety) days from the Appointed Date or prior to commencement of major structural works, whichever is earlier.
- d) Prior to the occurrence of Project Milestone-I, the Contractor shall have mobilised key resources, commenced preliminary and enabling works including utility identification and initial shifting activities, and submitted to the Authority duly.
- e) Established site offices and construction facilities
- f) Commenced preliminary works including surveys, utility identification and enabling works.

II. Project Milestone-II

- a) Project Milestone-II shall occur on the date falling on the 180th (One Hundred and Eightieth) day from the Appointed Date (the "Project Milestone-II").
- b) Prior to the occurrence of Project Milestone-II, the Contractor shall have progressed the Advance Works to not less than 50% (Fifty per cent) completion and the Balance Works to not less than 25% (Twenty Five per cent) completion, including substantial progress in utility shifting, temporary diversion road and creek bridge works, and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 25% (Twenty Five) of the Contract Price.

III. Project Milestone-III

- a) Project Milestone-III shall occur on the date falling on the 365th (Three Hundred and Sixty Fifth) day from the Appointed Date (the "Project Milestone-III").
- b) Prior to the occurrence of Project Milestone-III, the Contractor shall have completed 100% (One Hundred per cent) of the Advance Works and progressed

the Balance Works to not less than 50% (Fifty per cent) completion, ensured operational readiness of the creek bridge (one carriageway) and diversion road for uninterrupted traffic movement, completion of all critical utility shifting and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 50% (Fifty per cent) of the Contract Price and shall have commenced construction of all Project Facilities.

IV. Project Milestone-IV

- a) Project Milestone-IV shall occur on the date falling on the 540th (Five Hundred and Fortieth) day from the Appointed Date (the "Project Milestone-IV").
- b) Prior to the occurrence of Project Milestone-IV, the Contractor shall have progressed the Balance Works to not less than 75% (Seventy-Five per cent) completion and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 75% (Seventy-Five per cent) of the Contract Price.

V. Project Milestone-V (Scheduled Completion Date)

- a) The Scheduled Completion Date shall occur on the date falling on the 730th (Seven Hundred and Twentieth) day from the Appointed Date.
- b) On or before the Scheduled Completion Date, the Contractor shall have completed 100% (One Hundred per cent) of the Project, including all Balance Works and Project Facilities, in accordance with this Agreement, and submitted to the Authority duly and validly prepared Stage Payment Statements for the entire Contract Price.

5. Priority and Sequencing

The Contractor shall:

- Prioritise execution of Advance Works to ensure early traffic integration;
- Execute Balance Works in parallel without affecting Advance Works milestones;
- Ensure uninterrupted traffic flow at all times during construction.
- No claim shall arise on account of such sequencing and prioritisation requirements.
- Ensure timely preparation and submission of the approved three-dimensional physical model and architectural proposals forming part of the Project requirements;

6. Measurement and Certification

Progress under Advance Works and Balance Works shall be:

- Measured based on physical progress and milestone achievement;
- Verified and certified by the Authority's Engineer;
- Stage Payments will be linked with Schedule-Has per the provisions of the Agreement.

- Submission and acceptance of the three-dimensional physical model by the Authority shall constitute a prerequisite for certification of the associated milestone-linked payment component under Schedule-H.

7. 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 12.1.2)
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 ROB 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 confirm to the provisions of this Agreement. The physical tests shall include [to be decided with engineer at the time of physical tests as per relevant IRC course/manual].
- (ii) Riding quality test: The Contractor shall conduct test for Riding quality of each lane of the carriageway shall be checked with the help of a Network Survey Vehicle(NSV) fitted with latest equipment and the maximum permissible roughness for the purpose 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: 1996of the IRC Highway Research Board on Non-Destructive Testing Techniques, at two spots in every span, to be chosen at random by the Authority's Engineer. Bridges with a span of15(fifteen) meters 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 ROB 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 Contractor shall carryout a check to determine conformity of the Project ROB 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 ROB 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 EPC Contractor and the agency for testing shall be appointed as finalize in consultation with the Authority.

4. Completion Certificate

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

5. The EPC Contractor will carry out tests with following equipment at his own cost in the presence of Authority'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)
6	Bridge Load Test	Test as per IRC SP-51 : 2014	At least once after completion of the work

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

I,.....(Name of the Authority's Engineer),acting as the Authority's Engineer, under and in accordance with the Agreement dated(the "Agreement"), for the Construction of Road Over Bridge (ROB) including Roads and allied facilities at Tuna – Tekra on Engineering, Procurement and Construction (EPC) Mode through(Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project ROB can be safely and reliably placed in service of the Users thereof.

It is certified that, in terms of the aforesaid Agreement, all works forming part of Project ROB have been completed, and the Project ROB is hereby declared fit for entry into operation on this the day of 2028..... . Schedule Completed date for which was the day of2028.....

SIGNED, SEALED AND DELIVERED For
and on behalf of the Department'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 deduction 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

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

Sr. No.	Item/ Defect/ Deficiency	Percentage
(a)	Carriageway/Pavement	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	Road, Embankment, Cuttings, Shoulders	
(i)	Edge drop, inadequate cross-fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, rain-cuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	Bridges and Culverts	
(i)	De-silting, cleaning. Vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
(i)	Any Defects in super structures, bearings and sub- structures	10%
(ii)	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,roadmarkings,200m/km/5thkm stones	5%
(f)	Miscellaneous Item	
(i)	Removal of dead animals, broken down/ accidental vehicles, fallen trees, road blockades or malfunctioning of mobile	10%

Sr. No.	Item/ Defect/ Deficiency	Percentage
	crane	
(ii)	Any other Defects in accordance with paragraph1.	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 para1.2 above of this schedule

M2 = Monthly Lump-sum payment in accordance para1.2 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 kilometre, the non-conforming length shall be taken as one kilometre.

- (iii) The Contractor shall immediately replenish the Maintenance Bank guarantee upon any deductions made by the Authority's Engineer as per Article 23.1 of this Agreement.

SCHEDULE - N
(See Clause 18.1.(i))
SELECTION OF AUTHORITY'S ENGINEER

1. Appointment of Authority's Engineer

- (i) The Authority has appointed BMT Consultants (India) Pvt. Ltd. (Merizen) as the Authority's Engineer for the Project, to discharge the functions and duties specified under this Agreement.
- (ii) The Authority's Engineer shall perform its roles and responsibilities in accordance with the provisions of this Agreement, including but not limited to review, supervision, certification, inspection, and monitoring of the Project works.
- (iii) The Contractor shall fully cooperate with the Authority's Engineer and shall comply with all reasonable instructions, directions, approvals, and certifications issued by the Authority's Engineer in accordance with the provisions of this Agreement.

2. Replacement of Authority's Engineer

- (i) In the event of termination, resignation, or inability of the Authority's Engineer to perform its functions, the Authority shall appoint a replacement Authority's Engineer forthwith.
- (ii) Any such replacement shall be an experienced and competent firm, and the Contractor shall continue to comply with the directions and instructions of the newly appointed Authority's Engineer without any disruption to the Project.

3. Terms of Reference

The Terms of Reference (the "TOR") of the Authority's Engineer shall be as set forth in Annex-I of this Schedule-N, and shall include, inter alia:

- Review and approval of designs and drawings
- Supervision and monitoring of construction works,
- Certification of milestone achievements and payments
- Quality control and compliance verification
- Coordination with Railway Authorities and other stakeholders, as applicable

4. Appointment of Government Entity

Notwithstanding anything contained in this Schedule, the Authority may, at its discretion, appoint a government-owned entity as the Authority's Engineer, provided that:

- such entity is a body corporate with primary functions including engineering consultancy, supervision, or advisory services; and
- such entity is not owned or controlled by the Authority.

(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 in to between The Executive Engineer,(the "Authority")and..... (the "Contractor")for the Construction of Road Over Bridge (ROB) including Roads and allied facilities at Tuna – Tekra on Engineering, Procurement and Construction (EPC) Mode ,and a copy of which his annexed hereto and marked as Annex-A to form part of this TOR.
- (ii) The TOR shall apply to construction and maintenance of the Project ROB.

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 Article1 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 of the matter which is not specified in (a), (b), (c) or(d) above and which creates an obligation or 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 within10 (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 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 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, design calculations, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1.6. The Authority's Engineer shall complete such review and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended up to 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.
- (ii) The Authority's Engineer shall review 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 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 there on 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 ROB 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 confirm 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 4.9, 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 confirming to Good Industry Practice for quality assurance.
- (x) The Authority's Engineer shall test check at least 20 (twenty) 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 4.9, and the criteria or acceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The test 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 forth with 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 forth with, 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 10.2.4 (iv).
- (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 ROB 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 19.4.1, 19.6.1, and 19.8.1)

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 19.3.1 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:
 - a. Any amount to be deducted in accordance with the provisions of the Agreement except taxes.
 - b. Any amount towards deduction of taxes; and
 - c. Total of (a.) and (b) above.
- (g) Net claim: (e) – (f) (c.);
- (h) The amounts received by the Contractor up to the last claim:
 - i. For the Works executed (excluding Change of Scope orders);
 - ii. For Change of Scope Orders, and
 - iii. Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

- (i) the monthly payment admissible in accordance with the provisions of the Agreement.
- (j) the deductions for maintenance work not done.
- (k) net payment for maintenance due, (a) minus (b);
- (l) amounts reflecting adjustments in price under Clause 19.12; and
- (m) 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 affect 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 1.1above shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1other than risks which are not insurable at commercial terms.

2. Insurance for Contractor's Defects Liability

The Contractor shall affect and maintain insurance cover 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 1and 2of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences.

The insurance cover shall be not less than the Contract Price.
- (ii) The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor's performance of this Agreement excluding:
 - a. The Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and
 - b. Damage which is an unavoidable result of the Contractor's obligations to execute the Works.

4. Insurance to be in joint names

Theinsuranceunderparagraphs1 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"), Construction of Road Over Bridge (ROB) including Roads and allied facilities at Tuna – Tekra on Engineering, Procurement and Construction (EPC) Mode through.....Name of Contractor), here by certify that the Tests on completion of Maintenance Period in accordance with Article14 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 ROB from the Contractor on this day.....

SIGNED, SEALED AND DELIVERED

(Signature)

(Name and designation of Authority's Representative)

(Address)