

Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25 on EPC Mode

**GOVERNMENT OF INDIA
MINISTRY OF ROAD TRANSPORT & HIGHWAYS**

**ENGINEERING PROCUREMENT AND
CONSTRUCTION (EPC)**

FOR

Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25 on EPC Mode

VOLUME - iii

SCHEDULES

May 2025

**NATIONAL HIGHWAYS CIRCLE
HYDERABAD
ROADS & BUILDINGS DEPARTMENT
TELANGANA**

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Schedules

Construction of 2 No's of Foot Over Bridges at Km 267/6-8 & 273/0-2 on Mahabubnagar -Jadcherla section of NH-167 under Road Safety Annual Plan for the year 2022-23 on EPC mode.

Schedule-A

(See Clauses 2.1 and 8.1)

Site of the Project

1. The Site

- (i) Site of the Project Highway shall include the Land, buildings, structures and road works as described in **Annex-I** of this **Schedule-A**.
- (ii) The dates of handing over Right of Way to the Contractor are specified in the Annex-II of this Schedule A.
- (iii) An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2.1 of this Agreement.
- (iv) The Plan and profile of the Project Highway are specified in **Annex-III**. The proposed profile of the Project Highways shall be followed by the contractor with minimum FRL as indicated in the Plan & Profile. The Contractor, however, improve/upgrade the Road Profile as indicated in Annex-III based on site/design requirement.
- (v) The status of the environment clearances obtained or awaited is given in **Annex-IV**.

Annex - I

(Schedule-A)

Site

1. The Site

Proposed Foot Over Bridges are located in Mahabubnagar district of Telangana state on NH-565 from Nakrekal-Nagarjunasagar section. The Ministry of Road Transport & Highways has sanctioned 1 No's of foot over bridge under Road safety scheme at Km 24+570 (Nalgonda), on Nakrekal-Nagarjunasagar section. of NH-565.

Now, the present locations of Foot Over Bridges chainages are mentioned below

S.No	FOB Location
	Existing Chainage
1	24+570

Above sanctioned locations are in Municipal Limits of Mahabubnagar & District Head Quarters with few Government institutions, commercial and business establishments where people floating and pedestrians who are crossing the roads at the above proposed locations are more.

2. Land

The Site of the Project Highway comprises the land (existing right of way) as described below:

S. No.	Existing Chainage (km)	ROW (m)	Remarks
1	24+570	30.00	

3. Carriageway

The existing carriageway of the project highway is of four-Lane carriage way and the existing pavement type is flexible. Carriageway details are given below:

Existing Chainage		Length (Km)	Width (m)
From	To		
267/6	267/6-8		14.0m

4. Major Bridges

The Site includes the following existing Major Bridges:

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

5. Minor Bridges

The Site includes the following minor bridges:

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S. No.	Existing Chainage (km)	Type of Structure			No. of Spans C/C with span length (m)	Overall Width (m)
		Foundation	Sub-structure	Super structure		
Nil						

6. Grade separators

The Site includes the following grade separators:

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

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

The Site includes the following ROB (Road over railway line) / RUB (Road under Railway Line

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

8. Railway level crossings

The Site includes the following level crossing:

S. No.	Existing Chainage (Km)	Railway Chainage	Level Crossing No	Remarks
NIL				

9. Underpasses (Vehicular, Non-Vehicular)

The Site includes the following underpasses:

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

10. Causeways

The Site includes the following causeways:

S. No.	Existing Chainage (km)	Type of Structure			No. of Spans C/C with span length (m)	Overall Width (m)
		Foundation	Sub-structure	Super structure		
Nil						

11. Culverts

S.No.	Existing Chainage	Type of Culvert	Span c/c Arrangement No x Vent (m)	Width (m)	Remarks
Nil					

11.1 Pipe Culverts

S.No.	Existing Chainage	Type of Culvert	Span c/c Arrangement No x Vent (m)	Width (m)	Remarks
Nil					

11.2 Slab Culverts

S. No.	Existing Chainage	Type of Culvert	Span Arrangement No x Vent (m)	Width (m)	Remarks
Nil					

12. Bus shelters:

S. No.	Existing Chainage (Km)	Length (m)	Left Hand Side	Right Hand Side
NIL				

13. Truck Lay byes

The details of truck lay byes are as follows:

S. No.	Existing Chainage (Km)	Length (m)	Left Hand Side	Right Hand Side
NIL				

14. Road side existing drains:

S. No.	Existing Chainage (Km)	Length (m)	Side	Type	Remarks
NIL					

15. Major Junctions (At-grade):

S. No.	Location (Existing KM)	Side	Type	Width of Cross road (m)	Name of Cross road	Type of cross road
NIL						

16. Minor Junctions:

S. No.	Location (Existing KM)	Type of Cross Road	Width of Cross Road (m)	Leads to	
				LHS	RHS
Nil					

17. Bypasses:

The details of bypasses are noted below:

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

18. Details of any other Structures

S. No.	Starting Chainage km.	Ending Chainage km.	Length	Side
NIL				

19. Built-up Locations

Project Stretch shall be considered as per table below.

S. No.	Starting Chainage (Km)	Ending Chainage (Km)	Length (m)	Village Name
Nil				

Annex – II

(As per Clause 8.3 (i))

(Schedule-A)

Dates for providing Right of Way

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

S. No.	Design Chainage(km)	Width (m)	Date of Providing ROW*
1	2	3	4
Full Right of Way (Full Width)	24+570	30.00	On Appointed Date

NOTE: The Authority shall provide the Right of Way on Appointed date in compliance to clause 10.3 of Agreement, barring encroachments in few sections.

Annex - III

(Schedule-A)

Alignment Plans-Not applicable

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

- (i) The alignment of the Project Highway is enclosed in alignment plan. Finished road level indicated in the Plan and Profile shall be followed by the contractor as minimum FRL. In any case, the finished road level of the project highway shall not be less than those indicated in the alignment plan. The contractor shall, however, improve/upgrade the Road profile as indicated in Annex-III based on site/design requirement.
- (ii) Traffic Signage plan of the Project Highway showing numbers & location of traffic signs is enclosed. The contractor shall, however, improve/upgrade upon the traffic signage plan as indicated in Annex-III based on site/design requirement as per the relevant specifications/IRC Codes/Manual.

Annex - IV

(Schedule-A)

Environment Clearances

The details of the project clearances are as follows.

S.No	Clearances	Present Status
1	Environment Clearance	Not required. As per MOEF notification S.O. 1533 August, 2015 (Schedule E, Project activity 7(f) and as per general conditions.
2	Forest Clearance	Not required.

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Schedule B

(See Clause 2.1)

Development of the Project Highway

1. Development of the (FOB)

Design and construction of the Foot over Bridge with electrically operated lifts -2nos 10 passenger capacity, along with stair case and escalator combination on either side as described in this Schedule-B and in Schedule-C.

2. Rehabilitation and augmentation

Not Applicable

3. Specifications and Standards

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

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Annex – I (Schedule-B)

Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25 on EPC Mode

The scope of the instant project is Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana. The project is comprised of Construction of FOBs with semi/full mechanized Foot Over Bridges (Electrically operated lifts - 2 nos, 10 members capacity along with staircase and Escalator on either side) in accordance with the IRC codes, specifications, other relevant IS Codes and standards of MORTH.

1. Construction of FOB(1No):

1.1. The construction of Foot over Bridge shall follow the guidelines specified in IRC codes and MORT&H guidelines to the extent land is available.

Design Chainage corresponding to Existing Chainage

S. No.	Existing Chainage (Km)	Design Chainage (Km)	Remarks
1	24+570	24+570	Construction of FOB with electrically operated lifts -2nos (10 nos passenger capacity and along with stair case and Escalators on either side

1.2. Width of Foot Over Bridge

(a) 3.0 m wide walkway to be constructed in accordance with the typical cross section as specified in the Schedule-B, Provided the width of the walkway shall be as specified in the following table:

Sl. No.	Chainage	Walk way Width (m)	GAD
1	24+570	3.0	Drawings.pdf

Except as otherwise provided in this Agreement, the width of the walk way and cross-sectional features shall conform to paragraph 1.2 above.

2. Geometric Design and General Features

2.1. General

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NA

2.2. Design Speed

NA

2.3. Improvement of the existing Road Geometrics

NA

2.4. Right of Way

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

2.5 Type of Shoulders-Not Applicable

(b) 0.5m earthen shoulder in diversion road shall be provided as per TCS covered with top 150mm minimum compacted layer of Granular material.

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

2.5. Lateral and Vertical Clearances at Underpasses/FOB

(a) Lateral and vertical clearances at FOB and provision of guardrails/crash barriers shall be as per the provision of relevant Manual.

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

S.No	Location (Chainage ,Km)	Span / Opening (m)	Vertical clearance (m)	GAD
1	24+570	30	5.5	Drawings.pdf

2.7. Lateral and Vertical Clearance at Overpasses:

Not Applicable

2.8. Diversion Roads/Service Roads:

Not Applicable

2.9. Grade separated structures

Not Applicable

2.10. Cattle (Animal Underpass) and Pedestrian Underpass/Overpass

Not Applicable

2.11. GAD of the Foot over Bridge

Applicable typical cross-section for the Foot over Bridge is given below:

S. No	Design Chainage	Outer to outer Length of FOB in (m)	GAD
1	24+570	30	Drawings.pdf

GAD of the Foot over Bridge is enclosed separately under file name **drawings.pdf** in tender documents. Please refer.

2.12 Special conditions & Specifications for the FOB:

The scope of the Project includes New Construction

- i. The centre-to-centre width of the FOB shall be 3.0 m. and its minimum clear height between road surface and bottom of the FOB to be 5.5 m.
- ii. The skywalk shall be covered with pre- painted Galvalume trapezoidal profile roofing sheets of minimum 0.47mm thick with Alu-Zinc coating with appropriate drainage system
- iii. The minimum clear height of the roof from the floor of skywalk shall not be less than 2.5 m.
- iv. The floor of the skywalk shall be continuous without any obstructions and shall be of anti-skid material.
- v. The FOB shall include safety features such as guardrails/ handrails along the length of FOB for safety of the users.
- vi. The FOBs shall be maintained free of obstructions, and the developer shall not put up any fixtures that may obstruct the passage on the skywalk and/ or shall not keep any wares, furniture or other articles in the corridor.
- vii. Proper signages in at least 3 languages to be provided on the FOB
- viii. The planning, design and execution of electrical installation, installation of lifts/escalators in FOBs shall be carried out in accordance with Part VIII-Building Services (Section 2-Electric Installations, Section 5- Installation of Elevators and Escalators, of National Building Code (NBC) of India prepared by BIS and as prevalent at the time of execution of the works, as the case may be.
- ix. The planning, design, construction, and installation of drainage system in FOBS shall be in accordance with the Part IX (Section 1-

Plumbing Services, Section 2-Plumbing and Sanitation as the case may be) of NBC of India prepared by BIS and as prevalent at the time of execution of the work.

- x. The Developer shall provide the required fire fighting equipment and facilities including fire hydrants, fireproof doors etc. conforming to the relevant standards and the applicable rules and regulations. For Fire Protection and Fire Safety requirements the Developer is required to follow the guidelines as provided in National Building Code (NBC) of India published by the Bureau of Indian Standards shall be followed.
- xi. The materials used for the FOB, flooring, roofing etc., should be fire resistant.
- xii. GAD of FOB is enclosed, and all components shall be as minimum specified in the drawings and higher specifications can be adopted by the contractor without any Change of scope.
- xiii. Two lifts of 10 passenger capacity shall be provided.
- xiv. One side Escalator & one side stair case shall be provided on each side of FOB
- xv. All anti corrosive structural components shall be with structural steel, plates, girders, angles etc., and fabricated, jointed properly as per specification.
- xvi. Flooring in walkway shall be of chequered plate and minimum thickness shall be 6mm.
- xvii. Necessary lighting arrangements shall be provided in lifts, walkway, staircase and in entire Foot Over Bridge.
- xviii. Necessary electrical connections from the concerned authorities shall be taken and all lifts, lightings, electrical items shall be in operation stage.
- xix. The footpath shall be laid to original position after fixing the FOB and necessary arrangements shall be provided for disabled person to step in and step out.
- xx. The FOBs shall be designed for pedestrian Live load of 5KN/m² and wind load as per IRC 6.

B All design standards and specifications apart from serving the needs of the general public/ pedestrians would require conforming to the requirements of the differently abled persons.

C. The design and construction of FOBs shall be in accordance with the IRC codes, specifications, other relevant IS codes and standards of MoRT&H (Manual of Specifications and Standards for Four Laning of Highways (IRC: SP: 84-2019), referred to herein as the Manual, IRC: SP-

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56-2011- Guidelines for Steel Pedestrian Bridges (First Revision) & IRC 24-2011.

3. Intersections and grade separators

(i) At-grade intersections

a) Major Junctions :Nil

S. No	Location of Intersection	Type of Intersection	Cross Road Type	Remarks
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b) Minor Junctions :

c)

S. No	Location of Intersection	Type of intersection	Leads To		Cross Road Type
			LHS	RHS	
Nil					

(ii) Grade separated intersection with ramps

S. No	Location of Intersection	Salient Features	Minimum length of viaduct to be provided	Road to be carried over/under the structure
Nil				

Note : The existing junction of other NH below the elevated structures shall be improved to NH standards .

4. (a) Road embankment and cut section-Not applicable

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

(ii) Raising of the Existing Road:

5. Footover Bridge design

5.1. The FOB shall be designed for pedestrian live load of 5Km/m2 and wind load as per IRC-6

5.2. Type of pavement

Not Applicable

5.3. Design requirements

B All design standards and specifications apart from serving the needs of the general public/ pedestrians would require conforming to the requirements of the differently abled persons.

C. The design and construction of FOBs shall be in accordance with the IRC codes, specifications, other relevant IS codes and standards of MoRT&H (Manual of Specifications and Standards for Four Laning of Highways (IRC: SP: 84-2019), referred to herein as the Manual, IRC: SP-56-2011- Guidelines for Steel Pedestrian Bridges (First Revision) & IRC 24-2011.

5.3.1 Design Period and Strategy – not applicable

Flexible pavement for new pavement and for widening and strengthening of the existing pavement shall be designed for a minimum design period of 15 years. Stage construction shall not be permitted.

5.3.2 Design Traffic-Not applicable

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the contractor shall design the pavement for design traffic of minimum 15 MSA. The EPC contractor has to conduct traffic surveys before designing and in case if there is excess traffic, the same shall be adopted and will not consider as change of scope.

Pavement design shall be as per section 5 of the manual subject to the minimum of the following crust composition.

A) Widening/Realignment/New Construction/Reconstruction Sections: (Flexible Pavement)- not applicable

S.No	Layer Composition	Crust Thickness(mm)	
		Main Carriageway	Diversion Road/Service road
1	Bituminous Concrete (Grade-II)	40	40
2	Dense Bituminous Macadam	85 (Grade -1)	50(Grade-2)
3	Wet Mix Macadam	250	250
4	Granular Sub Base	200	200
5	Subgrade (CBR>12%)	500	500
	Total Thickness(mm)	1075	1040

Note 1: VG-40 Grade bitumen shall be used for DBM/BC layers with Resilient Modulus of 3000Mpa shall be used in DBM layer.The lower

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DBM layer will be made fatigue resistant with $V_a = 4.5\%$ & $V_b = 11.5\%$ as per clause 9.2 of IRC: 37-2018.

***Note 2:** Profile corrective course over the existing carriageway to be provided as per provisions of Section 501.8.3.4 of MORTH specifications as indicated in TCS drawings.*

5.3.3 Conditions for FOB:

The scope of the Project includes New Construction

- i. The centre-to-centre width of the FOB shall be 3.0 m. and its minimum clear height between road surface and bottom of the FOB to be 5.5 m.
- ii. The skywalk shall be covered with pre- painted Galvalume trapezoidal profile roofing sheets of minimum 0.47mm thick with Alu-Zinc coating with appropriate drainage system
- iii. The minimum clear height of the roof from the floor of skywalk shall not be less than 2.5 m.
- iv. The floor of the skywalk shall be continuous without any obstructions and shall be of anti-skid material.
- v. The FOB shall include safety features such as guardrails/ handrails along the length of FOB for safety of the users.
- vi. The FOBs shall be maintained free of obstructions, and the developer shall not put up any fixtures that may obstruct the passage on the skywalk and/ or shall not keep any wares, furniture or other articles in the corridor.
- vii. Proper signages in at least 3 languages to be provided on the FOB
- viii. The planning, design and execution of electrical installation, installation of lifts/escalators in FOBs shall be carried out in accordance with Part VIII-Building Services (Section 2-Electric Installations, Section 5- Installation of Elevators and Escalators, of National Building Code (NBC) of India prepared by BIS and as prevalent at the time of execution of the works, as the case may be.
- ix. The planning, design, construction, and installation of drainage system in FOBS shall be in accordance with the Part IX (Section 1- Plumbing Services, Section 2-Plumbing and Sanitation as the case may be) of NBC of India prepared by BIS and as prevalent at the time of execution of the work.
- x. The Developer shall provide the required fire fighting equipment and facilities including fire hydrants, fireproof doors etc. conforming to the relevant standards and the applicable rules and regulations. For

Fire Protection and Fire Safety requirements the Developer is required to follow the guidelines as provided in National Building Code (NBC) of India published by the Bureau of Indian Standards shall be followed.

- xi. The materials used for the FOB, flooring, roofing etc., should be fire resistant.
- xii. GAD of FOB is enclosed, and all components shall be as minimum specified in the drawings and higher specifications can be adopted by the contractor without any Change of scope.
- xiii. Two lifts of 10 passenger capacity shall be provided.
- xiv. One side Escalator & one side stair case shall be provided on each side of FOB
- xv. All anti corrosive structural components shall be with structural steel, plates, girders, angles etc., and fabricated, jointed properly as per specification.
- xvi. Flooring in walkway shall be of chequered plate and minimum thickness shall be 6mm.
- xvii. Necessary lighting arrangements shall be provided in lifts, walkway, staircase and in entire Foot Over Bridge.
- xviii. Necessary electrical connections from the concerned authorities shall be taken and all lifts, lightings, electrical items shall be in operation stage.
- xix. The footpath shall be laid to original position after fixing the FOB and necessary arrangements shall be provided for disabled person to step in and step out.
- xx. The FOBs shall be designed for pedestrian Live load of 5KN/m^2 and wind load as per IRC 6.

B All design standards and specifications apart from serving the needs of the general public/ pedestrians would require conforming to the requirements of the differently abled persons.

C. The design and construction of FOBs shall be in accordance with the IRC codes, specifications, other relevant IS codes and standards of MoRT&H (Manual of Specifications and Standards for Four Laning of Highways (IRC: SP: 84-2019), referred to herein as the Manual, IRC: SP-56-2011- Guidelines for Steel Pedestrian Bridges (First Revision) & IRC 24-2011.

6. Roadside drainage: Nil.

(i) Reinforced Concrete Drains: Nil

7. Design of FOB

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7.1. General

The design of FOB is in accordance with the IRC codes, specifications other relevant IS codes and standards of MoRTH.

7.1.1. Utility services to be carried over the structures

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

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

7.2. Culverts

Not Applicable

7.2.1. Reconstruction of existing culverts:

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

S.No	Chainage (Km)		Type of Structure	Proposed Structure Details				
	Existing	Design		Span Arrangement (m)	Skew (degree)	Total Width (m)	TCS Type	Remarks
Nil								

7.2.2. Reconstruction of existing culverts:

S.N o	Chainage (Km)		Type of Structur e	Proposed Structure Details				
	Existi ng	Desig n		Span Arrange ment (m)	Skew (degre e)	Tota l Widt h (m)	TCS Type	Remar ks
Box Culvert								

7.2.3. Widening of existing culverts:

Nil

7.2.4. Additional culverts

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

S.No	Chainage (Km)		Type of Structure	Proposed Structure Details				
	Existing	Design		Span Arrangement (m)	Skew (degree)	Total Width (m)	TCS Type	Remarks

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S.No	Chainage (Km)			Proposed Structure Details				
	Existing	Design	Type of Structure	Span Arrangement (m)	Skew (degree)	Total Width (m)	TCS Type	Remarks
Nil								

7.2.5. Retaining of Existing Culverts

Nil

7.3. Bridges:

Nil

7.3.1. Existing bridges to be reconstructed

Nil

7.3.1.1. Temporary Diversion for Bridges

Nil

7.3.1.2. *The following narrow bridges shall be widened:*

Nil

7.3.1.3. *Additional new bridges:*

Nil

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

S. No	Location at km	Remarks
-NIL-		

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

S. No.	Chainage (Km)		Proposal	Proposed Structure Details		Repairs/replacement of railing/parapets
	Existing	Design		Type of Structure	Span Arrangement (m)	
Nil						

7.3.1.6. *Drainage system for bridge decks*

An effective drainage system for bridge decks shall be provided as specified in the Manual.

7.3.1.7. *Structure in marine environment*

- NIL-

7.4. Rail-road bridges

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(a) **Design, construction and detailed of ROB/RUB shall be as specified in the provision of relevant manual and as per approval accorded by Railway authorities.**

(b) **Road Over Bridges**

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

SL No	Chainage (Km)		Proposed Bridge Details			Remarks
	Existing	Design	Span Arrangement (m)	Super Structure	Width (m)	
-NIL-						

(c) **Road under Bridges**

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

SL No	Chainage (Km)		Proposed Bridge Details			Remarks
	Existing	Design	Span Arrangement (m)	Super Structure	Width (m)	
-NIL-						

7.5. **Grade separated Structures**

The grade separated structures shall be provided at the following locations and of the type and length specified in clause 2.9 and 3.

S.No	Design Chainage (Km)	Type of Bridge	Proposed Structure Details		
			Type of Structure	Span Arrangement (m)	Deck Width (m)
Nil					

7.6. **Repairs and strengthening of structures**

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

A. Bridges

S. No.	Chainage (Km)		Proposal	Proposed Structure Details		Nature and extent of repairs/strengthening to be carried out
	Existing	Design		Type of Structure	Span Arrangement (m)	
Nil						

B. ROB/RUB

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

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-NIL-

C. Overpasses/Underpasses and other structures

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

7.7. Slope Pitching locations

The stone pitching 300 mm thick laid over 150 mm thick filter material and M20 grade cement concrete chutes shall be provided to both sides of embankment at the following locations

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

8. Traffic control devices and road safety works

Traffic control devices and road safety works shall be provided in accordance with Section 9 of the Manual and Specifications of the reflecting sheeting is As per the Clause 9.3 of the Manual of Specification and Standards.

9. Roadside furniture

Roadside furniture shall be provided in accordance with the provisions of chapter 9 & 11 of IRCSP:73/2018 and IRC-S87/2019 as per Schedule-C.
Pedestrian facilities shall be provided as per IRC-SP:73/2018, IRC-SP 87/2019 Para 9.8 and refer Schedule-B of annex I TCS & Clause 2.11 of Schedule-B

10. Overhead gantry:

Nil

11. Compulsory Afforestation

Nil

12. Hazardous locations

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

S. No	Location stretch from (km) to (km)	LHS/RHS
Nil		

13. Special requirements for hill roads

-NIL-

14. Change of Scope

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

NOTE:

Any additional length of W- beam crash barrier pedestrian guard rail required as per site requirement shall not constitute as change of scope, save and except any variation arising out of a change of scope expressly undertaken in accordance with the provisions of article 13.

15. Rain Water Harvesting-Not applicable

As per Ministry of Environment and Forests Notification, New Delhi dated 4.01.1997 (as amended on 13.01.1998, 05.01.1999 & 6.11.2000), the construction of Rain water harvesting structure is mandatory in and around Water crisis area notified by the Central Ground Water Board.

16. Reinforced Earth wall Locations:

-Nil-

Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25 on EPC Mode

SCHEDULE-B1
(See 15 of Annex-I to
Schedule-B)
Utility Shifting

The shifting of utilities and felling of trees shall be carried out by the Contractor. The details of utilities is attached in Annex-I to Schedule-B1. The Contractor has to verify & shift all the utilities on the Project Site under the supervision of Utility Department/Agency.

All the Utilities which affects the execution of EPC work or Maintenance of Project highway in accordance with Article-9 of EPC Agreement.

Annex-I

(Schedule-B1)

Utility Shifting

Shifting of obstruction existing utilities indicated in Schedule-A to an appropriate location in accordance with the standards and specification of concerned utilities owning department is part of the scope of work of the contractor / Concessionaire. The bidder may visit the site along with Authority's representative and Utility Department / agency representative and assess & verify the quantum of shifting of utilities for the projects before submission of the bid. The specifications of concerned utility owning department shall be applicable and followed.

The Details of the Utilities requiring to be shifted is given in the Annex-II of Schedule B1.:

Notes:

The type / spacing / size / specification of poles / towers / lines / cables to be used in shifting work and shall be as per the guidelines of utility owning department and it is to be agreed solely between the Contractor / Concessionaire and the utility owning department. No change of scope shall be admissible, and no cost shall be paid for using different type /spacing/ size/specification in shifted working comparison to those in the existing work or for making any overhead crossing to underground as per requirement of utilities owing department and/or construction of project highway. The Contractor/Concessionaire shall carry out joint inspection with utility owning department and get the estimates for the utility owning department. The assistance of the Authority is limited to giving forwarding letter on the proposal of contractor / concessionaire to utility owning department whenever asked by the contractor/ concessionaire. The decision/approval of utility owning department shall be binding on the contractor/concessionaire.

The supervision charges at the rates / charges applicable of the utility owning department shall be paid directly by the Authority to the utility owning department as and when contractor / concessionaire furnishes demand of utility owning department along with a copy of estimated cost given by the later.

The dismantled material /scrap of existing utility to be shifted/dismantled shall be long to the contractor/ concessionaire who would be free to dispose-off the dismantled material as deemed fit by them unless the contractor/concessionaire is required to deposit the dismantled material to utility owning department as per the norm and practice and in that case the amount of credit

Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25 on EPC Mode

for dismantled material may be availed by the contractor /concessionaire as per estimate agreed between them.

The utilities shall be handed over after shifting work is completed to utility owning department to their entire satisfaction. The maintenance liability shall rest with utility owning department after handing over process is completed as far as utility shifting works are concerned.

Annex-II

(Schedule-B1)

Utility Shifting

For the calculation of the cost for arriving at percentage weightage in the Schedule-H, the Material and service cost with addition of GST@18% has been taken. The bidder shall quote considering all the statutory taxes, levies, cess etc.

A. Electrical Utility

Refer to the original estimates of Utility Shifting attached at **Annexure-III**, as provided by the Utility Department / Agency along the project stretch. Material code referred to in the individual activity description pertains to item specifications of the Utility Department/Agency. Activity No. refers to the activities as provided in the estimates by the Utility Department/Agency.

The proposal envisages the following:

1. Shifting of 33kv 11kv and LT Electrical lines and DTR's for construction of FOB near st. Alphonusus High school In Nalgonda town III Section of Nalgonda Town Subdivision.

Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25 on EPC Mode

Activity no: 10			Activity Description: DTR Shifting		
S.No	Materials Code	Materials Text	Item Catagory	Quantity	Unit
1	HGF10002	11KV HG Fuse Sets with Insulators	Stock item	3	EA
2	WRS00005	G.I. Wire 4mm (No.8)	Stock item	60.000	KG
3	HWR00002	11KV Metal parts(C&T)	Stock item	18	SET
4	INS10003	11KV Polymer Insulators (C&T)	Stock item	18	EA
5	BXS00047	LT Distribution Boxes (SMC)	Stock item	3	EA
6	FBR00017	LT/11KV M.S. Stay Clamps	Stock item	6	SET
7	CBX00004	LT XLPE Cable 1 Core 120 Sq. mm	Stock item	240.000	M
8	MST00013	MS Channel 75x40 mm	Stock item	150.000	KG
9	MST00002	MS Angle 50x50x6	Stock item	90.000	KG
10	PLS00004	PSCC Poles 9.1 Mts 280Kgs	Stock item	3	EA
11	FBR00002	M.S.Back Clamps for 9.1 M PSCC Pole	Stock item	12	SET
12	INS00002	LT Shackles	Stock item	30	EA
13	HWR00016	LT Metal parts	Stock item	30	SET
14	MST00014	MS Flat 50x6 mm	Stock item	20.000	KG
15	ABS10019	11KV 200A TT Gang Operated AB Switch PPT	Stock item	3	EA
S.No	Services Code	Services Text	Item Catagory	Quantity	Unit
1	SWR10395	Erect. of 11kv HG Fuseset incl earthing	-	3	SET
2	SWR20102	Erection of 11kv TT type AB switch	-	3	EA
3	SWR10463	Erection of Three Phase DTRs	-	3	EA
4	SWR21844	Column type DTR Plinth topslab 5'x5'x6"	-	3	EA
5	SMR11485	S-Earthing GI flat 25x3 mm incl material	-	120.000	KG
6	SMR11483	S-CI Pipe earthing 80mm dia 2.75m long	-	9	EA
7	SWR10357	ERECT. OF LINES-Providing of earthing	-	9	EA
8	SWR11745	Dimantle-11KV HG Fuse Set incl earthing	-	3	SET
9	SWR11743	Dismantle-AB Swithces (all types)	-	3	EA

Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25 on EPC Mode

10	SMR11487	S-MS Bolts & Nuts,Washers etc.,	-	30.000	KG
11	SWR10674	Erection of LT distribution box	-	3	EA
12	SWR10112	EXCAV. OF PIT HARD(2.6" x 2.6" x 6.0")	-	3	EA
13	SWR10343	ERECTION OF LINES-Erection of 9.1M Pole	-	3	EA
14	SWR20308	SubTrnsprt 9M PSCC Pole incl. L&UL<10KM	-	3	EA
15	SWR10356	Mass concreting of supports incl. cement	-	1.620	M3
16	SWR21043	Hring of Crane for mounting equipment	-	3	LS
17	SWR12163	Dismantle-CRS DTR Plinth	-	3	EA
18	SWR20075	Dismantling of LT Distribution box	-	3	EA
19	SWR10292	LOADING of 11 KV XLPE cable > 35 Sqmm	-	240.000	M
20	SWR22356	Laying of 1Core XLPE 120Sqmm Cable	-	240.000	M
21	SWR11860	Transport of Cond Drum,VCBs upto 10Km	-	1	EA
22	SWR10921	Laying of earth mat,excavation 25x3mm	-	2	RMT

S.No	Materials Code	Materials Text	Item Catagory	Quantity	Unit
1	INS30007	33KV Polymer Insulators (B&S)	Stock item	12	EA
2	HWR00004	33KV Metal parts(B&S)	Stock item	12	SET
3	INS30008	33KV Polymer Pin Insulators With GI Pins	Stock item	6	EA
4	INS10003	11KV Polymer Insulators (C&T)	Stock item	30	EA
5	HWR00002	11KV Metal parts(C&T)	Stock item	30	SET
6	INS10009	11KV Polymer Pin Insulators with GI pins	Stock item	15	EA
7	INS00002	LT Shackles	Stock item	5	EA
8	HWR00016	LT Metal parts	Stock item	5	SET
9	PLS00013	PSCC Poles 11 Mts 365 Kgs	Stock item	4	EA
10	MST00014	MS Flat 50x6 mm	Stock item	80.000	KG
11	MST00013	MS Channel 75x40 mm	Stock item	150.000	KG
12	MST00002	MS Angle 50x50x6	Stock item	110.000	KG
13	CBA00004	LT AB Cable XPLE 3C X 70+16+50 Sq. mm	Stock item	300.000	M
14	CDR00003	AAA Conductor 55 Sq. mm	Stock item	900.000	M
15	CDR00004	AAA Conductor 100 Sq. mm	Stock item	450.000	M

S.No	Services Code	Services Text	Item Catagory	Quantity	Unit
1	SWR10466	Formation of 33kvline vertical cutpoint	-	2	EA
2	SWR11861	Transport of Cond Drum,VCBs >10 & <20Km	-	1	EA
3	SWR10365	Stringing of 55sqmm 33/11kv Line 3 Cond	-	0.300	KM
4	SWR22065	Dismantling of 11kv 34/ 55 Sqmm SC	-	0.300	KM
5	SWR11319	Dismantle-8.0 m long PSCC pole	-	4	EA
6	SMR11683	S-M+3 Tower GALV	-	4	EA
7	SWR11850	Erect- M+3 Tower GALV	-	4	EA
8	SMR11684	S-Mat. for Extn of M+3 Tower by 3M GALV	-	8	EA
9	SWR11851	Erect-Extn of 3M for M+3 Tower GALV	-	8	EA
10	SWR20190	Removing and Reconnection of LT Services	-	50	EA

11	SWR11873	Cutting Charges-MS Channel 75x40mm	-	8	EA
12	SWR11320	Dismantle-9.1 M long PSCC pole	-	4	EA
13	SWR10356	Mass concreting of supports incl. cement	-	4.000	M3
14	SMR11487	S-MS Bolts & Nuts,Washers etc.,	-	30.000	KG
15	SWR21897	Formation of LTCut point(Ver/Hor)-1 ckt	-	2	EA
16	SWR10653	Formatn of Horiz Cut point for 11KV line	-	4	EA
17	SWR10112	EXCAV. OF PIT HARD(2.6" x 2.6" x 6.0")	-	4	EA
18	SWR11180	SubTrnsprt 11M PSCC Pole incl. L&UL<10KM	-	4	EA
19	SWR10978	Errection of 11 M long PSCC pole	-	4	EA
20	SWR12241	Dismantle-H/V 33KV Cut Point	-	1	EA
21	SWR10856	Earth work excav hard rock bould <3cum	-	19.010	M3
22	SWR10307	FABR-Drilling of holes upto 20 mm dia 4	-	100	EA
23	SWR10323	Fab Stay clamps with 50 x 6 mm MS Flat	-	10	EA
24	SWR11873	Cutting Charges-MS Channel 75x40mm	-	10	EA
25	SWR10296	Cutting Charges for MS angle all sizes	-	10	EA
26	SWR10301	Cutting Charges for MS flat all sizes	-	20	EA
27	SWR10666	Stringing of AB cable 3x70 + 1x16 + 1x50	-	0.300	KM
28	SWR11860	Transport of Cond Drum,VCBs upto 10Km	-	1	EA
29	SWR22065	Dismantling of 11kv 34/ 55 Sqmm SC	-	0.300	KM
30	SWR10366	Stringing 100sqmm 33/11kv Line 3 Cond SC	-	0.150	KM
31	SWR22063	Dismantling of 100 Sqmm conductor SC	-	0.150	KM

Activity no: 50			Activity Description: 11 KV line AB switch		
S.No	Materials Code	Materials Text	Item Catagory	Quantity	Unit
1	CDR00003	AAA Conductor 55 Sq. mm	Stock item	30.000	M
2	INS10003	11KV Polymer Insulators (C&T)	Stock item	6	EA
3	HWR00002	11KV Metal parts(C&T)	Stock item	6	SET
4	MST00003	MS Angle 65x65x6	Stock item	40.000	KG
5	MST00012	MS Channel 100x50 mm	Stock item	120.000	KG
6	PLS00004	PSCC Poles 9.1 Mts 280Kgs	Stock item	1	EA
7	ABS10009	11KV 400A Conv DB AB/s with insulators	Stock item	1	EA
8	MST00014	MS Flat 50x6 mm	Stock item	30.000	KG
9	FBR00002	M.S.Back Clamps for 9.1 M PSCC Pole	Stock item	4	SET
10	FBR00034	M.S.Stay Clamps for 9.1 M PSCC Pole	Stock item	4	EA
11	FBR00009	LT 3 Ph. 5 Wire Cross Arms	Stock item	1	EA
12	INS00001	LT Pin Insulators	Stock item	5	EA
13	HWR00015	LT GI Pins	Stock item	5	EA
S.No	Services Code	Services Text	Item Catagory	Quantity	Unit
1	SWR10393	Erection of 11kv ABSwitch incl earthing	-	1	EA
2	SMR11488	S-GI Bolts & Nuts,Washers etc.,	-	20.000	KG
3	SWR10467	Formation of 11kvline vertical cutpoint	-	1	EA
4	SWR10356	Mass concreting of supports incl. cement	-	0.540	M3
5	SMR11483	S-CI Pipe earthing 80mm dia 2.75m long	-	1	EA
6	SWR11860	Transport of Cond Drum,VCBs upto 10Km	-	1	EA
7	SMR11485	S-Earthing GI flat 25x3 mm incl material	-	40.000	KG
8	SWR10357	ERECT. OF LINES-Providing of earthing	-	1	EA
9	SWR10353	Assembly and erection of Stay set11kv<	-	1	SET
10	SWR10110	EXCAV. OF PIT HARD (2.6" x 2.6" x 5.0')	-	1	EA
11	SWR20308	SubTrnsprt 9M PSCC Pole incl.	-	1	EA

B. Water Pipelines Utility Shifting

Nil

Schedule C
(See Clause 2.1)

Project Facilities

1. Project Facilities

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

- a) Lifts -2No.s
- b) Escalators-2 No.s
- c) Staircase-2 No.s
- d) Roadside furniture;
- e) Pedestrian facilities;- Footpaths with Chequered tiles & Pedestrian Guard railing
- f) Electrification of Foot over Bridge

2. Description of Project Facilities

Each of the Project Facilities is described below showing:

a) Lifts -2No.s:

10 passenger Gearless Machine Room Less Elevator (Lift) -2 no's including comprehensive maintenance for 2 years during Defect Liability Period Make: Schindler 5000 Series or its equivalent model of Kone or OTIS.

b) Escalators-2 No.s:

2-No Escalators along with providing stainless steel panels grade 304 in 1.2mm with stiffener backing for rigidity, on one side and one soffit of escalator (Rise-6500mm and incl. degree 30) as per approved drawing and specification including comprehensive maintenance for 2 years during Defect Liability Period. Make: Schindler 9300 or its equivalent model of Kone or OTIS.

c) Staircase-2 No.s:

Stair case-2No.s shall be provided as per drawings.pdf

d) Roadside furniture;

The roadside furniture shall include the provision of the;

i. Traffic Signs:

Traffic signs shall be provided as per Manual IRC SP: 73-2018, IRC SP:84-2019 and IRC:67-2012. Locations of the sign boards (roadside signs, overhead signs and kerb mounted signs) shall be finalized with the consultation of Authority Engineer.

e) Pedestrian facilities;

The pedestrian facilities shall include the provision of the;

i. Footpaths with Chequered tiles & Pedestrian Guard railing:

Footpath (M15) shall be constructed for a minimum length of 30 m covered with Chequered tiles 25mm thick shall be laid, Pedestrian Guard railing shall be provided as per relevant manual on either side of the carriageway.

f) Electrification of Footover Bridge:

Supply and Fixing of Rigid PVC pipes, Appropriate FRLSH/ HFFR PVC insulated flexible ISI marked copper cable, 4 Core 6.0Sqmm PVC/XLPE, tubelights, 10W LED Bulk head fitting with milky diffuser heat sink, 4 no.s 12 Way SPN DB with IP 43 Protection, 1 No 8 Way VTPN DB with IP 43 Protection, 1 No 4 Way TPN DB Horizontal with IP 43 Protection, 4.No's earthings by excavating a pit to a depth of 2.25Mt, Supply and fixing of heavy duty type double compression weather proof type brass cable glands and all other incidental electrical items required for efficient functioning of Lifts & escalators

Schedule D

(See Clause 2.1)

Specifications And Standards

1. Construction

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

2. Design Standards

1. The FOB shall be designed for pedestrian live load of 5KN/m² and wind load as per IRC-6 and as per conditions mentioned earlier in **2.12 Special conditions & Specifications for the FOB.**
2. All design standards and specifications apart from serving the needs of the general public/ pedestrians would require conforming to the requirements of the differently abled persons.
3. The design and construction of FOBs shall be in accordance with the IRC codes, specifications, other relevant IS codes and standards of MoRT&H (Manual of Specifications and Standards for Four Laning of Highways (IRC: SP: 84-2019), referred to herein as the Manual, IRC: SP-56-2011- Guidelines for Steel Pedestrian Bridges (First Revision) & IRC 24-2011.

Annex-I

(Schedule-D)

Specifications and Standards for Construction

1. Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards published by IRC (referred to as "Manual" in this Schedule) and MORTH Specifications for Road and Bridge Works. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

All bridges having span more than 15m shall be got proof checked while designing and get safety audit after completion by IITs/NITs with reports by the EPC contractor.

2. Deviations from the Specifications and Standards

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

Schedule - E

(See Clauses 2.1 and 14.2)

Maintenance Requirements

1. Maintenance Requirements

- 1.1 The Contractor shall, at all times maintain the Project Highway /FOB in accordance with the provisions of this Agreement, Applicable Laws and Applicable Permits.
- 1.2 The Contractor shall repair or rectify any Defect or deficiency set forth in Paragraph 2 of this Schedule-E within the time limit specified therein and any failure in this behalf shall constitute non-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.
- 1.3 All Materials, works and construction operations shall conform to the MORTH Specifications for Road and Bridge Works, and the relevant IRC publications. Where the specifications for a work are not given, Good Industry Practice shall be adopted.

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

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

4. Extension of time limit

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

5. Emergency repairs/restoration

Notwithstanding anything to the contrary contained in this Schedule-E, if any Defect, deficiency or deterioration in the Project Highway /FOB poses a hazard to safety or risk

of damage to property, the Contractor shall promptly take all reasonable measures for eliminating or minimizing such danger.

6. Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

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

8. Repairs on account of natural calamities

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

Annex – I

(Schedule-E)

Repair/rectification of Defects and deficiencies

The Contractor shall repair and rectify the Defects and deficiencies specified in this Annex-I of **Error! Reference source not found.** within the time limit set forth in the table below.

Table-1:Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Service(LOS)		Frequency of Inspection	Tools / Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement(Pavement of MCW, Service Road, approaches of Grade structure, approaches of connecting roads 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/ltp/ reports/03031/)	24-48hours	MORT&H Specification 3004.2

Asset Type	Performance Parameter	Level of Service(LOS)		Frequency of Inspection	Tools / Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications	
		Desirable	Acceptable						
	Cracking	Nil	< 5 % subject to limit of 0.5 sqm for any 50 m length	Daily			7-15 days	MORT&H Specification 3004.3	
	Rutting	Nil	< 5 mm	Daily	Straight Edge		15 -30 days	MORT&H Specification 3004.2	
	Corrugations and Shoving	Nil	< 0.1 %of area	Daily	Length Measurement Unit like		2-7 days	IRC:82-2015	
	Bleeding	Nil	< 1 % of area	Daily	Scale, Tape, odometer etc.		3-7 days	MORT&H Specification 3004.4	
	Ravelling/ Stripping	Nil	< 1 % of area	Daily			7-15 days	IRC:82-2015 read with IRC SP81	
	Edge Deformation/ Breaking	Nil	< 1 m for any 100 m section and width <0.1 m at any location, restricted to 30cm 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	60SN	50SN	Bi- Annually		180 days		BS: 7941-1:2006	
	Pavement Condition Index	3	2.1	Bi- Annually		180 days		IRC:82-2015	
	Other Pavement Distresses					2-7 days		IRC:82-2015	
	Deflection/ Remaining Life			Annually		Falling Weight Deflectometer		IRC 115: 2014	180 days
	Rigid Pavement (Pavement of MCW, Service Road, Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Roughness BI	2200m m/km	2400mm/km	Bi- Annually	Class I Profilometer	ASTM E950 (98) :2004 and ASTM E1656 - 94: 2000	180 days	IRC:SP:83-2008
		Skid	Skid Resistance no. at different speed of vehicles		Bi- Annually	SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)	IRC:SP:83-2008	180 days	IRC:SP:83-2008
Minimum SN			Traffic Speed (Km/h)						
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,	IRC	7-15 days	MORT&H Specification 408.4	

Asset Type	Performance Parameter	Level of Service(LOS)		Frequency of Inspection	Tools / Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	Acceptable					
	Slope of camber/cross fall	Nil	<2% variation in prescribed slope of camber / cross fall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15 % variation in prescribed side slope	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Protection	Nil	Nil	Daily			7-15 days	MORT&H Specification
	Rain Cuts/ Gullies in slope	Nil	Nil	Daily Specially During Rainy Season			7-15 days	MORT&H Specification

[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.]

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

Table-2:Maintenance Criteria for Rigid Pavements:

S. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the cased<D/2	Forth cased>D/2
CRACKING						
1	Single Discrete Cracks not intersecting with any joint	w=width of crack L=length of crack d=depth of crack D = depth of slab	0	Nil, not discernible	No Action	Not applicable
			1	w < 0.2 mm. hair cracks		
			2	w=0.2-0.5mm,discerniblefrom slow-moving car	Seal without delay	Seal, and stitch if L>1m. Within 7days
			3	w=0.5-1.5mm,discerniblefrom fast-moving car		
			4	w = 1.5-3.0mm	Seal, and stitch if L >1 m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15days
			5	w > 3 mm.		
2	Single Transverse (or Diagonal) Crack intersecting with one or 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 < 0.2 mm, hair cracks	Route and seal with epoxy.	Staple or Dowel Bar

S. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the cased <D/2	For the cased >D/2
			2	w=0.2-0.5mm, discernible from slow vehicle		
			3	w=0.5-3.0mm, discernible from fast vehicle	Route, seal and stitch, if L > 1m. Within 7 days	
			4	w = 3.0-6.0mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected. Portion with norms and specifications- See Para 5.5 & 9.2 within 15 days
			5	w > 6 mm, usually associated with spalling, and/or slab rocking under traffic	Not Applicable, as it may be full depth	
3	Single Longitudinal Crack intersecting with one or more joints	w=width of crack L=length of crack d=depth of crack D = depth of slab	0	Nil, not discernible	No Action	
			1	w<0.5mm, 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=0.5-3.0mm, discernible from fast vehicle	Route seal and stitch, if L>1 m. Within 15 days	-
			3	w = 3.0-6.0mm	Staple, if L> 1 m. Within 15 days	Partial Depth Repair with stapling. Within 15 days
			4	w=6.0-12.0mm, usually associated with spalling	Not Applicable, as it may be full depth	
			5	w>12 mm, usually associated with spalling, and/or slab rocking under traffic		Full Depth Repair Dismantle and reconstruct affected portion as per norms and specifications-
4	Multiple Cracks intersecting with one or more joints	w=width of crack	0	Nil, not discernible	No Action	-
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > 1 m. Within 15 days	
			2	w=0.2-0.5mm, discernible from slow vehicle		
			3	w=0.5-3.0mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, Reinstall sub-base, Reconstruct whole slab as per specifications within 30 days
			4	w=3.0-6.0 mm panel broken into 2 or 3 pieces		
			5	w>6mm and/or panel broken into more than 4 pieces		

S. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the cased<D/2	Forth cased>D/2
5	Corner Break	w = width of crack L = length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5 mm; only 1cornerbroken	Seal with low viscosity epoxy to secure broken parts Within 7 days	Seal with epoxy seal with epoxy Within 7days
			2	w<1.5mm;L<0.6m,onlyone corner broken		
			3	w<1.5mm;L<0.6m,twocorners broken	Partial Depth(Refer Figure 8.3 of IRC.SP: 83-2008) Within 15 days	Full depth repair
			4	w>1.5mm;L>0.6morthree corners broken		
			5	ree or four corners broken		
6	Punchout(Applicable to Continuous Reinforced Concrete Pavement(CRCP) only)	w=width of crack L = length (m/m2)	0	Nil, not discernible		No Action
			1	w < 0.5 mm; L < 3m/m ²	Not Applicable as it may be full depth	Seal with low viscosity epoxy to secure broken parts. Within 15days
			2	either w> 0.5 mm or L<3 m/m ²		
			3	w > 1.5 mm and L <3 m/m ²		
			4	w>3mm,L<3m/m ² and deformation		
			5	w>3mm,L>3m/m ² and deformation		Full depth repair- Cut out and replace damaged area taking care not to damagers in forcement. Within 30days
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 affecting.
			4	r = 25-50 %		
					Within 30 days	
5	r > 50% and h> 25mm	Reconstructslabs,4or more slabs if affecting. Within 30 days				
8	Scaling	r = damaged	0	Nil, not discernible	Short Term	Long Term

S. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action		
					For the cased<D/2	Forth cased>D/2	
					No action.	Not Applicable	
					Local repair of areas damaged and liable to be damaged. Within 7days		
			1	r <2%	BondedInlaywithin15 days		
			2	r = 2-10 %			
				3	r =10 -20%		Reconstructslabwithin30 days
				4	r = 20-30 %		
				5	r > 30 % and h > 25mm		
			9	Polished Surface/Glazing	t=texture depth, sand patch test		0
1	t > 1 mm						
2 '	t = 1-0.6 mm	Monitor rate of deterioration					
3	t = 0.6-0.3mm						
4	t = 0.3-0.1mm						
			5	t < 0.1 mm	Diamond Grinding if affecting50% or more slabs in a continuoustretchofminimu m5 km. Within 30 days		
10	Popout (Small Hole), PotholeReferPara8.4	n=number/m ² d=diameter h = maximum depth	0	d<50mm;h<25mm;n<1per5 m ²	No action.	Not Applicable	
			1	d=50-100mm;h<50mm;n<1 per 5 m ²	Partialdepthrepair65 mm deep. Within 15 days		
			2	d=50-100mm;h>50mm;n<1 per 5 m ²			
			3	d=100-300mm;h<100mmn<1 per 5 m ²	Partialdepthrepair110mmi. e.10 mm more than the depth of the hole. Within 30 days		
			4	d=100-300mm;h>100mm;n<1 per 5 m ²			
			5	d>300mm;h>100mm:n>1per5 m ²	Full depth repair. Within 30 days		
Joint Defects							
11	Joint Seal Defects	Loss or damage L	0	Difficult to discern.	Short Term	Long Term	

S. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the cased<D/2	Forth cased>D/2
					No action.	
			1	Discernible<25%but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	Not Applicable
			3	Notable. L >25% insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within7 days	
			5	Severe; w >3mm negligible protection against ingress of water and trapping incompressible material	Clean, widen and reseal the joint. Within 7 days	
12	Spalling of Joints	w=width on either side of the joint L = length of spalled portion (as % joint length)	0	Nil, not discernible	No action.	Not Applicable
			1	w < 10 mm	Apply low viscosity epoxyres in/mortar in cracked portion. Within 7 days	
			2	w = 10-20mm,L<25%		
			3	w = 20-40mm,L>25%	Partial Depth Repair. Within 15 days	
			4	w = 40-80mm,L>25%	30 -50mm 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)	f = difference of level	0	not discernible, < 1mm	No action.	No action.
	In Cracks or Joints		1	f < 3 mm		Replace the slab as appropriate. Within 30days
			2	f = 3-6 mm	Determine cause and observe, take action for diamond grinding	
			3	f = 6-12mm	Diamond Grinding	
			4	f= 12 -18mm	Raise sunken slab.	Replace the slab as appropriate. Within 30days
			5	f> 18 mm	Strengthen subgrade and sub-base by grouting and raising sunken slab	
14	Blowup or Buckling	h = vertical displacement from normal profile	0	Nil, not discernible	Short Term	Long Term
					No Action	
			1	h < 6 mm		

S. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the cased<D/2	Forth cased>D/2
			2	h = 6-12mm	Install Signs to Warn Traffic	
			3	h = 12-25mm	within 7 days	
			4	h > 25 mm	Full Depth Repair. Within 30 days	
			5	shatteredslabs,ie4or more pieces	Replace broken slabs. Within 30 days	
15	Depression	h=negative vertical displacement from normal profile L=length	0	Not discernible, h < 5mm	No action.	Not Applicable
			1	h = 5-15mm		
			2	h=15-30mm,Nos<20%joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30-50mm		
			4	h>50mmor>20%joints	Strengthen subgrade. Reinstate 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	Short Term	Long Term
					No action.	scrabble
			1	h = 5-15mm	Follow up.	
			2	h=15-30mm,Nos<20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30-50mm		
			4	h>50mmor>20%joints	Stabilise subgrade. Reinstate pavement at normal level if length< 20 m. Within 30 days	
5	h > 100mm					
17	Bump	h=vertical	0	h < 4 mm	No action	
		Displacement from normal profile	1	h = 4-7 mm	Grind, in case of new construction within 7 days	Construction Limit for New Construction.
			3	h = 7-15mm	Grind, in-case of on-going Maintenance within 15 days	Replace in-case of new construction. Within 30days
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	Lane to Shoulder Drop	f=difference of level	0	Nil, not discernible< 3mm	Short Term	Long Term

S. No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the cased<D/2	Forth cased>D/2
					No action.	
			1	f = 3-10mm	Spot repair of shoulder within 7 days	
			2	f = 10-25mm		
			3	f = 25-50mm	Fill up shoulder	
			4	f = 50-75mm	within 7 days	For any 100 m stretch Reconstruct shoulder, if affecting25% or more of stretch. Within 30days
			5	f > 75 mm		
Drainage						
19	Pumping	quantity offines 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/Frequent10 -25%	Lift or jack slab within 30days.	
			Nos/100m stretch	5	abundant, crack development > 25%	Repair distressed pavement sections. Strengthen subgrade and sub-base. Replace slab. Within 30 days
20	Ponding	Ponding on slabs due to blockage of drains	0-2	No discernible problem	No action.	
			3 to 4	Blockages observed in drains, but water flowing	Cleandrainsetcwithin7days, Follow up	Action required to stop water damaging foundation within 30 days.
			5	Ponding, accumulation of water observed	-do-	

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

Asset Type	Performance Parameter	Level of Service (LOS)			Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specification s and Standards
Highway	Availability of Safe Sight Distance	As per IRC SP :73-2018, a minimum of safe stopping sight distance shall be available throughout.			Monthly	Manual Measurements with Odometer along with video/ image backup	Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as trees, temporary encroachments. In case of permanent structure or design deficiency: Removal of obstruction/improvement of deficiency at the earliest Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.		IRC:SP84-2014
		Design Speed, kmph	Desirable Minimum Sight Distance (m)	Safe Stopping Sight Distance (m)					
		100	360	180					
		80	260	130					
Pavement Marking	Wear	<70% of marking remaining			Bi- Annually	Visual Assessment as per Annexure-F of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect - within 2 months	IRC:35-2015

Asset Type	Performance Parameter	Level of Service (LOS)			Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specification s and Standards
	Day time Visibility	During expected life Service Time Cement Road -130mcd/m2/lux Bituminous Road - 100mcd/m2/lux			Monthly	As per Annexure-D of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months	IRC:35-2015
	Night Time Visibility	<u>Initial and Minimum Performance for Dry Retro reflectivity during night time:</u>			Bi-Annually	As per Annexure-E of IRC:35-2015	Re - painting	Cat-1 Defect – within 24 hours Cat-2 Defect – within 2 months	IRC:35-2015
		Design Speed	(RL) Retro Reflectivity (mcd/m2/lux)						
			Initial (7 days)	Minimum Threshold level (TL) & warranty period required up to 2 years					
		Up to 65	200	80					
		65 - 100	250	120					
		Above100	350	150					
	<u>Initial and Minimum Performance for Night Visibility under wet condition(Retro reflectivity):</u>								
		Initial 7 days Retro reflectivity: 100 mcd/m2/lux Minimum Threshold Level: 50mcd/m2/lux							
	Skid Resistance	Initial and Minimum performance for Skid Resistance: Initial (7days): 55BPNMin. Threshold: 44BPN*Note: shall be considered under urban/city traffic condition encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc			Bi-Annually	As per Annexure-G of IRC:35-2015		Within 24 hours	IRC:35-2015
Road Signs	Shape and Position	Shape and Position as per IRC:67-2012.Signboard should be clearly			Daily	Visual with video/image backup	Improvement of shape, in case if shape is damaged.	48 hours in case of Mandatory	IRC:67-2012

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		visible for the design speed of the section.			Relocation as per requirement	Signs, Cautionary 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	change of signboard	48 hours in case of Mandatory	RC:67-2012
				signboard using Retro Reflectivity Measuring Device. In accordance with ASTM D4956-09.		Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/Cantilever Sign boards	
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually m	Use of distance Reasuring tape H	raising Kerb eight	Within 1 Month	RC 86:1983
	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image K backup	Kerb Repainting	Within 7-days	RC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP:84-2014 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:84-2014, IRC:35-2015

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Pedestrian Guardrail	<u>Functionality:</u> Functioning of guardrail as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:84-2014
	Traffic Safety Barriers	<u>Functionality:</u> Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014, IRC:119-2015
	End Treatment of	<u>Functionality:</u> Functioning of End Treatment as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP:84-2014,
	Traffic Safety Barriers			backup			IRC:119-2015
	Attenuators	<u>Functionality:</u> Functioning of Attenuators as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP-2014, IRC:119-2015
	Guard Posts and Delineators	<u>Functionality:</u> Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: 79 -1981
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67-2012
	Traffic Blinkers	<u>Functionality:</u> Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:84-2014
Highway Lighting System	Highway Lights	Illumination: Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:84-2014
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:84-2014
	Toll Plaza Canopy Lights	Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with luxmeter	Improvement in Lighting System	24 hours	IRC:SP:84-2014
		No major/minor failure in the lighting system	Daily	-	Rectification of failure	8 hours	IRC:SP:84-2014
Trees and Plantation including median plantation	Obstruction in a minimum head-room of 5.5 m above carriageway or obstruction in visibility of road signs	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC:SP:84-2014

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Deterioration in health of trees and bushes	Health of plantation shall be as per requirement of specifications & instructions issued by Authority from time to time	Daily	Visual with video/image backup	Timely watering and treatment. Or Replacement of Trees and Bushes.	Within 90 days	IRC:SP:84-2014
	Vegetation affecting sight line and road structures	Sight line shall be free from obstruction by vegetation	Daily	Visual with video/image backup	Removal of Trees	Immediate	IRC:SP 84-2014
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every 4 hours	
	Defects in electrical, water and sanitary installations	-	Daily	-	Rectification	24 hours	
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
Pipe/box/slab culverts	Free waterway/unobstructed flow section	85% of culvert normal flow area to available	2 times in a year (before and after rainy season)	Inspection by Bridge Engineer as per IRC SP: 35-1990 and recording of depth of silting and area of vegetation.	Cleaning silt up soils and debris in culvert barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrel before rainy season.	15 days before onset of monsoon and within 30 days after end of rainy season.	IRC 5-2015, IRC SP:40-1993 and IRC SP:13-2004

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Leak-proof expansion joints if any	No leakage through expansion joints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35-1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-1993 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not more than 0.25 sqm	Bi-Annually	Detailed inspection of all components of culvert as per IRC SP:35-1990 and recording the defects	Repairs to spalling, cracking, delamination, rusting shall be followed as per IRC:SP:40-1993.	15 days	IRC SP 40-1993 and MORTH Specifications clause 2800
		Delamination of concrete not more than 0.25 sq.m.					
		Cracks wider than 0.3 mm not more than 1m aggregate length					
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sqm, damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Bridges including ROBs Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORTH Specification 2811
Bridge - Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORTH Specification 3004.2 & 2811.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specification s and Standards
	User safety (condition of crash barrier and guard rail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed condition survey as per IRC SP: 35-1990.	Repairs and replacement of safety barriers as the case may be	3days	IRC: 5-1998, IRC SP: 84-2014 and IRC SP: 40-1993.
	Rusted reinforcement	Not more than 0.25 sq.m	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out the repairs to affected concrete portion with epoxy mortar / concrete	15 days	IRC SP: 40-1993 and MORTH Specification 1600.
	Spalling of concrete	Not more than 0.50 sq.m					
	Delamination	Not more than 0.50 sq.m					
	Cracks wider than 0.30 mm	Not more than 1m total length	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting with epoxy mortar, investigating causes for cracks development and carry out necessary rehabilitation.	48 hours	IRC SP: 40-1993 and MORTH Specification 2800.
	Rainwater seepage through deck slab	Leakage – nil	Quarterly	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Grouting of deck slab at leakage areas, waterproofing, repairs to drainage spouts	1 months	MORTH specifications 2600 & 2700
	Deflection due to permanent loads and live loads	Within design limits.	Once in every 10 years for spans more than 40m	Load Test Method	Carry out major rehabilitation works on bridge to retain original design loads capacity	6 months	IRC SP: 51-1999.
	Vibrations in bridge deck due to moving trucks	Frequency of vibrations shall not be more than 5 Hz	Once in every 5 years for spans more than 30m and every 10 years for spans between 15 to 30m	Laser displacement sensors or laser vibrometers	Strengthening of super structure	4 months	AASHTO LRFD specifications
	Leakage in Expansion joints	No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rain water through expansion joint in case of buried and asphalt plug and	Bi-Annually	Detailed condition survey as per IRC SP: 35-1990 using Mobile Bridge Inspection Unit	Replace of seal in expansion joint	15 days	MORTH specifications 2600 and IRC SP: 40-1993.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specification s and Standards
		copper strip joint.					
	Debris and dust in strip seal Expansion joint	No dust or debris in expansion joint gap	Monthly	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Cleaning of expansion joint gaps thoroughly	3 days	MORTH specifications 2600 and IRC SP: 40-1993.
	Drainage spouts	No down take pipe missing/broken below soffit of the deck slab. No silt, debris, clogging of drainage spout collection chamber.	Monthly	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	Cleaning of drainage spouts thoroughly. Replacement of missing/broken down take pipes with a minimum pipe extension of 500mm below soffit of slab. Providing sealant around the drainage spout if any leakages observed.	3 days	MORTH specification 2700.
Bridge-substructure	Cracks/spalling of concrete/rusted steel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting/guniting and micro concreting depending on type of defect noticed	30 days	IRC SP: 40-1993 and MORTH specification 2800.
	Bearings	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture of reinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile Bridge Inspection Unit	In case of failure of even one bearing on any pier/abutment, all the bearings on that pier/abutment shall be replaced, in order to get uniform load transfer on to bearings.	3 months	MORTH specification 2810 and IRC SP: 40-199.
Bridge Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection as per IRC SP:35-1990 using Mobile Bridge	Suitable protection works around pier/abutment	1 month	IRC SP: 40-1993, IRC 83-2014, MORTH specification

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
				Inspection Unit. In case of doubt, use Underwater camera for inspection of deep well sin major Rivers.			2500
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sq.m, damage to solid apron(concrete apron) not more than 1 sq.m	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching.	30 days after defect observation or 2 Weeks before onset of rainy season whichever is earlier.	IRC: SP 40-1993 and IRC:SP:13-2004.
Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or evener constructed under the scope of the contractor.							

Note: For all tables 1to4 above, latest BIS &IRC standards(even those not indicated herewith) along with MoRTH specifications shall be binding for all maintenanceactivities.

A. Flexible Pavement

Nature of Defector deficiency		Time limit for repair/rectification
(b) Granular earth shoulders, side slopes, drains and culverts		
(i)	Variationbymorethan1%inthe prescribedslope of camber/cross fall (shall not be less than the camber on the main carriageway)	7 (seven) days
(ii)	Edge drop at shoulders exceeding40 mm	7 (seven) days
(iii)	Variationbymorethan15%inthe prescribed side(embankment) slopes	30 (thirty) days
(iv)	Rain cuts/gullies in slope	7 (seven) days
(v)	Damage to or silting of culverts and side drains	7 (seven) days
(vi)	Desilting of drains in urban/semi-urban areas	24 (twenty four) hours
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)
(c) Roadside furniture including road sign and pavement marking		
(i)	Damage to shape or position, poor visibility or loss of retro-reflectivity	48 (forty eight)hours
(ii)	Painting of km stone, railing, parapets, crash barriers	As and when required/ Once every year
(iii)	Damaged/missing signs road requiring replacement	7 (seven) days
(iv)	Damage to road mark ups	7 (seven) days
(d) Road lighting		
(i)	Any major failure of the system	24 (twenty four) hours
(ii)	Faults and minor failures	8 (eight) hours
(e) Trees and plantation		
(i)	Obstruction in a minimum head- room of 5 m above carriage way or obstruction in visibility of road signs	24 (twenty four)hours
(ii)	Removal of fallen trees from carriageway	4 (four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment

Nature of Defector deficiency		Time limit for repair/rectification
(iv)	Trees and bushes requiring replacement	30 (thirty) days
(v)	Removal of vegetation affecting sightline and road structures	15 (fifteen) days
(f) Rest area		
(i)	Cleaning of toilets	Every 4(four) hours
(ii)	Defects in electrical, water and sanitary installations	24 (twenty four) hours
(g) [Toll Plaza]		
(h)	Other Project Facilities and Approach roads	
(i)	Damage in approach roads, pedestrian facilities, truck lay-byes ,bus-bays, bus-shelters, cattle crossings, [Traffic Aid Posts, Medical Aid Posts] and service roads	15 (fifteen)days
(ii)	Damaged vehicles or debris on the road	4 (four) hours
(iii)	Malfunctioning of the mobile crane	4 (four) hours
Bridges		
(a) Superstructure		
(i)	Any damage, cracks, spalling/ scaling Temporary measures Permanent measures	within 48 (forty eight) hours within15 (fifteen) days or as specified by the Authority's Engineer
(b) Foundations		
(i)	Scouring and/or cavitation	15 (fifteen)days
(c) Piers, abutments, return walls and wing walls		
(i)	Cracks and damages including settlement and tilting, spalling, scaling	30 (thirty) days
(d) Bearings(metallic)of bridges		
(i)	Deformation, damages, tilting or shifting of bearings	15 (fifteen) days Greasing of metallic bearings once in a year
(e) Joints		
(i)	Malfunctioning of joints	15 (fifteen)days
(f) Other items		
(i)	Deforming of pads in elastomeric bearings	7 (seven) days

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

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

Schedule - F

(See Clause 4.1 (vii)(a))

Applicable Permits

1. Applicable Permits

- 1.1 The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:
- (a) Permission of the State Government for extraction of boulders from quarry;
 - (b) Permission of Village Panchayats and Pollution Control Board for installation of crushers;
 - (c) Licence for use of explosives;
 - (d) Permission of the State Government for drawing water from river/reservoir;
 - (e) Licence from inspector of factories or other competent Authority for setting up batching plant;
 - (f) Clearance of Pollution Control Board for setting up batching plant;
 - (g) Clearance of Village Panchayats and Pollution Control Board for setting up asphalt plant;
 - (h) Permission of Village Panchayats and State Government for borrow earth; and
 - (i) Any other permits or clearances required under Applicable Laws.
- 1.2 Applicable Permits, as required, relating to environmental protection and conservation shall have been procured by the Authority in accordance with the provisions of this Agreement.

Schedule – G

(See Clauses 7.1 and 19.2)

Annex-I

(See Clause 7.1)

Form of Bank Guarantee

[Performance Security/Additional Performance Security]

To
Superintending Engineer (R&B)
NH Circle
Hyderabad

WHEREAS:

- (a) _____ [name and address of contractor] (hereinafter called the “**Contractor**”) and **The Roads & Buildings Department, Government of Telangana represented by Engineer-in-Chief (R&B)**, NH acting through Superintending Engineer (R&B) NH Circle Hyderabad (hereinafter called the “**Authority**”) have entered into an agreement (hereinafter called the “**Agreement**”) Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25 on EPC Mode subject to and in accordance with the provisions of the Agreement
- (b) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the {Construction Period/ Defects Liability Period and Maintenance Period} (as defined in the Agreement) in a sum of Rs..... cr. (Rupees crore) (the “**Guarantee Amount**”).
- (c) We,through our branch at (the “**Bank**”) have agreed to furnish this bank guarantee (*hereinafter called the “**Guarantee**”*) by way of Performance Security.

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

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor’s obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the Authority, under the hand of an officer not below the rank of [General Manager in the National Highways Authority of India], that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due

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

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfilment and/ or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Agreement or for the fulfilment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Guarantee shall cease to be in force and effect on ****\$. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.
11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

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

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

1. The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
2. The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

\$ Insert date being 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 7.2 of the Agreement).

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

Form for Guarantee for Advance Payment

To
Superintending Engineer (R&B) NH Circle
Hyderabad

WHEREAS:

- (A) [name and address of contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "Agreement") with the **The Public Works Department, Government of Telangana represented by Engineer-in-Chief (R&B)**, NH acting through Superintending Engineer (R&B) NH Circle Hyderabad (hereinafter called the "**Authority**") for "Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25 on EPC Mode", subject to and in accordance with the provisions of the Agreement.
- (B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing @Bank Rate + 3% advance payment (herein after called "Advance Payment") equal to 10% (ten per cent) of the Contract Price; and that the Advance Payment shall be made in two installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} installment of the Advance Payment is Rs. ----- cr. (Rupees ----- crore) and the amount of this Guarantee is Rs. ----- cr. (Rupees ----- crore) (the "Guarantee Amount")\$.
- (C) We,through our branch at (the "**Bank**") have agreed to furnish this bank guarantee (hereinafter called the "**Guarantee**") for the amount of Rs. ----- cr. (Rs.-----crore) (the "**Guarantee Amount**").

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

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

\$ The Guarantee Amount should be equivalent to 110% of the value of the applicable instalment.

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

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

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Advance Payment.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Guarantee shall cease to be in force and effect on ***,\$. Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and

warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.
11. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

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

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

1. The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
2. The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.
3. The bank shall be any bank listed in the list of nationalised/Govt banks only but not any scheduled commercial private banks.

\$ Insert a 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 and 19.3)
Contract Price Weightages

1.1 The Contract Price for this Agreement is Rs. (Including 18% GST)
1.2 Proportions of the Contract Price for different stages of Construction of the FOB shall be as specified below:

Item	Weightage in % of Contract Price	Stage for payment	Percent weightage
1	2	3	4
I. Earth work excavation including levelling course below foundation for FOB	0.61%	A-Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material as per Technical specification under section 304 of MOST's specification for Road & Bridge Works.	
		1) ordinary soil	56.63%
		B-Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.	
		1) levelling course below foundation	43.37%
II. Supplying, Fitting and Placing HYSD bars & Reinforce cement Concreting for Foundation of FOB	5.08%	A. Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications for foundation of FOB including Lift foundation	43.72%
		B. Plain/Reinforced cement concrete in open foundation structure complete as per drawing and Technical Specifications RCC M-35 for foundation of FOB including Lift foundation	56.28%
III. Supplying, Fitting and Placing HYSD bars & Reinforce cement Concreting for Sub structure of FOB	3.02%	A. Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Substructure complete as per Drawing and Technical Specifications for substructure of FOB including Lift substructure	62.68%
		B. Plain/Reinforced cement concrete in Sub structure complete as per drawing and Technical Specifications RCC M-35 Grade for substructure of FOB including Lift substructure	37.32%
IV. Erection of structural steel members for FOB & profile roofing for walkway	43.94%	A. Supply, fabrication, transportation and erection of structural steel members for FOB including providing hot dip galvanising to steel section with all consumables, conveying & lifting arrangements as per drawings issued Including STAIR CASE	93.69%
		B. Supplying and fixing aluminium composite cladding (ALCOPANEL)-4mm thick	5.48%

		C. Supply of Pre-painted Galvalume Trapezoidal Profile Roofing sheets with 0.47mm thickness, Coating: Alu-Zinc coating AZ150 GSM. Tensile Strength: 550 MPA. Paint coating: Regular Modified Polyester painting. Painting Thickness (Top): 18 to 20 Microns, (Bottom): 5 to 7 Microns. Sheet Width: 1.020, Length: Maximum 12 Meters with Regular Range Colours	0.83%
V. Provision of Lift	8.19%	Supply, transportation, installation, Testing and commissioning of 10 passenger Gearless Machine Room Less Elevator (Lift) -2 no's including comprehensive maintenance for 2 years during Defect Liability Period Make: Schindler 5000 Series or its equivalent model of Kone or OTIS	100.00%
VI. Provision of Escalators	25.68%	Supply, Installation, Testing and commissioning of 2-No Escalators along with providing stainless steel panels grade 304 in 1.2mm with stiffener backing for rigidity, on one side and one soffit of escalator (Rise-6500mm and incl. degree 30) as per approved drawing and specification including comprehensive maintenance for 2 years during Defect Liability Period Make: Schindler 9300 or its equivalent model of Kone or OTIS	100.00%
VI. Electrical works	2.48%	Supply and Fixing of Rigid PVC pipes, Appropriate FRLSH/ HFFR PVC insulated flexible ISI marked copper cable, 4 Core 6.0Sqm PVC/XLPE, tubelights, 10W LED Bulk head fitting with milky diffuser heat sink, 4 no.s 12 Way SPN DB with IP 43 Protection, 1 No 8 Way VTPN DB with IP 43 Protection, 1 No 4 Way TPN DB Horizontal with IP 43 Protection, 4.No's earthlings by excavating a pit to a depth of 2.25Mt, Supply and fixing of heavy duty type double compression weather proof type brass cable glands and all other incidental electrical items required for efficient functioning of Lifts & escalators	100.00%
VI. Utility Shifting	4.67%	Shifting of 33kv 11kv and LT Electrical lines and DTR's for construction of FOB near st. Alphonosus High school In Nalgonda town III Section of Nalgonda Town Subdivision.	100.00%
VII. Other Miscellaneous works	6.33%	A. footpath/separators	16.98%
		B. cement kerb	1.25%
		C. 304 grade stainless steel hand railing, balustrade for stair case and walk way	48.09%
		D. Walkway railing steel, member verticals and toughened glass panels	33.68%

Procedure of estimating the value of work done.

(i) Road works Procedure for estimating the value of road work done shall be as follows:

Item	Weightage in % of Contract Price	Stage for payment	Percent weightage	Payment procedure
1	2	3	4	6
I. Earth work excavation including levelling course below foundation for FOB	0.61%	A-Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material as per Technical specification under section 304 of MOST's specification for Road & Bridge Works.		Payment shall be made on prorata basis on completion of Earth work excavation including Levelling course for at least side of the Foot Over Bridge
		1) ordinary soil	56.63%	
		B-Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.		
		1) levelling course below foundation	43.37%	
II. Supplying, Fitting and Placing HYSD bars & Reinforce cement Concreting for Foundation of FOB	5.08%	A. Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications for foundation of FOB including Lift foundation	43.72%	Payment shall be made on prorata basis on completion of at least one side foundation for Foot Over Bridge
		B. Plain/Reinforced cement concrete in open foundation structure complete as per drawing and Technical Specifications RCC M-35 for foundation of FOB including Lift foundation	56.28%	
III. Supplying, Fitting and Placing HYSD bars & Reinforce cement Concreting for Sub structure of FOB	3.02%	A. Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Substructure complete as per Drawing and Technical Specifications for substructure of FOB including Lift substructure	62.68%	Payment shall be made on prorata basis on completion of at least one side Sub-structure for Foot Over Bridge
		B. Plain/Reinforced cement concrete in Sub structure complete as per drawing and Technical Specifications RCC M-35 Grade for substructure of FOB including Lift substructure	37.32%	
IV. Erection of structural steel members for FOB & profile roofing for walkway	43.94%	A. Supply, fabrication, transportation and erection of structural steel members for FOB including providing hot dip galvanising to steel section with all consumables, conveying & lifting arrangements as per drawings issued including STAIR CASE	93.69%	Payment shall be made on prorata basis on completion of activity for at least one Foot Over Bridge
		B. Supplying and fixing aluminium composite cladding (ALCOPANEL)-4mm thick	5.48%	

		B. Supply of Pre-painted Galvalume Trapezoidal Profile Roofing sheets with 0.47mm thickness, Coating: Alu-Zinc coating AZ150 GSM. Tensile Strength: 550 MPA. Paint coating: Regular Modified Polyester painting. Painting Thickness (Top): 18 to 20 Microns, (Bottom): 5 to 7 Microns. Sheet Width: 1.020, Length: Maximum 12 Meters with Regular Range Colours	0.83%	
V. Provision of Lift	8.19%	C. Supply, transportation, installation, Testing and commissioning of 10 passenger Gearless Machine Room Less Elevator i(Lift) -2 no's including comprehensive maintenance for 2 years during Defect Liability Period Make: Schindler 5000 Series or its equivalent model of Kone or OTIS	100.00%	Payment shall be made on prorata basis for installation of atleast 1 Lift
VI. Provision of Escalators	25.68%	Supply, Installation, Testing and commissioning of 2-No Escalators along with providing stainless steel panels grade 304 in 1.2mm with stiffener backing for rigidity, on one side and one soffit of escalator (Rise-6500mm and incl. degree 30) as per approved drawing and specification including comprehensive maintenance for 2 years during Defect Liability Period Make: Schindler 9300 or its equivalent model of Kone or OTIS	100.00%	Payment shall be made on prorata basis for installation of atleast 2 Lifts
VI. Electrical works	2.48%	Supply and Fixing of Rigid PVC pipes, Appropriate FRLSH/ HFFR PVC insulated flexible ISI marked copper cable, 4 Core 6.0Sqm PVC/XLPE, tubelights, 10W LED Bulk head fitting with milky diffuser heat sink, 4 no.s 12 Way SPN DB with IP 43 Protection, 1 No 8 Way VTPN DB with IP 43 Protection, 1 No 4 Way TPN DB Horizontal with IP 43 Protection, 4.No's earthings by excavating a pit to a depth of 2.25Mt, Supply and fixing of heavy duty type double compression weather proof type brass cable glands and all other incidental electrical items required for efficient functioning of Lifts & escalators	100.00%	
VI. Utility Shifting	4.67%	Shifting of 33kv 11kv and LT Electrical lines and DTR's for construction of FOB near st.Alphonosus High school In Nalgonda town III Section of Nalgonda Town Subdivision.	100.00%	
VII. Other Miscellaneous works	6.33%	A. footpath/separators	16.98%	Payment shall be made on prorata basis on completion of Miscellaneous works of at least one Foot Over Bridge
		B. cement kerb	1.25%	
		C. 304 grade stainless steel hand railing, balustrade for stair case and walk way	48.09%	
		D. Walkway railing steel, member verticals and toughened glass panels	33.68%	

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

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

Where

P = Contract Price

L = Total equivalent 2-Lane length in km as defined above

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

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

2. Procedure for payment for Maintenance-Not applicable

- (a) The cost for maintenance shall be as stated in Clause 14.1.1
- (b) Payment for Maintenance shall be made in accordance with the provisions of Clause 19.7.

Schedule - I

(See Clause 10.2 (iv))

Drawings

1. Drawings

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

2. Additional Drawings

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

Annex – I

(Schedule - I)

List of Drawings

As per the Manuals and Good Industry Practice.

Schedule - J

(See Clause 10.3 (ii))

Project Completion Schedule

1. Project Completion Schedule 09 months (270 Days) from appointed date.

During Construction period, the Contractor shall comply with the requirements set forth in this Schedule-J for each of the Project Milestones and the Scheduled Completion Date. Within 15 (fifteen) days of the date of each Project Milestone, the Contractor shall notify the Authority of such compliance along with necessary particulars thereof.

2. Project Milestone-I

2.1 Project Milestone-I shall occur on the date falling on the **80th day** [35% of the Scheduled Construction Period] day from the Appointed Date (the "Project Milestone-I").

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

3. Project Milestone-II

3.1 Project Milestone-II shall occur on the date falling on the **162nd day** [60% of the Scheduled Construction Period] day from the Appointed Date (the "Project Milestone-II").

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

4. Project Milestone-III

1.1 Project Milestone-III shall occur on the date falling on the **230th day** [85% of the Scheduled Construction Period] day from the Appointed Date (the "Project Milestone-III").

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

5. Scheduled Completion Date

- 5.1 The Scheduled Completion Date shall occur on the 270th day [Scheduled Construction Period] from the Appointed Date.
- 5.2 On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

6. Extension of time

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

Schedule - K

(See Clause 12.1 (ii))

Tests on Completion

1. Schedule for Tests

- 1.1 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.
- 1.2 The Contractor shall notify the Authority's Engineer of its readiness to subject the Project Highway to Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the Authority's Engineer shall, in consultation with the Contractor, determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority's Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule-K.

2. Tests

- 2.1 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 [***].
- 2.2 Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a Network Survey Vehicle (NSV) fitted with latest equipments and the maximum permissible roughness for purposes of this Test shall be [2,000 (two thousand)] mm for each kilometre.
- 2.3 Tests for bridges: All major and minor bridges shall be subjected to the rebound hammer and ultrasonic pulse velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on Non-destructive Testing Techniques, at two spots in every span, to be chosen at random by the Authority's Engineer. Bridges with a span of 15 (fifteen) metres or more shall also be subjected to load testing.
- 2.4 Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and Standards, except tests as specified in clause 5, but shall include measuring the reflectivity of road markings and road signs; and measuring the illumination level (lux) of lighting using requisite testing equipment.
- 2.5 Environmental audit: The Authority's Engineer shall carry out a check to determine conformity of the Project Highway with the environmental requirements set forth in Applicable Laws and Applicable Permits.

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

3. Agency for conducting Tests

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

4. Completion Certificate

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

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

Sr. No.	Key metrics of Asset	Equipment to be used	Frequency of condition survey
1	Surface defects of pavement	Network Survey Vehicle (NSV)	At least twice a year (As per survey months defined for the state basis rainy season)
2	Roughness of pavement	Network Survey Vehicle (NSV)	At least twice a year (As per survey months defined for the state basis rainy season)
3	Strength of pavement	Falling Weight Deflectometer (FWD)	At least once a year
4	Bridges	Mobile Bridge Inspection Unit (MBU)	At least twice a year (As per survey months defined for the state basis rainy season)
5	Road signs	Retro-reflect meter	At least twice a year (As per survey months defined for the state basis rainy season)

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

Schedule - L

(See Clause 12.2)

Completion Certificate

1. I, (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated (the "Agreement"), for **"Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25 on EPC Mode "** through Engineering, Procurement and Construction (the "EPC") basis"(the "Project Highway") through (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.
2. It is certified that, in terms of the aforesaid Agreement, all works forming part of Project Highway have been completed, and the Project Highway is hereby declared fit for entry into operation on this the day of 20..... , Scheduled Completed Date for which was the day of20.....

SIGNED, SEALED AND DELIVERED

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

(Signature)
(Name)
(Designation)
(Address)

Schedule - M

(See Clauses 14.6, 15.2 and 19.7)

Payment Reduction for Non-Compliance-Notapplicable

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

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

2. Percentage reductions in lump sum payments on monthly basis

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

S. No.	Item/Defect/Deficiency	Percentage
(a)	<u>Carriageway/Pavement</u>	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	<u>Road, Embankment, Cuttings, Shoulders</u>	
(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)	<u>Bridges and Culverts</u>	
(i)	Desilting, cleaning, vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
(d)	<u>Roadside Drains</u>	
(i)	Cleaning and repair of drains	5%
(e)	<u>Road Furniture</u>	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th km stones	5%
(f)	<u>Miscellaneous Items</u>	
(i)	Removal of dead animals, broken down/accidental vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	<u>Defects in Other Project Facilities</u>	5%

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

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

Where

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

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

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

L1= Non-complying length

L=Total length of the road

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

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

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

Schedule - N

(See Clause 18.1 (i))

Selection of Authority's Engineer

1. Selection of Authority's Engineer

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

2. Terms of Reference

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

3. Appointment of Government entity as Authority's Engineer

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

Annex - I

(Schedule - N)

Terms of Reference for Authority's Engineer

1. Scope

1.1 These Terms of Reference (the "TOR") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated..... (the "Agreement"), which has been entered into between the [name and address of the Authority] (the "Authority") and..... (the "Contractor")# "**Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25 on EPC Mode**" and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

1.2 The TOR shall apply to construction and maintenance of the Project Highway.

2. Definitions and interpretation

2.1 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.

2.2 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.

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

3. General

3.1 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.

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

(a) any Time Extension;

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

(c) the Termination Payment; or

(d) issuance of Completion Certificate or

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

- 3.3 The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.
- 3.4 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.
- 3.5 The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.
- 3.6 In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

4. Construction Period

- 4.1 During the Construction Period, the Authority's Engineer shall review and approve the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1 (vi). The Authority's Engineer shall complete such review and approval and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended up to 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.
- 4.2 The Authority's Engineer shall review and approve any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.
- 4.3 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.
- 4.4 The Authority's Engineer shall complete the review and approve of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.
- 4.5 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.

- 4.6 The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.
- 4.7 The Authority's Engineer shall inspect the Construction Works and the Project Highway and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular, the Authority's Engineer shall include in its Inspection Report, the compliance of the recommendations made by the Safety Consultant.
- 4.8 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.
- 4.9 For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified the Agreement and in accordance with Good Industry Practice for quality management. For purpose of this paragraph 4 (ix), the tests specified in the MORTH Specifications for Road and Bridge Works and respective Indian Roads Congress Standards/Guidelines/Manuals, together with any Indian/International other Standards mentioned therein including any modifications/substitutions thereof shall be deemed to be tests confirming to Good Industry Practice for quality management.
- 4.10 The Authority's Engineer shall witness all the quality control tests carried out Contractor at its laboratory/main by the site laboratory/field/plants. These include tests for all materials, mixes, products, etc. Authority's Engineer shall also witness all tests of finished products like bearing in the manufacturers' laboratory mandated in as respective standards. Authority's Engineer will also conduct review of quality control documents in respect manufactured of materials/finished factory products, etc. as per IRC:SP: 112.
- 4.11 The timing of tests referred to in Paragraph 4 (ix), and the criteria for acceptance/rejection of their results shall be determined by the Authority's Engineer in accordance with the MORTH specifications for Road & Bridge works and respective Indian Roads Congress Standards (Guidelines/Manuals together with any other Indian/International Standards referred thereto. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice
- 4.12 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.
- 4.13 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.

- 4.14 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.
- 4.15 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.
- 4.16 Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measure, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.
- 4.17 In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.
- 4.18 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-Not applicable

- 5.1 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.
- 5.2 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.
- 5.3 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.

5.4 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.

5.5 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

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

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

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

7. Payments

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

7.2 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.

~~7.3 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.~~

~~7.4 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

- 9.1 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.
- 9.2 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.
- 9.3 Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as-built Drawings, in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Project Highway as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project Highway and setback lines, if any, of the buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.
- 9.4 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.
- 9.5 The Authority's Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.

Schedule - 0

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

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

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

2. Monthly Maintenance Payment Statement-Not applicable

~~The monthly Statement for Maintenance Payment shall state:~~

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

3. Contractor's claim for Damages

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

Schedule - P

(See Clause 20.1)

Insurance

1. Insurance during Construction Period

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

2. Insurance for Contractor's Defects Liability

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

3. Insurance against injury to persons and damage to property

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

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

Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25 on EPC Mode

3.2 The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor's performance of this Agreement excluding:

- (a) the Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and
- (b) damage which is an unavoidable result of the Contractor's obligations to execute the Works.

4. Insurance to be in joint names

The insurance under paragraphs 1 to 3 above shall be in the joint names of the Contractor and the Authority.

Schedule-Q

(See Clause 14.10)

Tests on Completion of Maintenance Period-Not applicable

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.

Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25 on EPC Mode

Schedule-R

(See Clause 14.10)

Taking Over Certificate

I, (Name and designation of the Authority's Representative) under and in accordance with the Agreement dated (the "Agreement"), for "Construction of Foot over Bridge at Km 24+570 of Nakrekal-Nagarjunasagar section of NH-565 in the state of Telangana for the year 2024-25." (the "Project") on Engineering, Procurement and Construction (EPC) basis through (Name of Contractor), hereby certify that the Tests on completion of Maintenance Period in accordance with Article 14 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement and I hereby certify that the Authority has taken over the Project highway from the Contractor on this day.....

SIGNED, SEALED AND DELIVERED

(Signature)

(Name and designation of Authority's Representative)

(Address)

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