TECHNICAL SCHEDULES

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 the Right of Way to the Contractor are specified in **Annex-II of this Schedule-A.**

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

(iv) The alignment plans showing the location of landslide / protection works of the Project Highway are specified in **Annex-III**. No modification in the existing alignment of the Project Highway is contemplated.

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

Annex – I

(Schedule-A)

Site

[Note: All the Chainage/ location referred to in Annex-I to Schedule-A shall be existing Chainage.]

1. Site

The Site of the (two lane) Project Highway comprise slope protection and landslide mitigation at CH Km 40.050 (approx.) near 7th Mile of NH-10 during the FY 2026-27 on EPC Mode under NHIDCL in the state of West Bengal.

The land, carriageway and slope protection locations comprising the Site are described below.

Sl no.	Chainage		Length (m)	Side (Hill /Valley)
	From	To		
1	40+050	40+120	70	Valley

2. Land

The Site of the Project Highway comprises the land (Existing Right of Way) as described in the Annex-II.

3. Carriageway

The present carriageway of the Project Highway is Two Lane. The type of the existing pavement is flexible.

4. Major Bridges/Viaduct

The Site includes the following Major Bridges/Viaduct:

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

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

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

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

6. Grade separators

The Site includes the following grade separators:

S.No.	Chainage	Type of Structure		No. of Span with span length (m)	width
		Foundation	Superstructure		
NIL					

7. Minor bridges

The Site includes the following minor bridges:

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

8. Railway level crossings

The Site includes the following railway level crossings:

S. No.	Location (Km)	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)	Width (m)
NIL				

10. Culverts

The Site has the following culverts:

S. No.	Chainage (Km)/Culvert No	Type of Culvert	Span system (No*W*H) (m)	Width (m)
Nil				

11. Bus shelter

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

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

12. Truck Lay byes

The details of truck lay byes are as follows:

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

13. Roadside drains

The details of the roadside drains are as follows:

S. No.	Location			Type	
	From (Km)	To (Km)	Side (Left/Right/Both	Masonry/CC (Pucca)	Earthen (Kutcha)
1	40+050	40+150	Right	100	

14. Major junctions

The details of major junctions are as follows:

S.No.	Location (Km)		At grade	Separated	Category of Cross Road			
	From	To			NH	SH	MDR	Others
NIL								

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

15. Minor junctions

The details of the minor junctions are as follows:

S. No.	Location (Km)	Type	
		Type of junctions (T / Y / +)	Cross road
NIL			

16. Bypasses

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

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

17. Existing Protection Works

S. No.	Ch. From	Ch. To	Length (m)	Type of Protection	Side (Left/Right)

18. Existing Utilities

The Site includes the existing utilities as described in **Sheet-I (Annex-I to Schedule-A)**

Sheet-I

(Annex-I to Schedule-A)

(i) Electrical Utilities

The site includes the following electrical utilities: -

a) Extra High-Tension Lines (EHT Lines)

S. No.	Design Chainage (Km)		Length (in Km)				Crossings			
	From	To	400KV	220KV	110KV	66KV	400KV	220KV	110KV	66KV
Nil										

b) High Tension / Low Tension Lines (HT / LT Lines)

S. No.	Design Chainage (Km)		Length (in Km)			Crossings			Transformer	
	From	To	33 KV	11KV	LT	33KV	11KV	LT	No	Capacity (KVA)
Nil										

(ii) Public Health Utilities (Water / Sewage Pipe Lines)

(iii) Any Other Line

S. No	Chainage (Km)		Length (Km)				Crossings			
	From	To	Water Supply Line		Sewage Line		Water Supply Line		Sewage Line	
			With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	With Pumping	With Gravity Flow	With Pumping	With Gravity Flow
Nil										

(This is illustrative and may change as per features of existing Utilities.)

Annex - II

(As per Clause 8.3 (i))

(Schedule-A)

Annex-II: **Dates for providing Right of Way of Construction Zone**

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

S. No.	Design Chainage From km to km		Length (m)	Available/Existing ROW (m)	Proposed ROW Width (m)	Date of providing Right of Way*
(1)	(2)		(3)	(4)	(5)	(6)
(i)	Right of Way (full width)					
(a)	40+050	40+120	70	8 – 12	10 - 12	On Appointed date
(ii)	(iii) Part Right of Way (part width): NA					
(iv)	(v) Balance Right of Way (width): NA					

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

Annex - III

(Schedule-A)

Alignment Plans

The existing alignment plan shall be followed. No modification in the existing alignment of the Project Highway is contemplated.

Annex – IV

(Schedule-A)

Environment Clearances

Sr. No.	Clearances	Present Status
1	Environment clearance	Not Applicable

Schedule - B

(See Clause 2.1)

CONSTRUCTION FOR MITIGATION MEASURES FOR SLOPE PROTECTION

1. Construction for Slope Protection Measures

Survey, identification of extent of instability, investigations, detailed designing and execution / construction of Slope Protection measures shall be done as described in Schedule B and in Schedule C as per approved design and standards, duly checked by the Proof & Safety Consultant and vetted by any one of the IITs during construction stage and its maintenance for 3 years from the date of successful completion of the project / works with complete adherence of all relevant codal provisions, specifications and safety standards.

2. Development of the Project

Development of the project shall include Specialized Slope Protection measures as described in Annex-I of this Schedule B and Schedule-C.

3. Specifications and Standards

The Mitigation Measures for Slope Protection shall be constructed in conformity with the Specifications and Standards specified in Annex-I of Schedule-D.

Annex - I

(Schedule-B)

Description

CONSTRUCTION FOR SLOPE PROTECTION MEASURES

1. Execution/ Construction of Slope Protection Measures

(i) The Project refers to Slope protection and landslide Mitigation at Slope stabilization and protection works at CH Km 40.050 (approx.) near 7th Mile of NH-10 during the FY 2026-27 on EPC Mode under NHIDCL in the state of West Bengal.

(ii) The design and construction of the slope protection measures shall be carried out in accordance with the applicable codes, manuals, and specifications of the Indian Standards Institution (ISI), Indian Roads Congress (IRC) including its Special Publications, as well as relevant circulars and guidelines issued by the Ministry of Road Transport and Highways (MoRTH).

(iii) The proposed landslide protection works, retaining structures, drains etc. of the project highway as indicated in Schedule B and Schedule C and their Annexures shall be treated as minimum requirements. Based on site condition and design requirements the Contractor shall finalise their Detailed Designs and submit to Authority & its Engineer and Safety Auditor for its review / approval, before start of the project execution in accordance with Article 10 of the EPC Agreement. The designs so approved shall not be in contradiction with the scope of the project. For avoidance of doubt, the provisions mentioned in Schedule B & C shall not be changed, only the design of the components is to be submitted for review / approval by following details given in Schedule-B, C and D.

(iv) General Scope and Features

The Contractor shall carryout Survey, Identify the extent of instability, investigations, detailed designing duly checked by the Proof & Safety Consultant as stipulated under Article-10 and duly vetted by any one of the IITs. The investigations shall comprise of geological, geo-physical and geotechnical exploration works required for stability analysis and design of slope protection measures. All the civil works shall be carried out as per approved design and drawings of slope protection measures and as per technical specifications as given in Annexure-I of Schedule-D.

2. Widening of the existing highway

i. Width of Carriageway

(a) The present carriageway of the Project highway is partially damaged. The proposed slope protection measures shall be executed at damaged locations to reinstate the present carriageway to the original configuration (2-Lane with paved

shoulder, i.e. Paved carriageway shall be 7m wide with 1.5 m paved shoulder both side and 1.0 m earthen shoulder valley side).

(a) The existing carriageway shall be protected by the Contractor and if any damages occurred to the existing carriageway during the execution shall be reinstated by the Contractor. The entire cross-sectional elements shall be accommodated in the available/proposed ROW.

3. Geometric Design and General Features

(i) General

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the Manual, referred to as the Manual and other relevant IRC Codes.

(ii) Design speed

The design speed for the project road shall be the minimum design speed of 40 Km per hr. for Mountainous & Steep terrain as per the Manual.

(iii) Improvement of the existing road geometrics

The raising in road level shall match existing Finished Road Level (FRL) at either ends of the protection work stretches as per Geometric design. Alignment of the protection work shall follow the existing alignment of the Project.

(iv) Right of Way

Details of the Right of Way are given in Annex-II of Schedule-A. The existing shoulder including the roadside drain shall be re-constructed and its adequacy to be established in the length of proposed slope protection measures.

(v) Location of the Protection

Sl no.	Chainage		Area (sqm)	Remarks
	From	To		
1	40+050	40+120	A1 = 6700	The area for slope protection measures given in the table is as per site condition.
TOTAL				

(vi) Typical cross-sections of the Project Highway

The Applicable typical cross section for slope protection measures shall be developed as TCS-1 (Anx-B1) as given in table below:

S. No.	Chainages	TCS Type	Stretch Length (m)	Side (Hill /Valley)
1	40+050 to 40+120 KM	TCS-1 (Anx-B1)	70	Valley

Note-

(a) Extent of work -

• Start and end location of landslide protection work given in above table is tentative and shall be as per site requirements during execution of work.

• Stretch length specified above is minimum and height required for protection shall be as per site condition at the time of execution.

• The proposed type of Retaining Structures and sections mentioned are the minimum requirements and work shall be carried out based on detailed design carried out by the Contractor before execution following same TCS.

• Unfinished work before onset of monsoon must be protected by providing interim drainage measures, and retaining measures so that the executed protection measures are not affected during monsoon.

• All the boundaries / edges of the project site must be protected using relevant slope protection & erosion control measures as per site conditions giving proper closures and merging back to stable natural ground.

• The overall construction shall be top-down in terms of geometric corrections and immediate installation of erosion control measures & Anchors, berm by berm for landslide slope protection works. Drainage provision shall be such to maintain effective drainage at all point of time during construction including final drainage arrangement.

(b) Investigations - At the start of the work, all required Survey/Investigations/Studies shall be done by the EPC Contractor for finalization of detailed designs of landslide & slope protection measures and the same must be incorporated in the design report.

(c) Design Basis

I.The slope stability of landslide by geometric corrections, using toe/breast/retaining walls, surface protection, internal reinforcement, etc with consideration of sub-surface and surface water flow impact.

II. Complete surface and sub-surface drainage plan through catch water drains, berm drains, and subsurface drains, including controlling water penetration in to subsoil through avoiding ponding and through cracks treatment behind the landslide top edges; with some of it seen as much behind as hundreds of meters from landslide edges. The treatments should be to fill the cracks up and seal it from top to stop further ingress of water into it, for any further propagation of cracks.

III. Hill cutting shall be undertaken only after the finalization and approval of the cutting scheme and methodology proposed by the contractor with adequate protection and stabilization measures. Under no circumstances shall cut slopes be left unattended or unprotected in accordance with the provisions of IRC/SP:48-2023 and MoRTH guidelines. The responsibility of safe passage of commuters on NH 10 lies with the EPC contractor. Moreover, EPC contractor to submit the work plan and working safety plan before commencement of the work.

4. TCS wise description of Landslide Protection Measures are described hereunder:

Chainages	Slope Protection Measures	TCS
40+050 to 40+120 Km (Approx.)	Excavation in Ordinary rock by manual means including cutting and trimming of side slopes and disposing of excavated earth with all lifts and lead upto 1000 metres Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden/rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item. Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure. Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type: 10x12, Mesh opening: 100mm X 120mm b. Mesh Wire dia. 2.7/3.7mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 10 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 32.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 15.5 kN/m in the perpendicular to the twist direction in accordand with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and saft type confirming to the requirements of	TCS-1

Chainages	Slope Protection Measures	TCS
	specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. ID/OD - Internal diameter/Outer diameter of Polymer coated wire.	
	Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 6mm dia wire rope cable with a minimum breaking load of 35kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection 95% Zn + 5% AJ Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope (10mm dia) & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the wark in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-chage. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of respresentative/s of E-i-C on his own expenses.	
	Supply and fixing layer of Geo-jute mat with spraying of seeds of Lemon grass/Dedonia/Vetiver etc., including all cost of material, labour and T&P required to complete the work in all respect, with following properties: a. Material 100% natural, b. Weight 500 GSM, c. Minimum Breaking Load along Machine Direction (warp way) -10.0(kN/m), Cross Direction (Weft way)- 10.0(kN/m). d. Max. Elongation at break (in %): Machine Direction (warp way) 10, Cross Direction (Weft way)-12.	
	Providing and installing subsurface drainage pipes - Semi Perforated PVC pipe (lined with Non-woven Geotextile) of 100mm internal diameter as per the drawings etc. complete Including the cost of drilling and as directed by Engineer -In - Charge.	
	Supplying and Installation of non woven geotextile having mass/unit area -250 gsm over the slope to be treated including all cost of labour, materail and T & P required for proper completion of work.	
	Providing and laying Plain Cement Concrete in levelling course complete as per Drawing and Technical Specifications. PCC Grade M-15 using batching plant & manual placing.	
	Providing and laying Plain Cement Concrete in levelling course complete as per Drawing and Technical Specifications. RCC Grade M-25 using batching plant & manual placing.	

Chainages	Slope Protection Measures	TCS
	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and Technical Specifications.	
	Gabian Structure for Retaining Earth /RIVER TRAINING & PROTECTION WORKS Providingandconstructionofagabian structure for retaining earth with segmentsofwirecratesofsize7mx3m x 0.6m(7.50mx 3.0mx0.6m) each divided into 1.5 m compartments by cross netting, made from 4 mm galvanisedsteelwire@32kgper10sqm havingminimumtensile strengthof 300 Mpa (tensile strength 300-450 Mpa) conforming to IS:280 and galvanizing coating conforming to IS:4826, woven intomeshwithdouble twist,mesh size notexceeding100x100mm, filledwith boulders with least dimension of 200 mm,all looseendstobetiedwith4mm galvanised steel wire (Reference to MORT&H's specification 2503.3)	
	Parapet wall - PLUM CONCRETE (1:3:6) - Plain cement concrete of nominal mix (1:3:6) with coarse aggregate of which stone boulder of size 225 mm to 150mm of 60% of total dry volume to be placed in position as directed by Eng-in charge ,67% - 40 mm down single &33% - 20 mm down bazri , Coarse Sand ,Cement (53 grade) mechanically mixed in 1:3:6 of rest volume and placed in position and compacted by any means as directed including cost of shuttering.	

Note-

(i) A trench / ditch shall be excavated above the crown of slope for embedding the high tensile wire mesh / rolled cable net with concrete in a way that a shallow contour drain is formed to prevent the flow of surface run-off on treated surface. Works for RCC Cladding wall or RCC step wall shall be of minimum grade M25.

(ii) Testing for longitudinal tensile strength and punching resistance shall be conducted during the PDI of HT cable net/wire-mesh for each lot from the manufacturing firm and should have maintained in house testing facility to ensure the product quality.

(iii) To determine the design, pull out strength value, 3 numbers of test anchor shall be installed along lower elevation at the site. The pull-out test shall be conducted on these installed anchors as per IS 11309 and average of 3Nos Pull Out strength value shall be considered as Design Pull Out value for all installed anchors at this location. 2% of installed anchors shall be tested on this average value. All the cost towards pull out tests (3 numbers and 2%) at each location shall be borne by EPC Contractor on its own. The tests shall be done in supervision of Authority Engineer.

(iv) The cement pressure grouting shall be done at a min. pressure ranging from 1 to 3 kg/cm^2 till all the cracks are suitably sealed / filled.

Excavation in Ordinary rock by manual means including cutting and trimming of side slopes and disposing of excavated earth with all lifts and lead upto 1000 metres
Supply and Installation of Self driven rock anchor made of 40CR material with outer dia of 38 mm and inner dia of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden/rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm dia drill bit, couplers, 10mm thick base plate and nut and bolt complete in all respect but excluding the cost of cement grouting which will be paid extra as per relevant BOQ item.
Cement pressure grouting through Hollow Soil/Solid Rock Anchor of outer dia 76/51/38/32/25 in Rock/overburden including all cost of material and equipments required to complete the grouting work at desired pressure.
Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties: a. Mesh type: 10x12, Mesh opening: 100mm X 120mm b. Mesh Wire dia. 2.7/3.7mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 10 numbers of mesh openings per meter of mesh perpendicular to twist. c. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 32.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 15.5 kN/m in the perpendicular to the twist direction in accordand with the requirements of IS 16014:2018. d. Zinc Coating: The coating weight shall be heavily coated and saft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972. ID/OD - Internal diameter/Outer diameter of Polymer coated wire.
Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 6mm dia wire rope cable with a minimum breaking load of 35kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection 95% Zn + 5% AJ Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope (10mm dia) & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the wark in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-chage. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of respresentative/s of E-i-C on his own expenses.
Supply and fixing layer of Geo-jute mat with spraying of seeds of Lemon grass/Dedonia/Vetiver etc., including all cost of material, labour and T&P required to complete the work in all respect, with following properties: a. Material 100% natural, b. Weight 500 GSM, c. Minimum Breaking Load along Machine Direction (warp way) -10.0(kN/m), Cross Direction (Weft way)-

10.0(kN/m). d. Max. Elongation at break (in %): Machine Direction (warp way) 10, Cross Direction (Weft way)-12.
Providing and installing subsurface drainage pipes - Semi Perforated PVC pipe (lined with Non-woven Geotextile) of 100mm internal diameter as per the drawings etc. complete Including the cost of drilling and as directed by Engineer - In - Charge.
Supplying and Installation of non woven geotextile having mass/unit area -250 gsm over the slope to be treated including all cost of labour, materail and T & P required for proper completion of work.
Providing and laying Plain Cement Concrete in levelling course complete as per Drawing and Technical Specifications. PCC Grade M-15 using batching plant & manual placing.
Providing and laying Plain Cement Concrete in levelling course complete as per Drawing and Technical Specifications. RCC Grade M-25 using batching plant & manual placing.
Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and Technical Specifications.
Gabian Structure for Retaining Earth /RIVER TRAINING & PROTECTION WORKS Providingandconstructionofagabian structure for retaining earth with segmentsofwirecratesofsize7mx3m x 0.6m(7.50mx 3.0mx0.6m) each divided into 1.5 m compartments by cross netting, made from 4 mm galvanisedsteelwire@32kgper10sqm havingminimumtensile strengthof 300 Mpa (tensile strength 300-450 Mpa) conforming to IS:280 and galvanizing coating conforming to IS:4826, woven intomeshwithdouble twist,mesh size notexceeding100x100mm, filledwith boulders with least dimension of 200 mm,all looseendstobetiedwith4mm galvanised steel wire (Reference to MORT&H's specification 2503.3)
Parapet wall - PLUM CONCRETE (1:3:6) - Plain cement concrete of nominal mix (1:3:6) with coarse aggregate of which stone boulder of size 225 mm to 150mm of 60% of total dry volume to be placed in position as directed by Eng-in charge ,67% - 40 mm down single &33% - 20 mm down bazri , Coarse Sand ,Cement (53 grade) mechanically mixed in 1:3:6 of rest volume and placed in position and compacted by any means as directed including cost of shuttering .

5. Road Embankment and Cut /fill Section

Construction of road embankments/cuttings shall confirm to the Specifications and Standards given in IRC: SP:48-2023 and IRC: SP:84-2019. Notwithstanding anything to the contrary contained in this agreement or Manual, the proposed profile of the project locations as indicated in Appendix B1 of Schedule-B shall be treated as minimum requirement. The project road was being constructed and got damaged due to landslide during construction. The required cut/fill section of the landslide protection works shall follow the detailed drawings/Specifications and Standards prepared for the slope protection measures of the site.

~~**6. Pavement Design**~~

(i) ~~Pavement design shall be carried out in accordance with section 5 of the IRC: SP: 73- 2018. The raising in road level shall match existing Finished Road Level (FRL) at either ends of the protection work stretches as per Geometric design. Alignment~~

~~of the protection work shall follow the existing alignment of the Project. It is expected that the existing pavement may get damaged during construction of slope protection measures in the concerned stretches near the sites. Accordingly, following stretches of the existing road shall be reconstructed after completion of slope protection measures: -~~

(ii) ~~**Type of pavement**~~

~~Flexible pavement shall be provided for the main carriageway, and it shall be designed in accordance with relevant manual with the minimum crust composition:~~

~~BC – 40 mm~~

~~DBM- 110 mm~~

~~WMM- 250 mm~~

~~GSB- 300 mm~~

(iii) ~~**Design requirements**~~

~~**a) Design Period and strategy**~~

~~Flexible pavement shall be designed for a minimum design period of 10 years.~~

~~**b) Design Traffic**~~

~~Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for design traffic of 25 million standard axles.~~

7. **Hill / Valley side Drainage:** Road side PCC drain shall be provided at valley side of the road to ensure drainage continuity at either ends of the work stretches as per Geometric design.

Surface and subsurface drains for the project site are shown in the Typical drawings **TCS-1 (Appendix B-1).** The Contractor shall also provide road side drain along the length of the road. Surface water collected in catch water drain shall be connected to existing drainage system through chutes / cascades. Any modifications required to connect newly constructed drains with existing drainage system shall also be constructed by the contractor.

The Contractor shall prepare the proper drainage plan of the project on the basis of the contours of the area, hydrological data and geological mapping. Based on the outlet availability and discharge requirements including discharge through channels at the top of the hill, or any other sources, all sources of water shall be collected through a catch water drain/anchor trench at the top of the hill and at every hill slope location through berms.

The design shall be prepared by the Contractor as per the manual specified in Schedule D. The detailed design of structures and drainage plan prepared by the Contractor shall be approved by Authority / Authority's Engineer. The Contractor

shall provide continuity of drain to the nearest stable natural stream available to the area.

8. Design of Structures

(i) General

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

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

S. No.	Bridge/structure at (Km)	Width of carriageway and cross-sectional features*
NIL		

c) The following structures shall be provided with footpaths:

S. No.	Location at Km	Remarks
NIL		

d) All bridges shall be high-level bridges.

e) The following structures shall be designed to carry utility services as per site requirement:

S. No	Bridge at (Km)	Utility service to be carried	Remarks
NIL			

f) Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the typical cross-sections given.

(ii) Culverts

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

b) Reconstruction of existing culverts:

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

S. No.	Culvert location (Km)	Span/Opening (m)	Remarks, if any
NIL			

c) Widening of existing culverts:

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

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

S. No.	Culvert location	Type, span, height and width of existing culvert (m)	Repairs to be carried out [specify]
Nil			

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

S No.	Culvert location (Km)	Span/Opening (m)
Nil		

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

S. No.	Location at Km	Type of repair required
NIL		

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

(iii) **Bridges**

NIL

(iv) **Rail-road bridges**

NIL

(v) **Grade separated structures**

NIL

(vi) **Repairs and strengthening of bridges and structures.**

NIL

(vii) **List of Major Bridges and Structures**

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

Sl. No.	Location	Span Arrangement(m)
NIL		

~~**9. Traffic Control Devices and Road Safety Works**~~

a) ~~Traffic control devices and road safety works shall be provided in accordance with section 9 of the IRC: SP: 73:2018. National Highway traffic shall be operational in at least 7m width at all times at damaged locations.~~

b) Traffic signs shall be provided as per IRC 67 & MORTH circular no RT – 25035/07/2023-RS(Part) dated 24.12.2024 as mentioned in Schedule-C. Specifications of the reflective sheeting shall be Class C sheeting described in IRC:67 and type VIII, IX & XI as per ASTM D 4956-09 fixed over Aluminium or Aluminium Composite Material.

S.No	Chainage (Km)	Signs	Minimum Nos	Size (Cm)
NIL				

~~**c) Road Marking:** The markings shall cover road marking for the pavement at all project sites referred in para 6(ii) of Annex-I of Schedule-B, as per relevant code and manual. Pavement marking shall be completed as per IRC 35 & & MORTH circular no RT – 25035/07/2023- RS(Part) dated 24.12.2024.~~

~~**d) Road studs :** The Reflective Pavement Markers (RRPM) i.e. road studs shall be provided to improve the visibility in night time and wet weather conditions. These shall be prismatic retroreflective type conforming to ASTM D 4280. Table 9.1 of Manual presents the warrants for providing Road studs in two lane highway and the priorities to be followed along with placement details shall be as per IRC:35. The colour pattern of road studs for edge line and centre line with respect traffic movement is depicted in Fig. 9.3 of Manual. The Reflective Pavement Markers (RRPM) i.e. road studs shall be provided at all project sites referred in para 6(ii) of Annex-I of Schedule-B.~~

10. Roadside Furniture

(i) Roadside furniture shall be provided in accordance with the provision relevant manual and Schedule-C.

~~(ii) Overhead traffic signs.~~

11. Muck Dumping Sites: The EPC Contractor shall arrange the muck dumping sites at their own cost. The EPC Contractor shall have to present a Muck Disposal Plan according to the applicable rules and regulations of the Government of West Bengal and the Government of India. The excavated material available from excavation may be used by the EPC Contractor for the construction of project- related works provided it meets the standards and specifications as defined in Schedule D and after payments of all applicable royalties and levies, including taxes as per Government of West Bengal and Government of India rules and regulations. The EPC Contractor shall relocate and dump the excess material (at its own cost) at the suitable area identified by EPC Contractor, in a way to avoid any negative impact

on the terrestrial and aquatic environment. For stabilization of dumped material, engineering measures and/or other measures, retaining structures shall be proposed by the EPC Contractor (at its own cost), with individual plans and cross sections for all muck disposal areas. The NGT Order dated 01.11.2018 shall be followed for disposal of muck.

12. **Damage to structures outside ROW:** The Contractor shall adopt such work methodology ensuring that there shall be no damages to structures located outside RoW (either private or Govt. structures such as permanent or temporary building structures, sheds, utilities, trees, or other immovable structures) on account of construction and maintenance of the project highway. To avoid the above issues, it is clarified that the cost of the repair/damaged structures, failing outside the ROW, should be borne by the Contractor, wherever damages are on account of the Contractor. Further, it shall be Contractor's responsibility to retain videographic and photographic records of structures at vulnerable areas.

~~13. **Hazardous Locations**~~

~~The safety barriers (Thrie Beam with delineators) shall also be provided at the hazardous locations near and around the project sites. Exact locations shall be finalised by Authority's Engineer considering road safety.~~

14. **Retaining wall:**

It is expected that the existing Retaining wall may get damaged during construction of slope protection measures in the concerned stretches. Accordingly, reconstruction of the retaining wall at each of the sites shall be done in 'the length extending 20 m beyond the design chainages of site in both the directions.' PCC/RCC Retaining wall shall be constructed with minimum height same as that of existing wall. However, retaining wall is not required to be constructed at those sites where RCC wall / RCC step wall is proposed to be constructed under slope protection measures.

15. **Work Zone Traffic Management Plan**

The traffic diversion shall be prepared as per IRC SP 55 for smooth flow of traffic and safety. If required, a diversion plan shall be proposed and traffic management plan for reinstatement of project road at identified locations. The Contractor shall not block carriageway during construction at any time and necessary safety measures required during execution of work shall be provided as per IRC SP: 55, Guidelines on Traffic Management in Work Zones. No separate payment shall be made for providing Traffic Management Plan at site during execution of work.

16. **Change of Scope**

The length, and height of protection works, drainage system, shotcrete, concrete cladding/Retaining structures, breast wall and other items specified herein above shall be treated as minimum tentative requirements. The actual quantities as

required on the basis of detailed investigations shall be determined by the Contractor in consultation with Authority and its Engineer and in accordance with the Specifications and Standards. Any increase in length/area up to 10% for location of protection work and area up to 10% of location mentioned in this Schedule -B shall not constitute a Change of Scope, save and except any variations in the quantities arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13 of the EPC Contract Agreement.

17. Utility Shifting

Details are given in **Sheet-II (Annexure-I to Schedule-B)**

Utility Shifting: NIL.

Annexure-B-II

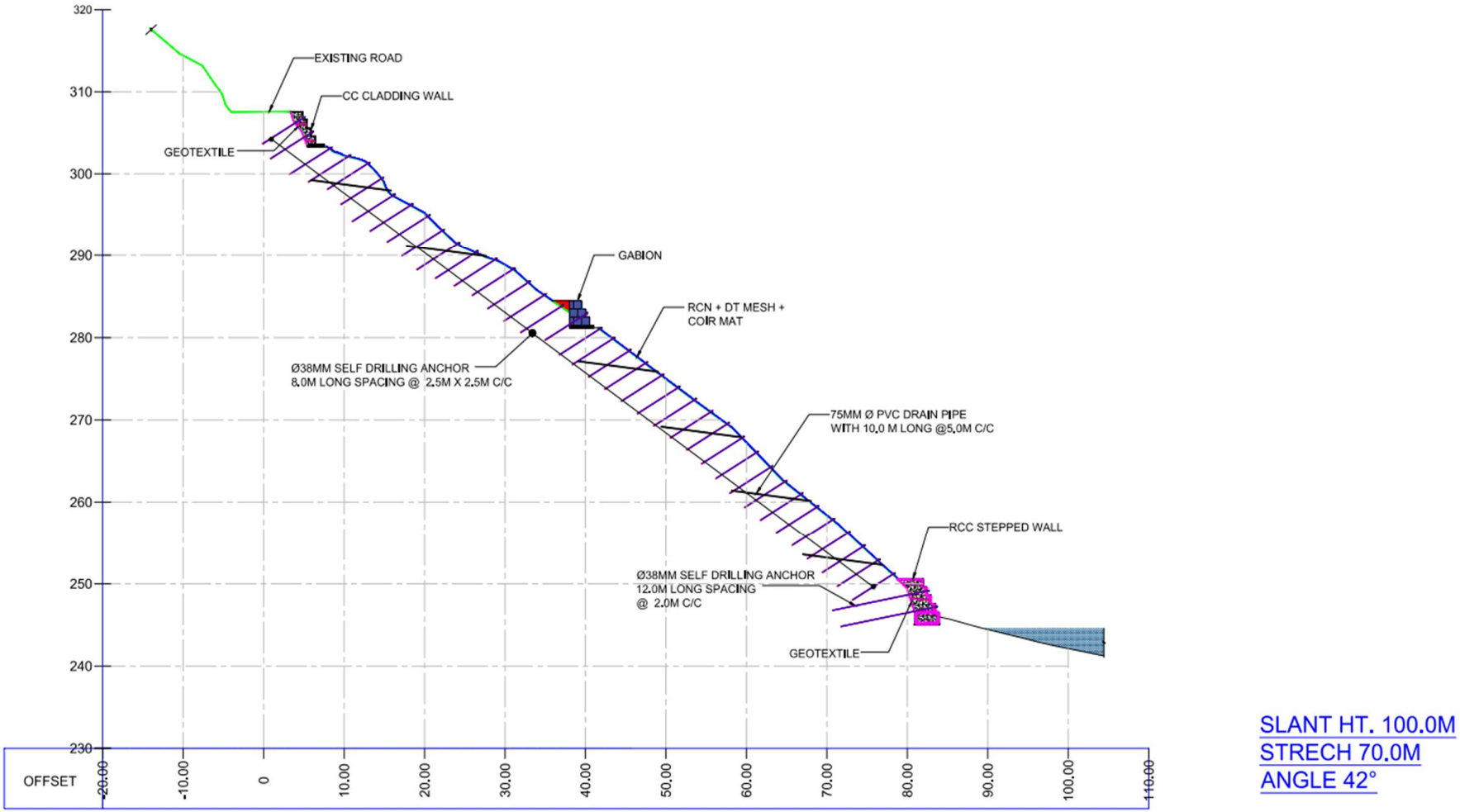
Schedule-B

Widening Scheme:

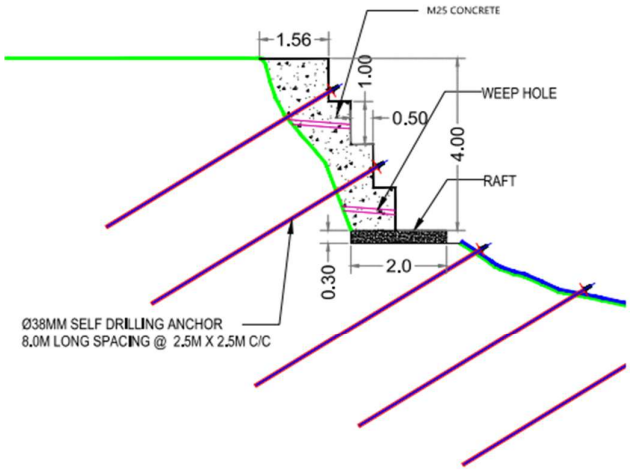
The present carriageway of the Project highway is partially damaged. The proposed slope protection measures shall be executed at damaged location to reinstate the present carriageway to the original configuration (2-Lane with paved shoulder, i.e. Paved carriageway shall be 7m wide with 1.5 m paved shoulder both side and 1.0 m earthen shoulder valley side).

Applicable TCS as per Scheme
TCS-1

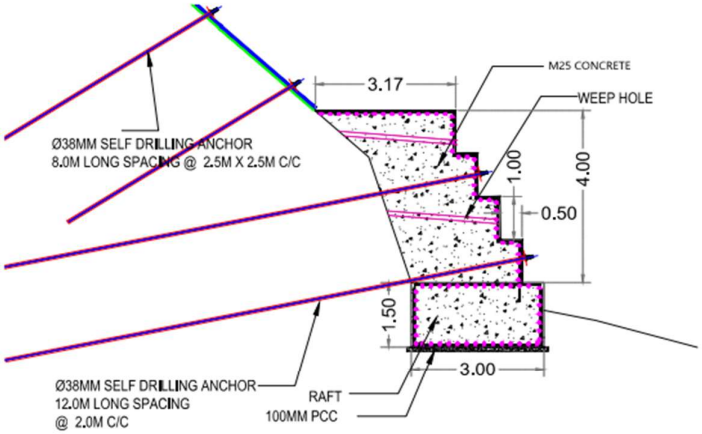
Anx-B1



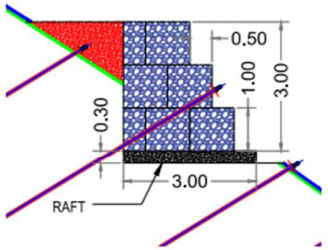
SLANT HT. 100.0M
STRECH 70.0M
ANGLE 42°



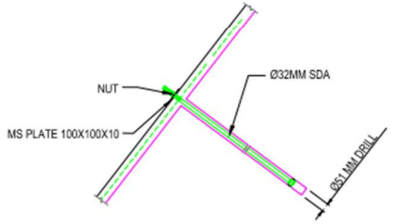
SECTION CH 40+075
TYPICAL DETAILS CC CLADDING WALL



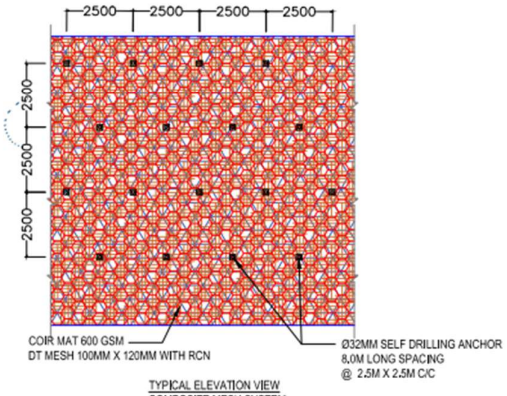
SECTION CH 40+075
TYPICAL DETAILS RCC STEPPED WALL



TYPICAL DETAILS GABION WALL
(NTS)



TYPICAL DETAIL OF
SELF DRILL ANCHOR (SDA)
(NTS)



TYPICAL ELEVATION VIEW
COMPOSITE MESH SYSTEM
(NTS)

CLIENT :
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

PROJECT : Widening to 2-Lane with paved shoulder along with specialized slope protection works in vulnerable sinking/sliding zones from Km. 0 to 52.100 of NH-10 (Sevoke-Rangpo Section) in the state of West Bengal
(Repair and Rehabilitation of Hill and Valley side)

CONSULTANT: M/S MSV INTERNATIONAL INC. in association with M/S DAYANANDAMAN CONSTRUCTION & CONSULTANT PVT. LTD.

STABILITY MEASURES
FOR LOCATION NO: KM-40.05 AT CH. 40+050 TO CH. 40+120
(SEVOKE - RANGPO SECTION)
NH -10 WEST BENGAL
SHEET 1 OF 3

Schedule - C

(See Clause 2.1)

Project Facilities

1. Project Facilities

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

~~a) toll plaza;~~

b) ~~roadside furniture~~;

~~c) pedestrian facilities;~~

~~d) tree plantation;~~

~~e) truck lay-byes;~~

~~f) bus-bays and bus shelters;~~

g) ~~rest areas;~~

h) Parapet wall; and

i) ~~Others to be specified: As described below~~.

2. Description of Project Facilities

Each of the Project Facilities is described below:

(a) ~~**Roadside Furniture**~~

~~Roadside furniture shall be provided in accordance with the manual of specification & standards.~~

(b) ~~**Traffic Signs & Marking**~~

~~**i. Traffic signs** viz roadside signs, overhead signs and kerb mounted signs. Traffic signs include road signs (Mandatory, Cautionary, and Informatory), overhead signs and gantry mounted signs along the entire Project as per design and site conditions. Also, Specifications of the reflective sheeting. Type-XI type of reflective sheeting to be provided as referred to the provision of Section 6.7.1 of IRC: 67-2022 of the Manual. The details are given in the table below:~~

~~S.No~~	~~Chainage (Km)~~	~~Signs~~	~~Minimum Nos~~	~~Size (Cm)~~
~~NIL~~				

~~**ii. Pavement Marking:** Pavement markings shall cover road marking for the entire Project Highway as per relevant code and manual~~.

iii. Parapet wall –

PLUM CONCRETE (1:3:6) - Plain cement concrete of nominal mix (1:3:6) with coarse aggregate of which stone boulder of size 225 mm to 150mm of 60% of total dry volume to be placed in position as directed by Eng-in charge ,67% - 40 mm down single &33% - 20 mm down bazri , Coarse Sand ,Cement (53 grade) mechanically mixed in 1:3:6 of rest volume and placed in position and compacted by any means as directed including cost of shuttering .

Schedule - D

(See Clause 2.1)

Specifications and Standards

1. Construction

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

2. Design Standards

The Project Highway including Project Facilities shall conform to design requirements set out in the following documents and Annex-I of this schedule:

a). Manual of Specification and Standards for Two Laning of Highways with paved shoulder (IRC: SP: 73 - 2018), referred to herein as the Manual for 2-lane project road.

b). IRC SP: 48 – 2023 (Hill Road Manual): referred to herein as the Hill Road Manual

Annex – I
(Schedule-D)
Specifications and Standards for Construction

1. Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for [Two-Laning of Highways (IRC:SP:73)], referred to as the Manual, and MORTH Specifications for Road and Bridge Works. In addition, provisions of relevant Codes, Standards, Specifications, Guidelines etc. of IRC, MoRTH, AASHTO, ASTM, Euro Codes and British Codes shall also be referred. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

1.1 Design Standards

(i) IRC- HRB- Special Report-23 -State of the Art: Design and Construction of Rock fall Mitigation systems.

(ii) IRC: SP: 42 – 2014, Guidelines of Road Drainage.

(iii) IRC SP: 116-2018 – Guidelines for Design and Installation of Gabion Structures.

(iv) BS 8006-1:2010+A1:2016–Code of Practice for Strengthened /Reinforced Soil& other fills.

(v) BS 8081:2015+A2:2018 – Code of Practice for Grouted Anchors.

(vi) FHWA-NHI-14-007 – Soil Nail Walls Reference Manual (FHWA GEC 007), 2015.

(vii) FHWA-IF-99-015 – Ground Anchors and Anchored System (GEC No. 4), 1999.

(viii) IS 16014:2018, Mechanically Woven, Double-Twisted, Hexagonal Wire Mesh Gabions, Revet Mattresses, Rock Fall Netting and Other Products for Civil Engineering Purposes (Galvanized Steel Wire or Galvanized Steel Wire with Polymer Coating) — Specification.

(ix) IS 14268: 2017 - Uncoated Stress Relieved Low Relaxation Seven-Wire (Ply) Strand for Prestressed Concrete— Specification.

(x) IS: 1893-1 (2016), —Criteria for Earthquake Resistant Design of Structure, Bureau of Indian Standards, and New Delhi.

(xi) Ministry of Road Transport and Highways (MORTH), —Specifications for Road and Bridges Works – Fifth Revision.

(xii) Geological, geotechnical& Geophysical investigations as per IRC: 78, Specifications for drilling, coring testing etc. issued by ISI. BIS, MoRT&H and other relevant codes are applicable.

(xiii) Other Indian / International Standards applicable as per Good Industry Practice.

ANNEXURE-II: TECHNICAL SPECIFICATIONS

(SPECIFICATIONS AND STANDARDS FOR DESIGN AND CONSTRUCTION)

The following Specifications and Standards shall be applied in addition to IRC: SP: 84-2019 and IRC SP: 48 – 2023, MoRTH specifications with all amendments till bid due date. Out of given alternatives in the agreement, such specifications and standards shall be adopted, for design of slope protection measures specified in Schedule-B, which are proven to be better. Authority Engineer's decision shall be final in this regard.

1. SUPPLY AND INSTALLATION OF SELF DRILLING ANCHORS (SDA) OF 38mm DIAMETER

The SDA shall be designed and arranged to stabilize in-situ strata. The grout shall be made of OPC min. grade 43 & above with suitable admixtures. SDA bars shall have corrosion protection coating including hexagonal nut, washer plate, coupler for connecting bars all with hot dipped Zinc coated of 86micron. Additionally post installation all the exposed portion shall be coated with epoxy coating of minimum 150 micron. The SDA rod shall be continuously threaded. For convenience of installation, appropriate arrangement (coupler) shall be made to connect two smaller lengths of SDA to achieve the required length. As mentioned in Hill Road Manual, BS 8081-2015 shall be referred for design, testing, monitoring, and maintenance.

Installation of Self driven rock anchor made of 40CR material with outer diameter of 38 mm and inner diameter of 19 mm, Yield Load Carrying Capacity of Minimum 400 KN in soil / overburden / rock suitable for drilling placing and cement grouting. Installation with all accessories such as 76 mm diameter sacrificial drill bit, couplers, 200*200mm base plate with 10mm thick and nut and bolt complete in all respect. The cement grouting shall be done at a min. pressure ranging from 1 to 3 kg/cm^2 till all the cracks are suitably sealed / filled.

Any equivalent or greater proven alternative technologies that meet the minimum technical criteria of anchors may be used subject to prior written approval of competent authority in NHIDCL. These criteria include Bond Strength, Anchor Length, Yield load, Tensile strength, Pull-out resistance, and Corrosion protection measures etc. for the design life.

2. CONCRETE:

The minimum concrete grades for various structures shall follow specifications

- Surface CC drains: M15
- PCC works : M25
- PCC / RCC works for Concrete Cladding wall: M25,

IS 456 shall be used for all concrete related designs, and quality control.

3. Double Twisted Hexagonal Steel Wire Mesh, Zinc + 5% Al Class A + Durable polymer coated

Supply and fixing of Double Twisted Mesh including all cost of material, labour and T&P required to complete the work in all respect with following properties:

A. Mesh type: 10x12, Mesh opening: 100mm X 120mm

B. Mesh Wire dia. 2.7/3.7mm (ID/OD), mechanically edged/selvedged with galvanization as per EN 10223-3, and shall have minimum 10 numbers of mesh openings per meter of mesh perpendicular to twist.

C. Tensile strength (500 Mpa) at a minimum elongation of 10%. The minimum tensile strength of the mesh panel must be 32.0 kN/m (+/-5kN/m) in the parallel to the twist direction and 15.5 kN/m in the perpendicular to the twist direction in accordand with the requirements of IS 16014:2018.

D. Zinc Coating: The coating weight shall be heavily coated and saft type confirming to the requirements of specifications IS 4826:1972. Adhesion of Zinc Coating: No flakes or crack shall be observed while testing for adhesion of zinc coating as per IS 4826:1972.

ID/OD - Internal diameter/Outer diameter of Polymer coated wire.

4. HT Rolled Cable Net

Supply and installation of high tensile rolled cable net having aperture size not more than 300mm in one direction and minimum longitudinal tensile strength 100 KN/M and punching resistance 200 kN, comprising of minimum 6mm dia wire rope cable with a minimum breaking load of 35kN. The tensile strength of wire of the cable should be 1770 N/sqmm having corrosion protection 95% Zn + 5% AJ Class-B (Galfan) Coating as per IS/ISO-17746-2016 for treatment of slopes including all cost of material (net, boundary rope (10mm dia) & rope anchor etc. comprising of the complete system), labour, special labour and T&P required to complete the wark in all respect in accordance with drawings, Technical Specifications and as per the direction of Engineer-in-chage. Product Manufacturer shall have in-house test facility for conducting longitudinal tensile strength and punching resistance test and shall be responsible for carrying out both test (longitudinal tensile strength and punching resistance) during PDI, per lot in presence of respresentative/s of E-i-C on his own expenses.

5. SUBSURFACE DRAINS

Providing and installing subsurface drainage pipes - Semi Perforated PVC pipe (lined with Non-woven Geotextile) of 100mm internal diameter as per the drawings etc. complete Including the cost of drilling and as directed by Engineer -In - Charge. - 75MM Ø PVC DRAIN PIPE WITH 10.0 M LONG @5.0M C/C.

6. Geo-jute mat.

Supply and fixing layer of Geo-jute mat with spraying of seeds of Lemon grass/Dedonia/Vetiver etc., including all cost of material, labour and T&P required to complete the work in all respect, with following properties: a. Material 100% natural, b.

Weight 500 GSM, c. Minimum Breaking Load along Machine Direction (warp way) - 10.0(kN/m), Cross Direction (Weft way)- 10.0(kN/m). d. Max. Elongation at break (in %): Machine Direction (warp way) 10, Cross Direction (Weft way)-12.

7. Non woven geotextile

Supplying and Installation of non woven geotextile having mass/unit area -250 gsm over the slope to be treated including all cost of labour, materail and T & P required for proper completion of work.

8. Gabian Structure for Retaining Earth /RIVER TRAINING & PROTECTION WORKS

Gabian Structure for Retaining Earth /RIVER TRAINING & PROTECTION WORKS Providingandconstructionofagabian structure for retaining earth with segmentsofwirecratesofsize7mx3m x 0.6m(7.50mx 3.0mx0.6m) each divided into 1.5 m compartments by cross netting, made from 4 mm galvanisedsteelwire@32kgper10sqm havingminimumtensile strengthof 300 Mpa (tensile strength 300-450 Mpa) conforming to IS:280 and galvanizing coating conforming to IS:4826, woven intomeshwithdouble twist,mesh size notexceeding100x100mm, filledwith boulders with least dimension of 200 mm,all looseendstobetiedwith4mm galvanised steel wire (Reference to MORT&H's specification 2503.3)

Schedule - E

(See Clauses 2.1 and 14.2)

Maintenance Requirements

1. Maintenance Requirements

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

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

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

2. Repair/rectification of Defects and deficiencies

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

3. Other Defects and deficiencies

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

4. Extension of time limit

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

5. Emergency repairs/restoration

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

6. Daily inspection by the Contractor

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

7. Pre-monsoon inspection / Post-monsoon inspection

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

8. Repairs on account of natural calamities

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

Annex – I

(Schedule-E)

Repair/rectification of Defects and deficiencies

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

Table -1: Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	**Acceptable**					
Flexible Pavement (Pavement of MCW, Service Road, approaches of Grade structure, approaches of connecting roads, slip roads, lay	Potholes	Nil	< 0.1 % of area and subject to limit of 10 mm in depth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82: 2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA 2003 (http://www.tfhrc.com/pavement/lttp/reports/03031/)	24-48 hours	MORT&H Specification 3004.2
	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 Scale,		2-7 days	IRC:82-2015

Asset Type	Performance Parameter	Level of Service (LOS)		Frequency of Inspection	Tools/Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/Repair	Maintenance Specifications
		Desirable	Acceptable					
byes etc. as applicable)	Bleeding	Nil	< 1 % of area	Daily	Tape, odometer etc.		3-7 days	MORT&H Specification 3004.4
	Ravelling/ Stripping	Nil	< 1 % of area	Daily			7-15 days	IRC:82-2015 read with IRC SP 81
	Edge Deformation/ Breaking	Nil	< 1 m for any 100 m section and width < 0.1 m at any location, restricted to 30 cm from the edge	Daily			7- 15 days	IRC:82-2015
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)	Class I Profilometer : ASTM E950 (98) :2004 –Standard Test Method for measuring Longitudinal Profile of Travelled Surfaces with Accelerometer Established Inertial Profiling Reference ASTM E1656 -94: 2000- Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	180 days	IRC:82-2015
	Skid Number	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			Bi-Annually			2-7 days	IRC:82-2015

<table>
<tr><th rowspan="2">Asset Type</th><th rowspan="2">Performance Parameter</th><th colspan="2">Level of Service (LOS)</th><th>Frequency of Inspection</th><th>Tools/Equipment</th><th>Standards and References for Inspection and Data Analysis</th><th>Time limit for Rectification/Repair</th><th>Maintenance Specifications</th></tr>
<tr><th>Desirable</th><th>Acceptable</th></tr>
<tr><td></td><td>Deflection/ Remaining Life</td><td></td><td></td><td>Annually</td><td>Falling Weight Deflecto meter</td><td>IRC 115: 2014</td><td>180 days</td><td>IRC:115-2014</td></tr>
<tr><td>Rigid Pavement (Pavement of MCW, Service Road, Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)</td><td>Roughness BI</td><td>2200mm/km</td><td>2400mm/km</td><td>Bi-Annually</td><td>Class I Profilometer</td><td>ASTM E950 (98) :2004 and ASTM E1656 -94: 2000</td><td>180 days</td><td>IRC:SP:83-2008</td></tr>
<tr><td></td><td>Skid</td><td colspan="2">Skid Resistance no. at different speed of vehicles
<table><tr><th>Minimum SN</th><th>Traffic Speed (Km/h)</th></tr><tr><td>36</td><td>50</td></tr><tr><td>33</td><td>65</td></tr><tr><td>32</td><td>80</td></tr><tr><td>31</td><td>95</td></tr><tr><td>31</td><td>110</td></tr></table></td><td>Bi-Annually</td><td>SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)</td><td>IRC:SP:83-2008</td><td>180 days</td><td>IRC:SP:83-2008</td></tr>
<tr><td rowspan="2">Embankment/ Slope</td><td>Edge drop at shoulders</td><td>Nil</td><td>40mm</td><td>Daily</td><td rowspan="2">Length Measurement Unit like Scale, Tape, odometer etc.</td><td rowspan="2">IRC SP:73-2018, IRC 36-2010 & IRC 56-2011</td><td>7-15 days</td><td>MORT&H Specification 408.4</td></tr>
<tr><td>Slope of camber/cross fall</td><td>Nil</td><td><2% variation in prescribed slope of camber /cross fall</td><td>Daily</td><td>7-15 days</td><td>MORT&H Specification 408.4</td></tr>
</table>

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

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

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

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

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			4	w = 1.5 - 3.0 mm	Seal, and stitch if L > l m. Within 7 days	Staple or Dowel Bar Retrofit, FDR for affected portion. Within 15days
			5	w > 3 mm.		
2	**Single Transverse (or Diagonal) Crack intersecting with one or 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. Within 7 days	Staple or Dowel Bar Retrofit. Within 15days
			2	w = 0.2 - 0.5 mm, discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1 m. Within 7 days	
			4	w = 3.0 - 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected. Portion with norms and specifications - See Para 5.5 & 9.2 Within 15days
			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 < 0.5 mm, discernable from slow moving vehicle	Seal with epoxy, if L > 1 m. Within 7 days	Staple or dowel bar retrofit. Within 15days
			2	w = 0.5 - 3.0 mm, discernible from fast vehicle	Route seal and stitch, if L > l m. Within 15 days	-
			3	w = 3.0 - 6.0 mm	Staple, if L > 1 m. Within 15 days	Partial Depth Repair with stapling.

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
			4	w = 6.0 - 12.0 mm, usually associated with spalling	Not Applicable, as it may be full depth	Within 15 days
			5	w > 12 mm, usually associated with spalling, and/or slab rocking under traffic		Full Depth Repair Dismantle and reconstruct affected portion as per norms and specifications - See Para 5.6.4 Within 15 days
4	**Multiple Cracks intersecting with one or more joints**	**w = width of crack**	0	Nil, not discernible	No Action	-
			1	w < 0.2 mm, hair cracks	Seal, and stitch if L > l m. Within 15 days	
			2	w = 0.2 - 0.5 mm. discernible from slow vehicle		
			3	w = 0.5 - 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, Reinstate subbase, Reconstruct whole slab as per specifications within 30 days
			4	w = 3.0 - 6.0 mm panel broken into 2 or 3 pieces		
			5	w > 6 mm and/or panel broken into more than 4 pieces		
5	**Corner Break**	w = width of crack L = length of crack	0	Nil, not discernible	No Action	-
			1	w < 0.5 mm; only 1 corner broken	Seal with low viscosity epoxy to secure broken parts Within 7 days	Seal with epoxy seal with epoxy Within 7days
			2	w < 1.5 mm; L < 0.6 m, only one corner broken		
			3	w < 1.5 mm; L < 0.6 m, two corners broken	Partial Depth (Refer Figure 8.3 of IRC:SP: 83-2008) Within 15 days	Full depth repair
			4	w > 1.5 mm; L > 0.6 m or three corners broken		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
			5	hree or four corners broken		Reinstate sub-base, and reconstruct the slab as per norms and specifications within 30days
6	**Punch-out (Applicable to Continuous Reinforced Concrete Pavement (CRCP) only)**	w = width of crack L = length (m/m2)	0	Nil, not discernible		No Action
			1	w < 0.5 mm; L < 3 m/m^2	Not Applicable, as it may be 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 > 3 mm, L < 3 m/m^2 and deformation		Full depth repair - Cut out and replace damaged area taking care not to damage reinforcement. Within 30days
			5	w > 3 mm, L > 3 m/m^2 and deformation		
Surface Defects						
7	Ravelling or Honeycomb type surface	r = area damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	r < 2 %	Local repair of areas damaged and liable to be damaged. Within 15 days	
			2	r = 2 - 10 %		
			3	r = 10-25%	Bonded Inlay, 2 or 3 slabs if Affecting. Within 30 days	
			4	r = 25 - 50 %		

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	**For the case d > D/2**
			5	r > 50% and h > 25 mm	Reconstruct slabs, 4 or more slabs if affecting. Within 30 days	
8	**Scaling**	r = damaged surface/total surface of slab (%) h = maximum depth of damage	0	Nil, not discernible	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	r < **2 %**	Local repair of areas damaged and liable to be damaged. Within 7days	
			2	r = 2 - 10 %		
			3	r = 10 - 20%	Bonded Inlay within 15 days	
			4	r = 20 - 30 %		
			5	r > 30 % and h > 25 mm	Reconstruct slab within 30 days	
9	**Polished Surface/Glazing**	t = texture depth, sand patch test	0		No action.	Not Applicable
			1	t > 1 mm		
			2 '	t = 1 - 0.6 mm	Monitor rate of deterioration	
			3	t = 0.6 - 0.3 mm		
			4	t = 0.3 - 0.1 mm		
			5	t < 0.1 mm	Diamond Grinding if affecting 50% or more slabs in a continuous stretch of minimum 5 km. Within 30 days	
10	**Pop out (Small Hole), Pothole Refer Para 8.4**	n = number/m^2 d = diameter	0	d < 50 mm; h < 25 mm; n < 1 per 5 m^2	No action.	Not Applicable

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case d < D/2	For the case d > D/2
		h = maximum depth	1	d = 50 - 100 mm; h < 50 mm; n < 1 per 5 m^2	Partial depth repair 65 mm deep. Within 15 days	
			2	d = 50 - 100 mm; h > 50 mm; n < 1 per 5 m^2		
			3	d = 100 - 300 mm; h < 100 mm n < 1 per 5 m^2	Partial depth repair 110mm i.e.10 mm more than the depth of the hole. Within 30 days	
			4	d = 100 - 300 mm; h > 100 mm; n < 1 per 5 m^2		
			5	d > 300 mm; h > 100 mm: n > 1 per 5 m^2	Full depth repair. Within 30 days	

Joint Defects						
11	**Joint Seal Defects**	loss or damage L = Length as % total joint length	0	Difficult to discern.	**Short Term**	**Long Term**
					No action.	Not Applicable
			1	Discernible, L< 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	

Joint Defects						
			3	Notable. L > 25% insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in Selected locations. Within 7 days	
			5	Severe; w > 3 mm negligible protection against ingress of water 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 epoxy resin/ mortar in cracked portion. Within 7 days	
			2	w = 10 - 20 mm, L < 25%		
			3	w = 20 - 40 mm, L > 25%	Partial Depth Repair. Within 15 days	
			4	w = 40 - 80 mm, L > 25%	30 - 50 mm deep, h = w + 20% of w, within 30 days	
			5	w > 80 mm, and L > 25%	50 - 100 mm deep repair. H = w + 20% of w. Within 30 days	

Joint Defects						
13	**Faulting (or Stepping) in Cracks or Joints**	f = difference of level	0	not discernible, < 1 mm	No action.	No action.
			1	f < 3 mm		
			2	f = 3 - 6 mm	Determine cause and observe, take action for diamond grinding	Replace the slab as appropriate.
			3	f = 6 - 12 mm	Diamond Grinding	Within 30days
			4	f= 12 - 18 mm	Raise sunken slab.	Replace the slab as appropriate.
			5	f> 18 mm	Strengthen subgrade and sub-base by grouting and raising sunken slab	Within 30days
14	**Blow-up or Buckling**	h = vertical displacement from normal profile	0	Nil, not discernible	**Short Term**	**Long Term**
			1	h < 6 mm	No Action	
			2	h = 6 - 12 mm	Install Signs to Warn Traffic within 7 days	
			3	h = 12 - 25 mm		
			4	h > 25 mm	Full Depth Repair. Within 30 days	

Joint Defects						
			5	shattered slabs, ie 4 or more pieces	Replace broken slabs. Within 30 days	
15	**Depression**	h = negative vertical displacement from normal profile L =length	0	Not discernible, h < 5 mm	No action.	Not Applicable
			1	h = 5 - 15 mm		
			2	h = 15-30 mm, Nos <20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints	Strengthen subgrade. Reinstate pavement at normal level if L < 20 m. Within 30 days	
			5	h > 100 mm		
16	**Heave**	h = positive vertical displacement from normal profile. L = length	0	Not discernible. h < 5 mm	**Short Term** No action.	**Long Term** Scrabble
			1	h = 5 - 15 mm	Follow up.	
			2	h = 15 - 30 mm, Nos <20% joints	Install Signs to Warn Traffic within 7 days	
			3	h = 30 - 50 mm		
			4	h > 50 mm or > 20% joints		

Joint Defects						
			5	h > 100 mm	Stabilise subgrade. Reinstate pavement at normal level if length < 20 m. Within 30 days	
17	**Bump**	h = vertical displacement from normal profile	0	h < 4 mm	No action	
			1	h = 4 - 7 mm	Grind, in case of new construction within 7 days	Construction Limit for New Construction.
			3	h = 7 - 15 mm	Grind, in case of ongoing Maintenance within 15 days	Replace in case of new construction. Within 30days
			5	h > 15 mm	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30days
18	**Lane to Shoulder Drop-off**	f = difference of level	0	Nil, not discernible < 3mm	**Short Term** No action.	**Long Term**
			1	f = 3 - 10 mm	Spot repair of shoulder within 7 days	
			2	f = 10 - 25 mm		
			3	f = 25 - 50 mm	Fill up shoulder within 7 dayss	
			4	f = 50 - 75 mm		

Joint Defects						
			5	f > 75 mm		For any 100 m stretch Reconstruct shoulder, if affecting 25% or more of stretch. Within 30days
Drainage						
19	**Pumping**	quantity of fines and water expelled through open joints and cracks Nos	0	not discernible	No Action	
			1 to 2	slight/ occasional Nos < 10%	Repair cracks and joints Without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	appreciable/ Frequent 10 - 25%	Lift or jack slab within 30 days.	
		Nos/100 m stretch	5	abundant, crack development > 25%	Repair distressed pavement sections. Strengthen subgrade and subbase. Replace slab. Within 30 days	
20	**Ponding**	Ponding on slabs due to blockage of drains	0-2	No discernible problem	No action.	
			3 to 4	Blockages observed in drains, but water flowing	Clean drains etc within 7 days, Follow up	Action required to stop water damaging

Joint Defects						
			5	Ponding, accumulation of water observed	-do-	foundation within 30 days.

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

<table>
<tr><th>Asset Type</th><th>Performance Parameter</th><th>Level of Service (LOS)</th><th>Frequency of Measurement</th><th>Testing Method</th><th>Recommended Remedial measures</th><th>Time limit for Rectification</th><th>Specifications and Standards</th></tr>
<tr><td>Highway</td><td>Availability of Safe Sight Distance</td><td>As per IRC: 52-2019, a minimum of safe stopping sight distance shall be available throughout.
<table><tr><th>Design Speed, kmph</th><th>Desirable Minimum Sight Distance (m)</th><th>Safe Stopping Sight Distance (m)</th></tr><tr><td>50</td><td>120</td><td>60</td></tr><tr><td>40</td><td>90</td><td>45</td></tr></table></td><td>Monthly</td><td>Manual Measurements with Odometer along with video/ image backup</td><td colspan="2">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.</td><td>IRC : 52-2019</td></tr>
<tr><td>Pavement Marking</td><td>Wear</td><td><70% of marking remaining</td><td>Bi-Annually</td><td>Visual Assessment as per Annexure-F of IRC:35-2015</td><td>Re - painting</td><td>Cat-1 Defect – within 24 hours
Cat-2 Defect - within 2 months</td><td>IRC:35-2015</td></tr>
</table>

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

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		Minimum Threshold Level: 50 mcd/m^2/lux					
	Skid Resistance	Initial and Minimum performance for Skid Resistance: Initial (7days): 55BPN Min. Threshold: 44BPN *Note: shall be considered under urban/city traffic condition encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar markings etc	Bi-Annually	As per Annexure-G of IRC:35-2015		Within 24 hours	IRC:35-2015
Road Signs	Shape and Position	Shape and Position as per IRC:67-2022. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is damaged. Relocation as per requirement	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/Cantilever Sign boards	IRC:67-2022
	Retro reflectivity	As per specifications in IRC:67-2022	Bi-Annually	Testing of each signboard using Retro Reflectivity Measuring Device. In accordance	Change of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs)	IRC:67-2022

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
				with ASTM D 4956-09.		1 Month in case of Gantry/ Cantilever Sign boards	
Kerb	Kerb Height	As per IRC 86:1983 depending upon type of Kerb	Bi-Annually	Use of distance measuring tape	Raising Kerb Height	Within 1 Month	RC 86:1983
	Kerb Painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7-days	RC 35:2015
Other Road Furniture	Reflective Pavement Markers (Road Studs)	Numbers and Functionality as per specifications in IRC:SP 73-2018 and IRC:35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC:SP:73-2018, IRC:35-2022
	Pedestrian Guardrail	Functionality: Functioning of guardrail as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:SP:73-2018,
	Traffic Safety Barriers	Functionality: Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:73-2018, IRC:119-2015
	End Treatment of Traffic Safety Barriers	Functionality: Functioning of End Treatment as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:73-2018, IRC:119-2015
	Attenuators	Functionality: Functioning of Attenuators as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP-2014, IRC:119-2015
	Guard Posts and Delineators	Functionality: Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: 79 – 2019

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC:67-2022
	Traffic Blinkers	Functionality: Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC:SP:73-2018,
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:73-2018
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC:SP:73-2018,
		No minor failure in the lighting system	Monthly	-	Rectification of failure	8 hours	IRC:SP:73-2018,
	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:73-2018,
		No major/minor failure in the lighting system	Daily	-	Rectification of failure	8 hours	IRC:SP:73-2018,

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Trees and Plantation including median plantation	Obstruction in a minimum head-room of 5.5 m above carriageway or obstruction in visibility of road signs	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC:SP:73-2018,
	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:73-2018,
	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:73-2018,
Rest Areas	Cleaning of toilets	-	Daily	-	-	Every 4 hours	
	Defects in electrical, water and sanitary installations	-	Daily	-	Rectification	24 hours	

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Other Project Facilities and Approach roads	Damage or deterioration in Approach Roads, pedestrian facilities, truck lay-bys, bus-bays, bus-shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other works		Daily	-	Rectification	15 days	IRC:SP:73-2018,

Table 4: Maintenance Criteria for Structures and Culverts:

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Pipe/box/slab culverts	Free waterway/unobstructed flow section	85% of culvert normal flow area to available.	2 times in a year (before and after rainy season)	Inspection by Bridge Engineer as per IRC SP: 35-1990 and recording of depth of silting and area of vegetation.	Cleaning silt up soils and debris in culvert barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrel before rainy season.	15 days before onset of monsoon and within 30 days after end of rainy season.	IRC 5-2015, IRC SP:40-2019 and IRC SP:13-2004
	Leak-proof expansion joints if any	No leakage through expansion joints	Bi-Annually	Physical inspection of expansion joints as per IRC SP: 35-1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP:40-2019 and IRC SP:69-2011
	Structurally sound	Spalling of concrete not	Bi-Annually	Detailed inspection of all components of	Repairs to spalling, cracking, delamination,	15 days	IRC SP 40-2019 and

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		more than 0.25 sqm		culvert as per IRC SP:35-1990 and recording the defects	rusting shall be followed as per IRC: SP:40-2019.		MORTH Specifications clause 2800
		Delamination of concrete not more than 0.25 Sqm.					
		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 40-2019 and IRC: SP:13-2004.
Bridges including ROBs Flyover etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Bridge - Super Structure	Bumps	No bump at expansion joint	Daily	Visual inspection as per IRC SP:35-1990	Repairs to BC on either side of expansion joints, profile correction course on approach slab in case of settlement to approach embankment	15 days	MORT&H Specification 3004.2 & 2811.
	User safety (condition of crash barrier and guard rail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed condition survey as per IRC SP: 35-1990.	Repairs and replacement of safety barriers as the case may be	3days	IRC: 5-2015, IRC SP: 73-2018 and IRC SP: 40-2019.
	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: 40-2019 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: 40-2019 and MORTH Specification 2800.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
	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 40 m	Load test method	Carry out major rehabilitation works on bridge to retain original design loads capacity	6 months	IRC SP: 51-2015.
	Vibrations in bridge deck due to moving trucks	Frequency of vibrations shall not be more than 5 Hz	Once in every 5 years for spans more than 30m and every 10 years for spans between 15 to 30 m	Laser displacement sensors or laser vibro-meters	Strengthening of super structure	4 months	AASHTO LRFD specifications
	Leakage in Expansion joints	No damage to elastomeric sealant compound in strip seal expansion joint, no leakage of rain water through expansion joint in	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: 40-2019.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		case of buried and asphalt plug and 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: 40-2019.
	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.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
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: 40-2019 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, IRC 83 and IRC SP: 40-2019.

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Bridge Foundation	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection as per IRC SP:35-1990 using Mobile Bridge Inspection Unit. In case of doubt, use Underwater camera for inspection of deep wells in major Rivers.	Suitable protection works around pier/abutment	1 month	IRC SP: 40-2019, MORTH specification 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 40-2019 and IRC: SP:13-2022.
Slope Protection (Landslide & Sinking)	Movement & deformation in landslide & sinking zones	Movement & deformation beyond permissible limit should be made	14 Days	Once in month/ as when noticed	Standard method as approved by the Authority QA/QC plan of the contractor	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier	Refer the Schedule B and Schedule D

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
		good to the design standard					
	Any material or defect development in workmanship used in protection work	The material and workmanship specification should be in accordance with Schedule B and Schedule D	14 Days	Once in month/ as when noticed	Standard method as approved by the Authority QA/QC plan of the contractor	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	Refer the Schedule B and Schedule D
Note: Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of the contractor.							

Table 5: Maintenance Criteria for Hill Roads

In addition to above, for hill roads the following provisions for maintenance is also to done.

Hill Roads			
	Nature of Defect / Deficiency	**Temporary Measures for Minor rectification**	**Permanent Measures for Major rectification**
(i)	Damage to PCC Breast wall / RCC Cladding / RCC step wall	within 48 (forty-eight) hours	15 (Fifteen) days
(ii)	HT Rolled cable Net, DT Mesh, Coir Mat, 3D Net, SDA	within 48 (forty-eight) hours	15 (Fifteen) days
(iii)	Any damage to other assets of project,	within 48 (forty-eight) hours	within 15 (fifteen) days or as specified by the Authority's Engineer
(iv)	Landslides requiring clearance	12 (Twelve) hours	

Note: For all tables 1 to 5 above, latest BIS & IRC standards (even those not indicated herewith) along with MoRTH specifications shall be binding for all maintenance activities. 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 ED(P).

Schedule - H

(See Clauses10.1 (iv) and 19.3)

Contract Price Weightages

1.1 The Contract Price for this Agreement is Rs……

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

Item	Weightage in Percentage to the Contract Price	Stage of for Payment	Percentage Weight in particular Item
1	**2**	**3**	**4**
Km 40+050 to 40+120 (approx.)			
Road works including culverts	0.00%	**A- 2 Lane Curve Improvement / Realignment / New / Reconstruction**	
		(1) Granular Sub-Base Course grade-iii (GSB)	0.00%
		(2) Wet Mix Macadam (WMM)	0.00%
		(3) Prime Coat	0.00%
		(4) Tack Coat	0.00%
		(5) Dense Graded Bituminous Macadam grading 2	0.00%
		(6) Bituminous Concrete grading 2	0.00%
		B - Reconstruction and New Construction Culverts.	
		(7) Culverts (3*4)	0.00%
Slope Protection Works	100.00%	(a) Excavation in Ordinary rock by manual means	0.02%
		(b) Supply and Installation of Self driven rock anchor including Cement pressure grouting	58.22%
		(c) Supply and installation of high tensile rolled cable net	17.88%
		(d) Supply and fixing of Double Twisted Mesh	3.78%

		(e) Supply and fixing layer of Geo-jute mat with spraying of seeds of Lemon grass/Dedonia/Vetiver etc.	3.31%
		(f) Providing and laying Plain Cement Concrete (M-25) using batching plant and manual placing including supplying, fitting and placing HYSD bar.	12.46%
		(g) Providing and installing subsurface drainage pipes - Semi Perforated PVC pipe (lined with Non-woven Geotextile)	2.04%
		(h) Supplying and Installation of non-woven geotextile having mass/unit area -250 gsm over the slope	0.10%
		(i) Gabian Structure for Retaining Earth /RIVER TRAINING & PROTECTION WORKS	2.14%
		(j) Parapet wall - PLUM CONCRETE (1:3:6) - Plain cement concrete of nominal mix.	0.05%

1.3 Procedure of estimating the value of work done.

1.3.1 Road works

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

Table 1.3.1

Stage of for Payment	**Percentage Weight in particular Item**	**Payment Procedure**
Road works including culverts		
A- 2 Lane Curve Improvement / Realignment / New / Reconstruction		
(1) Earthwork up to top of the sub-grade	0%	~~Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length or 500m whichever is less.~~
(2) Cement Treated Sub-Base Course (CTSB)	0%	
(3) Bituminous Stabilized Material (BSM)	0%	
(4) Bituminous Concrete (BC)	0%	
(5) Earthen / Granular Shoulders	0%	
B - Reconstruction and New Construction Culverts.	0%	
(1) Culverts	0%	~~Cost of each culvert shall be determined on pro rata basis with respect to the total number of culverts.~~

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

Where

P = Contract Price

L = Total equivalent intermediate-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

1.3.2 Slope Protection Works

Procedure for estimating the value of Slope Protection Work shall be as stated in table 1.3.2

Table 1.3.2

Stage of for Payment	**Percentage Weight in particular Item**	**Payment Procedure**
(a) Excavation in Ordinary rock by manual means	0.02%	Unit of measurement is cum. Payment shall be made on pro rata basis on completion of each stage in a quantity not less than 50% of the total scope of work.
(b) Supply and Installation of Self driven rock anchor including Cement pressure grouting.	58.22%	Unit of measurement is linear length of anchors. Payment shall be made on pro rata basis on completion of each stage in a length of not less than 10% of the total anchor length.
(c) Supply and installation of high tensile rolled cable net.	17.88%	Unit of measurement is area in sqm. Payment shall be made on pro rata basis on completion of each stage in an area of not less than 10% of the total area.
(d) Supply and fixing of Double Twisted Mesh.	3.78%	
(e) Supply and fixing layer of Geo-jute mat with spraying of seeds of Lemon grass/Dedonia/Vetiver etc..	3.31%	
(f) Providing and laying Plain Cement Concrete (M-25) using batching plant and manual placing including supplying, fitting and placing HYSD bar.	12.46%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of each stage in a length of not less than 10% of the total length of concrete wall.
(g) Providing and installing subsurface drainage pipes - Semi	2.04%	Unit of measurement is linear length. Payment shall be made on

Stage of for Payment	Percentage Weight in particular Item	Payment Procedure
Perforated PVC pipe (lined with Non-woven Geotextile).		pro rata basis on completion of each stage in a length of not less than 10% of the total length.
(h) Parapet wall - PLUM CONCRETE (1:3:6) - Plain cement concrete of nominal mix.	0.05%	
(i) Supplying and Installation of non-woven geotextile having mass/unit area -250 gsm over the slope.	0.10%	
(j) Gabian Structure for Retaining Earth / RIVER TRAINING & PROTECTION WORKS.	2.14%	Unit of measurement is linear length. Payment shall be made on pro rata basis on completion of each stage in a length of not less than 10% of the total length of Gabian wall.

~~**1.3.3 Other works**~~

~~Procedure for estimating the value of other work shall be as stated in table 1.3.3~~

~~Table 1.3.3~~

~~**Stage of for Payment**~~	~~**Percentage Weight in particular Item**~~	~~**Payment Procedure**~~

2. Procedure for payment for Maintenance

(a) ~~The cost for maintenance shall be as stated in Clause 14.1 (i)~~

(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

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

a) Drawing of Plan, Section will all relevant details showing mitigation measures in entire project section.

b) Detailed Drawings of road drainage measures and drainage Plan.

c) Detailed Drawings of slope protection measures like Secured Drapery in Hill Side.

d) Detailed Drawings of Nailed cladding wall in hill.

e) Drawing and details of hydro-seeding.

f) Drawings for drainage system etc.

g) Drawings for traffic diversion plans and traffic control measures in construction zones.

h) Detailed Drawings of Breast wall

i) Detailed design and drawing of all components required for project completion of works including Early Warning System (EWS).

j) Any other drawing relevant to the Project Highway as desired by Authority/Client.

Schedule - J

(See Clause 10.3 (ii))

Project Completion Schedule

1. Project Completion Schedule

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

2. Project Milestone-I

(i) Project Milestone-I shall occur on the date falling on the 63rd (Sixty-Three) **day** from the Appointed Date (the **"Project Milestone- I"**).

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

3. Project Milestone-II

(i) Project Milestone-II shall occur on the date falling on the **121st (One Hundred and Twenty-One)** day from the Appointed Date (the **"Project Milestone- II"**).

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

4. Project Milestone-III

(i) Project Milestone-III shall occur on the date falling on the **244th (Two Hundred and Forty-Four) day from the Appointed Date (the "Project Milestone- III").**

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

5. Scheduled Completion Date

(i) The Scheduled Completion Date shall occur on the **365th (Three Hundred and Sixty-Five) day** from the Appointed Date

(ii) On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

6. Extension of time

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

Schedule - K

(See Clause 12.1 (ii))

Tests on Completion

1. Schedule for Tests

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

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

2. Tests

(i) Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include to be decided with Authority's Engineer at the time of physical tests as per standard.

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

(iii) ~~Tests for bridges: All major and minor bridges shall be subjected to the rebound hammer and ultrasonic pulse velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on 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.~~

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

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

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

3. Agency for conducting Tests

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

4. Completion Certificate

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

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 Rehabilitation and Upgradation to four lane configuration & strengthening of "**Slope stabilization and protection works at CH Km 40.050 (approx.) near 7th Mile of NH-10 during the FY 2026-27 on EPC Mode under NHIDCL in the state of West Bengal**" on Engineering, Procurement and Construction (EPC) basis through …… (Name of Contractor), hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in service of the Users thereof.

~~2 It is certified that Rain water harvesting and artificial recharging arrangements have been provided by the contractor as per Schedule "C" of the contract agreement and are functional. Details (with location chainage) are as given in Annex.~~

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

SIGNED, SEALED AND DELIVERED

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

(Signature)

(Name)

(Designation) (Address)

Schedule - M

(See Clauses 14.6, 15.2 and 19.7)

Payment Reduction for Non-Compliance

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

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

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

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

2. Percentage reductions in lump sum payments on monthly basis

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

S. No.	Item/Defect/Deficiency	Percentage
(a)	**Carriageway/Pavement**	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	**Road, Embankment, Cuttings, Shoulders**	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	**Bridges and Culverts**	
(i)	Desilting, cleaning. vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%

S. No.	Item/Defect/Deficiency	Percentage
(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
(iv)	Any Defects in Special slope protection works	20%
(d)	**Roadside Drains**	
(i)	Cleaning and repair of drains	5%
(e)	**Road Furniture**	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5th km stones	5%
(f)	**Miscellaneous Items**	
(i)	Removal of dead animals, broken down/accidented vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	**Defects in Other Project Facilities**	5%

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

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

Where,

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

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

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

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

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

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

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

Schedule - N

(See Clause 18.1 (i))

Selection of Authority's Engineer

1. Selection of Authority's Engineer

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

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

2. Terms of Reference

(iii) 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

(iv) 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

Scope

(i) These Terms of Reference (the "**TOR**") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "**Agreement**), which has been entered into National Highways & Infrastructure Development Corporation, 1st & 2nd Floor, Tower A, World Trade Centre, Nauroji Nagar, New Delhi – 110029 (the "Authority") and ..... (the "Contractor")# Slope protection and landslide Mitigation at "Slope stabilization and protection works at CH Km 40.050 (approx.) near 7th Mile of NH-10 during the FY 2026-27 on EPC Mode under NHIDCL in the state of West Bengal", and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

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

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

Definitions and interpretation

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

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

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

General

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

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

a). any Time Extension;

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

c). the Termination Payment; or

d). issuance of Completion Certificate or

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

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

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

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

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

Construction Period

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

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

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

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

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

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

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

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

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

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

(xi) The timing of tests referred to in Paragraph 4 (ix), and the criteria for acceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests

that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.

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

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

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

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

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

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

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

Maintenance Period

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

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

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

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

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

Determination of costs and time

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

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

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

Payments

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

(ii) Authority's Engineer shall -

a). within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of

the amount so determined as part payment, pending issue of the Interim Payment Certificate; and

b). within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor, after adjustments in accordance with the provisions of Clause 19.10.

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

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

Other duties and functions

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

Miscellaneous

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

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

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

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

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

Schedule - O

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

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

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

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

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

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

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

f). Deductions:

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

ii. Any amount towards deduction of taxes; and

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

g). Net claim: (e) – (f) (iii);

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

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

v. For Change of Scope Orders, and

vi. Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

i). The monthly payment admissible in accordance with the provisions of the Agreement;

j). The deductions for maintenance work not done;

k). Net payment for maintenance due, (a) minus (b);

l). Amounts reflecting adjustments in price under Clause 19.12; and

m). Amount towards deduction of taxes

3. Contractor's claim for Damages

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

Schedule - P

(See Clause 20.1)

Insurance

1. Insurance during Construction Period

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

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

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

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

2. Insurance for Contractor's Defects Liability

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

3. Insurance against injury to persons and damage to property

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

(ii) The insurance cover shall be not less than: Rs. 5,00,000/- (Rupees Five Lakh only)

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

a). the Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and

b). Damage which is an unavoidable result of the Contractor's obligations to execute the Works.

4. Insurance to be in joint names

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

Schedule-Q

(See Clause 14.10)

Tests on Completion of Maintenance Period

1. 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 required test of Slope Protection as required under codal provisions.

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 **Slope protection and landslide Mitigation at** "Slope stabilization and protection works at CH Km 40.050 (approx.) near 7th Mile of NH-10 during the FY 2026-27 on EPC Mode under NHIDCL in the state of West Bengal" on 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 ***