NATIONAL HIGHWAYS AUTHORITY OF INDIA

(Ministry of Road Transport and Highways)Government of India

DEMOLITION OF EXISTING MNB AND RECONSTRUCTION OF MINOR BRIDGE AT CHAINAGE 62+645 ON NEW NH-07 (OLD NH -64) IN PATIALA DISTRICT IN THE STATE OF PUNJAB.

TECHNICAL SCHEDULES (A, B, C, D & H)

SCHEDULE - A

(See Clause 2.1 and 8.1)

1. The Site

1.1 Site of the construction of minor bridge shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.

1.2 The dates of handing over the Right of Way to the Contractor are specified in Annex-II of this Schedule-A.

1.3 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.

1.4 General Arrangement drawing of the Project Highway are specified in Annex-III. The proposed levels FRL as indicated in the alignment plan shall be treated as an approximate assessment. The contractor shall design the Road Profile of the project highway based on site/design requirement specified in Schedule-D.

1.5 The status of the environment clearances obtained or awaited is given in Annex IV

Annex – I
(Schedule-A)
Site for Four Laning

1.1 The Site

The Site of the project highway is a section of NH-07. Proposal is for Construction of Minor Bridge at Chainage 62+645 on NH-07 in Patiala district in the state of Punjab. The land, carriageway and structures comprising the site are described below.

1.2 Description of the Project Highway

The project highway is existing alignment is at the Patiala Bypass of Patiala District. Latitude and longitude of the project corridor lies between 30.27938516184699, 76.37535945252809 respectively. An index map showing the existing features of the Project Highway is given at Appendix A-I.

1.3 Terrain

The terrain along the project stretch is predominantly plain terrain.

2. Land

The site of the project highway comprises the land is detailed in Annex-II of this Schedule A.

3. Carriageway

The present Carriageway is 4 Lane Configuration.

4. Service road
The existing service /slip road details are as follows: NIL

5. Major Bridges
The Site includes the following existing Major Bridges: NIL

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

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

7. Grade separators
The Site includes the following existing minor bridges: NIL

8. Minor bridges
The Site includes the following existing minor bridges:

S. No.	Existing Chainage (Km)	Type of structure			No. of Spans x length (m)	Overall Width (m)	Side
		Type of Foundation	Sub Structure	Super Structure			
1	62.682	Open foundation	RCC Wall Type	Composite Steel Truss	1x41.50	12.00	LHS

9. Railway level crossings

The Site includes the following existing railway level crossings: NIL

10. Underpasses (vehicular, non-vehicular)

The Site includes the following existing underpasses: NIL

11. Culverts

The Site includes following existing culverts: NIL

12. Bus bays

The Stretch has the following existing Bus Bays /Bus Shelters: NIL

13. Truck Lay byes

The details of existing truck lay byes are as follows: NIL

14. Road side drains

The details of existing truck lay byes are as follows: NIL

15. Major junctions

The details of existing major junctions are as follows: NIL

16. Minor junctions

The details of the existing minor junctions are as follows: NIL

17. Bypasses

The details of the existing bypasses are as follows: NIL

18. Details of any other Structures

The details of the existing structure are as follows: NIL

19. Submergence Locations

No existing road has been utilized as part of the project alignment hence submergence location is notapplicable. NIL

20. Utilities:

i. Electrical Utilities

The site includes the following electrical utilities:

a) High Tension/Low tension (HT/LT) lines Crossing

HIGH TENSION WIRE CROSSING			
SL.NO.	**DESIGN CHAINAGE**		**HT WIRE CROSSING**
	From	**To**	
NIL			

b) Electric Poles, Transformer and TNS

ELECTRIC POLE , TRANSFORMER & TNS									
SL.NO.	**DESIGN CHAINAGE**		**ELECTRIC POLE**		**TRANSFORMER**		**TNS**		**ELECTRIC POLE CROSSING**
	From	**To**	**LHS**	**RHS**	**LHS**	**RHS**	**LHS**	**RHS**	
NIL									

ii.Public Health Utilities (Water/Hand Pump and Well)

The Site includes the following Public Health Utilities: -

HAND PUMP , WELL & WATER TANK								
SL.NO.	**DESIGN CHAINAGE**		**HAND PUMP**		**WELL**		**WATER TANK**	
	From	**To**	**LHS**	**RHS**	**LHS**	**RHS**	**LHS**	**RHS**
NIL								

iii.Any Other Lines:

S No	**Design Ch.**		**OFC**		**Telephone poles**	
	From	**To**	**LHS**	**RHS**	**LHS**	**RHS**
NIL						

No change of scope shall be paid for any over-ground utilities. However, underground utilities not mentioned in Schedule "B" shall form change of scope, which shall be worked out as per estimation of the concerned utility owning dept. and shall be payable.

Appendix A-I

Index map of Project Highway



Annex II
(Schedule-A)
Dates for providing Right of Way

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

Sl. No.	Stretches		Length (in Km)	ROW Width (in m)	Date of providing ROW*
	From (Km)	To (Km)			
(i) Full Right of Way (full width)				45	100% ROW to behanded over on Appointed Date

Annex – III
(Schedule-A)

Alignment Plans:

1. The General Arrangement drawing of proposed minor bridge is enclosed in alignment plan. Finished road level indicated in the plan shall be treated as an approximate assessment. The contractor shall design the minor bridge of the project highway based on site/design requirement specified in Schedule-D.

Annex – IV

(Schedule-A)

Environment Clearances

The following environment clearances have been obtained:

1. Environmental clearance is not required.
2. Clearance under Wildlife (protection) Act 1972 is not required.

SCHEDULE - B

(See Clause 2.1)

DEVELOPMENT OF THE PROJECT HIGHWAY

1. Development of the Project Highway

Development of the Project Highway shall include design and construction of the Project Highway as described in this Schedule-B and in Schedule-C. GAD of minor bridge are specified in Annex-III of Schedule A and shall be deemed to be part of this Schedule B. The proposed profile of the project highway as indicated in the Annex-III of Schedule A shall be treated as minimum assessment. Based on site/design requirement specified in Schedule-D, the Contractor shall design the alignment plans and profiles of the project highway with approval from Authority Engineer within the available Right of Way.

2. Specifications and Standards

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

Annexure-I

(Schedule – B)

Description of the Project

Construction of Minor Bridge at Chainage 62+645 on NH-07 in Patiala district in the state of Punjab.

1. Construction of Project Highway

1.1 The Project Highway shall follow the alignment shown in the GAD specified in Annex III of Schedule-A, unless otherwise specified by the Authority. Notwithstanding anything to the contrary contained in this Agreement or IRC:SP:84-2019, the proposed profile of the project highway as indicated in the Annexure-III of Schedule-A shall be treated as an minimum assessment. The Contractor shall design the alignment plans and profiles of the project highway based on site/design requirement mentioned in Schedule D with approval from the Authority's Engineer within the available Right of Way. The same shall not constitute a change of scope, save and except any variations arising out of a change of scope expressly undertaken in accordance with the provision of Article 13.

1.2 Width of carriageway

1.2.1 4-lane divided carriageway shall be undertaken. The paved carriageway shall be provided as indicated below and referred to in paragraph 2.8 of this Schedule–B and Annex –I of Schedule–D.

1.2.2 Except as otherwise provided in this Agreement, the width shall be adjusted to fit into appropriate plans and cross sections developed in accordance with TCS enclosed.

1.2.3 Except as otherwise provided in this Agreement, but subject to provisions of Annex –I of this Schedule–B, the width of the paved carriageway shall conform to Section 1.2.1 of Schedule B.

1.2.4 The entire cross-sectional elements shall be accommodated in the available/proposed ROW. If required, suitable retaining structures shall be provided to accommodate the highway cross section within the available/ proposed ROW and the same shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

Note:

a) In addition to width of paved carriageway mentioned in clauses above, additional lane/lanes shall be given as acceleration/deceleration lane and taper for Loops/Ramps to the required length shall be provided at interchange locations as per Specifications.

b) In addition to width of paved carriageway mentioned in clause above, at RE wall and Retaining wall locations the width of paved carriageway including paved shoulder and edge strip shall be as given in the corresponding TCS.

2.0 Geometric design and general features

2.1 General

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the IRC: SP:84-2019.

2.2 Design speed

The design speed shall be the ruling/minimum design speed specified in Clause 2.2 of the IRC: SP:84-2019.

2.3 Improvement of the existing road geometrics

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

S. No.	Proposed Chainage (in km)		Type of Deficiency	Remarks
	Start	End		
Nil				

2.4 Right of Way

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

2.5 Type of shoulders

The shoulder specification shall be as per Section 2 and Section 5 of IRC: SP:84-2019.

2.6 Service Roads/Slip Roads/Connecting Roads

Service Roads/ Slip Roads shall be constructed at the locations and for the lengths indicated below:

Sl. No.	Location of Service Roads/Slip Roads (Design Chainage in Km)		Right Hand Side (RHS)/Left Hand Side) or Both Sides	Length (m)	Remarks
	From	To			
A	NIL				

2.7 Grade separated structures

2.7.1 Grade separated structures shall be provided as per paragraph 2.13 of the IRC: SP:84-2019. Proposed levels at structure locations as shown in plan & profile specified in Annex III of schedule A are only for guidance and any changes in levels shall not constitute any change of scope. The requisite particulars are given below:

SVUP

Sl. No.	Design Chainage (In Km)	Type of structure	Span Arrangement (m)	Skew Angle	Deck Configuration (m)	Width of Open median (m)
NIL						

LVUP

Sl. No.	Design Chainage (In Km)	Type of structure	Span Arrangement (m)	Skew Angle	Deck Configuration (m)	Width of Open median (m)
NIL						

VUP

Sl. No.	Design Chainage (In Km)	Type of Crossing	Type of structure	Clear opening in square Direction (m)	Skew Angle	Deck Configuration (m)
NIL						

BOX TYPE UNDERPASS

Sl. No.	Chainage (km)	Type of Structure	Span Arrangement (Clear opening) (m)	Skew angle	Deck Configuration (m)	Width of Open Median (m)
Nil						

FLYOVER

S.No.	Design Chainage (Km)	Type of Crossing	Type of Structure	Span Arrangement (m)	Skew Angle	Deck Configuration (m)	Width of Open Median (m)
NIL							

INTERCHANGE

S. No.	Design Chainage (Km)	Type of Crossing	Type of Structure	Span Arrangement (m)	Skew Angle	Deck Configuration (m)	Width of Open Median (m)
NIL							

STRUCTURE AT LOOP AND RAMPS

Sl. No.	Chainage (Km)	Connecting Roads	Structure Type	Clear Span (m)	Skew Angle	Deck Configuration (m)	Total length C/C of Exp. Joint (m)	Width of Open Median (m)
NIL								

DETAILS OF LOOP AND RAMP:

Minimum lane configurations of Loops / Ramps for each interchange are as follows:

Interchange No & Chainage (Km)	Ramp /Loop/Road No	Description	Lane Configuration	Length (km)	TCS Type
NIL					

Note:

i. The minimum vertical clearance of all LVUP and SVUP structures shall be 4m.

ii. The minimum vertical clearance of all VUP, VOP, Fly-over and interchange structures shall be 5.5m.

iii. Wherever liquefaction is observed in foundation, Ground improvementshall be done to compact the soil to increase its penetration resistance and satisfy clause 8.4.4 (v)of IRC- SP:114-2018.

iv. Special vehicle loading is to be considered in Design of structures.

v. The realignment of existing track to the SVUP/LVUP/Flyover outside the PROW and connecting roads between consecutive underpasses wherever required as per plan & profile uploaded with bid document and specified in Annex III of schedule A is to be constructed by the contractor as per site requirement in consultation with Authority Engineer and the same would not constitute any change of scope.

vi. Any other structures falling within acceleration / deceleration lane /taper length of the interchanges shall be constructed to the required width within the scope of work. This shall not be treated as change of scope, save and except any variations arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

vii. The length of loops and ramps are minimum and likely to get changed as per site requirement. Any change as per site requirement may not constitute change of scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

viii. The width of Paved Carriageway for the loops and ramps of the interchanges shall be minimum as Given TCS. However, where toll plaza has to be constructed, the width of Paved Carriageway shall be as per the width of toll plaza lane configuration given in Schedule C including taper length

as per manual.

ix. The lane configuration and width of all structures shall be as per respective paragraph of this schedule.

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

Sr. No.	Start	End	Length	Description	Type of TCS
1	62.625	62.661	0.41	Typical cross section for Minor Bridge	TCS-I

2.8 Typical Cross Section of Project Highway

Typical Cross sections are attached in Appendix B-1.

Note: TCS schedule as given above shall be treated as minimum assessment. Actual length of the TCS schedule shall be prepared by the contractor based on detailed investigations and site requirements. Any variation in length of respective TCS specified in Schedule B shall not constitute a change of scope, save and except any variations in the length arising out of a change of scope expressly undertaken in accordance with the provisions of Article 13.

3 Intersections and grade separators

All intersections and grade separators shall be as per Section 3 of the IRC: SP:84-2019. Properly designed intersections shall be provided at the locations and of types and features given in the tables below:

a) At-grade intersections:

Sl. No	Design Chainage	Leads To		Junction Type	Improvement Proposed	Remarks
		Left	Right			
Nil						

b) Grade separated intersection with/without ramps

The grade separated intersection shall be provided as specified in paragraph 2.7 of Annexure-I ofschedule B.

Note:

i. Type of Junction to be improved as per IRC:SP:84-2019 and MOST type design for intersection on National Highways, 1992.

ii. Any other junction not mentioned above but observed during the construction of the project shall be improved as per IRC:SP:84-2019 requirements. The same shall not constitute a Change of Scope, save and except any variations arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13. Moreover, any additional SVUP/LVUP/VUP at crossroad location not provided for in the Schedule B but required during the execution of work will be dealt under the provisions of Article 13.

iii. The contractor shall take up 'Detailed Engineering study' to ascertain further details of all intersections and treatment of the intersections shall be designed in accordance with the latest guidelines mentioned out in section-3 of IRC:SP:84-2019. The same shall not constitute a Change of Scope, save and except

any variations arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

iv. Junction improvement under grade separators shall be carried out as per IRC IRC:SP:84-2019 with proper entry/exit to cross roads and slip/service roads.

v. Location and span arrangement of grade-separated structures are indicative. Exact location may be decided in consultation with Authority Engineer. Any Change in span arrangement shall not be treated as change of scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

4 Road embankment and cut section

4.1 Construction of new road embankment/cuttings shall conform to the Specifications and Standards given in section 4 of the IRC: SP:84-2019 and the specified cross-sectional details.

Notwithstanding anything to the contrary contained in this Agreement or IRC: SP:84-2019, the proposed profile of the project highway as indicated in the Annex-III of Schedule A shall be deemed to be part of this Schedule B and shall be treated as minimum assessment. Based on site/design requirement specified in Schedule-D, the Contractor shall design the alignment plans and profiles of the project highway within the available Right of Way.

4.2 Reinforced Earth Wall shall be provide at following Interchange Locations:

Interchange No & Chainage (Km)	Ramp /Loop/Road No	Description	Length (m)	Side	TCS Type
NIL					

4.3 Raising of the existing road: **NIL**

5 Pavement design

5.1 Pavement design shall be carried out in accordance with Section-5 of the IRC: SP:84-2019 and IRC 37 & IRC 58.

5.2 Type of pavement

a) The pavement shall be flexible pavement for the main carriageway and service road including paved shoulders for the entire length of project highway and loop/ramps at interchange locations.

b) For slip/service roads to wayside amenities and interconnecting roads to VUPs/LVUPs/SVUPs flexible pavement.

c) Rigid pavement shall be provided at Toll Plaza locations including the tapered section.

d) Connecting road shall be provided with flexible/rigid pavement.

i. **Reconstruction of Stretches : NIL**

ii. **Overlay: NIL**

6 Road side drainage

Drainage system including surface and subsurface drains for the Project Highway shall be provided as per Section 6 of the IRC:SP:84-2019. Lined and Unlined Drains (except at ROB location) which gets terminated at all cross road locations shall be provided in the entire project corridor as per the TCS referred in paragraph 2.8 of the Annex-I of Schedule B and Annex-I of Schedule D.

7 Design of structures

7.1 General

7.1.1 All bridges, culverts and structures shall be designed and constructed in accordance with section- 7 of the IRC: SP:84-2019 and shall conform to the cross-sectional features and other details specified therein. Project Highway is proposed to be constructed to four lane configuration with provision for widening to four-lane configuration in future. As such, superstructure of all bridges and structures has already been provided for the four lane configuration as per IRC SP-84:2019. Special vehicle loading is to be considered in Design of structures.

7.1.2 Width of the carriageway of new bridges and structures more than 60.0m length shall be as follows: NIL

7.1.3 The following structures shall be provided with footpaths:

S. No.	Design Chainage (Km)	Remarks
NIL		

7.1.4 All bridges shall be high-level bridges.

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

S. No.	Design Chainage (Km)	Utility service to be carried	Remarks
All Bridges to be Designed to carry Utility Services			

7.1.6 Cross-section of all structures including new culverts and bridges at deck level for the Project Highway shall conform to the typical cross-sections given in section 7 of the IRC: SP:84-2019 and TCS in Para 2.8 of Annex-I of this Schedule B.

7.2 Culverts

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

7.2.2 Reconstruction of existing culverts: NIL

7.2.3 Widening of existing culverts:

All existing culverts at the following location which are not to be reconstructed shall be widened.

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

7.2.4 New culverts (given in table below) shall be constructed for width equal to the roadway width of the Project Highway & as per typical cross-section given in the TCS specified in Para 2.8 and alignment plan. The details are given as under:

S.NO	Design Chainage	Span	Type of structure
NIL			

7.2.5 Culverts at Loop and Ramps:

Sl. No.	Design Chainage	Type of structure	Proposed Span (m)	TCS type	Location
NIL					

Note:

a. The overall width of the above culverts shall be equal to Roadway width only (excluding median)in case of depressed median. In case of connecting road, culvert also needs to be provided in the gap between main carriageway & connecting road. In cases of the culverts with fill and/or raised median, culvert to be provided though out Roadway width and median width. Any additional length required as per site conditions shall not constitute a Change of Scope.

b. Any additional Barrel length required as per site conditions shall not constitute a Change of Scope, save and except any variations arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

c. Location of the above culverts are indicative and span arrangement is minimum specified. Exact location of these culverts shall be decided in consultation with Authority Engineer. The actual vent way/span arrangements of culverts shall be determined on the basis of detailed investigations by the Contractor in accordance with the Specifications and Standards. Any variations in vent way/span arrangements specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

7.2.6 Repairs/replacements of railing/parapets, flooring and protection works of the existing culverts shall

be undertaken as follows: **NIL**

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

7.2.8 In case of culverts proposed for widening/repair as per details in Clause 7.2.3 above, the same shall be re-constructed if the design shows that these are unsafe for design loads. No change of scope shall be considered in such cases.

7.3 Bridges

7.3.1 Existing bridges to be re-constructed/widened

The existing bridges at the following locations shall be re-constructed/widened: **NIL**

7.3.2. Dismantling of Old Minor Bridge:

Old Minor Bridge at the following locations on the Project Highway shall be dismantled.

Old *Minor Bridge (OVER RIVERS/ STREAMS/ NALLAS):*

Sl. No	Chainage (In Km)	Type of Structure	Remarks
1	62+645	Composite Steel Truss	Dismantling existing bridge super structure (Deck slab, composite steel girder, crash barrier/ railing, expansion joint, bearing pedestal all respected relevant.

7.3.3 New bridges

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

Major Bridges : NIL

Minor Bridges (OVER RIVERS/ STREAMS/ NALLAS):

Sl. No	Design Chainage (In Km)	Span Arrangement (m) c/c form expansion joint	Skew	Type of Structure	Deck Configuration (m)	Width of Open median (m)	Vertical clearance	Remark
1	62+645	2x20.75	0	PSC Girder with pile foundation	1 * 12	NA	As per given along existing bridge (RHS) ref. letter no. DRA-SBIPL/PWD/TL-STUP/2016/153	

Only LHS side minor Bridge shall be reconstructed as per details mentioned in table.

Note:

i. The minimum vertical clearance from Cross road in case of all Major/Minor Bridge Cum underpass is specified in respective column.

ii. The Deck level of the Major/Minor Bridge on River stream and Nalla should be governed by HFLof stream/Navigational HFL and Clearance as per guidelines of Inland Waterways Authority of India, wherever applicable.

iii. The Deck level of the Major/Minor Bridge on canal should be governed by Full supply level of Canal.

iv. The span arrangements and vertical clearance are tentative and the same shall be followed as perapproved GAD by the concern Irrigation Authority and any change shall not be treated as change in scope of work.

v. Wherever liquefaction is observed in Open foundation and Raft Structures, Ground improvementshall be done to compact the soil to increase its penetration resistance and satisfy clause 8.4.4 (v)of IRC-SP:114-2018.

vi. Special vehicle loading is to be considered in Design of structures.

sViaducts (OVER GAS/OIL PIPELINES):

S. No.	Design Chainage(Km)	Span Arrangement (m)	Skew Angle	Type of Structure	Deck Configuration (m)	Width of Open median (m)	Remarks
NIL							

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

7.3.5 Repair/replacements of railing/parapets of the existing bridges shall be undertaken as follows: **Nil**

7.3.6 Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in paragraph 6.8 of the IRC: SP:84-2019

7.3.7 Structures in marine environment:**Nil**

7.4 Rail-road bridges

7.4.3 Design, construction and detailing of ROB/RUB shall be as specified in section 7 of the IRC: SP:84-2019

7.4.4 Road over bridges (road over rail) shall be provided at the following locations, as per GAD drawings attached

Sl. No.	Design Chainage	Proposed Span Arrangement (m)	Name of crossing (m)	Type of structure	Deck Configuration (m)	Remarks
NIL						

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

7.5 Grade separated structures

The grade separator shall be provided as specified at para 2.7 of Annex-I of Schedule B

7.6 Repairs and strengthening of Bridge/Structures

The existing structures to be repaired/ strengthened, and the nature and extent of repairs strengthening required: **Nil**

7.7 **List of Major Bridges and Structures**

Sl. No.	Name of the Structure	Total Numbers
1	ROB	0
2	Interchange	0
3	Flyover	0
4	Major Bridge	0
5	Major Bridge cum LVUP	0
6	Major Bridge cum SVUP	0
7	Major Bridge cum VUP	0
8	Minor Bridge	1
9	Minor Bridge cum underpass	0
10	VUP	0
11	LVUP	0
12	SVUP	0
13	Box Type Underpass	0
14	Viaduct	0
15	Culvert	0
16	Structures on Loops of Interchange (VUP & VOP)	0
17	Culverts on Loops of Interchange	0
Total		**01**

8 Traffic control devices and road safety works

8.3 Traffic control devices and road safety works shall be provided in accordance with Section 9 of theIRC: SP:84-2019.

a) Traffic Signs:

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

b) Pavement Marking:

Pavement markings shall cover road marking for the entire Project Highway

c) Safety Barrier:

Safety barrier shall conform to section 9.7 of IRC: SP:84-2019.

- RCC Crash barriers shall be provided on bridges/structures/ VUPs/ LVUPs/ SVUPs, RE Walls/ retaining walls as specified in Schedule B and Schedule D.

- RCC Crash barriers with Friction Slab shall be provided on Approaches to VUP/ LVUP as per TCS Referred in Schedule – B.
- New Jersey Type Crash Barrier shall be provided on Median as per TCS referred in Schedule-B

8.4 Sheeting shall be provided in accordance with section 9.2 of the IRC: SP:84-2019.

9 Roadside furniture

9.3 Roadside furniture like km/Hectometer Stones, Railings, Traffic Impact Attenuators, Delineators shall be provided in accordance with the provisions of Section 9 and Section 12 of IRC: SP:84-2019 and Traffic Signage plan as indicated in Annexure-III of Schedule-A and deemed to be part of this Schedule-B.

S. No.	Project Facility	Location	Design Requirements
1	Traffic Signs and Pavement Markings	Entire length of project road	As per Schedule D
2	Kilometer and 200m stones	Entire length of project road	As per Schedule D
3	Road side Delineators	Horizontal curves of project road	As per Schedule D

9.4 Traffic Signs (excluding overhead signs at Toll Plaza). Traffic sign boards as per details given below shall be provided in the project highway as per the road signage plan indicated in Annexure- III of Schedule-A which shall be deemed to be part of this Schedule-B

Sl. No.	Type of Sign
1	One Way Object Hazard Marker (OHM)
2	Two Way Object Hazard Marker (OHM)
3	Height restriction (Regulatory Sign)
4	Speed Limit Signs (Regulatory Sign)
5	Merging Traffic Ahead (Cautionary Sign)
6	Compulsory Keep Left Sign (Regulatory Sign)
7	Compulsory Ahead Sign (Regulatory Sign)
8	U-Turn Prohibited Sign (Regulatory Sign)
9	Give way sign (Regulatory Sign)
10	Chevron Marker (At Curves)
11	Triple Chevron Marker (At roundabout)
12	Reassurance Sign (Direction & Place Identification Sign)
13	Roundabout Sign (Cautionary Sign)
14	Left/ Right Hand Curve (Cautionary Sign)
15	National Highway Route Marker Sign
16	Entry/ Exit Sign (Information Sign)
17	End of Project Highway Sign
18	Map type Advance Direction Sign
19	Flag type Advance Direction Sign

20	Advance Direction Sign on ROB Viaduct Superstructure
21	Advance Directional Sign (Overhead Cantilever/ Gantry)
22	Rest Area Information Sign (Overhead Cantilever/ Gantry)
23	Slogan Gantry

Note:

The type, numbers and location of Traffic Signage's shown in Traffic Signage plan as indicated in Annexure-III of Schedule-A are tentative and minimum specified. The actual numbers and location of Traffic Signage's shall be determined by the Contractor in accordance with the IRC:SP:84-2019 requirements with approval from the Authority's Engineer. Any variation in the number and typeof road sign boards specified in this Clause of Schedule-B shall not constitute a Change of Scope,save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13. Adequate signs for toll plaza shall be provided asgiven in this schedule and manual.

10 Compulsory Afforestation

Median plantation, compulsory afforestation shall be as given Schedule 'C'

11 Hazardous Locations

The safety barriers shall also be provided at the hazardous locations as per site requirement in consultation with the NHAI/Authority Engineer and in accordance with the provisions of IRC:SP:84-2019

12 Retaining Wall/ Breast Wall

Retaining walls and protection works shall be provided at locations as indicated below and as provided in TCS schedule in cl. 2.7 of schedule-B

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

13 Special Requirement for Hill Roads **Nil**

14 Diversion of Irrigation Canal/ Drain/Field channel

Contractor shall shift the Irrigation canal/ drain/field channels at the locations detailed below for construction of project highway. The typical cross-section of the proposed canal/ local stream is enclosed at appendix B-2 for reference

Sl. No.	Design Chainage (Km)		Side	Length (m)	Remarks
	From	To			
NIL					

Note:

The actual cross-section of canal/ stream to be shifted and extent of such shifting (length) shall bedetermined by the Contractor as per the site/ design requirement with approval of concerned irrigation authority & Authority's Engineer. Any variation in the cross-section and length specifiedin this Clause of Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

15 Embankment Protection

In addition to slope protection at Bridges/ ROBs/ Flyover/ Underpasses & Chute Drain locations, Road embankment shall be protected for complete stretch by providing suitable protection measure except above mentioned locations

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

Note:

Above length of protection measure for embankment protection is tentative and minimum specified. The actual length of boulder pitching shall be determined by the Contractor in accordance with the IRC: SP:84-2019 requirements based on site investigations with approval from the Authority's Engineer. Any variation in the length specified in this Clause of Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

16 **Rainwater Harvesting**

As per Ministry of Environment and Forests Notification, New Delhi dated 14.01.1997 (as amended on 13.01.1998, 05.01.1999 & 6.11.2000), the construction of rain water harvesting structure is mandatory in and around Water Crisis area, notified by the Central Ground Water Board. Accordingly, the provision of rainwater harvesting shall be provided at every 500m in the entire project length and shall be executed as per requirement of IRC SP: 42-2014 and IRC SP: 50- 2013

17 Shifting of Utilities

Shifting of obstructing existing utilities indicated in Schedule A to an appropriate location in accordance with the standards and specifications of concerned Utility Owning Department is partof the scope of work of the Contractor/Concessionaire*. The bidders may visit the site and assessthe quantum of shifting of utilities for the project before submission of their bid. Copy of utility relocation plan is enclosed. The specification of concerned Utility Owning Department shall be applicable and followed.

Note-I:

a) The type/spacing/size specifications of poles/towers/lines/cables to be used in shifting work shall be as per the guidelines of Utility Owning Department and it is to be agreed solely between the Contractor/Concessionaire* and the Utility Owning Department. No change of scope shall be admissible and no cost shall be paid for using different type/spacing/size/specifications in shifted work in comparison to those in the existing work or for making any overhead crossings to underground as per requirement of Utility Owning Department and/or construction of project highway. The Contractor/Concessionaire* shall carry out joint inspection with Utility Owning Department and get the estimates from Utility Owning Department. The assistance of the Authority is limited to giving forwarding letter on the proposal of Contractor/Concessionaire* to Utility Owning Department whenever asked by the Contractor/Concessionaire*. The decision/approval of Utility owning Department shall be binding on the Contractor/ Concessionaire*.

b) The supervision charges at the rates/charges applicable of the Utility Owning Department shall be paid directly by the Authority to the Utility owning Department as and when Contractor/Concessionaire* furnishes demand of Utility Owning Department along with a copy of estimated cost given by the latter.

c) The dismantled material/scrap of existing Utility to be shifted /dismantled shall belong to the Contractor/Concessionaire* who would be free to dispose-off the dismantled material as deemed fit by them unless the Contractor/Concessionaire* is required to deposit the dismantled material to Utility Owning Department as per the norms and practice and, in that case the amount of credit for dismantled material may be availed by the Contractor/Concessionaire* as per the estimate agreed between them.

d) The utilities shall be handed over after shifting work is completed to Utility Owning Departmentto their entire satisfaction. The maintenance liability shall rest with the Utility Owning Department after handing over process is complete as far as utility shifting works are concerned

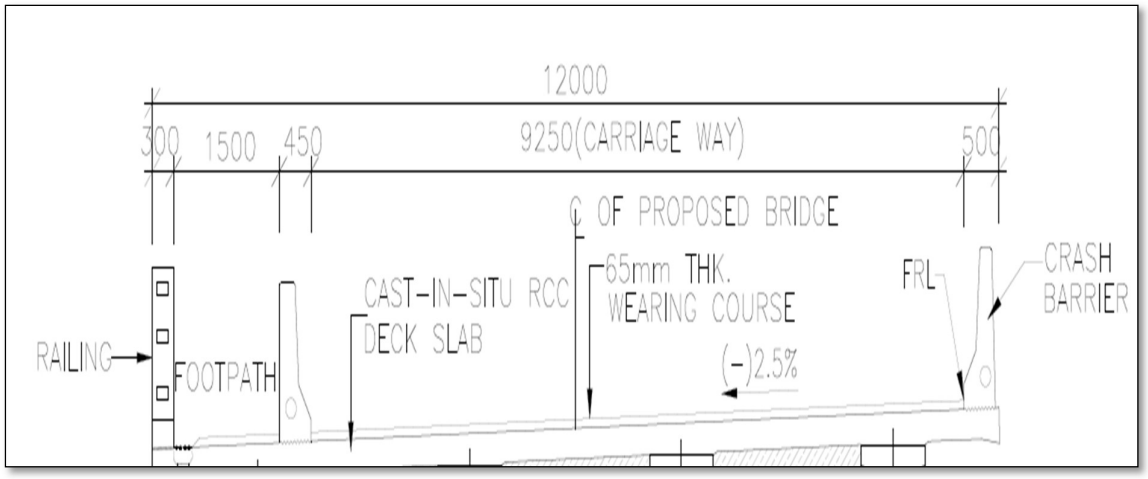
e) All existing overhead utilities (mentioned in Schedule-A or not) will be shifted as per above by contractor without any change of scope. Any underground utilities not mentioned in Schedule-A will be taken in COS.

Note II- Copy of Utility shifting plans enclosed as Annexure-II to Schedule B

18 Change of Scope

The length of structures and bridges specified hereinabove, except for structures over existing water bodies like ponds, lakes etc. shall be treated as minimum assessment. The proposed span arrangement of structures may be changed based on innovative design of structure, latest construction techniques and aesthetics of structures. Actual lengths of structures and bridges as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Existing water bodies like ponds, lakes etc., which are to be preserved from environment impact mitigation point of view, shall be bridged to the extent of fullponding level at peak rainy season as per requirement of EMP submitted to MoEF at the time ofEnvironmental Clearance. Any variations in the lengths specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Changeof Scope expressly undertaken in accordance with the provisions of Article13

Appendix-B-1



TCS-I – Typical cross section of Minor Bridge

Appendix-B-2

(Schedule B-1)

Felling of trees shall be carried out by the Contractor. The cost of the same shall be borneby the Authority. The details of trees are as follows:

S. No	Type of Utility	Unit	Quantity	Location/stretch (LHS/RHS)
NIL				

SCHEDULE – C
(See Clause 2.1)
PROJECT FACILITIES

1 Project Facilities

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

a) Toll plazas
b) Roadside furniture
c) Operation and Maintenance Centers
d) Way side amenities / Service Areas
e) Truck Parking Areas
f) Pedestrian Facilities/ Cattle Crossings/SVUP
g) Lighting
h) Environmental Management Plan
i) Land Scaping and Tree Plantation
j) Advanced Traffic Management System (ATMS)
k) Noise Barriers
l) Utilities
m) Rainwater harvesting

1.2 Project Facilities to be completed on or before project completion date have been described in Annex-I of this Schedule-C.

Annex - I
(Schedule-C)

1 Project Facilities

The Contractor shall construct the Project Facilities described in this Annex-I to form part of the Project Highway. The Project Facilities shall include:

a) Toll plazas
b) Roadside furniture
c) Operation and Maintenance Centers
d) Way side amenities / Service Areas
e) Smaller Parking Places with Toilet Facilities Service Area
f) Truck Parking Areas
g) Pedestrian Facilities/ Cattle Crossings/SVUP
h) Lighting
i) Environmental Management Plan
j) Land Scaping and Tree Plantation
k) Advanced Traffic Management System (ATMS)
l) Noise Barriers
m) Utilities
n) Rainwater harvesting

2 Description of Project Facilities

2.1 Toll Plazas

The Toll Plazas on loops / ramps / main carriageway shall be provided as per Schedule D and minimum lane requirement in the opening year are as follows:

Chainage (in km.)	Toll Plaza	Location	Direction (Entry: to project road, Exit: from project road)	No. of toll lanes
NIL				

2.2 Roadside furniture

2.2.1 Kilometer and Hectometer Stones

Kilometer and Hectometer stones shall be provided in accordance with **Schedule - D**.

2.2.2 Road Signs

The Road Signs shall be provided in accordance with **Schedule - D**.

2.2.3 Road Marking

The Road Marking shall be provided in accordance with **Schedule - D**.

2.2.4 Road Delineators

The Road Delineators shall be provided in accordance with **Schedule - D**.

2.2.5 Reflective Pavement Markers & Solar Studs

The Reflective Pavement Markers & Solar Studs shall be provided in accordance with **Schedule - D**.

2.2.6 Traffic Impact Attenuators

The Traffic Impact Attenuators shall be provided in accordance with **Schedule - D**.

2.2.7 Crash Barriers

RCC Crash Barriers

RCC Crash barriers shall be provided on bridges/structures/ retaining walls as specified in Schedule B and Schedule D.

2.3 Operation and Maintenance centers - NIL

Dedicated operation and maintenance center shall be provided in accordance to Schedule D.

2.4 Way side Amenities / Service Areas - NIL

2.4.1 Facilities

A) Way side Amenities / Service Areas

S. No.	Start (Km)	End (Km)	Side	Type of facility	Area
NIL					

2.4.2 Specifications and Standards for above facilities

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

2.4.3 Scope of Work

The project scope would include the following major activities: NIL

2.4.4 Project Facilities development: NIL

2.5 Pedestrian Facilities / Cattle Crossings/SVUP

Pedestrian/ Cattle Underpasses/SVUP shall be provided at locations specified in **Schedule – B.**

2.6 Lighting

The Contractor shall provide lighting as per **Schedule - D** at following locations of the Projectroad.

(i) Toll Plazas area

(ii) Operation and maintenance centers

(iii) Way side amenities / Service Areas

(iv) Truck Parking Areas

(v) Interchanges

(vi) Flyovers

(vii) Underpasses and Overpasses

(viii) Traffic aid posts, vehicle rescue posts, medical aid posts and all other facility & service buildings.

(ix) Interior illuminated signs

(x) Yellow flashing lights to alert drivers

In addition to the above locations the following locations shall have continuous project highway Lighting.

Sl. No.	Locations	Stretches	Remarks
1	Urban Areas	-	--
2	Stretches along project highway from start to end of approaches of all Service Areas (Way side amenities, Truck parking and Smaller parking places with toilet facilities)	Locations as given this Schedule C	--

Minimum level illumination on locations of the Project Highway where exterior lighting is provided shall be 40 lux. In general 'code of practice for lighting of public thoroughfare IS 1944 shall be followed. All facility buildings shall be illuminated adequately.

The lighting fittings (with LED features) shall be powered by solar system with back up facilities (power and battery both) at all locations.

The solar system will be used for the entire highway. The solar panel at interchange, toll plazas and bridges shall be grid connected whereas the other places shall be battery backup. The electrical connection with all its infrastructures shall be done by the contractor. Additional battery backup shall be provided.

2.7 Environmental Management Plan

The Contractor shall implement the Environmental Management plan & action Plan for undertaking possible mitigation measures in accordance with guidelines for Highway Projects of the Ministry of Environment and Forests and Wildlife Department. The conditions & directions stipulated by the MOEF &CC shall be made available by the Authority.

2.8 Land Scaping and Tree Plantation: NIL

2.9 Advanced Traffic Management System (ATMS) - NIL

Advanced Traffic Management System (ATMS) shall be provided as per Schedule D as given in Schedule - B. - **NIL**

2.10 Noise Barriers

The Contractor shall provide Noise barriers at the following locations: **NIL**

2.11 Utilities

Provision of accommodating utilities shall be made within utility corridor on either side of Project highway. Box/H.P. culverts proposed in Schedule B shall be used for crossing of underground utilities, wherever required. However, in location where the distance between two adjacent box culverts is more than 1 km, utility ducts in form of NP-4 Hume Pipe 1.2m diameter shall be provided across the Project Highway and along with inspection chamber as per IRC:SP:84-2019 requirements. Location for such utility crossing shall be finalized in consultation with Independent Engineer.

2.12 Rain-Water Harvesting

As per Ministry of Environment and Forests Notification, New Delhi dated 14.01.1997 (as amended on 13.01.1998, 05.01.1999 & 6.11.2000), the construction of rainwater harvesting structure is mandatory in and around Water Crisis area, notified by the Central Ground Water Board. The provision of rainwater harvesting shall be provided at every 500m in the entire project length and shall be executed as per requirement of IRC SP: 42-2014 and IRC SP: 50-2013

2.13 Truck lay-bye: NIL

2.14 Bus-bays and shelters: NIL

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 Annex-I of this Schedule-D.

Annex - I
(Schedule-D)

SPECIFICATIONS AND STANDARDS FOR HIGHWAYS

1 Manual of Specifications and Standards to apply

Four laning of the Project Highway shall conform to the 'Manual of Specifications and Standards for Four Laning of Highways' published as IRC: SP: 84-2019 with all amendments and additions till date (Referred to as "Manual" in this Schedule) and MORTH Specifications for Road and Bridge Works (5th revision). Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority Engineer & Independent Engineer.

2 Deviations from the Manual

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

Sl. No.	Clause No.	Details of Item	Description of Deviation
1	2.17	Typical Cross Section	The typical cross section shall be as given in Schedule B.
2	5.2	Type of Pavement	The type of pavement shall as specified in Schedule B.
3	7.3	Overall width of structures	The Overall Deck Configuration of all structures shall be as per Schedule B and
4	9.7.1	Road side safety barriers	As specified in Schedule B and TCS

SCHEDULE - H

See Clauses10.1 (iv) and 19.3

Contract Price Weightages

The Contract Price for this Agreement is _____.

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

Item	Weightage in percentage to the Contract Price	Stage for Payment	Percentage weightage
1	2	3	4
New and Re construction of Minorbridges (length >6 and <60 m.)	97.22%	**New and Re construction of Minor bridges (length >6 and <60 m.)**	
		(1) **Foundation**	31.87 %
		(2) Sub-Structure: On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	12.33 %
		(3) **Super-structure:** On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect	48.79%
		(4) **Protection Work:** On Completion of Bolder apron & Filter Media	4.24 %
Other Works	2.78%	(1) Road Furniture	0.10%
		(2) Dismantling (Existing Bridge)	2.68%

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

Table 1.3.1

Stage of Payment	Percentage weightage	Payment Procedure
A-Widening and strengthening of existing road		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in a length of not less than 10 (ten) percent of the total length.
(1) Earthwork up to top of the sub-grade	0.00 %	
(2) Sub-Base Course	0.00 %	
(3) Non Bituminous Base Course	0.00 %	
(4) Bituminous Base Course	0.00 %	
(5) Wearing Coat	0.00 %	
(6) Widening and repair of culverts	0.00 %	Cost of completed culverts shall be determined pro rata basis with respect to the total no. of culverts. The payment shall be made on the completion of atleast five culverts.
B.1- Reconstruction/New 2-lane realignment/bypass (Flexible pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km. length, whichever is less.
(1) Earthwork up to top of the sub-grade	0.00 %	
(2) Sub Base Course	0.00 %	
(3) Non-Bituminous Course	0.00 %	
(4) Bituminous Base Course	0.00 %	
(5) Wearing Coat	0.00 %	
B.2- Reconstruction/New 2-lane realignment/bypass (Rigid pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km. length, whichever is less..
(1) Earthwork up to top of the sub-grade	0.00 %	
(2) Sub Base Course	0.00 %	
(3) Dry Lean Concrete (DLC) Course	0.00 %	
(4) Pavement Quality Control (PQC) Course	0.00 %	
C.1- Reconstruction/ New service road (Flexible pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 500 m. length, whichever is less.
(1) Earthwork up to top of the sub-grade	0.00 %	
(2) Sub Base Course	0.00 %	
(3) Non-Bituminous Course	0.00 %	
(4) Bituminous Base Course	0.00 %	
(5) Wearing Coat	0.00 %	

Stage of Payment	Percentage weightage	Payment Procedure
C.2- Reconstruction/ New service road (Rigid pavement)		Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 5(five) km. length, whichever is less.
(1) Earthwork up to top of the sub-grade	0.00 %	
(2) Sub Base Course	0.00 %	
(3) Dry Lean Concrete (DLC) Course	0.00 %	
(4) Pavement Quality Control (PQC) Course	0.00 %	
D- Reconstruction and New culverts on existing road, realignments, bypasses:	0.00 %	Cost of each culvert shall be determined on pro rate basis with respect to the total number of culverts. Payment shall be made on the completion of each culverts.
(1) Culverts (length < 6m)		

For example, if the total length of bituminous work to be done is 100 km, the cost per km of bituminous work shall be determined as follows:

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

Where P= Contract Price L = Total

length in km

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

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

Minor Bridges and Underpasses/Overpasses

Procedure for estimating the value of Minor bridge and Underpasses/Overpasses shall be as stated in

Table 1.3.2

Stage of Payment	Weightage	Payment Procedure
1	2	3
A.1-Widening and repair of minor bridges		
Length > 6m and < 60m	0.00 %	Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length of the minor bridges. Payment shall be made on the completion of widening & repair works of a minor bridge.
A.2- New and Re constructionof minor bridges		
(i) **Foundation +Sub-Structure:** On completion of the foundation work including foundations for wing and return walls, abutments, piers upto the abutment/pier cap.	0.00 %	(i) **Foundation +Sub- Structure:** Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. Payment against foundation + sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation +sub- structure of each bridge subject to completion of atleast two foundations along with sub-structure upto abutment/pier cap level of each bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) **Super-structure:** On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	0.00 %	(ii) **Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure of atleast one span in all respects as specified in the column of "Stage of Payment" in this sub-clause.
(iv) **Approaches**: On completion of approaches including Retaining walls, stone pitching, protection works complete in all respect and fit for use.	0.00 %	(iii) **Approaches:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of "Stage of Payment" in this sub-clause.
(v) Guide Bunds and River Training Works: On completion of Guide Bunds and river Training Works complete in all respects	0.00 %	(iv) **Guide Bunds and River Training Works:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of Guide Bunds and River training Works in all respects as specified.

Stage of Payment	Weightage	Payment Procedure
1	2	3
B.1-Widening and repair of underpasses/overpasses		Cost of each underpass/overpass shall be determined on pro rata basis with respect to the total linear length of the underpasses/overpasses. Payment shall be made on the completion of widening & repair works of a underpass/overpass.
B.2- New Underpasses/Overpasses:		
(i) Foundation : On completion of the foundation work including foundations and pile cap	0.00 %	Cost of each structure shall be determined on pro rata basis in respect to the total linear length (m) of all the structures. Payment shall be made on completion of each stage of structure as per the weightage given in the table.
(ii) Sub-structure: On completion of abutment, piers up-to the abutment / pier cap.	0.00 %	
(iii) Super – Structure: On completion of the structure along with super-structure, including crash barrier , approach slab , wearing coat , test on completion etc, elevated structure complete in all respect and fit for use.	0.00 %	
(iv) RE-Wall : (a) on casting and erection of re wall panel complete in all respect .	0.00 %	Payment shall be made on pro-rata basis on completion of 25% (twenty five percent) of the total area.
(b) Crash barrier, Friction slab.	0.00 %	Payment shall be made on pro-rata basis on completion of 25% (twenty five percent) of the total length.
(a) Approach slab	0.00 %	Payment shall be made on the pro rata basis on the completion of the work.
(v) Approach Road: a) Earthwork upto top of the sub-grade	0.00 %	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of stage in a length of not less than 10% of total length.
b) Sub base course	0.00 %	
c) Base course (wet mix macadam)	0.00 %	
d) Bituminous base course (dense graded bituminous macadam)	0.00 %	

e) Wearing coat	0.00 %	

Major Bridge works, ROB/RUB and Structures

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

Table 1.3.3

Stage of Payment	Weightage	Payment Procedure
1	2	3
A.1- Widening and repairs of Major Bridges	0.00 %	
(i) Foundation	0.00 %	(i) **Foundation:** Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro- rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the major Bridge subject to completion of atleast two foundations of the major Bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00 %	**(ii) Sub-Structure:** Payment against Sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of the major bridge subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge.
(iii) Super-structure (including bearings)	0.00 %	**(iii)Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	0.00 %	**(iv) Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00 %	**(v) Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	0.00 %	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.

Stage of Payment	Weightage	Payment Procedure
1	2	3
(vii) Guide Bunds, River Training works etc.	0.00 %	**(vii) Guide Bunds, River Training works:** Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(viii) Approaches (including Retaining walls, stone pitching and protection works)	0.00 %	**(viii) Approaches**: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
A.2- New/Reconstruction of Major Bridges		
(i) Foundation	31.87 %	(i) **Foundation:** Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridge. Payment against foundation shall be made on pro- rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the major Bridge subject to completion of atleast two foundations of the major Bridge. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	12.33 %	**(ii) Sub-Structure:** Payment against Sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of the major bridge subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the major bridge.
(iii) Super-structure (including bearings), Wearing Coat including expansion joints and Miscellaneous Items like hand rails, crash barriers, road markings etc.)	42.48 %	(iii) **Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	4.86 %	**(iv) Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	1.44 %	**(v) Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	0.00 %	(vi) **Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.

Stage of Payment	Weightage	Payment Procedure
1	2	3
(vii) Guide Bunds, River Training works etc.	4.24 %	(vii) **Guide Bunds, River Training works:** Payments shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(viii) Approaches (including Retaining walls, stone pitching and protection works)	0.00 %	**(viii) Approaches**: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
B.1 -Widening and repairs of	0.00 %	
(a) RUB	0.00 %	
(b) ROB	0.00 %	
(i) Foundation	0.00 %	(i) **Foundation:** Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROBs/RUBs. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the ROB/RUB subject to completion of atleast two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00 %	**(ii) Sub-Structure:** Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of the ROB/RUB subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the ROB/RUB.
(iii) Super-structure	0.00 %	**(iii)Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints in case of ROB. In case of RUB, rigid pavement under RUB including drainage facility as specified.	0.00 %	**(iv) Wearing Coat:** Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00 %	(v) **Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.

Stage of Payment	Weightage	Payment Procedure
1	**2**	**3**
(vi) Wing walls/return walls	0.00 %	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return wallscomplete in all respects as specified.
(vii) Approaches (including Retaining walls, stone pitching and protection works)	0.00 %	**(vii) Approaches**: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
B.2- New	0.00 %	
(a) RUB	0.00 %	
(b) ROB	0.00 %	
(i) Foundation	0.00 %	(i) **Foundation:** Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROBs/RUBs. Payment against foundation shall be made on pro- rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the ROB/RUB subject to completion of atleast two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00 %	**(ii) Sub-Structure:**. Payment against Sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of the ROB/RUB subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the ROB/RUB.
(iii) Super-structure (including bearings, Wearing Coat including expansion joints and Miscellaneous Items like hand rails, crash barriers, road markings etc.)	0.00 %	(iii) **Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints in case of ROB. In case of RUB, rigid pavement under RUB including drainage facility as specified.	0.00 %	**(iv) Wearing Coat:** Payment shall be made on completion of (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and (b) in case of RUB- rigid pavement under RUB including drainage facility complete in all respects as specified as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00 %	**(v) Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.

Stage of Payment	Weightage	Payment Procedure
1	**2**	**3**
(vi) Wing walls/return walls	0.00 %	**(vi) Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00 %	**(vii) Approaches**: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
C.1- Widening and repairs of Elevated Section/Flyovers/ Grade Separators		
(i) Foundation	0.00 %	(i) **Foundation:** Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures. Payment against foundation shall be made on pro- rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the structure subject to completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00 %	**(ii) Sub-Structure:** Payment against Sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of the structure subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the structure.
(iii) Super-structure (including bearings)	0.00 %	(iii) **Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	0.00 %	**(iv) Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00 %	(v) **Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	0.00 %	(vi) **Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.

Stage of Payment	Weightage	Payment Procedure
1	2	3
(vii) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00 %	**(vii) Approaches:** Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.
C.2 -New Elevated Section/Flyovers/ Grade Separators		
(i) Foundation	0.00 %	(i) **Foundation:** Cost of each structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures. Payment against foundation shall be made on pro- rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the structure subject to completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.00 %	**(ii) Sub-Structure:** Payment against Sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of the structure subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the structure.
(iii) Super-structure (including bearings)	0.00 %	(iii) **Super-structure:** Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	0.00 %	**(iv) Wearing Coat:** Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous Items like hand rails, crash barriers, road markings etc.	0.00 %	(v) **Miscellaneous:** Payments shall be made on completion of all miscellaneous works like hand rails, crash barriers, road markings etc. complete in all respects as specified.
(vi) Wing walls/return walls	0.00 %	**(vi)Wing walls/return walls:** Payments shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (including Retaining walls/Reinforced Earth wall, stone pitching and protection works)	0.00 %	(vii) **Approaches**: Payments shall be made on completion of both approaches including stone pitching, protection works, etc. complete in all respects as specified.

Note:(1) In case of innovate Major Bridge projects like cable suspension/cable stayed/ Extra Dozed and exceptionally long span bridges, the schedule may be modified as per site requirements before bidding with due approval of Competent Authority.

(2) The Schedule for exclusive tunnel projects may be prepared as per site requirements before bidding with due approval of Competent Authority.

Other Works

Procedure for estimating the value of other works done shall be as stated in:

Table 1.3.4

Stage of Payment	Weightage	Payment Procedure
1	2	3
(i) Toll plaza	0.00 %	Unit of measurement is each completed toll plaza. Payment of each toll plaza shall be made on pro rata basis with respect to the total of all toll plazas.
(ii) Road side drains	0.00 %	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10 % (ten per cent) of the total length.
(iii) Road signs, markings, km stones, safety devices,	0.10 %	
(iv) Project Facilities	0.00 %	Payment shall be made on pro rata basis for completed facilities.
a) Bus bays	0.00 %	
b) Truck lay-byes	0.00 %	
c) Junctions	0.00 %	
e) Incident Management System of 60 Months	0.00 %	Unit of measurement is monthly basis and will Start after Completion of work
(v) Roadside plantation	0.00 %	Unit of measurement is linear length.
(vi) Repair of protection works other than approaches to the bridges, elevated sections/ flyovers/grade separators and ROBs/RUBs.	0.00 %	Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten per cent) of the total length.
(vii) Approaches to ROB and Underpasses	0.00 %	**Approaches**: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of "Stage of Payment" in this sub-clause.

Stage of Payment	Weightage	Payment Procedure
vii) Safety and traffic management during construction	0.00 %	Payment shall be made on proratebasis every six months
viii) Site clearance and dismantling	2.68 %	Payment shall be made on pro rata basis on completion of the work.
ix) Miscellaneous(new Jersey Type crash Barrier , ,separator)	0.00 %	Unit of measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10 % (ten per cent) ofthe total length.
x) Lighting	0.00 %	Unit of measurement is number. Payment shall be made on completion of a stage in a number of not less than 10 % (ten per cent) of the total Numbers.
xi) Utility	0.00 %	Unit of measurement is number. Payment shall be made on completion of a stage in a number of not less than 10 % (ten per cent) of the total Numbers.

2. Procedure for payment for Maintenance

The cost for maintenance shall be as stated in Clause14.1.1.

Payment for Maintenance shall be made in quarterly installments in accordance with the provisions of Clause19.7 (a).