Schedule-A

(See Clauses2.1 and 8.1)

Site of the Project

1 The Site

(i) Site of the [Two-Lane] Project Highway/Bridge 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, treesand any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, andsuch inventory shall form part of the memorandum referred to in Clause 8.2 (i) of this Agreement.

(iv) The GAD of the Project Highway/Bridge are specified in Annex-III. The proposed profile of the Project Highways/Bridge shall be followed by the contractor with minimum FRL as indicated in the GAD. The Contractor, however, improve/ upgrade the Road/Bridge Profile as indicated in Annex-III based on site/design requirement.

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

Annex – I

(Schedule-A)

Site

1. Site

The Site of the ["Construction of 02 Lane New Ram Ganga and Baigul River Bridge with Approach road and Protection work parallel to old existing bridge near village Kolaghat Tahsil-Jalalabad on Jalalabad-Shamsabad-Mohmdabad-Saurikh-Vidhuna marg (SH-163) in Distt. Shahjahanpur. in the State of Uttar Pradesh.The land, carriage way and structures comprising the Site are described below.

2. Land

The Site of the Project Highway/ Bridge comprises the land (sum total of land already in possession and land to be possessed) as described below:

S.No.	Chainage(km)		Right of Way (m)	Remarks
	From	To		
1.				1.522 Hectare land require

3. Old Major Bridges

The Site includes the following old Major Bridge:

S.No.	Chainage (km)	Type of Structure			No. of Spans with span length (m)	Width (m)
		Foundation	Sub-structure	Super-structure		
1.		Well Foundation	Solid Pier 2 M dia,	PSC Beam, Deck Slab	1800 m	8.5M

4. Roadover-bridges (ROB)/Road under-bridges(RUB): NIL
5. Grade separators: NIL
6. Minor bridges : NIL
7. Railway level Crossings: NIL
8. Under passes (vehicular, non-vehicular) : NIL
9. Culverts: NIL
10. Busbays: NIL
11. Truck Lay byes: NIL
12. Road side drains: NIL
13. Major junctions: NIL
14. Minor junctions: NIL
15. Bypasses: NIL
17. Other structures: NIL

Annex–II

(AsperClause8.3(i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

S. No.	Work Detail	Date
1	90% ROW	On the appointed date.
2	Remaining 10% ROW	After 90 days from appointed date

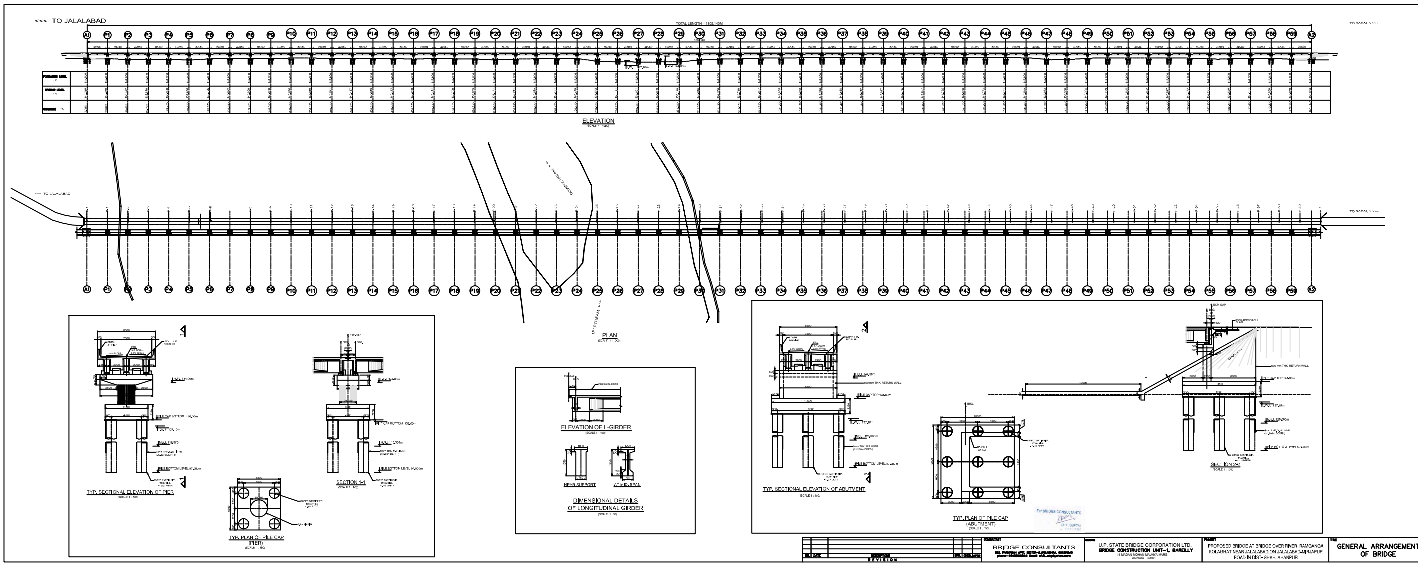
Annex - III

(Schedule-A)

Alignment Plans/GAD

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

Encl:GAD



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. R.L.'S ARE IN METRES.
2. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED. NO DIMENSION SHALL BE SCALED.
3. THE DIMENSIONS AND LEVELS SHOWN IN THIS DRAWING ARE TENTATIVE AND MAY UNDERGO CHANGES AT THE TIME OF DETAILED DESIGN.
4. ANGLE BETWEEN THE CENTER LINE OF BRIDGE AND THE FLOW OF WATER IN RIVER IS 90°.
5. GRADE OF CONCRETE FOR VARIOUS STRUCTURES SHALL BE AS FOLLOWS:-
   a) P.S.C. SUPERSTRUCTURE..........M45
   b) R.C.C. ABUTMENT, ABUTMENT CAP, PIER & PIER CAP..........M40
   c) R.C.C. CRASH BARRIER..........M40
   d) R.C.C. PILE FOUNDATION..........M40
6. THE BRIDGE SHALL BE DESIGNED FOR 2 LANES OF CLASS A OR 1 LANE OF CLASS 70R, WHICHEVER PRODUCES THE WORST EFFECT.
7. THE REINFORCEMENT SHALL BE OF THERMO MECHANICALLY TREATED (TMT) BARS (GRADE Fe500D) CONFORMING TO IS:1786-1985.
8. CABLE CONSISTING OF 19 Nos. OF 12.7mm DIA. 7-PLY CLASS 2 STRAND AS PER IS:6006-1983 SHALL BE USED FOR MAIN PRESTRESSING.
9. 65mm THICK ASPHALTIC WEARING COAT SHALL BE LAID OVER DECK SLAB.
10. THE REINFORCEMENT SHALL BE OF THERMO MECHANICALLY TREATED (TMT) BARS (GRAD Fe500D) CONFORMING TO IS:1786-1985.
11. HYDRAULIC DATA :-
    a) H.F.L. 144.00m
    b) L.W.L. 137.100m
    c) DISCHARGE (FOR CALCULATION OF SCOUR -AFTER MAKING NECESSARY INCREAMENT AS PER CLAUSE 703.1 OF IRC 78-2014..........15082 CMECS
    d) VERTICAL CLEARENCE ABOVE H.F.L..........1.5m
    IF THERE IS ANY DISCREPANCY IN THE ABOVE VALUES, THE MATTER SHOULD BE REPORTED TO THE DESIGN OFFICE.
12. GROUND LEVELS AT VARIOUS LOCATIONS/CHAINAGES ARE REPRODUCED FROM THE CROSS-SECTION GIVEN BY U.P.S.B.C.
13. SEISMIC PARAMETERS :-
    a) IMPORTANCE FACTOR..........1.5
    b) SEISMIC ZONE..........IV
14. GEOTECHNICAL DATA:-
    AS PER S.S.I. REPORT PROVIDED BY U.P.S.B.C. , THE FOLLOWING SOIL PARAMETERS HAVE BEEN TAKEN.
    a) SILT FACTOR (SCOUR ZONE)..........= 1.00
    b) VALE OF 'C' (GRIP ZONE)..........= 0.0 Kg./Cm^2
    c) VALE OF Ø (GRIP ZONE)..........= 30.0°
15. PILES SHALL BE BORED CAST-IN-SITU HAVING DIAMETER OF 1500mm. VERTICAL LOAD CARRYING CAPACITY AS PER SSI REPORT ARE AS BELOW,
    (i) VERTICAL LOAD CAPACITY OF 1500mmØ, 21 m DEEP PILES BELOW M.S.L. (AND TOTAL PILE DEPTH 41m) HAS BEEN TAKEN AS 525 MT.
16. DEPTH OF PILE FOUNDATION HAVE BEEN FIXED ON THE BASIS OF SOIL PARAMETERS MENTIONED ABOVE. IF THE PARAMETERS OF SOIL ACTUALLY MET ARE DIFFERENT, REVISED PILE DEPTHS HAVE TO BE ADOPTED.
17. BORED CAST IN SITU PILES OF 1500mm Ø SHALL HAVE PERMANENT LINER OF MINIMUM 6mm THICHNESS UP TO 1m BELOW M.S.L.
18. BACK FILLING MATERIALS SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS.
    a) Ø = > 30°
    b) c = 0
    c) y = 1.8T / CUM
19. SOIL DENSITY OF BACK FILL SHALL CONFIRM TO CLAUSE 305.2.1.5 OF MORT & H SPECIFICATION.
20. STRIP SEAL EXPANSION JOINT SHALL BE PROVIDED AT EVERY PIER, ABUTMENT LOCATION AND POT-PTFE BEARING SHALL BE PROVIDED UNDER EACH GIRDER.

CONSULTANT: BRIDGE CONSULTANTS	CLIENT: U.P. STATE BRIDGE CORPORATION LTD. BRIDGE CONSTRUCTION UNIT-1, BAREILLY 16-MADAN MOHAN MALVIYA MARG LUCKNOW - 226001	PROJECT: PROPOSED BRIDGE AT BRIDGE OVER RIVER RAMGANGA KOLAGHAT NEAR JALALABAD.ON JALALABAD-MIRJAPUR ROAD IN DIST-SHAHJAHANPUR	TITLE: GENERAL ARRANGEMENT OF BRIDGE	JOB NO. 326; SCALE: AS NOTED; DWG. NO. RAMGANGA(JALALABAD)/BC/01; REV. R0

REVISION

Annex – IV *(Schedule-A)*

Environment Clearances

NO clearance required

Schedule - B

(See Clause2.1)

Development of the Project Highway/Major Bridge

1. Development of the Project Highway/Bridge

Development of the Project Highway/Bridge shall include design and construction of the Project Highway/Bridge as described in this Schedule-B and in Schedule-C. The GAD of the Project on the location is specified as appended **in Annex-III of Schedule A** and shall be deemed to be part of this Schedule B.

2. Work

The shall include "Construction of 02 Lane New Ram Ganga and Baigul River Bridge with Approach road and Protection work parallel to old existing bridge near village Kolaghat Tahsil-Jalalabad on Jalalabad-Shamsabad-Mohmdabad-Saurikh-Vidhuna marg (SH-163) in Distt. Shahjahanpur, installation of road furniture and metal crash barrier, etc as described in Annex-I of this Schedule-B and in Schedule-C.

3. Specifications and Standards

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

Annex – I

(Schedule-B)

Description of Highway Project/Major Bridge

1. Construction of New Major Bridge alongwith 200 m approached on each side

(i) The Project Highway/Major bridge shall constructed parallel to the existing alignment of the old existing bridge unless otherwise specified by the Authority and shown in the alignment plans specified in Annex-III of Schedule-A. Geometric deficiencies, if any, in the existing horizontal and vertical profiles shall be corrected as per the prescribed standards for plain/rolling terrain to the extent land is available.

(ii) Width of Carriageway

The width of carriageway over bridge & its approaches shall be follow typical cross sections as enclosed to this Schedule B. Two-Lanning without paved shoulders shall be undertaken. The paved carriageway shall be [7(seven) m] wide in accordance with the typical cross section's drawings .

2. 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 Manual of Specification and Standards for Two Laning of Highways with paved shoulder - IRC:SP:73-2018.

2.2. Design Speed

The design speed shall be as specified in Clause 2.2 of the Manual IRC: SP: 73-2018 and Schedule D.

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:

2.4. Right of way

Refer to paragraph 2.3 of the Manual. The right of way is available as per Plan & profile.

2.5. Service Roads: NIL

2.6. Details of New Major Bridge/Approach Road on either side to be constructed:

1	**New Major Bridge**		
1.1	Span Arrangement	58 x 30.050 + 2 x 29.620	Refer GAD
1.2	Total length of Bridge	1802.140 m	
1.3	Minimum Vertical Clearance over HFL	1.5 m	
1.4	Formation Width of Major Bridge	8.50 m	7.5 m Carriageway + 2 x 0.50 m RCC Crash Barrier
1.5	Minimum design Discharge	15082 cumecs	Refer GAD Note 11
1.6	H.F.L	RL 144.000 m	
1.7	L.W.L	RL 137.100 m	
1.8	Maximum Scour Level for pier	RL 118.500 m	Cann't be higher than these levels whatever is the reason.
1.9	Maximum Scour Level for Abutment	RL 128.000 m	
1.10	Depth of 6 mm M.S liner for Pier Piles	20.50 m (Minimum)	
1.11	Depth of 6 mm M.S liner for abutment Piles	21.250 m (Minimum)	
1.12	Minimum grade of Concrete		
1.12.1	PSC Superstructure	M 45 (Minimum)	Refer GAD
1.12.2	RCC Substructure	M 40 (Minimum)	
1.12.3	RCC Crash barrier	M 40 (Minimum)	
1.12.4	RCC Pile Foundation	M 40 (Minimum)	
1.13	SEISMIC PARAMETER		
1.13.1	Importance Factor	1.5	
1.13.2	Seismic Zone	IV	
1.14	Silt factor (scour Zone)	1.00	Cann't be higher than this whatever is the reason.
1.15	Type of Expansion Joint	Strip seal joint	
1.16	Type of Bearing	POT-PTFE bearing	

2	**Approach Road**		
2.1	Formation Width	12.00 m	7.00m(Carriageway) + 2 x 2.50m(Earthen shoulder)
2.2	Paved Carriageway	7.00 m	
2.2	Length		
(a)	Jalalabad Side	200 m	
(b)	Badaun side	200 m	
2.4	Length of Metal crash barrier	2 x 2 x 200 m	
2.5	Side drains	2 x 2 x 200 m	

Note:

1. No major change in span arrangement given in tentative GAD as appended in Schedule A shall be entertained unless it is required as per constraint(s)and approved by Authority. Any excess financial implication due to required such changes shall be borne by the EPC contractor and any saving,if any, shall be adjusted accordingly.
2. 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.
3. Both banks of river shall be protected by protection work around each abutments and along each approaches as per codal and / or design requirement, specification utilising existing embankment.
4. 65 mm bituminous concrete (BC) wearing coat shall be provided on Main bridge.
5. RCC Crash barrier shall be provided with hand rail in accordance with IRC:5-2015 and relevant provisions.

3 PAVEMENT DESIGN OF APPROACH ROAD ON EITHER SIDE Of MAJOR BRIDGE

3.1 Type of Pavement

The flexible pavement shall be designed for the Main carriageway and Service/Slip Roads as per section 5 of Manual and in conformity with the IRC: 37-2018 for the minimum **design life of 20 years**. The crust composition for Main carriageway & service road, entry/ exit ramps shall be not less than as given below:

Sr. No.	Description of item	Minimum pavement Composition of Flexible Pavement (mm) for **Main Carriageway**
1	Bituminous Concrete (BC)	30
2	Dense Bituminous Concrete (DBM)	65
3	Wet Mix Macadam (WMM)	165
4	Granular Sub base (GSB)	250

3.2 Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the concessionaire shall design the pavement for Main Carriageway minimum design traffic of 5 MSA or as per the actual traffic at the time of construction whichever is higher.

4 DESIGN OF STRUCTURES

3.1 General

All structures shall be designed and constructed in accordance with section 7 of the Manual and shall conform to the cross-sectional features and other details specified therein.

3.2 Foundation

All piers shall be supported on group of piles (Minimum group of 4 piles per pier), connected by solid pile cap, the spacing of piles should be considered in relation to the nature of the ground, their behavior in groups and the execution.

The Minimum diameter and Founding level of Piles shall be as per below:

Type	Minimum diamter of Piles	Founding level of Piles (canot be higher than this)
(a) Pier Pile	1.5 m dia	RL 97.000 m
(b) Abutment Piles	1.5 m dia	RL 97.00 m

The pile shaft cannot be continued to act as a pier and such pile system shall not be allowed.

3.3 Substructure/Superstructure

The **Substructure/Superstructure** shall be designed and constructed in accordance with section 7 of the Manual and shall conform to the cross-sectional features and other details specified therein.

5 DRAINAGE SYSTEM FOR BRIDGE DECKS

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

6 TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS

The traffic control devices and road safety works shall be provided in accordance with Section 9 of the Manual. The reflective sheeting shall be provided in accordance with section 9.2.3 of the Manual and in conformity with the IRC: 67-2022.

7 ROADSIDE FURNITURE

Roadside furniture like Road Boundary Stones, km/Hectometer Stones, Railings, Traffic Impact Attenuators, and Delineators shall be provided in accordance with the provisions of Section 9 of the manual.

8 RETAINING WALLS & PROTECTION WORKS

Provide Retaining/RE walls in approaches to structures and at any other locations as per site conditions to contain the project facility within the available right of way as per the cross section provisions mentioned in Schedule-B conforming to Schedule "D".

Approaches to Fly-over shall be confined by RE walls only (due to land/utility/space constraint) and in any case no free slope will be permitted. In addition, RCC Breast wall of suitable dimensions (Length, width, height) shall be designed and provided to facilate slip roads within the available right of way.

Note: Any additional 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.

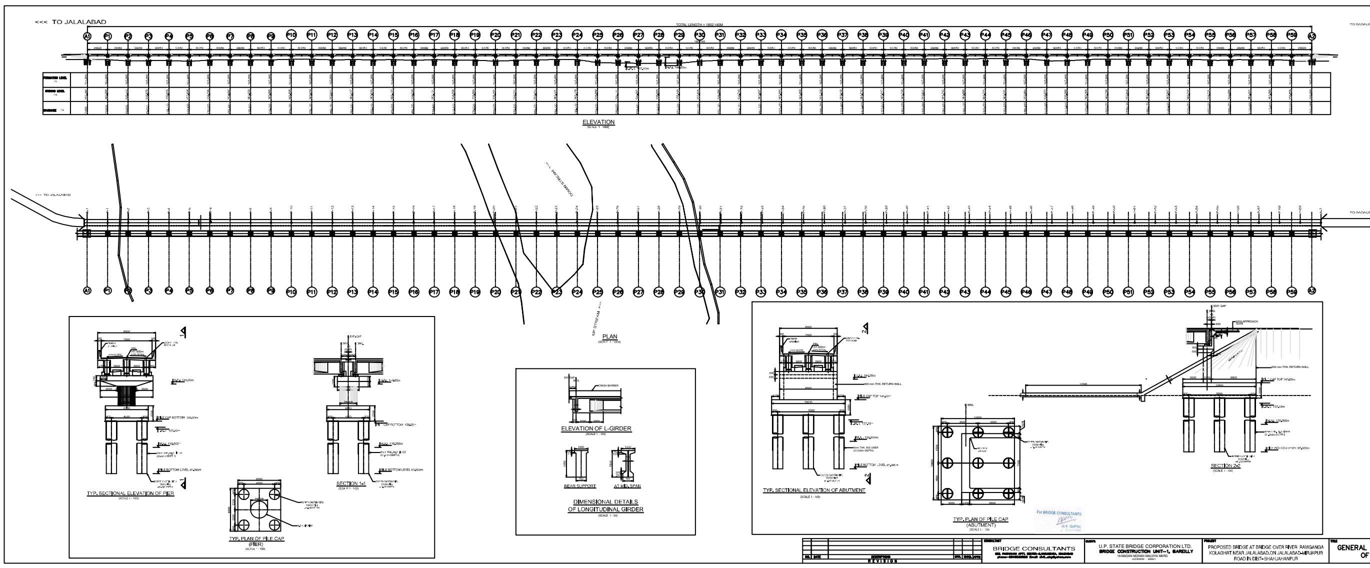
9 USE OF FLY-ASH

Use of fly-ash shall be considered in the construction as per latest NHAI guidelines/Policy circular's/MOEF guidelines dated 27/08/2018, No. 24028/14/2018-H.

10 CHANGE OF SCOPE

Any variations in the lengths specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

Typical Sections



NOTES:

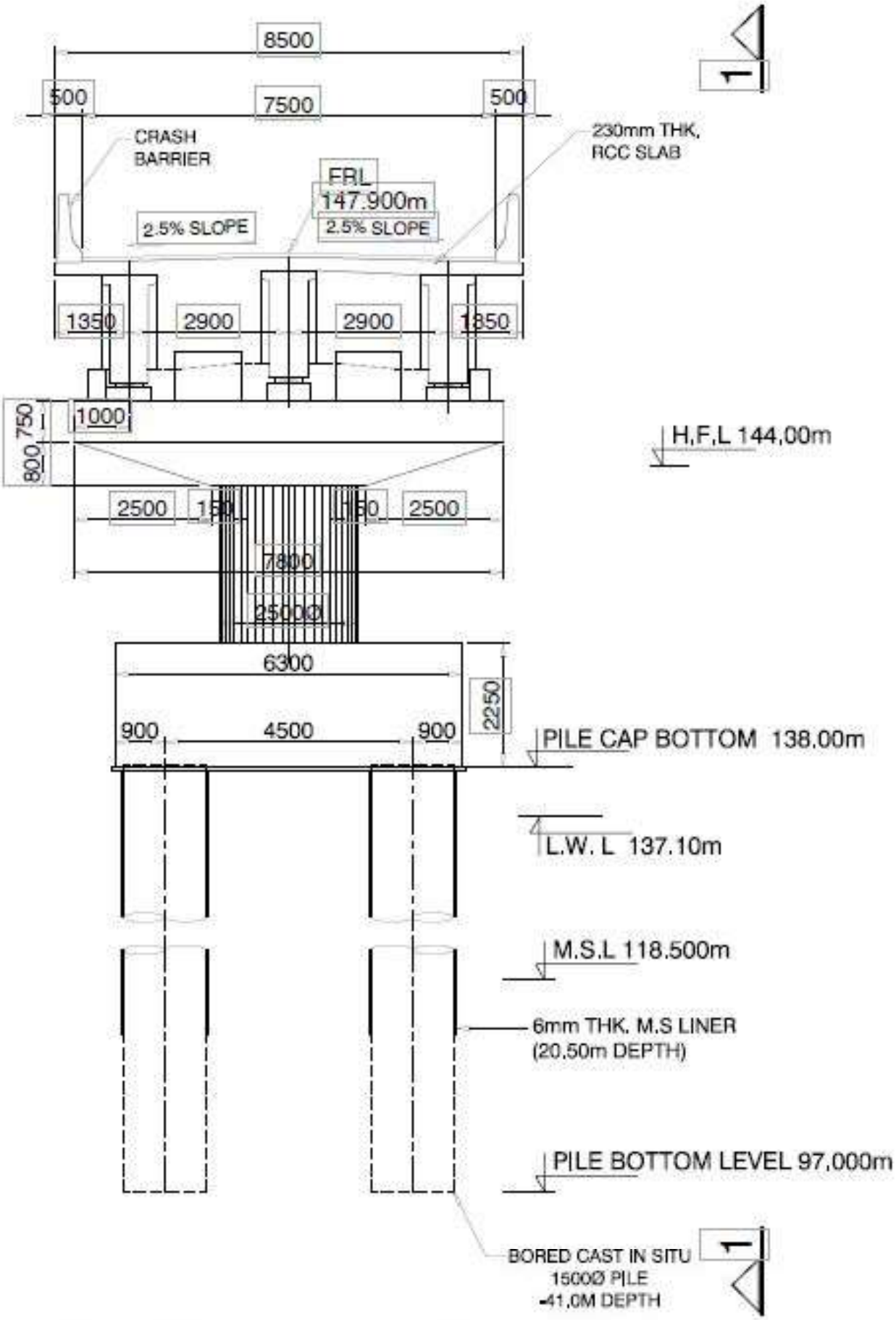
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. R.L.'S ARE IN METRES.
2. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED. NO DIMENSION SHALL BE SCALED.
3. THE DIMENSIONS AND LEVELS SHOWN IN THIS DRAWING ARE TENTATIVE AND MAY UNDERGO CHANGES AT THE TIME OF DETAILED DESIGN.
4. ANGLE BETWEEN THE CENTER LINE OF BRIDGE AND THE FLOW OF WATER IN RIVER IS 90°.
5. GRADE OF CONCRETE FOR VARIOUS STRUCTURES SHALL BE AS FOLLOWS:-
   a) P.S.C. SUPERSTRUCTURE....................M45
   b) R.C.C. ABUTMENT, ABUTMENT CAP, PIER & PIER CAP..........M40
   c) R.C.C. CRASH BARRIER....................M40
   d) R.C.C. PILE FOUNDATION....................M40
6. THE BRIDGE SHALL BE DESIGNED FOR 2 LANES OF CLASS A OR 1 LANE OF CLASS 70R, WHICHEVER PRODUCES THE WORST EFFECT.
7. THE REINFORCEMENT SHALL BE OF THERMO MECHANICALLY TREATED (TMT) BARS (GRADE Fe500D) CONFORMING TO IS:1786-1985.
8. CABLE CONSISTING OF 19 Nos. OF 12.7mm DIA. 7-PLY CLASS 2 STRAND AS PER IS:6006-1983 SHALL BE USED FOR MAIN PRESTRESSING.
9. 65mm THICK ASPHALTIC WEARING COAT SHALL BE LAID OVER DECK SLAB.
10. THE REINFORCEMENT SHALL BE OF THERMO MECHANICALLY TREATED (TMT) BARS (GRAD Fe500D) CONFORMING TO IS:1786-1985.
11. HYDRAULIC DATA :-
    a) H.F.L. 144.00m
    b) L.W.L. 137.100m
    c) DISCHARGE (FOR CALCULATION OF SCOUR -AFTER MAKING NECESSARY INCREAMENT AS PER CLAUSE 703.1 OF IRC 78-2014..........15082 CMECS
    d) VERTICAL CLEARENCE ABOVE H.F.L..........1.5m

    IF THERE IS ANY DISCREPANCY IN THE ABOVE VALUES, THE MATTER SHOULD BE REPORTED TO THE DESIGN OFFICE.
12. GROUND LEVELS AT VARIOUS LOCATIONS/CHAINAGES ARE REPRODUCED FROM THE CROSS-SECTION GIVEN BY U.P.S.B.C.
13. SEISMIC PARAMETERS :-
    a) IMPORTANCE FACTOR..........1.5
    b) SEISMIC ZONE..........IV
14. GEOTECHNICAL DATA:-

    AS PER S.S.I. REPORT PROVIDED BY U.P.S.B.C. , THE FOLLOWING SOIL PARAMETERS HAVE BEEN TAKEN.
    a) SILT FACTOR (SCOUR ZONE)....................= 1.00
    b) VALE OF 'C' (GRIP ZONE)....................= 0.0 Kg./Cm²
    c) VALE OF Ø (GRIP ZONE)....................= 30.0°
15. PILES SHALL BE BORED CAST-IN-SITU HAVING DIAMETER OF 1500mm. VERTICAL LOAD CARRYING CAPACITY AS PER SSI REPORT ARE AS BELOW,

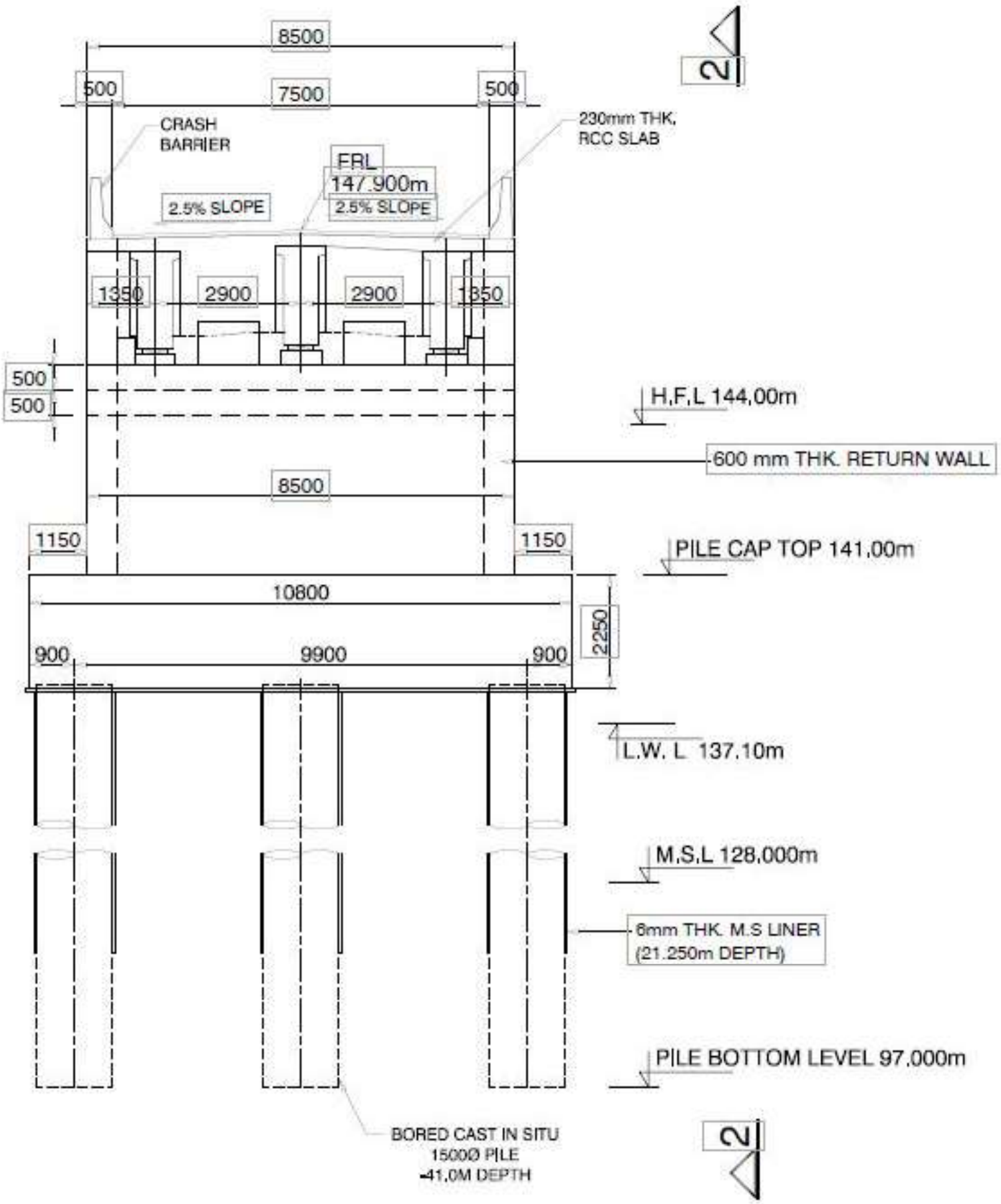
    (i) VERTICAL LOAD CAPACITY OF 1500mmØ, 21 m DEEP PILES BELOW M.S.L. (AND TOTAL PILE DEPTH 41m) HAS BEEN TAKEN AS 525 MT.
16. DEPTH OF PILE FOUNDATION HAVE BEEN FIXED ON THE BASIS OF SOIL PARAMETERS MENTIONED ABOVE. IF THE PARAMETERS OF SOIL ACTUALLY MET ARE DIFFERENT, REVISED PILE DEPTHS HAVE TO BE ADOPTED.
17. BORED CAST IN SITU PILES OF 1500mm Ø SHALL HAVE PERMANENT LINER OF MINIMUM 6mm THICHNESS UP TO 1m BELOW M.S.L.
18. BACK FILLING MATERIALS SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS.
    a) Ø = > 30°
    b) c = 0
    c) γ = 1.8T / CUM
19. SOIL DENSITY OF BACK FILL SHALL CONFIRM TO CLAUSE 305.2.1.5 OF MORT & H SPECIFICATION.
20. STRIP SEAL EXPANSION JOINT SHALL BE PROVIDED AT EVERY PIER, ABUTMENT LOCATION AND POT-PTFE BEARING SHALL BE PROVIDED UNDER EACH GIRDER.

REVISION	CONSULTANT	CLIENT	PROJECT	TITLE		
NO. DATE DESCRIPTION DRN. CHKD. APPD.	BRIDGE CONSULTANTS	U.P. STATE BRIDGE CORPORATION LTD. BRIDGE CONSTRUCTION UNIT-1, BAREILLY 16-MADAN MOHAN MALVIYA MARG LUCKNOW - 226001	PROPOSED BRIDGE AT BRIDGE OVER RIVER RAMGANGA KOLAGHAT NEAR JALALABAD,ON JALALABAD-MIRJAPUR ROAD IN DIST-SHAHJAHANPUR	GENERAL ARRANGEMENT OF BRIDGE	JOB NO. 326 SCALE AS NOTED DATE JUN. 2023	DWG. NO. RAMGANGA(JALALABAD)/BC/01 REV R0



TYP. SECTIONAL ELEVATION OF PIER

(SCALE 1 : 100)



TYP. SECTIONAL ELEVATION OF ABUTMENT

(SCALE 1 : 100)

Schedule-C

(See Clause2.1)

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) Tollplaza[s]; Nil

(b) Road side furniture; as per manual

(c) Pedestrian facilities; Nil

(d) Tree plantation; Nil

(e) Trucklay-byes; Nil

(f) Bus-bays and busshelters; Nil

(g) Restareas; and others to be specified: Nil

2. Description of Project Facilities: NIL

Each of the Project Facilities is described below:

Sl. No.	ProjectFacility	Location	Design Requirements	Other essential details

Note: Provide adequate details of each Project Facility to ensure their design and completion in accordance with the project-specific requirements and the provisions of the Manual.

SCHEDULE – D

SPECIFICATIONS AND STANDARDS

1 Construction

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

2 Design Standards

The Project Highway including Project Facilities shall conform to the design requirements set out in the following documents:

- Manual of Specifications and Standards for Two Laning of Highways (IRC: SP: 73-2018) referred to herein as the Manual as applied to proposed higway.
- IRC:SP: 88-2019
- **IRC:SP: 90-2010**
- IRC: 99-2018 & IRC:SP 102-2014
- IRC: SP 21-2009
- IRC: SP 55-2014
- IRC: SP: 113-2018
- IRC: SP 119-2015

Design standards are included in the tables below.

S. No	Description	Design Code
1.	Geometric Designs & standards	IRC:38 Guidelines for the design of horizontal curves
		IRC: SP-23 – Vertical curves for Highways
		IRC:39 – Standards for Road rail level crossings
		IRC:64– Capacity of Roads in Rural Areas
		IRC:66 – Sight Distance on Rural Highways
		IRC:73 – Geometric Design Standards for Rural (non-urban) Highways
		IRC:75 – Guidelines for design of High Embankment
		IRC:86 – Geometric Design standards for urban roads in plains
		IRC:106 – Guidelines on the capacity of urban roads in plain areas
2.	Design of Pavement	IRC:37 – Guidelines for Design of Flexible Pavement
		IRC:58 – Guidelines for Design of Rigid Pavements
		IRC:115 – Guidelines for strengthening of flexible pavements
3.	Junctions/Intersections/ interchanges	IRC:65- Traffic Rotaries
		IRC:92 - Guidelines for Design of Interchanges
		IRC: SP:41 – Design of At grade junctions
4.	Kilometer stones, 200m stones, and boundary pillar	IRC:81 – Type Design for Highway kilometer stones
		IRC:26 -Type design for 200m stones
		IRC:25 -Type design for boundary stones
5.	Traffic Signs	IRC:31 – Route marker signs for state routes
		IRC:67 – Code of practice for road signs
		IRC:79– Recommended practice for Road Traffic signs

S. No	Description	Design Code
		IRC:SP:31 – Road Traffic signs
6.	Road Markings	IRC:35 – Code of practice for road markings, road delineators
7.	Ancillary Works	IRC:80 – Type design for pick-up bus stops on Rural Highways
		IRC: SP: 12 – Guidelines on the provision of parking areas.
8.	Drainage	IRC: SP:42 – Guidelines on Road Drainage
		IRC: SP:50 – Guidelines on urban drainage
9.	Safety Measures	IRC:103 – Guidelines for pedestrian facilities
		IRC:SP:44 – Highway Safety Code
		IRC: SP:55 – Guidelines for safety in construction zones
10.	Bridges and Structures	IRC: 5 – Standard Specification and Code of Practice for Road Bridges, Section 1 – General Features of Design
		IRC: 6 – Standard specifications and code of practice for Road bridges (Section: II) Loads and Load combinations
		IRC: 21 – Standard Specification and Code of Practice for Road bridges, Section III – Cement Concrete (Plain and reinforced)
		IRC: 112 – Code of practice for concrete road bridges
		IRC: SP:13– Guidelines for the design of small bridges and culverts
		IRC: 78 – Standard Specification and Code of Practice for Road Bridges, Section VII – Foundation and Substructure
		IRC: 83- (Part I) – Standard Specification and Code of Practice for Road bridges, Section IX – Bearing, Part I: Roller & Rocker Bearing
		IRC: 83- (Part II) – Standard Specification and Code of Practice for Road bridges, Section IX – Bearing, Part II: Elastomeric Bearings
		IRC: 83- (Part III) – Standard Specification and Code of Practice for Road bridges, Section IX – Bearings, Part III: POT, PIN, Metallic Guide and Plane Sliding Bearings
		IRC: 89 - Guidelines for design and construction of River Training and Control Works for Road Bridges
		IRC: SP:35 – Guidelines for inspection and Maintenance of Bridges
		IRC: SP: 40 – Guidelines on Repair, Strengthening, and Rehabilitation of Concrete Bridges.
		IRC: SP: 114 – Guidelines for seismic design of road bridges
		IRC: SP:65-2018: Guidelines for Design and Construction of Segmental Bridges (First Revision)
		-2016: Guidelines for Design of Continuous Bridges (First Revision)

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 Six-Laning of Highways (IRC: SP: 87-2019), as the case may be referred to as the Manual, and MORTH Specifications for Road and Bridge Works 5th Revision 2013. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Employer's Representative.

2 Deviations from the Specifications and Standards

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

2.2 Notwithstanding anything to the contrary contained in Paragraph 1 above, the following specifications and standards shall apply to the project highway, and for purposes of this agreement; the aforesaid specifications and standards shall be deemed to be amended to the extent set forth below. Measures shall be provided to mitigate safety and other hazards arising from each of the following deviations from the Specifications and Standards. Measures to mitigate safety hazards shall address any recommendations contained in the Road Safety Audit Reports.

Sl. No.	Clause No.	Description	Deviation
1	Clause 2.2	Design Speed: Ruling or minimum Design speed shall be followed	The minimum design speed shall be 80 kmph and as per Plan & Profile drawing as appended in Schedule A.
2	Clause 2.6	Type and width of Shoulders	The type and Width of shoulders shall be as per the **Typical cross sections as per GAD as enclosed in Schedule A & B**
3	Clause 2.17 of IRC: SP:87-2019	Typical Cross Sections	Typical Cross Sections shall be as per the **GAD as enclosed in Schedule A & B**
4	Clause 4.2	Road Embankment: Principles for the height of the embankment	The minimum FRL shall be followed as per the **GAD as appended in Schedules A & B.**
5	Clause 5.2 & 5.2.1	Provision of Flexible or Rigid pavement	The type of Pavement shall be flexible**.**
6	Clause 5.4.1 (i)	Design period of Flexible Pavement	Flexible Pavement shall be designed for a minimum design period of 20 years.
7	Clause 5.11	Earthen Shoulders	Earthen Shoulders on either side of the road shall be of selected earth with MDD not less than 17.5 kN/cu.m. and 4-day soaked CBR of min 9% at min 97% of dry density, placed on top of granular sub-base (that is an extension from pavement upto the daylight). The PI and LL shall not exceed 6 and 25 respectively. The remaining portion shall conform to section 300 of MoRTH Specifications.
8	Clause 7.3 (ii)	Deck Width of bridge	The deck width of bridge shall be as per **TCS given in GAD as appended in Schedule A & B.**

Sl. No.	Clause No.	Description	Deviation
9	MoRTH Specification no. 501.3, 505 & 507	Hot mix plant for Bituminous Mixes	All bituminous courses (bituminous base course/wearing course) shall be carried out using a type Hot Mix Plant of 100-120 TPH capacity having a minimum output of 75 TPH.

1.3 Any deviations from standards shall require advanced approval by the Authority's Engineer. The Contractor shall also prepare a Table of Deviations for deviations from standards which lists each deviation, location, justification, and other relevant information.

1.4 In the absence of any definite provisions on any particular issue in the aforesaid Specifications, reference may be made to the latest codes and Specifications of IRC, BIS, BS, ASTM, AASHTO, and CAN/CSA in that order. Where even these are silent, the construction and completion of the works shall conform to sound engineering practice as approved by the Authority Engineer / Authority.

SCHEDULE - H

See Clauses10.1 (iv) and 19.3

Contract Price Weightages

1.1 The contract price for this agreement is **Rs.** **(excluding GST)**

1.2 Proportions of the Contract Price for different Stages of Construction of the Project Highway shall be considered.

Item	Weightage in Percentage to the contract Price	Stage of Payment	Percentage Weights
1	2	3	4
1. Approach Road (Flexible pavement)	1.2%	i) - Earthwork	30.95%
		ii) - Sub grade + GSB	25.13%
		iii) - WMM + Bituminous work + Approach slab	40.98%
		iv) **Metal Crash Barrier (**Both Sides)	2.94%
2. Major Bridge	97.48%	(i) Foundation	61.92%
		(ii) Sub Structure	8.40%
		(iii) Super Structure i/c Bearing	26.98%
		(iv) Wearing Coat i/c Expansion Joint	0.71%
		(v) Miscellaneous work (Crash Barrier + Hand Rail + Weep Holes + Drain Pipe)	1.99%
3. Other works	1.31%	(i) Protection Work	89.48%
		(ii) Road markings + Road Signage + Overhead Sign Board + Painting (Crash Barrier, Kerb)+ km stones etc.	2.62%
		(iii) Road side drains	7.89%

1.3 The procedure for estimating the value of work done :

1.3.1 Road Works:

Stage of Payment	Payment Procedure
1	**2**
Construction of Approach Road (Flexible pavement)	
i) - Earthwork	The unit of measurement is linear length. Payment of each stage shall be made on a pro-rata basis on completion of a stage in full length.
ii) - Sub grade + GSB	
iii) - WMM + Bituminous work + Approach Slab	
iv) **Metal Crash Barrier (**Both Sides)	

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 refer to other clauses of the Contract Agreement.

1.3.2 Major Bridge

Stage of Payment	Payment Procedure
1	2
(i) Foundation	The cost of each foundation shall be determined on a pro-rata basis with respect to the total number of foundations.Payment against the foundation shall be made on a pro-rata basis on completion of a stage i.e. completion of at least one foundation up to pile cap level. In case load testing is required for the foundation, the trigger of the first payment shall include load testing where specified.
(ii) Sub Structure	Payment against Sub-structure shall be made on a pro-rata basis on completion of a stage i.e. the completion of one sub-structure of abutment/pier up to its cap level.
(iii) Super Structure i/c Bearing	Payment shall be made on a pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of at least one span in all respects as specified. 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be on completion of stage as above.
(iv) Wearing Coat i/c Expansion Joint	Payment shall be made on completion of the wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous work (Crash Barrier + Hand Rail + Weep Holes + Drain Pipe)	Payments shall be made on completion of all miscellaneous works like handrails, crash barriers, road markings, etc. complete in all respects as specified.

1.3.3 Other works

Stage of Payment	Payment Procedure
1	2
Other works	
(i) Protection Work	Payments shall be made on completion of all works.
(ii) Road markings + Road Signage + Overhead Sign Board + Painting (Crash Barrier, Kerb)+ km stones etc.	The unit of measurement is linear length in km. Payment shall be made on a pro-rata basis on completion of a stage in a length of not less than 50 % (Fifty percent) of the total length.
(iii) Road side drains	Payments shall be made on completion of all works.